Types of Japanese Firms' FDI in Poland, Czech Republic, and Hungary: A Firm-Level Analysis

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Abstract

This study focuses on Japanese firms having performed FDI into Poland, Czech Republic, and Hungary, all of which have been the gateway of FDI in Central and Eastern European countries from the 1990s, just after East European Revolution of 1989. The data used in this study are Overseas Japanese Companies database (OJC database) of Toyo Keizai Inc, consisting of "foreign affiliate data" and "Japanese parent company data". Foreign affiliate data have information on affiliates such as country, industry, description of business, capital, number of employees, number of employees dispatched from Japan, year and month when the affiliate was established, sales, and objective of investment, and firm-level data of Japanese companies operating in either of those three countries in the 1990s to early 2020s from the database are examined. The main results are as follows. First, machinery industries and wholesale industries of those products have many affiliates in all of the three countries, although distributions of industries are different among them. Especially, compositions of manufacturers and wholesalers are totally different among those industries, which can be classified as the following three patterns: Pattern One (more manufacturers): transportation equipment. Pattern Two (equal numbers): electrical machinery. Pattern Three (more wholesalers): general-purpose machinery and business oriented machinery. Second, many wholesalers of machineries were established in the 1990s to 2010s, followed by manufacturers producing them in the 2000s and 2010s. Also, there are differences about those early-established affiliates. In Poland, most of those affiliates were wholesalers, while in Czech Republic and Hungary, majorities of those affiliates were manufacturers. This tendency holds for each of three machinery industries, i.e., general-purpose machinery, electrical machinery, and transportation equipment. However, those results are tentative in a sense that behaviors of Japanese parent companies, whose characteristics are available in Japanese parent company data of OJC database, should be examined more to explain why those industry- or country differences occur.

Keywords: Japanese Firms' FDI, Poland, Czech Republic, Hungary, Manufacturing Affiliates, Wholesale Affiliates, and Establishment Years of Affiliates.

JEL Classification: F23, F63.

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1 Introduction

Facing higher tariffs imposed by the U.S. government, multinational enterprises (MNEs) of Japan and other non-U.S. countries are now trying to minimize im-pacts of the U.S. tariffs on their businesses. One attempt by Japanese MNEs is to develop non-U.S. markets, and Asian countries other than China and EU are the two best candidates for them. For Japanese companies, especially those in manufacturing industries, EU is important from both market- and global value chain (GVC)- points of views from their past experiences. Since the 1990s, due to the motives of GVC, Japanese MNEs have conducted foreign direct investment (FDI) in Central and Eastern European Countries (CEEs) as well as exports to those countries.[1] Among CEEs, this article focuses on Poland, Czech Republic, and Hungary, all of which became an EU member in 2004 and grew steadily since then.[2] This study focuses on Japanese firms having performed FDI into either of those three countries, which has been the gateway of FDI in CEEs. Firm-level data of Japanese companies operating in the three countries in the 1990s to early 2020s are examined.

The main results of this study are as follows. First, machinery industries (general-purpose, electrical, and transportation) and wholesale industries of those products have many affiliates in the three countries, although distributions of industries are different among them. Especially, compositions of manufacturers and wholesalers are totally different among those three industries plus business oriented machinery, which can be classified as the following three patterns: Pattern One (more manufacturers): transportation equipment. Pattern Two (equal numbers): electrical machinery. Pattern Three (more wholesalers): general-purpose machinery and business oriented machinery. Besides these industries, some related industries such as producers of rubber products and fabricated metal, and service providers such as ware-house/logistics also have many affiliates. Second, many wholesalers of the three machineries were established in the 1990s to 2010s, followed by manufacturers producing either of those machineries in the 2000s and 2010s. Also, there are differences about those early-established affiliates. In Poland, most of those affiliates were wholesalers, while in Czech Republic and Hungary, majorities of those affiliates were manufacturers. This tendency holds for each of three machinery industries, i.e., general-purpose machinery, electrical machinery, and transportation equipment.

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[1] Especially, the GVC perspective is becoming more important for Japanese firms, because they need to reconsider their heavy dependence on China from two prospects; one is to avoid direct impacts of U.S.-China economic conflicts, and the other is to secure some crucial raw materials such as rear earth as well as intermediate inputs whose dominant provider in the world market is China.

[2] Comparing Poland with Czech Republic and Hungary, Iemoto (2014) points out that Poland's economy was less damaged by 2008 world financial crisis and subsequent economic crises in some other EU countries.

The structure of this article is as follows. Section two makes a brief review of related literature. Section three explains details of dataset used in this study. Section four shows various characteristics of Japanese affiliates in the three countries by industry, especially when they were established and in what (sequential) order Japanese parent companies established them. This article is concluded in section five with some remarks.

2 Related Literature

Whether exports and FDI are substitutes or complements are discussed by many researchers. Blonigen (2001) shows that Japanese auto-parts exports to and local production of auto parts in the U.S. are substitutes, while Japanese auto-parts ex-ports to and local production of automobiles are complements on data of 1978-91. Svensson (1996) gets similar results with Swedish MNE data of 1974-90. Head and Ries (2004) develop a model of vertically integrated MNEs, showing that overseas production and intermediate-good exports can be complements.

Krautheim (2013) analyzes this issue from a slightly different perspective, and develops a model of heterogenous firms of exporting, horizontal FDI (HFDI), or exporting-supporting FDI (ESFDI), which includes investments in wholesale and retail by manufacturers in order to support their exports to the FDI host countries. Therefore, the author implicitly assumes that HFDI and exports are substitutes, and ESFDI and exports are complements. In the model, the fixed cost of HFDI is higher than that of ESFDI, while HFDI can save the transport cost for exporting. From the model, four propositions are derived, and among them, Proposition 1 stating that the most productive firms choose HFDI, followed by ESFDI of firms with intermediate productivity levels, is highly related with this article. German firm-level data from 1989 to 2009 support predictions from those propositions. The data shows that for FDI to Western European countries, number of ESFDI is larger than that of HFDI. However, the opposite holds for FDI in Eastern Europe; number of HFDI is larger than that of ESFDI. The last observation is also discussed in this article, focusing on Japanese FDI in Poland.

