

The Study on Nationality Structure of Services Imports in China:Based on the Value-added Trade Estimation

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Abstract:This paper uses the world input-output table (WIOD) based on value-added trade estimates the overall service industry and diferent intensive type of services import country (region) structure of China, and compared with the traditional total value accounting methods. Meanwhile, the paper also discusses the effect of the GDP, services imports and goods imports on services imports.the results are following.(1)heimportsmarket of China`s services value-added are mainly from the developed countries , and the developing countries is accounting for relatively small.(2)Chinese Knowledge and technology-intensive services imports from developed countries are a higher proportion, but there still exist differences of the import country (region) structure for different element intensity services in the two calculation meyhod. (3)indirect services value-added imports caused by goods imports are slightly larger than direct services value-added importsthrough services imports . So,China must play the spillover effects of of services imports,improve the services imports quality and and expand services imports appropriately,and add supporting intensity of the the advanced technology-intensive manufacturing and encourage imports service elements .

Key Words : VALUE-ADDED TRADE,SERVICES IMPORT,COUNTRYOR REGION STRUCTURE

I. Introduction

Under the impact of " On the balance of trade " of mercantilism and " infant industry protection theory " of Liszt,the scholars and practitioners from domestic and foreignalmost all advocate their own interests to expand exports. Based on these,our government has been implementing " Reward export and import restrictions " trade policy , and the trade surplus is considered as an important indicator of economic development and growth . However, the frequent trade friction induced by huge trade surpluses and enormous pressure of RMB appreciation brought by huge foreign exchange reserves have led us to re-examine our trade policy ,while China has become the world's largest exporter .At the same time , although the " Made in China" label has been all over the world, China 's manufacturing exports mainly dependent on cheap labor and capital investment are still in the low end of the global value chain , and have been a series of more serious questioncaused by the spread of the financial crisis , such as a small part of the large foreign-funded enterprises dominate China's export trade (Manova & Zhang, 2009), " inhibition effect" resulting in a business increase value ratio(Zhang Jie , 2013) , and developed " capture" (Niu Weiping , 2012) by the developed countries and many more. However, faced with the

third industrial revolution , more and more countries had invested productiveservices to manufacturing which is the middle - investment industry with knowledge-intensive , technology-intensive. Professional services providedthe manufacturing industry with transportation and warehousing , finance and insurance, for R & D , computer software , telecommunications and other communication services , whose role is recognized around the world .Keller (2002) had pointed out that OECDhad achieved the increasing lof domestic technologyby increasing producer services imports , the importation trade of production service has a positive role in promoting the development of the manufacturing sector of the importing country (Hoekman, 2006), not only to enhance our manufacturing industry efficiency (Mongolian Anglo and Yin Xiangshuo , 2010) , and also to promote a long-term manufacturing endogenous growth stabilizing (Yeling Li and Zhao Linhai , 2008) , it is a leading force in the industrial structure adjustment and up the value chain target (Liu Zhibiao , 2014) . in other words , the productive service importing trade,as an important part of trade in services,become more and more important of import as an increasingly highlighted (Yang Ling , 2014) .In fact , the developed countries in the new international division of laboralmost all areof the top global or regional service center now, they firmly occupied the top of global Global Value Chain and create most of new wealth through the provision of high-quality production services or services for consumption to other countries . In this regard , the State Council file about " a number of opinions support the steady growth of foreign trade "(Guo Ban Fa [2014] No. 19) made it clear to gradually expand the service imports , and about " Opinions on Strengthening imports " (SCS No. [2014] 49) further pointed out that we should vigorously develop trade in services imports , actively expand domestic knowledge needed advice, research design service, energy saving, environmental services , technology-intensive production and imports of services and tourism imports. Under the impetus of this series of policy , China's imports of services have made great progress.In the period of " the Twelfth Five-Year Plan " , China 's services import and export rising global rankings . According to WTO statistics , China's total trade in services in 2015 ranked second in the world , China's service imports grew 18.6% , the proportion of services imports in the total imports (of goods and services and imports) was 20.2 % , the gap of service importation between China and the United States ranked first in the world narrowed sharply to \$ 32 billion , and services trade deficit narrowed to \$ 136.62 billion .

