



Research Article

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The effect of international knowledge-based service trade on employment in China

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ABSTRACT

Inextricably bound to good service trade, high added value and high-tech, these features determines knowledge-based service trade having a negligible impact on employment. This paper studies the effect of international knowledge-based service trade on employment and it get the conclusion: the export of knowledge-based service trade has promoted the growth of employment's scale, while the import has negative effects on employment's scale. Finally, tying in knowledge-based service trade's features, this paper put forward some policy recommendations for optimizing the positive effects of knowledge-based service trade.

Key words: Knowledge-based service trade; Effect on employment; Policy recommendations

INTRODUCTION

China, as a developing country, is also a populous country, with the rapid development of its economic level and the acceleration of urbanization, the employment has received great concern form domestic experts and scholars. China's current unemployment is mainly attributable to structural unemployment, including unemployment which caused by industrial restructuring and structural imbalances with labour supply and labour demand. The 18th CPC national congress pointed that promoting strategic adjustment of economic structure is the main direction of accelerating the transformation of economic development, in order to solve the major structural problems, it must focus on optimizing the industrial structure and improving the structure of demand. Service trade as an important measure of international competitiveness of the industry, not only for an optimal industrial structure, but also ability to highly absorb employment due to the characteristics of service trade itself, these made service trade more and more incorporated into the study. However, in the study that the effects of service trade on employment is often overlook knowledge-based service trade. Because, according to conventional wisdom, knowledge-based service trade along with high-tech, as the technology will make the knowledge and technology continually materialized, which means high economic growth and low employment. However, due to the high-tech and knowledge, knowledge-based service trade can provide a high degree of service offerings to other industries and downstream enterprises, which means it is significantly better than traditional service in order to promote the production and indirectly increase employment opportunities. So study the effect of knowledge-based service trade on employment is conducive to the improvement of employment by optimizing the industrial structure.

THE MECHANISM OF THE EFFECT OF KNOWLEDGE-BASED SERVICE TRADE ON EMPLOYMENT

With China's accession to WTO, service trade, especially knowledge-based service trade has an unprecedented development, whether it is from the amount or the structure. But from the standpoint of employment, import of knowledge-based service trade can be seen as a substitute for domestic output, export can be seen as a domestic output, from this side, the effect of knowledge-based service trade has duality, including magnetic effect and crowding out effect.

Magnetic effect is officially called adsorption effect Originally refers to a country or region will generate a lot of "magnetic" due to the rapid economic growth, thereby it continuing to attract a variety of factors of production, including capital, technology, manpower, and so on. This effect indicates that, when economy develops after a certain level, any one country or region can promote economic effect and social effect while developing itself. On here, we defines that the magnetic effect of knowledge-based service trade has a huge role in GDP growth promoting, which was due to the rapid development of knowledge-based service trade. Okun's Law says that every 2% increase in GDP, the unemployment rate decreased by about 1%. Although proportional relationship was not particularly strict, at least it has a positive stimulating effect between GDP and employment. The knowledge-based service trade has undoubtedly occupied a very important position in the GDP. With the deepening development of global free trade, the proportion of Chinese knowledge-based services trade is growing, so at the time that the knowledge-based service trade promotes GDP, it also indirectly stimulates the growth of employment. In the process of rapid development, knowledge-based service trade constantly attract factors of production, including labor factors, in order to achieve the pulling effect on employment [1].

For crowding out effect, it refers that, to a market of country or region, new demand or supply may cause some factors of production crowding out from original market going into other markets. Generally refers to the increase in government spending causing lower private consumption or investment. On here, crowding out effect refers that, import or export increased, which would let the demand or supply changed in the country. These was mainly because, first of all, knowledge-based service trade's import made deepening of domestic market competition, correspond, domestic demand reduced would trigger some failing business which has a correlation with knowledge-based service trade failures, besides that, joblessness rose. Secondly, some export of knowledge-based service trade can improve organic composition of capital. If the growth rate of the labor force cannot keep up the pace of employment growth, then the corporate demand for labor will correspond decreased, thus have an impact effect on national employment.

