RESEARCH ON THE CONSTRUCTION AND APPLICATION OF CHINESE ENTERPRISES' OVERSEAS PORT INVESTMENT CONFIDENCE INDEX BASED ON D-S EVIDENCE THEORY

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ABSTRACT

After the "One Belt, One Road" strategy was proposed, China's overseas port investment has developed rapidly. In order to help Chinese port companies reduce their investment risks, this article provides help and suggestions for Chinese companies' overseas port investments by establishing a port investment confidence index system. This article has established a port investment confidence index system, covering four aspects: economic scale, external links, internal vitality and institutional quality. Then, through DS evidence theory, using the subjective weights obtained from the questionnaire survey and the objective weights calculated from the data obtained from each database query to evaluate some countries along the "Belt and Road" route to prove the rationality and operability of the indicator system designed in this article And provide advice and assistance for Chinese companies' overseas port investment. Based on the subjective weights obtained in this article, Chinese companies are more inclined to invest in economies with better internal economic development and a sound institutional environment. By comparing the objective weights of income, this paper finds that when companies invest in economies with a higher degree of development, they pay more attention to the impact of the business environment of the economy when they invest in economies with a higher degree of development. Low-level economies will give priority to the profitability and development prospects of ports when investing.

Contribution/Originality: This article has established a port investment confidence index system, covering four aspects: economic scale, external links, internal vitality and institutional quality.

1. INTRODUCTION

1.1. Background & Significance

With the gradual implementation of the "Belt and Road" strategy and the initial exploration of the market economy operation of relevant regional countries by the people in the past decade, more and more Chinese companies have implemented the "going out" strategy and invested in some "Belt and Road" strategies. Countries along the route. On the other hand, China has been a host country in international investment for a long time and lacks relevant experience in foreign investment as a home country. This has also objectively deepened the concerns of Chinese companies in the process of foreign investment. Based on the above considerations, this article will construct a port investment confidence index to serve the "going global" strategy of Chinese companies and provide reliable suggestions for Chinese companies' overseas port investment. At the same time, the leading role of the port

itself in economic development can also be used to judge the development potential and development trend of an economy from a new perspective.

By consulting relevant literature, it is found that China's research on port industry investment confidence index is still in its infancy. Related index research also focuses on the cash flow and stability of the evaluation object itself. The perspectives and indicators of these studies have their limitations when used to evaluate port investment confidence: First, the port itself has considerable economic externalities. Therefore, it is incomplete to confine the discussion to the port itself; secondly, the port itself has considerable economic externalities. The amount of investment is relatively large and the return period is relatively long. Simply relying on the short-term rate of return to judge the prospects of investment has limitations. Again, countries along the "Belt and Road" have different levels of development and different systems and cultural environments. These factors It plays a vital role in the development of the economy, and because previous studies have limited the evaluation objects to domestic and ignored endogenous issues, in the process of evaluating port investment confidence, this article considers local business The environment is taken into consideration. Based on the above considerations, this article will comprehensively consider the current research status, characteristics of port assets, and Chinese perspectives to construct a "port investment confidence index".

2. LITERATURE REVIEW

2.1. Research Status of Port Prosperity Index

The "prosperity index" is a tool used to measure cyclical fluctuations in the economy and industries. It is a professional research work to evaluate and monitor a certain industry and market through the prosperity index. Its research has been started since the beginning of the 20th century. It was not until 1909 that the Babson Statistical Company of the United States released the Babson Economic Activity Index. Only then did the world begin to conduct economic forecasting and investment planning through the more mature prosperity index.

In recent years, research on the prosperity index has been gradually launched in China. Dihong, Huazhong, Li, and Xiangyu (2003) analyzed the demand, supply, industrial policy, and price that affect the industry's prosperity, and selected relevant indicators. Then, he used factor analysis to construct an industry prosperity index and analyzed the prosperity of the coal industry. Many scholars have constructed the prosperity index according to the characteristics of different industries and conducted analysis based on this. Xian-li and Yu (2003) studied the prosperity index of the steel industry. He selected a group of representative and sensitive economic indicators, selected a benchmark indicator, and then classified the indicators according to the peak and valley analysis method, and finally used the synthetic index method constructs the prosperity index of China's steel industry. The research team of Research Group (2008) used principal component analysis to compile a comprehensive prosperous index of China's hotel industry based on supply factors, demand factors, production capacity, operating efficiency, and economic benefits. The above analyzed the development and changes of China's hotel industry in the past 20 years. Qian and Yifei (2012) used the improved diffusion index method to construct the prosperity index of the global dry bulk shipping market from the four aspects of supply, demand, price and cost of the dry bulk market, and further analyzed its the internal cause of change.

At present, China's research on the prosperity index of the port industry mainly consists of two parts: the port prosperity index of the Shanghai International Shipping Center and the monthly "Comments on the National Port Industry Prosperity Index" of the "China Port". The former mainly analyzes the operating conditions of ports in the Yangtze River Delta region, which mainly includes two parts: First, the situation of the entire port group in the Yangtze River Delta region, reflecting the operating status of the entire region. The second is the operating conditions of various ports in the Yangtze River Delta, which mainly include port operating data and financial data. It mainly reflects the current status of port operations through port container throughput index, port throughput index, and port foreign trade cargo throughput index, and reflects port financial status through port operating

income index and port profit index. The "National Port Industry Prosperity Index Review" divides Chinese ports into six parts: the Bohai Rim, the Beibu Gulf, the upper and middle reaches of the Yangtze River, the Yangtze River Delta, the west bank of the Straits and the Pearl River Delta. Then count their cargo throughput index, foreign trade throughput index, container throughput index, domestic trade bulk cargo price index and foreign trade bulk cargo price index (the index is based on the data of a certain month as 100), and finally the average Value to measure the prosperity index of the national port industry. It can be seen that the former's prosperity index considers more factors, but the latter involves a larger range. Both reflect the changes in the port's operating conditions, but the underlying reasons for their changes cannot be analyzed, and the description of their prosperity index requires a large amount of and continuous data. For some with low statistical levels and less data" Ports of countries along the Belt and Road are not applicable.

2.2. Research Status of Business Environment Index

Wenxin (2015) regards the business environment as the laws and regulations used by the economy to promote and restrict business activities. A good business environment cannot be separated from good government supervision and a set of efficient and low-cost procedures. The research not only considered the perfection of social laws and regulations, but also considered the government's ability to perform functions. His research focuses on the "system" aspect of the business environment. Zhiqiang and Xiahai (2012) analyzed the relationship between the business environment and economic development based on the data on the business environment of 30 major cities in China. The research results show that an excellent urban business environment has an obvious promotion effect on urban economic development; even if other potential factors affecting economic development are controlled, the business environment's impact on economic development is still very significant and very stable.

