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The Function of Branch Plants in the Kyushu Automobile Industry

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Abstract

This study clarifies the type of function and organizational structure of the automobile-related businesses that have developed into the Kyushu region of Japan. The author used a questionnaire survey to collect data. This study focuses on the mass production of products as the core function of the establishments with branch factories. Moreover, this study shows that personnel and investment functions are consistent with the staffing within the business establishments. Findings reveal that although many staff members are assigned to production and sites, the allocation to sales, procurement, and outsourcing is extremely limited. Thus, this study investigates how the establishments that have entered the market conduct business with local companies. We determined that introductions or instructions from customers/parent companies often lead to transactions. Moreover, the business establishments in this study have weak procurement functions, and the selection of suppliers and subcontractors is designated and led by customers and parent companies.

1. Introduction

This study aims to clarify the function and organizational structure of the automobile-related business establishments located at the hub of the Kyushu automobile industry. With the expansion of Nissan Motor, Daihatsu, and Toyota Group's finished vehicle factories, a new automobile cluster was established in the Kyushu region. Research on these new automobile agglomerations has received much attention in related fields. For the Kyushu automobile industry to overcome the problems of the branch factory and promote further development, it must have a business relationship with local companies and must form an input–output relationship within the region (Nakamura, 2004). Several studies have viewed the problem of the relationship between the companies expanding into the local area

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and local companies as brought about by branch plants to the regional economy.

A branch factory is defined as a business establishment specializing in specific processes and functions by spatially separating indirect departments involved in strategic decision-making (Fujikawa, 2001). Research by Yamazaki (1999) and others revealed consistent high growth in industrial shipment values in areas into which many branch factories have expanded. However, the regional economy has been deemed unsatisfactory. For the branch factories, the regional economy faces the following problems: (1) low-quality employment and a brain drain, (2) a lack of accumulation of creative innovation ability, (3) weak spillover effects, (4) an outflow of profits and low social return, and (5) a low level of labor (Massey, 1995; Fujikawa, 2001; Nakamura, 2004).

In the case of the Kyushu automobile agglomeration, this study examines the difficulty of forming a network between the branch factory and local company, which causes a weak spillover effect in the branch factory economy (Fujikawa, 2001). The Kyushu automobile industry is in the geographical range of the Fukuoka and Oita prefectures. In both prefectures, the expansion of automobile-related branch factories has recently led to automobile agglomeration centered on these branch factories.

To clarify the above problems, this study examines the functions and organizational structure of the automobile-related business establishments that will be the hubs advancing toward agglomeration. The automobile agglomeration structure is hub-and-spoke (Markusen, 1996), and the agglomeration hub connects those outside and inside the agglomeration. This study allows us to understand the division of labor between agglomerations and between hubs. We conjecture that the functional division of labor defines the structure inside the agglomeration. If a business establishment that becomes a hub is incorporated into the central management function of other regions' establishments, the hub becomes a branch factory, creating a problem in that region's branch factory economy. Figure 1 presents this study's analytical viewpoint.

Several studies have tackled accumulation. For instance, Kobayashi (2010)

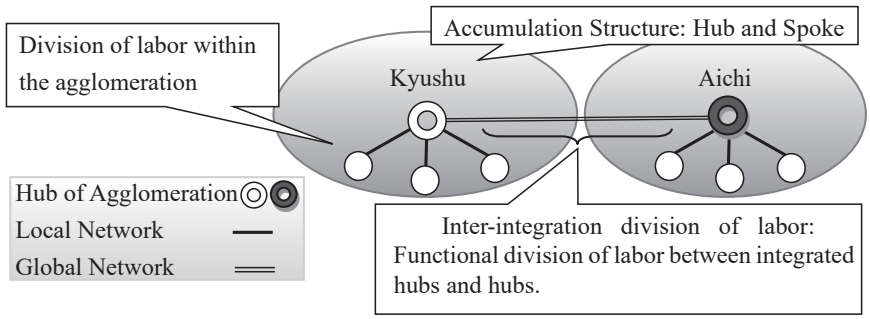

Figure 1 The analytical viewpoint of this study.

studied the Kyushu automobile accumulation. In the context of Japan, Fujiwara (2007) provided the most comprehensive findings regarding the automobile industry and formation of new agglomerations in rural areas. Additionally, several authors have focused on finished vehicle and tier 1 companies located at the top of the Kyushu automobile agglomeration. They also examined the structure of the division of labor between Aichi, Kyushu, and Tohoku (Sakakibara, 2014) and local companies in the Kyushu and Tohoku regions. Furthermore, Sakakibara (2015b, 2015c, 2020, 2021) clarified how the company entered the automobile industry. Thus, previous research has specified the gradual formation of the Kyushu automobile industry. However, the function and organizational structure of the business establishments and the transaction processes with local companies remain unclear. Therefore, this study aims to clarify these points by examining the Kyushu automobile industry.

The remainder of this paper is structured as follows. Section 2 discusses the formation of the Kyushu automobile agglomeration from the advancement of business establishments and importance of the automobile industry in the Fukuoka and Oita prefectures. Section 3 clarifies the functions and organizational structure of these business establishments, transaction processes with local companies, and decision-making. Section 4 presents the business function and organizational structure. Finally, Section 5 concludes the paper.

