

Research on the Risk Evaluation of Telecommunication Market Development and Management Based on the TSCP Theory

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Abstract — To research on the risk evaluation of telecommunication market development and management, the TSCP method is proposed in this paper. With the rapid development of electronic information technology, telecommunication products multiply and its demand is also bigger and bigger. Therefore telecommunication industry has become the sunrise industry. And it has been a leader in industrial development since the 21st century, becoming a new growth point of China's economy. Based on the management data from 2009 to 2012 of the listed telecommunication industry companies, the study adopts TSCP-score model method to analyze the existed management risks of China's flourishing telecommunication industry and carry out the study of management risk evaluation. Through using TSCP-model and the analysis of mass data, the findings are as follows: the management situation of China's most telecommunication industry enterprises is not very good with TSCP value between 1.81 and 2.675, and the international debt crisis of this industry is still spreading. This study aims to learn the management situation and development potential of China's telecommunication industry and warns the relevant enterprises to management risk prevention.

Keywords - risk evaluation; telecommunication market; Development and Management; TSCP Theory

I. INTRODUCTION

Telecommunications industry influences a country's information security, economic development and convenience of people's life, almost all countries experienced telecommunications monopoly, regulation and competition, they also pay close attention to the structure and competition of telecommunications market. China's telecommunications industry has been seeking better and faster development since 1994 when China Unicom entered, it has experienced three major structural changes, for the first time competition was introduced, for the second time telecommunications services and regional company was divided, for the third time different business was allowed to operate by one company.

Many of the telecommunications market structure and competition studies use the traditional SCP paradigm, that the market structure determines market conduct, subsequently decided market competition, but the basic telecommunication industry has its own characteristics, such as economies of scale and network economies, fully competitive market structure is not good for the development of the telecommunications market. So this article is based on the effective competition theory, use statistical analysis, game theory analysis and DEA empirical analysis to illustrate the problem. Meramat's [1] article criticize effectiveness of the China's telecom market, and draws that effective competition in the telecommunications market in general has increased annually, but there are some non-effective problem such as vicious price competition, collusion and Matthew phenomenon. Then he analyzes China's lack of effective competition factors in basic telecommunications market, such as lack of legislation, exchange and network facilities monopoly. Basic

telecommunications market regulation goal should be to promote effective competition, regulate markets non-effective competition and develop market rules.

From market structure regulation, interconnection regulation and business conduct regulation we proposed some measures to promote effective competition. In the background of 3G times, the telecom market reforms still be placed on the market structure changes, this article found changes in market structure to some extent improve the competitive situation effectively in early and mid-times, but then non-effective competition comes out. Ou's [2] article believes that the development of the telecommunications market depends on the promotion of effective competition, rather than structural changes and the introduction of competition, this point will inspire the long-term direction of development and regulation of telecommunications.

According to the systematically research of the development of international telecom market, the reforming of China telecom industry, and the impact on entry into WTO about China telecom industry, the Xie's [3] article reveals that government-monopolized pattern of China telecom market has been broken, and competition has been the core of development. And then, the article points out the service-marketing strategy of Shenzhen Unicom Co. under the competitive market environment, by analyzing deeply competitive condition of mobile telecommunications market in Shenzhen. Then, he studies emphatically on product strategy, place strategy, and major client strategy and also analyses deeply the macro environment of telecom market in China, introduces China post & telecommunication industry development history, and analyses emphatically the impact on the entry into WTO about China telecom industry. Nie's paper [4] studies on competitive environment of mobile telecommunications market in Shenzhen and the competitive

position of Shenzhen Unicom Co., introduces the importance of CDMA project to China Unicom Co and points out the service-marketing strategy of Shenzhen Unicom Co. under the competitive market environment, and analyses emphatically product strategy, place strategy, and major client strategy.

II. THE CURRENT STATE FOR TELECOMMUNICATION MARKET DEVELOPMENT AND MANAGEMENT IN CHINA

Everything in the world can't develop and evolve without competition and coordination, so does telecommunication market. First, the structure of telecommunication market, the introduction of competition mechanism and competition features was discussed by the use of the theory of systems science. Further, the merits and demerits caused by competition were analyzed. Recent years, the reformation in telecommunication manage system, the perfection in standardization of telecommunication and the introduction of advanced technology make the competition and coordination of world telecommunication market in present day more colorful.

