RIETI Discussion Paper Series 21-E-023

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RIETI Discussion Paper Series 21-E-023
March 2021

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Abstract

China has seen dramatic economic growth in the last decades and attracted foreign capital and human resources. This paper studies firm characteristics of the Japanese firms investing in China. We combine several sources of micro-data and construct panel data on Japanese manufacturing firms from 1995 to 2009. As a result we find that the number of firms investing in China steadily increased over time and FDI in China increased domestic sales, productivity, wages and number of employees of Japanese firms, rather than increasing technological development.

Keywords: FDI, China, Japanese firms.
JEL classification: F23.

* This study is conducted as a part of the Project "East Asian Industrial Productivity" undertaken at the Research Institute of Economy, Trade and Industry (RIETI). This study utilizes the micro data of the questionnaire information based on the "Basic Survey of Japanese Business Structure and Activities", "Basic Survey on Overseas Business Activities", and "Census of Manufacture", which are conducted by the Ministry of Economy, Trade and Industry (METI). Kogyou Tokei Converter and Kikatsu Kaiji Converter are provided by RIETI. The author is grateful for helpful comments and suggestions by Discussion Paper seminar participants at RIETI.

1. Introduction

China has seen dramatic economic growth in the last decades and attracted foreign capital and human resources. In 2001 China shifted to open economy by accession to WTO. In addition to trade policy reform, the Chinese government promoted domestic market reform. One example is policy to promote inward foreign direct investment (FDI). The inward FDI promotion policy has led many foreign firms to build many affiliates and develop their business in China. Japan is not exceptional. The Japanese FDI to China drastically increased over decades. According to the Ministry of Commerce, China, the Japanese FDI to China amounts 3,270 million USD in 2017. Among developed countries, Japan is one of the largest economies investing in China, and accounts for 2.4% of total inward FDI in China as of 2017. Thus it is worthwhile to study which Japanese firms have invested in China in the last decades. This paper is aimed at investigating what characteristics the Japanese firms investing in China have and how different they are in firm characteristics and domestic activities from those that do not invest. In this paper we use Japanese firm-level data to look into this. To this end we create a unique data set on Japanese firms and their affiliates abroad by combining several rich data sources.

Nowadays China has huge power in the global economy and largely affects even domestic economies in many other countries. A large amount of imports from China has put downward pressure on wage and reduced employment in manufacturing in the United States (Autor et al, 2013). Production networks known as the global value chain are driven by China, increasing Asian trade with China (Feng et al. 2016) and changing comparative advantage (Baldwin and Okubo, 2019). Japan, the largest neighboring country of China, is largely affected by the Chinese economy. Nowadays Japan highly depends on China in imports and intermediate inputs as well as exports. China is one of the largest trading

partners for Japan. Furthermore, some Japanese firms have engaged in FDI to lower costs and facilitate selling to the large Chinese market. There are several channels in the impact of China on the Japanese economy, but our main focus in this paper is the Japanese firms investing in China. As a result, we find that firms investing in China subsequently grow along various margins such as employment, sales, wage, the number of plants and productivity, while it does not significantly promote R&D investment and new product development.

2. Background and Literature Review

The Chinese government undertook several economic reforms in the last decades. One of them is promotion of inward FDI. The inward FDI policy targets some specific sectors or products, where the government made some guidelines to classify products allowed for foreign companies' production. The products are classified as promoted, restricted and prohibited. Once the products are categorized as promotion, inward FDI is accommodated. The list of inward FDI products has been revised once in a few years. On the list, many conditions are specified in most products. For instance, even in the case of promotion, several conditions are required such as produced by advanced technology or green technology. Some recent papers investigate the impact of such inward FDI policy in China on the Chinese economy. They uncover how the Chinese inward FDI policy can lead to economic growth and positive impact on Chinese local firms (Harding and Javorcik, 2011, 2012; Lu et al. 2017). Lu et al. (2017) in particular sees positive impact of relaxation of FDI regulations.

Apart from the Chinese economy reform, the FDI literature long discussed motives for FDI, cost efficiency such as vertical FDI or market seeking FDI such as

horizontal FDI. The literature discussed substitute or complement between host and home countries. The current FDI studies see more complex mechanisms (Yeaple, 2003; Baldwin and Okubo, 2014) and discuss the implications of FDI beyond the dichotomy of horizontal and vertical types.

