On the Factors Influencing the Competitiveness of Chinese Service Trade after Entering WTO

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Abstract—Service trade is an important force of influencing economic development. A review on the related literatures is done firstly. Then through the construction of a Diamond Model, the main factors which influence the competitiveness of Chinese service trade are determined. With three competitiveness indexes served as the reference series respectively, the influencing factors served as the comparable series, three grey incidence models are then built up to conduct an empirical analysis on the main factors influencing the competitiveness of service trade after China entering WTO. The result indicates that urbanization level, open degree of service industry and foreign direct investment have larger impacts on Chinese service trade competitiveness, followed in turn by GDP in service industry and human capital, while commodity trade has the minimum impact. Further discussion provides train of thought for the upgrade of Chinese service trade competitiveness.

Keywords—Service Trade; Competitiveness; Diamond Model; Grey Incidence Model

I. INTRODUCTION

WITH the strong promotion of economic globalization, service trade has been developed very quickly. Its proportion in the global trade is expanding continuously and its status in the world economy is upgrading day by day. Service trade has increasingly become the focus of world attention and competition, and its competitiveness has become an important index to measure a nation's development status of service trade and its comprehensive strength.

For a long time, although the scale of Chinese service trade is smaller than that of commodity trade, its strong growth tendency after entering WTO has aroused wide attention.

Service trade competitiveness is usually measured by Market Share of Service Export (MS) [1], Service Trade Competitive Index (TC) and Revealed Comparative Advantage of Service Trade (RCA) [2]. Although the results are different when using different indicators to measure the competitiveness of Chinese service trade after entering WTO, they have all demonstrated the lower competitiveness of Chinese service trade.

Therefore, judging the main factors affecting Chinese

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service trade after entering WTO, building up model to analyze the influencing degree and then getting relevant implications, will help to improve the competitiveness of Chinese service trade and promote the harmonious development of Chinese economy.

II. LITERATURE REVIEW

There are a lot of research literatures studying the influencing factors of service trade competitiveness abroad. They indicated that the development of service industry, commodity trade, the development of the international capital flows, human capital, R&D input, and domestic demand all affected the international competitiveness of services trade of one country (Burgess [3], 1990; Grace Wright [4], 2004).

With the continuously increasing importance of service trade, Chinese scholars paid more attention to the theoretical and empirical research on the affecting factors of service trade competitiveness. Pure theoretical analysis was relatively less, such as ZHENG Jichang and XIA Qing (2004) [5], Huang Lujin and WANG Jingjing (2010) [6]. They analyzed various factors influencing service trade competitiveness theatrically based on diamond model. The majority of researches analyzed empirically on the influencing factors of service trade competitiveness based on the definition the influencing factors. Such studies can be divided into two classes: in the first class, the scholars selected by themselves and did not give reasons when they defined the influencing factors (HE Wei [7], 2005; ZHAO Jingfeng etc [8], 2006; SHI Zili etc [9], 2007; YIN Feng etc [10], 2009); in the second class, the scholars chose affecting factors according to diamond model and then analyzed empirically (WANG Yongning [11], 2009).

Compared with the existing research fruits, this paper does different work in the following three aspects:

(1) The period for empirical analysis. There is no direct research achievements on China entering WTO in the existing research, but the development environment and status of service trade have changed greatly after entering WTO. So, it has great significance to study the influencing factors of service trade competitiveness especially for after entering WTO.

(2) Research methods. Current researches are mostly based on large sample regression analysis method. However, this study interval is defined as China entering WTO and the sample size is limited, therefore, the grey incidence model based on small sample is constructed for empirical analysis.

(3) Index for showing the service trade competitiveness. The

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:5, No:5, 2011

existing research mostly used service exports or service trade as the dependent variable to measure the service trade competitiveness, but these indicators were inadequate and cannot measure service trade competitiveness comprehensively. Three indicators, i.e. MS, TC and RCA, are used to represent the service trade competitiveness in this paper.