2. Advancement of the Automobile Industry in the Kyushu Region

2.1 *Changes in Major Business Establishments and Industries in the Kyushu Region*

This section analyzes the advancement of the automobile industry, its structure, and the regional economy in the Kyushu region. We will mainly focus on the Fukuoka and Oita prefectures, where the finished vehicle factories are located. The Nissan Kyushu Plant has had a relatively long history as an automobile industry since its establishment in Fukuoka Prefecture in 1975. Currently, it has four finished vehicle offices. Since its expansion in 1975, Toyota Motor and Daihatsu have also expanded into the northern part of Kyushu. It is changing to an automobile concentration area, and it has the third largest production volume after the Nishi-Mikawa/Tokai area and Kanto area. Table 1 shows the major automobile factories in the northern part of Kyushu.

The scale of the automobile industry in all industries in the Fukuoka and Oita prefectures is presented in Figure 2. Moreover, the manufacturing and shipping values of the transportation machinery and the number of employees in the Fukuoka and Oita prefectures are shown in Figure 2.

In comparison to 2002, the 2020 number of employees in the transportation machinery in Fukuoka Prefecture was 31,740 (14.3%), and the shipment value was 3,352 billion yen (33.8%) (the percentage in parentheses is the ratio of all

Table 1 Major automobile plants in northern Kyushu

Company Name	Factory Name	Location	Production Item	Start of Production	Number of Employees
Nissan Kyushu Motor Co., Ltd.		Kanda Town, Fukuoka Prefecture	Complete the car	April 1975	Approximately 4,400 people
Toyota Motor Kyushu	Head Office (Miyata Plant)	Miyawaka City, Fukuoka Prefecture	Complete the car	December 1992	Approximately 10,800 people
	Kokura Plant	Kitakyushu City and Kanda Town, Fukuoka Prefecture	Hybrid car parts	August 2005	
	Kanda Plant	Kanda Town, Fukuoka Prefecture	Automotive engines	December 2005	
Daihatsu Kyushu	Head Office and Oita Plant	Nakatsu City, Oita Prefecture	Complete the car	December 2004	Approximately 4,500 people
	Kurume Plant	Kurume City, Fukuoka Prefecture	Engines for passenger cars	August 2008	
Nissan Shatai Kyushu		Kanda Town, Fukuoka Prefecture	Complete the car	September 2009	Approximately 1,100 people

Source: Created from each company's HP. **Note:** *April 2021, **March 2021.

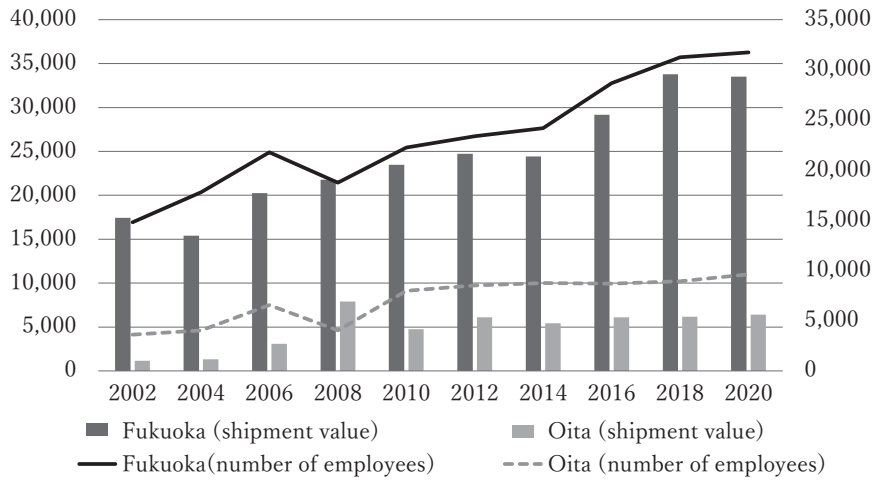

Figure 2 Changes in the shipment value and in the number of employees in the transportation machinery industry in the Fukuoka and Oita prefectures. **Source:** "Industrial Statistics" in each prefecture.

manufacturing industries in the prefecture). The shipment value and number of employees have increased 1.9 and 2.1 times, respectively. Automobile production in Oita Prefecture began in 2004 with the start of operations at the Daihatsu Kyushu-Oita Plant, a production subsidiary of Daihatsu. Before that, the company's production of transportation machinery was not high, but it has gradually increased with the expansion of Daihatsu Kyushu. As of 2020, the number of transportation machinery employees in Oita Prefecture was 9,622 (14.6%), and the shipment value was 640.3 billion yen (14.9%). The shipment value was 5.6 times that of 2002, and the number of employees has more than doubled at 2.7.

2.2 *Entry of Automobile-Related Parts Factories in the Kyushu Region*

The finished vehicle manufacturers and factories expanded first into the northern part of Kyushu. They gradually gathered related business establishments. Figure 3 shows the number of automobile-related parts factories that have entered the Fukuoka and Oita market in recent years. As shown, the advancement of the automobile parts industry is concentrated in the Fukuoka and Oita prefectures. In 2007, 52 companies entered the market in seven prefectures in Kyushu. However, this figure decreased significantly in 2008 because of production adjustments after the Lehman shock. In 2008, there were 208 companies in Fukuoka Prefecture and 112 companies in Oita Prefecture. Currently, 602 companies have advanced in the seven prefectures of Kyushu, but Fukuoka Prefecture has the largest number, accounting for 36.5% of the companies. This is followed by Oita Prefecture with 18.6%. In addition, many automobile-related parts factories have expanded into the Saga and Kumamoto prefectures since 2007, suggesting the further concentration of the automobile industry.

