Research project on the international transfer of production technology systems in multinational corporations*

Yutaka Fujioka

1. Summary of the survey

Japanese multinational companies have rapidly expanded overseas production since the early 2000s. The developing of such manufacturing centers is an urgent need more than ever for these businesses, which are being pressed to reexamine how they manage international transfers of their manufacturing technology systems.

In this study, the Research Project on the International Transfer of Production Technology Systems in Multinational Corporations was formed on the presupposition that the manner in which such systems are transferred overseas influences the growth and independence of the manufacturing centers.[1] As such, the research team determined to conduct a survey to explore the actual

* This research received considerable assistance from many corporations. I would like to convey our heartfelt gratitude for their understanding of our main purport and for setting aside the time to take part in our survey. I also acknowledge our appreciation for the following grants: 1) 2018 JSPS Grant-in-Aid for Scientific Research C “Study of the Horizontal Transfer of Production Technologies in Multinational Corporations” (Grant Number 18K01867), and 2) Seinan Gakuin University’s Domestic Research Fund.

1 The research team comprises the following four members: Yutaka Fujioka, the author of this paper, research representative, and professor of Seinan Gakuin University’s Faculty of Commerce and the Graduate School of Business Administration; and Professor Norio Kambayashi, Professor Takuji Hara, and Associate Professor Yoshiko Niwamoto of the Graduate School of Business Administration, Kobe University. However, all observations in this research are those of the research representative, who is the author of this summary, and therefore any error is attributed to this author.

overseas transfer of production technology systems of Japanese multinational corporations' overseas production subsidiaries.[2]

We utilized Toyo Keizai Inc.'s Overseas Japanese Companies Data (Text Version 2019) to select the overseas production subsidiaries (factories) of Japanese multinational manufacturing companies that are the target of this study. This database is the result of the most comprehensive investigation of Japanese multinationals' overseas subsidiaries, and it is a standard source of information when conducting research on this subject. We therefore followed this trend and extracted 3,025 overseas production subsidiaries from the database.[3]

On July 25, 2019, the team posted from Japan a cover letter (in both Japanese and English), a questionnaire (in both Japanese and English), and a return-mail envelope (addressed and stamped by the team) in a B5-sized envelope to the overseas subsidiaries that were the survey target. We decided to collect the paper-based questionnaire via Japan Post's International Business Reply Service (IRBS) Charge system, which allows the original sender to pay for the postage afterwards, and the reply deadline for both the paper-based and web-based questionnaire was set for August 30, 2019.

The questionnaire was also prepared in webform for greater convenience for the respondents, to increase the response rate. We used DIP Ltd. Co.'s Free Web Questionnaire DIP Survey-Free System to create the webform in both Japanese and English, and we sent the links and tokens (codes) issued for each overseas manufacturing subsidiary in our survey to encourage response via the survey website.

The respondent was asked to select the questionnaire medium and language

2 This research defines a production technology system as "a wide-ranging technological system of manufacturing technologies that includes production management know-how."

3 The locations of the overseas subsidiaries are the USA, Thailand, Indonesia, Vietnam, Malaysia, and Taiwan.

of their choice -- paper or online, in Japanese or English. Our research team therefore attempted to provide them with as much convenience as we could conceive, and aiming for a 20% response rate based on previous research in our area of study, we waited for the replies from our target companies.[4] However, the response remained at 7.5% of the initial number of cooperation requests by the beginning of September, at 229 replies.

To improve this rate, we decided to send reminders to the companies from which we had not yet received replies, requesting once again their cooperation in answering our survey. We set October 9, 2019 as the new response deadline, and we posted from Japan the reminders to the remaining 2,781 overseas manufacturing subsidiaries on September 9, 2019. We were unable to include printed questionnaires and return-mail envelopes again, due to budget constraints, but we indicated the link to the web version along with the respective tokens and requested the companies' cooperation in participating in our survey.

As a result, we received 169 more responses by mid-November, and adding this number to the first batch we had received before we had sent out the reminders, the number of replies totaled 398 (=229+169). Our research targets Japanese overseas manufacturing companies whose main factories have been in operation for at least 5 years, so excluding 7 companies whose factories have been operating for under 5 years, our final number of valid responses became 391 (=398-7).[5]

4 Previous research on similar subjects conducted with similar methods achieved response rates of 15 to 40%. For example, Gupta and Govindarajan (2000, p. 482) attained a particularly high rate of 38% , but more recent studies were lower, such as Sarkar, Aulakh, and Madhok (2009, p. 591) at 14% and Schleimer and Pedersen (2014, p. 319) at 19%, neither of which reached 20%.