In addition to ESFDI, for MNEs entering EU markets, effects of EU-Enlargement are an important factor. Meinhart (2024) estimates gravity equation of FDI among EU and other countries, taking differences between countries joining EU before 2004 (EU15) and CEEs joining EU after 2004 into account. Using data of FDI stocks from 1985 to 2017, estimated gravity equations show that there are large variations of EU membership effects captured by interaction terms of border and disaggregated EU dummies; For EU15, effects on Inward FDI are significant while for CEEs, those on outward FDI are significant. It is al-so shown by disaggregated EU-membership analysis that Poland is one of top beneficiaries of EU membership for its inward FDI from both EU15 and CEEs.

Related with EU-enlargement effects on inward FDI, how CEEs participate GVC may affect its economic growth. Kersan-Skabic and Barisic (2023) estimate effects of inward FDI stocks of

manufacturing industries in CEEs on degree of their participation for GVC for six manufacturing industries with advanced technology such as pharmaceutical and machineries. They estimate dynamic panel model whose dependent variables are three indicators of GVC participation, i.e., backward, forward, and total (sum of backward and forward), separate-ly with data of eleven CEEs including Poland from 2005 to 2018 by GMM. Their estimates show significant positive effects of inward FDI on both backward and total participation for GVC, given that CEEs import intermediate goods from other EU countries with advanced technology such as some of EU 15.

3 Data Description

The data used in this study are Overseas Japanese Companies database (hereafter, OJC database) of Toyo Keizai Inc, . This dataset has been used by many researchers to study FDI by Japanese firms (see Ito et al. 2024, for instance). OJC database consists of "foreign affiliate data" and "Japanese parent company data". Foreign affiliate data have information on affiliates such as country, industry, description of business, capital, number of employees, number of employees dispatched from Japan, year and month when the affiliate was established, sales, and objective of investment. Foreign affiliate data also have information on parent companies of the affiliates such as name of parent company, parent company's investment ratio, name of local company with which the parent company has formed a joint venture, and investment ratio of parent company's local partner.

Japanese parent company data have information on parent companies such as industry, listing classification, address of headquarter, and capital. They also have information on foreign affiliates of the parent companies such as name, country, industry, and investment ratio. To classify industries, Toyo Keizai Inc.'s original industry code is used (fifty-seven industries including "not classifiable").[3] Note that OJC database is based on survey conducted in October of a year earlier. For companies answering the survey for a multi-year period, their information configures panel data. However, some affiliates whose Japanese parent companies have stopped reporting on the survey are still operating. This article follows some of such affiliates by following websites of the affiliates and/or the (Japanese) parent companies.

4 Analysis of Japanese Affiliates in Poland, Czech Republic, and Hungary

In this section, how Japanese companies have developed their networks of production and other activities in Poland, Czech Republic, and Hungary is described by examining their affiliates in those countries. First, subsection 4.1 shows number of Japanese affiliates in 2022 by industry, which shows that some specific industries have more affiliates than others from 1990 to 2022. Then, for

[3] In this article, Toyo Keizai Inc.'s industry code is replaced with Japan Standard Industry Classification (Rev. 14, 2023) by the author.

some selected industries, including those specific ones, subsection 4.2 describes characteristics of establishment years of the affiliates such as distributions over time, industry, and type of affiliates established in specific years or periods.

4.1 Number of Japanese Affiliates by Industry

Tables 1 show number of Japanese affiliates by Industry in Poland, Czech Republic, and Hungary. Tables 1a and 1b are about manufacturing and wholesale industries respectively. In Table 1a, the following five manufacturing industries have more than ten affiliates in the three countries total (names and numbers of affiliates in those industries are marked by dark gray in the table).

- three machinery industries, i.e., general-purpose machinery, electrical machinery, equipment and supplies (electrical machinery hereafter), and transportation equipment.
- chemical and allied products.
- fabricated metal products.

Other manufacturing industries following those five top-runners are food and beverages, rubber products, and business oriented machinery, having more than five affiliates in total respectively (names and numbers of affiliates are marked by light gray). In sum, machinery industries and related manufacturing industries such as raw materials and/or parts suppliers have many affiliates in those three countries.

<Table 1a>

However, there are within-country variations about distributions of the three machinery industries in Table 1a. While they are evenly distributed in Poland, industry concentration can be observed in Czech Republic (transportation equipment, although the numbers of general-purpose and electrical machineries are nine and eleven respectively, which are not small), and in Hungary (electrical machinery and transportation equipment).

Table 1b is about wholesale industries. Four wholesale industries selling machineries, i.e. general-purpose, electrical, transportation, and business oriented, have more than ten affiliates in the three countries total (names and numbers of affiliates in those industries are marked by dark gray in the table as well as Table 1a). It is plausible to see that as affiliates in a foreign country, many manufacturers are associated with many wholesalers, whether the wholesalers are subsidiaries of manufacturers in their home countries or not. From Tables 1a and 1b, this is true for both the above four pairs of manufacturers and wholesalers.[4] However, compositions of manufacturers and wholesalers are totally different among those

[4] Although the numbers of affiliates are fewer, chemical and allied products has the same tendency.

four industries, which can be classified as the following three patterns (numbers inside brackets are those of manufacturing and wholesale affiliates in an industry respectively).

- Pattern One (more manufacturers): transportation equipment (48 and 14).
- Pattern Two (equal numbers): electrical machinery (34 and 28).
- Pattern Three (more wholesalers): general-purpose machinery (18 and 37) and business oriented machinery (7 and 16).