The companies that have expanded into the northern part of Kyushu, such as

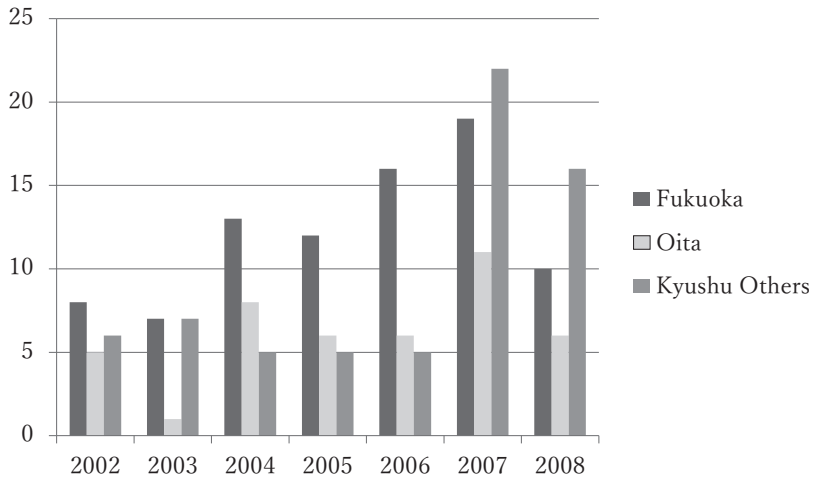

Figure 3 The number of automotive parts plants in Fukuoka and Oita. **Source:** Hirata (2008).

Toyota Boshoku Kyushu, Denso Kitakyushu Works, and Aisin Kyushu, are the top tier suppliers. The expansion was necessitated by the expansion of the finished vehicle factories. Owing to this expansion, the agglomeration has increased. Moreover, in the northern part of Kyushu, the linkage in the area has become closer because of the advancement of related tier 1 suppliers. Meanwhile, the local procurement rate from the seven prefectures of Kyushu is 50%,[1] considerably lower than the Chubu and Kanto regions, where related industries are highly concentrated but somewhat higher than the Tohoku region (Kyushu Industrial Revitalization Center, 2006).

However, even if the parts are procured in the region, most suppliers are from the production subsidiaries of the tier (Fujikawa, 1999). Additionally, Toyota only manufactures transmissions in Kyushu. The trends of suppliers are important to raise the procurement rate in northern Kyushu in the future (Hirata & Koyanagi, 2006).

Despite these issues, the regional network of the Kyushu automobile agglomeration is increasing. This study focused on the function and structure of the business establishments that have become part of the Kyushu automobile agglomeration, and it approached the process of regional network formation from there.

3. Overview of Responding Establishments

3.1 *Survey Outline*

This study uses a questionnaire survey conducted in March 2020. It examines the function and organizational structure of higher-ranking business establishments located in the tier. A total of 322 business establishments (including 233 business establishments in the Fukuoka and Oita prefectures) are considered branch factories according to the Kyushu Automobile Industry Promotion Council, which was created by the Kyushu Automobile and Motorcycle Industry Promotion Council. The author selected 89 business establishments to receive the questionnaire. The branch factories here include factories in multiple locations or two types of business establishments that are nominally independent companies but are production subsidiaries of the parent company.

The researchers extracted the establishments that are deemed branch factories of any type from the establishment names listed in the database.[2] Of these, 82 offices responded. We then extracted the establishments that are deemed the top tier suppliers from the primary delivery destinations. As a result, 31 business establishments were used in this study,[3] which included 23 business establish-

1) The scope of this study is only northern Kyushu. However, this numerical value will be lowered a little more if it is limited to the prefecture where the automobile industry is located, that is, in the northern part of Kyushu, as described earlier.

2) Place names, such as Kyushu, Fukuoka, and Oita, were included in the extracted information containing factory name and description.

3) The questionnaires that are rarely answered are also excluded here.

ments in Fukuoka Prefecture and eight business establishments in Oita Prefecture. The ratio of responding business establishments by prefecture was almost the same as that of the ratio of business establishments where the survey forms were sent. (The following discussions are based on business-by-business transactions unless otherwise noted.)

3.2 *Attribute of Responding Establishment*

Table 2 presents the vital information of the responding establishments: location, operation start year, the number of full-time employees, main production items, and main delivery destinations. For the main production items, the answers to the survey form are listed as they are. Meanwhile, the names of the main delivery destinations are unified.

Table 2 Attributes of the answer office

Office Number	Location	Start of Operation Date*	Number of Employees**	Key Production Items	Main Destinations
1	Fukuoka	7	4	Steel wire for cold forging	Mazda, Ondo Works, Saga Iron Works
2	Fukuoka	7	5	Automotive interior parts processing	Toyota Boshoku Kyushu
3	Fukuoka	3	6	Electric Condenser Microphone, MEMS Microphone	Nissan Motor Co., Ltd., Sony Corporation
4	Fukuoka	7	6	Automotive seat pad manufacturing	Japan, Delta Kogyo
5	Fukuoka	6	5	Manufacture of stamped parts and molds for automobiles	Denso Kyushu, Japan Climate Systems, Marelli, Yabakei Works, Futaba Kyushu, Sanfuku
6	Oita	7	6	Manufacture of anti-vibration rubber products for automobiles	Sumitomo Riko
7	Oita	7	5	Auto Parts	Daihatsu Kyushu
8	Fukuoka	7	5	Automobile parts manufacturing	Daihatsu Kyushu, Nissan Motor Kyushu
9	Fukuoka	7	4	Intake Manifold, Locker Cover, Carbon Canister	Mazda, Mitsubishi Motors Corporation, Nissan Motor Co., Ltd.

