THE EFFECT OF OUTWARD FOREIGN DIRECT INVESTMENT ON A DOMESTIC ECONOMY
- THE CASE OF JAPAN -

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THE EFFECT OF OUTWARD FOREIGN DIRECT INVESTMENT ON A DOMESTIC ECONOMY
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ABSTRACT

This paper investigates the relationship between domestic employment and the real wage, added value production index, foreign sales by the companies, the investing country’s real gross domestic product, the corporation’s production, and exchange rates using the data on the Japanese manufacturing sector and Japanese macroeconomic data from the first quarter of 1997 to the fourth quarter of 2011. The paper concludes that domestic labor demand will decrease as Japanese firms increase their overseas operations, and that employment will increase when the companies increase their home production and export of higher added-value products. My results suggest that government can counteract effects of the expansion of foreign direct investment by encouraging companies to focus on producing higher value-added goods and services at home. While companies’ expansion of overseas operations is critical for them to be competitive in foreign and domestic markets, to support overall welfare investing countries need to produce and nurture new businesses. Otherwise, people in those countries will lose jobs, which could ultimately harm the economy of the country.
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I. Introduction

This paper examines the effects of outward foreign direct investment (FDI) on a country’s demand for labor. For businesses in many developed countries, expansion of overseas operations is common, and some believe that due to some form of this business behavior, many have lost their jobs. Considering the fact that a high rate of unemployment can lead to social anxiety and to a decrease in economic welfare, it is important to study this phenomenon as a public policy issue.

My hypothesis is that the growing trend of overseas operations by Japanese firms has had a negative effect on domestic labor demand, and that the government of Japan can counter this effect by encouraging Japanese companies to focus on producing higher value-added goods and services. I propose to study this question using Japanese macroeconomic data in a multivariate regression.

Since the collapse of its bubble economy in 1991, Japan has been struggling to recover from economic stagnation. Japan’s economy temporarily revived since 2002, due to the completion of resolving excess debts, the depreciation of its currency and the long-lasting high economic growth in the global economy.¹

However, since 2007, the country has been suffering from a serious economic recession due to major economic upheavals, such as the sub-prime mortgage crisis in 2007, the insolvency of Lehman Brothers Holdings in 2008, and the Great East Japan Earthquake in 2011. Other factors have also hindered economic development in Japan, including: the high corporate tax

¹ Shirakawa (2012)
rate, an extraordinarily appreciated currency, and a shortage of energy caused by the suspended operation of nuclear power plants after the huge earthquake.²

Due to these circumstances, more and more Japanese firms have been expanding their overseas operations, a procedure which many people fear will decrease domestic investment and increase the unemployment rate. In this paper, I propose to analyze the present situation in which Japanese companies expand their overseas operations and assess the effects of this expansion on the home economy. Then I will propose measures to encourage the expansion of high value-added production in Japan.

The paper is organized as follows: Section II lays out the background of my research and reviews relevant previous works; Section III shows the effects of growing outbound foreign investment by Japanese companies; Section IV explains my hypothesis, methodology and regression model; Section V discusses regression results; and, Section VI offers policy recommendations and conclusions.

² Keidanren (2013)
Ⅱ. Background and Literature Review

1. Theoretical background

The efficient expansion of overseas operations by business firms contributes to a higher national income for a home country through the improvement of corporate profits and the transfer of domestic labor to other higher-value added sectors. For instance, when a manufacturer increases foreign production and reduces domestic production, laborers working at the closed factories are laid off, which also causes other business firms and capital to leave the home country. However, if the manufacturers achieve better results thanks to expansions of their overseas operations, and the laid off workers are transferred to other growing industries, then the overall economy will benefit. In fact, many empirical analyses have indicated that FDI induces exports from the investing country to the invested country, and that it does not necessarily reduce domestic employment. Thus, we can see that the expansion of overseas production may do the economy of a home country more good than harm.

However, Kojima (1973, 1985) and Kojima and Ozawa (1984) argues that the nation’s terms of trade can be affected differently depending upon whether FDI is carried out in a sector with comparative advantage or a sector with comparative disadvantage. If FDI takes place between a sector with a comparative disadvantage for the home country and a sector with a comparative advantage for a foreign country, then the terms of trade improve through the reduction of the relative prices of imported goods into the home country. The trade of the two countries expands, and the economic welfare of the home country increases. On the other hand, if FDI takes place between a sector with a comparative advantage for the home country and a sector with a comparative disadvantage for a foreign country, then the reverse can happen.
So far, the expansion of overseas operations by Japanese firms has been performed in the former situation, and any adverse effects to the Japanese economy have been small. Recently, however, this trend has been gradually changing; and, the adverse effects to the economy can become larger.³

2. Literature Review

It is rational for individual companies to expand their overseas operations if the growth rates are higher and production costs are lower in foreign countries. As a result of the expanded foreign operations, each firm can expect the increase in its profit. However, the entire economy may suffer damage because of the decrease in production, exports, and employment at home. Therefore, it is crucial to analyze the effect of FDI on the total economy as well as the incentives for companies to expand their overseas operations.

(1) The motivation of firms for FDI

We can assume that businesses determine whether to increase their foreign operations by comparing the costs and benefits of FDI. In this section, therefore, I consider the costs and benefits of FDI and then go on to discuss the issue of taxation, because taxation affects corporations’ decision-making processes with regard to the implementation of FDI.