Pattern One (more manufacturers) for transportation equipment is due to the concentration of manufacturers of this industry in Czech Republic, observed in Table 1a. On the other hand, both manufacturers and wholesalers of electrical machinery are evenly distributed in all of the three countries. For general-purpose and business oriented machineries, Poland and Czech Republic have relatively more wholesalers, shown in Table 1b.

<Table 1b>

Like the manufacturing affiliates, there are within-country variations about distributions of wholesalers of the four machinery industries in Table 1b. While they are evenly distributed in Hungary (the number of general-purpose machinery affiliates is bit larger though), industry concentration can be observed both in Poland and Czech Republic on general-purpose and electrical machineries.[5]

Table 1c covers construction and service industries. Compared to the manufacturing and wholesale industries in Tables 1a and 1b, numbers of Japanese affiliates are few in most industries (many service industries have no affiliate in either of the three countries and thus are not included in the table). Among them, two service industries marked by dark gray in the table, warehousing and worker dispatching services, have relatively many affiliates in the three countries total (fourteen and eleven respectively). Services provided by those two industries may have demand from Japanese affiliates of other industries, especially manufacturing ones. However, to see why these two industries have many affiliates needs more investigation about motives of their (Japanese) parent companies and/or changes in demand for their services in the three countries.[6]

<Table 1c>

[5] For Poland, the number of business oriented machinery affiliates is not small (nine).

[6] For instance, most affiliates of worker dispatching services in Poland and Hungary are owned by just one non-Japanese parent company. Such concentration and other factors are behind the numbers of affiliates of those two service industries.

4.2 Establishment Years of Japanese Affiliates

Tables 2 and Figures 1 are about establishment years of Japanese affiliates for selected industries (based on the numbers of affiliates in Tables 1). First, Tables 2 show averages of establishment years by industry, industry group (manufacturing, wholesale, and service), and all (selected) industries (Table 2a is Poland, 2b is Czech Republic, and 2c is Hungary respectively). About establishment year, on average, wholesale industries in the middle of each of the tables have the longest history, followed by manufacturing and service ones. This may reflect the following pattern of Japanese manufacturers entering the markets of those three and other European countries; first, exports with sales network developed by FDI of wholesalers (ESFDI a la Krautheim 2013) and then FDI of manufacturers. This possibility is discussed from various other viewpoints later. Especially, two manufacturing industries, electrical machinery and transportation equipment, seem to have taken this market-entry pattern, although there are some differences between the three countries about the shares of wholesale affiliates, whose details are shown later.

<Table 2a>
<Table 2b>
<Table 2c>

Figures 1 describe how establishment years of Japanese affiliates distribute over time from 1990 to 2022 in each of the three countries (Figure 1a is Poland, 1b is Czech Republic, and 1c is Hungary respectively).[7] First, the figures shows that many Japanese affiliates were established in the 2000s, which may be due to the EU enlargement in 2004. However, not a small number of affiliates were established in the 1990s, especially in Hungary (Figure 1c), as "oldest" column of Tables 2 also suggests (note that East European Revolution occurred in 1989). Therefore, some affiliates may have been established far earlier than the EU enlargement in 2004. Such behaviors by Japanese parent companies may have reflected their expectations for future development of EECs. Second, there are differences about those early-established affiliates. In Poland, most of those affiliates were wholesalers, while in Czech Republic and Hungary, majorities of those affiliates were manufacturers. Third, there are differences about distribution of establishment years for service industries. In Poland and Czech Republic, most service affiliates were established in the 2000s or later, while in Hungary, a half of service affiliates were established in the 1990s.

[7] Figures 1b and 1c, i.e., Czech Republic and Hungary, include affiliates established before 1990, although the numbers of those affiliates are few.

<Figure 1a>

< Figure 1b>

< Figure 1c>

Figures 2 show the distributions of establishment years of Japanese affiliates in Poland for the three machinery industries separately, general-purpose and electrical machineries and transportation equipment (Figure 2a,2b, and 2c respectively), all of which have many affiliates of both manufacturers and wholesalers (Tables 1a and 1b). For all of those three industries, wholesalers were firstly established in the period of 1990-94, which shows the same tendency as Figure 1a, distribution of affiliates including other industries. However, there is one big difference among those three industries. While general-purpose and electrical machineries established wholesale affiliates almost every period from the 1990s to 2010s, for transportation equipment, establishment of wholesale affiliates was concentrated in the following two periods, the first half of the 1990s and the 2000s.[8]

<Figure 2a>

< Figure 2b>

< Figure 2c>

Figures 3 show the distributions of establishment years of Japanese affiliates in Czech Republic for the three machinery industries separately, general-purpose and electrical machineries and transportation equipment (Figure 3a, 3b, and 3c respectively), all of which have many affiliates of both manufacturers and wholesalers (Tables 1a and 1b). For all of those three industries, wholesalers were firstly established in the 1990s. However, in the 2000s, majority of affiliates established were manufacturers, especially for transportation equipment (all affiliates were manufacturers). This tendency is the same as Figure 1b, distribution of affiliates including other industries. Next, there is tendency similar with that in Poland (Figures 2). While general-purpose and electrical machineries established wholesale affiliates almost every period from the 1990s to 2010s, for transportation equipment, establishment of wholesale affiliates were concentrated in the second half of the 1990s only.[9]

<Figure 3a>

< Figure 3b>

< Figure 3c>

[8] In Figure 2b, no affiliate of electrical machinery was established from 2020 to 22, and In Figure 2c, no affiliate of transportation equipment was established from 2010 to 14 and 2020 to 22.

[9] In Figure 3a, no affiliate of general-purpose machinery was established from 2020 to 22.

