Hindawi
Advances in Civil Engineering
Volume 2021, Article ID 7859284, 9 pages
https://doi.org/10.1155/2021/7859284

Research Article

Study on Development Risk of Overseas Transportation Infrastructure under the New Form Based on Interpretive Structure Model

Liang Ou,[1] **Chongsen Ma**,[1] **Yun Chen**,[1] **and Jing Zhang**[2]

[1]*School of Traffic & Transportation Engineering, Changsha University of Science and Technology, Changsha 410000, Hunan, China*
[2]*Hunan Kunqiao Engineering Project Management Co., Ltd., 410000 Hunan, China*

Correspondence should be addressed to Liang Ou; 3055471394@qq.com

Received 17 November 2021; Accepted 2 December 2021; Published 16 December 2021

Academic Editor: Mingfeng Lei

With the improvement of China's comprehensive national strength, more and more construction enterprises began to undertake overseas construction projects. Under the premise of the epidemic situation and the increasingly severe international situation, it is of great significance to study the risk control of overseas transportation infrastructure construction. This paper constructs the risk influencing factor model of overseas transportation infrastructure development risk in the new form from six aspects, that is, decision-making risk, design and planning risk, construction risk, operation risk, government risk, and force majeure, and uses the interpretative structure model and fuzzy comprehensive evaluation method. The key factors affecting the risk of overseas transportation foundation design and development are studied, and the adaptive solutions are put forward.

1. Introduction

Construction of transportation infrastructure plays an important role in promoting economic growth and promoting the upgrading and development of the tertiary industry. In recent years, there have been many breakthroughs in the construction of transportation infrastructure, one of which is the increasing overseas construction of transportation infrastructure aboard. Meanwhile, a number of major livelihood and manufacturing projects in key fields have also made important progress. The breakthrough of overseas transportation infrastructure construction mainly stems from the new facing situation: (1) with the continuous development of the national Belt and Road Initiative strategy, Chinese enterprises are facing a major opportunity to go abroad to participate in the construction of overseas transport infrastructure. (2) Diverse construction content and enrichment of resources lead transportation infrastructure to a tertiary industry service facility construction. (3) With the increasing traffic demand all over the world, overseas transportation infrastructure construction has the characteristics of larger investment, long-scale construction duration, and policy uncertainty, which led to a greater risk. In particular, it also faces the influence of special risk factors such as poor control of construction land, political instability, and social conflict caused by the normalization of epidemic situation. (4) Transformation of ways to realize profit: the more profit attention is paying to operation duration from the original profit mainly relying on transportation infrastructure construction. Therefore, it is of great significance for Chinese infrastructure enterprises to research the risk assessment of overseas transportation infrastructure development and clarify the means to deal with the risk.

Construction enterprises can make full use of advanced experience in China's construction industry and export China's standards while developing overseas transportation infrastructure investment projects, which can not only establish a good image in the world and enrich China's experience in overseas investment, but also realize the "going global" policy of China's construction industry. Investment

in overseas transportation infrastructure is a very important part of China's overseas strategy, which is of great significance to drive the increase of China's exports, promote the peripheral economic growth, and realize the mutual progress with surrounding countries.

At present, the research on risk management of transportation infrastructure construction has attracted more and more attention of some scholars domestically and abroad. Since 2014, the research on risk management of transportation infrastructure has increased rapidly, which focuses on "Belt and Road Initiative risk rating," "the PPP risk allocation," and "risk assessment of financing securitization." The main research and evaluation methods include difference-in-difference model, analytic hierarchy process, and fuzzy set. The research content covers a wide mature range, but few study on development risk factors analysis of overseas transportation infrastructure.

Li et al. studied the risk assessment of cross-border transportation infrastructure construction projects and improved the fuzzy comprehensive evaluation method on the premise of considering the dual correlation effect [1]; Jin and Suo put forward a risk assessment method of transportation infrastructure construction based on stochastic DEMATEL-VIKOR considering relevance and randomness [2]; Chang studied the risks related to profits distribution in the process of transportation infrastructure construction and modified the profits distribution model based on Shapley value [3]; Zolfaghari and Mousavi proposed a combined decision-making model based on fuzzy set and Shapley value method to research risk assessment of transportation infrastructure construction projects [4].