Some scholars have studied the relationship between the business environment and FDI. Tong (2015) conducted an empirical study on the relationship between China's business environment and FDI inflows on the basis of statistical data analysis. Its empirical research and analysis show that the registered property and cross-border trade in the business environment indicator system have a significant role in promoting FDI inflows. Later, from the perspectives of the rule of law and internationalization of the business environment, it put forward relevant suggestions for improving China's business environment. Suggest. Yuling (2016) studied the impact of the business environment of the BRICS countries on foreign direct investment. Based on the analysis of the "Business Environment Report", her research considered the common effect of various indicators on the business environment. The results It shows that the improvement of the business environment is of great help to the accumulation of FDI stock in the economy, but it will not increase the FDI flow in a short time.

Some scholars have conducted research on how to improve the convenience of business environment. Dong (2014) pointed out that the index of business environment convenience is essentially to require the government to implement efficient supervision, not to give up supervision to provide maximum freedom and convenience. This is consistent with the description of the transformation of government functions in the Doing Business report. Zhiqiang and Xiahai (2012) starts from the protection of investors, the difficulty of starting a business, and the transparency of the government, and establishes a panel data model with the FDI flow of the host country as an independent variable to evaluate the convenience of business in the economy. Evaluation. Finally, it is concluded that the degree of business facilitation is important for enhancing international image, deepening international cooperation, and increasing FDI flows.

In foreign countries, some scholars have conducted research on the business environment for a long time. The American scholar Wenxin (2015) proposed the "grading scale method" for evaluating the country's business environment as early as 1969, and evaluated the business environment from eight aspects. Later, on the basis of his research, there are more and more researches on the business environment in the world. Djankov, Porta, and Lopez-de-Silane (2002) created a dummy variable for the 20 most regulated economies and artificially created a

ranking system to estimate business environment data. The research results show that a lower level of regulation is more conducive to stimulating economic growth, but Djankovetal The dummy variables used reduce the reliability of data analysis, and he generalizes all countries without considering the huge differences between countries. Djankov., La, and Lopezdesilanes (2002) used a cross-sectional analysis of fixed effects to focus on the overall impact and found that countries with a higher ranking in the business environment in 2004 had a significant relationship with economic growth. Busse and Groizard (2008) uses a similar method to analyze the relationship between business environment indicators and gross domestic product.

At the same time, some scholars analyze the impact of the differences in the business environment faced by enterprises. Pullin (2003) analyzed the external environment of the development of enterprises in various regions of Germany by comparing the external environment such as government policies, wage levels and regional specialization in different regions of Germany, and studied the effects of different external environments on enterprises in the same country. The impact of normal business activities. Jeong, Cho, and Jones (2012) pointed out that the overall business environment faced by an enterprise is composed of different parts, and they individually affect the business activities of the enterprise at different stages of enterprise development. To a certain extent, the external environment faced by an enterprise has a greater impact on the enterprise in the long run than its various internal factors.

3. MODELING

3.1. Construction of Port Investment Confidence Index Index System

This article will construct a port investment confidence index from two aspects of port prosperity and business environment. Among them, the port boom will take into account the development prospects of the host country's port industry and its investment potential. As for the business environment, it will take into account the difficulty for Chinese companies to conduct business in the host country. Therefore, the port investment confidence index in this article should include at least the following four aspects (As shown in Figure 1):
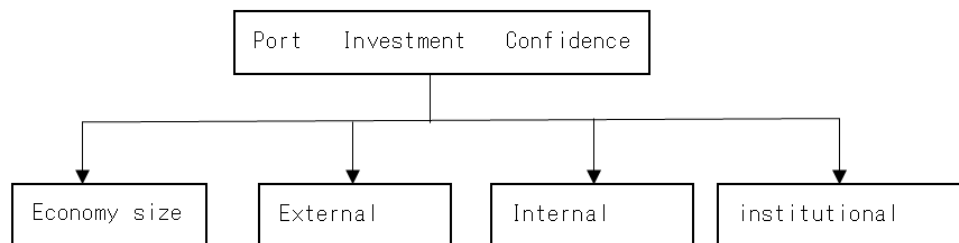

Figure-1. Main content of port investment confidence.

3.1.1. Economy Size

The development of the port is inseparable from the support of its hinterland. Regional development will increase the demand for port transportation, and this is one of the important driving forces for port development. The countries along the "Maritime Silk Road" are mostly coastal countries. For most countries, the degree of national development restricts the development of their port industry. For other countries at a higher level of development, their economic development is bound to the port puts forward higher requirements and at the same time provides a large amount of goods for the port. Therefore, when analyzing the development prospects of ports, the size of the economy is an influencing factor that must be taken into consideration.

3.1.2. External Link

As an important node of the transportation network, the extent of its function is closely related to the resource situation of the economy in which it is located, the degree of economic development and the degree of external trade development. Therefore, this article attempts to use external link indicators to assess the degree of closeness of

economic links with the outside world. Starting from the problems analyzed in this article, this article analyzes the connection between transportation and economy. The closer the link between the economy and the outside world, the less resistance Chinese companies that enter the economy as foreign companies will face.

3.1.3. Internal Vitality

Port investment is a project with huge investment and long return period, so it is necessary to ensure the long-term development of investment objectives. The vigorous vitality means that the economy has the thrust of development, but also has the initiative to seek development, which means that the local economy is in a stable rising period, and for the port industry, this period is the development of business and expansion. Good time for the market. And a booming, vibrant economy will also make investors more optimistic about local development, thereby reducing investment worries. This factor is particularly important in the process of judging the status of ports in developing countries along the "Belt and Road".

3.1.4. Institutional Quality

Analyzing the quality of the system will also enable this article to understand the local system and market development, and help investors further analyze the local development prospects and the difficulty of port operations. The quality of the system mainly includes two aspects.

Table-1. Port investment confidence index index system.

