Offshoring of Service Industry in Japan

INFORUM World Conference
Hazyview, South Africa
August 22, 2011
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Introduction

In spite of the dominant role in the economy, has the service industry in Japan changed her character such as the manufacturing industry has strengthened the offshoring confronting to the globalized economy? In his sensational article on a potentially growing offshoring service industry in U.S.A., Alan Blinder (2006) estimated about 40 million employments which lose the job opportunity. There is a growing interest in this business activity. In this paper, we analyze the offshoring activity in Japanese service industry. In this paper, we adopt the index of VSL developed by Hummels et al. (2001) as the offshoring activity. Japanese service trade compared with non-service trade is analyzed in time series data for the year 1990 to 2008.

VSL is defined as the import content of export in the economy. In the several OECD researches, they show a certain growing tendency of offshoring under the globalizing world. Backer-Yamano (2008) and Meng-Yamano-Colin (2010) compared the strength of offshoring among 32 economies using OECD Input-Output tables.

Overview of Service Industry in Japan

Service industry in aggregate has a largest portion in production size and in employment. The following Figure 1 and Figure 2 show the output and the employment of service industry in Japan compared with non-service industry for the year 1990 to 2008. Figure 3 also shows the relative size of Japanese export of service industry to non-service industry. The relative ratio of output in service is 65% in 2008 and the ratio of employment is 78% in the total economy. However, as Figure 3 shows, the same ratio of export is only about 23% in 2008.

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5 OECD I-O Database: www.oecd.org/sti/inputoutput
Figure 1 Output in Japan

![Output in Japan](image)

Figure 2 Employment in Japan

![Employment in Japan](image)
The export in the service industry in Japan has kept the share of 20s’ % since 1990.

Japan and U.S.A. in Growing World Service Trade

WTO classified the activities of service trade across the border in several modes. Under the growing globalization, service trade has attracted attention. According WTO (2008), the share of service trade in the total global trade is about 20%.\(^6\) Service trade is known to have the complementarity with goods trade.\(^7\) According to WTO-WTR (2008)\(^8\), the “other commercial services” in WTO database for the period 1988-2006 have been growing faster than trade in intermediate goods.

The service trade in the global economy provided by WTO data is broadly defined in three groups such as transportation, travel and other commercial services. In this analysis, we compared Japanese service trade (measured in export) with USA’s service trade which is the biggest exporter in the world. We can examine how countries have developed the service trade. In this moment, we show the growth trend of service trade in Japan and U.S.A. Service trade by U.S.A. seems a biggest contributor to a globalized economy. Japan has a same biggest share of transportation trade in service trade as U.S.A. The second biggest share in service trade in U.S.A. is travel trade. Differently from U.S.A., Japanese second largest

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\(^6\) WTO, World Trade Report, 2008.


\(^8\) WTO, ibid.
service trade is the other commercial services.

**Figure 4 Service Trade in Japan**

![Service Trade in Japan](image)

Data source: World Trade Organization, Statistics Database.

**Figure 5 Service Trade in U.S.A.**

![Service Trade in U.S.A.](image)

Data source: World Trade Organization, Statistics Database.
Measurement of Offshoring in Service Industry

The equation of vertical specialization used by Hummels et al. (2001)\textsuperscript{9} for measuring the import content of export) was rewritten by B. Meng, N. Yamano and C. Webb (2010)\textsuperscript{10} as follows:

\[ VSL = m (I - A_d)^{-1} F^f \]

where \( m \) indicates 1 by \( n \) row vector of import coefficients (share of imported intermediate goods to total input by \( n \) sectors), \( A_d \) is the domestic input coefficient matrix of sectors (\( n \) by \( n \)), \( I \) is the unit (or identity) matrix, \((I - A_d)^{-1}\) the domestic Leontief inverse matrix, and \( F^f \) is the \( n \) by 1 column vector of exports. \( F \), final demand consists of \( F^i \) and \( F^f \). Meng- Yamano-Webb compared the national wide VSL among nations each other using OECD Input-Output tables in 1995, 2000, and 2005. According to their paper, VSL shows that economy and industry’s degree of participation in international production networks, also implies the backward linkages in domestic inter-industrial production chains. Our analysis focuses on the industrial sectors with the time series data during 1990 to 2008 (or 2007) in Japan.

Robert Feenstra (2010)\textsuperscript{11} could find the relation between

**Figure 6 Relative Per Capita Wage Rate of Service Industry to Non-Service Industry**

Note: In this figure, the Non-Service industry covers the 1\textsuperscript{st}-44\textsuperscript{th}, and the service industry covers 45\textsuperscript{th}-73\textsuperscript{rd} sectors

\textsuperscript{9} Hummels, D., Ishii, J. and Yi K.-M. (2001), ibid., pp.75-96.

\textsuperscript{10} Meng, B., Yamano, N. and Webb, C., “Vertical Specialisation Indicator Based on Supply-Driven Input-Output Model”, IDE Discussion Paper, No.270, JTERO-IDE.