³ More than 70 percent of the overseas affiliates of Japanese companies replied that their technological levels are on par with those of Japanese companies at home (METI, 2009, p. 1). This indicates that a growing number of Japanese firms can expand their overseas operations with regard to the production of higher added-value goods.
(a) Costs and benefits of FDI

Through horizontal FDI, in which multi-plant firms duplicate roughly the same activities in multiple countries, firms investing in foreign markets can save on trading costs including transportation costs and tariff burdens. For example, Japanese auto companies reduced their exports, and built many assemble plants in the U.S. in 1980s. While this import restriction was caused by the political pressures from the U.S. car makers that were being harmed by competition with the Japanese makers, we can assume that this business behavior was a sort of horizontal FDI: Japanese firms should have been able to reduce transportation costs and to evade tariff burdens thanks to building plants in the U.S., which was the biggest market for the Japanese auto firms then. They can also respond promptly to changes in local consumers’ preferences since they can produce goods near the markets. On the other hand, companies that practice horizontal FDI lose economies of scale, since they need to cover new fixed cost for starting new businesses in local markets, and they must divide their productive processes.

Many academic researchers have shown that companies increase their horizontal FDI to limit trading costs. Markusen and Maskus (2001), for example, found that there was a positive correlation between sales of local subsidiaries and trade-cost barriers. Additionally, Yeaple (2003) showed that transportation costs and tariffs decreased exports from companies in home countries.

Through vertical FDI, in which firms locate different stages of production in different countries, they can save on the wage payments by transporting downstream processes to lower income countries. At the same time, these businesses may sacrifice some efficiency by dividing

---

4 The definitions used here of horizontal FDI and vertical FDI come from Rajan and Reinert (2009).
their production processes. Thus, Hanson et al. (2005), using firm-level data on U.S. multinationals, concluded that the lower the wage levels of the foreign countries, the more investment the home companies will make.

(b) Taxation and FDI

Businesses tend to invest in countries with lower tax rates since taxes are a burden for them. Empirical research indicates that companies take the corporate tax rate into account when selecting countries into which they will expand. For instance, Deveraux and Griffith (1998, 2002) showed that the location of multinational corporations is affected by the corporate tax rate. Also, Desai et al. (2004) pointed out that indirect tax\(^5\) rates affected the implementation of FDI, to the same extent as the corporate tax rate.

(2) The effects of FDI

In this section, I examine the effects of FDI on the domestic economy in terms of exports, productivity, and employment.

(a) The relationship between exports and FDI

When we think of the effects of an increase in overseas operations by home companies, we need to consider the alternative and complementary relationships among goods. In other words, when a company increases its overseas operations, the value of its exports will also increase if the relationship between the goods produced overseas and the goods produced in the home country is complementary. This is called “the export promotion effect”. On the other hand, the value of its exports will decrease if the relationship between the goods produced in a foreign

---

5 A tax that is levied on transactions irrespective of the circumstances of buyer or seller (Martinez-Vazquez, Vulovic & Liu, 2009, P. 2).
country and the goods produced domestically is competitive: This is called “the export substitution effect”.

Empirical analyses generally agree that vertical FDI causes export promotion, while horizontal FDI causes export substitution. Blonigen (1999), for example, analyzed the relationship between FDI in the U.S. by Japanese automobile companies and the value of the exports from Japan to the U.S. He argued that the building of auto assembly plants by the Japanese business firms in the U.S. would increase the export of auto parts from Japan to the U.S., while the building of the auto parts plants in the U.S. would substitute for the export of auto parts from Japan. Head and Ries (2001) pointed out that FDI by an end products manufacturer would substitute for the value of its exports from the home company, although such FDI would increase the value of the exports of its affiliated companies.

Many macroeconomic research papers, including Lipsey and Weiss (1981) and Clausing (2000), have claimed that the relationship between FDI and exports is complementary, and that therefore, FDI induces exports. Lipsey et al. (2000), using data on Japanese manufacturers, concluded that an increase in sales by overseas local offices promotes exports from Japan. Fukao and Amano (1998) concluded that foreign investments in Asian countries by Japanese firms would have positive effects on Japan’s economy because of the export promotion effect. On the other hand, the Ministry of Economy, Trade and Industry (METI, 2010) argued that FDI by Japanese business firms had negative effects on total exports in 2007.

In sum, the relationship between FDI and the value of the exports depends on the type of FDI. Therefore, we need to consider the characteristics of each instance of FDI in order to know whether FDI decreases exports or not.
(b) The relationship between productivity and FDI

Analyzing the effect of a business exodus on the productivity of firms is crucial. If a firm’s expansion of overseas operations causes its productivity to decrease, then economic welfare is reduced. On the other hand, it is possible that an exodus of some business operations will promote the productivity of a home country. Companies that expand overseas operations can learn new techniques through competition with overseas local firms, and they can enhance their operational efficiency through the division of operations with foreign enterprises. Hence, we need to rely on empirical analysis in order to grasp the effect of FDI on firms’ productivity.

Some empirical analyses have already been done. Matsuura et al. (2008), for example, found that FDI implemented by Japanese electrical machinery businesses increased the productivity of domestic manufacturers. Hijzen et al. (2007) showed that the productivity of the companies that engaged in FDI increased by approximately two percent; and, Obashi et al. (2010) suggested that the productivity of manufacturers that conducted vertical FDI increased by about four percent.

However, Elhanan et al. (2003) found that the relationship really worked the other way, and that it was companies with high productivity that implemented FDI. This disagreement suggests that we need to control for endogeneity if we would like to examine the relationship between firms’ FDI increase and productivity.

(c) The relationship between employment and FDI

Theoretically, the expansion of overseas operations should increase the national income of a home country through the improvement of corporations’ sales, if the factors of production can be smoothly redistributed. As a result, labor demand increases, wage levels go up at home,
and workers are better off. In the actual economy, however, it can be very hard for workers to find new jobs after they have lost previous ones. Hence, if this kind of friction exists in the labor market, it is probable that the economy of a home country cannot fully enjoy the benefits of an increase in overseas operations. Furthermore, large structural changes in industries, which have been caused by rapid increases in offshore manufacturing, can cause a large number of people to lose their jobs. Thus, Fahr and Vanhala (2010) showed that the expansion of overseas operations by corporations would induce the loss of employment in a home country due to friction in the labor market. Similarly, Mitra and Ranjan (2009) determined that the expansion of overseas operations in a certain sector would raise the unemployment rate in that sector if there were impediments to the free movement of labor among sectors.