5 Enterprises that provided valid responses were located in the USA (125 companies, 32.0%), Thailand (88 companies, 22.5%), Indonesia (69 companies, 17.6%), Vietnam (27 companies, 6.9%), Malaysia (46 companies, 11.8%), and Taiwan (36 companies, 9.2%). The industries of these corporations comprise the following: glass and ceramics (5 companies, 1.3%); rubber products (16 companies, 4.1%); pulp and paper (3 companies, 0.8%); pharmaceutical products (3 companies, 0.8%); chemicals (59 companies, 15.1%); chemicals wholesale (2 companies, 0.5%); machinery (40 companies, 10.2%); machinery

There were 71 questionnaires and reminders that were returned due to unknown addresses/addressees, and 36 of the responses that we received gave various reasons for not being able to answer the survey, including the fact that they were not production subsidiaries, that they were holding companies, that they had no authority to answer the survey items, or that they were under integrated management with the overseas subsidiary in the same country of location. Furthermore, as mentioned above, 7 overseas production subsidiaries' main factories had been operating for less than 5 years. Consequently, subtracting these numbers from the original number of 3,025 posted requests, the final valid number of posted requests became 2,911 (=3,025-71-36-7), and the ultimate valid response rate became 13.4% (=391÷2,911).[6]

Businesses around the world have been tightening control over information in recent years, and as such, survey response rates have been continuing to decline. Even in globally recognized, previous research in the field of business administration, it has become extremely difficult to achieve a 20% valid response

---

wholesale (1 company, 0.3%); metal products (27 companies, 6.9%); construction (2 companies, 0.5%); foods (27 companies, 6.9%); food wholesale (1 company, 0.3%); precision instruments (15 companies, 3.8%; fiber and apparels (7 companies, 1.8%); other services (1 company, 0.3%); other wholesale (1 company, 0.3%); other manufacturing (17 companies, 4.3%); iron and steel (14 companies, 3.6%); steel and other metals wholesale (1 company, 0.3%); electric appliances (64 companies, 16.4%); fishery, agriculture and forestry (2 companies, 0.5%); non-ferrous metals (6 companies, 1.5%); transportation equipment (77 companies, 19.7%).

6 Between non-response and valid-response companies, other than the years each expanded abroad, there were no statistically significant differences in payroll number, sales volume (equivalent in US dollars), number of dispatched employees from Japan, number of shareholding companies in Japan, investment ratio of Japanese investors, or investment ratio of the principal Japanese companies. However, the difference of the number of years these companies had been expanding globally was still under two years, which is not enough to influence the overseas manufacturing subsidiaries in any substantial manner. Therefore, it may be understood that there is no difference in attitude regarding the questions between non-response companies and valid-response companies, and that there is no concern to draw conclusions regarding the general population from a sample of this research.

rate.[7] Under such circumstances, it can be said that the 391 samples and the 13.4% valid response rate that our research obtained is not exceedingly low, but rather, a result of our vigorous efforts.

This is a report on the initial descriptive statistics of our survey, to be utilized for a general understanding of Japanese multinational corporations' international transfers of production technology systems. The detailed presupposition, analysis model, hypotheses, verification results, interpretation, and theoretical and practical implications of this research will be described separately by this author (Fujioka, 2020).

7 This trend is noticeable in the response rate of the surveys carried out by the same researchers. Kambayashi (2003, p.68) achieved a total response rate of 39.8%, but Kambayashi and Hirano (2019, p. 12) obtained just 4.5%. These numbers cannot be simplistically compared because the research themes and approaches differed, but it is unmistakably getting more difficult to conduct surveys in recent years.

2. Descriptive statistics of the survey

Q1. The following inquire about international technology transfers between your factory and your mother factory in Japan. Please answer each question.

(1) In the past 5 years, how long have engineers and operators of your factory been to your mother factory in Japan to study production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 389

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(2) In the past 5 years, how long have engineers and operators of your factory been to your mother factory in Japan to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 0, N: 389

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(3) In the past 5 years, how long have engineers and operators of your mother factory in Japan been to your factory to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have come to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 3, N: 385

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(4) In the past 5 years, how long have engineers and operators of your mother factory in Japan been to your factory to study production technology systems (including production control technology)? For example, count 9 months when 3 people have come to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 0, N: 388

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

Q2. The following inquire about technology transfers within the country where your factory is located. Please answer each question.