\textsuperscript{11} Robert Feenstra (2010), Offshoring in the Global Economy – Microeconomic Structure and Macroeconomic Implications, MIT Press.
Figure 7 Export Dependence measured by the Ratio of Export to GDP in constant price
Figure 8  Ratio of Non-Service Export to Total Export in Japan
Calculated by author using JIDEA ver.8 Database

Figure 9  Share of Employment in Manufacturing (sector 1-44) and Non-Manufacturing (sector 45-73)
Figure 10 Japanese GDP, Export and Import in Merchandise GDP measured in real term

Analytical Results
We could show the index of VSL in Japan calculated in the above equation.

Figure 11 Share of Import Content in Japanese Export
Share of Import Content in Japanese Export

- non-service share
- service share
### Table 1 Share of Import Content in Japanese Export

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>total content import</td>
<td>4,639.1</td>
<td>4,887.1</td>
<td>4,821.3</td>
<td>5,295.4</td>
<td>6,071.3</td>
<td>6,653.0</td>
<td>4,943.4</td>
<td>6,113.7</td>
<td>5,270.1</td>
<td>4,799.1</td>
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<tr>
<td>total export</td>
<td>38,115.1</td>
<td>38,662.3</td>
<td>39,209.6</td>
<td>39,544.7</td>
<td>40,291.5</td>
<td>41,141.2</td>
<td>37,265.3</td>
<td>41,856.4</td>
<td>40,035.1</td>
<td>37,438.1</td>
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<td>non-service</td>
<td>3,829.5</td>
<td>4,107.3</td>
<td>3,926.9</td>
<td>4,244.4</td>
<td>4,953.4</td>
<td>5,856.9</td>
<td>4,143.7</td>
<td>5,156.2</td>
<td>4,446.7</td>
<td>4,094.6</td>
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<td>service</td>
<td>809.6</td>
<td>779.8</td>
<td>894.4</td>
<td>1,051.0</td>
<td>1,118.0</td>
<td>796.1</td>
<td>799.6</td>
<td>957.5</td>
<td>823.4</td>
<td>664.4</td>
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<td>non-service share</td>
<td>10.0%</td>
<td>10.6%</td>
<td>10.0%</td>
<td>10.7%</td>
<td>12.3%</td>
<td>14.2%</td>
<td>11.1%</td>
<td>12.3%</td>
<td>11.1%</td>
<td>10.9%</td>
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<tr>
<td>service share</td>
<td>2.1%</td>
<td>2.0%</td>
<td>2.3%</td>
<td>2.7%</td>
<td>2.8%</td>
<td>1.9%</td>
<td>2.1%</td>
<td>2.3%</td>
<td>2.1%</td>
<td>1.8%</td>
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<table>
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<th>Year</th>
<th>2000</th>
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<th>2005</th>
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<tr>
<td>total content import</td>
<td>7,328.5</td>
<td>6,814.9</td>
<td>8,018.6</td>
<td>14,904.2</td>
<td>16,198.0</td>
<td>17,391.7</td>
<td>21,030.0</td>
<td>23,223.9</td>
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<tr>
<td>total export</td>
<td>44,327.0</td>
<td>41,836.2</td>
<td>44,267.0</td>
<td>63,953.0</td>
<td>70,634.3</td>
<td>73,758.1</td>
<td>80,476.8</td>
<td>86,007.7</td>
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<tr>
<td>non-service</td>
<td>6,484.0</td>
<td>6,074.8</td>
<td>7,200.0</td>
<td>13,835.7</td>
<td>14,924.0</td>
<td>15,747.6</td>
<td>19,396.9</td>
<td>21,487.5</td>
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<tr>
<td>service</td>
<td>844.5</td>
<td>740.1</td>
<td>818.7</td>
<td>1,068.5</td>
<td>1,274.0</td>
<td>1,644.1</td>
<td>1,633.1</td>
<td>1,736.5</td>
</tr>
<tr>
<td>non-service share</td>
<td>14.6%</td>
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<td>16.3%</td>
<td>21.6%</td>
<td>21.1%</td>
<td>21.4%</td>
<td>24.1%</td>
<td>25.0%</td>
</tr>
<tr>
<td>service share</td>
<td>1.9%</td>
<td>1.8%</td>
<td>1.8%</td>
<td>1.7%</td>
<td>1.8%</td>
<td>2.2%</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Unit: Billions of Japanese Yen and Percentage

### Table 2 Import Content Ratio of Export by Industry in Japan, 1990-2007

<table>
<thead>
<tr>
<th>Industry</th>
<th>Japan</th>
<th>USA</th>
<th>EU</th>
<th>China</th>
<th>Japan</th>
<th>USA</th>
<th>EU</th>
<th>China</th>
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<td>957.5</td>
</tr>
</tbody>
</table>

Unit: Billions of Japanese Yen and Percentage

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As Figure 12 and Figure 13 show, the order of the export in service industries and the import content of service export by sectors does not correspond necessarily. Industries of Advertisement and Information match each other reflecting the globalization.