Figures 4 show the distributions of establishment years of Japanese affiliates in Hungary for the three machinery industries separately, general-purpose and electrical machineries and transportation equipment (Figure 4a, 4b, and 4c respectively), all of which have many affiliates of both manufacturers and wholesalers (Tables 1a and 1b), except for only one manufacturer of general-purpose machinery. For all of those three industries, wholesalers were firstly established in the first half of the 1990s. However, in the second half of the 1990s and 2000s, majority of affiliates established were manufacturers, except for general-purpose machinery (all affiliates were wholesalers). This tendency is the same as Figure 1c, distribution of affiliates including other industries. Next, establishment of affiliates were concentrated in the 1990s and 2000s, unlike either Poland and Czech Republic (Figures 2 and 3 respectively). In the 2010s, numbers of established affiliates, either manufacturer or wholesaler, are few, and no affiliate has been established since 2020.

<Figure 4a>

< Figure 4b>

< Figure 4c>

5 Remarks

This study examines behaviors of Japanese firms having performed FDI into Poland, Czech Republic, and Hungary, and finds that machinery industries and wholesale industries of those products have many affiliates in all of the three countries, although distributions of industries are different among them. This study also shows that many wholesalers of machineries were established in the 1990s to 2010s, followed by manufacturers producing them in the 2000s and 2010s, with mentioning differences among countries and/or industries.

There are possible extensions of this study. First, regional distribution of affiliates and its relation with (macro)economic and/or geographic characteristics of the three countries should be explored more. There are some clusters of Japanese affiliates in Poland, Czech Republic, and Hungary.[10] Those clusters may have been developed due to subsidies and/or other policies by central/local governments which should be explored as well. Second, behaviors of Japanese parent companies should be examined more. For instance, relationships between affiliates in the three countries and/or industries may give some clues about reasons why the affiliates were established.

[10] Shimuta (2014) shows that two clusters of transportation equipment, i.e., auto and aviation, had developed in Poland by the early 2010s. JETRO Overseas Research Department, Europe, Russia and CIS Division (2024) shows details of clusters of transport equipment and other industries in Poland, and also shows that affiliates of manufacturing MNEs of China and South Korea are operated in this country. The latter suggests possible competition among affiliates of MNEs of those countries and Japan.

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Table 1a Number of Japanese Affiliates by Industry (Manufacturing)

Industry/Country	Poland	Czech Republic	Hungary	3-Country Total
Food and Beverages	4	1	2	7
Textile Products	0	1	1	2
Chemical and Allied Products	4	9	6	19
Medicines	1	1	0	2
Rubber Products	6	1	2	9
Ceramic, Stone, and Clay Products	2	1	0	3
Iron and Steel	0	1	0	1
Non-Ferrous Metals and Products	1	2	0	3
Fabricated Metal Products	5	7	0	12
General-Purpose Machinery	8	9	1	18
Electrical Machinery, Equipment and Supplies	9	11	14	34
Transportation Equipment	9	25	14	48
Business Oriented Machinery	1	4	2	7
Other	5	2	1	8
Manufacturing Total	55	75	43	173
All-Industry Total	135	127	79	341

Note: Industries marked by dark gray have ten or more affiliates in the three countries total, and those marked by light gray have five or more affiliates, respectively.

Table 1b Number of Japanese Affiliates by Industry (Wholesale)

Industry/Country	Poland	Czech Republic	Hungary	3-Country Total
General Merchandise	1	0	0	1
Food and Beverages	1	0	0	1
Chemicals and Allied Products	2	4	2	8
Medicines	0	1	0	1
Iron and Steel Products, Non-Ferrous Metals	1	2	1	4
General-Purpose Machinery	19	11	7	37
Electrical Machinery, Equipment and Supplies	13	10	5	28
Transportation Equipment	6	3	5	14
Business Oriented Machinery	9	3	4	16
Other	3	4	0	7
Wholesale Total	55	38	24	117
All-Industry Total	135	127	79	341

Note: Industries marked by dark gray have ten or more affiliates in the three countries total, and those marked by light gray have five or more affiliates, respectively.

Table 1c Number of Japanese Affiliates by Industry (Construction, Service, and Other)

Industry/Country	Poland	Czech Republic	Hungary	3-Country Total
Construction	1	1	0	2
Freight Transport	0	2	1	3
Warehousing	6	5	3	14
Information Services	3	1	1	5
Goods Rental and Leasing	1	0	0	1
Financial Auxiliaries	1	1	1	3
Non-Life Insurance Institutions	1	0	0	1
Real Estate	1	0	0	1
Travel Agency	0	1	1	2
Worker Dispatching Services	9	0	2	11
Other Services	2	3	3	8
Establishments Engaged in Administrative or Ancillary Economic Activities	0	1	0	1
Total (Construction, Service, and Other)	25	15	12	52
All-Industry Total	137	129	80	346

Note: Industries marked by dark gray have ten or more affiliates in the three countries total, and those marked by light gray have five or more affiliates, respectively.

Table 2a Average Establishment Years of Japanese Affiliates for Selected Industries (Poland)

Industry	Obser-vations	Mean	Standard Deviation	Oldest	Newest
Manufacturing					
Food and Beverages	4	2014	3.10	2010	2017
Chemical and Allied Products	4	2008	6.34	2000	2015
Rubber Products	6	2005	6.80	1998	2016
Fabricated Metal Products	5	2007	2.70	2003	2010
General-Purpose Machinery	8	2005	5.63	1998	2016
Electrical Machinery, Equipment and Supplies	9	2007	8.32	1997	2019
Transportation Equipment	9	2007	7.44	1999	2019
Business Oriented Machinery	1	2015	-	2015	2015
Manufacturing: All-Industry Average	46	2007	6.63	1997	2019
Wholesale-Trade					
Chemicals and Allied Products	2	2005	15.56	1994	2016
General-Purpose Machinery	19	2004	9.03	1990	2020
Electrical Machinery, Equipment and Supplies	13	2002	8.56	1990	2017
Transportation Equipment	6	1996	6.74	1991	2007
Business Oriented Machinery	9	2002	8.28	1990	2013
Wholesale: All-Industry Average	49	2002	8.75	1990	2020
Service					
Warehousing	6	2006	4.49	2001	2011
Information Services	3	2007	14.11	1992	2020
Worker Dispatching Services	9	2008	4.18	2001	2015
Service: All-Industry Average	18	2007	6.20	1992	2020
All-Industry Average	113	2005	7.96	1990	2020

