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## **Factoryless Goods Producers in Japan**

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Abstract

In parallel with the deepening of the global value chain, manufacturing firms in advanced countries are servitizing, and, in this respect, factoryless goods producers (FGPs) are attracting attention in international economics. On the other hand, in Japan, policymakers are interested in maintaining domestic manufacturing facilities to keep the ability to develop new products. This study presents descriptive statistics on Japanese FGPs, using micro data from the Basic Survey of Japanese Business Structure and Activities. Although the large majority of Japanese FGPs are classified in information and communications or wholesale industries, some FGPs belong to retail or services industries. This study indicates that FGPs are larger and have higher productivity and wages compared with non-FGPs, are investing intensively in intangible assets, including research and development, and have large headquarters functions. Under the trend of task-based international specialization, the growth of FGPs is expected to contribute to the overall earning potential of the Japanese economy.

*Keywords:* Factory, Manufacturing, Outsourcing, Global value chain, Intangible asset

*JEL Classification:* D22, F61, L23, L24, L80

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## Factoryless Goods Producers in Japan

### 1. Introduction

In recent years, owing to reductions in trade costs and trade barriers, international fragmentation of manufacturing production and deepening of global value chain (GVC) have been advancing rapidly. In the process of manufacturing products, various services, such as transportation and communication, finance and insurance, and legal and accounting, are used as intermediate inputs. Recent studies on value-added trade using world input–output tables have made clear that the value of indirect trade of services embodied in traded goods is considerable (for surveys, see Timmer *et al.*, 2014; Johnson, 2014). Francois *et al.* (2015) analyze the structure of services embodied in trade on a value added basis using panel data of the global input–output tables and state that advanced economies are having more service-intensive exports.

In vertically fragmented value chains, advanced countries tend to specialize in skill-intensive tasks, which are not the fabrication process, but are tasks located at both ends of the “smile curve.” Upstream (pre-production) activities such as development and design of products and downstream (post-production) activities including marketing and after services are examples of the skill-intensive tasks, which are service producing activities based on a highly-educated skilled workforce. In short, presently, international competitiveness of an advanced country in value-added trade depends heavily on the quantity and quality of the intermediate services produced in that country.

In parallel with the deepening of the GVC, manufacturing firms in advanced countries outsource fabrication processes to low-cost countries, thus servitizing their domestic functions. In particular, the increase in the number of “factoryless goods producers (FGPs)” or “factoryless goods producing firms (FGPFs)” attracts attention in the United States (Kamal *et al.*, 2013; Bernard and Fort, 2015). Although the exact definition and the boundaries of FGPs have not yet been firmly established, these are firms outsourcing all of their manufacturing process to other firms, their own domestic activities completely devoid of manufacturing. According to recent studies, these firms are generally classified as wholesalers, but they engage in the design of products, coordination of production process, marketing, and distribution of their products,

which are very different from the activities of traditional wholesalers.<sup>1</sup>

Examples of FGPs include the British appliance firm, Dyson Ltd., the well-known IT firm, Apple Inc., and the U.S. fabless semiconductor manufacturer, Mindspeed Technologies Inc. A large number of FGPs are supposed to be active in pharmaceutical and apparel industries. In Japan, First Retailing Co., Ltd. (UNIQLO), Nitori Co., Ltd., and Ryohin Keikaku Co., Ltd. (MUJI) are firms of similar characteristics to FGPs. These firms are classified as retailers and their domestic activities concentrate on planning and development of products, marketing, and retailing. For example, UNIQLO, a specialty store retailer (SPA), fabricates their products by contracting factories in China and Nitori produces furniture and home fashion products in low cost Asian countries such as Indonesia and Vietnam.

Both in the United States and in Japan, there are two types of FGPs. Some originally manufacturing firms transform into FGPs by offshoring their production process to low-wage emerging or developing countries. On the other hand, some firms start their businesses as FGPs by focusing only on design, development, and marketing.