The risk assessment of overseas transportation infrastructure development and construction has three characteristics: firstly, the increased diversity of risks. Due to the high construction project investment with long construction cycle characteristics, the corresponding risks have more diverse and uncertain characteristics. The second characteristic is the increased correlation of risks. In the process of transportation infrastructure development, various risks are interrelated and affect each other. If they are not handled properly in the process, the correlated risks may cause chain effect; thirdly, there are great differences in the development environment, which include great differences in the political system, economic development level, and cultural atmosphere of various countries that lead to different types of risks in different actual development process. Meanwhile, most of the existing studies focus on the risk of a specific stage in the development process, but less research on the impact of the corelated risks analysis from the whole process. In actual implementing condition, it is easy to ignore the direct correlation impact of risks, resulting in result deviation. Therefore, it is necessary to solve the above problems through the research on the whole process of overseas transportation infrastructure construction and development.

This research takes the advantages of the interpretive structure model with the fuzzy comprehensive evaluation and build the basic directed graph of risk impact factors through the interpretive structure model as a reference, solving the problems of numerous and complex, difficulties, and contradictions of expert scoring and index selection to put forward corresponding solutions according to identified risks. By combining interpretive structure model with fuzzy comprehensive evaluation, a directed topology hierarchy diagram of risk factors is provided to enable experts to have a general understanding of the relationship between various dimensions of many influencing factors to reduce the roughness and imprecision and improve reliability of results. At the same time, compared with the previous method of directly substituting the data of explaining the structural model into the calculation of fuzzy comprehensive matrix, it improves the correlation between the two different models, so that the model avoids rigid fusion in the process of application, which leads to more reasonable result. Therefore, the method adopted in this paper has better reliability and rationality.

2. Models and Methods

2.1. Interpretative Structural Modeling (ISM) Related Concepts. The concept of Interpretative Structural Modeling Method (ISM) is proposed by Professor Linstone. Interpretative Structural Modeling finds out the relationship between the elements of the system through certain technologies and means and classifies the complex relationships between the elements through the form of directed graphs, improving the researchers' understanding of the internal system and relationship of the subjects.

There exist many design risk factors with long duration, and many factors which are difficult to be quantified in the process of overseas transportation infrastructure development. Therefore, before factors analysis and model-building, this research selects the interpretative structural model to analyze the risk factors in the whole process of overseas transportation infrastructure development and establishes a preliminary directed graph through research, which helps solve the problems in the analysis process of fuzzy analytic hierarchy process, such as many influencing factors and heavy workload of filling data in the judgment matrix. The process of using ISM method to study the risk influencing factors development process of overseas transportation infrastructure is shown in Figure 1.

2.2. Fuzzy Analytic Hierarchy Process Related Concepts. Analytic Hierarchy Process (AHP) has been widely used in various evaluation methods dominated by subjective cognition. However, in the calculation process of traditional analytic hierarchy process, the construction of judgment matrix is greatly affected by subjective factors. The consistency test of judgment matrix is complex and cumbersome, and the rationality of consistency judgment rules is also controversial. In order to solve the above problems, scholars proposed to introduce the fuzzy consistent matrix into the AHP analysis. This method combining the analytic hierarchy process (AHP) with the fuzzy mathematics theory is called the fuzzy analytic hierarchy process (FAHP), which can well solve the decision-making of people's subjective fuzziness on the problem. For fuzzy analytic hierarchy process, in the