In recent years, the telecommunication market has been developed rapidly in China. Because of the stable and lasting development of the national economy, the advancing of the information-based society and the increasing of the consuming ability, the demands in the telecommunication will be stimulated to increase. And in the following years, the telecommunication market will be enlarged continuously. With the pushing forward of the system reforms in the telecommunication industry, the competitive pattern has been formed and the consuming sense of the consumers has been shaped and matured. The tendency will be more evident that the consumption of the users is individualized and the demands of the users towards the variety and the quality of the service of the telecommunication enterprises are enhanced. The expansion of the telecommunication market and the maturation of the users' psychology provide the telecommunication enterprises with the chance of deeper development on one hand and the problems on the other. These problems during the course of competition are provoking.

Along with the high-speed development of modern information and communications technology industry, the influence of telecommunications products on social economy and people's production and lives augments gradually. Telecommunications has become one of the pillar industries in the national economy. As a kind of typical network information product, the telecommunications product has significantly different characteristics from the traditional product. Its essential characteristic is the network effects. The network effect is the relationship between the utility of consumers by consuming products and network size, which is a demand-side economies of scale. The exist and level of network effect will affect the choice of consumers, decision behavior of the operators, the value of products, and development of the whole market by the root. Compared with developed countries, the development of telecommunications industry of our country is still placed in the quest stage both seen from the theories and fulfillment,

both government regulation and competition in the industry need summary of practices and support of theories. These are just perplexing development of the telecommunications product industry with speech service for lord in China currently. The network effect on the telecommunications market abroad has conducted an in-depth analysis and empirical studies, to verify the network effect of economic theory, but so far we lack of evidence and analysis. Therefore, thorough analysis on this essential attribute of telecommunications product and its influence in telecommunications market has obvious guide meaning both in theories and practices.

Wang [5] summarizes the competitive state and the existing problems in the telecommunication market and make an analysis of them. The competitive state in his paper is analyzed in three hierarchies, that is, the hierarchies of the network resources, the basic services and the increment services. Separately the network resources pattern is developed from the state-owned resources to the fixed communicative resources which are owned by the Chinese telecommunications, China Netcom, China Railway Communication and China Unicom. The mobile communicative network resources are owned by China Mobile and China Unicom. And Chinese satellite communication enterprise owns the satellite communication resources. Because these enterprises are state-owned ones, the resources are state-owned in essence. In the market of the basic service, Chinese telecommunication, China Netcom, China Railway Communication and China Unicom control the fixed telephone market. And until the end of 2005, there were 3500 million users. No matter from the perspectives of the market share, the scale of network and the market recognition, China Unicom and China Netcom occupy the leading position in the southern and northern markets separately. China Telecommunication has 214 million users in 21 provinces all over the country and it occupies 61%, China Netcom has 12 million users and it occupies 34.2% and China Unicom and China Railway Communication have 17 million users in total and occupy 4.8%.

This study takes China's telecommunication industry as its research target and refers to predecessors' experience analyzing management data, then works out the management situation and finally provides theoretical basis for China's telecommunication industry dealing with the management risks [6].

III. THE TSCP MODEL

At present stage, the main way to carry out company management risk studies is multivariate model method which including TSCP model, Logistic regression model, Artificial neural network model and etc, and TSCP model is the most widely used among them. TSCP model refers to the TSCP-score model, which was firstly put forward by American scholar Altman in the year 1968 [7]. It adopted the multivariate linear discriminate analysis to conduct early warning analysis of enterprise's management crisis. During which five of management data was chose by Altman and through calculation of the weighted average of the data to test the management risk, then the metric called TSCP model

was concluded to judge the management risk degree of the company [8]. The five management indexes of TSCP model selected are as follows:

X1: Working capital/ Total assets, it reflects the cash ability and scale characteristics of assets;

X2: Retained earnings/Total assets, it reflects the accumulated profit ability of the company;

X3: Profits before interest and tax /Total assets, it reflects profitability of the assets;

X4: Market value of owner's equity / Total liabilities, it reflects the condition of enterprises when facing management risk;

X5: The total sales/ Total assets, it reflects asset turnover situation and evaluates asset efficiency of the enterprise.