The other strand of the FDI literature is on the FDI impact on the economy. There is a literature on the spillover impact of FDI on host countries. Many studies investigate spillover effect of foreign affiliates on local economy, employment growth, productivity (Javorcik, 2004), technology transfer (e.g. Aitken et al. 1997) and R&D spillovers (e.g. Branstetter, 2006). Hanson et al. (2005) and Belderbos et al. (2001) investigates vertical backward linkages through input-output of local sourcing by affiliates in the host country. An opposite direction is our interest, i.e. impact of FDI on the home country. The United States and European countries engaged active FDI. Harrison and McMillan (2011) investigate whether domestic job in the United States is lost by FDI. Japan is also one of the largest scale of FDI. Some studies show how the Japanese outward FDI affects the Japanese economy in the lost decades (e.g. Kneller et al. 2012). More in detail, some previous studies uncover the impact of FDI on productivity, employment and wage in Japan. According to Head and Ries (2001), the Japanese FDI increased skill intensity in parent firms from 1960 to 1990. Our main focus is the impact of FDI in China on the Japanese parent firms. In this line, Yamashita and Fukao (2010) and Ando and Kimura (2019) investigate the job reallocation between parent and foreign affiliates. Kambayashi and Kiyota (2015) also examines the impact on domestic employment.[1]

Our paper is in this line, the impact of FDI on parent firms. But there are some contrasts. First, our study focuses only on FDI to China rather than overall FDI. Second,

[1] Similar investigations are done by Edamura et al. (2011) and Hijzen et al.(2007).

our domestic activities and firm characteristics cover a variety of variables, not only employment, productivity and wage, but also firm organization such as employees in headquarters and plants as well as the number of manufacturing plants and products. We investigate this using the Japanese micro-data.

3 Data

3.1 Data source

This paper uses several micro-data sets, provided by the Ministry of Economy, Industry and Trade of Japan (METI). As main data, we use the Japanese firm-level data, the Basic Survey of Japanese Business Structure and Activities (BSJBSA). We also use manufacturing plant data, the Census of Manufacture, and the data on Japanese firms' foreign direct investment, Basic Survey on the Oversea Business Activities (BSOBA).

BSJBSA covers all firms with more than 50 regular employees and with more than 30 million yen of capital asset with approximately 85% of reply rate. The data contain a wide variety of firm-level information such as the number of employees, the number of employees worked in headquarter offices, wage payments, sales, profits, tangible asset, R&D investment and patents. Our sample period is from 1995 to 2009, until the end of the Global Financial Crisis. This allows us to focus on the reform period in the inward

FDI policy in China. We limit the sample to manufacturing firms and drop firms if they are missing in sample for 1 year.

The Census of Manufacture covers all manufacturing plants over Japan with more than 4 regular employees with approximately 95% of reply rate. The data contain the number of regular employees, total output and product-level output. The plant-level data is summed up to firm level and then combined with BSJBSA, which allows us to count the number of products and the number of manufacturing plants per firm.[2] We note that the product is at 6 digit-level, following time-consistent product code (Bernard and Okubo, 2016).

BSOBA covers all foreign affiliates by Japanese firms with approximately 70% of reply rate. The foreign direct investment is defined as foreign affiliates with more than 10% ownership of the Japanese firms. BSOBA include the status of operation, sales, purchase, profits and employees for each foreign affiliate as well as the information on their parent

[2] We use the converter to construct panel data for the Census of Manufacture, Kogyo Tokei Converter, provided by RIETI. To combine with BSJBSA, we use name, sector, products produced and address information of headquarters in both data, converter on parent-affiliate information of BSJBSA (Kikatsu Oyako Kigyo Converter) and Economic Census, provided by METI. More than 85% of manufacturing firms in BSJBSA can be matched with the Census of Manufacture in our sample period. Unmatched manufacturing firms in BSJBSA are 1) out of coverage in the Census of Manufacture due to different definition on manufacturing, 2) have commercial establishments as main associated with some manufacturing production and 3) due to different response rates. The response rate in BSJBSA is 85% but the Census of Manufacture is 95%.

firms in Japan. Our sample limits to manufacturing affiliates.[3] By using the parent firm information, we combine the information on foreign affiliates with BSJBSA.[4] Our sample covers 33.9 % (30.9%) of total employment in the manufacturing sector in Japan in 2009 (in 1995).