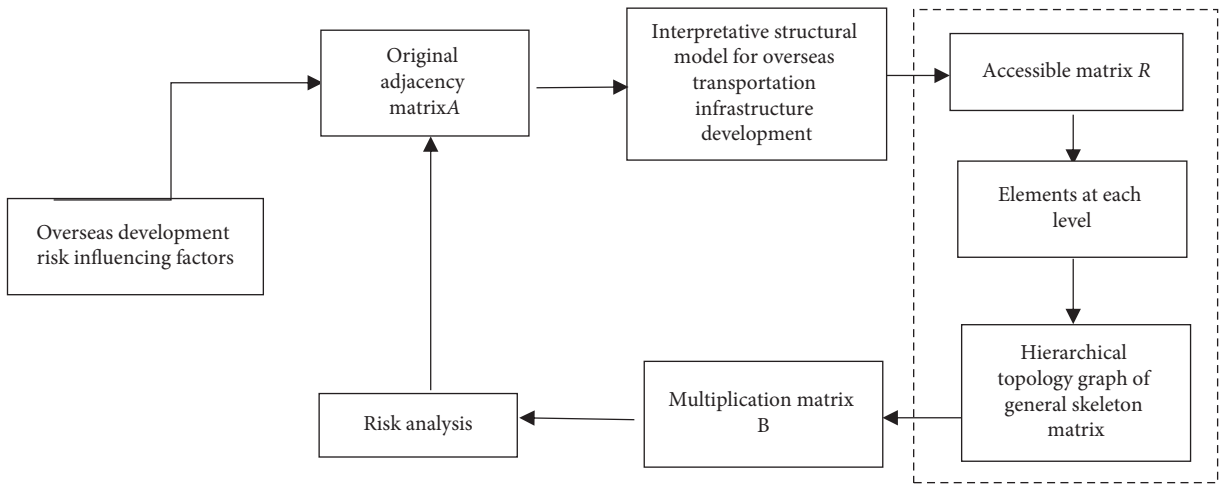

Figure 1: Steps of structural model calculation.

process of questionnaire filling, if the CI value does not meet the requirements of the request, the research would use particle swarm optimization algorithm to modify the questionnaire. On this basis, the questionnaire retains expert opinions to extremely extend and also meet the requirements of matrix calculation.

2.3. Concepts Related to Transport Infrastructure. Transportation infrastructure refers to the fixed assets public infrastructure facilities needed to complete passenger transport and logistics, mainly divided into the following five categories: railway transport infrastructure, road transport infrastructure, waterway transport infrastructure, air transport infrastructure, and pipeline transport infrastructure. Due to the difficulty of obtaining some data, this research mainly selects the risk factors of railway transport infrastructure and highway transport infrastructure as the research object, for which cross-border highways and high-speed railways, as an important part of the relevant infrastructure construction about the Belt and Road Initiative promoting infrastructure construction and realizing the interconnection between countries along the route, also make the research of this paper more practical.

The "new form" mentioned in this paper refers to the behavior of overseas infrastructure construction in response to the call of the "Belt and Road" and "going global" in the new stage of large construction enterprise development in order to obtain sustainable interests and expand the scale.

The new form is reflected in the following three points: firstly, with the saturation of the domestic market, overseas construction enterprises will continue to increase, and competition will become more intense; secondly, the scope of project construction continually expand not only for Chinese enterprises, but also for neighboring friendly countries that continue to cooperate and develop, to achieve a global layout; thirdly, with the continuous effect of coronavirus epidemics, the normalization of epidemic prevention and control will be gradually accepted. And in the development process of the project, it will be greatly affected by the level of epidemic prevention and control of the sovereign government of the construction site.

3. Quantitative Evaluation Research

3.1. Determination of Risk Evaluation Index

3.1.1. Selection of Risk Factors. The selection of risk factors is the premise of risk analysis of overseas transportation infrastructure development. The paper takes the following three steps to select risk factors:

(1) Based on the existing literature, the risk factors were preprocessed by manual screening.

(2) By seeking the internal relevance of the risk factors preliminarily determined, the seven criteria layer indicators of decision-making risk, construction risk, operational risk, government risk, investment and financing risk, legal risk, and force are finally determined, and the initial list of risk factors is finally formed.

(3) In the aspect of factor correction, relevant experts and relevant researchers from enterprises such as the Central South Institute of Chinese Municipalities are required to seek expert opinions through online surveys and revise the indicators. Finally, 24 evaluation layer indicators were determined. For risk factors of overseas transportation infrastructure development, see Table 1.

Key indicators indicate the following:

(1) Decision-making risk refers to the risk factors that may affect the completion of the project in the process of project decision-making, including decision-making conditions change risk, decision-making expertise, and decision-making information collection integrity of three indicators. The risk of decision-making condition change refers to the risk caused by the change of the main conditions that are dependent on in the decision-making process mainly

Table 1: Risk factors of overseas transportation infrastructure development.

Target level	Criterion level	Index level
Influencing risk factors of overseas transportation infrastructure development [5–11]	Decision-making risk	Decision-making conditions change risk
		Decision-making expertise risk
		Decision-making information collection integrity risk
	Construction risk	Quality of infrastructure construction
		Construction license convenience
		Safety awareness of local construction personnel
		Normative differences
		Labor efficiency difference
	Operation risk	Management talent reserve
		Local transport developments
		Labor cost of construction
	Policy risk	Eternal policy environment
		External policy environment
		Local government corruption situation
		Religion conflict
	Investment and financing risk	Currency risk
		Economic pattern risk
		Banks lending risk
		Local government debt default risk
	Legal risk	Government stability risk
		Risk of legal differences
		Justice of law enforcement
	Risk of force majeure	Risk of force majeure of political environment
		Risk of force majeure of social environment

due to the change of time and construction situation in the actual construction of the project.

