Based on Fuzzy Comprehensive Evaluation Method The Investment Risk Assessment of Chinese Enterprises in The Countries Along "The Belt and Road"

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Abstract. "Belt and Road Forum for International Cooperation" held in Beijing in May this year. once again, "The Belt and Road" strategic initiative to the world, causing the world's enthusiastic response. The core of the "One Belt, One Road" strategy initiative is to promote infrastructure construction and interconnection, dock national policies and development strategies, deepen pragmatic cooperation, promote coordinated and coordinated development and achieve common prosperity. With the "The Belt and Road" strategy in-depth, Chinese enterprises will go abroad, in the countries along the country to invest in more and more examples, accompanied by the increasing risk. Analysis of the failure of investment cases, we can easily find that this is the majority of enterprises overseas investment in the lack of careful assessment of risk and risk of foreign investment risk management has a great relationship. In this paper, the risk factors are used to identify the risk factors table, and the fuzzy comprehensive evaluation method is used to estimate the comprehensive risk value of many uncertain factors that cannot be determined by the overseas investment. The risk assessment system is constructed to help Chinese enterprises to follow the "Investment to avoid risks, improve the success rate.

1. Introduction
"The Belt and Road" is short of "The Silk Road Economic Zone" and "21st Century Maritime Silk Road", which is put forward by the Chinese President Xi Jinping in September October 2013. As China's top national strategy, not only for China's own rapid economic development to provide opportunities, but also for the country along "The Belt and Road" to strengthen economic cooperation and common prosperity. According to the statistics of the Ministry of Commerce of the People's Republic of China, from January to October in 2016, China's direct investment in non-financial sector of 51 countries related to "one way" reached $12.07 billion, accounting for 8.3% of the total. In terms of foreign contracting projects, from January to October in 2016, China's enterprises signed 6877 new foreign-related contract projects in 61 countries related to "The Belt and Road", and the new contract amount was $84.39 billion, up 30.7% than last year; the turnover reached $52.74 billion, an increase of 5.6%. Although the "one by one" strategy for our enterprises in overseas development has brought great opportunities, and we also clearly aware of the risks and opportunities coexist. China CCPIT public data show that China has more than 20,000 enterprises in overseas investment, but "more than
90% is a loss" in 2014. In fact, there are many investment failure data is not objective disclosure. Therefore, we make investment decisions, the need to take full account of the factors, a comprehensive assessment of risk, scientific decision-making, to avoid investment failure.

2. The Importance of Risk Management of Overseas Investment in Chinese Enterprises

Foreign investment risk is due to the lack of business overseas investment environment, investment projects, effective risk assessment, resulting in a certain blindness of overseas investment, which may be risk. Foreign investment risk management is to solve this problem, through risk identification to understand the risks faced by investment projects, and the appropriate method to estimate the size of the investment project risk value, as a basis for rational use of various risk response measures, Project risk to effectively control, with a minimum cost to ensure that the overall objectives of investment projects to achieve the management.

Foreign investment is facing many risks, from the early decision-making, project construction, operation process, there are a variety of risks. Once the risk occurs, it will cause the loss of overseas investment projects, these losses are not only economic aspects, but also includes the staff of health care, corporate credit, corporate social responsibility and other non-economic aspects. If the enterprise ignores the risk factors, or cannot correctly assess the risk, so as to make scientific decisions, the risk not only affects the economic interests of enterprises so simple, and even will be crushed the entire overseas investment projects.

In 2008, China Aluminum Group and American Aluminum Group acquired a 12% stake in Rio Tinto for $14.5 billion, and afterwards, American Aluminum Group withdrew and transferred its shares to China Aluminum Group, known as "raid before dawn"; TCL acquisition of France Thomson TV business, Gree electrical investment in Brazil to set up factories, SAIC acquisition of Ssangyong Motor, also did not achieve the desired purpose, caught in an unexpected dilemma. "China Global Investment Tracking" data column has a "trouble project" column, that was later rejected by the regulatory authorities, some or all of the failure of the project, a total of 88 troublesome projects, totaling $198.1 billion in 2005-2012. At first, most of the troublesome projects involved the energy industry, and later, the troubled projects involved in the diversification of the industry. This failure of the case, nearly a decade has been too numerous to mention.