However, analyzing how FDI affects the number of employees in a home country must consider both the export promotion effect and the export substitution effect. As I stated above, an increase in overseas operations by Japanese firms can increase production in Japan if the export promotion effect outweighs the export substitution effect. However, there may be no new job creation if the businesses that continue to operate in Japan are capital intensive. Thus, the relationship between an increase in overseas operations and domestic employment opportunity is still not clear, and we need to rely on empirical analyses to clarify the situation.

Empirical analyses using microeconomic data have shown that an increase in overseas operations does not necessarily decrease domestic employment. Yamashita and Fukao (2009), for example, using the data on individual companies, showed that the expansion of overseas production by Japanese firms does not always decrease employment in Japan; rather they concluded, the increase in overseas production might actually contribute to maintaining the
nation’s employment. Similarly, Hijzen et al. (2007) found that, over a three-year period, in companies that implemented FDI, the number of employees increased on average by six percent more than employment at companies that did not implement FDI. What can be behind these results are the positive effects of overseas expansion of domestic activity. As Hanson et al. (2003) pointed out, increased overseas operations might enhance the scale of home economic activity due to better resource allocation and the expanded overseas market.

In addition, it is probable that FDI affects the composition of the employees as well as their number. That is, if the operation of a labor-intensive sector shifts abroad, a home country may specialize in the production of high-tech products. As a result, the demand for high-skilled workers can increase. Head and Ries (2002) and Obashi et al. (2010) analyzed this issue. Using financial data from Japanese companies, Head and Ries (2002) estimated that if a business firm increased its overseas operations in lower-income countries, the share of wages paid to workers in its non-production departments would increase. Similarly, Obashi et al. (2010) analyzed how FDI would affect the wages and the number of employees working at non-production departments and in manufacturing plants of Japanese firms. They found that, after the implementation of vertical FDI, demand for skilled-production workers increased in Japan. As a result, while vertical FDI had little effect on the number of employees, wages for skilled-production workers increased at home.

On the other hand, empirical analyses using macroeconomic data do not reach a uniform conclusion. Or at least, we cannot easily conclude on the basis of these studies that FDI will cause a decline of domestic employment. Fukao and Yuan (2001) divided FDI into two categories: one in which the companies substitute overseas production for domestic production,
and one in which the companies aim to acquire local markets. Based on an analysis of data on Japanese industries from 1987 to 1998, they found that an increase in FDI of the former type by Japanese firms decreased domestic employment in the manufacturing sector by 580,000 jobs. However, they found also that an increase in the latter type of FDI had a positive effect on domestic employment. On net, they concluded, FDI by Japanese corporations increased employment in Japan by 6,000. Similarly, Agnese (2011) analyzing data from 1980 and 2005 showed that the effect of an increase in overseas operations by Japanese companies on the employment rate in Japan was negligible.

3. Aims of the present paper

Previous research has shown that an exodus of business firms from a home country affects domestic exports and that exports affect the employment rates in that country. However, while empirical analyses using microeconomic data have reached a consensus that increased in overseas operations do not necessarily reduce the domestic employment, the findings of researchers who have used macroeconomic data have been inconsistent. Furthermore, previous researchers have said very little about a solution to related employment problems, such as job loss and the decrease in the salaries of workers. To address these limitations in the literature, in the present study I will use Japanese macroeconomic data to examine the effect of FDI on the employment opportunities and, if I find that FDI does lead to increased unemployment, propose solutions for this problem.

Understanding the causes and effects of outward FDI is crucial for policy makers in many countries. Due to the rise of emerging economies, most developed nations are going to face this
issue in the near future, if they do not already. Among those developed nations, Japan is a good example to analyze. At present the country is experiencing a huge expansion of overseas business operations and is struggling to find solutions to potentially related employment problems. My study investigates what has been going on in the Japanese economy and proposes some policy measures for easing the effects of the business exodus.
III. The effects of growing foreign investment by the Japanese firms

Effects of the increase in foreign operations by Japanese manufacturers fall in four categories. The first concerns the export substitute effect: products produced in foreign markets substitute for Japanese exports of finished products, which decreases exports from Japan. The second is the export promotion effect: exports of capital goods and intermediate goods from Japan increase as Japanese firms increase their overseas operations. The third is the adverse import effect: imports of goods produced in foreign markets increase. The fourth is the import replacement effect: imports of raw materials decreases due to the increasing overseas operations.

Of these four effects, the export substitute effect and the adverse import effect have negative results on domestic production. On the other hand, the export promotion effect has positive results for domestic production, while the import replacement effect does not directly affect domestic production. Overall, therefore, to determine the net effect of these categories, I need to rely on empirical analysis.
Ⅳ. Hypothesis, Model, and Data

1. Hypothesis

My hypothesis is that the growing trend of overseas operations by Japanese firms has had a negative effect on domestic labor demand, and that the government of Japan can counter this effect by encouraging Japanese companies to focus on producing higher added-value goods and services, which I expect to increase domestic employment. In other words, Japanese citizens will be better off if companies promote research and development of higher added-value commodities and increase their production of these goods at home, and the government of Japan should support such business activities.

2. Model

(1) Theoretical model

In theory, to maximize profit, firms hire up to the point at which the marginal product of labor equals the real wage (Mankiw & Ball, 2011, p. 52). In practice, however, labor demand can be affected by other factors. Thus I add the following variables to my model.

First, I add the firms’ earnings as an independent variable since labor demand should be affected by the corporate performance. It can generally be assumed that companies will employ more laborers as their sales increase. Second, I choose an added value index to measure how much value companies add to their products. The addition of this variable is based on my hypothesis that domestic employment will increase if companies focus on producing higher added-value goods and services. Finally, my model also includes some macroeconomic variables. When the economy is booming, labor demand tends to be high, and vice versa. Thus, I choose
GDP, firms’ production at home, and the foreign exchange rate as independent variables. GDP reflects macroeconomic conditions and firms’ performance in general. Firms’ production can reflect the labor demand since the more products companies produce, the more laborers they need. And the exchange rate can have a major effect on the net exports of the country.