(2) Construction risk refers to the construction risk caused by the construction party itself or external reasons in the process of project construction due to unpredictable factors. In this process, special attention should be paid on the inevitable use of overseas workers in overseas construction process. Therefore, the difference in labor efficiency domestic and abroad has a great impact on project implementation.

(3) Operational risk refers to the risk that occurs during the operation of the project from bidding to the end of the operation period, including relevant management talent reserves, local transportation situation, and construction labor costs. The labor cost of construction site not only refers to the personnel cost in the construction process but also includes the cost of the operation process. Throughout the whole development process, the difference of personnel costs domestic and abroad has a great impact on the success or failure of project operation. Therefore, the construction site labor costs should be attributed to operational risks.

(4) Government risk is also known as political risk. It includes four main influencing factors: internal environment (politics), external environment (politics), government corruption, and religious conflict risk. The stability of the regime in the construction site and the social stability have a great impact on the transportation infrastructure projects that focus on operation. Therefore, it is necessary to make a reasonable assessment of project risks.

(5) Investment and financing risks refer to the risks related to the economy in the process of investment and financing, including the selection of project investment and financing mode, the default risk of participants in the process, the risk of the debtor failure to perform relevant responsibilities, and macroeconomic impact risk. Due to the large investment, high development difficulty of transportation infrastructure construction projects, most of them need to select reasonable and proper financing mode for project construction. Therefore, reasonable control of this type of risk is of great significance for the completion of construction project.

(6) Legal risk refers to the risk related to legal issues in the whole life cycle of the project.

(7) Force majeure risk includes political environment force majeure risk and social environment force majeure risk.

In order to determine the final evaluation index, the paper makes a pretest on the determined initial index. The dimensions, reliability, and validity of the indicators were analyzed. The indicators are determined by questionnaire, online survey, and offline survey.

Table 2: Validity analysis.

Index item	Influencing factor loading coefficient						
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Decision-making conditions change risk				0.956			
Decision-making expertise risk				0.925			
Decision-making information collection integrity risk				0.896			
Quality of infrastructure construction		0.958					
Construction license convenience		0.815					
Safety awareness of local construction personnel		0.869					
Normative differences		0.876					
Labor efficiency difference		0.818					
Management talent reserve					0.944		
Local transport developments					0.879		
Labor cost of construction					0.887		
Eternal policy environment			0.954				
External policy environment			0.884				
Local government corruption situation			0.898				
Religion conflict			0.869				
Currency risk	0.961						
Economic pattern risk	0.893						
Banks lending risk	0.815						
Local government debt default risk	0.871						
Government stability risk	0.897						
Risk of legal differences							0.927
Justice of law enforcement							0.911
Risk of force majeure of political environment						0.948	
Risk of force majeure of social environment						0.944	
Latent root	4.008	3.923	3.387	2.688	2.570	1.849	1.816
Variance explained rate (%)	16.698	16.347	14.111	11.200	10.708	7.706	7.565
Cumulative variance (%)	16.698	33.045	47.156	58.356	69.065	76.770	84.335
Cronbach α				0.708			
KMO				0.690			
Bart value				1727.827			
df				276			
p				0.000			

The results of validity analysis are shown in Table 2.

This paper invited 100 relevant practitioners, researchers, and graduate students of related majors to conduct pretest analysis on the questionnaire. Finally, 86 valid questionnaires were collected. Through this analysis, it can be found that the *Cronbach* α coefficient is 0.708, greater than 0.7, and the data reliability quality is good, which can be further studied. At the same time, the *KMO* value of the data is 0.690, and the data validity is acceptable. In addition, the *KMO* value is 0.690, greater than 0.6, which means that the data is valid. In addition, the cumulative variance interpretation rate of seven factors after rotation was 84.335% > 50%, indicating that the information content of the study can be effectively extracted. Therefore, the questionnaire quality is good and can be further studied.

