

The Hollowing Out of the Manufacturing Industry:

Will Foreign Direct Investment Reduce Employment in Japan?

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2011 was a year that sorely tested the Japanese economy. The Great East Japan Earthquake, and the electricity shortages resulting from the subsequent Fukushima Daiichi Nuclear Power Plant accident, had an enormous impact on Japanese firms. Poor economic conditions in Europe and the US also led to an appreciation of the yen that eroded export company profits. Although the current account remained in the black, Japan's trade balance showed a deficit (Table 1).

Such conditions have led to some pessimism in viewing the Japanese manufacturing industry. There is growing concern that more companies, faced with a strong yen and constraints on electric power, will move operations overseas, thereby accelerating the hollowing out of the domestic manufacturing industry.

The issue of whether or not foreign direct investment (FDI) will reduce domestic employment has been examined not only in Japan but also in Germany and France. A number of these studies have found that FDI does not necessarily reduce domestic employment.

There are a number of reasons why FDI may not reduce domestic employment. First, FDI designed to open up foreign markets (market-seeking FDI) does not necessarily reduce domestic production. Although FDI that shifts exports to local production may have the effect of reducing domestic production and employment, local production designed to expand sales in foreign markets does not replace domestic production.

Second, expanded foreign local production of finished goods may be accompanied by increased exports of intermediate goods from the home country. In other words, foreign local production may replace domestic production when considering only a single production process, but when considering multiple production processes foreign local production and domestic production are often complementary. For example, local production of automobiles in China often increases the export of engines and other parts from Japan.

The export of intermediate goods also includes that of services. For example, when a Japanese company engages in local production

of automobiles through a subsidiary in China, the subsidiary often pays to receive technology from the Japanese parent. In such cases there is a positive effect on employment in the R&D division in Japan. Expanded foreign local production is also accompanied by increased duties for the domestic headquarters, such as managing currency exchange risk and administering a global procurement network. In such cases, expanded foreign local production has a positive effect on employment at headquarters. The repatriation of profits from foreign subsidiaries to headquarters can be understood to include payment for services performed domestically by the headquarters.

Third, it is difficult to imagine a reduction in domestic employment when manufacturing firms establish foreign subsidiaries for the purpose of wholesale, retail, or service operations. When a Japanese automobile manufacturer, for example, establishes an automobile dealer subsidiary in China, this does not decrease employment in Japan.

In summary, there are many cases where FDI does not decrease domestic employment.

Are Japanese Firms Really Reducing Domestic Employment?

Professor Yasuyuki Todo (the University of Tokyo), Professor Tomohiko Inui (Nihon University), and others have previously analyzed whether or not FDI by Japanese firms reduces domestic employment. According to their research using firm-level data from the *Basic Survey of Business Structure and Activities* (Ministry of Economy, Trade, and Industry), FDI has the effect of increasing domestic employment. Firms that started FDI during the period from 1995 to 2000 subsequently increased employment by 3%–5%. In other words, for Japanese firms during this period, the evidence did not support a hollowing out of the manufacturing industry.

I conducted an analysis similar to that of Todo *et al* using more recent data — specifically, information from the *Basic Survey of*

TABLE 1

Japan's balance of payments

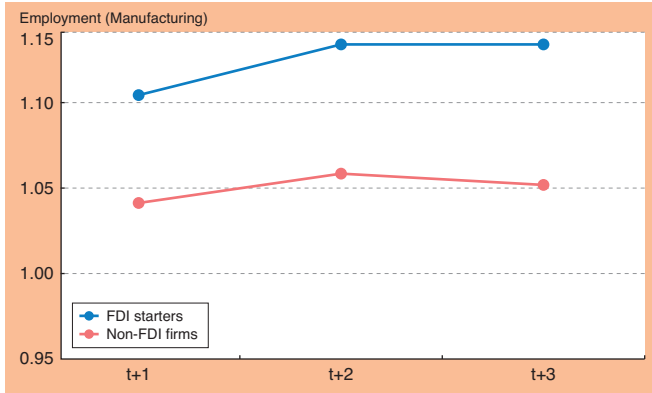
(100 million yen)

	2010	2011	Growth rate
Current account	178,879	95,507	-47%
Trade balance	79,789	-16,165	-120%
Export	639,218	627,248	-2%
Import	559,429	643,412	15%
Services	-14,143	-17,616	25%
Income	124,149	140,384	13%
Current transfers	-10,917	-11,096	2%

Source: Japanese Ministry of Finance, Balance of Payments Statistics

CHART 1

Employment over time for firms that started FDI & those that did not (Manufacturing industry)



Note: Indicates employment as a multiple of that for the year prior to FDI start.
 Source: Calculated by author based on the Basic Survey of Business Structure and Activities

Business Structure and Activities for 287 Japanese firms that started FDI during the period from 2003 to 2005. The analysis found that within a period of one to three years, firms that started FDI increased their employment by an average of 10%–14% relative to the year prior to starting FDI.