The formulas are as follows: $TSCP=1.2X1+1.4X2+3.3X3+0.6X4+1.0X5$

The X1 is the ratio of the working capital to total assets. Generally speaking, if the X1 number is greater, it means that the enterprise has more current capital and the management condition is better. The X2 is the ratio of the retained earnings to total assets. The number reflects the ability of the enterprise's reinvestment and refund. X3 is the ratio of profits before interest and tax to total assets, the number can be used to judge profitability of the assets. X4 is the ratio of the stock value to total indebtedness; the number reflects anti-risk capability of the company. X5 is the ratio of the total sales to total assets, the value reflects operational capability of the company's assets. Through data of the five variables above, which reflects the management change of the company, TSCP model is used to comprehensive analyze the strength of company resisting management risk. Generally speaking, the higher the management risk is, the lower the TSCP value is. So the possibility of bankrupt is higher. Altman thought: 2.675 is the critical point of the TSCP value, if TSCP value is greater than 2.675, it means that the company's management situation is better. If not, the management situation is bad and the management crisis is existed. However, TSCP value below 1.81 means bankrupt of the enterprise; TSCP value between 1.81 and 2.675 indicates management crisis has already existed in the company, and Altman called this "the grey zone".

The greater the TSCP value is, the better the company's management situation has. So the possibility of management crisis is lower; or the other way around. However there is some limitation in this model, firstly, specific data values about the enterprise management crisis possibility cannot be given the enterprise's management crisis possibility. Secondly, the consideration of change in cash flows impacting on management situation is inadequate. However TSCP model is still the best method adopted to research the management situation of enterprise except the above deficiencies.

IV. THE SELECTION OF DATA FOR EXPERIMENT

This study selects some management data of the listed company in CCER and the origin and quality are security. After the management crisis in 2008, the telecommunication

industry had entered into a difficult developmental stage. It is very vital for the enterprise to discover the problem and improve it and adjust strategy development. To be serious, the destiny of the enterprise even can be changed. The study selects dozens of A-share listed enterprises in Shanghai and Shenzhen counter exchange from 2009 to 2012 as research object, see the specific data in Table 1.

According to the principle of universality, relevance, comparability and practicality, with referring to the achievements of predecessors and considering the actual situation of the enterprise, emphasis is placed on the following factors when selecting target. According to the research data needed in TSCP model, the selection of management indicators in this study is mainly from five aspects such as solvency, operational capacity, profitability, the ability of growth, cash flow of the company totally 23 indicators, in which the most representative eleven indicators related are selected. And then in accordance with the management data in balance sheet, profit statement, cash flow statement and relevant list, various management ratios are figured out to form early warning index system of management risk.

The research objects of Altman's TSCP model are companies in capitalist country featuring perfect capital market, sound allocation of resource, accuracy and scientifically of the data. While because of the different national conditions in China, the market economy is in the initial stage of development and the capital market relatively poorly structured, causing the existence of strong speculative in stock market. The market value of owner's equity in the X4 model can't well reflect the real value of the owner, so the study adopt data of owners' equity book value to make the results more accurate and practical.

According to the TSCP model of Altman, when TSCP value is greater than 3, it means that the company's management situation is better. When TSCP value is greater than or equal to 2.8 and less than 3, there is some possibility of company happening management risk. When TSCP value is greater than or equal to 1.8 and less than 2.8, there is a high possibility of company happening management risk. TSCP value less than or equal to 1.8 indicates management crisis has already existed in the company. See Table 2 the distribution of TSCP value from 2009 to 2011 in the analyzing enterprise.

V. THE EXPERIMENT RESULT AND DATA ANALYSIS

From the results we can see that 74 companies of 84 companies studied had already occurred management risk in the year 2009, accounting for 88.1 percent of the total. The management condition of the five companies appeared better, accounting for 5.94 percent of the total. Prediction accuracy of the comprehensive results is 94.06 percent. See the Fig. (1) as follows.

The results in 2010 showed that up to 75 companies had management crisis, accounting for 89.30 percent of the total sample. TSCP value greater than 3 accounting for 2.38 percent of the total sample. 7 companies had serious management risk, accounting for 8.32 percent of the total sample. And 97.62 percent of sample was predicted right.