INTERNATIONAL STATUS OF KNOWLEDGE-BASED SERVICE TRADE

With the development of economic globalization, driven by the developed countries, the global economic structure demonstrates the total trend that "industrial economy" makes the transition to "service economy". Services industry in developed countries occupied more than 75% of GDP. In these countries, developed trade service not only created GDP's highly growth, but also absorbed a huge population of employment. In the past 2012, China's service trade ranked third in the world for \$470.6billion in total import and export. Knowledge-based service trade accounted for 29.5%, of which the export of knowledge-based service trade accounted for 35.6% of total exports. China formally entered the ranks of the service trading power, but compared with developed countries still has a long distance.

In practical terms, we can define the international market share as the ratio of one service's total import and export in to which were in the world. This indicator is generally used to reflect a countries' competitive power of export or import and world status for a service trade [2]. Here we compared our knowledge-based service trade with the top two trade power, Germany and the United States. As you can see in Figure 1 and 2, although China's service trade has occupied the third position in the world, but compared to other trading nations, knowledge-based services trade still have a great gap, especially export of Chinese knowledge-based service trade have the quite big disparity than the United States. But as far as development trend concerned, competitive power of Chinese knowledge-based service trade's export and import showed a rising momentum.

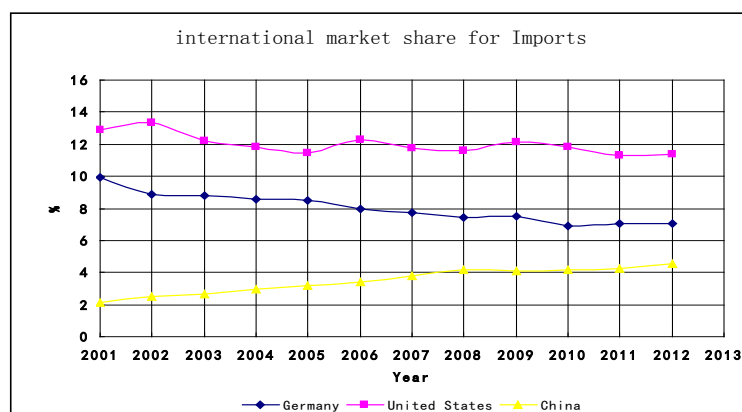


Fig. 1: the international market share of Chinese knowledge-based service trade's import compared with Germany and U.S.A.

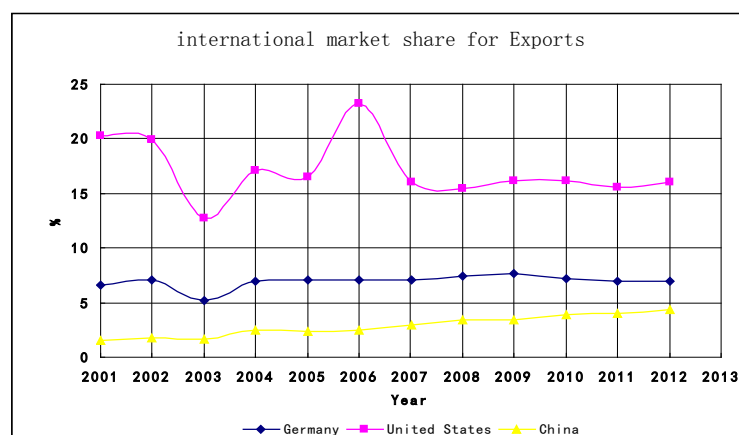


Fig. 2: the international market share of Chinese knowledge-based service trade's export compared with Germany and U.S.A.