Office Number	Location	Start of Operation Date*	Number of Employees**	Key Production Items	Main Destinations
10	Fukuoka	6	6	Headlining, Sunshade, Door trim, Backdoor rim, etc.	Nissan Motor Co., Ltd. (Toyota Motor Corporation, Vevasto Japan)
11	Fukuoka	6	4	Automation, Labor-saving equipment, Transportation equipment, etc.	Toyota Motor Kyushu
12	Oita	7	6	Front and rear wheel drive devices for automobiles	Daihatsu Kogyo Co., Ltd., Daihatsu Kyushu
13	Oita	4	6	Automotive body seal parts	Nissan Kyushu, Daihatsu Kyushu, Daihatsu Motor Co., Ltd.
14	Oita	7	6	Manufacture of plastic products	Koito Kyushu, Toyota Gosei
15	Fukuoka	7	4	Automotive parts, Living and living, Energy-related	Toyota Motor Corporation
16	Fukuoka	6	4	Wheel and tire assembly	Toyota Kyushu
17	Oita	5	7	Manufacture of headlamps and rear lamps for automobiles	Nissan Motor Co., Ltd. (Suzuki Motor Co., Ltd., 694)
18	Fukuoka	7	2	Automotive parts, Living and living, Energy-related	Futaba Kyushu, Sanfuku
19	Oita	7	3	Transportation equipment manufacturing (press working, bending, welding, etc.)	Nissan Shatai
20	Fukuoka	7	5	Sheet metal parts for automobiles	Mitsubishi Motors Co., Ltd., Nissan Motor Co., Ltd., Daihatsu Motor Co., Ltd.
21	Fukuoka	7	4	Press die design and manufacture	Toyota Iron Works, Fftaba Industry, Aoi Machine Industry Co., Ltd., Kawamura Metal, East Pre
22	Fukuoka	7	4	Automobile parts manufacturing	Footaba Kyushu

Office Number	Location	Start of Operation Date*	Number of Employees**	Key Production Items	Main Destinations
23	Fukuoka	3	6	Soft urethane foam, headrests, and other automotive parts	Toyota Boshoku Kyushu, Mazda, Juya Fronte, etc.
24	Fukuoka	7	7	Automotive body parts and chassis parts	Toyota Motor Corporation, Toyota Kyushu, Daihatsu Kyushu
25	Fukuoka	6	5	Manufacture of floor carpets	Nissan Motor Co., Ltd.
26	Fukuoka	2	5	Automotive seat frames	Japan Regulations, Daihatsu Kyushu, Toyota Boshoku Kyushu
27	Oita	7	5	Daihatsu Hi-Z side panel, Tail panel, Gertraleam, Local molding, Resin molding	Daihatsu Kogyo Co., Ltd., Daihatsu Kyushu
28	Fukuoka	7	6	Automotive presses and resin products	Toyota Motor Kyushu
29	Fukuoka	6	6	Automobile parts manufacturing	Unipres Kyushu, Otaba Kyushu
30	Fukuoka	7	4	Manufacture and sale of aluminum alloys	Daihatsu Kyushu
31	Fukuoka	7	5	Automotive skeleton parts	Nissan Kyushu, Toyota Kyushu, Daihatsu Kyushu

Note: *Start of operation: 1, before 1950; 2, 1950s; 3, 1960s; 4, 1970s; 5, 1980s; 6, 1990s; and 7, since the 2000s. **Employee size: 1, 1–3 people; 2, 4–9 people; 3, 10–19 people; 4, 20–49 people; 5, 50–99 people; 6, 100–299 people; 7, 300–499 people; and 8, more than 500 people.

4. Business Function and Organizational Structure

4.1 *Functions of Responding Offices*

First, we examined the following seven functions of the office: planning/development, prototyping/processing, mass production, sales destination decision, purchasing (subcontractor selection), personnel (recruitment), and investment decisions. The respondents were asked regarding the strength and weakness of each business establishment's functions on a 4-point scale: "1 = *no function*," "2 = *possessed but weak*," "3 = *partially possessed*," and "4 = *central function*." Table 3 shows the functions of each respondent. Meanwhile, the composition ratio of the evaluation of each function is presented in Figure 4.

Table 3 Functions of the business establishments

Office Number	Planning and Development	Prototype and Processing	Mass Production	Sales Destination Decision	Purchasing	Personnel	Investment
1	No function	Partially	Central	Weak	Central	No function	No function
2	No function	Weak	Central	No function	Weak	Weak	No function
3	Partially	Partially	Central	No function	Central	Central	No function
4	Weak	Partially	Central	No function	Partially	Central	No function
5	No function	No function	Central	Weak	Weak	Weak	No function
6	No function	No function	Central	No function	Weak	Central	No function
7	No function	No function	Central	No function	No function	No function	No function
8	No function	Partially	Central	Partially	Partially	Partially	Partially
9	No function	No function	Partially	No function	No function	Weak	No function
10	No function	No function	Central	No function	No function	Partially	No function
11	Weak	Weak	Central	Partially	Central	Weak	No function
12	No function	Weak	Central	No function	No function	Partially	No function
13	No function	Partially	Central	No function	No function	Partially	No function
14	No function	No function	Weak	No function	No function	No function	No function
15	Central	Weak	No function	No function	No function	Weak	No function
16	No function	Central	Central	No function	Partially	No function	No function
17	No function	Partially	Central	No function	Partially	Central	Partially
18	No function	Weak	Central	No function	No function	No function	No function
19	No function	No function	Central	No function	No function	No function	No function
20	No function	No function	Central	No function	No function	No function	No function
21	Central	Central	Central	Central	Central	Central	No function
22	No function	No function	Central	No function	Weak	Weak	No function