However, research on imported services are mainly concentrated in two areas , one isthe research on services imports promoting manufacturing efficiency and the relationship between services imports and economic growth , the main opions are that services importationcan promote manufacturing technical progress and efficiency raising of a country by a series of effects and means,such asthe accumulation of physical capital, human capital , institutional changes,and so on (Mary Amiti &Shang-Jin Wei,

2005.Francois & Woerz, 2007.Alan Macpherson, 2008. Fan Xiufeng , Han Yafeng , 2012 .Wang Chao Yi, 2013.Mosha , Zhou Xiaoming , 2015.and etc.) .The other one is on the status of services importation,such as total trade , industrial structure and industry structure and complexity degree of the services imports (Li & Murtaza, 2007. Marvasi, 2010.Yang Ling , 2014 .and etc.) . However, the existing studies have paid little attention to structural problems of importing country , and a large number of existing research results are based on estimated gross calculation method .However, the division of labor in the global value chain model, the traditional grosscalculation method can not avoid facing repeated calculation problem , in some ways it is difficult to reveal the true status of a country's industries (including services) , whereby the scientific of conclusions based on this calculation metod may also be questioned.Moreover, The Development of " trade value-added " concept and a series of related empirical research had provided another idea (Koopman, Wang and Wei 2014, Timmer et al 2014), and together with the database development of the World Input-Output Database (WIOD) and the Trade in value added (TIVA) , so these new ways of thinking about trade and the new data make economists better describe the true origin of added value of country and industrial imports (Richard Baldwin, Rikard Forslid and Tadashi Ito , 2015) .Based on this, this paper will use the input-output table (WIOD) data and trading framework based on the added value to estimates services imports structure at the angle of the overall service industry and different elements intensive types of the country (region)from 1995 to 2011, and comparing with the traditional grosscalculation method,to clear the "macro" features of China`s service imports as well as " substructure " Evolution under a category services, and to study the factors influencing China`s service imports At last,this paper try to provide scientific basis for enhancing China the international competitiveness of services and policy formulation of opening up service industries.

2.the research methods and data sources

2.1 Research Methods

Referencethe method ofJohnson and Noguera (2012) to measure a country's industrial value-added export levels , thus indirectly measure a country's industrial value-added import level. According to the definition of Johnson and Noguera (2012) , the value-added export is the value-added of productionin a country and end-usein another country. Moreover , a country's industrial added value imports includenot only imports value achievementfrom the industry's directly imports, but also indirectly achieved by other industry imports. Based on the formula (1) to measure the value of a country's exports :

$$\begin{aligned}
VT &= \begin{bmatrix} VT_{11} & VT_{12} & \cdots & VT_{1G} \\ VT_{21} & VT_{22} & \cdots & VT_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ VT_{G1} & VT_{G2} & \cdots & VT_{GG} \end{bmatrix} = VBY \\
&= \begin{bmatrix} V_1 & 0 & \cdots & 0 \\ 0 & V_2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & V_G \end{bmatrix} \begin{bmatrix} B_{11} & B_{12} & \cdots & B_{1G} \\ B_{21} & B_{22} & \cdots & B_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ B_{G1} & B_{G2} & \cdots & B_{GG} \end{bmatrix} \begin{bmatrix} Y_{11} & Y_{12} & \cdots & Y_{1G} \\ Y_{21} & Y_{22} & \cdots & Y_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ Y_{G1} & Y_{G2} & \cdots & Y_{GG} \end{bmatrix} \quad (1)
\end{aligned}$$

Formula (1), assuming that there are G countries in worldwide, N sectors, and V is the GN row and GN column, which is direct domestic value added coefficient matrix of the world's countries, V_s is the diagonal matrix with N rows and N columns whose element in the diagonal line is various sectors of direct value added coefficient of the country s; B is the global Leontief inverse matrix row with GN row and GN column. B_{sr} is N rows and N columns which represents the total production demand from the country s when the national r increase additional unit of final demand. Y is GN row and G column, which is the final product used matrix around the world, Y_{sr} is N rows and 1 column, which represents the final production demand vector of state r from the countries S.