Among Japanese policymakers, a view that maintaining domestic “mother factories” is necessary to preserve and enhance the ability to develop new manufacturing products is widely spread (Ministry of Economy, Trade and Industry *et al.*, 2012). From this viewpoint, FGPs may be regarded as an undesirable form of manufacturing. However, the actual situation of FGPs has not been yet well understood in most countries, including Japan.

Against this background, this study presents facts about Japanese FGPs using micro data from the Basic Survey of Japanese Business Structure and Activities (BSJBSA) conducted by the Ministry of Economy, Trade and Industry (METI) for the years from 2009 to 2013.

To summarize the major findings, first, it is worth mentioning that although the large majority of Japanese FGPs are classified as ICT or wholesale industries, some FGPs belong to the retail or service industries. Second, the FGPs are larger in size and have higher productivity and wages than comparable non-FGPs. Third, the FGPs are investing intensively in intangible assets including research and development (R&D) and have large headquarters functions.

The rest of this paper is structured as follows: section 2 explains the data and defines the notion of the FGPs used in this study section 3 reports descriptive facts on the Japanese FGPs, such as industry classification and firm size, and compares the productivity, wages, R&D

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<sup>1</sup> In the United States, whether FGPs should be classified into manufacturing or non-manufacturing industry is discussed (see Kamal *et al.*, 2013).

activity, intangible investments, and the size of headquarters functions of FGPs with comparable non-FGPs; and section 4 concludes with policy implications.

## 2. Data and Definition

As previously mentioned, the micro data used in this study are from the BSJBSA conducted by METI for the fiscal years from 2009 to 2013. The BSJBSA, an annual survey launched in the early 1990s, has been frequently used in empirical studies on productivity, international trade, and foreign direct investment of Japanese firms. The BSJBSA provides representative official statistics for all Japanese firms with 50 or more regular employees engaged in mining, manufacturing, electricity and gas, wholesale, retail, and several service industries.<sup>2</sup> Approximately 30,000 firms are surveyed every year.<sup>3</sup> The purpose of the BSJBSA is to capture a comprehensive picture of Japanese firms, including their basic financial information (such as sales, profits, costs, wages, and book value of capital), the number of employees, the number of domestic/overseas establishments, R&D expenditures, and foreign direct investments.

In the BSJBSA, both the sales of goods and services and the number of subsidiaries and related firms (separately for domestic and overseas) by 3-digit industry classifications are available.<sup>4</sup> More importantly, the BSJBSA collects information on the outsourcing of manufacturing activity (i.e., purchases of contract manufacturing services). Specifically, it establishes whether a firm has domestic/overseas outsourcing of manufacturing activities, and surveys the monetary value of outsourcing (total and overseas). Although this value has been surveyed since the launch of the BSJBSA, the values of outsourcing of manufacturing and services have not been clearly separated until the 2009 survey. Additionally, the separate values of domestic and overseas outsourcing were also not available until then. From the 2010 survey

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<sup>2</sup> Service industries covered in the BSJBSA include credit card and installment finance businesses, eating and drinking services, information services, goods rental and leasing, scientific research, professional and technical services, and living-related and personal services.

<sup>3</sup> To be more precise, the number of firms in the sample from 2009 to 2013 is 29,096, 29,570, 30,647, 30,577, and 30,217, respectively.

<sup>4</sup> A “subsidiary” is defined as a firm in which a parent firm owns more than 50% of the voting rights. A “related firm” is a firm in which a parent firm owns no less than 20% but no more than 50% of the voting rights. In this study, subsidiaries and related firms are aggregated and called “subsidiaries.”