3.2 Variables

In our analysis, we use sales and the number of regular employees, the number of employees in headquarter office, R&D investment and patent for the Japanese manufacturing firms which are taken from BSJBSA. We note that R&D dummy is one if R&D investment at year t is positive, and otherwise zero. Likewise, patent dummy is one if firm owns patent and otherwise zero. In addition, we use the number of products and plants, which is derived from the Census of Manufacture. The destination country of foreign affiliates is identified by BSOBA. In particular our main focus is whether the Japanese firms have foreign affiliates in China.

3.3 Stylized Facts

Figure 1 plots total employment in the Japanese manufacturing sector. The total number of employees as well as total manufacturing workers steadily decline over time, which reflects de-industrialization and stagnant economic growth in Japan. However, the decline of the number of total employees moderates in the 2000s while the number of manufacturing workers slightly increased in the middle 2000s.

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[3] Our sample limits to affiliates for manufacturing production. Thus we drop foreign affiliates for sale promotion and customer services for manufacturing.

[4] We use the converter between BSOBA and BSJBSA, Kikatsu Kaiji Converter, provided by RIETI.

Our main focus is the Japanese firms investing in China. Table 1 reports the number of firms with affiliates in China and other firms. Total number of the Japanese firms reaches peak around 1997 and then slightly decline afterward. On the other hand, the Japanese FDI to China increased over time, and in particular, drastically increased after the middle of 2000s. Furthermore the share of firms that invest in China increases from only 2% in 1995 to 10% in 2009. Table 2 reports the number of firms which have ever invested in China during our sample period. The number of firms is 865 in 1995 and 954 in 2009, which accounts for 10% and 12 % in all Japanese firms, respectively.

Now we compare characteristics of firms which have ever engaged FDI to China or not. Table 3 reports basic statistics in 1995 and 2009. Firms with affiliates in China tend to be large size, have more employees in manufacturing production as well as headquarter office, produce more varieties of product, have more manufacturing plants, larger sales, higher wage per employee, higher productivity (sales per sales). They also tend to have higher R&D investment and hold patents.

Figures 2 plot average values for these variables. Overall, firms who have engaged in FDI to China tend to have much larger in many variables, i.e. larger size, more sales and higher wage. Over-time decreases in the number of total employees and total manufacturing workers are larger in firms with FDI in China, compared with firms that do not invest in China.

4. Estimations

Next we look at the difference between firms with Chinese affiliates and those without in a regression framework. This allows us to control for confounding observed and

unobserved effects such as industry trends and firm characteristics. We estimate the following equations by OLS:

$$X_{it} = \beta China\_aff_{it} + \mu_{it} + \gamma_i + \varepsilon_{it}$$

where *China_aff* denotes the dummy for new affiliates in China. If firm *i* establishes the first affiliate in China at year t, then the dummy takes the value of one for that year. This is identified by BSOBA. The dependent variable, *X*, is a set of the variables for firm *i* at year t which are taken from BSJBSA and the Census of Manufacture, i.e. (log of) total employees, (log of) manufacturing employees, (log of) employees in headquarter office, (log of) sales (unit: million yen), (log of) sales per employee (productivity) (unit: million yen), R&D dummy, patent dummy, the number of products, and the number of manufacturing plants. μ and γ denote 2-digit industry-year fixed effect and firm fixed effect, respectively. ε is error term. We note that our estimation sample is limited to 1997 to 2009, because the inward FDI policy started since 1997 in China.

Table 4 reports results on these firm characteristics. To save the space, the table reports only the coefficient of *China_aff* dummy in each estimation. *China_aff* dummy is significantly positive in estimations on total employees, manufacturing workers, employees in headquarters, sales, sales per employee, wage per employee, and patent, although estimations in R&D investment and the number of products see positive coefficients but not significant. FDI to China plays role in stimulating production inside Japan through FDI to China. As a result of FDI to China, the numbers of total employee, manufacturing workers, and employees in headquarter offices in Japanese parent firms increase by 1.9%, 2.3% and 3.5%, respectively.

The magnitude of coefficients is larger in employment in headquarter offices than the number of manufacturing workers and total employees. Thus firms with FDI in China increase domestic employment, and in particular, the size of headquarter employment. Overall, the Japanese firms increase employees, wage per-worker, productivity, sales, and the number of plants. However, it does not substantially change the number of products and R&D investment. The Japanese firms investing in China do not result in innovative activities such as producing new products and investing in R&D.