3. Identification and Evaluation of Enterprises' Overseas Investment Risks

3.1. Identification of Foreign Investment Risk of Enterprises

As Chinese enterprises face more risks than overseas investment, such as the political risk, cultural risk, safety risk, ecological environment risk and economic environment risk of the country where the enterprise is located, the Chinese enterprises should first carry out risk assessment of the projects of investment intention countries before investing abroad. The author divides the risk into three-dimension layers according to the degree of difficulty of identification, which is macro, medium and micro. Figure 1. is a pyramid-type risk identification map for Chinese companies investing abroad.
3.2. Risk Assessment of Overseas Investment Projects - Application Based on Fuzzy Comprehensive Evaluation Method

Risk assessment is the use of qualitative methods, quantitative methods or qualitative and quantitative methods to estimate the risk of the possibility of the risk factors and the feasibility of overseas investment.

There are many methods of risk assessment, such as Delphi method, analytic hierarchy process, regression analysis method, failure tree method, etc. These common risk assessment methods are lack of effective consideration for the uncertainty of factors, so this paper uses fuzzy comprehensive evaluation method Foreign investment is estimated by the combined risk value of many risk factors that cannot be determined.

If an overseas investment project is expected to build a period of 3 years, the investment amount of 1.2 billion yuan. The steps to evaluate the risk using the fuzzy comprehensive evaluation method are as follows:

Step 1: the company hired 10 experts with overseas investment experience of the investment project to assess the risk factors, and experts to assess the views of statistics, the statistical results shown in Table 1.

| Risk factors                        | Risk identification (Unit: number) |
|-------------------------------------|------------------------------------|
|                                     | Higher risk | high risk | General risk | Low risk | Lower risk |
| Political risk                      | 3           | 3         | 3            | 1        | 0          |
| Policy risk                         | 3           | 4         | 2            | 1        | 0          |
| Economic risk                       | 1           | 2         | 4            | 2        | 1          |
| Cultural risk                       | 3           | 2         | 3            | 2        | 0          |
| Ecological environment risk         | 3           | 3         | 3            | 1        | 0          |
| Competitive risk                    | 1           | 2         | 3            | 2        | 2          |
| Technical risk                      | 1           | 1         | 4            | 3        | 1          |
| Infrastructure risk                 | 3           | 2         | 3            | 2        | 0          |
| Business risk                       | 2           | 3         | 4            | 1        | 0          |
| Financial risk                      | 2           | 2         | 4            | 2        | 0          |
| Social responsibility risk           | 3           | 3         | 4            | 0        | 0          |
| HR risk                             | 0           | 1         | 5            | 3        | 1          |
Step 2: Establishment of evaluation subordinate matrix
The reviews are set to five levels, namely: greater risk, great risk, general risk, low risk, and lower risk. The weight of each level is based on expert test method, which gives the number of experts for this comment is \( a_i, i = 1,2,3,4,5,6,7 \). The total number of experts is \( b, b = 20 \), Different risk factors corresponding to the rating level risk value is \( c \). The formula is as follows:

\[
c = \frac{a_i}{b}
\]

The evaluation subordinate matrix as described above is shown in Table 2.