Level 2 indicators	Level 3 indicators	Statistical approaches
Economy size	GDP θ_{11}	Related yearbooks
	Total population θ_{12}	Related yearbooks
	Container terminal throughput θ_{21}	World Bank Database
	Net foreign direct investment inflow θ_{22}	World Bank Database
External link	Total merchandise imports and exports θ_{23}	World Bank Database
	Per capita retail sales of consumer goods θ_{31}	World Bank Database
Internal vitality	Total number of listed companies θ_{32}	World Bank Database
	Number of patent applications θ_{33}	World Bank Database
	Effective labor supply θ_{34}	World Bank Database
	Starting a business θ_{41}	Time, cost (business environment report)
institutional quality	Apply for building permit θ_{42}	Time, cost, construction quality control index (business environment report)
	Geting power θ_{43}	Power supply reliability, electricity price (business environment report)
	Registered property θ_{44}	Time, cost, land management quality (business environment report)
	Protect Investors θ_{45}	Dispute Mediation Index, Shareholder Governance Index, Minority Investor Protection Index (Business Environment Report)
	Taxes θ_{46}	Number of tax payments, total tax rate (Business Environment Report)
	Cross-border trade θ_{47}	Import and export time and cost, domestic transportation cost and time (Business Environment Report)
	Execution of the contract θ_{48}	Time, cost, recovery rate, strength of the bankruptcy framework (Business Environment Report)
	Bankruptcy θ_{49}	

On the one hand, it is the degree of perfection of the system. After all, "there is a law to follow" is the foundation of a region's system construction, and a region with sound laws must have fewer investment risks than other regions. On the other hand, it is the implementation of laws and regulations, which include the performance of contracts, the court's litigation cycle, etc., reflecting the efficiency of the operation of a regional system, and it can also make a detailed analysis of the problems that may be encountered in port operations. , In order to estimate the difficulty of port operations.

3.2. Index Evaluation Model Based on D-S Evidence Theory

Evidence is the basis of D-S evidence theory. In this article, the evidence that needs to be substituted into the DS evidence theory is the weight obtained by different methods. In order to take into account the basic situation of Chinese enterprises and the objective conditions of each economy, this article will adopt the weight obtained by subjective weighting method (The subjective weight) and the weight obtained by the objective weighting method (objective weight) are each used as evidence for evaluation. This article will use AHP method and entropy method to get the evidence used. After substituting the obtained evidence into the D-S evidence theory for analysis, the final evaluation result is obtained.

3.2.1. Calculation of Subjective Weight

This weight is calculated by the AHP method.

1. Construct a hierarchical analysis framework model. The port investment confidence index index system constructed in this paper is shown in Table 1. The indicators are divided into target level, criterion level and factor level. The target level is the purpose of decision-making, that is, the evaluation of port investment confidence. The standard level is the main factor affecting port investment confidence. The factor layer is the subdivision factor that affects the main factor.

2. Construct a judgment matrix. In the constructed index system, both the criterion layer and the factor layer contain multiple factors. In order to confirm the importance of these factors, a judgment matrix needs to be constructed. Through the questionnaire survey, the relative importance of the two indicators of the same level and the same superior index to the superior index is constructed to construct a judgment matrix, namely:

$$B = \begin{pmatrix} b_{11} & b_{12} & .. & b_{1n} \\ b_{21} & b_{22} & .. & b_{2n} \\ \vdots & & & \vdots \\ b_{n1} & b_{n2} & b_m & \end{pmatrix} \#(1)$$

b_{ij} means the relative importance of factor b_i over factor b_j. The relative importance b_{ji} of factor b_j to factor bi should satisfy b_{ji} $1/$ b_{ij}, and both are greater than 0. If b_{ij} 1, the importance of the two factors is the same.

3. Calculate indicator weights. To calculate the relative importance of a factor to its corresponding upper-level factor, the calculation steps are as follows.

First calculate the product of each row of the judgment matrix, namely

$$M_j = \prod_{j=1}^{n} b_{ij} \#(2)$$

Then calculate the nth root of M_j to get W_i, namely

$$\overline{W_i} = \sqrt[n]{M_j} \#(3)$$

Then normalize:

$$W_i = \frac{\overline{W_i}}{\sum_{i=1}^{n} \overline{W_i}} \#(4)$$

From this, the feature vector can be obtained $W \llbracket \llbracket W_1, W_2, \ldots, W_n \rrbracket$

4. Consistency check. The construction of the matrix is based on the knowledge and experience of the evaluator. During the evaluation process, it is difficult for the evaluator to worry about the consistency of all indicators before and after comprehensively. Therefore, the eigenvalues of the judgment matrix will be biased. Generally speaking, moderate deviations are allowed, but excessive deviations will make researchers question the accuracy of the results. Therefore, a consistency check is required.

First, calculate the largest characteristic root λmax of the judgment matrix:

$$\lambda_{max} = \sum_{i=1}^{n} \frac{(BW)_i}{nW_i} \#(5)$$

Then calculate the consistency check index CI:

$$CI = \frac{\lambda_{max} - n}{n - 1} \#(6)$$

Then look up the table to obtain the average random consistency index RI corresponding to the n-th order judgment matrix. If CI/RI<0.1, the judgment matrix is considered acceptable and the result is credible. If CI/RI>0.1, it is necessary to adjust the judgment matrix appropriately and redistribute the weight of each indicator until it passes the consistency test.

3.2.2. Calculation of Objective Weight

The objective weights used in this article are calculated using the entropy method. Taking the research objectives analyzed in this article as an example, the specific calculation steps are as follows.

First, use the min-max method to standardize the indicators to eliminate the dimensional difference of the grid indicators. The indicators involved in this article are all positive indicators, so the formula is as follows:

$$x'_{ij} = \frac{x_{ij} - x_{j-min}}{x_{j-max} - x_{j-min}} \#(7)$$

x_{ij} is the initial value of the i-th index in year j, x'_{ij} is the corresponding processed value, and x_{j-max}, x_{j-min}

are the maximum and minimum values of the index sequence. At the same time, the standardized results will be applied to the index assignment of the index system in this article. Then normalize the obtained standardized data to obtain the data required for entropy calculation and index weight calculation.

Using formula (4-2) the information entropy of the indicator,

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^{n} p_{ij} \ln p_{ij} \#(8)$$

e_j is the information entropy of the indicator, n is the sample size of the indicator, the number of years of statistics.

Then calculate p_{ij}, p_{ij} is the weight of the data of the i-th index in the j-th year

$$p_{ij} = \frac{x'_{ij}}{\sum_{i=1}^{n} x'_{ij}} \#(9)$$

Then calculate the coefficient of variance of each indicator:

$$g_j = 1 - e_j \#(10)$$

The larger the g_j the more important the indicator.

Finally calculate the weight of each indicator:

$$w_j = \frac{g_j}{\sum_{j=1}^{m} g_j} \#(11)$$

wj is the weight of the indicator, m is the number of indicators. Therefore, the objective weight needed in this article is obtained.

3.2.3. Application of D-S Evidence Theory

When making judgments and decisions on a problem, the set of all solutions that can be made is represented by Θ, and Θ is called the identification frame. The elements in Θ are mutually exclusive, but they completely contain all the possibilities of the problem. A subset of Θ is called a proposition, and its form can be expressed as:

$$\Theta = \{\theta_1, \theta_2, \theta_3, \dots \dots \theta_n\}$$

The power set 2^{Θ} of Θ represents the set of all subsets of Θ, that is, all possible subsets. The basic probability distribution function of the identification framework is $2^{\Theta} \rightarrow (0,1)$, which is also called the mass function. The mass function can be regarded as the evaluation of the problem by experts in evidence theory with their own knowledge and experience. An evaluation can be regarded as evidence by the decision maker of the problem. The mass function satisfies the following conditions:

$$m(F) = 0 \#(12)$$

$$\sum_{A \subset \theta} m(A) = 1, \forall A \subset \theta \#(13)$$

m(A) is the basic trust assignment value of proposition A, that is, the degree of evidence supporting proposition A.