(1) Are there any fellow group factories in the country where your factory is located, in addition to your factory? Please check one answer that applies the most.

❑ No ❑ Yes

No: 236 (60.4%), Yes: 155 (39.6%), N: 391 (100.0%)

※ If you select "No" here, please skip the questions below and advance to Q3 on the next page.
If you select "Yes" here, please continue to part (2) of Q2, below.

(2) In the past 5 years, how long have engineers and operators of your factory been to a fellow group factory (or more) in the country where your factory is located, to study production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 237

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(3) In the past 5 years, how long have engineers and operators of your factory been to a fellow group factory (or more) in the country where your factory is located, to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 236

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(4) In the past 5 years, how long have engineers and operators of a fellow group factory (or more), in the country where your factory is located, been to your factory to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have come to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 0, N: 237

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(5) In the past 5 years, how long have engineers and operators of a fellow group factory (or more), in the country where your factory is located, been to your factory to study production technology systems (including production control technology)? For example, count 9 months when 3 people have come to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 237

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

Q3. The following inquire about international technology transfers between your factory and fellow group factories in other countries (excluding your mother factory in Japan). Please answer each question.

(1) Are there any fellow group factories in other countries, excluding your mother factory in Japan? Please check one answer that applies the most.

❑ No ❑ Yes

No: 76 (19.4%), Yes: 314 (80.3%), N: 390 (100.0%)

※ If you select "No" here, please skip the questions below and advance to Q4 on the next page.
If you select "Yes" here, please continue to part (2) of Q3, below.

(2) In the past 5 years, how long have engineers and operators of your factory been to a fellow group factory (or more) in another country (or more) (excluding your mother factory in Japan, to study production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 312

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(3) In the past 5 years, how long have engineers and operators of your factory been to a fellow group factory (or more) in another country (or more) (excluding your mother factory in Japan) to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have gone to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 0, N: 313

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(4) In the past 5 years, how long have engineers and operators of a fellow group factory (or more) in another country (or more) (excluding your mother factory in Japan) been to your factory to teach production technology systems (including production control technology)? For example, count 9 months when 3 people have come to teach for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 0, N: 313

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

(5) In the past 5 years, how long have engineers and operators of a fellow group factory (or more) in another country (or more) (excluding your mother factory in Japan) been to your factory to study production technology systems (including production control technology)? For example, count 9 months when 3 people have come to study for 3 months (= 3 people x 3 months). Please check one answer that applies the most.

Median: 1, N: 313

❑ 0 day	❑ 1 day or more, up to less than 1 month	❑ 1 month or more, up to less than 3 months	❑ 3 months or more, up to less than 6 months
❑ 6 months or more, up to less than 1 year	❑ 1 year or more, up to less than 3 years	❑ 3 years or more, up to less than 7 years	❑ 7 years or more

Q4. The following inquire about the characteristics of the production technology system(s) in your factory in the past 5 years. To what extent do the following statements accurately reflect them in the past 5 years? Please circle one number that applies the most to each statement.

	Not true at all		Neither agree nor disagree		Very true	Average	N
(1) A useful manual describing your manufacturing process has been able to be written.	1	2	3	4	5	2.98	389
(2) Large parts of your manufacturing control have been embodied in standard type software that we modified for our needs.	1	2	3	4	5	3.17	389
(3) Large parts of your manufacturing control have been embodied in software developed within your factory exclusively for your use.	1	2	3	4	5	2.56	387
(4) Extensive documentation describing critical parts of the manufacturing process have existed in your factory.	1	2	3	4	5	3.33	389
(5) New manufacturing personnel have been able to easily learn how to manufacture the product by talking to skilled manufacturing employees.	1	2	3	4	5	3.17	388
(6) New manufacturing personnel have been able to easily learn how to manufacturing your product by studying a complete set of blueprints.	1	2	3	4	5	2.42	387
(7) Educating and training new manufacturing personnel has been a quick, easy job.	1	2	3	4	5	2.26	387
(8) New manufacturing personnel have known enough after a normal high school education to manufacturing your product.	1	2	3	4	5	3.23	389
(9) New manufacturing personnel have known enough after vocation training to manufacture your product.	1	2	3	4	5	3.05	387
(10) Processes for changing physical characteristics of a material (for example chemical reactions, refinement, heat treatment) have been important to manufacturing.	1	2	3	4	5	3.32	389
(11) Processes for changing the shape of material (for example casting, pressing, rolling, bending) have been important to manufacturing.	1	2	3	4	5	3.35	389
(12) Processes for giving materials certain dimensions (for example turning, milling, drilling, sawing) have been important to manufacturing.	1	2	3	4	5	3.10	389
(13) Processes for assembling different parts to a whole (for example welding, soldering, gluing, screwing) have been important to manufacturing.	1	2	3	4	5	3.38	389
(14) It has been impossible for anyone in your factory to know everything about the entire manufacturing process.	1	2	3	4	5	3.36	389
(15) To get high product quality it has been very important that your manufacturing personnel has long experience from the specific plant where they are working.	1	2	3	4	5	3.76	390
(16) Workers in important parts of the manufacturing process have needed to be in constant contact with engineers or product quality will go down.	1	2	3	4	5	3.35	390
(17) Your product has been able to be manufactured in a unit isolated from all other production without quality being influenced at all.	1	2	3	4	5	2.51	389