3.1.2. Preparation before Data Collection. Because there are many indexes in the evaluation layer, the experts may have contradictions when filling out the fuzzy analytic hierarchy process questionnaire. Therefore, before the formal start of the survey, some experts are invited to analyze the impact of the index categories. And get the original relation matrix A.

$$A = \begin{pmatrix} & & & & & & \\ & 1 & & & & & \\ & 1 & 1 & & & & \\ 1 & 1 & 1 & & & & \\ 1 & 1 & & & 1 & & \\ 1 & 1 & 1 & 1 & 1 & 1 \end{pmatrix}. \quad (1)$$

And get its multiplication matrix B:

$$B = \begin{pmatrix} 1 & & & & & & \\ & 1 & & & & & \\ & 1 & 1 & & & & \\ & 1 & 1 & 1 & & & \\ 1 & 1 & 1 & & 1 & & \\ 1 & 1 & & & 1 & 1 & \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{pmatrix}. \quad (2)$$

The reachable matrix R:

$$R = \begin{pmatrix} 1 & & & & & & \\ & 1 & & & & & \\ & 1 & 1 & & & & \\ & 1 & 1 & 1 & & & \\ 1 & 1 & 1 & & 1 & & \\ 1 & 1 & 1 & & 1 & 1 & \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{pmatrix}. \quad (3)$$

The calculated general skeleton matrix S:

$$S = \begin{pmatrix} & & & & & & \\ & 1 & & & & & \\ & & 1 & & & & \\ 1 & & 1 & & & & \\ & & & & 1 & & \\ & & & 1 & & 1 & \end{pmatrix}. \quad (4)$$

The results drawn from the general skeleton matrix S give priority to the directed topology hierarchy, as shown in Figure 2.

When using the fuzzy analytic hierarchy process to determine the weight, we must first establish a multilevel structure between the indicators. For overseas transportation infrastructure development risk, the risk index set is $U = \{U_1, U_2, \ldots, U_7\}$, and each index layer consists of n risk evaluation indexes. The index structure is constructed according to Table 1. The steps of using fuzzy analytic hierarchy process to calculate the weight are as follows:

(1) Through the established index system, a fuzzy judgment matrix is constructed for the criteria layer index and the index layer index. Through expert investigation, the indicators at the same level are compared with each other. The 9-level scale is used to reflect the importance of each index.

(2) Weight of each index is calculated through the relative importance of each index comparing. Due to the characteristics of overseas transportation infrastructure development, there are many considering influencing factors. In order to reduce inaccuracy and redundancy of expert filling data, in the investigation, the results calculated by the interpretative structural model are also provided as a reference for the priority directed topological hierarchy diagram. As the paper invited a number of experts to fill out the questionnaire, in order to fully reflect the true views of the experts, the data processing selected a group matrix method to summarize data filled out by experts.

(3) Test the consistency parameter of the judgment matrix, generally CI < 0.1; it is considered to meet the requirements. If the consistency CI value is greater than 0.1, the matrix needs to be adjusted.

3.2. Overseas Transportation Infrastructure Development Risk Analysis. This paper uses Mathis FAHP fuzzy analytic hierarchy process software to calculate the data. The established analysis model is shown in Table 1, and a five-level risk factor evaluation set r is established, corresponding to each other U = {lowrisk, lower risk, medium risk, higher risk, high risk}. A total of 80 relevant experts, project participants, and designers were invited to participate in the survey, and 74 valid questionnaires were collected. The fuzzy judgment matrix of criterion layer calculated by group matrix method is shown in Table 3. The adjusted CI value is 0.0994, meeting the requirements. Weight calculation results are shown in Table 4.

Through the analysis of the calculation results, it can be found that government risk, construction risk, and operation risk are more influencing risks in the construction of overseas transportation infrastructure, which should be paid more attention to. In the secondary index level indicators, the construction of labor costs, government corruption, and management talent reverse are more important.

3.3. Risk Response Strategies and Suggestions. Through the data analysis in Table 3, we can find that the risk distribution among various categories of indicators is relatively uniform, but the impact gap is large for the secondary evaluation level indicators. Therefore, in the actual development process of the project, taking targeted measures for key risks and influencing factors can better control the project development risk and promote the sustainable operation for the project. The paper puts forward strategies and suggestions for the risk disposal of overseas transportation infrastructure development based on the three stages of decision-making, construction, and operation of project development:

3.3.1. Project Decision Period

(1) During the project decision-making period, the biggest risk comes from the decision-making professionalism and management personnel reserve. Therefore, on the basis of fully collecting and possessing information, professional experts should be invited to make decisions to improve the accuracy and rationality of decision-making.