**Table 2.** Experts’ evaluation subordinate matrix

| Target layer                      | Dimension layer (\( L \)) | Weights (\( W \)) | Risk factor layer (\( l_i \)) | Expert commentary collection |
|----------------------------------|----------------------------|-------------------|-------------------------------|-----------------------------|
|                                  |                            |                   |                               | Segmentation weight (\( w_i \)) | Higher risk | High risk | General risk | Low risk | Lower risk |
|                                  |                            |                   |                               | 10 | 8 | 6 | 4 | 2 |
| overseas investment risk         |                            |                   | Political risk (\( l_{11} \)) | 0.3 | 0.3 | 0.3 | 0.3 | 0.1 | 0 |
|                                  |                            |                   | Policy risk (\( l_{12} \))    | 0.2 | 0.3 | 0.4 | 0.2 | 0.1 | 0 |
|                                  |                            |                   | Economic risk (\( l_{13} \))  | 0.1 | 0.1 | 0.2 | 0.4 | 0.2 | 0.1 |
|                                  |                            |                   | Cultural risk (\( l_{14} \))  | 0.2 | 0.3 | 0.2 | 0.3 | 0.2 | 0 |
|                                  |                            |                   | Ecological environment risk (\( l_{15} \)) | 0.2 | 0.3 | 0.3 | 0.3 | 0.1 | 0 |
| macro layer                      |                            | 0.5               |                               |                             |               |         |             |         |             |
| medium layer                     |                            |                   | Competitive risk (\( l_{21} \)) | 0.3 | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 |
|                                  |                            |                   | Technical risk (\( l_{22} \)) | 0.3 | 0.1 | 0.1 | 0.4 | 0.3 | 0.1 |
|                                  |                            |                   | Infrastructure risk (\( l_{23} \)) | 0.4 | 0.3 | 0.2 | 0.3 | 0.2 | 0 |
| medium layer                     |                            | 0.3               |                               |                             |               |         |             |         |             |
| micro layer                      |                            |                   | Business risk (\( l_{31} \))  | 0.3 | 0.2 | 0.3 | 0.4 | 0.1 | 0 |
|                                  |                            |                   | Financial risk (\( l_{32} \))  | 0.2 | 0.2 | 0.2 | 0.4 | 0.2 | 0 |
|                                  |                            |                   | Social responsibility risk (\( l_{33} \)) | 0.4 | 0.3 | 0.3 | 0.4 | 0 | 0 |
|                                  |                            |                   | HR risk (\( l_{34} \))        | 0.1 | 0 | 0.1 | 0.5 | 0.3 | 0.1 |
Step 3: Fuzzy comprehensive evaluation.

\[ L_1 = \begin{bmatrix} l_{11} \\ l_{12} \\ l_{13} \\ l_{14} \\ l_{15} \end{bmatrix} = \begin{bmatrix} 0.3 & 0.3 & 0.3 & 0.1 & 0 \\ 0.3 & 0.4 & 0.2 & 0.1 & 0 \\ 0.1 & 0.2 & 0.4 & 0.2 & 0.1 \\ 0.3 & 0.2 & 0.3 & 0.2 & 0 \\ 0.3 & 0.3 & 0.3 & 0.1 & 0 \end{bmatrix} \]

\[ L_2 = \begin{bmatrix} l_{21} \\ l_{22} \\ l_{23} \\ l_{24} \\ l_{25} \end{bmatrix} = \begin{bmatrix} 0.1 & 0.2 & 0.3 & 0.2 & 0.2 \\ 0.1 & 0.1 & 0.4 & 0.3 & 0.1 \\ 0.3 & 0.2 & 0.3 & 0.2 & 0 \end{bmatrix} \]

\[ L_3 = \begin{bmatrix} l_{31} \\ l_{32} \\ l_{33} \\ l_{34} \end{bmatrix} = \begin{bmatrix} 0.2 & 0.3 & 0.4 & 0.1 & 0 \\ 0.2 & 0.2 & 0.4 & 0.2 & 0 \\ 0.3 & 0.3 & 0.4 & 0 & 0 \end{bmatrix} \]

\[ W = (w_1, w_2, w_3) = (0.5, 0.3, 0.2) \]

\[ w_1 = (0.3, 0.2, 0.1, 0.2, 0.2) \]

\[ w_2 = (0.3, 0.3, 0.4) \]

\[ w_3 = (0.3, 0.2, 0.4, 0.1) \]

\[ A_1 = w_1 \cdot L_1 = (0.3, 0.2, 0.1, 0.2, 0.2) \]

\[ A_2 = w_2 \cdot L_2 = (0.1, 0.1, 0.3, 0.2, 0.2) \]

\[ A_3 = w_3 \cdot L_3 = (0.3, 0.2, 0.3, 0.1, 0) \]

\[ A = W \cdot L = (0.5, 0.3, 0.2) \]
Step 3: Analyze the evaluation results.