Then the evidence processing in this article based on the D-S evidence theory is mainly divided into the following steps:

1. Construct an identification framework Θ, and transform the research into the research of collections.
2. Establish the initial distribution of the reliability of the proposition, that is, analyze the evidence based on the evidence to determine the degree of support for each proposition.
3. Synthesize existing evidence, construct multiple trust functions, then obtain the fused trust function through calculation, and then make decisions based on the fused trust function.

In this process, the trust function and likelihood function of the evidence theory show the restriction on the trust degree of the proposition.

The trust function on the identification frame Θ is defined as:

$$Bel(A) = \sum_{B \subseteq A} m(B) \#(14)$$

Bel(A) is the trust function of proposition A, which represents the lower limit of the trust degree of proposition A. The likelihood function on the identification frame Θ is defined as

$$Pl(A) = \sum_{B \cap A \neq \phi} m(B) \#(15)$$

It represents the degree of trust that proposition A is not false, that is, the upper limit of the degree of trust in proposition A.

Dempster synthesis rules are also called evidence synthesis formulas, which can be expressed as follows:

$$m(C) = m_i(X) \oplus m_j(Y) = \frac{\sum_{X_N = C, \forall XY \oplus} m_i(X) \times m_j(Y)}{1 - \sum_{X_N = \phi, \forall XY_G \theta} m_i(X) \times m_j(Y)}, X \cap Y \neq \phi \#\#\#\#\#\#\#\#\# \quad (16)$$

$$m(C) = 0, X \cap Y = \phi \# \quad (17)$$

In the above formula, i,j=1,2,...m, the above is the rule for combining two evidences. When more evidence is encountered, the formula can also be extended by its interchangeability and associativity.

4. CASE STUDY

4.1. Selection of Research Objectives

The first category of countries includes Israel, Turkey, Greece, Singapore, New Zealand, Saudi Arabia, Croatia, the United Arab Emirates and Malaysia. These countries all have a better economic foundation, a higher standard of living of their residents, and a more complete legal system. Among the research objects of this article, they belong to the more developed countries. The second category includes the Islamic Republic of Iran, South Africa, Russia, and India , Indonesia, Pakistan, Sri Lanka, Thailand, Kenya, Arab Republic of Egypt. When categorizing the research objectives in this article, the average per capita GDP of China in five years is used as the basis. However, when considering Russia, although its average per capita GDP is higher than that of China, due to its vast territory and uneven development, its per capita GDP Areas with higher GDP are concentrated in areas with rich oil and gas resources, while the per capita GDP on the east and west sides suitable for port investment is lower. Therefore, this article believes that it is more reasonable to include them in the second category of countries for consideration. Such countries are underdeveloped countries among the research objects, and their development has shortcomings, but they all have certain development prospects. Take India and Russia as examples. India has a huge population base and rapid economic and technological growth, but its various systems still need to be improved. For Russia, it has a sound industrial system and rich natural resources, but its light industry is not developed, and its high latitude also limits the development of local ports. Therefore, they are included in the second category of countries.

4.2. Data Collection

4.2.1. Questionnaire

This paper uses the AHP method to confirm the required subjective weights. Therefore, the questionnaires were sent to relevant experts via the Internet. Afterwards, 26 questionnaires were collected and 3 invalid questionnaires were screened out. Finally, the subjective weights of this paper were derived from 23 valid

questionnaires. See the appendix for the details of the questionnaire. All respondents responded via mobile phones. Among them, 12 were from Beijing, 10 were from Guangzhou, and one was from Shanghai.

4.2.2. "Global Business Environment Report"

The data on the business environment indicators involved in this article are all from the "Global Business Environment Report". The data in the report are derived from the perspective of the enterprise, which is consistent with the starting point of this article. Taking the indicator of "starting a business" as an example, researchers put virtual enterprises of the same scale and conditions into each economy, and obtained the number of procedures required to start a business, the time and cost and other related factors, and finally summarized the data. Obtain the frontier distance score of "starting a business" in each economy. On the other hand, the statistical methods of the Global Business Environment Report have undergone many changes. It is not meaningful to directly compare historical data. However, this article focuses on the horizontal comparison between countries in the same year, and the result obtained is essentially the frontier distance score of each country in the same year, so it is still meaningful to compare the final results.

4.2.3. World Bank Database

The indicators in this article cover a wide range of aspects, covering transportation, scientific research, economy and other aspects. At the same time, the research objects are various economies. Therefore, the data in the World Bank database is exactly what this article needs. Most of the data in the World Bank database are summarized by country and region, and cover all aspects. Therefore, the data used in the indicators such as "Total Import and Export of Commodities", "Number of Resident Patent Applications" and "Number of Listed Companies" mentioned in this article are all From the World Bank database. However, when selecting research targets in this article, it is found that there are still missing data in some countries, which has become one of the limitations of the research targets in this article.

4.3. Calculation of Subjective Weight

This article uses the AHP1-9 scale method, and the meaning of the specific scale is shown in Table 2.

Table-2. Scale meaning.

Scaling	Meaning
1	Comparing the two factors, they have the same importance
3	Comparing two factors, one factor is slightly more important than the other
5	Comparing two factors, one factor is obviously more important than the other
7	Comparing two factors, one factor is more important than the other
9	Comparing two factors, one factor is absolutely more important than the other
2,4,6,8	The median value of the above adjacent judgment

If the comparison between index B1 and index B2 is judged as a, then the judgment between index B2 and index B1 is 1/a.

Based on the above principles, the "Port Investment Confidence Index Expert Questionnaire" was produced and distributed, the 26 questionnaires obtained were statistically summarized, 3 invalid questionnaires were eliminated, and the data of the remaining 23 questionnaires were sorted to obtain indicators at all levels. Judgment matrix, use excel to calculate, and adjust the judgment matrix to meet the consistency test of CR=CI/RI<0.1（As shown in Table-3.

Table-3. Random fluctuation consistency index.

Order	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45

4.3.1. Level 2 Indicators

Table-4. Judgment Matrix of Level 2 indicators.

Index	Economic scale	External links	Internal vitality	Institutional quality	Weights
Economic scale	1	1/2	1/3	1/2	0.12
External links	2	1	1/3	1/2	0.17
Internal vitality	3	3	1	1	0.39
Institutional quality	2	2	1	1	0.32

The judgment matrix of the secondary index is shown in Table 4, CR=0.03404, which passed the consistency test.