Office Number	Planning and Development	Prototype and Processing	Mass Production	Sales Destination Decision	Purchasing	Personnel	Investment
23	No function	Weak	Central	No function	Weak	Weak	No function
24	Weak	Weak	Central	Partially	Central	Central	Central
25	No function	No function	Central	No function	No function	Weak	No function
26	Partially	Central	Central	No function	Central	Central	Partially
27	No function	Weak	Central	No function	Weak	Weak	Weak
28	No function	No function	Central	No function	No function	Partially	No function
29	Partially	Weak	Central	Partially	Partially	Central	Partially
30	No function	No function	Central	No function	No function	No function	Partially
31	Weak	Central	Central	Partially	Central	Central	Partially

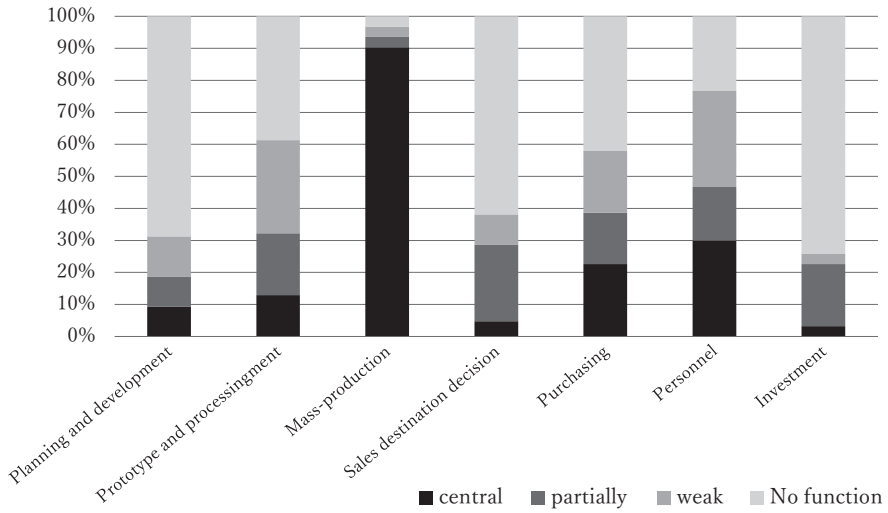

Figure 4 Office functions (composition ratio %).

As shown in Table 3 and Figure 4, the core function of the responding establishments is mass production. Additionally, some business establishments have prototype/processing, purchasing (subcontractor selection), and personnel (recruitment, etc.) functions. Moreover, not all business establishments specialized in mass production. Meanwhile, the functions of planning/development, sales destination decisions, and investment decisions, which are closely related to the advanced central management function, are extremely weak.

4.2 *Staffing of Business Establishments*

To support the functions of these business sites, we look at the staffing of business establishments, which is categorized into sales, procurement/outsourcing, research and development, production technology, personnel/general affairs, production/site, and others. The results are shown in Table 4.

Table 4 Staffing at the business establishment sites

Office Number	Sales	Procurement /Outsourcing,	Research and Development	Production Technology	Personnel/ General Affairs	Production	Others
1	1	2	0	0	1	23	7
2	0	0	0	2	3	85	0
3	0	11	29	22	8	59	3
4	0	1	0	8	10	148	0
5	2	5	0	6	2	34	2
6	0	2	0	5	4	130	40
7	0	0	0	2	2	62	17
8	1	1	0	2	2	48	6
9	0	0	0	3	2	30	3
10	0	0	0	8	5	169	9
11	3	3	0	11	0	4	1
12	0	0	0	0	3	120	0
13	0	3	0	10	4	174	2
14	3	2	0	2	1	100	0
15	0	0	23	0	0	0	2
16	0	43	0	0	1	2	0
17	0	20	0	26	6	300	0
18	0	0	0	0	0	5	2
19	0	0	0	0	0	15	0
20	0	0	0	0	0	50	0
21	0	1	3	3	1	32	1
22	1	0	0	1	0	22	10
23	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	2	5	4	13	18	348	48
25	0	0	0	0	1	59	0
26	1	1	0	1	1	50	0
27	0	2	0	2	2	74	0
28	0	0	0	1	0	170	8
29	3	3	0	12	2	120	0
30	0	0	0	1	0	19	0
31	3	3	1	6	4	6	0

Note: The shading in the table indicates the department with the highest number of employees.

As shown in Table 4, except for establishments 11, 15, 16, and 23, which did not respond, all establishments have the largest number of personnel in production/site. However, many establishments do not have personnel assigned to sales, R&D, and procurement/outsourcing, and the number is relatively small even if they do have such personnel. The staffing in each department is consistent with the functions of the establishments in Table 3 and Figure 3.