Therefore, I hypothesize that labor demand is determined by the wage and productivity of workers, value added of the products, corporate activities and economic conditions. The labor demand function is shown as follows;

\[
\text{Labor} = f \left( \frac{W}{P}, H, \Pi, Y, Q, E, \varepsilon \right)
\]

(\textit{i})

Where, \( W \) is workers’ wages;

\( P \) is the price level;

\( H \) is the value added of the goods and services

\( \Pi \) is corporate sales;

\( Q \) is corporate production;

\( Y \) is real GDP;

\( E \) is exchange rate; and

\( \varepsilon \) represents random fluctuations.

(2) \textbf{Empirical model}

In order to test my hypothesis, I estimate the following equation:

\[
\ln \text{LABOR} = \beta_0 + \beta_1 \ln WAGE_{-1} + \beta_2 \ln HVAL_{-1} + \beta_3 \ln FOREISL_{-1} + \beta_4 \ln GDP_{-1} + \\
\beta_5 \ln IIP_{-1} + \beta_6 \ln EXR_{-1} + u
\]

(\textit{ii})

Where,

\textbf{LABOR} is the Regular Employment Index with the average index in 2010 being equal to 100;
$\text{WAGE}_{t-1}$ is the Real Wage Index in the previous quarter with the 2010 average being equal to 100;

$\text{HVAL}_{t-1}$ is the Added Value Index in the previous quarter;

$\text{FOREISL}_{t-1}$ is the foreign sales ratio by Japanese companies in the previous quarter;

$\text{GDP}_{t-1}$ is the real GDP in the previous quarter;

$\text{IIP}_{t-1}$ is the Index of Industrial Production in the previous quarter with the 2003 average being equal to 100;

$\text{EXR}_{t-1}$ is the Real/Effective Exchange Rate Index in the previous quarter with the 2010 average being equal to 100; and

$\mathbf{u}$ is the error term

3. Data

In order to analyze the effect of high added-value production by Japanese businesses on the employment index in Japan, I selected data on the Japanese manufacturing sector from the first quarter of 1997 to the fourth quarter of 2011 as my sample. I know that ideally I would collect data for a longer period of time to implement more reliable research, but as I state below, the shortness of the data collection period for overseas sales by Japanese companies prevents me from doing that.

The sources of data on these industries’ sales in both domestic and overseas markets are the “Financial Statements Statistics of Corporations by Industry” published by the Ministry of Finance and the “Survey of Trends in Business Activities of Foreign Affiliates” published by the METI.
I calculated the foreign sales ratio as follows:

\[
\frac{\text{corporate sales by overseas subsidiaries}}{\text{corporate sales by offices in Japan + corporate sales by overseas subsidiaries}} \tag{iii}
\]

Other macroeconomic data are derived from three official sources. The Regular Employment Index and the Real Wage Index come from the “Monthly Labor Survey” published by the Japanese Ministry of Labor, Health and Wealth. The second and third sources are “Trade Statistics of Japan” published by the Ministry of Finance and “Price Indexes Annual” published by the Bank of Japan. I use these two sources to obtain the Added Value Index, which I calculate as follows:

\[
\frac{\text{Export Unit Value Index (Ministry of Finance)}}{\text{Export Price Index (Bank of Japan)}} \tag{iv}
\]

Since the Export Unit Value Index of the Ministry of Finance is calculated by dividing the income from the sale of exported goods (export value) by the number of goods exported (export quantum), if income from the sale of high quality items increases, while the number of items sold remains constant, the index will rise. On the other hand, the Export Price Index of the Bank of Japan is computed by adjusting for differences in the quality of goods. Thus, a rise in the Added Value Index indicates that exports have a higher added value, and a fall of the Added Value Index implies the opposite.\(^6\)

I combine data for these variables in a time-series dataset with 60 observations for each variable. While I wish I could have data for a longer period of time, the government of Japan only began its survey on overseas sales by Japanese companies in 1997. If I could have acquired more data, I could have used a higher number of observations, which would make my analysis

\(^6\) Ministry of Economy, Trade and Industry (2012)
more reliable. Table 1 includes descriptive statistics for key variables in my study, based on the available data.

Table 1: Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Observation</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABOR</td>
<td>60</td>
<td>96.38</td>
<td>93</td>
<td>101</td>
<td>2.361901</td>
</tr>
<tr>
<td>WAGE</td>
<td>60</td>
<td>105.8883</td>
<td>99.1</td>
<td>113.9</td>
<td>4.321413</td>
</tr>
<tr>
<td>HVAL</td>
<td>60</td>
<td>98.88211</td>
<td>81.4883</td>
<td>123.1314</td>
<td>12.56817</td>
</tr>
<tr>
<td>FOREISL</td>
<td>60</td>
<td>12.34941</td>
<td>7.02846</td>
<td>17.30661</td>
<td>3.10265</td>
</tr>
<tr>
<td>GDP</td>
<td>60</td>
<td>492.5005</td>
<td>462.9506</td>
<td>529.9538</td>
<td>19.81744</td>
</tr>
<tr>
<td>IIP</td>
<td>60</td>
<td>96.48556</td>
<td>71.3</td>
<td>112.1</td>
<td>7.207569</td>
</tr>
<tr>
<td>EXR</td>
<td>60</td>
<td>103.2113</td>
<td>81.47667</td>
<td>128.84</td>
<td>11.4024</td>
</tr>
<tr>
<td>MOFEXP</td>
<td>60</td>
<td>99.01333</td>
<td>86.97</td>
<td>115.33</td>
<td>7.095551</td>
</tr>
<tr>
<td>BOJEXP</td>
<td>60</td>
<td>101.1356</td>
<td>81.4333</td>
<td>123.0333</td>
<td>9.764722</td>
</tr>
<tr>
<td>FSALES</td>
<td>60</td>
<td>14560.54</td>
<td>8037.274</td>
<td>22835.5</td>
<td>4824.139</td>
</tr>
<tr>
<td>DSALES</td>
<td>60</td>
<td>101362.5</td>
<td>82741.54</td>
<td>125417.5</td>
<td>9139.013</td>
</tr>
</tbody>
</table>