Q5. The following inquire about the relationship between your factory and your mother factory in Japan in the past 5 years. To what extent do the following statements accurately reflect this relationship in the past 5 years? Please circle one number that applies the most to each statement.

	Not true at all		Neither agree nor disagree		Very true	Average	N
(1) Your factory has had extensive authority over introductions of new products.	1	2	3	4	5	3.58	387
(2) Your factory has had extensive authority over significant modifications of existing products.	1	2	3	4	5	3.65	386
(3) Your factory has had extensive authority over modifications of production processes.	1	2	3	4	5	3.81	386
(4) Your factory has had extensive authority over organizational restructuring that involved the creation or abolition of departments.	1	2	3	4	5	3.87	386
(5) Your factory has had extensive authority over recruitment and promotion to positions just below that of the factory manager.	1	2	3	4	5	4.11	385
(6) Your factory has had extensive authority over departmental managers' career development plans.	1	2	3	4	5	3.94	386
(7) Your factory would continue to operate without significant disruption in production even if its operation budget were to suffer a 10% reduction.	1	2	3	4	5	3.23	385
	Not true			True			
(8) The factory manager of your factory worked at your mother factory or headquarters in Japan for at least one year in his/her career.	0			1		0.35	388
(9) The factory manager of your factory has had a mentor (or more) at your mother factory or headquarters in Japan.	0			1		0.60	387
(10) The factory manager of your factory has visited your mother factory or headquarters in Japan at least once a year.	0			1		0.48	389

Q6. The following inquire about your factory's production technology in the past 5 years. How do you assess your factory's capacity today, compared to 5 years ago? Please circle one number that applies the most to each statement.

	Not true at all		Neither agree nor disagree		Very true	Average	N
(1) Your factory's production cost competitiveness has increased compared to 5 years ago.	1	2	3	4	5	3.69	389
(2) Your factory's customer satisfaction has increased compared to 5 years ago.	1	2	3	4	5	3.84	388
(3) Your factory's market defect rate has decreased compared to 5 years ago.	1	2	3	4	5	3.85	389
(4) Your factory's productivity, such as man-hours per product, has increased compared to 5 years ago.	1	2	3	4	5	3.90	388
(5) Your factory's delivery time, after receiving orders from customers, has shortened compared to 5 years ago.	1	2	3	4	5	3.65	386
(6) Your factory's production flexibility in the variety of products and volume, corresponding to the market, has increased compared to 5 years ago.	1	2	3	4	5	3.83	387
(7) Your factory's annual number of new product launches has increased compared to 5 years ago.	1	2	3	4	5	3.31	389

	Not true at all		Neither agree nor disagree		Very true	Average	N
(8) Your factory's original development of production technologies that retain high-precision or rapid processing abilities has increased compared to 5 years ago.	1	2	3	4	5	3.22	387
(9) Your factory's mass production launches of new products have become faster compared to 5 years ago.	1	2	3	4	5	3.44	388
(10) Your factory's new product proposals and development have increased compared to 5 years ago.	1	2	3	4	5	3.23	387

Q7. The following inquire about your factory's personnel training in the past 5 years. How do you assess the current skills of your factory's engineers and operators, compared to 5 years ago? Please circle one number that applies the most to each statement.