THE FEATURES OF THE EFFECT OF KNOWLEDGE-BASED SERVICE TRADE ON EMPLOYMENT

Knowledge-based services trade refers that, various types of knowledge as goods flows between trading nations in the world. As one of the premier growth of the knowledge economy, knowledge-based services trade is growing point and growth points of contemporary international service trade. Changes arising from the service industry is built on the basis of technological progress, and with the development of knowledge-based services trade, high-tech achievements popularized and developed around the world, thus to stimulate the economic development of each trading nation. The rapid development of knowledge-based service trade not only promoted the development of primary and tertiary industries, but also promoted the development of cultural. Besides these, Knowledge-based services trade has its own characteristics; these features had some impact on the whole employment, not only on service employment.

1. It affects employment through its inseparability with goods service.

According to WTO website's classification, knowledge-based services trade, including communication services, construction services, insurance services, financial services, computer and information services, patents and license fees, consulting services, advertising, film and other audiovisual business services. From the contents of a knowledge-based service trade, we can find that most of the knowledge-based services trade and goods trade cannot be separated. Such as insurance services, patents and licensing fees. They must be accompanied by goods service. So part of the knowledge-based service's production, circulation and consumption should closely tie with goods trade, which means the effect of service trade on employment should closely integrated with goods trade [3].

2. It affects employment through high-tech and knowledge.

High knowledge and high-tech are the typical characteristics of knowledge-based service trade. Therefore, the effect of knowledge-based service trade on employment is inseparable with the effect of technology on employment. Early in the period of classical economics, as classical economists represented by Ricardian considered that technological progress is a double-edged sword, while promoting an increase in employment can also cause structural unemployment. Since the nineties of the twentieth century, from the study of effect of technology on employment, it showed that the effect included "creative destruction mechanism" and the "creation of employment and compensation mechanism". The characteristics of high-tech and knowledge determine the effect of knowledge-based services trade on employment acted by the destruction and compensation mechanisms to work together.

3. It affects employment through high value-added.

Knowledge-based service products have the characteristics of less input and multi-output. While high-tech and knowledge does not necessarily with high value-added, but in a knowledge-based service products, it achieve the balance point between high-tech and high-yield. Which means high-tech became the biggest feature compared with other services [4]. Through the feature of high value-added, knowledge-based service trade has promoted the development of sustainable economy centering knowledge. It significantly affects employment in various industries by providing high knowledge service to other industries or the upstream and downstream enterprises.

EMPIRICAL ANALYSIS OF THE EFFECT OF KNOWLEDGE-BASED SERVICE TRADE ON EMPLOYMENT

1. Source of data and index definition

Based on WTO website, in this paper, we defined "other business service" (except transport service and tourism service) as knowledge-based service. It includes communication services, construction services, insurance services,

financial services, computer and information services, royalties and license fees, other business services, personal, cultural and recreational services. In consideration of the availability of statistical data, we selected indicators of knowledge-based services trade exports (KSEX) and imports (KSIM) to represent knowledge-based service trade's exports and imports. And we selected indicator of the total number of employees to represent the employment situation. Then we select each index data from 1982 to 2012. Meanwhile, in order to avoid the effects of heteroscedasticity, we digitized the data at first, respectively represented by LKSEX, LKSIM, and LCP.

Table 1: The index system of sample data (unit: billion USD; ten thousand people)