The number of establishments that do not have sales personnel is particularly high. This is because these operations are deeply integrated into the decision-making and network of the parent company and head office. Therefore, these establishments do not need to sell their own products. This is consistent with the fact that the function of deciding sales destinations is particularly weak. Some business establishments have a purchasing (subcontractor selection) function. Moreover, although other establishments have staff for procurement and outsourcing, most of these personnel are for sales. Thus, the branch factory lacks the important sales destination function.

4.3 *Business Establishment Type, R&D, and the Subcontractor's Leading Department*

This section classifies the types of business establishments according to the presence or absence of the head office function and a parent company with a capital relationship.[4] The presence of a head office in the business establishment and absence of a parent company with a capital relationship are called the "independent type." Meanwhile, if both head office and a parent company with a capital relationship are present in the business establishment, it is defined as the "subsidiary type." Lastly, the business establishment with no head office is classified as the "branch factory type." Of the 31 establishments, there are 0 independent establishments, 9 (29.0%) subsidiaries, and 22 (71.0%) branch factories.

Next, we examined where R&D is conducted. Within the corporate group, the choices are as follows: "Own R&D department inside the office," "Own R&D department located outside the office," "There is no independent R&D department within the company," and "Others." Only one business establishment (3.3%) answered that the company's R&D department is located within the business establishment, whereas 17 (56.7%) answered that their company's R&D department is outside the business establishment and has become independent. The remaining 12 respondents (40.0%) stated that their companies have no R&D departments.

Then, we examined the location of the authority that selects raw material suppliers and outsourced companies. These are important when considering the formation of a local network. Regarding which department will take the lead in selecting raw material suppliers and outsourced companies, we asked the respon-

4) A "parent company with a capital relationship" is defined as a separate company that holds 50% or more of the shares.

dents to choose from four options: “procurement departments such as the purchasing department inside the business establishment,” “procurement departments such as the in-house purchasing department located outside the business establishment,” “designated and led by the customer/parent company,” and “others.” Of the total respondents, 10 (32.2%) chose procurement departments inside the business establishment (e.g., purchasing departments), and 10 chose procurement departments outside the business establishment (e.g., in-house purchasing department). Meanwhile, the remaining 11 respondents (35.5%, N = 31) depend on the designation and initiative of the customer/parent company. This is consistent with the fact that there only few procurement/outsourcing personnel or that many establishments do not have them (Table 4). Meanwhile, less than one-third of the establishments are selected under the initiative of the procurement department, such as the internal purchasing department. Not all business establishments have procurement functions, and some business establishments have procurement functions in the Kyushu automobile agglomeration (Table 5).

Table 5 Types of offices and leading departments for R&D and outsourcing selection

Office Number	Office Type	Leading R&D Department	Lead Department in Selecting Subcontractees
1	Division of labor field type	Company department outside the office	Led by customers and parent companies
2	Division of labor field type	There is no independent research department in the company	Led by customers and parent companies
3	Subsidiary type	Department in the office	Procurement department in the office
4	Subsidiary type	There is no independent research department in the company	Led by customers and parent companies
5	Division of labor field type	Company department outside the office	Led by customers and parent companies
6	Subsidiary type	There is no independent research department in the company	Led by customers and parent companies
7	Division of labor field type	Company department outside the office	In-house procurement department outside the office
8	Subsidiary type	There is no independent research department in the company	Procurement department in the office
9	Division of labor field type	Company department outside the office	In-house procurement department outside the office
10	Division of labor field type	Company department outside the office	In-house procurement department outside the office
11	Division of labor field type	Company department outside the office	Procurement department in the office

Office Number	Office Type	Leading R&D Department	Lead Department in Selecting Subcontractees
12	Division of labor field type	There is no independent research department in the company	Led by customers and parent companies
13	Subsidiary type	There is no independent research department in the company	Led by customers and parent companies
14	Division of labor field type	There is no independent research department in the company	Procurement department in the office
15	Division of labor field type	Company department outside the office	Procurement department in the office
16	Division of labor field type	Company department outside the office	In-house procurement department outside the office
17	Subsidiary type	There is no independent research department in the company	Procurement department in the office
18	Division of labor field type	Company department outside the office	In-house procurement department outside the office
19	Division of labor field type	Company department outside the office	In-house procurement department outside the office
20	Division of labor field type	Company department outside the office	In-house procurement department outside the office
21	Division of labor field type	There is no independent research department in the company	Procurement department in the office
22	Division of labor field type	Company department outside the office	Led by customers and parent companies
23	Division of labor field type	There is no independent research department in the company	Led by customers and parent companies
24	Subsidiary type	There is no independent research department in the company	Led by customers and parent companies
25	Division of labor field type	Company department outside the office	In-house procurement department outside the office
26	Division of labor field type	Company department outside the office	Procurement department in the office
27	Division of labor field type	There is no independent research department in the company	In-house procurement department outside the office
28	Division of labor field type	Company department outside the office	In-house procurement department outside the office
29	Subsidiary type	N/A	Led by customers and parent companies
30	Division of labor field type	Company department outside the office	Procurement department in the office
31	Subsidiary type	Company department outside the office	Procurement department in the office

4.4 *Network of Business Establishments*

Next, we looked at the networks of these offices (Table 6), starting with the delivery destination. When asked regarding their relationship with the leading business establishments in terms of sales, 25 respondents (86.2%) answered that they have no capital relationship with this establishment (N = 29). For the office location, 16 (53.3%) were located at Fukuoka Prefecture, 9 (30.0%) outside Kyushu, and 5 (16.7%) were in Aichi Prefecture. Meanwhile, for the percentage of sales of the leading companies in terms of delivery destination to their own sales, 18 respondents (62.1%) revealed that it is greater than 50% (N = 29). On the basis of the delivery destinations, it became clear that these offices are connected to few delivery destinations.