Table 2b Average Establishment Years of Japanese Affiliates for Selected Industries (Czech Republic)

Industry	Obser-vations	Mean	Standard Deviation	Oldest	Newest
Manufacturing					
Food and Beverages	1	1992	-	1992	1992
Chemical and Allied Products	9	2011	7.41	2000	2019
Rubber Products	1	2010	-	2010	2010
Fabricated Metal Products	7	2010	5.08	2004	2017
General-Purpose Machinery	9	2004	6.08	1994	2015
Electrical Machinery, Equipment and Supplies	11	2002	6.09	1995	2016
Transportation Equipment	25	2004	5.39	1992	2017
Business Oriented Machinery	4	2008	1.26	2007	2010
Manufacturing: All-Industry Average	67	2005	6.59	1992	2019
Wholesale-Trade					
Chemicals and Allied Products	4	2005	12.37	1989	2018
General-Purpose Machinery	11	2003	6.53	1994	2012
Electrical Machinery, Equipment and Supplies	10	2006	10.01	1990	2019
Transportation Equipment	3	1993	1.15	1992	1994
Business Oriented Machinery	3	2004	2.65	2002	2007
Wholesale: All-Industry Average	31	2003	8.57	1989	2019
Service					
Warehousing	5	2007	9.23	1998	2022
Information Services	1	2015	-	2015	2015
Worker Dispatching Services	0	-	-	-	-
Service: All-Industry Average	6	2008	8.91	1998	2022
All-Industry average	105	2005	7.37	1989	2022

Table 2c Average Establishment Years of Japanese Affiliates for Selected Industries (Hungary)

Industry	Obser-vations	Mean	Standard Deviation	Oldest	Newest
Manufacturing					
Food and Beverages	2	2011	9.19	2004	2017
Chemical and Allied Products	6	2012	6.29	2003	2020
Rubber Products	2	2005	4.95	2001	2008
Fabricated Metal Products	0	-	-	-	-
General-Purpose Machinery	1	2011	-	2011	2011
Electrical Machinery, Equipment and Supplies	14	2001	7.09	1995	2017
Transportation Equipment	14	2002	5.97	1991	2015
Business Oriented Machinery	2	1999	0	1999	1999
Manufacturing: All-Industry Average	41	2004	7.38	1991	2020
Wholesale-Trade					
Chemicals and Allied Products	2	2001	12.02	1992	2009
General-Purpose Machinery	7	1998	7.48	1990	2009
Electrical Machinery, Equipment and Supplies	5	2001	10.33	1990	2017
Transportation Equipment	5	2001	8.28	1991	2008
Business Oriented Machinery	4	2004	9.98	1991	2015
Wholesale: All-Industry Average	23	2001	8.48	1990	2017
Service					
Warehousing	3	2002	11.79	1992	2015
Information Services	1	1988	-	1988	1988
Worker Dispatching Services	2	2010	0.71	2009	2010
Service: All-Industry Average	6	2002	10.83	1988	2015
All-Industry average	70	2003	8.07	1988	2020

Figure 1a Distribution of Establishment Years of Japanese Affiliates, 1990-2022 (Poland)

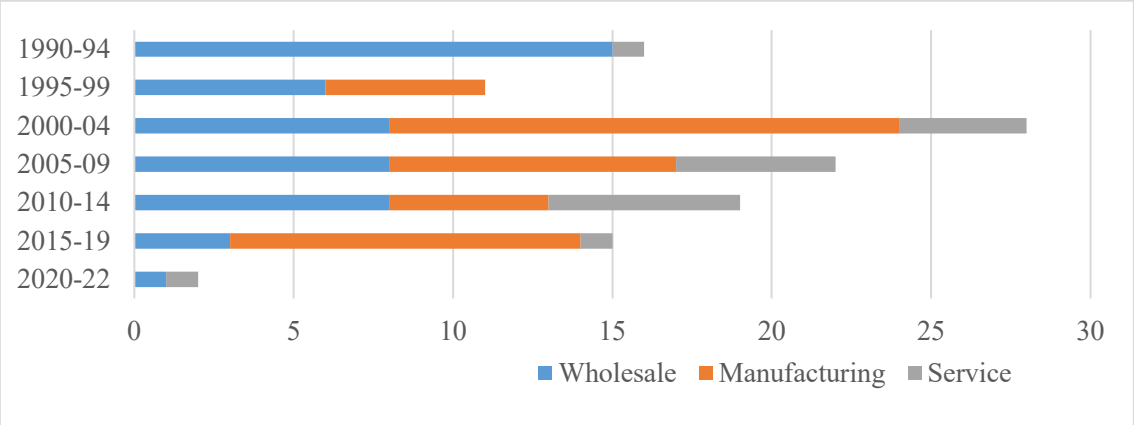

Figure 1b Distribution of Establishment Years of Japanese Affiliates, 1990-2022 (Czech Republic)