This indicates that FDI to China could boost demand for the intermediate inputs or resource from Japan, which might stimulate domestic production activities. However, this is mainly for expanding manufacturing production but not significantly stimulating developing new technology and new products in Japan.

5. Conclusion

This paper studies firm characteristics of the Japanese firms investing in China. We combine several micro-data and construct panel data on the Japanese manufacturing firms from 1995 to 2009. As a result we find that the number of firms investing in China steadily increased over time in spite of lost decades in Japan. The Japanese firms that engaged in FDI to China increased physical production, such as expanding employment, sales, productivity and the number of plants, although new products and R&D investment are not changed.

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Table 1: Japanese firms investing in China

	China FDI	Non-china FDI	Total	China FDI share
1995	148	8035	8183	0.018086
1996	216	8693	8909	0.024245
1997	238	8799	9037	0.026336
1998	228	8794	9022	0.025272
1999	243	8698	8941	0.027178
2000	258	8471	8729	0.029557
2001	254	8219	8473	0.029978
2002	317	8015	8332	0.038046
2003	401	7675	8076	0.049653
2004	479	7496	7975	0.060063
2005	539	7450	7989	0.067468
2006	574	7304	7878	0.072861
2007	640	7108	7748	0.082602
2008	728	7015	7743	0.09402
2009	786	6769	7555	0.104037

Table 2: Firms ever investing in China

	China Ever	China Never	Total	Share of China Ever
1995	865	7318	8183	0.10570695
1996	919	7990	8909	0.10315411
1997	942	8095	9037	0.10423813
1998	941	8081	9022	0.1043006
1999	944	7997	8941	0.10558103
2000	947	7782	8729	0.10848894
2001	965	7508	8473	0.11389118
2002	970	7362	8332	0.11641863
2003	983	7093	8076	0.12171867
2004	982	6993	7975	0.1231348
2005	985	7004	7989	0.12329453
2006	989	6889	7878	0.12553948
2007	974	6774	7748	0.12570986
2008	978	6765	7743	0.12630763
2009	954	6601	7555	0.12627399

Table 3: FDI to China, 1995 to 2009

1. Firms never investing in China

No patent data is available in 1995

		Total Employee	Manu Workers	Emp HQ	Wage per emp	Sales	Sales per Emp	R&D	Patent	Num plant	Num product
1995	num	7318	7318	7318	7318	7318	7318	7318	7318	7318	6438
	mean	276.3194	223.4091	147.8172	4.332893	9921.592	28.31149	0.432905		1.704427	2.809724
	sd	695.8887	452.8184	251.6091	1.607102	53486.62	28.01297	0.495512		1.409939	2.554058
	median	136	120	88	4.235061	3120	22.12276	0		1	2
	min	50	4	0	0.034483	63	0.293023	0		1	1
	max	23385	14229	7751	16.1062	2754687	582.8344	1		35	47
2009	num	6601	6601	6601	6601	6601	6601	6601	6601	6601	6571
	mean	255.2768	208.3606	132.9099	4.460714	12454.01	36.62444	0.39691	0.321466	1.555219	2.665652
	sd	586.012	427.3798	266.566	1.480197	81234.44	59.73677	0.489294	0.467075	1.156151	2.315471
	median	133	113	82	4.425926	3547	25.65672	0	0	1	2
	min	50	4	1	0	180	2.385246	0	0	1	1
	max	18465	14026	12506	15.18919	3478499	2191.05	1	1	18	47

2. Firms ever investing in China

		Total Employee	Manu Workers	Emp HQ	Wage per emp	Sales	Sales per Emp	R&D	Patent	Num plant	Num product
1995	num	865	865	865	865	865	865	865	865	865	848
	mean	2483.897	1808.056	656.7815	5.011335	129735.6	37.86445	0.82659		3.796532	5.745283
	sd	6688.385	5069.517	1679.838	1.699863	447745.3	27.2724	0.378821		4.264163	10.14901
	median	653	473	225	5.05921	20625	31.78788	1		2	3
	min	56	12	1	0.110546	533	3.804965	0		1	1
	max	77185	61001	24200	13.23127	8218500	367.5592	1		45	149
2009	num	954	954	954	954	954	954	954	954	954	952
	mean	1967.654	1309.745	481.1226	5.247493	147406.4	50.93629	0.779874	0.733753	2.998952	5.137605
	sd	5280.437	3777.584	1318.741	1.793175	506856.1	64.13865	0.414549	0.442227	3.111263	6.938742
	median	533.5	364.5	170.5	5.347537	19380.5	37.06012	1	1	2	3
	min	53	8	1	0	256	3.773022	0	0	1	1
	max	76140	61763	22470	12.17287	9278483	1072.027	1	1	31	107