As a comparison with those firms that had started FDI, 287 firms with similar performance that had not were also selected. Employment at firms that had not started FDI increased by 3%–6%.

This comparison of firms that started FDI with those that did not shows a positive employment effect for FDI of about 6%–8%; whether or not a firm started FDI made a large difference in its subsequent growth. *Chart 1* indicates post-FDI employment over time for firms that started FDI and for those that did not.

These results are exactly opposite to what is anticipated by the assertion that FDI will reduce employment and lead to a hollowing out of the manufacturing industry. Overseas expansion can offer opportunities for growth. The same results were found when looking only at firms that started FDI in Asia. That is, firms that started FDI in Asia also saw an increase in their domestic employment.

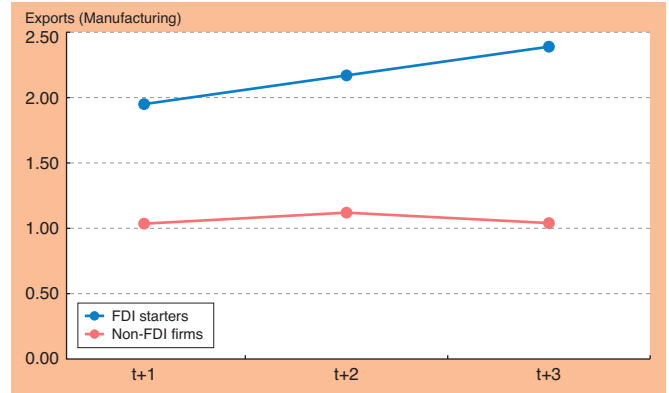
Why Doesn't Domestic Employment Decline?

Why, then, do firms that start FDI subsequently increase rather than decrease their domestic employment? One reason, as previously noted, is that production of finished goods at foreign subsidiaries is accompanied by increased exports of intermediate goods from headquarters.

I have, therefore, analyzed changes in exports. Firms that started FDI, on average, subsequently increased exports by between 2 and 2.4 times, a rapid increase. This suggests that firms that started FDI increased domestic employment to cope with the increased exports.

CHART 2

Exports over time for firms that started FDI & those that did not (Manufacturing industry)



Source: Calculated by author based on the Basic Survey of Business Structure and Activities

On the other hand, exports at firms that did not start FDI increased by only 5%–10%. *Chart 2* indicates post-FDI exports over time for firms that started FDI and for those that did not.

Nissan Case Study

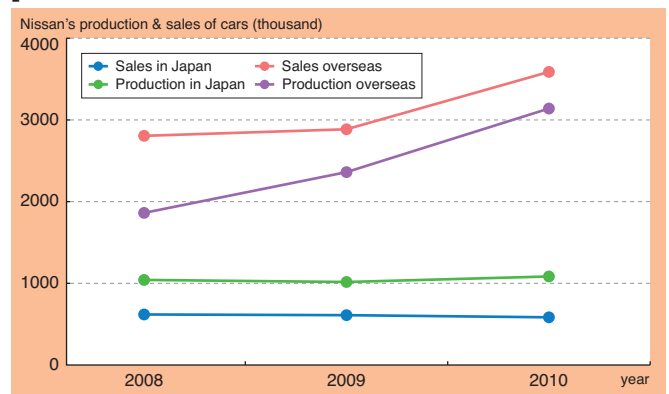
Up until this point, analysis has been limited to firms that started FDI. Would, then, a firm that already had numerous overseas subsidiaries decrease domestic production and domestic employment when expanding overseas local production?

Let's consider the situation with Nissan, one of Japan's leading automobile manufacturers.

In recent years Nissan has switched production of some of its vehicle models, including the March, from domestic production to overseas production. The company decided to produce the March in

CHART 3

Number of Nissan automobiles produced & sold



Source: Calculated by author based on information made public by Nissan

Thailand and import it to Japan. As indicated in [Chart 3](#), the number of vehicles Nissan produced and sold overseas rose between 2008 and 2010. The number of vehicles produced and sold in Japan, however, actually changed very little rather than declining. It is evident that Nissan continues to export from Japan as its production there exceeds its sales.