Table 6 Top suppliers and subcontractees

Office Number	Relationship with the First Largest Supplier	Prefecture with the First Place of Delivery	Percentage of First Largest Customers (%)	Percentage of Subcontracted Cost	Kyushu's Always Subcontracted Company
1	Other companies that are not related to capital	Hiroshima	30	Hardly any	0
2	Other companies that are not related to capital	Fukuoka	80	10% to 29%	1
3	Other companies that are not related to capital	Kanagawa	20	10% to 29%	4
4	Other companies with capital relationships	Aichi	100	Hardly any	0
5	Other offices within the same company	Aichi	21	10% to 29%	14
6	Other companies that are not related to capital	Aichi	20	Hardly any	5
7	Other companies that are not related to capital	Oita	55	50% to 69%	1
8	Other companies that are not related to capital	Fukuoka	90	10% to 29%	4
9	Other companies that are not related to capital	Hiroshima	70	50% to 69%	5
10	Other companies that are not related to capital	Fukuoka	100	Hardly any	2

Office Number	Relationship with the First Largest Supplier	Prefecture with the First Place of Delivery	Percentage of First Largest Customers (%)	Percentage of Subcontracted Cost	Kyushu's Always Subcontracted Company
11	Other offices within the same company	Fukuoka	N/A	50% to 69%	50
12	Other companies with capital relationships	Oita	60	Hardly any	1
13	Other companies that are not related to capital	Fukuoka	54	10% to 29%	2
14	Other companies that are not related to capital	Saga	30	10% to 29%	2
15	N/A	N/A	0	Hardly any	N/A
16	Other companies that are not related to capital	Fukuoka	100	10% to 29%	4
17	Other companies that are not related to capital	Kanagawa	40	30% to 49%	5
18	Other companies that are not related to capital	Fukuoka	100	Hardly any	0
19	Other companies that are not related to capital	Fukuoka	35	30% to 49%	11
20	Other companies that are not related to capital	Fukuoka	50	10% to 29%	5
21	Other companies that are not related to capital	Aichi	60	Hardly any	5
22	Other companies that are not related to capital	Fukuoka	100	Hardly any	3
23	Other companies that are not related to capital	Saga	40	10% to 29%	3
24	Other companies that are not related to capital	Fukuoka	90	30% to 49%	8
25	N/A	Fukuoka	N/A	N/A	2
26	Other companies with capital relationships	Aichi	80	50% to 69%	10

Office Number	Relationship with the First Largest Supplier	Prefecture with the First Place of Delivery	Percentage of First Largest Customers (%)	Percentage of Subcontracted Cost	Kyushu's Always Subcontracted Company
27	Other companies that are not related to capital	Oita	60	10% to 29%	8
28	Other companies that are not related to capital	Fukuoka	95	10% to 29%	3
29	Other companies that are not related to capital	Fukuoka	40	30% to 49%	21
30	Other offices within the same company	Fukuoka	35	More than 70%	50
31	Other companies that are not related to capital	Fukuoka	70	10% to 29%	6

Next, we examined the subcontractors of these offices. For the percentage of outsourcing to the total cost of business, we provided four options: 10%-29%, 30%-49%, 50%-69%, and 70% or more. A total of 12 establishments (40.0%) chose 10–29%, followed by nine establishments (30.0%), although subcontractors were rarely used (N = 30).

There is a hypothesis that if the procurement department in the office leads the selection of raw materials and subcontractors, the outsourcing ratio will be high. Therefore, this study divides the outsourcing ratio according to which department leads the procurement (Figure 5). As projected, the outsourcing ratio of business establishments in which the election of subcontractors is led by the procurement department is higher than the ratio of businesses led by other departments.

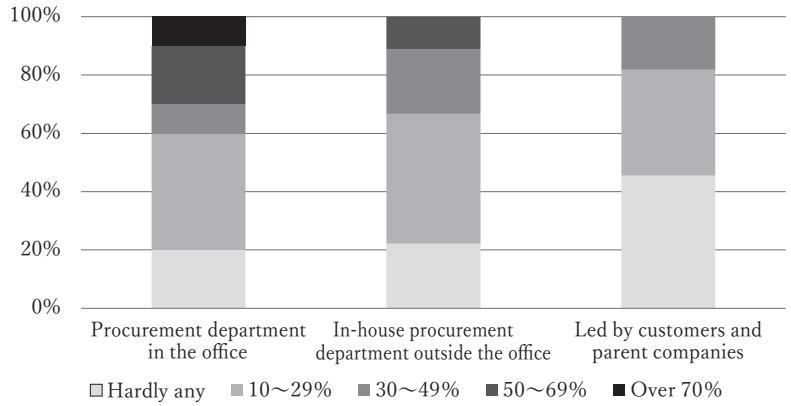

Figure 5 Location of the subcontracting department and the ratio to outsource cost.