(2) During the project decision-making period, the possible changes in the operation of the project shall be fully considered, and the disposal plan shall be made for relevant changes to reduce the possible impact of unpredictable changes in conditions during decision-making on project development. Meanwhile, decision-making should also take into account the local government debt situation and consider the local government actual compliance ability. It is also important to reduce the impact of local government debt default on project construction and operation through contracts or mortgages [12–14].

(4) The bid price shall be reasonably determined on the basis of fully considering the differences in labor efficiency and labor cost domestic and abroad. For

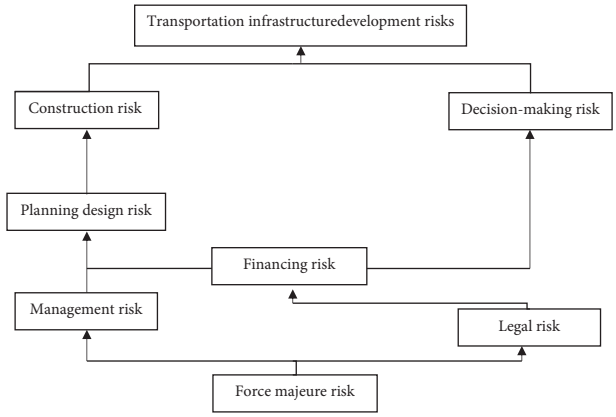

Figure 2: Results priority directed topological hierarchy graph.

Table 3: Fuzzy judgment matrix of criterion layer.

	Decision-making risk	Decision-making risk	Decision-making risk	Decision-making risk	Decision-making risk	Decision-making risk	Decision-making risk	Weight (wi)
Decision-making risk	0.5	0.7686	0.3243	0.2451	0.4483	0.274	0.5294	0.1233
Construction risk	0.2314	0.5	0.2916	0.5939	0.2548	0.4228	0.3871	0.1039
Operation risk	0.6757	0.7084	0.5	0.186	0.5666	0.7311	0.2862	0.1502
Policy risk	0.7549	0.4061	0.814	0.5	0.789	0.7277	0.5516	0.1925
Financing risk	0.5517	0.7452	0.4334	0.211	0.5	0.6007	0.7284	0.1557
Legal risk	0.726	0.5772	0.2689	0.2723	0.3993	0.5	0.4288	0.1273
Force majeure risk	0.4706	0.6129	0.7138	0.4484	0.2716	0.5712	0.5	0.1471

Table 4: Weight calculation results.

Index level indicator	Whole weight	Peer weight	Criterion level
Decision-making conditions change risk	0.0452	0.3667	Decision-making risk (0.1438)
Decision-making expertise risk	0.0452	0.3667	
Decision-making information collection integrity risk	0.0329	0.2667	
Quality of infrastructure construction	0.0197	0.19	Construction risk (0.1456)
Construction license convenience	0.026	0.25	
Safety awareness of local construction personnel	0.0145	0.14	
Normative differences	0.0239	0.23	
Labor efficiency difference	0.0197	0.19	
Management talent reserve	0.0451	0.3	Operation risk (0.1446)
Local transport developments	0.0451	0.3	
Labor cost of construction	0.0601	0.4	
Eternal policy environment	0.0545	0.283	Policy risk (0.1466)
External policy environment	0.0355	0.1845	
Local government corruption situation	0.0609	0.3163	
Religion conflict	0.0416	0.2162	
Currency risk	0.0325	0.2087	Financing risk (0.1418)
Economic pattern risk	0.0267	0.1717	
Banks lending risk	0.0337	0.2165	
Local government debt default risk	0.0214	0.1375	
Government stability risk	0.0414	0.2656	
Risk of legal differences	0.0382	0.3	Legal risk (0.1355)
Justice of law enforcement	0.0891	0.7	
Risk of force majeure of political environment	0.103	0.7	Force majeure risk (0.134)
Risk of force majeure of social environment	0.0441	0.3	

example, due to the different construction markets domestic and abroad, adopting reasonable low-price bidding strategy may be judged as low price dumping by the local government. Therefore, domestic construction enterprise should avoid low-cost bidding and reasonably evaluate the project cost. At the same time, we should fully consider the international market risks in the construction process, formulate reasonable risk response means, expand the scope of RMB settlement, and avoid unnecessary losses to the project due to changes in exchange rate.

(5) Early risk prevention strategy cannot fully cover all stage risks. For some overseas construction projects, early poor effect of negotiation, adjustment, and other measures can lead to uncontrollable failure result [15]. Therefore, in the process of project development, insurance institutions can be selected to provide guarantee for project construction to reduce the adverse impact of uncertain political factors on the project.