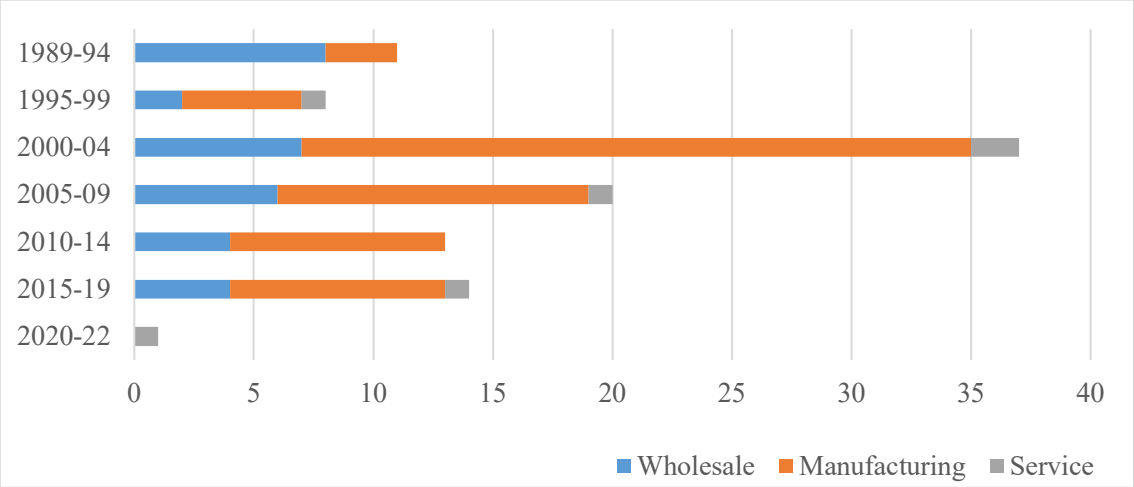

Figure 1c Distribution of Establishment Years of Japanese Affiliates, 1990-2022 (Hungary)

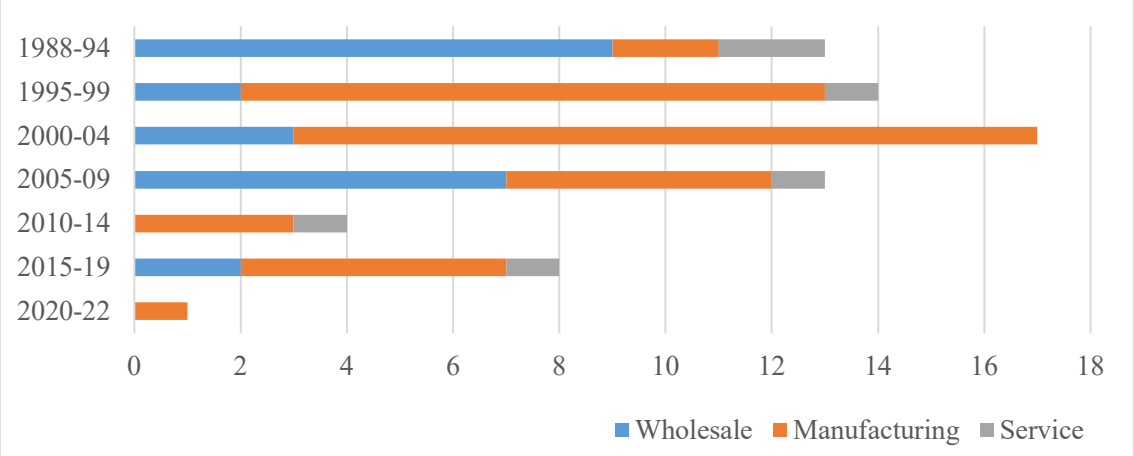

Figure 2a Distribution of Establishment Years of Japanese Affiliates in Poland, 1990-2022: Wholesalers and Manufacturers of General-Purpose Machinery

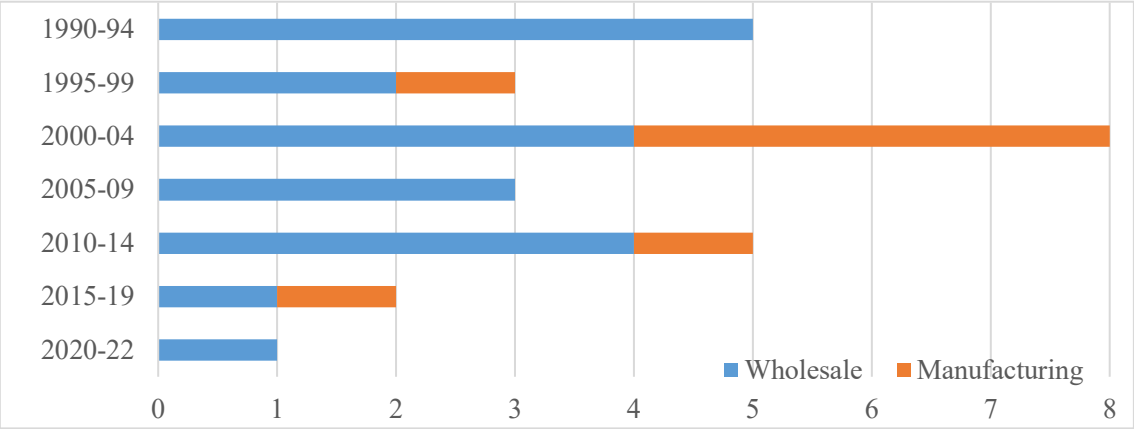

Figure 2b Distribution of Establishment Years of Japanese Affiliates in Poland, 1990-2022: Wholesalers and Manufacturers of Electrical Machinery, Equipment and Supplies

