QUANTITATIVE RESEARCH ON COUNTRY RISK INDEX OF CHINESE OVERSEAS INVESTMENTS

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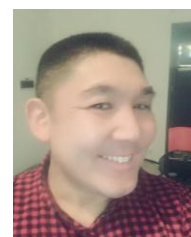
ABSTRACT

It is vitally important for Chinese overseas enterprises to understand and manage foreign countries' country risks under further and fast developing economic globalization situation. In this paper, through thoroughly investigating Chinese overseas enterprises, foreign country risks are quantified as one single number as the country risk index to forecast the investment risk for Chinese overseas enterprises.

Contribution/Originality: This study is one of very few studies which have investigated the political, management, legal, culture, and nature risks quantitatively for Chinese overseas investments.

1. INTRODUCTION

The so called investment risk is defined as the uncertainty of investment returns due to the uncertainty of the economic conditions and others related situations. By the narrow definition, the investment risk refers to the possible loss of the investments. Similarly, international investment risk refers the possible loss of the international investments due to the uncertainty of the international conditions. Due to the rapid globalization, many countries are positively seeking the overseas investments. Especially the biggest developing country, Chinese funds and enterprises are actively expanding its overseas investments. To the end of the year 2010, Chinese 13 thousand companies are investing in the overseas 180 nations. By setting up 16 thousand overseas enterprises, Chinese overseas investment capital reaches 320 billion dollars and ranked as 17th in the world with an average growth rate 50% per year. These process is enhancing due to recent one belt and one road initiatives. With the fast expansion of Chinese overseas investments, the risk management and control is presented to Chinese enterprises. Although many researches are targeted to the overseas country risks, such as single variable model (FitzPatrick, 1932) multi-

variable model (Altman, 1968; Beaver, 1968; Ohlson, 1980) etc. But till now, there is no reliable and operational country risk index model which can give early warning for overseas investments (Aziz *et al.*, 1988; Kent, 1992) especially for Chinese characteristic enterprises. As the leading engine of the world economy, Chinese enterprises data are vitally important not only to Chinese companies but to the world.

This paper takes the similar survey methods like Forlend, S&P, and Moody (Kaplan and Ruback, 1995; Best, 2010; Moody, n.d; S&P, n.d) index to investigate thoroughly all kinds of country risks which are facing the Chinese overseas investment companies, and trying to figure out the weights of these risks from their influences on Chinese overseas investment companies. Furthermore, a comprehensive country risk index is summarized up from these risks. From the data of major foreign countries' risk factors which Chinese capitals are flowing to, creative new quantitative models are derived for the risk factors considered in this paper such as political risk, nature risk, etc., by using the novel rank methods and regression approach. After these, the final country risk index model which is used to act as a risk warning index for Chinese overseas investment are presented. The comparisons are made from S&P, Moody (Moody, n.d; S&P, n.d) with the new model here.

In the second section, the survey results are presented and analyzed; Section 3 will quantize all kinds of country risks; in section 4, Chinese overseas country risk warning index model is presented and the real evidence analysis from this model is performed. Section 5 summarizes the conclusions from the model.

2. SURVEY RESULTS

2.1. Question Sheet Design and Survey

From the Chinese realistic situation and past research, the Chinese overseas investment risks are classified as five categories: political risk, management risk, legal risk, culture risk, nature risks and special industry risk, etc. The standard of selection of risk factors are as follows (FitzPatrick, 1932; Altman, 1968; Beaver, 1968; Ohlson, 1980; Aziz *et al.*, 1988; Kent, 1992; Kaplan and Ruback, 1995; Best, 2010) direct influence, independent to the Chinese overseas investments. For example, political risk are risks which cause investment return uncertainty due to all kinds of international and domestic political events. This five risks will be divided into the many sub categories, such as, 1)political risk is divided into 9 categories, such as war, civil riots, levy, remittance, government default, delay payment, profit transfer, market admittance, third country intervention, political violence. 2) management risk is defined as the management uncertainty due to overseas economic environment which includes 5 sub categories, such as government regulation risk, Sovereign debt risk, foreign financial risk, exchange rate risk, system transparency. 3) legal risk refers to the investment uncertainty due to overseas legal system, which mainly includes incompliance risk. 4)culture risk is defined as the investment return uncertainty due to the conflicts caused by the overseas culture factor. 5) nature risk is defined as the return uncertainty due to all kinds of uncontrollable nature factors, which includes nature disasters and international terrorists. These five factors are influencing all Chinese overseas companies and are used to model Chinese overseas investment risks. They are investigated thoroughly from the Chinese overseas companies and their influential powers, the weights are calculated from the survey results. The final comprehensive country indices are calculated from the weights which are used as the early warning country risk for all Chinese overseas investments.