3.3.2. Project Construction Period

(1) During the project construction period, the influencing factors with high risk include the convenience and specification differences of construction license. Due to the different procedures and requirements for construction permit domestic and abroad, there may be some differences in the mandatory standards of construction specifications. Therefore, in the construction process, local standards should be observed on the basis of existing construction management experience.

(2) Meanwhile, due to the differences in labor efficiency of construction workers in different countries, the construction period shall be reasonably arranged to ensure the smooth completion of the project.

(3) During the project construction period, the local political situation should be paid more attention, and, according to this, the enterprise should reasonably arrange funds investment. And it is important to maintain good communication with banks and financial institutions to avoid bank lending and impact on project construction.

3.3.3. Project Operation Period

(1) During the operation period, the operation cost shall be fully considered [16–19]. If it is necessary to participate in the operation activity for construction enterprise of overseas transportation infrastructure, the operation cost shall be fully considered referring to the domestic project demonstration, and the correction calculation shall be carried out on the basis of integrating the operation cost of domestic projects and referring to the local development level, so as to ensure the smooth operation of the project.

(2) In the process of operation, there are many contacts with local people and government. In this process, local cultural factors and religious issues should be fully considered to avoid conflicts.

(3) Meanwhile, we must make contingency plans for force majeure, especially in the normalization management of *COVID-19*, make adequate preventive measures, and prepare early alerting measures for the impact of all kinds of force majeure on projects, so as to enhance the operational stability of the project.

4. Conclusion

At present, there is little research on the development risk of overseas transportation infrastructure under the new form. The research on the development risk of overseas transportation infrastructure under the new form combined with ISM and fuzzy analytic hierarchy process needs to be deepened further. This paper analyzes the risk of overseas transportation infrastructure development by combining ISM and fuzzy analytic hierarchy process. In the process of research, it can better solve the problems existing in the expert scoring process in the previous fuzzy analytic hierarchy process due to too much content of judgment matrix, strong randomness of expert scoring, and improve the reliability of the results.

Based on the previous research, this paper constructs 7 criteria level indicators and 24 indicator level indicators and realizes the multiangle judgment of the risk of overseas transportation infrastructure development. It can be found that government risk, construction risk, and operation risk are more important risk factors in the construction of overseas transportation infrastructure, which should be paid more attention. Among the secondary indicators, the labor cost of construction land, government corruption, and management talent reserve are more important.

For the judged main risk factors matrix, during the decision-making period of transportation infrastructure construction, it is necessary to increase the reserve of relevant talents, formulate a perfect risk plan and investigate the surrounding business environment, and make a scientific and reasonable prediction. In the process of project construction, we should pay full attention to the differences between domestic and foreign construction standards and labor rates, reasonably arrange the use of funds, maintain the relationship between financial institutions and enterprises, and ensure the source of project funds. In addition, we should try to establish an information platform shared by multiple enterprises to monitor the external risks in the construction process and ensure the operation of the project. During the operation of the project, the enterprise should pay attention to the political, religious, and cultural environment of the construction site and the operation site, avoid conflicts with aborigines during the construction process, and fully consider local customs and habits during the operation process.

Through the research on the development risk of overseas transportation infrastructure under the new form, this paper puts forward the important influencing factors

that may have a great impact on the development of overseas transportation infrastructure and relevant countermeasures, which can provide some reference for the construction of relevant projects and improve the investment efficiency. At present, there is still a need for further research on the relationship of risk factors contained in the study and the impact degree on the project caused by the relationship between them. Therefore, it is necessary to conduct in-depth research on the practical cases of the new form overseas transportation infrastructure construction projects.

The limitations of this paper are mainly reflected in the following two points.

(1) Since the construction and development of overseas transportation infrastructure in China is still in the development stage, and also due to the limitation of research method, the conclusion of the study is influenced by subjective factors. In future research, we will try to adopt empirical research, multisubject modeling, and other methods for further research to enhance the reliability of the research findings.

(2) This paper only analyzes the impact of each indicator on the development risk of overseas transportation infrastructure but does not consider the impact of the interaction of each influencing factor. In future research, we will further analyze the impact of the combination of influencing factors on the development risk.

Data Availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest

The authors declared that they have no conflicts of interest regarding this work.