Formula (1) described the value-added export distribution between countries in each country (industry). VT is the global value-added production and export matrix with GN row and GN column. VT_{sr} is N rows and N columns matrix which represents the value of national S production but end-use of the National r. VT_{ss} elements in the matrix VT diagonal indicates value-added which is produced by country s and used in domestic, such as the VT_{11} represents value-added of both production and end-use in the country 1. and the elements in the non-diagonal of the matrix VT constitute a matrix of bilateral value-added trade between the countries, such as the VT_{12} showing the added value of production in Country 1 and end-use in Country 2, namely the value-added export from country 1 to country 2 is the import of country 2 from country 1. the first row the off-diagonal elements of matrix VT is obtained by adding the sum of the rest of the world countries value-added exports. The meanings of matrix VT other lines are similar to the first row, the diagonal elements VT_{22} in the second row represents the added-value of production in country 2 and end-use in country 2 own, while other elements like VT_{2i} ($i \neq 2$) represents the value-added of production in country 2 but end-use in Country i, that means that the added value export of country 2 to country 1 is the imports of countries i from country 2. And so on. Therefore, using the formula (1) can measure a country's (industrial) value-added exports, thereby indirectly measure a country's (industrial) added value of imports.

2.2 Data

According to the above method, the calculation of a country's industrial imports of value-added need the world input-output matrix data. At present, more authoritative and popular used international input-output table has four data, such as the international input-output table developed by OECD and the World Trade Organization, and GTAP database, Asian international input-output table, WIOD data. Among them, the first three database contains only a few years the world input-output tables, and discontinuous in time. However, The WIOD database developed by EU can provide the world input-output tables from 1995 to 2011, covering 17 years time series data of 35 industries in 41 countries. Among these, and from the 18th to 35th categories is about services and a total of 18 services sector (see Table 1), which can provide detailed data for this paper estimating China and the world's major economies and their industry's value-added import and export. So, Taking into account the continuity and integrity of the data, we use the latest release of the world's EU WIOD input-output tables. At last, this paper, according to the above-mentioned measurement methods, estimates China's service industry bilateral value-added imports from 1995 to 2011, and study country or regional structure of China's services value-added imports.

Table 1 the code and name of service sector in the world the input-output table

Code	Name	Code	Name
c18	Construction	c27	Post and Telecommunications
c19	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	c28	Financial Intermediation
c20	Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	c29	Real Estate Activities
c21	Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	c30	Renting of M&Eq and Other Business Activities
c22	Hotels and Restaurants	c31	Public Admin and Defence; Compulsory Social Security
c23	Inland Transport	c32	Education
c24	Water Transport	c33	Health and Social Work
c25	Air Transport	c34	Other Community, Social and Personal Services
c26	Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	c35	Private Households with Employed Persons

Data : World Input-Output Database , www.wiod.org.

3. Calculation results and analysis

3.1 Services overall estimation

According to estimation results in Table 2 ,we can get some information. (1) Approximately two-thirds of China`s services imports are from developed countries, and Japan and the United States share the majority and were more than 10%. But Japan's share showed a downward trend. Japan's held largest share before 2005 and the United States surpassed Japan after 2005. followed by Germany , the share of imports is at 5.8% between ~ 10.2. other European countries , such as Australia , France, Britain and other times , is substantially less than 5 % . (2) the proportion of services imports from emerging

industrial economies like Korea and Taiwan is declined largely and between 8.7% ~ 15.4 . (3) the share of service imports from BRICS is small but steady increase between 2.3% ~ 7.8 ,and Russia's share is relatively larger than Brazil and India . (4) the share from other developing countries is little and holds volatility in between 12 to 20%. In short , the value-added imports of China's services is mainly from developed countries led by the US and Japan and Germany , followed by the newly industrialized economies of Korea , Taiwan and other BRIC countries.

Table 2 the country (region) structural of services import of China based on value-added in trade calculation unit , %