Where,

-LABOR: the Regular Employment Index with the average index in 2010 being equal to 100;

-WAGE: the Real Wage Index with the 2010 average being equal to 100;

-HVAL: the Added Value Index;

-FOREISL: the foreign sales ratio by Japanese companies;

-GDP: the real Gross Domestic Product (Trillions of Yen);

-IIP: Index of Industrial Production (2003 average=100);

-EXR: Real/ Effective Exchange Index (2010 average=100);

-MOFEXP: Export Unit Value Index (Ministry of Finance);

-BOJEXP: Export Price Index (Bank of Japan);

-FSALES: Corporate Sales by Overseas Subsidiaries of Japanese Companies (billions of Yen);

-DSALES: Corporate Sales by Japanese Companies in Japan (billions of Yen).
V. Regression results

1. Output from OLS estimation

Table 2 summarizes the relationship I estimate based on Equation (ii) specified above between employment in Japan and my independent variables and Table 3 contains the estimated coefficients for these variables, using the Ordinary Least Squares (OLS) method.

<table>
<thead>
<tr>
<th>Table 2: Model Summary (OLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
</tr>
<tr>
<td>R-Squared</td>
</tr>
<tr>
<td>F-Statistic</td>
</tr>
<tr>
<td>Prob&gt;F</td>
</tr>
<tr>
<td>Root Mean Square Deviation</td>
</tr>
<tr>
<td>Durbin-Watson Statistic</td>
</tr>
</tbody>
</table>

*** denotes statistically significant results at the 99% level of confidence.

<table>
<thead>
<tr>
<th>Table 3: Model coefficients (OLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>LWAGE$_1$</td>
</tr>
<tr>
<td>LHVAL$_1$</td>
</tr>
<tr>
<td>LFOREISL$_1$</td>
</tr>
<tr>
<td>LGDP$_1$</td>
</tr>
<tr>
<td>LIIP$_1$</td>
</tr>
<tr>
<td>LEXR$_1$</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
</tbody>
</table>

***, **, and * denote statistically significant results at the 99%, 95% and 90% level of confidence, respectively.

The estimated equation using OLS regression is:

$$\text{LLABOR} = 3.285 + 0.546\text{LWAGE}_1 + 0.436\text{LHVAL}_1 - 0.035\text{LFOREISL}_1 - 0.442\text{LGDP}_1 - 0.024\text{LIIP}_1 - 0.070\text{LEXR}_1 + u$$ (v)
This regression produces good results, since both the R-Squared and F-Statistic are fairly high, which indicates that the coefficients of the regression are statistically significant overall, and that the model explains a large part of the fluctuation of employment in Japan. In addition, some of the coefficients have meaningful implications. For example, while the variable $L\text{FOREISL}_{1}$ is not statistically significant, its sign is negative, which supports my hypothesis that the expansion of firms’ overseas operations decreases domestic labor demand. The sign of $L\text{HVAL}_{1}$ is positive and this variable is statistically significant at 99 percent confidence level, which also backs up my hypothesis that increase in exports of higher added-value goods will expand employment in Japan. The variable $L\text{EXR}_{1}$ is negative and statistically significant at the 95 percent confidence level, which coincides with the economic theory that an appreciated currency causes domestic exports to decrease, leading to a drop in labor demand in a home country.

However, we should consider these implications with caution because it is probable that the errors are serially correlated, which violates the Gauss-Markov Assumption for time series regressions of “No Serial Correlation.” (Wooldridge, 2009, p. 349-350) If we run a regression when there is a problem of serial correlation, then it is highly possible that standard errors of the coefficients are underestimated, and thus we fail to specify the model correctly. Indeed, the Durbin-Watson statistic in Table 2, which is used to test for first order serial correlation in the errors of a time series regression model, indicates that there is a positive autocorrelation in this regression.
2. Output from Prais-Winsten estimation

To address the autocorrelation problem in my model, I rely on the Prais-Winsten (PW) method, which is a method of estimating a multiple linear regression model with serial correlation and for correcting the standard errors. Table 4 summarizes the relationship between employment in Japan and my independent variables, and Table 5 contains the coefficients for these variables, which are obtained by PW estimation.

<table>
<thead>
<tr>
<th>Table 4: Model Summary (PW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
</tr>
<tr>
<td>R-Squared</td>
</tr>
<tr>
<td>F-Statistic</td>
</tr>
<tr>
<td>Prob&gt;F</td>
</tr>
<tr>
<td>Root Mean Square Deviation</td>
</tr>
<tr>
<td>Durbin-Watson Statistic</td>
</tr>
</tbody>
</table>

*** denotes statistically significant results at the 99% level of confidence.

<table>
<thead>
<tr>
<th>Table 5: Model coefficients (PW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>LWAGE&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>LHVAL&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>LFOREISL&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>LGDP&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>LIIP&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>LEXR&lt;sub&gt;-1&lt;/sub&gt;</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
</tbody>
</table>

***, **, and * denote statistically significant results at the 99%, 95% and 90% level of confidence, respectively.
The estimated equation using the Prais-Winsten method is:

$$\text{LLABOR} = 3.695 + 0.086\text{LWAGE}_{-1} + 0.091\text{LHVAL}_{-1} - 0.003\text{LFOREISL}_{-1} + 0.091\text{LGDP}_{-1} - 0.055\text{LIIP}_{-1} - 0.052\text{LEXR}_{-1} + u$$  \hspace{1cm} (vi)

The equation shows the relationship between employment in Japan and various factors such as real wage, foreign sales ratio, and real effective foreign exchange rate. While values of the coefficients are slightly different compared to those of the OLS regression, the Durbin-Watson statistic is closer to 2, which means that I have successfully dealt with the serial correlation problem in my model.