(for the fiscal year 2009) onward, the values of domestic and overseas outsourcing of manufacturing activities are available.<sup>5</sup>

In this study, FGPs are defined by utilizing the following information included in the BSJBSA: (1) the value of sales from the firm's own manufacturing activity, (2) whether the firm has subsidiaries classified as manufacturers, and (3) the values of domestic and overseas outsourcing of manufacturing activities. In addition, industry classification, major financial information (sales, costs, profits, book value of capital, etc.), and the number of employees are used to calculate labor productivity and total factor productivity (TFP). The R&D activity, intangible investment, and the ratio of employees working in headquarters functions are also used to compare FGPs with non-FGPs.<sup>6</sup>

However, FGP definition is still at a stage of trial-and-error. Bernard and Fort (2013, 2015), using establishment-level data from the Census of Wholesale Trade (U.S. Census Bureau), propose a definition of FGPs as "they both participate in the pre-production process of design or engineering of the product and are involved in the control of manufacturing through the purchase of contract manufacturing services" at the establishment level and hold no manufacturing plants in the United States, as an additional condition. Kamal *et al.* (2013), using survey data from the U.S. Census Bureau and the Bureau of Economic Analysis (BEA), focus on contract manufacturing services (CMS) and analyze firms that outsource all actual transformation (manufacturing) activities to other firms.

In this study, we define FGP ("broadly defined FGP") as a firm satisfying all of the three conditions: (1) it has no sales from the firm's own manufacturing activity, (2) it has no subsidiary classified as manufacturing, and (3) it outsources manufacturing activities to other (domestic or overseas) firms. The first condition that a firm does not manufacture products is obviously necessary. In the BSJBSA, many firms are not classified as manufacturers, even if they have sales from their own manufacturing activities, because their main activity is simply not listed as manufacturing. There are, for example, 1,560 such firms in the 2013 survey alone.

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<sup>5</sup> The flow figures (e.g., sales, costs, and profits) of the 2010 BSJBSA, for example, are for the fiscal year 2009 (April 2009 to March 2010). Throughout, we simply call this 2009 data.

<sup>6</sup> The "headquarters function" is different from the "headquarters" in the BSJBSA. As the subsets of the headquarters establishments, "headquarters functions" include "research and planning," "information processing," "research and development," "international affairs," and "other (general affairs, personnel, and accounting)" functions. In this study, we define the size of the headquarters functions as the ratio of workforce engaged in the headquarters functions defined by the BSJBSA. The detail of the headquarters functions in BSJBSA can be found in Morikawa (2015).

Among these firms, 53% are classified as wholesalers, followed by (narrowly defined) services industries (18%), retail (6%), and ICT (5%). The number of such firms was 1,465 in 2009, indicating an increasing trend, but the composition by industry has remained essentially unchanged. The second condition is because some firms separate manufacturing segments as subsidiaries, but still conduct manufacturing activities as a group, being typically regarded as manufacturers. By combining these two conditions, we can extract firms whose domestic activities are completely different from pure manufacturing (i.e., pure non-manufacturing firms). The third condition is essential since a firm not satisfying this condition cannot be regarded as a “goods producer.”

Firms satisfying all three conditions include those that outsource their manufacturing activities only to domestic firms, but the main focus of this study is on “narrowly defined FGPs” that outsource manufacturing activities overseas, because the main research objective is servitization of manufacturing firms in relation to the development of GVC.

Based on the definition of FGPs, this study first overviews their number and industry classification. Subsequently, it investigates the characteristics (i.e., firm size, productivity, wages, R&D activity, investments in intangible assets, and the size of headquarters functions) of FGPs in comparison with non-FGPs. A practical difficulty is how to select appropriate comparison groups (non-FGPs). Since, by definition, FGPs are not classified as manufacturers, pure manufacturing firms are not necessarily an appropriate comparison group. In this study, firms satisfying the first and the second conditions (no domestic manufacturing activities) that do not outsource any manufacturing activities are chosen as the comparable non-FGPs.

When contrasting firm characteristics such as productivity and wages, residuals after controlling for 3-digit industry and firm size (log number of regular employees) are used. More specifically, descriptive statistics with t-test results with an exception of a simple probit estimation are used to explain the probability of conducting R&D.