Table 4: Coefficient of China_Aff

Dependent variables	Coeff	Std		R-sq	F	Sample
Total Employee	0.019391	0.005595	***	0.9722	12.01	106,380
Total Manu Workers	0.023459	0.007509	***	0.9446	9.76	106,380
HQ emp	0.035727	0.010741	***	0.8743	11.06	106,264
Wage per emp	0.017572	0.00675	***	0.6867	6.78	106,326
Sales	0.032851	0.006661	***	0.9721	24.32	106,380
Sales per emp	0.01346	0.005845	**	0.9135	5.3	106,380
R&D dummy	0.004592	0.006865		0.7172	0.45	106,380
Patent dummy	0.016152	0.007965	**	0.7359	4.11	106,380
Num Plant	0.004253	0.005745	***	0.9224	0.55	106,380
Num product	0.17187	0.120756		0.8625	2.03	101,399

***: 1%, **: 5%, *: 10%

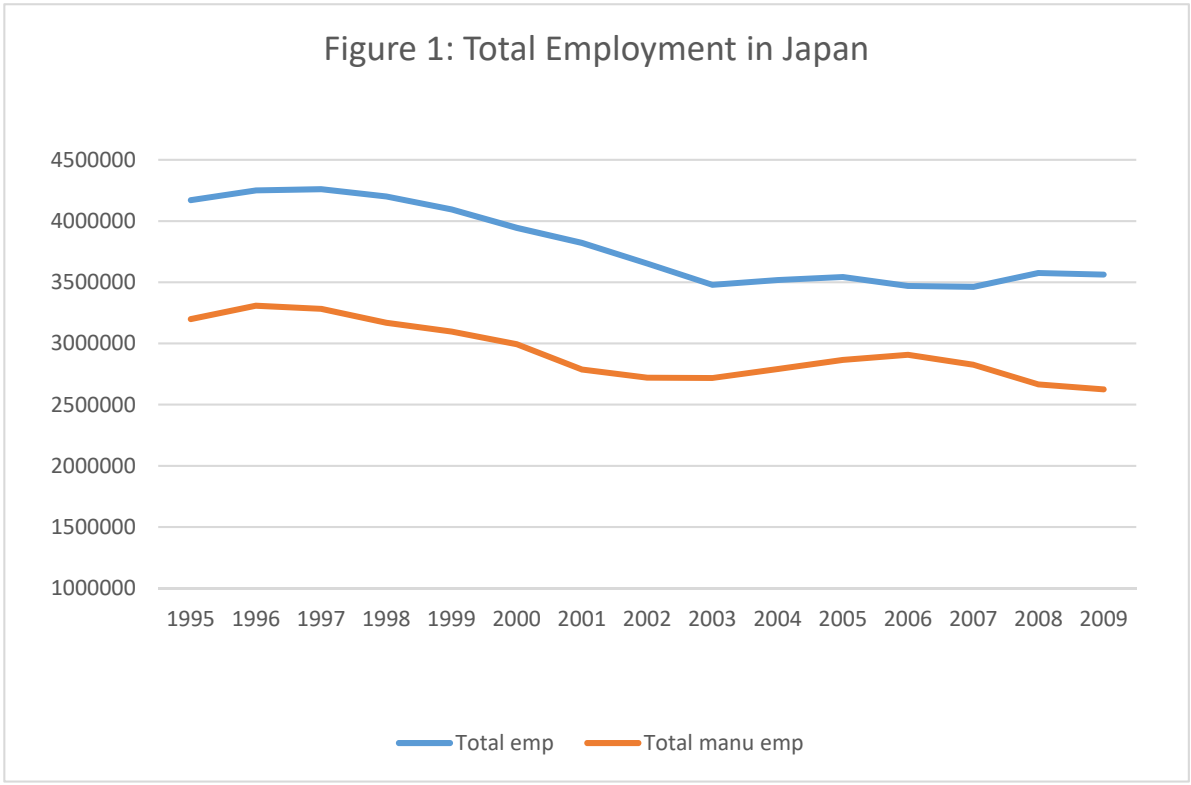
Figure 1: Total Employment in Japan
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Total emp
Total manu emp

Figure 2: Basic Characteristics