The sign and magnitude of each coefficient in Table 5 represent the effect of that independent variable on the employment which is derived from the regression using the Prais-Winsten method, and I interpret the results as follows:

*First*, the sign of $\text{LWAGE}_{-1}$ is positive and that of $\text{LIIP}_{-1}$ is negative, which contradicts my initial expectation and economic theory. Table 5 indicates that employment increases by 0.086 percent when the real wage increases by 1 percent. However, according to standard economic theory, labor demand is a negative function of workers’ wages. Hence, I expected the sign of $\text{LWAGE}_{-1}$ to be negative. However, we can probably ignore this result since the coefficient of $\text{LWAGE}_{-1}$ is not statistically significant even at the 90 percent level of confidence. A possible explanation of this result is the downward rigidity of wages in Japan. Aside from part-time workers, it is very difficult for employers to reduce the wages of their workers; thus employment can hardly be explained by wages, at least in the short term.

The negative sign of the coefficient of $\text{LIIP}_{-1}$ contradicts my supposition that firms will increase their labor demand when they expand their productive activities. Furthermore, the
coefficient is statistically significant at the 95 percent level of confidence, which implies that I cannot ignore this effect when interpreting the regression. One possible reason for the negative sign of this coefficient is that products made by Japanese firms contribute to increases in employment in foreign countries rather than in Japan. When Japanese firms mainly make consumption goods at home, we can assume that domestic employment will increase because the expansion of companies’ production will put upward pressure on domestic labor demand. However, when most of the products manufactured by the companies in Japan are capital goods, it is probable that the increase in the firms’ production will contribute to foreign employment as well as domestic employment. This is because the capital goods produced by Japanese companies can be exported to developing countries and used to build factories and production machines in those economies. As a result, those countries can reduce their imports of consumption goods from Japan and may also compete more efficiently with Japan when exporting consumption goods to other countries.

The Index of Industrial Production (IIP), calculated by the government of Japan, shows that Japan’s production of capital goods was at a relatively high level from 2005 through 2008. Therefore, we can assume that the capital goods produced in Japan during that period increased production in other countries, which reduced these countries’ imports of consumption goods from Japan and had a negative effect on Japanese employment.

Second, the negative sign of the coefficient of LFOREISL_{-1} and the positive sign of the coefficient of LHVVAL_{-1} indicate that domestic labor demand will decrease as Japanese firms increase their overseas operations, and that employment will increase when the companies increase their production and export of higher added-value products, which supports my
hypothesis. As I stated in the Section II, at least theoretically, the expansion of overseas production by companies will do the economy of a home country more good than harm if FDI takes place between a sector with a comparative disadvantage in the home country and a sector with a comparative advantage in the foreign country. I also wrote that while the expansion of overseas operations by Japanese firms followed that pattern, recently this trend has been gradually changing and adverse effects on the Japanese economy have been occurring. The negative but small coefficient of LFOREISL\(_{-1}\) backs up this statement suggesting that expansion of overseas operations by Japanese firms may be slightly decreasing employment at home.

The positive sign of \(LHVAL\_1\) is consistent with my hypothesis. The coefficient of \(LHVAL\_1\) shows that when exports of higher added-value products increase by one percent, Japanese employment increases by 0.09 percent. Also, \(LHVAL\_1\) is statistically significant at the 90 percent confidence level. While the job creation effect of \(LHVAL\_1\) is positive, it seems relatively small. This is possibly because an increase in \(LHVAL\_1\) will not only increase, but also decrease domestic employment. By concentrating on the production of higher added-value goods at home and removing the production of lower added-value goods from Japan, Japanese firms will reduce labor demands for producing lower added-value goods, while those firms will expand labor demands for producing higher added-value goods in Japan. Thus, I think that the job creation effect of this variable becomes small because the former effect will offset the latter effect to some extent.

Next, the positive sign of the coefficient of \(LGDP\_1\) indicates that Japanese employment will increase as economic activity increases. Although \(LGDP\_1\) is not statistically significant at the 90 percent confidence level, we can still draw some meaning from the result. The regression
shows that when Japan’s GDP grows by one percent, its employment improves by 0.09 percent, which is a fairly modest impact. One reason for this limited effect may be the structure of Japan’s recent GDP growth. On the one hand, the annual rate of the capital investment by the private sector has not dramatically changed since late 1990s, and has even decreased recently. On the other hand, for the last decade, government spending has increased constantly in an attempt to stimulate the deteriorating economy. However, critics argue that public investment is inefficient and does not have a strong impact on the economy. If this criticism is true, it is understandable that the growth of GDP has not significantly contributed to an increase in employment, because most of the recent economic growth was a result of possibly ineffective government spending. My analysis supports this idea.

Finally, the negative sign of the coefficient of $LEXR_i$ indicates that appreciation of the Japanese Yen will decrease domestic employment. The magnitude of the coefficient shows that when the effective real exchange rate goes up by one percent, employment in Japan will fall by 0.05 percent. Also, the coefficient of $LEXR_i$ is statistically significant at the 95 percent level. This result coincides with basic international economic theory. When the currency depreciates, exports from a home country to a foreign country increase through the improvement of price competitiveness, as a result of which, both production and employment in the home country increase. The reverse will happen when a currency of a home country appreciates. Although, the coefficient of $LEXR_i$ is statistically significant, its magnitude appears to be relatively small. I
believe this is because the export dependency of Japan is quite low and the job creation effect
caused by an increase in exports is limited.\(^7\)

3. Multicolinearity problem

I should refer to another potential problem that my model contains. I tested for and found
a multicolinearity problem between LGDP\(_{-1}\) and LFOREISL\(_{-1}\) as the table 6 shows. While there
is no definite criterion for detecting a multicolinearity problem in the model, it often said that we
need to doubt the existence of a multicolinearity when Variance Inflation Factor (VIF) is high.
(Wooldridge, 2009, p. 99) In the table 6, the VIF of LGDP\(_{-1}\) and LFOREISL\(_{-1}\) is remarkably high,
and so I think my model has a multicolinearity problem.