According to the quantification value of the rating level in Table 2, the closer the value of the final evaluation result is to 10, the higher the investment risk; the closer to 0, the lower the investment risk. The formula is as follows:

$$\alpha_i = \sum_{i=12..5} \lambda_i \beta_i$$

Among them, the risk value is $\alpha_i$, The risk value of the expert assessment is $\beta_i$, The quantization value of the corresponding comment level is $\lambda_i$.

In this case, the comprehensive risk of foreign investment and the quantification of each risk factor are calculated as shown in Table 3.

| Target layer | Dimensio $\mathbf{L}$ | Risk factor layer ($i$) | risk value of the expert assessment ($\beta$) | Risk value $\alpha_i$ |
|--------------|-----------------------|------------------------|---------------------------------------------|----------------------|
| Overseas investment risk | Macro layer $L_1$ | Political risk ($l_{11}$) | Higher risk | High risk | General risk | Low risk | Lower risk | 7.600 |
| | Policy risk ($l_{12}$) | 0.3 | 0.3 | 0.3 | 0.1 | 0 | 7.800 |
| | Economic risk ($l_{13}$) | 0.1 | 0.2 | 0.4 | 0.2 | 0.1 | 6.000 |
| | Cultural risk ($l_{14}$) | 0.3 | 0.2 | 0.3 | 0.2 | 0 | 7.200 |
| | Ecological environment risk ($l_{15}$) | 0.3 | 0.3 | 0.3 | 0.1 | 0 | 7.600 |
| Medium layer $L_2$ | Competitive risk ($l_{21}$) | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 | 5.600 |
| | Technical risk ($l_{22}$) | 0.1 | 0.1 | 0.4 | 0.3 | 0.1 | 5.600 |
| | Infrastructure risk ($l_{23}$) | 0.3 | 0.2 | 0.3 | 0.2 | 0 | 7.200 |
| Micro layer $L_3$ | Business risk ($l_{31}$) | 0.2 | 0.3 | 0.4 | 0.1 | 0 | 7.200 |
| | Financial risk ($l_{32}$) | 0.2 | 0.2 | 0.4 | 0.2 | 0 | 6.800 |
| | Social responsibility risk ($l_{33}$) | 0.3 | 0.3 | 0.4 | 0 | 0 | 7.800 |
| | HR risk ($l_{34}$) | 0 | 0.1 | 0.5 | 0.3 | 0.1 | 5.200 |
| | Comprehensive risk assessment | $0.238$ | $0.248$ | $0.326$ | $0.154$ | $0.034$ | $7.004$ |

According to Table 3, the investment risk is generally above the risk level because of the high risk of political risk, policy risk, cultural risk, ecological environment risk, infrastructure construction risk and social responsibility risk. Therefore, the overall risk of investment risk is in the upper level, it is recommended to invest with caution.
4. Conclusion
With the rapid development of China's economy and the implementation of the strategy of "The Belt and Road", China's overseas investment was a rapid growth trend, which objectively challenge the international tradition of the distribution of power distribution. This may lead to opposition and containment by vested interests, and may also cause panic and exclusion in other countries. Therefore, China's overseas investment enterprises face a wide range of risks. Before investing, Chinese enterprises use the fuzzy comprehensive evaluation method to successfully implement overseas investment projects, together with the rest of the world to share dividends "The Belt and Road" Initiative brought.

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