4.3.2. Economic Scale Index

Table-5. Economic scale index judgment matrix.

Index	GDP	Total Population	Weights
GDP	1	4.6	0.82
Total Population	2/9	1	0.18

The economic scale indicator judgment matrix is shown in Table 5, CR=0, which passes the consistency test.

4.3.3. External Link Indicators

Table-6. External link indicator judgment matrix.

Index	Container terminal throughput	Total merchandise imports and exports	Foreign Direct Investment	Weights
Container terminal throughput	1	1	1	0.333
Total merchandise imports and exports	1	1	1	0.333
Foreign Direct Investment	1	1	1	0.333

Note: CR=0, passing the consistency test.

4.3.4. Internal Vitality Index

Table-7. Internal vitality index judgment matrix.

Index	Social retail	Patents	Number of listed companies	Labor Supply	Weights
Social retail	1	2	1/3	5	0.270
Patents	1/2	1	1/3	3	0.185
Number of listed companies	3	3	1	5	0.455
Labor Supply	1/5	1/3	1/5	1	0.090

Note: CR=0.0828, which passed the consistency test.

4.3.5. Institutional Quality Index

Table-8. Institutional quality index judgment matrix.

Index	Starting a business	Apply for building permits	Registered property	Protect Investors	Taxes	Cross-border trade	Execution of the contract	Bankruptcy	Get power	Weights
Starting a business	1	1	1/2	5/21	1/2	2	1/4	3	12/5	0.07
Apply for building permits	1	1	3	1/6	1/3	5	3	24/5	3	0.12
Registered property	2	1/3	1	5/26	1/4	4	1/5	2	22/5	0.07
Protect Investors	21/5	6	26/5	1	1	18/5	47/10	9/2	9/2	0.29
Taxes	2	3	4	1	1	1	4	47/10	5	0.19
Cross-border trade	1/2	1/5	1/4	5/28	1	1	1/4	24/5	5	0.05
Execution of the contract	4	1/3	5	10/47	1/4	4	1	5	4	0.12
Bankruptcy	1/3	5/24	1/2	2/9	10/47	5/24	1/5	1	5/24	0.02
Get power	5/27	1/3	5/22	2/9	1/5	1/5	1/4	24/5	1	0.03

Note: CR=0.09753, which passed the consistency test.

Each group of indicators has passed the consistency test, and finally the subjective weight is calculated by formula (3-2), formula (3-3) and formula (3-4).

The subjective weights finally obtained by the AHP method are shown in Table 9.

Table-9. List of Subjective Weights of Port Investment Confidence Inde.

Level two indicators	weight	Level three indicators	Weight
Economic scale	0.12	GDP	0.82
		Total Population	0.18
External links	0.17	Container terminal throughput	0.333
		Total merchandise imports and exports	0.333
		Foreign Direct Investment	0.333
Internal vitality	0.39	Social retail	0.270
		Patents	0.185
		Number of listed companies	0.455
		Labor supply	0.090
Institutional quality	0.32	Start a business	0.078
		Apply for building permit	0.126
		Registered property	0.071
		Protect Investors	0.291
		Taxes	0.199
		Cross-border trade	0.056
		Execution of the contract	0.122
		Bankruptcy	0.024
		Get power	0.032

4.4. Calculation of Objective Weight

4.4.1. Sample Data Processing

The data used in this section mainly comes from the World Bank database and the Global Business Environment Report.

First, standardize the original data according to formula (3-7), and the processed data is shown in Table 10 and Table 11.

4.4.2. Confirm Indicator Weight

Substituting the normalized data of the first type of country in 2016 and the second type of country data into the formulas (3-8), (3-9), (3-10) and (3-11) to get the 2016 two types The entropy value and objective weight of each national indicator.

In this paper, the results obtained by using the entropy method for 2016 data of various countries are shown in Table 12.

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Table-10. Table of Standardization Processing of Indicator Data in the Category I of Countries in 2016.

Category I countries	Israel	Turkey	Greece	Singapore	New Zealand	Saudi Arabia	Croatia	UAE	Malaysia
GDP	0.33	1.00	0.17	0.30	0.17	0.73	0.00	0.37	0.30
Total Population	0.06	1.00	0.09	0.02	0.01	0.37	0.00	0.07	0.36
Container terminal throughput	0.07	0.27	0.12	1.00	0.09	0.24	0.00	0.64	0.77
Total merchandise imports and exports	0.16	0.51	0.07	1.00	0.06	0.48	0.00	0.77	0.54
Foreign Direct Investment	0.17	0.17	0.02	1.00	0.00	0.09	0.00	0.12	0.20
Per capita retail sales of consumer goods	0.86	0.17	0.60	0.75	0.99	0.08	0.15	1.00	0.00
Patents	0.21	1.00	0.09	0.25	0.17	0.17	0.02	0.00	0.17
Number of listed companies	0.39	0.33	0.11	0.46	0.06	0.07	0.05	0.00	1.00
Labor supply	0.07	1.00	0.11	0.05	0.03	0.40	0.00	0.16	0.46
Start a business	0.63	0.42	0.64	0.86	1.00	0.00	0.44	0.55	0.58
Handle construction	0.37	0.21	0.41	0.61	1.00	0.57	0.00	0.97	0.82
Get power	0.00	0.42	0.04	0.80	0.44	0.23	0.02	1.00	0.95
Registered property	0.07	0.52	0.00	0.73	1.00	0.64	0.45	0.88	0.60
Protect Investors	0.72	0.67	0.39	0.94	1.00	0.00	0.44	0.33	0.89
Taxes	0.00	0.07	0.26	0.69	0.69	0.15	0.37	1.00	0.12
Cross-border trade	0.67	0.61	0.88	0.79	0.70	0.00	1.00	0.45	0.66
Execution of the contract	0.23	0.56	0.00	1.00	0.72	0.15	0.61	0.68	0.49
Bankruptcy	0.98	0.47	0.76	1.00	0.96	0.00	0.73	0.55	0.84

Table 11. Table of standardization processing of indicator data in the second group of countries in 2016.