### 3. Results

#### 3.1 Japanese FGPs: Overview

The number of FGPs calculated from the BSJBSA is reported in Table 1. The figures in

column (1) are the total number of firms whose domestic activities are pure non-manufacturing. For example, in 2013, 14,623 firms among the total of 30,217 in the BSJBSA sample are the pure non-manufacturing firms. The figures in columns (2) and (3) are the numbers of broadly defined FGPs and narrowly defined FGPs, respectively. The percentages of FGPs are calculated using the number of firms in column (1) as denominators.

In 2013, the numbers of broadly defined and narrowly defined FGPs are 2,688 (8.0%) and 451 (1.2%), respectively. As such, it can be confirmed that there are numerous FGPs in Japan, although these figures are confined to the sample covered by the BSJBSA. The total numbers of regular employees working in the FGPs are 1,146 thousands (broadly defined FGPs) and 237 thousands (narrowly defined FGPs), indicating that FGPs have a significant presence in the Japanese economy.

By definition, the FGPs are not classified as manufacturers. Although recent studies in the United States have focused on establishments or firms classified as wholesalers, the main business of First Retailing Co., Ltd. (UNIQLO), Nitori Co., Ltd., and Ryohin Keikaku Co., Ltd. (MUJI) is retailing. In fact, these firms define themselves as specialty store retailers. Consequently, Table 2 shows the BSJBSA industry classifications of FGPs.<sup>7</sup> Unexpectedly, 40.4% of the broadly defined and 49.6% of the narrowly defined FGPs are classified in the ICT industry. Wholesale industry has the next largest share of FGPs: 23.4% of the broadly defined and 30.5% of the narrowly defined FGPs. Nearly 20% of FGPs are classified in retail or service industries. The findings indicate that focus only on wholesalers may omit many FGPs and that it is desirable to consider widely the FGPs definition and analysis.

The monetary value of outsourced manufacturing activities is reported in Table 3. In 2013, the values are 5.7 trillion yen (broadly defined FGPs) and 1.8 trillion yen (narrowly defined FGPs), and the ratios to total sales are 14% and 21%, respectively. The total value of overseas outsourcing by the narrowly defined FGPs is 0.6 trillion yen, that is, 33% of the total outsourced value. The shares of outsourcing to subsidiaries are not significant (less than 20%), meaning that a large portion of outsourcing is outsourced to non-affiliated firms.

### 3.2 Characteristics of FGPs

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<sup>7</sup> “Other” industries include construction and electricity, gas, and water supply.



Subsequently, various characteristics of FGPs are compared to those of non-FGPs (Table 4). In these calculations, data for the fiscal years from 2009 to 2013 was used. The figures show the percentage differences after controlling for firm size (log regular employees), 3-digit industry, and year dummies.<sup>8</sup> Firm size, labor productivity, TFP, and mean wages of FGPs are all higher than the comparable non-FGPs', the differences being more remarkable for the narrowly defined FGPs. After accounting for differences in industry, firm size of the narrowly defined FGPs is about 40% larger than that of non-FGPs.<sup>9</sup> Labor productivity and TFP of the narrowly defined FGPs are about 10% higher than those of non-FGPs, and the wage level is about 8% higher.<sup>10</sup> All of these differences are statistically significant at the 1% level. The results indicate that FGPs, especially narrowly defined FGPs, are superior firms, suggesting FGPs may play an important role to vitalize the Japanese economy under the constant globalization trend.