III. Identification of the Main Influencing Factors of Chinese Service Trade Competitiveness Based on Diamond Model

Diamond model was put forward by famous strategic management experts Michael Porter in Harvard Business School, and can be used to analyze the reasons why a country has strong competitiveness in an industry. Diamond model indicated that the different mixture of production factors, demand condition, related and support industry, manufacturer strategy, structure and competition is the key determinant for a country to succeed in the international competition, and there are two other variables besides these four factors which are government and opportunity. Based on this diamond model, we can get the influencing factors affecting Chinese service trade competitiveness and their measuring index, which are shown in Fig. 1.
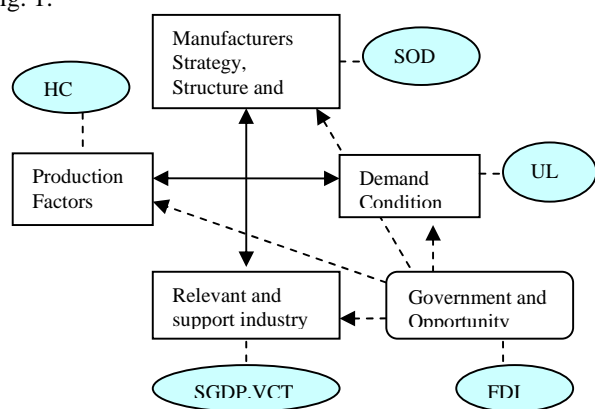

Fig. 1 Main influencing factors and index of Chinese service trade competitiveness based on diamond model

(1) Production Factors. According to diamond model regards, production factors include primary production factors and advanced production factors, and the latter is more important for the formation of competitive advantage. So that, HC (Human Capital）is used to measure the senior production factors in this paper, specifically denoting it by the student number in higher school per 100 people.

(2)Demand Conditions. Demand condition mainly refers to the domestic market needs, including the scale and quality of demand requirements, etc. Because urbanization can bring service requirement and improve the quality of the service demand, we use UL (Urbanization Level) to measure the demand conditions, namely the proportion of urban population in the total population.

(3) Related and Support Industry. A certain industry has a close relationship with related and supportive industries. Service industry scale is the industry foundation of service

trade. Commodity trade can also drive the development of service trade. Therefore, we adopt SGDP (GDP in Service Industry) and VCT (Value of Commodity Trade) to stand for related and support industry.

(4) Manufactures Strategy, Structure and Competition. Potter points out, the power promoting enterprise to compete internationally is very important. This power may come from tension of international demand, or pressure of local competitors or market thrust. The strong competitor in domestic market is the biggest associated factor for the creative and continuous industry advantage. Generally, we should use the industry concentration to measure industry competition and monopoly degree. However, due to the lack of data and considering the effect of openness on the degree of competition in the industry, we use SOD (Open Degree of Service Industry), or the ratio of service trade value to GDP to measure the manufactures strategy, structure and competition.

(5) Government and Opportunity. Opportunity can be met rather than seek, and opportunity can influence the four factors above. The powerful role of the government in Chinese economy can control and affect the four basic factors, and also brings opportunities to the ascension of service trade competitiveness. Considering the actual conditions of our country and the accessibility of data, we use FDI (Foreign Direct Investment) to measure the government and opportunity elements.

IV. Grey Incidence Analysis on Influencing Factors of Chinese Service Trade Competitiveness After Entering WTO

A. Model and Data

Since we want to analyze the factors influencing the competitiveness of Chinese service trade after entering WTO, we should use the statistics after 2002. However, the statistics of 2009 is not comprehensive and there is only 7-year data (2002-2008), so the sample size is limited and we'd better use the grey system theory to analyze rather than the typically econometric method based on large samples.