Nissan Factories in Japan: Skilled Workers Making High-Quality Cars

At Nissan's factories in Japan, such as its Oppama and Tochigi plants, skilled workers produce high-quality vehicle models like the electric Leaf and the luxury Skyline. The electric Leaf was first produced in 2010 at the Oppama plant.

Roughly 3,000 employees work at Nissan's Oppama plant, with an average age of 42 and an average 22 years of continuous service. Employees begin by learning only part of the manufacturing process but over time undergo training that enables them to work on a variety of manufacturing steps. At the Oppama plant, it takes roughly 16 hours for each finished vehicle to be assembled and produced.

One of the advantages of domestic production is the high concentration of component suppliers in Japan. Roughly 30,000 parts are required to produce a single automobile. Electric vehicles require slightly fewer parts, but not dramatically so. Partner component suppliers produce roughly 70% of the total number of parts. Components are brought in from around the country and conveyed to each of the plant's manufacturing line stations by unmanned robotic transports. Many partner component suppliers are located in the area surrounding the plant.

Nissan produces its automobiles using a built-to-order manufacturing process. When an order is received from a customer, the necessary components are ordered, production is begun, and the finished vehicles are delivered by the appointed deadline. The customer's name is written on the worksheet affixed to each car as it moves along the production line. This system, called "synchronized manufacturing", functions smoothly because parts suppliers are concentrated in Japan.

More than 90% of the vehicles produced at the Tochigi plant are exported, including some export-only models. Why, then, are they produced domestically? The machinery at overseas plants, although produced by different manufacturers, is the same as that in Japanese factories. There are two reasons to produce in Japan: the existence of skilled labor and the concentration of parts suppliers.

First, at the Tochigi plant, skilled workers produce luxury vehicles. There are 5,746 employees working at the plant, with an average age of 44.1 and an average 24.5 years of continuous service in the factory division. Furthermore, 80% are regular full-time employees.

Second, parts suppliers are concentrated in Moka city, located 7–8 kilometers from the Tochigi plant. The plant does business with roughly 250 parts suppliers. Emphasizing low costs and high quality, the plant also does business with overseas suppliers. Nevertheless,

in terms of achieving synchronized manufacturing, the concentration of parts suppliers near the Tochigi plant is of no small significance.

How, then, does Nissan cultivate the skilled workers employed at its factories in Japan? The workers themselves come from all around the country. Most are high school graduates. Their assignments are determined according to the type of job they want to do and their aptitude. Some are dispatched to provide support overseas (Spain, China, Indonesia, Russia, etc.) and some move to the engineering division, but most work continuously at the same factory. Jobs are ranked, and workers are evaluated based on both job performance and examinations. These evaluations are reflected in their pay.

Factory employees are organized in a pyramidal structure according to their skills. At the top is the plant manager, followed by directors, managers, group leaders, and other staff. A select few directors are further designated as "Meister" by the plant manager.

Skilled workers cultivated through such a system produce luxury cars in Japan for sale around the world. Nissan's Global Production Engineering Center and Global Training Center, where the company conducts "Meister training" for employees from countries around the world, are located in Japan.

The Nissan case suggests four things. First, it suggests that Japanese firms reorganize their production locations by making a sharp distinction between high-quality models and mass-market models. Production of the mass-market March was switched from domestic to overseas while domestic plants continue to produce luxury models and the electric Leaf. The role of Japan's leading-edge factories is limited to producing high-quality models to satisfy Japanese consumers who demand vehicles that are high in quality and environmentally harmonious. In this way, the shift to overseas production of a given model does not necessarily result in a hollowing out of domestic manufacturing.

Second, it suggests the importance of close proximity between the R&D division and the production division. R&D of leading-edge vehicles takes place in Japan, and vehicles are tested at domestic plants. The Tochigi plant includes proving grounds in addition to its casting plant, axle plant, and vehicle plant. A test course encircles the plant. The Oppama plant includes a research institute dedicated to basic research on automobile bodies. The electric Leaf was first produced at the Oppama plant.

Third, it suggests the importance of skilled workers. The average employee at Nissan's Tochigi and Oppama plants has more than 20 years of continuous service. Profitability is secured by having skilled workers with extensive experience who can manufacture high value-added products on extremely productive lines that eliminate even the smallest waste. Nissan representatives point out that the difference between overseas and domestic factories is not the equipment but the employees (craftsmen).