4.5 *Starting a Transaction with a Subcontractor*

There are five reasons given in the survey for starting a transaction with a subcontractor: "introduction from the supplier/subcontractor of the material," "introduction/instruction from the customer/parent company," "introduction from the trading company/wholesaler," "introduction/matching from the public institution," and "introduction from the subcontractor." For each choice of "selling," "leading to business negotiations from the exhibition," and "looking at the website of the subcontractor," the respondents are asked to select "3" if there are many transactions, "2" if there are not many, and "1" if there are few (see Table 7 and Figure 6).

The survey revealed that "introductions/instructions from customers/parent companies" often lead to transactions. This is consistent with the fact that these business establishments have weak procurement functions and are "designated and led by customers and parent companies" when selecting suppliers and subcontractors. "Introduction from the supplier/subcontractor of the material" also often leads to transactions.

Table 7 Ways that trade with subcontractors is initiated

Office Number	Suppliers and Subcontracting Destinations	Customers and Parent Companies	Trading Company Wholesaler	Public Sector	Subcontracted Sell-Off	Exhibition	Subcon-tracting Hp
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	3	3	3	3	2	3	3
3	2	1	2	3	2	3	3
4	3	3	3	3	3	3	3
5	1	1	2	2	2	2	2
6	3	1	3	2	2	3	2
7	3	1	3	2	3	3	3
8	2	3	3	2	3	3	3
9	1	1	2	2	2	3	2
10	2	1	3	3	3	3	3
11	3	2	2	3	1	2	3
12	2	3	3	3	3	2	3
13	2	2	3	2	2	3	3
14	3	2	3	3	3	3	3
15	3	2	2	2	2	2	1
16	1	3	3	3	3	3	3
17	2	2	2	3	1	2	3
18	3	3	3	3	3	3	3
19	1	2	3	3	2	3	3
20	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Office Number	Suppliers and Subcontracting Destinations	Customers and Parent Companies	Trading Company Wholesaler	Public Sector	Subcontracted Sell-Off	Exhibition	Subcon-tracting Hp
21	2	3	3	3	1	2	2
22	3	2	2	3	2	3	3
23	3	2	3	3	3	3	3
24	1	2	2	3	2	2	2
25	3	2	2	3	2	3	3
26	2	1	3	3	3	2	2
27	2	2	2	2	2	2	2
28	2	2	2	2	2	2	2
29	2	2	2	3	2	3	3
30	1	2	2	3	1	2	2
31	2	2	2	2	2	2	3

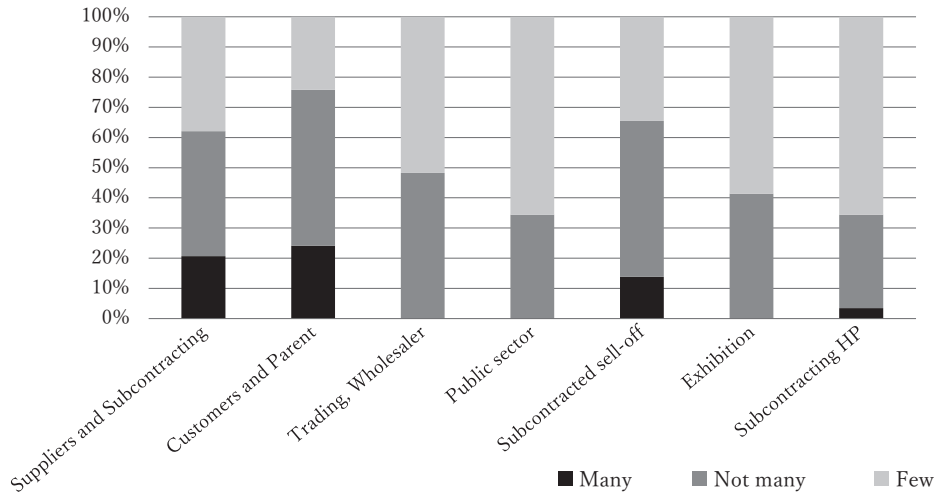

Figure 6 Ways in which trade with subcontractors is initiated (composition ratio %).

5. Conclusion

Using the results of the questionnaire survey, this study has clarified the function and type of organizational structure of the automobile-related business establishments that have advanced into the Kyushu region. Elucidating the functions and organizational structures of these establishments will help in explaining the global division of labor in the automobile industry. It will be of great significance to local governments that have expectations of increased automobile agglomeration.

As expected, the core function of the establishments under study is the mass production of products. However, these establishments must exhibit certain personnel and investment functions that should be consistent with the staffing within the business establishments. Although many personnel are assigned to production and sites within the office, sales, procurement, and outsourcing employment are extremely limited. Hence, the functions and organizational structures of these business establishments are related to the difficulty in forming a network between branch factories and local companies (Fujikawa, 2001).

This problem is by no means permanent. In fact, a certain number of respondents have a purchasing function and procurement and outsourcing staff, and the local procurement rate is rising for the entire Kyushu automobile agglomeration. Therefore, we investigated how the establishments that have entered the market transact with local companies. We found that "introductions/instructions from customers/parent companies" most often lead to transactions. This is consistent with the fact that these business establishments have weak procurement functions and are "designated and led by customers and parent companies" when selecting suppliers and subcontractors.

However, there are several limitations to this study. First, the number of cases surveyed in this research is extremely limited because there are only a few advanced branch factories located in the hub of agglomeration. The author also conducted a similar survey in the northern part of Kyushu in parallel with this survey (Sakakibara, 2020). If differences in the entry processes between northern Kyushu and Kyushu exist, they must be evaluated and explained.

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