Category II countries	Iran	Russia	South Africa	India	Indonesia	Pakistan	Sri Lanka	Thailand	Kenya	Egypt
GDP	0.16	0.55	0.10	1.00	0.39	0.10	0.00	0.15	0.00	0.12
Total Population	0.05	0.09	0.03	1.00	0.18	0.13	0.00	0.04	0.02	0.06
Container terminal throughput	0.12	0.25	0.29	0.97	1.00	0.14	0.39	0.63	0.00	0.50
Total merchandise imports and exports	0.15	0.75	0.24	1.00	0.43	0.08	0.02	0.64	0.00	0.10
Foreign Direct Investment	0.07	0.73	0.04	1.00	0.09	0.04	0.01	0.06	0.00	0.18
Per capita retail sales of consumer goods	0.37	1.00	0.76	0.03	0.27	0.01	0.35	0.44	0.00	0.28
Patents	0.55	1.00	0.10	0.49	0.04	0.00	0.01	0.04	0.00	0.03
Number of listed companies	0.05	0.03	0.04	1.00	0.08	0.09	0.04	0.10	0.00	0.03
Labor supply	0.04	0.13	0.03	1.00	0.23	0.12	0.00	0.06	0.02	0.04
Start a business	0.71	1.00	0.50	0.24	0.00	0.41	0.72	0.64	0.17	0.72
Handle construction	1.00	0.66	0.75	0.00	0.70	0.54	0.79	0.92	0.55	0.83
Get power	0.63	1.00	0.48	0.86	0.84	0.00	0.67	0.98	0.37	0.45
Registered property	0.51	1.00	0.43	0.25	0.27	0.00	0.14	0.56	0.29	0.35
Protect Investors	0.00	0.62	0.85	1.00	0.58	0.85	0.62	0.73	0.31	0.31
Taxes	0.35	0.98	1.00	0.00	0.51	0.08	0.25	0.71	0.69	0.19
Cross-border trade	0.13	0.64	0.43	0.40	0.55	0.00	0.71	1.00	0.60	0.28
Execution of the contract	0.62	1.00	0.49	0.00	0.18	0.20	0.09	0.80	0.60	0.18
Bankruptcy	0.00	0.70	0.70	0.15	0.90	0.40	0.45	1.00	0.11	0.30

Table-12. Entropy and objective weight based on entropy method in 2016.

Index	Entropy of Category I countries	The objective weight of Category I countries	Entropy of Category II countries	The objective weight of Category II countries
GDP	0.8619	0.0432	0.7503	0.0672
Total Population	0.6334	0.1146	0.5852	0.1116
Container terminal throughput	0.7919	0.0650	0.8618	0.0372
Total merchandise imports and exports	0.8185	0.0567	0.7861	0.0575
Foreign Direct Investment	0.6418	0.1120	0.6235	0.1013
Per capita retail sales of consumer goods	0.8373	0.0508	0.8160	0.0495
Patents	0.7476	0.0789	0.6019	0.1071
Number of listed companies	0.7494	0.0783	0.5424	0.1231
Labor supply	0.7124	0.0899	0.6025	0.1069
Start a business	0.9276	0.0226	0.9088	0.0245
Handle construction	0.9006	0.0311	0.9458	0.0146
Get power	0.7948	0.0641	0.9318	0.0184
Registered property	0.8920	0.0338	0.8911	0.0293
Protect Investors	0.9150	0.0266	0.9268	0.0197
Taxes	0.8150	0.0578	0.8682	0.0355
Cross-border trade	0.9351	0.0203	0.9064	0.0252
Execution of the contract	0.8930	0.0334	0.8565	0.0386
Bankruptcy	0.9330	0.0209	0.8778	0.0329

Table-13. List of objective weights of the Category I of countries over the years.

The objective weight of Category I countries	2012	2013	2014	2015	2016	Mean
GDP	0.0444	0.0455	0.0434	0.0452	0.0432	0.0444
Total Population	0.1153	0.1170	0.1162	0.1199	0.1146	0.1166
Container terminal throughput	0.0684	0.0688	0.0687	0.0682	0.0650	0.0678
Total merchandise imports and exports	0.0548	0.0558	0.0552	0.0578	0.0567	0.0561
Foreign Direct Investment	0.0977	0.0936	0.1389	0.1135	0.1120	0.1111
Per capita retail sales of consumer goods	0.0444	0.0477	0.0505	0.0503	0.0508	0.0487
Patents	0.0794	0.0628	0.0660	0.0757	0.0789	0.0725
Number of listed companies	0.0721	0.0806	0.0804	0.0755	0.0783	0.0774
Labor supply	0.0870	0.0890	0.0900	0.0941	0.0899	0.0900
Start a business	0.0278	0.0295	0.0224	0.0236	0.0226	0.0252
Handle construction	0.0202	0.0204	0.0186	0.0257	0.0311	0.0232
Get power	0.0386	0.0400	0.0411	0.0671	0.0641	0.0502
Registered property	0.0338	0.0265	0.0271	0.0358	0.0338	0.0314
Protect Investors	0.0396	0.0459	0.0302	0.0305	0.0266	0.0346
Taxes	0.0422	0.0465	0.0359	0.0427	0.0578	0.0450
Cross-border trade	0.0484	0.0486	0.0560	0.0210	0.0203	0.0389
Execution of the contract	0.0552	0.0505	0.0382	0.0323	0.0334	0.0419
Bankruptcy	0.0308	0.0313	0.0211	0.0210	0.0209	0.0250

Table-14. List of objective weights of the Category II of countries over the years.

The objective weight of Category II countries	2012	2013	2014	2015	2016	Mean
GDP	0.0669	0.0682	0.0673	0.0614	0.0672	0.0662
Total Population	0.1156	0.1117	0.1094	0.1067	0.1116	0.1110
Container terminal throughput	0.0335	0.0333	0.0329	0.0354	0.0372	0.0345
Total merchandise imports and exports	0.0641	0.0640	0.0622	0.0573	0.0575	0.0610
Foreign Direct Investment	0.0904	0.0922	0.0813	0.0945	0.1013	0.0920
Per capita retail sales of consumer goods	0.0592	0.0593	0.0560	0.0510	0.0495	0.0550
Patents	0.1324	0.1237	0.1159	0.1157	0.1071	0.1190
Number of listed companies	0.1195	0.1180	0.1182	0.1180	0.1231	0.1193
Labor supply	0.1093	0.1066	0.1049	0.1025	0.1069	0.1060
Start a business	0.0190	0.0175	0.0283	0.0260	0.0245	0.0231
Handle construction	0.0204	0.0162	0.0143	0.0133	0.0146	0.0158
Get power	0.0160	0.0158	0.0331	0.0282	0.0184	0.0223
Registered property	0.0168	0.0157	0.0231	0.0290	0.0293	0.0228
Protect Investors	0.0256	0.0366	0.0217	0.0196	0.0197	0.0246
Taxes	0.0169	0.0257	0.0275	0.0475	0.0355	0.0306
Cross-border trade	0.0287	0.0268	0.0408	0.0240	0.0252	0.0291
Execution of the contract	0.0315	0.0329	0.0274	0.0357	0.0386	0.0332
Bankruptcy	0.0344	0.0358	0.0357	0.0339	0.0329	0.0345

Table-15. Overview of the relevant data of Israel in 2016.