Fourth, it suggests that because synchronized manufacturing seeks correspondence between demand and supply, domestic parts suppliers continue to play a significant role.

Omron Case Study

I have shown that fear of a hollowing out of Japan's manufacturing industry is not justified by the statistical analysis. Nevertheless, concerns about the hollowing out of the manufacturing industry have spread widely throughout Japan.

On the other hand, there are many Japanese firms that display outstanding performance. Let's take a look here at Omron.

Omron, headquartered in Kyoto, is a long-established company, having been founded in 1933 and incorporated in 1948. Today Omron is a major corporate group with sales of more than 524 billion yen. What is more, its business fields are expected to grow. Omron's primary business fields are: industrial automation, electronic components, automotive electronic components, social systems, and healthcare.

Omron currently provides products around the world through five regional headquarters located in Japan, the Americas, Europe, Greater China, and the Asia-Pacific region. Sales in Japan now amount to less than half of the total. Indeed, sales and operating profits in Japan sharply declined during the five-year period from 2006 to 2010. On the other hand, sales and operating profits in China sharply increased.

Among Omron's 36,299 employees, roughly 11,000, or 32%, are in Japan. Employees in Greater China number roughly 17,000, more than in Japan. The reason there are so many employees in Greater China is the large number who work in manufacturing plants.

Importance of Research & Development

Omron is an R&D-oriented firm. In general, it conducts product development in Japan and supplies these products around the world. Omron has continued to focus primarily on developing products that use a wide variety of sensor technology. With the exception of thermometers and other health and medical equipment, the company's products are generally not sold directly to consumers but rather sold to companies. For example, Omron supplies mobile phone manufacturers with character recognition, reading and translating functionality for mobile phones.

Ever since Kazuma Tateishi founded Omron, the company has emphasized the importance of investing in R&D in leading edge fields. In 1941, it succeeded in the domestic production of a micro switch and later, through bold investment in R&D, sought to develop forward-looking technologies that created social demand and contributed to society. Tateishi believed that the company's mission was to satisfy social demand by creating new products and new industries through R&D.

In 1959 Omron earned sales of 1.3 billion yen, 10 times the figure for 1955, with 60% coming from new products. In 1960 the company succeeded in developing a groundbreaking new switch.

Also in 1960, the company established its Central R&D Laboratory in Nagaokakyo, Kyoto, with 280 million yen in funding. Ten years later in 1970, the company opened Omron R&D Inc. in California, the

TABLE 2

Omron sales & operating profit growth by region

Omron's growth rate by region (2006-2010)

	Sales	Net operating profit
Japan	-22%	-51%
North America	-24%	759%
Europe	-27%	-67%
China	40%	666%
Southeast Asia, etc	23%	49%

Source: Calculated by author based on information made public by Omron

first Japanese R&D facility in the US. In 2003, the 70th anniversary of the company's founding, Omron opened the Keihanna Innovation Center in Kizugawa city, Kyoto.

Tateishi believed that the goal of a company should be not merely the pursuit of profits but rather to make a contribution to society. In cooperation with Japan Sun Industries, a social welfare foundation, in 1972 Omron established Omron Taiyo Co., Ltd., a welfare factory for people with physical disabilities that continues to operate two factories in Kyoto and in Beppu city, Oita. At the same time, the company believed it was critical to continually pursue R&D to survive in competitive markets.

The Omron case suggests that leading edge R&D is one direction Japanese firms can take to win out over the competition.

Conclusion

Concerns about a hollowing out of the manufacturing industry have spread in the wake of the earthquake disaster. However, the statistical analysis performed in this paper provides evidence that FDI by Japanese firms does not reduce but rather increases employment at home. I therefore conclude that outward FDI by Japanese firms, as well as leading-edge R&D, is both important and necessary for the Japanese economy.

Furthermore, if Japanese firms do not invest in foreign countries, they might lose market share to the American and Korean firms that do. The international competitive environment has grown more difficult for Japanese firms in recent years. Rising technological levels in China, Taiwan, and South Korea mean that Japanese firms now have a declining share even in fields in which they once dominated.

In addition, the shift of the Japanese economy toward services has been underway for at least 30 years. That is, while the share of employment covered by the manufacturing industry decreases, the share of employment covered by the services sector increases. Today, manufacturing accounts for roughly 30% of employment, while services account for roughly 70%. Rather than worry about the hollowing out of a manufacturing industry whose importance is declining, the government should urgently act to raise the productivity of a services sector in which employment is growing. **JS**

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