2.2. Risk Factors: Results and Analysis

Through about 400 Chinese overseas companies' survey, the weights are calculated as in the follow table 1

Table-1. risk factors and risk weights

Risk	Weight
Political risk	0.246
Management risk	0.466
Legal risk	0.089
Culture risk	0.1989
Nature risk	0.0001
total	1.0

Source: from the public survey of this project.

From the table 1, it is very obvious the major risk is from the management risk which takes account of 46.6% of the total overseas investment risks; the second major risk is the political risk with a weight 24.6%; the third risk is the culture risk which accounts for 19.89%; legal risk is the fourth risk with a weight 8.9% ; The least risk is from the nature risk with the weight only 0.01% which is really small. One can see a foreign country's economic freedom, openness and political environment are vitally important to Chinese overseas investments.

3. RISK QUANTIZATION

3.1. Method

There are many risk quantization models such as Standard & Poor 4 level and 10 degree methods, Moody's 3 level and 9 degree model. But they are actually qualitative models. Even the famous Forlend indices are from the qualitative ranks.

Our goal is to calculate all risk factor's values, and then using the regression risk models to get the accurate quantitative numbers for the risk factors. The methods are presented as in the following sections.

3.2. Quantitative Models of Country Risks for Chinese Overseas Investments

To quantize the 5 category risks, the attempt is made to summarize the all 5 risk factors' values by using the weight in table 1. The approach is little creative and interesting here: first to each risk, the countries are ranked from the risk value 100 to 0, then for each country all 5 risks are ranked with the risk value from 100 to 0 according to their relative risk level in the world with the 100 as the most dangerous country for that risk consideration or most strong risk factor level in the world, 0 is the opposite. Then the regression is made to figure out the quantitative models.

i)   Political Risk Quantization Model

As in section 2, political risk is divided into 9 factors, here for the simplicity, the 9 factors are restructured as 5 new factors, 1. war and civil riots (WR), 2.government credibility (GC) which summarizes levy, remittance, government default, delay payment, profit transfer, 3. market admittance risks (MA), 4. third country intervention (TCI), 5. political violence (PV). Through the regress over 40 countries data, the political risk (PR) model is obtained as the following equation.

$$PR=0.117\times WR+0.05\times GC+0.513\times MA+0.044\times TCI+0.277\times PV \qquad (3.1)$$

One can see from (3.1) the MA and PV are the two most influential risk factors, WR is the third, GC and TCI are relatively small risk influential factors for the political risk.

ii)   Management Risk Quantitative Model

The management risk (MR) for Chinese overseas companies is divided into 5 risk factors from section 2, 1. government regulation risk (GR), 2. Sovereign debt risk (SD), 3.foreign financial risk (FR) 4. Exchange rate

risk(ER), 5 system transparency (ST). By using the same data, the model for management risk is shown as the following equation.

$$MR=0.141\times GR+ 0.180\times SD+0.002\times FR+0.221\times ER+0.456\times ST \qquad (3.2)$$

The equation 3.2 shows ST and ER are vital to management risks, FR is least important factor, and GR and SD are very important factors.

iii)   Legal Risk Quantitative Model
The legal risk (LR) is divided into two new factors: 1. the normalization and rationality of the legal system (NRL), 2. the stability of the legal system (SL). The regression result is in the following equation.

$$LR=0.469\times NRL+0.531\times SL \qquad (3.3)$$

The 3.3 results show that these two factors are with the similar importance.

iv)   Culture Risk Quantitative Model
Two factors are considered for the culture risk (CR): 1.extreme level of religions (EL), 2. diversification of the society(DS). The model is as

$$CR= 0.779\times EL+ 0.221\times DS \qquad (3.4)$$

It is shown EL is the most important factor from equation 3.4. That is why China is much better in the overseas investment than Iraq although Chinese value for DS is very high (little diversification).

v)   Nature Risk Quantitative Model
Two factors are considered for the nature risk (NR): 1.nature disaster (ND), such as earth quake, typhoon. 2. Terror activity (TA). The model is

$$NR= 0.09\times ND+0.91\times TA \qquad (3.5)$$

The equation 3.5 shows TA is the dominating risk factor. ND is unimportant compared with TA. This is why Japan is much better in investment than Afghanistan, although Japan is tortured by frequent earth quakes. By using these 5 quantitative models and Table .1, the country risk index (CRI) is calculated. Country investment index (CII) is defined as the opposite of the CRI, as CII=100 − CRI. The CII will classify the overseas investment countries as 5 categories: high suitability. Suitable, normal, not suitable, high risk for Chinese overseas investments. The higher CII, the more favorable for the overseas investments.

vi)   Risk Factor Value Calculations
The frequency of related risk events is used to calculate the risk factor for each country. The highest frequency Fmax-i in the world for risk factor i with risk factor value as 100. Others are calculated as

$$\text{Risk factor i value} = \left(1 - \frac{F_i}{Fmax_i}\right) \text{ X } 100 \qquad (3.6)$$

Fi is the frequency of the risk factor i related events in one country for a certain period,

Fmaxi is the highest frequency of the risk factor i related events in one country for the period in the world.