	1995	1997	1999	2001	2003	2005	2007	2009	2011
Developed countries	69.20	69.05	68.10	65.18	67.63	65.11	68.89	67.55	66.08
United States	15.44	17.04	15.84	16.37	14.29	14.37	15.83	16.57	17.13
Japan	19.94	19.12	17.90	15.94	16.19	14.83	13.33	12.92	10.27
Australia	3.22	3.89	2.96	2.33	2.46	3.10	3.50	4.43	5.46
Canada	2.40	2.20	1.66	1.90	1.65	1.78	2.16	1.92	2.08
Germany	6.67	5.86	6.66	7.11	9.07	8.47	9.01	10.13	8.81
France	4.19	3.80	3.51	3.64	3.44	3.51	3.28	4.31	4.35
United Kingdom	4.37	4.95	6.16	3.99	3.60	3.56	5.67	3.14	3.43
Italy	4.08	3.77	3.16	3.05	2.93	2.82	2.76	2.96	3.27
Netherlands	2.30	2.04	2.16	3.03	4.54	3.45	2.94	3.20	3.14
Spain	1.40	1.32	2.00	2.69	3.35	3.00	3.51	0.86	0.85
Belgium	1.75	1.67	1.66	1.13	1.21	1.14	1.44	1.37	1.63
NIEs	12.77	15.38	13.92	12.40	12.59	11.98	10.41	9.36	8.70
Korea	6.25	7.07	6.09	5.30	6.21	6.19	5.68	4.91	4.71
Taiwan, China	6.52	8.31	7.83	7.10	6.39	5.79	4.73	4.45	3.99
BRICS	2.34	3.42	2.82	3.72	4.18	5.46	5.92	6.01	7.71
Brazil	0.61	0.81	0.54	0.63	0.81	1.12	1.37	1.92	2.08
India	0.44	0.92	0.94	1.35	1.27	1.48	1.55	1.10	1.45
Russia	1.29	1.69	1.34	1.74	2.09	2.86	3.00	2.99	4.18
Other developing countries	15.69	12.16	15.16	18.71	15.59	17.45	14.78	17.08	17.52

Source: Authors' calculations .

Then, we added a further comparison of estimation results of China's Services imports Country or Region structure between value-added in trade calculation methods and the traditional trade estimates methods. Table 3 is the China's services import country (region) structure based on the traditional trade calculation method from 1995 to 2011. however , compared with the calculation results in Table 1 , there are similarities between the two. (1) Either calculation method , the developed countries occupy a major share and developing countries accounted for a relatively small in China's services imports. (2) the estimation results of two kinds of calculation methods also show that the proportion of services imports from emerging industrial economies of Korea and Taiwan are in decline , while the proportion from the BRIC countries has risen steadily.

But more importantly, there is a significant difference between the two measurement results . comparing the results of Tables 2 and 3 , we can find differences in the following aspects. (1) Based on value-added intrade estimating, the share of developed countries is relatively stable and were between 64.6% ~ 69.2% . while the results of calculations based on traditional trade calculation method, the

share of developed countries fluctuated between 50.8% ~ 74.9 . (2) based on the results of the traditional calculation , the share of China`s services imports from the United States is largest and rising fast from the lowest with less than 8% to the highest with 26.05% in 2010. while based on the results of the value-added in trade calculation, the share of services imports from the United States is relatively stable between 13.4% ~ 17.2% . (3) Based on estimated results of traditional trade calculation method, the proportion of Japan is low and much lower than the results based on value-added trade calculation method. German is relatively similar situation, but the differences between the two calculation methods is not so big in Japan. while the Netherlands and Australia are on the contrary , the share based on traditional trade calculation method is higher than based on the value-added in trade calculation method. Based on the traditional trade calculation method, Taiwan, one of the emerging economies, holds extremely small proportion and even zero in recent years .but based on the value-added in trade calculation method, its proportion are not small and fluctuating between 3.9% ~ 8.4%. (5) the share from other developing countries based on the traditional calculation method is higher than based on the value-added in trade calculation method before 2009, but it is on the contrary after 2009 .

Table 3 the country (region) structural of services import of China based on traditional trade calculation method unit %

	1995	1997	1999	2001	2003	2005	2007	2009	2011
Developed countries	61.44	69.40	65.38	53.50	68.08	56.73	71.98	71.98	72.82
United States	10.03	12.21	7.99	9.38	10.43	11.31	15.87	21.69	25.51
Japan	7.93	12.09	6.74	3.01	4.03	4.25	4.68	4.83	1.73
Australia	5.64	6.07	3.21	2.34	2.99	3.44	4.15	6.19	6.55
Canada	4.67	4.81	1.71	1.37	1.41	1.43	2.26	1.88	1.63
Germany	3.12	2.45	2.91	2.96	7.02	5.25	6.55	7.83	6.73
France	1.80	1.34	1.07	1.41	1.62	1.83	1.23	5.10	4.77
United Kingdom	7.16	8.61	13.98	2.35	2.17	1.98	9.43	3.15	3.34
Italy	4.77	4.84	2.35	2.10	1.79	1.94	1.69	2.65	3.76
Netherlands	4.39	3.56	4.60	9.53	14.54	8.06	6.15	7.48	6.62
Spain	3.05	3.71	7.75	11.47	12.15	8.77	9.48	0.20	0.12
Belgium	3.67	4.59	5.25	1.63	1.39	1.13	2.21	2.11	3.06
NIEs	9.24	9.23	8.10	7.40	8.77	7.44	5.75	3.62	4.87
Korea	9.15	9.13	8.01	7.32	8.73	7.43	5.75	3.62	4.87
Taiwan, China	0.09	0.10	0.09	0.08	0.04	0.01	0.00	0.00	0.00
BRICS	0.73	2.63	1.75	4.43	3.77	6.32	5.77	3.37	6.59
Brazil	0.03	0.03	0.01	0.01	0.03	0.15	0.08	0.10	0.13
India	0.21	0.24	0.47	2.47	0.93	0.82	0.67	0.29	0.29
Russia	0.49	2.36	1.28	1.95	2.81	5.35	5.01	2.98	6.17
Other developing countries	28.60	18.74	24.77	34.67	19.38	29.51	16.50	21.04	15.72