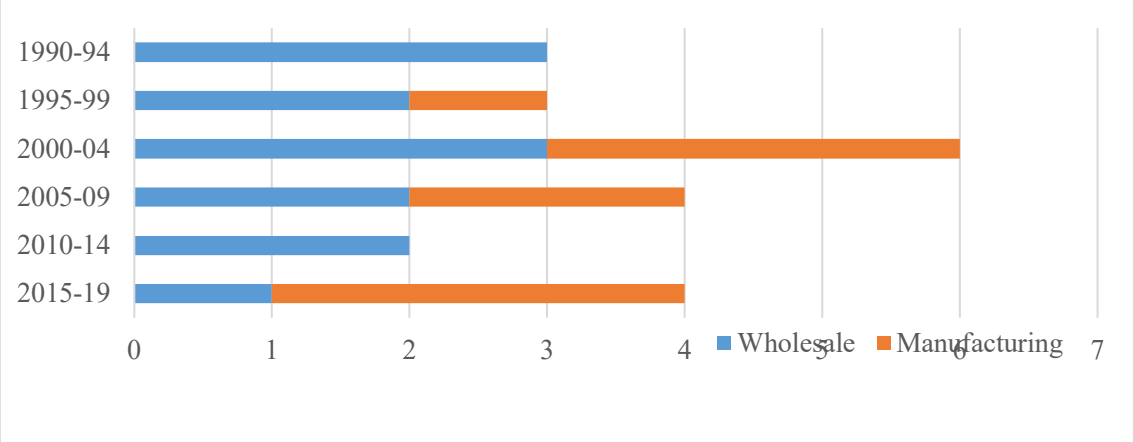

Figure 2c Distribution of Establishment Years of Japanese Affiliates in Poland, 1990-2022: Wholesalers and Manufacturers of Transportation Equipment

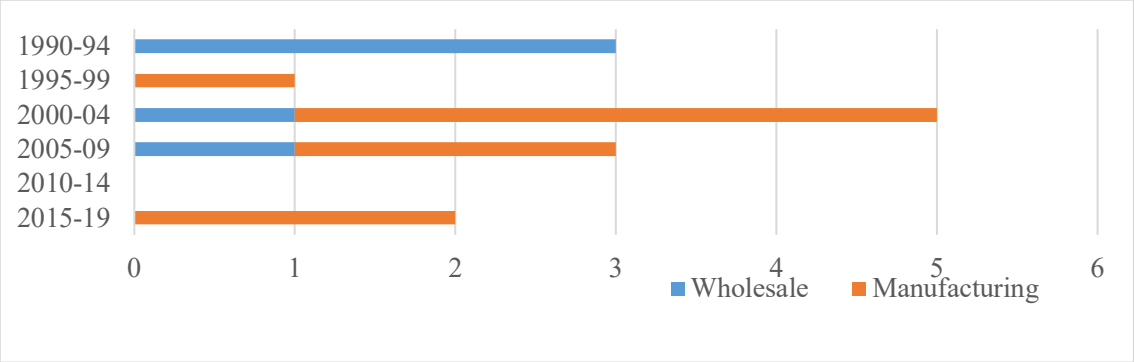

Figure 3a Distribution of Establishment Years of Japanese Affiliates in Czech Republic, 1990-2022: Wholesalers and Manufacturers of General-Purpose Machinery

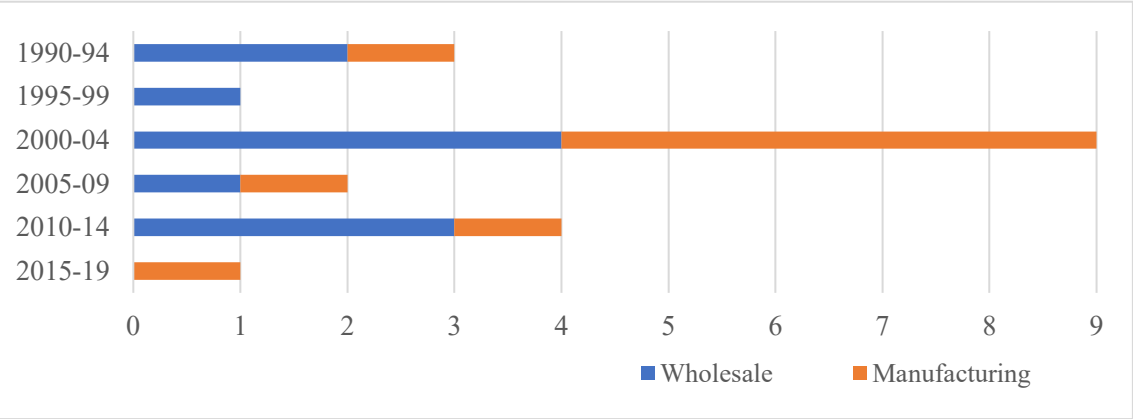

Figure 3b Distribution of Establishment Years of Japanese Affiliates in Czech Republic, 1990-2022: Wholesalers and Manufacturers of Electrical Machinery, Equipment and Supplies

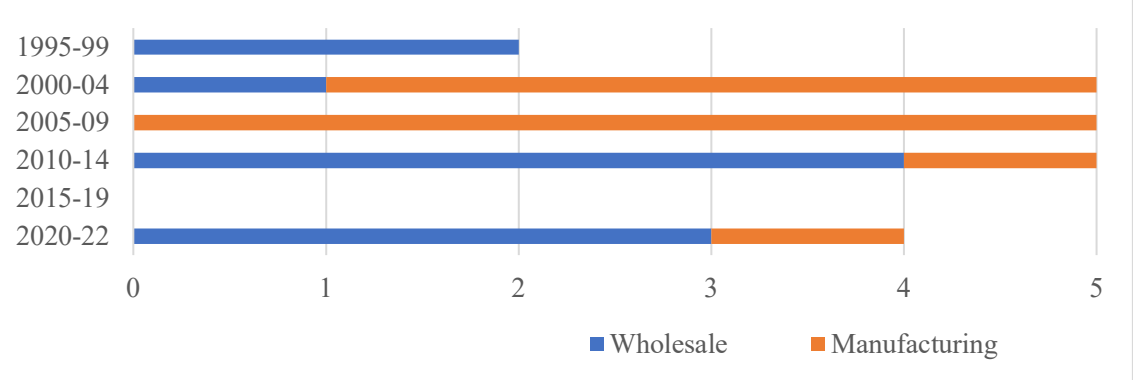

Figure 3c Distribution of Establishment Years of Japanese Affiliates in Czech Republic, 1990-2022: Wholesalers and Manufacturers of Transportation Equipment