By now, the quantitative process is closed for the country risk model. Together with Table .1, the final result for country risk index is summarized as the following equation.

$$CRI= 0.246 \times PR +0.466 \times MR +0.089 \times LR+0.199 \times CR+0.0001 \times NR \quad (3.7)$$

And the country investment index is

$$CII = 100 - CRI \quad\quad\quad (3.8)$$

By using the discussion in this section, all factors quantitative values can be calculated.

4. EVIDENCE INVESTIGATION FOR THE MODEL

Now, the model is used to calculate the several major CIIs for Chinese overseas investment countries, such as USA, Japan, Germany, etc. The results for the year 2013 are presented in the table 2.

Table-2. evidence investigation for the model

Index Country	CII of the model	S &P sovereign credibility rank	Moody sovereign credibility rank
USA	99.005	AA+	Aaa
China	72.88	AA-	Aa3
Japan	95.074	AAA	Aa3
Germany	89.242	AAA	Aaa
UK	96.438	AAA	Aaa
France	90.001	AA+	Aaa
India	60.942	BBB-	Baa3
Russia	78.218	BBB+	Baa1
Brazil	82.46	A-	Baa2
Australia	96.781	AAA	Aaa
Singapore	97.54	AAA	Aaa
Afghanistan	11.1	No rank	No rank

Source: (Altman, 1968; Kent, 1992)

For comparison, the S&P and Moody's sovereign credibility ranks are used as country investment risk indices. It seems the model is very consistent with these two major rank system results for 12 countries listed in the table 2. But there are two differences, 1) To USA, our model shows USA rank as AAA, which is different from S&P's AA+, the reason maybe that the USA financial crisis lowered the USA sovereign credibility, but to enterprise investment, USA rank is still the best place to go. That means S&P sovereign credibility rank put emphasis on debt. Our model is concentrated on the overseas investments. 2) To Russia, our model give a rank, and the S&P is with the rank BBB+, with little difference.

From these evidence results, it shows that Chinese overseas investment risk is similar with advanced countries with small differences. But our model is more concentrated on the overseas investment risk not the debt which are the S&P and Moody model's major concern.

5. CONCLUSIONS

Through the comprehensive survey and regression on the historical data, a quantitative country risk index model is studied. Our model's results are from the thorough investigation of Chinese overseas companies, it is very fit to Chinese overseas investments. By comparison with S&P and Moody, our results are very compatible with these well-known models. These demonstrates Chinese overseas investment risks are similar to other countries in the world. Although, here these model are used to only calculate the past results, but with more data, it can be used

to predicate the future country risk for Chinese overseas investments. So it can be used to give a warning index for overseas companies and investments. By issuing monthly or annually reports for all foreign countries CRI, it can give the guidance and precaution for Chinese overseas investment in the world.

REFERENCES

Altman, E.I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance, 23(4): 589–609. *View at Google Scholar | View at Publisher*

Aziz, A., D. Emanuel and G. Lawson, 1988. Bank prediction: An investigation of cash flow based models. Journal of Management Studies, 25(5): 419- 437. *View at Google Scholar | View at Publisher*

Beaver, W.H., 1968. Market prices, financial ratios, and the prediction of failure. Journal of Accounting Research, 6(2): 179-192. *View at Google Scholar | View at Publisher*

Best, R.W., 2010. The role of default risk in determining the market reaction to debt announcement. Financial Review, 32(1): 87-105.

FitzPatrick, P.J., 1932. A comparison of the ratios of successful industrial enterprises with those of failed companies. Journal of Accounting Research: October, 1932, p. 1598-1605; November, 1932, p. 1656-1662; December, 1932, p. 1727-1731.

Kaplan, S. and R. Ruback, 1995. The valuation of cash flow forecasts: An empirical analysis. Journal of Finance, 50(4): 1059-1093. *View at Google Scholar | View at Publisher*

Kent, D.M., 1992. A framework for integrated risk management in international business. Journal of International Business Studies, 23(2): 311-331. *View at Google Scholar | View at Publisher*

Moody, n.d. Data can be obtained from the web address. Retrieved from http://www.moodys.com/.

Ohlson, J.S., 1980. Financial ratios and the probabilistic prediction of bankruptcy. Journal of Accounting Research, 18(1): 109-131. *View at Google Scholar | View at Publisher*

S&P, n.d. Data can be obtained from the web address. Retrieved from http://www.standardandpoors.com/ratings/sovereigns/ratings-list/en/us/?subSectorCode=39&start=0&range=50.