| year | KSEX | KSIM | CP | year | KSEX | KSIM | CP |
|------|-------|--------|-------|------|--------|--------|-------|
| 1982 | 4.6 | 5.52 | 45295 | 1998 | 89.77 | 104.99 | 70637 |
| 1983 | 3.58 | 4.34 | 46436 | 1999 | 96.47 | 122.04 | 71394 |
| 1984 | 6.08 | 11.63 | 48197 | 2000 | 102.44 | 123.48 | 72085 |
| 1985 | 6.44 | 4.23 | 49873 | 2001 | 104.74 | 137.98 | 72797 |
| 1986 | 10.7 | 1.97 | 51282 | 2002 | 132.76 | 170.7 | 73280 |
| 1987 | 11.95 | 3.06 | 52783 | 2003 | 210.62 | 214.32 | 73736 |
| 1988 | 8.62 | 4.17 | 54334 | 2004 | 242.49 | 279.09 | 74264 |
| 1989 | 12.3 | 3.92 | 55329 | 2005 | 291.87 | 329.66 | 74647 |
| 1990 | 13.04 | 3.98 | 64749 | 2006 | 364.56 | 416.36 | 74978 |
| 1991 | 25.07 | 9.18 | 65491 | 2007 | 530.97 | 561.98 | 75321 |
| 1992 | 34.99 | 2.37 | 66152 | 2008 | 671.85 | 715.18 | 75564 |
| 1993 | 43.79 | 3.287 | 66808 | 2009 | 653.56 | 678.32 | 75828 |
| 1994 | 59.52 | 51.24 | 67455 | 2010 | 902.24 | 740.37 | 76105 |
| 1995 | 63.48 | 114.21 | 68065 | 2011 | 980.6 | 839.7 | 76420 |
| 1996 | 72.97 | 75.83 | 68950 | 2012 | 1015 | 923.02 | 76704 |
| 1997 | 94.75 | 96.49 | 69820 | | | | |

Source of data: China Statistical Yearbook; <http://tradeinservices.mofcom.gov.cn/>; <http://www.wto.org/>

2. Empirical analysis

Firstly, examined index by ADF unit root test, the test results were as follows:

| variables | ADF statistics | 5% | P | Type test | stationarity |
|-----------|----------------|-----------|--------|-----------|--------------|
| LCP | 3.362409 | -1.952473 | 0.9995 | (0,0,0) | no |
| D(LCP) | -18.72413 | -1.957204 | 0.0001 | (0,0,7) | yes |
| LKSEX | -0.408757 | -2.963972 | 0.9995 | (c,0,0) | no |
| D(LKSEX) | -7.065128 | -2.967767 | 0.0000 | (c,t,0) | yes |
| LKSIM | -0.021896 | -2.971852 | 0.9487 | (c,0,2) | no |
| D(LKSIM) | -5.729956 | -2.971853 | 0.0001 | (c,0,1) | yes |

Note: c,t,k in type test stand for intercept, tendency and Lag Intervals for Endogenous, D means first difference equation

From the results, we get that LCP, LKSEX and LKSIM were integration of order one; there may be a co-integration relationship. At first, we set a VAR model by LCP, LKSEX, and LKSIM. From the model, we get that the optimal lag intervals was 1, then we get result of co-integration as below:

| Unrestricted Co-integration Rank Test (Trace) | | | | |
|---|-------------|-----------|----------------|---------|
| Hypothesized | Trace | | 0.05 | |
| No. of CE(s) | Eigen value | Statistic | Critical Value | Prob.** |
| None * | 0.762488 | 53.25606 | 29.79707 | 0.0000 |
| At most 1 | 0.368791 | 13.00504 | 15.49471 | 0.1146 |
| At most 2 | 0.004337 | 0.121708 | 3.841466 | 0.7272 |

Trace test indicates 1 co-integrating EQN(s) at the 0.05 level

From the results above, at 0.5% level of confidence, there was a co-integration relationship by LCP, LKSEX and LKSIM. Then we use VECM to test. In above, the optimal lag intervals was 1, thus we estimated lag intervals in VECM was "0, 0". The result of VECM was as follow:

| Co-integrating eq: | CointEq1 |
|--------------------|------------|
| LCP(-1) | 1.000000 |
| LKSEX(-1) | -0.097253 |
| | (0.13011) |
| | [-0.74745] |
| LKSIM(-1) | 0.127476 |
| | (0.10377) |
| | [1.22847] |
| C | -11.16684 |

So, the standard equation is:

$$\begin{aligned} \text{LCP} &= 0.097253\text{LKSEX} - 0.127476\text{LKSIM} + 11.16684 & (1) \\ \text{s.e.} &= (0.13011) & (0.10377) \\ \text{Log} &= 43.55404 & \text{AIC} = -2.303602 & \text{SC} = -1.883243 \end{aligned}$$

Index of the error correction was -0.052766.