The second part of Table 4 reports comparisons of the propensity to conduct R&D, intangible investments (divided by total sales), and the size of headquarters functions (the ratio of regular employees working in the headquarters functions). According to a probit estimation controlling for firm size, industry, and years, the propensity to conduct R&D by the FGPs is around 10% higher than that of non-FGPs and is statistically significant at the 1% level. The ratio of intangible investments to sales for FGPs is also higher than that of non-FGPs by 0.6% to 0.7%. As the sample mean of the intangible investments is less than 0.1%, the difference is economically huge. That is, FGPs outsource direct manufacturing processes to other firms, but they allocate large resources to intangible investments including R&D. The last row of Table 4 is the difference in the size of headquarters functions. In modern firms, headquarters play important roles and FGPs have relatively large headquarters functions. As the core service sector inside firms, headquarters conduct a wide range of highly strategic activities, including the choice of business areas, the decision to introduce new products and services, the adoption of investment projects, human resources management, and financial management. Recent studies on Japanese firms indicate that headquarters functions contribute positively to the TFP

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<sup>8</sup> 3-digit industry and years are controlled in calculating differences in firm size.

<sup>9</sup> Although not reported in the table, firm age of the narrowly defined FGPs is about 2 years less than that of non-FGPs. On the other hand, the difference in age is insignificant for the broadly defined FGPs.

<sup>10</sup> The firm-level TFP is calculated non-parametrically using the cost-share based index number method that employs a hypothetical representative firm as reference. The calculation procedure is described in the Appendix.

of these firms (Morikawa, 2015). Thus, the large headquarters of FGPs are consistent with their higher productivity.

To summarize, the FGPs in Japan are larger in size, more productive, and more active in intangible investments than the comparable non-FGP firms. In addition, the share of employees working in the headquarters functions is high. The FGPs are modern firms specializing in tasks that advanced economies have comparative advantage in.

#### 4. Conclusion

International fragmentation of manufacturing processes and deepening of GVC have been advancing rapidly. In parallel with these trends, manufacturing firms in advanced countries are outsourcing fabrication processes to other firms located in low-cost countries, thus servitizing their domestic functions. FGPs are the ultimate form of servitization. On the other hand, policymakers are interested in maintaining domestic manufacturing facilities, such as mother factories, in order to maintain capability of developing new products.

However, the actual situation of FGPs has not been yet well understood and the efforts to clarify the facts on FGPs have started recently. This is the first study to deal with the FGPs in Japan, by utilizing micro data contained in the BSJBSA. According to this study, an FGP is as a firm 1) whose domestic activities including those conducted as subsidiaries or affiliates are not involved in manufacturing, and 2) that outsources manufacturing activities to other firms. The main interest of this study is on the narrowly defined FGPs that outsource manufacturing activities overseas.

There are many FGPs in Japan and they employ a significant workforce. According to the traditional industry classification system, a large number of Japanese FGPs are classified as ICT or wholesalers, but nearly 20% of FGPs belong to the retail or services industries. This finding suggests that focusing only on wholesalers may underestimate the role of FGPs in the economy.

The various characteristics of FGPs were further analyzed. The FGPs in Japan are larger in size, more productive, and more active in intangible investments than the comparable non-FGP firms. The mean size of the narrowly defined FGPs is about 40% larger than the non-FGPs. Productivity and wages of these FGPs are around 10% higher than those of non-FGPs, after accounting for the difference in size and industry. In addition, FGPs are more active in

intangible investments, including R&D, and the share of employees working in the headquarters functions is high. These findings suggest that the FGPs are modern firms specializing in tasks that advanced economies have comparative advantage in.

It is expected that reduction in transport and communication costs combined with the trade liberalization through comprehensive EPAs (e.g., Trans-Pacific Partnership agreement) will accelerate the fragmentation of production and the deepening of GVC. Increase in the number of excellent FGPs and their growth may contribute to the performance of the overall economy.

It should be noted, however, that the results of this study depend on the sample surveyed by the BSJBSA. Therefore, the results are presented under the reservation that the analysis in this study does not cover all of FGPs in Japan. Expanding sample firms is an issue for future research.