<table>
<thead>
<tr>
<th>Table 6 (Multicolinearity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>LGDP(_{-1})</td>
</tr>
<tr>
<td>LFOREISL(_{-1})</td>
</tr>
<tr>
<td>LWAGE(_{-1})</td>
</tr>
<tr>
<td>LHVAL(_{-1})</td>
</tr>
<tr>
<td>LIIP(_{-1})</td>
</tr>
<tr>
<td>LEXR(_{-1})</td>
</tr>
</tbody>
</table>

I tried to correct for multicolinearity by removing LGDP\(_{-1}\) from the equation, but the
autocorrelation correction still prevents LFOREISL\(_{-1}\) from being statistically significant with the
PW procedure. Hence, I estimate the equation using OLS regression without LGDI\(_{-1}\) to isolate
the effect of LFOREISL\(_{-1}\) in the regression, and get the result as Table 7 and Table 8 show.

\(^7\) According to IMF, *International Financial Statistics Yearbook 2011*, Japanese export dependency was
14.1 percent in 2010, while that of EU countries’ average was 16.2 percent. Export dependency is
calculated by '(Exports)/(GDP) \times 100.'
Table 7: Model Summary (OLS, without LGDP.1)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
<td>59</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.7331</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>29.12 ***</td>
</tr>
<tr>
<td>Prob&gt;F</td>
<td>0.0000</td>
</tr>
<tr>
<td>Root Mean Square Deviation</td>
<td>0.013326</td>
</tr>
<tr>
<td>Durbin-Watson Statistic</td>
<td>0.7912722</td>
</tr>
</tbody>
</table>

*** denotes statistically significant results at the 99% level of confidence.

Table 8: Model coefficients (OLS, without LGDP.1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error of Coefficients</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LWAGE.1</td>
<td>0.5937894</td>
<td>0.1754923</td>
<td>3.38</td>
<td>0.001***</td>
</tr>
<tr>
<td>LHVAL.1</td>
<td>0.385431</td>
<td>0.0387162</td>
<td>9.96</td>
<td>0.000***</td>
</tr>
<tr>
<td>LFOREISL.1</td>
<td>-0.0584795</td>
<td>0.0296547</td>
<td>-1.97</td>
<td>0.054*</td>
</tr>
<tr>
<td>LIIP.1</td>
<td>-0.1255422</td>
<td>0.0274804</td>
<td>-4.57</td>
<td>0.000***</td>
</tr>
<tr>
<td>LEXR.1</td>
<td>-0.0524141</td>
<td>0.0305457</td>
<td>-1.72</td>
<td>0.092</td>
</tr>
<tr>
<td>(Constant)</td>
<td>0.9941553</td>
<td>0.9912209</td>
<td>1.00</td>
<td>0.320</td>
</tr>
</tbody>
</table>

***, **, and * denote statistically significant results at the 99%, 95% and 90% level of confidence, respectively. The estimated equation using OLS regression with LGDP removed is:

\[
LLABOR = 0.994 + 0.594LWAGE.1 + 0.385LHVAL.1 - 0.058LFOREISL.1 - 0.126LIIP.1 - 0.052LEXR.1 + u
\] (vii)

Compared to the result from the Prais-Winsten estimation, the estimated equation using OLS regression without LGDP.1 shows that LFOREISL.1 is statistically significant and that the sign of the variable supports my hypothesis that expansion of firms’ overseas operations will decrease labor demand in Japan. Furthermore, the multicolinearity problem seems less serious as the table 9 shows, in which the VIF of LFOREISL.1 falls to a reasonable level. Therefore, while
my model has a multicollinearity problem, above I estimate the equation using the Prais-Winsten method without removing any variable to test my hypothesis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFOREISL_{-1}</td>
<td>20.79</td>
</tr>
<tr>
<td>LWAGE_{-1}</td>
<td>16.32</td>
</tr>
<tr>
<td>LHVAL_{-1}</td>
<td>7.47</td>
</tr>
<tr>
<td>LEXR_{-1}</td>
<td>3.88</td>
</tr>
<tr>
<td>LIIP_{-1}</td>
<td>1.53</td>
</tr>
</tbody>
</table>

4. Summary of the regression results

In this section, I first estimate the relationship between employment in Japan and my independent variables using the OLS method. The result is very good since the model explains large part of the changes of employment in Japan and some of the coefficients, not all though, have meaningful implications. For instance, the sign of $LFOREISL_{-1}$ is negative and the sign of $LHVAL_{-1}$ is positive, which supports my hypothesis that the expansion of overseas operations by companies decreases domestic employment but that increases in exports of higher added-value goods will expand employment in Japan. In addition, the sign of $LEXR_{-1}$ is negative, which coincides with the economic theory that an appreciated currency causes domestic exports to decrease, leading to a drop in labor demand in a home country. Unfortunately, though, it is probable that the errors in my model are serially correlated, and so this initial model is not specified correctly. Indeed, the Durbin-Watson statistic, which is well below 2, indicates that the regression has a positive serial correlation.

Therefore, I estimate the same model by relying on the Prais-Winsten method to address the serial correlation problem. Fortunately, I can obtain a good result since the Durbin-Watson
statistic is closer to 2, which indicates that the respecified model is not likely to have a serial correlation problem. The interpretation of the result is as follows:

- The sign of \( LWAGE_{-1} \) is positive and that of \( LIIP_{-1} \) is negative, which contradicts my initial expectation and economic theory. However, we can probably ignore the former since it is not statistically significant. As for the latter, one of the possible reasons is that products made by Japanese firms contribute to increases in employment in foreign countries through exporting of capital goods.