References

[1] J. Li, J. Zhang, and W. Suo, "Risk assessment in cross-border transport infrastructure projects: a fuzzy hybrid method considering dual interdependent effects," *Information Sciences*, vol. 488, pp. 140–157, 2019.

[2] Z. Jin and W. Suo, "Study on risk assessment method of traffic infrastructure construction considering risk correlation," *Management Assessment*, vol. 32, no. 06, pp. 45–55, 2020.

[3] L. Chang, *Research on Income Distribution of PPP Mode in Transportation Infrastructure Construction*, Beijing Jiaotong University, Beijing, China, 2018.

[4] S. Zolfaghari and S. M. Mousavi, "Construction-project risk assessment by a new decision model based on De-Novo multi-approaches analysis and hesitant fuzzy sets under uncertainty," *Journal of Intelligent and Fuzzy Systems*, vol. 35, no. 1, pp. 639–649, 2018.

[5] J. Charles and T. A. Falianty, "Managing leverage of infrastructure projects: aggregate and sectoral risk effect," *Journal of Asian Economics*, vol. 73, no. 3, Article ID 101284, 2021.

[6] Y. Yassien, M. Ezzeldin, M. Mohamed, and W. El-Dakhakhni, "Air transportation infrastructure robustness assessment for proactive systemic risk management," *Journal of Management in Engineering*, vol. 36, no. 4, Article ID 04020037, 2020.

[7] T. Rydén Sonesson, J. Johansson, and A. Cedergren, "Governance and interdependencies of critical infrastructures: exploring mechanisms for cross-sector resilience," *Safety Science*, vol. 142, no. 2, Article ID 105383, 2021.

[8] J. Guevara, M. J. Garvin, and N. Ghaffarzadegan, "The forest and the trees: a systems map of governance interdependencies in the shaping phase of road public-private partnerships," *Journal of Management in Engineering*, vol. 36, no. 1, Article ID 04019031, 2020.

[9] S. A. Thekdi and N. N. Joshi, "Prioritization of capacity investment projects with stakeholder divergence criteria for coordinated infrastructure development," *Journal of Infrastructure Systems*, vol. 22, no. 2, Article ID 04015019, 2016.

[10] K. Goh and J. Yang, "Importance of sustainability-related cost components in highway infrastructure: perspective of stakeholders in Australia," *Journal of Infrastructure Systems*, vol. 20, 2014.

[11] R. F. Herrera, O. Sánchez, K. Castañeda, and H. Porras, "Cost overrun causative factors in road infrastructure projects: a frequency and importance analysis," *Applied Sciences*, vol. 10, no. 16, p. 5506, 2020.

[12] L. Yang, J. Ma, Y. Zhang, C. Huang, and J. Zhou, "Research on the development strategy of highway traffic infrastructure along the Belt and road," *Engineering Science of China*, vol. 21, no. 4, pp. 14–21, 2019.

[13] H. Zhang, *Research on the Spatial Effect of Traffic Infrastructure Construction in the Silk Road Economic Belt*, Ji Lin University, Chaoyang, China, 2017.

[14] C. Jiang, "Failure causes and enlightenment of transportation infrastructure PPP project–based on the analysis of 25 typical PPP cases," *Journal of Beijing Jiaotong University*, vol. 15, no. 3, pp. 50–58, 2016.

[15] Y. Zhao, *Research on PPP Cooperation Mode between Government and State - Owned Enterprises in Transportation Infrastructure Construction Project[D]*, Chang'an University, Xi'an, China, 2016.

[16] L. Song, Q. Li, G. List, Y. Deng, and P. Lu, "Using an AHP-ISM based method to study the vulnerability factors of urban rail transit system," *Sustainability*, vol. 9, no. 6, p. 1065, 2017.

[17] M. K. Sen, S. Dutta, and G. Kabir, "An integrated approach for modelling and quantifying housing infrastructure resilience against flood hazard," *Journal of Cleaner Production*, vol. 288, 2020.

[18] B. T. B. Eshun and A. P. C. Chan, "An evaluation of project risk dynamics in sino-africa public infrastructure delivery; A causal loop and interpretive structural modelling approach (ISM-CLD)," *Sustainability*, vol. 13, no. 19, Article ID 10822, 2021.

[19] X. Jiang, K. Lu, B. Xia, Y. Liu, and C. Cui, "Identifying significant risks and analyzing risk relationship for construction PPP projects in China using integrated FISM-MICMAC approach," *Sustainability*, vol. 11, no. 19, p. 5206, 2019.