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Table 1

## The number and the shares of FGPs

	(1) No domestic manufacturing activities	(2) Outsourcing manufacturing activities (broadly-defined FGPs)	(2) Overseas outsourcing manufacturing activities (narrowly-defined FGPs)
2009	13,566	2,667	324
2010	14,020	2,744	396
2011	14,809	2,815	455
2012	14,841	2,805	464
2013	14,623	2,688	451

(Note) The figures are calculated from the BSJBSA. The firm with “no domestic manufacturing activities” is the firm that does not have sales from its own manufacturing activity and does not hold subsidiaries classified as manufacturing industry. The broadly defined FGP is a firm of “no domestic manufacturing activities” that outsources manufacturing activities to other firms. The narrowly defined FGP is a subset of the broadly defined FGP that outsources manufacturing activities overseas.

Table 2

## Industry classifications of the FGPs

Industry	(1) Broadly-defined FGPs	(2) Narrowly-defined FGPs
Wholesale	3,214	638
Retail	1,937	177
ICT	5,541	1,037
Services	2,541	219
Other	486	19
Total	13,719	2,090

(Note) The figures are calculated from the BSJBSA.

Table 3

The monetary value of outsourced manufacturing activities

	(1) Broadly-defined FGPs			(2) Narrowly-defined FGPs				
	Total value	% of sales	Value to subsidiaries	Total value	% of sales	Value to subsidiaries	Value to overseas	Value to overseas subsidiaries
2009	4.4	12.8%	0.7	1.2	17.5%	0.2	0.3	0.0
2010	4.7	13.3%	0.9	1.4	19.2%	0.3	0.2	0.1
2011	5.6	14.0%	0.8	2.1	22.8%	0.4	0.5	0.1
2012	5.4	13.8%	0.8	1.6	17.5%	0.2	0.5	0.1
2013	5.7	14.0%	1.0	1.8	21.1%	0.2	0.6	0.1

(Note) The figures are calculated from the BSJBSA. The values are expressed in trillion yen.

Table 4

Characteristics of the FGPs

	(1) Broadly-defined FGPs		(2) Narrowly-defined FGPs	
	Diff.		Diff.	
Size (ln employees)	5.4%	***	39.2%	***
Labor productivity	5.5%	***	10.0%	***
TFP	5.2%	***	10.4%	***
Mean wages	5.6%	***	8.2%	***
R&D propensity	8.7%	***	12.0%	***
Intangible investments/sales	0.6%	***	0.7%	***
Size of headquarters functions	0.8%	***	2.3%	***

(Notes) The figures are calculated from the BSJBSA. The comparison group (non-FGPs) consists of the firms with “no domestic manufacturing activities” and without any outsourcing of manufacturing activities. \*\*\* indicates statistical significance at the 1% level.

## Appendix

### Procedure of calculating TFP

The firm-level TFP is calculated non-parametrically using the cost-share based index number method that employs a hypothetical representative firm as reference.

The input and output of a hypothetical representative firm in the base year are calculated as the geometric means of all firms in the same industry, and the cost shares of labor and capital are calculated as arithmetic means. The TFP (expressed as a natural log) for each firm in each year is calculated relative to the hypothetical representative firm in the base year. In this study, hypothetical representative firms are defined by three-digit industries in the first year (2009). This method of calculating TFP is frequently used in empirical studies on productivity (Syverson, 2011). The similar calculation of TFP using the BSJBSA can be seen, for example, in Fukao and Kwon (2006), and Morikawa (2010).

The value-added is the sum of the operating profits, rent, wages, welfare costs, depreciation, and paid taxes. The total hours, that is, labor input, are the sum of the number of full-time employees multiplied by their industry level working hours and the number of part-time employees multiplied by their industry level working hours. The number of full-time and part-time employees is taken from the BSJBSA. Data on working hours at the industry level are obtained from the Monthly Labor Survey (Ministry of Health, Labor and Welfare). Data on capital stock are the book value of tangible assets reported in the BSJBSA. The labor cost is the sum of wages and welfare costs, and the capital cost is the value of tangible assets multiplied by the sum of the average bank lending rate and the depreciation rate plus rent for movable and immovable properties. In calculating real (constant price) values of value-added and capital, the GDP deflators of the National Accounts (Cabinet Office) are used.