This model has high accuracy of risk identification. And as time going on, the accuracy of prediction will be better and better. The forming of American capital market is earlier than that of China, what's more, the capital market of China developed not well from 2006 to 2009 featuring imperfect allocation of resource and more speculative. So we use book value of owners' equity instead of market value of owner's equity in the X4 indicator of Altman's TSCP model, and after that the forecast accuracy is much higher than before. This suggests that the adjustment is suitable for the national condition.

Firstly, the other 20 selected manufacturing listed companies including 10 ST and 10 non-ST companies are treated as verification sample. Each index data is standardized and then was used to figure out the number of indicators including X1, X2, X3, X4 and X5. And then use the formula to calculate the TSCP value, see the results in Table 3.

The results suggest that companies whose TSCP value greater than 3 reduced year by year, while those of TSCP value less than 1.8 increased more with the passing year. This indicated that China's telecommunication industry faced serious management risk, and more than half of the company existed some degree of management risk.

Despite the global management crisis has brought a lot of adverse effects on export-oriented electronic information industry in China, we should see the potential opportunity of development. See profits of the various economic types in China's telecommunication industry 2007 shown in Fig. (2).

Because of cheap labor force and low price of land utilization, the production cost of China's electronic manufacture industry has been lowered. That is the advantage of China's electronic manufacture industry, what's more, with the development of the economy, our telecommunication industry are also gradually with international standards by cooperating with advanced overseas companies. After a long period of development and accumulation, many new industrial advantages are achieved. (See Table 5): (1) The increasingly perfect of infrastructure and development environment; (2) Industrial scale expands rapidly, and the preliminary forming industrial system will become reasonable; (3) The capability for cluster development is enhanced; (4) A host of IT talents are cultivated, forming a team with more than 8 million people; (5) A batch of large enterprise with greater competitiveness are developed; (6) The domestic market expands quickly, and a large number of international operation experience is accumulated with the breakthrough of the international market; (7) The ability of technology research has some degree of improvement, the sense of standards making improves significantly.

Under the influence of the management crisis, the development of China's telecommunication industry development suffered a lot. But telecommunication industry in other parts of the world suffered more serious. By contrast, we still have a lot of advantages.

1) Small influence affected by the management crisis. The effect suffering from management crisis is small because of the relatively independent management and

capital market of China. Owing to the unique national conditions and effective control of the domestic economy, the impact, the loss and negative effects are relatively small, and the development foundation also appears stable.

2) The environment for development is good. The stability of political and management environment has strong attraction of the international funds. Some capital invests China in order to avoid risk, and which providing a lot of opportunity for the telecommunication industry and resolving their own crisis.

3) The development of foreign enterprise is difficult. The worsening of Enterprise survival environment in developed country brings good opportunities for enterprise internationalization development in China. The Influence of Management Crisis to overseas company is big. So more difficulties are faced by overseas telecommunication industry and their living environment is more severe. We have advantages over them by comparison, so the needed technology can be purchased at lower price and professional talents can be recruited.

4) The good international environment. Harmonious international political environment supplies better foundation for China exploiting new international market. The IT companies in developed countries facing great pressure to develop under the influence of management crisis and in a short term the development will be slow. So there is no time for concerning overseas market, which reduces competitive pressure of China's telecommunication industry to some extent and brings opportunity of expanding emerging market for China's company in the weak competitive environment. Besides above, the harmonious relationship with the developing countries and the obvious geographical advantages are good for exploiting emerging market.

Facing the crisis, we should resolve the difficulties bravely, withstand pressure, keep a cool head and seize the opportunity to adjust development strategies and formulate suitable measures.

Evolution of the company shall be realized, the administration of enterprises shall be strengthened, the cost of production shall be cut, enterprise management and production efficiency shall be promoted and the market competitiveness of enterprises shall be improved.

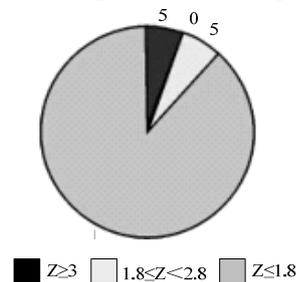


Figure 1. The distribution of TSCP value in the sample company in 2009.