Index	Basic data	Standardized data	Subjective weight	Objective weight
GDP (100 million US dollars)	3177.4578	0.3285	0.0993	0.0432
Total population (ten thousand)	854.71	0.0581	0.0216	0.1146
Container terminal throughput (TEU)	2450400	0.0716	0.0570	0.0650
Total import and export of goods (100 million US dollars)	1289.955	0.1569	0.0570	0.0567
Foreign Direct Investment (USD)	11902600000	0.1681	0.0570	0.1120
capita social consumption average retail sales (USD)	19809.43678	0.8578	0.1054	0.0508
Patents (a)	1,300	0.2057	0.0721	0.0789
Number of listed companies (a)	427	0.3932	0.1774	0.0783
Labor supply (a)	4,017,542	0.0735	0.0349	0.0899
Start a business	90.55	0.6320	0.0248	0.0226
Apply for building permit	71.54	0.3684	0.0400	0.0311
Get power	75.21	0.0000	0.0101	0.0641
Registered property	73.33	0.0718	0.0228	0.0338
Protect Investors	70.01	0.7220	0.0927	0.0266
Taxes	82.85	0.0000	0.0633	0.0578
Cross-border trade	57.93	0.6673	0.0180	0.0203
Execution of the contract	72.47	0.2316	0.0389	0.0334
Bankruptcy	52.84	0.9752	0.0078	0.0209

4.5. Evidence Fusion

There are three types of data involved in the final calculation of evidence fusion based on D-S evidence theory.

1. It is the subjective weight obtained through the questionnaire. This part of the data comes from the subjective judgments of relevant experts and has a certain degree of subjectivity, but it also reflects some of the preferences of Chinese investors and the relevant practitioners encountered in the actual investment process Case.

2. It is the objective weight obtained through the entropy method. This part of the data comes from the basic data of various countries and is objective.

3. It is the score of each indicator of each country. This part of the data uses the data standardized in the previous section. It can well reflect the differences between countries, but the disadvantage is that if you try to substitute new countries into the analysis, additional calculations will be added . The closer its value is to 0, it indicates that the country is at the end of the research target on this indicator. The closer its value is to 1, it indicates that the country is at the forefront of the research goals in this indicator.

This article briefly describes the calculation steps using 2016 Israel as an example (Shown in Table 15) .

First, the comprehensive probability value of the indicator needs to be calculated. Taking the indicator "economic scale" as an example, the comprehensive probability value obtained by subjective weight is called the subjective comprehensive probability value, and the probability value obtained by objective weight is called the objective comprehensive probability value. The subjective comprehensive probability value is the product of the corresponding subjective weight and standardized data, namely:

$$M_1\{\theta_{11}\} = 0.0993 \times 0.3285 = 0.0326$$

Similarly, the objective comprehensive probability value is the product of the corresponding subjective weight and standardized data, namely:

$$M_2\{\theta_{11}\} = 0.0432 \times 0.3285 = 0.0141$$

By analogy, the subjective comprehensive probability value set M1 can be obtained:

$$M_1 = \{M_1\{\theta_{11}\}, M_1\{\theta_{12}\}, \ldots \ldots, M_1\{\theta_{49}\}\}$$

And its corresponding uncertainty value $m1\{\theta\}$:

$$m_1\{\theta\} = 1 - M_1\{M_1\{\theta_{11}\}, M_1\{\theta_{12}\} \ldots \ldots, M_1\{\theta_{49}\}\}$$

Similarly, the objective comprehensive probability value set M2 and its corresponding uncertainty value m2{θ} can be obtained.

$$\text{Bel}_1(\theta_1) = M_1\{\theta_{11}\} + M_1\{\theta_{12}\} = 0.0339$$

$$\textit{Similarly, the trust function } \text{Bel}_1(\theta_2) = 0.0226 \quad , \quad \text{Bel}_1(\theta_3) = 0.1776 \quad ,$$

$$\text{Bel}_1(\theta_4) = 0.1275 \textit{ of other secondary indicators can be obtained.}$$

Similarly, the likelihood function of $\theta1$ for economic scale can be obtained by calculation as

$$Pl_1(\theta_1) = 1 - \text{Bel}_1(\overline{\theta_1}) = 1 - (M_1\{\theta_{21}\} + M_1\{\theta_{21}\}, \ldots \ldots, +M_1\{\theta_{49}\}) = 0.6723$$

In the same way, $Pl_1(\theta_2) = 0.6610$, $Pl_1(\theta_3) = 0.8160$, $Pl_1(\theta_4) = 0.7660$, and the upper and lower limits of the secondary index assignment can be determined by the trust function and the likelihood function.

Through the same method, the trust function and likelihood function of each secondary index based on objective weight can be obtained.

Next is evidence fusion, which combines the two sets of weights with differences, and finally obtains a more reliable result. The specific calculation is as follows :

$$K_{1,2} = \sum_{\theta_i \cap \theta_j \neq \phi} M_1(\theta_i) \times M_2(\theta_j) = 0.05653$$

$$M_{1,2}(\{\theta_1\}) = \sum_{\theta_i \cap \theta_j = A} M_1(\theta_i) \times M_2(\theta_j)/(1 - K) = 0.0421$$

Similarly, we can get $M_{1,2}(\{\theta_2\}) = 0.0409$, $M_{1,2}(\{\theta_3\}) = 0.2272$, $M_{1,2}(\{\theta_4\}) = 0.1752$

The results of Israel's integration in 2016 are shown in Table 16.

Table-16. 2016 Israeli integration results.

	Economic scale	External links	Internal vitality	Institutional quality
Fusion result	0.0421	0.0409	0.2272	0.1752

Then, according to the synthesis rules of DS evidence theory, namely formulas (3-16), (3-17), substituting the subjective weights, objective weights and standardized 2016 data of each country in this article, the port investment confidence index of each country is obtained The final results are shown in Table 17 and Table 18.

Table-17. 2016 Evaluation Results of the Port Investment Confidence Index of the Category I Countries.

Category I countries	Israel	Turkey	Greece	Singapore	New Zealand	Saudi Arabia	Croatia	UAE	Malaysia
Economic scale	0.0421	0.1413	0.0189	0.0115	0.0076	0.0840	0.0000	0.0216	0.0421
External links	0.0409	0.0804	0.0216	0.2623	0.0119	0.0833	0.0000	0.1295	0.1253
Internal vitality	0.2272	0.2854	0.1298	0.1699	0.1463	0.0888	0.0336	0.1215	0.2398
Institutional quality	0.1752	0.1800	0.1709	0.3537	0.4175	0.1044	0.2295	0.3586	0.2873
Total score	0.4854	0.6870	0.3412	0.7974	0.5833	0.3605	0.2631	0.6312	0.6944

Table-18. 2016 Evaluation Results of the Port Investment Confidence Index of the Category II Countries.