Source: Authors' calculations .

3.2 Services classification level estimation based on factor intensity

To further analyze the Country structure and trends of services import ,this paper took the classified investigation the above-mentioned 18 service sectors in accordance with factor intensity characteristics. In this paper ,18 service sectors were divided into three categories reference WIOD data build instructions and Stehrer`s Industrial Division for WIOD (2012). in Table 1 ,c18, c19, c20, c21, c22,

c26 and c35 of 18 services sectors are classified as labor-intensive services , the c23, c24, c25, c27 and c29 classified as capital-intensive services, the c28, c30, c31, c32, c33 and c34 classified as knowledge and technology-intensive services. Then, based on the value-added in trade calculation method , the paper measures the country structure of China's three categories of services import from 1995 to 2011. And , to knowing the Country structure and trends of services import ,this paper reported the results of the above two methods together.

Table 4 the country (region) structural of different elements intensiveservices import of China based on value-added in trade calculationunit ,%

		1995	1997	1999	2001	2003	2005	2007	2009	2011
Developed countries	the labor-intensive services	66.74	68.08	65.30	63.01	62.70	61.39	62.21	61.11	57.95
	thecaptial-intensive services	66.44	64.03	64.23	60.49	61.47	59.63	61.15	60.03	56.90
	theknowledge and technology intensive services	73.10	72.46	71.95	68.90	73.78	70.22	76.87	75.15	75.51
NIEs	the labor-intensive services	11.08	14.01	14.33	13.42	14.06	14.07	12.24	11.80	10.62
	thecaptial-intensive services	15.14	17.50	16.43	14.72	14.92	13.20	12.06	10.60	10.16
	theknowledge and technology intensive services	13.29	15.62	12.52	10.58	10.55	9.95	8.43	7.17	6.77
BRICS	the labor-intensive services	3.00	4.32	4.10	4.91	5.60	6.86	7.64	7.88	10.33
	thecaptial-intensive services	2.91	4.69	3.21	3.94	4.86	7.74	8.22	8.40	10.80
	theknowledge and technology intensive services	1.38	1.93	1.65	2.71	2.88	3.43	3.73	3.72	4.61
Otherdeveloping countries	the labor-intensive services	19.19	13.60	16.26	18.66	17.64	17.68	17.91	19.21	21.10
	thecaptial-intensive services	15.51	13.79	16.13	20.85	18.74	19.43	18.58	20.97	22.14
	theknowledge and technology intensive services	12.24	9.99	13.88	17.80	12.79	16.41	10.97	13.96	13.11

Source: Authors' calculations .

Table 4 showsthe country (region) structure of the different elements intensive services import in Chinabased on value-added in trade calculation method. According to the results shown in Table 4 , we can find the following feature. (1) no matter what type of services, China`s services are mainly imported from developed countries . the import share of knowledge and technology-intensive services especiallyis from the developed countries andmore than 70%, and the import share of the labor-intensive services from developed countries is slightly more than capital-intensive services. (2) For all types of services , the share of imports from the newly industrialized economies of Korea and Taiwanshows a downward trend. the import share of knowledge and technology intensive services holds the largest decline and down about 7% and followed by capital-intensive services, but the labor-intensive services are relatively stable .(3) no matter what type of services , the import share from the BRIC countries showed a significant upward trend.the capital-intensive services showed the largest increase with 8%,and labor-intensive services also increased very significantly with 7%, andthe knowledge and technology intensive services is relatively small rise with 3%. (4) For services imports from other developing countries, only the import share of capital intensive services increased significantly, and most of the year accounted for more than the labor-intensive services .