Enhancement of company's capital control and integration of company strength shall be carried out to improve the ability of dealing with management risk. This is not only a difficulty but also an opportunity to reorganization

the company when facing management risks. And the electronics manufacturing industry can take this opportunity to integrate the re-sources, comb the service, control the production, collect money, adjust development strategy of the company and look new profit point of the future development, wipe off non-core assets to improve increase the efficiency of the company's resource [8].

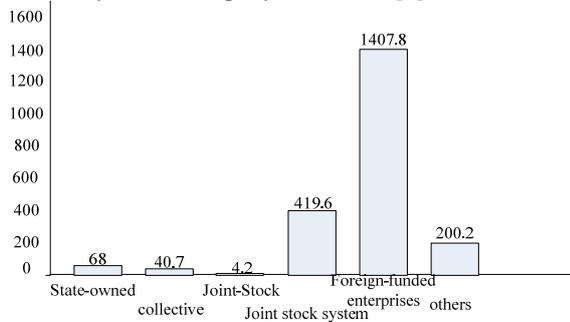


Figure 2. Profits of the various economic types in China's telecommunication industry.

VI. CONCLUSION

The development of the domestic market shall be accelerated and widen, expanding the internal demand of telecommunication products; on the other hand, the potential market of the overseas developing countries shall be explored aiming at sailing surplus products .

1) Take advantage of economic and industrial adjustment to create a healthy industry system. And this opportunity can be used to upgrade the telecommunication industry, introduce advanced technology and talents, promote management system of telecommunication industry and carry out information transformation in internal management of telecommunication industry.

2) Pay attention to the development trends of the global IT industry and telecommunication industry enterprises, and encourage domestic enterprises to carry out the integration of global resources. Setting up large-scale electronic information industry investment fund shall be supported by the country, and meanwhile innovation is encouraged.

TABLE I EARLY WARNING INDEX SYSTEM OF RISK

Management index		Definition	
Solvency index	Liquidity ratio	X1	Liquid assets/Current Liabilities
	Asset-liability ratio (%)	X2	(liability/assets) * 100%
Operational ability index	Total assets turnover ratio (time/year)	X3	Operating revenue/ average balance of fund
	Receivable turnover ratio (time/year)	X4	Business income/ Average balance of receivables
	Inventory turnover ratio (time/year)	X5	Business income/ Average balance of inventory
Profitability index	Net profit margin (%)	X6	(Net profit/ sales revenue) * 100%
	Return rate of total assets (%)	X7	(Net profit before income tax) * 100%
Growth ability index	Total assets growth rate (%)	X8	(Assets growth / Initial assets) * 100%
	Net Profit Growth Rate (%)	X9	(Net profit growth / Net profit of the previous period) * 100%
Cash flow index	Cash flow debt rate (%)	X10	(Net cash flow of business activities/ Current debts) x 100%
	Cash flow per share from operating activities (Yuan/ per share)	X11	Net cash flow of business activities/ Shares of common stock outstanding

TABLE II TSCP VALUE DISTRIBUTION

Year	The distribution of the TSCP value			
	TSCP≥3	2.8≤TSCP<3	1.8≤TSCP<2.8	TSCP≤1.8
2009	5	0	5	74
2010	2	0	7	75
2011	2	0	6	76

TABLE III TSCP VALUE DISTRIBUTION SHEET

Year	The distribution of the TSCP value			
	TSCP≥3	TSCP≥3	TSCP≥3	Z≤1.8
2009	8	0	7	5
2010	7	0	6	7
2011	6	0	5	9

TABLE IV THE ADVANTAGE OF CHINA’S TELECOMMUNICATION COMPANIES COMPARED TO THAT OF THE SIMILAR INTERNATIONAL COMPANIES.

Comparison program			China	developed country	developing country
Labor force	price	middle		weak	strong
	Number	strong	↑	middle	strong
	Quality	middle	↑	strong	weak
Land		middle		weak	strong
Raw material		middle		weak	strong
Industrial scale and structure		strong	↑	strong	weak
R&D ability		middle	↑	strong	weak
Company Strength (local)		middle	↑	strong	weak
Preferential industrial policies		middle		middle	strong
Infrastructure		strong	↑	strong	weak
Political environment		strong	↑	strong	middle
Market scale		strong	↑	strong	middle

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