- The negative sign of the coefficient of \( LFOREISL_{-1} \) and the positive sign of the coefficient of \( LHVAL_{-1} \) supports my hypothesis that I stated above.

- The positive sign of the coefficient of \( LGDP_{-1} \) indicates that Japanese employment increases as economic activity expands, while it is not statistically significant and its impact is moderate.

- The negative sign of the coefficient of \( LEXR_{-1} \) indicates that appreciation of the Japanese Yen will decrease domestic employment, which coincides with the standard theory of international economics.

Although the result obtained from the Prais-Winsten estimation is good, I found that my model contains a multicolinearity problem between \( LGDP_{-1} \) and \( LFOREISL_{-1} \). Since I was not able to correct this problem, I estimated the equation using OLS regression without \( LGDI_{-1} \) to isolate the effect of \( LFOREISL \) in the regression. The estimation result indicates that \( LFOREISL_{-1} \) is statistically significant and that the sign of the variable supports my hypothesis, and so I estimate the equation with all variables using the Prais-Winsten method.
VI. Conclusion and policy recommendations

1. Summary

In this paper, I examined theoretical research on the effects of outward FDI on the economy of a home country. By implementing a regression analysis, I determined that the expansion of overseas operations by Japanese firms has a negative effect on domestic employment. Moreover, the regression analysis shows that labor demand in Japan increases if Japanese companies focus on producing higher added-value goods and services. Furthermore, as economic theory suggests, currency depreciation will lead to the increase in exports and employment. Keeping these results in mind, I propose that the government of Japan should implement the following policies.

2. Policy recommendations

First, as a short-term measure to increase domestic employment, Japan should decrease the effective corporate tax rate immediately. Recently, many countries have reduced corporate tax rates to encourage the competitiveness of domestic businesses and eventually increase overall economic welfare. Japan’s effective corporate tax rate is approximately 40 percent, substantially higher than the tax rates of other countries. Given this higher tax rate, it is no wonder that firms expand into other industrial countries. Furthermore, a lower tax rate is effective both in preventing foreign companies from withdrawing from Japan and in encouraging foreign companies to invest in Japan. It also can increase net tax receipts because many more firms will pay taxes to the government of Japan, which offsets the decrease in tax receipt caused by the lower tax rates.
Next, to promote the production of more high added-value goods at home, the government of Japan should encourage the firms to invest more in research and development through the reform of the tax system. Unfortunately, the government has reduced the coverage of the existing R&D promotion tax provision. R&D tax reform could serve to enhance economic activities that would help to revive the Japanese economy.

Also, from a long-term perspective, while my empirical analysis shows that firms should focus on producing higher added-value goods in order to keep outgoing FDI from damaging the economy, workers cannot move to the higher added-value sectors without sufficient skills and knowledge. Therefore, the government should expand opportunities for vocational education for adult workers; and, at the same time, sponsor a higher level of instruction for basic skills, especially English, math and computer usage, for students in primary and secondary schools. By changing education in this manner, Japan will enjoy more of the benefits of globalization.

At the same time, the government needs to facilitate the acceptance of foreign workers with expertise and higher skills that the businesses can hire. These days, although many developed and developing countries have been trying to attract skilled workers from other countries to help their firms to strengthen the competitiveness, almost only Japan has been reluctant to accept foreign workers. If the Japanese do not change this attitude, Japanese firms will be inferior to companies of other countries in producing higher added-value goods. The people of Japan need to recognize that those workers from foreign countries will also contribute to the increase in the aggregate demand in Japan.

Finally, the government should deal with the volatility of the international exchange market. The Yen has become weaker since Prime Minister, Shinzo Abe, took office at the end of
2012. Before that, Japanese companies had long been suffering from currency appreciation, which had not reflected the fundamentals of the economy.\textsuperscript{8} While the manipulation of exchange rates is not a sound policy, since it is the market that determines exchange rates, the government should try to prevent the excessive volatility of the market and to maintain the exchange rate within a reasonable range so that Japanese companies can increase their competitiveness. To achieve this goal, the government and the Bank of Japan should take such measures as the purchase of foreign government bonds and implementation of an expansionary monetary policy, if necessary.

3. Limitations and suggestions for further study

This study has important limitation which readers should keep in mind and which suggest directions for future research. The main limitation is limited data. Since METI only started its survey of overseas sales by Japanese firms in 1997, I could only obtain a dataset with 60 quarterly observations for this variable. Thus, the accuracy of my estimates of the effect of overseas operations by Japanese firms is limited. When sufficient time has passed and METI gathers more data, a more precise analysis should be possible.

A second problem is my method of estimation. Although I ran a regression using OLS method, there was a multicolinearity problem among my variables, which might reduce the reliability of my analysis. Further study should solve this problem by trying other methods,

\textsuperscript{8} At the conclusion of their visit to Tokyo on June 12, 2012, an IMF mission team said “the exchange rate has appreciated over the past year partly because of safe-haven capital inflows, and our analysis suggests that the yen is moderately overvalued from a medium-term perspective.”
including panel data analysis, ridge regression, and principal component analysis, or by choosing other variables, to obtain more accurate results.
References


Fukao, K., & Yuan T. J. (2001). *Nippon no taigai tyokusetsu toshi to kudoka* [Foreign direct investment by Japanese companies, and deindustrialization of Japan]. Tokyo: RIETI.

Hanson, G. H., Matoloni, R. J., & Slaughter, M. J. (2003). Expansion abroad and the domestic operations of US multinational firms. Retrieved March 12, 2013, from [http://www.itpf.pwc.com/itpf/itpf.nsf/0/A8E7B71BAA83D0AC852576E4005C0D2A](http://www.itpf.pwc.com/itpf/itpf.nsf/0/A8E7B71BAA83D0AC852576E4005C0D2A)


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