The grey incidence is the important component of the grey system and its fundamental idea is that the closeness of a relation is judged based on the similarity level of the geometrical patterns of sequence curves. The more similar the curves are, the higher degree of incidence between sequences; and vice versa. We will use this method to analyze the various factors which influence the competitiveness of Chinese service trade. With international market share of service export (MS), service trade competitive index (TC) and revealed comparative advantage of service trade (RCA) served as reference series respectively, Human Capital (HC), Urbanization Level (UL), GDP in Service Industry (SGDP), Value of Commodity Trade (VCT), Open Degree of Service Industry (SOD), Foreign Direct Investment (FDI) served as comparative series (Table 1), we will calculate out the grey incidence degree and get the grey incidence order, so as to determine the relationship between the competitiveness of Chinese service trade and

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:5, No:5, 2011

various influencing factors.

TABLE I
VARIABLE AND ORIGINAL DATA

Variable number	Variable name	2002	2003	2004	2005
Y_1	MS	0.0247	0.0253	0.0279	0.0298
Y_2	TC	-0.0784	-0.0837	-0.0714	-0.0590
Y_3	RCA	0.5468	0.4919	0.4878	0.4619
X_1	HC	0.7033	0.8579	1.0259	1.1944
X_2	UL	0.3909	0.4053	0.4176	0.4299
X_3	SGDP	602.86	676.63	780.03	896.43
X_4	VCT	620.77	850.99	1154.56	1421.91
X_5	SOD	0.0588	0.0617	0.0692	0.0702
X_6	FDI	527.43	535.05	606.30	724.06

Variable number	Variable name	2006	2007	2008	
Y_1	MS	0.0324	0.0360	0.0385	
Y_2	TC	-0.0464	-0.0303	-0.0380	
Y_3	RCA	0.4567	0.4659	0.4858	
X_1	HC	1.3228	1.4266	1.5218	
X_2	UL	0.4390	0.4494	0.4568	
X_3	SGDP	1062.76	1366.12	1734.84	
X_4	VCT	1760.44	2176.18	2563.26	
X_5	SOD	0.0721	0.0741	0.0703	
X_6	FDI	727.15	835.21	1083.12	

Source: ①MS, TC and RCA are calculated out according to the relative data from WTO Database.

② $MS = \dfrac{X_{CS}}{X_{WS}}$, $TC = \dfrac{X_{CS} - M_{CS}}{X_{CS} + M_{CS}}$, $RCA = \dfrac{X_{CS}/X_C}{X_{WS}/X_W}$, where

X_{CS} denotes Chinese service export, X_{WS} is the world service export, M_{CS} is Chinese service import, X_C stands for the service export and commodity export of China, X_W is the service export and commodity export of the world.

③VCT (billion USD) is from WTO Database; FDI (billion USD) is from UNCTAD Database; SGDP (billion USD), HC and UL are from the Database of National Bureau of Statistics of China.

The specific calculation steps are as follows[12]:

Suppose the time sequences of related indexes during 2002 and 2008 are

$$Y_i = (y_i(1), y_i(2), y_i(3), y_i(4), y_i(5), y_i(6), y_i(7))$$
$$i = 1,2,3$$
$$X_j = (x_j(1), x_j(2), x_j(3), x_j(4), x_j(5), x_j(6), x_j(7))$$
$$j = 1,2,3,4,5$$

Where Y_i are the indexes of measuring the competitiveness of Chinese service trade, X_j are the influencing factors.

Step 1: Calculate the initial image of each sequence.

$$Y_i' = Y_i / y_i(1) = (y_i'(1), y_i'(2), \cdots, y_i'(7))$$
$$X_j' = X_j / x_j(1) = (x_j'(1), x_j'(2), \cdots, x_j'(7))$$

Step 2: Calculate the difference sequence.

$$\Delta_{ij}(k) = \left| y_i'(k) - x_j^i(k) \right|$$
$$\Delta_{ij} = (\Delta_{ij}(1), \Delta_{ij}(2), \cdots, \Delta_{ij}(7))$$

Step 3: Calculate the maximum and minimum difference.

$$M = \max_j \max_k \Delta_{ij}(k)$$
$$m = \min_j \min_k \Delta_{ij}(k)$$
$$k = 1,2,3,4,5,6,7$$

Step 4: Calculate the incidence coefficient.

$$\gamma_{ij}(k) = \frac{m + \xi M}{\Delta_{ij}(K) + \xi M}$$
$$\xi = 0.5$$

Step 5: Calculate the grey incidence degree.

$$\gamma_{ij} = \frac{1}{7} \sum_{k=1}^{7} \gamma_{ij}(k)$$

From the grey incidence degree, we can get the grey incidence order, which indicates the different influencing degree of various factors on the competitiveness of Chinese service trade.