Table 5the country (region) structural of different elements intensive services import of China based on traditional trade calculation method unit ,%

		1995	1997	1999	2001	2003	2005	2007	2009	2011
Developed	the labor-intensive services	59.85	75.31	74.91	66.70	59.97	49.83	54.14	60.08	56.59

countries	thecapital-intensive services	71.32	72.84	76.39	59.66	57.41	55.37	57.39	61.49	56.03
	theknowledge and technology intensive services	59.24	57.41	59.31	47.73	74.00	59.27	86.45	81.58	88.10
NIEs	the labor-intensive services	2.81	3.73	0.18	0.07	0.05	0.01	0.63	0.33	0.66
	thecapital-intensive services	7.48	6.40	9.46	10.76	16.18	11.84	12.53	10.28	13.40
	theknowledge and technology intensive services	21.55	20.14	10.05	8.25	8.10	7.47	4.44	1.68	2.31
BRICS	the labor-intensive services	0.73	2.39	3.72	6.01	7.19	13.80	10.87	5.78	12.39
	thecapital-intensive services	1.19	5.92	3.41	4.65	6.13	12.86	11.35	7.58	12.51
	theknowledge and technology intensive services	0.49	0.68	0.68	3.91	2.07	1.23	0.93	0.42	1.17
Otherdeveloping countries	the labor-intensive services	36.61	18.56	21.20	27.21	32.79	36.36	34.36	33.81	30.37
	thecapital-intensive services	20.02	14.84	10.74	24.93	20.29	19.93	18.73	20.64	18.06
	theknowledge and technology intensive services	18.73	21.78	29.96	40.11	15.83	32.03	8.18	16.32	8.43

Source: Authors' calculations .

Table 5 shows the country (region) structure of the different elements intensive services import in China based on traditional total value trade estimates of the of law , comparing with the results shown in Table 4 , we can find the following feature. (1) Two Calculation Results have shown that different types of services imports in China are mainly from developed countries , and the calculation results based on the value-added in trade calculation method is relatively stable , while the results based on the traditional trade calculation method is greater volatility. (2) For the import share of labor-intensive services and knowledge-intensive services import from NIEs , the results based on the value-added in trade calculation method is much larger than based on the traditional calculation method. for capital intensive services import from NIEs, the results based on the value-added in trade calculation method is larger than based on the traditional calculation method before 2003 but is not very different after 2003. (3) Two Calculation results have also shown that the import share of various types of services of China from BRIC countries is uptrend, and the labor-intensive services and capital-intensive services rising largely with more than 10%, but the knowledge and technology-intensive services rose less. (4) Based on the results of the calculation value of trade law , the import share of capital-intensive of China from other developing countries showed a clear upward trend based on value-added in trade calculation method, while holds a little change based on the traditional calculation method.

4. Model and analysis

4.1 Model

According to the previous analysis and related theoretical research , Models can be constructed as follows.

$$\log MSA_{it} = \alpha_0 + \alpha_1 \log MS_{it} + \alpha_2 \log MM_{it} + \alpha_3 \log GDP_{it} + \varepsilon_{it} \quad (2)$$

The subscript i indicates the country or region , the subscript t represents the year , $\alpha_0 - \alpha_4$ is the regression coefficient , ε_{it} is for the random disturbance . MSA_{it} represents the services value-added imports of China from the country or region i , and MS_{it} and MM_{it} represent imports amount of goods and services of China from the country or region i based on the traditional calculation method, and data is

from the European Union WIOD database . GDP is Per capita of each country or region which is from UNCTAD database .

4.2 Results analysis

The regression results in Table 6 is divided into four , including (1) , (2) , (3) and (4) which are the explained variable of regression analysis ,respectivelybased on the overall services value-added import , labor-intensive services value-added import , capital intensive services value-added import ,and knowledge and technology -intensive services value-added imports. From the panel data regression results in Table 6 shows the following results. (1) Overall, services import, goods import and per capita GDP have a significant positive effect on services value-added import of China , and the effect of goods import is slightly larger than the services imports from 1995 to 2011, indicating that the indirect services value-added imports in China caused by goods imports are slightly larger than the directly services value-added imports brought by services import .For the labor-intensive and capital-intensive services value-added import, the indirect services value-added imports in China caused by goods imports are significantly greater than the directly services value-added imports brought by services import, particularly evident in labor-intensive services. (3) For the knowledge and technology-intensive services, the directly services value-added imports brought by services import are significantly greater than the indirect services value-added imports in China caused by goods imports.