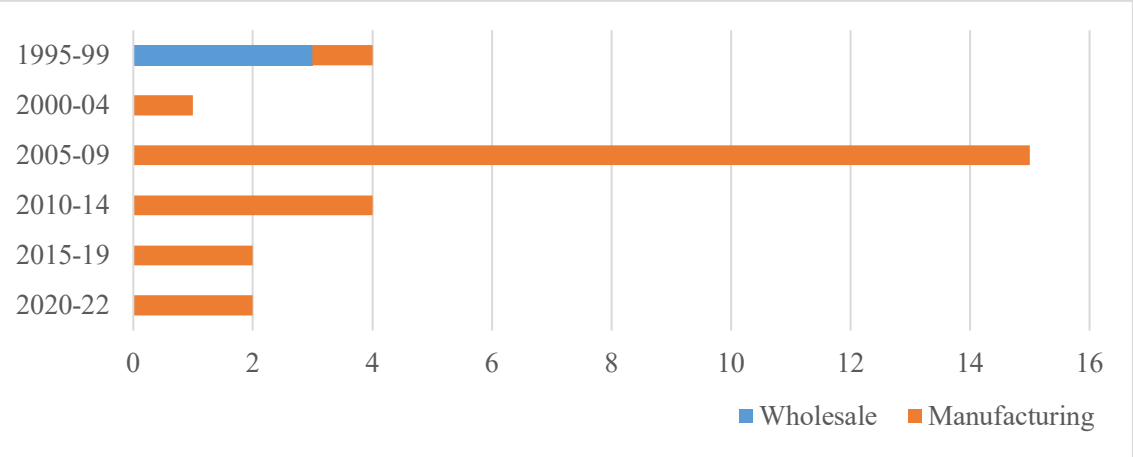

Figure 4a Distribution of Establishment Years of Japanese Affiliates in Hungary, 1990-2022: Wholesalers and Manufacturers of General-Purpose Machinery

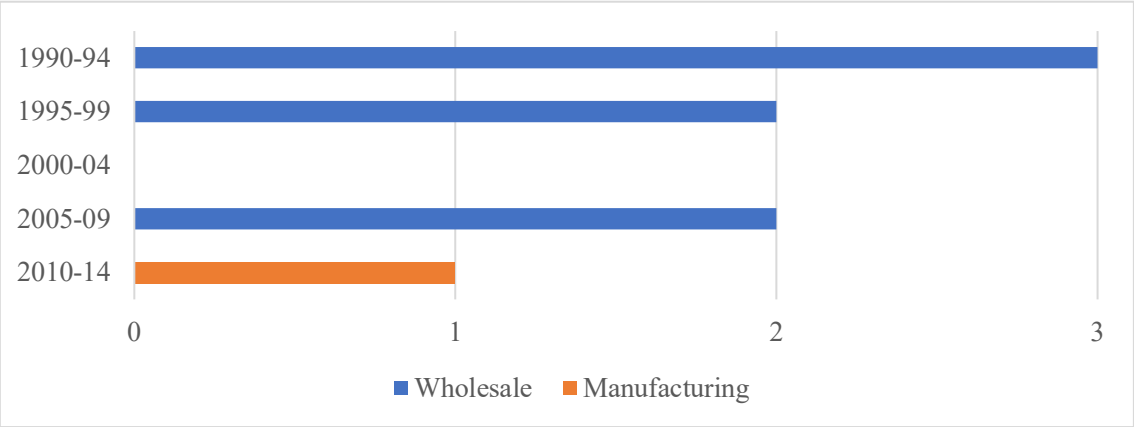

Figure 4b Distribution of Establishment Years of Japanese Affiliates in Hungary, 1990-2022: Wholesalers and Manufacturers of Electrical Machinery, Equipment and Supplies

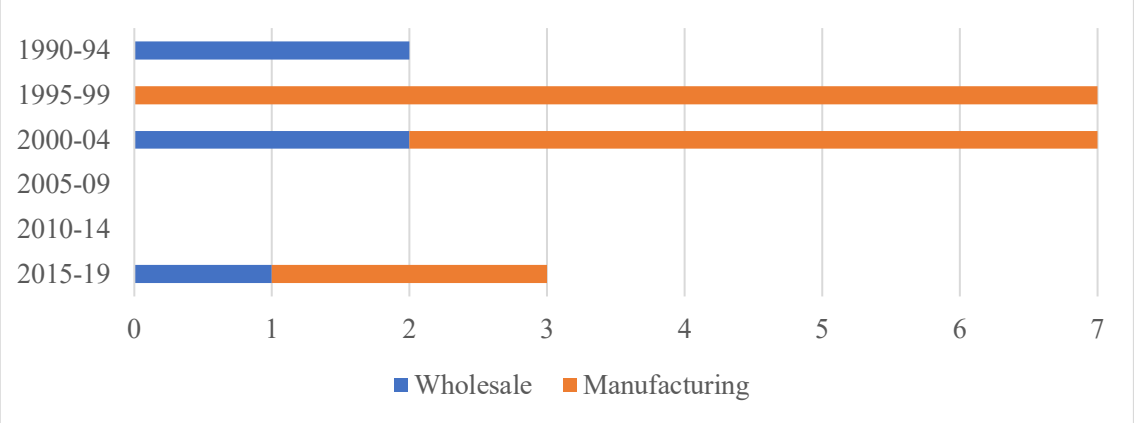

Figure 4c Distribution of Establishment Years of Japanese Affiliates in Hungary, 1990-2022: Wholesalers and Manufacturers of Transportation Equipment