B. Calculating result

Using the above steps, we can calculate out the grey incidence degree of influencing factors and each service trade competitive index (TABLE Ⅱ).

TABLE I
CALCULATING RESULT OF GREY INCIDENCE DEGREE

Grey incidence degree	MS	TC	RCA
HC	0.8056	0.6999	0.7111
UL	0.8658	0.8456	0.8648
SGDP	0.8169	0.7084	0.7165
VCT	0.6659	0.6046	0.5842
SOD	0.9237	0.7952	0.8620
FDI	0.8237	0.8173	0.7973

Source: Calculated by the author.

From the table 3 we can find that, although when we use market share of service export (MS), or service trade competitive index (TC), or revealed comparative advantage of service trade (RCA) to indicate the competitiveness of Chinese service trade, the order of influencing degree of each factor is different, this difference is mainly embodies in first three greater affecting factors, that is the urbanization level (UL), open degree of service industry (SOD) and foreign direct investment (FDI); however, the order of the last three factors remain unchanged, where the fourth factor is GDP in service

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:5, No:5, 2011

industry (SGDP), the fifth one is human capital (HC) and value of commodity trade (VCT) rows in the last.

V. CONCLUSIONS

In the economic globalization era, quantitatively analyzing the factors influencing the competitiveness of service trade plays an important role in accelerating the development of service industry and promoting the transformation of foreign trade growth mode. Based on the review of related literatures and using market share of service export, service trade competitive index and revealed comparative advantage of service trade as the indexes to measure the competitiveness of Chinese service trade respectively, a diamond model that expresses Chinese service trade competitiveness is constructed and the main influencing factors are decided. Furthermore, a grey incidence model is built up to get influence degree sequence of various influencing factors of service trade competitiveness between 2002 and 2008 or after China entering WTO.

In the six influential factors, the urbanization level, open degree of service industry and foreign direct investment are the biggest influential factors to the competitiveness of service trade. Urbanization can promote Chinese service trade competitiveness through channels: providing demand to the development of service industry and service trade, improving necessary resources endowment that the development of service industry needs, forming services convergent effect etc. The increasing service openness can lead to a greater degree of specialized production, and thus presents economies of scale. At the same time, the more competitive degree can be beneficial to the elevation of service efficiency and competitiveness. Not only the increase in FDI can improve the situation of lowness in capital quality and scarceness in knowledge and management factor in China, thus increase the supply level and export capability of service product, but also it can drive the upgrade of technology level and management capability of the service company though demonstrating effect, personnel training effect, correlation effect, and so on, thus increase the competitiveness of service trade.

But GDP in service industry, human capital and commodity trade have the relative smaller influence. Although service industry scale and commodity trade can be the industry foundation of the elevation of service trade competitiveness, this fundamental effect can not be wholly in role due to the relatively small size of Chinese service industries, not yet formed effective linkage effect between commodity trade and service trade. Meanwhile, the human capital level in the service industry is still lower, thus deterring its function on service trade competitiveness.

Therefore, great importance should be continuously attached to exerting the promoting effect of urbanization level, open degree of service industry and foreign direct investment on the development of service industry, accelerating industrial structure adjustment, expanding service industry scale, training advanced factors such as human capital, realizing the linkage

effect of commodity trade and service trade, so as to promote the development of service industry and the increase of service trade competitiveness, and achieve the continuous, healthy, and orderly development of Chinese economy.

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