The empirical research indicates that there is a long-term equilibrium between LCP, LKSEX and LKSIM. And while all other factors are held constantly, When LKSEX grew by one percentage; the point of employee would increase in the number 0.097253%. When LKSIM added one percentage, the point of employee would decrease 0.127476%. And in the short run, if co-integration equation was deviated, it would be pulled the non-equilibrium back to equilibrium by the intensity of “-0.052766”.

2. Discussion and conclusion

The effect of knowledge-based international service trade export on employment was magnetic effect, import was crowding out effect. It means that, the export of knowledge-based service trade may promote employment, and the import may inhibit employment, which was highly consistent with the analysis of knowledge-based service trade's character.

CONCLUSION

In summary, knowledge-based service trade, in particular, the export of it has a positive impact effect on employment. Thus, the development of knowledge-based service trade, especially the improvement of knowledge-based service trade export's international status, has important significance. So, we put some strategies of optimization the effect of knowledge-based service trade on employment.

1. To vigorously develop the domestic knowledge-based service industry, introduce private enterprises to enter the Knowledge-based service industry, in order to enhance the competitiveness of knowledge-based service exports. Because stability and advanced knowledge-based service industry is the precondition of developing knowledge-based service trade, and the top 2 of service great nation, Germany and The U.S.A, which are all strong service sectors. China has a big gap in this area.

2. Focusing on the development of financial and insurance industry, and other commercial services trade also need some measures, which meet the requirements of WTO law and policy, to protect and help. Thus, our finance, insurance and other business services can occupy certain competitiveness in the global knowledge-based services trade market. Because the financial and insurance trade and other commercial services trade started late in china, they have low competitiveness, but these service always have a direct or indirect relationship with the country's economic lifeline. So, for finance and insurance and other commercial services trade, we should keep protection together with intervention.

3. To enhance the development of consultation, proprietary rights and royalties' trade, to promote intellectual property and other relevant laws and regulations policies [5]. Here we need to be improved in several ways, first of all, we need to build some law and policy which fit our knowledge-based service trade's development and also comply with international knowledge-based service trade as soon as possible. The legal concept of intellectual property in china is relatively thin. Lack of awareness of the law would make the development of knowledge-based service trade is restricted, especially the consultation, patent and franchise fee. Furthermore, our reputation in the international market will be affected. Secondly, we need to actively participate in developing and improving the international intellectual property laws, to protect our rights in accordance with the laws and regulations in the service trade negotiations. Finally, we need to establish a national awareness of IPR protection, let citizens to fully familiar with intellectual property rights. From this way, we can vigorously promote the healthy development of patents and franchise fee trade, can avoid receiving pressures and restrictions from foreign countries in the process of proprietary rights and franchise fee export.

4. Lead to a more balanced development of the national construction services, and to Increase the openness of construction service. The construction industry is the pillar industry of the national economy; it plays an important role in promoting economic development and promotes social employment. Our construction industry develops very unbalanced, the output present three regions of china distribution. Outputs in the top are in Jiangsu, Zhejiang, Shandong and Guangdong eastern province, outputs in the low ranking are Ningxia, Qinghai western province and Tibet. From the output, the one in western is not even one percent of it in eastern. Therefore, on one hand, we should

break the situation with regional segmentation and blackout in construction industry, thus to ease the development of our construction industries' extremely unbalanced state, to improve the competitiveness in the domestic market. On the other hand, we should vigorously develop foreign markets, in order to improve our competitiveness in international market.

5. Efforts would be made to develop professional team for knowledge-based service. Knowledge-based service trade is a new type of service trade, which is different from past labor-intensive traditional service trade, it's a knowledge-intensive industry, need to invest a lot of expertise. But expertise only depends on professionals to exist and develop. So cultivating professionals plays an important role in developing knowledge-based service.

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