	Not true at all		Neither agree nor disagree		Very true	Average	N
(1) Your engineers and operators try harder to meet customer needs, and look for better ways of increasing customer satisfaction, compared to 5 years ago.	1	2	3	4	5	3.92	387
(2) Your engineers and operators emphasize the profit targets, and stress cost-saving and profit-making behaviors more, compared to 5 years ago.	1	2	3	4	5	3.84	389
(3) Your engineers and operators have established standards for high quality products and services, and exercise stronger control when attempting to realize them, compared to 5 years ago.	1	2	3	4	5	3.96	390
(4) Your engineers and operators establish numerical goals, set the budget and monitor the process by using quantitative information more, compared to 5 years ago.	1	2	3	4	5	3.79	389
(5) Your engineers and operators treat one's subordinates in a fair manner, and provide equal support and encouragement to all group members more, compared to 5 years ago.	1	2	3	4	5	3.70	389
(6) Your engineers and operators show sound thought and ethics, and behave in a way consistent with principles, beliefs and values more, compared to 5 years ago.	1	2	3	4	5	3.78	388
(7) Your engineers and operators choose the right person for the right job based on an accurate assessment of each subordinate's ability more, compared to 5 years ago.	1	2	3	4	5	3.63	387
(8) Your engineers and operators put group goals ahead of personal goals, and contribute to achieving group goals in collaboration with others more, compared to 5 years ago.	1	2	3	4	5	3.62	390
(9) Your engineers and operators anticipate future problems and investigate causes and possible consequences more, compared to 5 years ago.	1	2	3	4	5	3.45	389
(10) Your engineers and operators consider market situations, competitors, future goals and long-term company prosperity when making decisions more, compared to 5 years ago.	1	2	3	4	5	3.34	387
(11) Your engineers and operators make timely decisions in uncertain and risk-involved situations more, compared to 5 years ago.	1	2	3	4	5	3.34	389
(12) Your engineers and operators go beyond the status quo and implement new ideas more, compared to 5 years ago.	1	2	3	4	5	3.75	389

Q8. Please provide the following information about your factory.

(1) How many regular employees are there in your factory? _____ **person(s)**

Average: 547.65, N: 390

(2) How many Japanese expatriates are there in your factory? _____ **person(s)**

Average: 5.58, N: 389

(3) In what year did your factory begin operation? _____

Average: 1993.17, N: 390

(4) How was your factory established? Please check the box with the answer that applies.

❑ **New establishment** ❑ **Acquisition**

Average	N
0.13	382

Note: New Establishment: 0, Acquisition: 1

(5) What is your assessment of your factory's ratio of R&D expenditures to sales in the past 5 years, when you compare it to that of your mother factory in Japan? Please check one box with the answer that applies the most.

- ❑ **Your factory has not carried out R&D.** 182 (46.5%)
- ❑ **Considerably lower than your mother factory in Japan.** 133 (34.0%)
- ❑ **Slightly lower than your mother factory in Japan.** 27 (6.9%)
- ❑ **Approximately the same as your mother factory in Japan.** 16 (4.1%)
- ❑ **Slightly higher than your mother factory in Japan.** 12 (3.1%)
- ❑ **Considerably higher than your mother factory in Japan.** 15 (3.8%)

3. References

Yutaka Fujioka (2020) ***A study on the Horizontal Transfer of Production Technology Systems in Multinational Corporations***, Doctoral Dissertation at Graduate School of Business Administration, Kobe University (in Japanese).

Gupta, A. K. and Govindarajan, V. (2000) "Knowledge flows within multinational corporations," ***Strategic Management Journal***, Vol.21, No.4, pp.473-496.

Kambayashi, N. (2003) ***Cultural Influences on IT Use: A UK-Japan Comparison***, NY: Palgrave Macmillan.

Noria Kambayashi and Mitsutoshi Hirano eds. (2019) ***Personnel System in Japan: The Tradition and Reform***, Tokyo: Dobunkan Shuppan (in Japanese).

Sarkar, M. B., Aulakh, P. S. and Madhok, A. (2009) "Process capabilities and value creation in alliance portfolios," ***Organization Science***, Vol.20, No.3, pp.583-600.

Schleimer, S. C.and Pedersen, T. (2014) "The effects of MNC parent effort and social structure on subsidiary absorptive capacity," ***Journal of International Business Studies***, Vol.45, No. 3, pp.303-320.

Toyo Keizai (2019) ***Overseas Japanese Companies Data***, Text Version.