Table 6 Regression Results

Explanatory variables	Overall imports of services (1)	the labor-intensive services (2)	the capital-intensive services (3)	the knowledge and technology intensive services(4)
logMS	0.3216***	0.1870***	0.2894***	0.3855***
logMM	0.3220***	0.3892***	0.3257***	0.2976***
logGDP	0.6679***	0.7937***	0.7846***	0.6188***
C	-3.7321***	-5.8052***	-6.2441***	-4.4141***
R2	0.8429	0.7703	0.7403	0.8791
N	663	663	663	663
Prob>F	0.0000	0.0000	0.0000	0.0000
Hausmantest	Fixed effects	Fixed effects	Fixed effects	Fixed effects

Note: " *** " , " ** " and " * " represent respectively significance level of 1% , 5 % and 10%.

Source: Authors' calculations .

5. Conclusion and Policy

As the deepening of services participated in the global value chain division, the dependence of China in the global value chain and trade with other countries is also of great significance. In view of this , this paper uses the world input-output table (WIOD) based on value-added trade estimates the overall

service industry and different intensive type of services import country (region) structure of China, and compared with the traditional total value accounting methods. Meanwhile, the paper also discusses the effect of the GDP, services imports and goods imports on services imports. The results are following.

One, the import market of China's services value-added are mainly from the developed countries, and the developing countries is accounting for relatively small. And the share of services imports from NIEs such as Korea and Taiwan is in decline, while the share has risen steadily from the BRIC countries. For the developing countries, based on traditional accounting methods the share from other developing countries is higher than based on value-added in trade accounting methods before 2009, but is on the contrary after 2009. In short, these results indicate that China is high upstream dependence on the developed countries, China must increase their degree of investment services to reduce the adverse effects of fluctuations of the developed countries to the China.

Two, Chinese knowledge and technology-intensive services imports from developed countries are a higher proportion, but there still exist differences of the import country (region) structure for different element intensity services in the two calculation method. First of all, no matter what type of services and what kind of accounting method, developed countries are China's main source of services import, just the results based on the value-added in trade accounting relatively stable while based on the traditional trade accounting are volatility larger. And the proportion of services imports from NIEs such as Korea and Taiwan showed a downward trend, but the BRIC countries showed a significant increase. Secondly, for NIEs, the proportion of labor-intensive services and knowledge-intensive service import based on value-added in trade accounting is much larger than based on the traditional trade Accounting, capital intensive services holds the same trend before 2003 while are very different with steady trend after 2003. Third, the Chinese, the proportion of Chinese capital-intensive imports from other developing countries showed a clear upward trend.

Third, indirect services value-added imports caused by goods imports are slightly larger than direct services value-added imports through services imports. Chinese labor-intensive and capital-intensive services showed a significantly larger, especially the labour intensive services. However, the directly services value-added import brought by knowledge and technology-intensive services are greater than the indirect services value-added imports caused by goods import.

The profound understanding of the status of China's services import can bring about an important revelation to achieve the goal of "the rise in the amount of quality and quantity" of China's trade in services. First, we must play the spillover effects of services imports. China can make use of a golden opportunity of developing FTA "along the way" to increase R&D, integrated technology services, financial services and other high-order production services imports, and better meet the demand of

the efficiency of productive services to enhance advanced manufacturing technology. The second is to improve the services imports quality and and expand services imports appropriately. The productive service trade import complexity has a significant positive impact on the international competitiveness of manufacturing industries as a whole and technology-intensive manufacturing industries, and shows a greater role in promoting the international competitiveness of some technology-intensive. Therefore, China should develop the services quality by services import and its knowledge spillover effects under open conditions. Third, China should add supporting intensity of the advanced technology-intensive manufacturing and encourage imports service elements. Studies have shown that the indirect services value-added imports caused by goods imports are larger than the direct services import value-added through services imports. so, China should gradually liberalized restrictions on services imports, and encourage actively the advanced manufacturing to get more foreign productive service products. Otherwise, China should increase direct knowledge and technology -intensive import because the directly services value-added imports brought by it are significantly greater than the indirect services value added caused by goods import.

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