Category II countries	Iran	Russia	South Africa	India	Indonesia	Pakistan	Sri Lanka	Thailand	Kenya	Egypt
Economic scale	0.0160	0.0353	0.0088	0.1347	0.0448	0.0223	0.0004	0.0124	0.0024	0.0150
External links	0.0314	0.1419	0.0463	0.2308	0.1246	0.0253	0.0345	0.1048	0.0000	0.0739
Internal vitality	0.1478	0.2448	0.1189	0.3715	0.0831	0.0401	0.0575	0.0835	0.0025	0.0547
Institutional quality	0.1905	0.3299	0.3198	0.0972	0.2177	0.1687	0.2292	0.3549	0.2290	0.1799
Total score	0.3857	0.7520	0.4939	0.8341	0.4703	0.2564	0.3216	0.5556	0.2339	0.3236

After that, according to the steps described above, this article calculates the objective weights for each year from 2012 to 2016 based on the entropy weight method, and uses this as a basis to calculate the port investment confidence index of countries in 2012-2016. The final results are shown in Table 19.

Table-19. 182012-2016 national port investment confidence index.

Category I countries	2012	2013	2014	2015	2016
Israel	0.5075	0.5031	0.4814	0.4774	0.4854
Turkey	0.6530	0.6428	0.6604	0.7182	0.6870
Greece	0.3059	0.3217	0.3541	0.3469	0.3412
Singapore	0.8310	0.8268	0.8203	0.8121	0.7974
New Zealand	0.5955	0.5894	0.5566	0.5729	0.5833
Saudi Arabia	0.4868	0.5002	0.4477	0.4327	0.3605
Croatia	0.2066	0.1816	0.2372	0.2583	0.2631
UAE	0.5538	0.5731	0.5800	0.6091	0.6312
Malaysia	0.6984	0.7035	0.6989	0.7141	0.6944
Category II countries	2012	2013	2014	2015	2016
Iran	0.4047	0.3791	0.3851	0.3787	0.3857
Russia	0.7378	0.7386	0.7538	0.7180	0.7520
South Africa	0.5219	0.5372	0.5276	0.4882	0.4939
India	0.7762	0.7634	0.8221	0.8159	0.8341
Indonesia	0.4989	0.4935	0.5218	0.4690	0.4703
Pakistan	0.3135	0.2966	0.3242	0.2694	0.2564
Sri Lanka	0.3128	0.3216	0.3353	0.2949	0.3216
Thailand	0.5877	0.5914	0.5849	0.5753	0.5556
Kenya	0.2390	0.2148	0.2028	0.2238	0.2339
Egypt	0.3464	0.3210	0.3611	0.3194	0.3236

4.6. Evaluation Result Analysis

From the evaluation results, in addition to the economic scale indicators, there are some indicators in the index system established in this article that have a certain relationship with the size of the country, such as the total import and export volume of goods, labor supply, etc. Therefore, in the evaluation of this article, the economy Countries with large scale and large potential market have certain advantages, which is consistent with the considerations in this article when constructing the indicator system. On the other hand, countries with a better economic foundation and rapid economic development will also be better evaluated, and the quality of the final business environment will also affect the final evaluation of the economy.

5. THE CONCLUSION

At present, after five years of improvement and development of my country's "One Belt, One Road" policy, it has become an important part of my country's opening-up process and has also driven the development of my country's foreign investment. In this context, according to incomplete statistics, my country's current overseas port investment exceeds 80 billion, with investment targets all over the world. In the process of selecting investment objectives, Chinese investors will not only be affected by their own experience and knowledge, but will also be exposed to various objective data from various countries. If these information can be effectively and comprehensively considered, they will definitely be China's overseas port investment has helped a lot. Therefore, this paper constructs a port investment confidence index from two aspects of port prosperity and business environment through analysis of related research, and then conducts evaluation and analysis through D-S evidence theory. This paper uses the AHP method to collect data through questionnaires to construct subjective weights, and then collects historical data from various countries to construct objective weights using entropy weighting method. Most of the data used comes from the World Bank database and the Global Business Environment Report. Later, on this basis, the D-S evidence theory is used to evaluate the port investment confidence index of various countries, which not only takes into account the subjective wishes of Chinese investors, but also considers the real situation, while avoiding the shortcomings of subjective and objective empowerment.

REFERENCES

Busse, M., & Groizard, J. L. (2008). Foreign direct investment, regulations and growth. *World Economy, 31*(7), 861–886.

Dihong, C., Huazhong, Li, & Xiangyu, Y. (2003). Method selection and empirical analysis of establishment of industry climate index. *Systems Engineering, 21*(4), 72-76.

Djankov, S., Porta, R. L., & Lopez-de-Silane, F. (2002). Courts: The lex mundi project (No. w8890). National Bureau of Economic Research.

Djankov., S., La, P. R., & Lopezdesilanes, F. (2002). The regulation of entry. *The Quarterly Journal of Economics, 117*(1), 1-37.

Dong, X. (2014). *Thoughts on the greater role of Guangdong and Qiong provinces in the construction of the 21st century "Maritime Silk Road"*. Paper presented at the The Construction of the Maritime Silk Road and the Cooperation and Development of the Two Provinces of Qiong and Guangdong——The Third China (Hainan•Guangdong)) Proceedings of Reform and Innovation Forum.

Jeong, H., Cho, H., & Jones, A. (2012). Business process models for integrated supply chain planning in open business environment. *Journal of Service Science & Management, 5*(1), 1-13.

Pullin, J. (2003). Canonical quantization of general relativity: the last 18 years in a nutshell[C]//AIP Conference Proceedings. *American Institute of Physics, 668*(1), 141-153.

Qian, Q., & Yifei, Z. (2012). The establishment and research of the global dry bulk shipping market prosperity index. *Journal of Southwest University for Nationalities Natural Science Edition, 38*(2), 299-304.

Research Group, P. (2008). Research on the prosperity index of China's hotel industry. *Journal of Beijing International Studies University, 30*(5), 1-6.

Tong, Z. (2015). Analysis of China's business environment and FDI inflows. *Tianjin University of Finance and Economics*.

Wenxin, P. (2015). Research on the impact of business environment in underdeveloped regions on investment promotion. *Manager, 3*, 155-156.

Xian-li, G. T. M. K., & Yu, L. I. U. (2003). Development and application research of composite index of iron and steel industry of China. *China Industrial Economics, 11*, 71-77.

Yuling, S. (2016). Research on the impact of BRIC countries' business environment on foreign direct investment. *Guangdong University of Technology, 2016*, 1-55.

Zhiqiang, D., & Xiahai, W. (2012). System soft environment and economic development. *Management World, 4*, 9-20.