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Assessing Foreign Direct Investment Relationships Between Japan, the People's Republic of China, and the United States

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Abstract

The People's Republic of China (PRC) has received enormous inflows of foreign direct investment (FDI) in recent years, including significant flows from Japan and the United States (US). We examine these investment flows in detail to gain perspectives on their relative importance for the three countries involved. We also analyze the industrial composition of FDI flows over time. US FDI flows to the PRC have been less concentrated in manufacturing than average for investors in the PRC while Japan’s FDI flows have been much more concentrated in manufacturing, particularly in transport, electrical, and machinery industries in recent years. Using survey data from American and Japanese affiliates, we compare the employment patterns and sales destinations of American and Japanese affiliates in the PRC. We find a much higher degree of export-orientation for Japanese affiliates than American affiliates, with the latter tending to make the vast majority of their sales in the PRC's market. Over time, however, we find a tendency towards convergence in the sales destinations of Japanese and American affiliates.

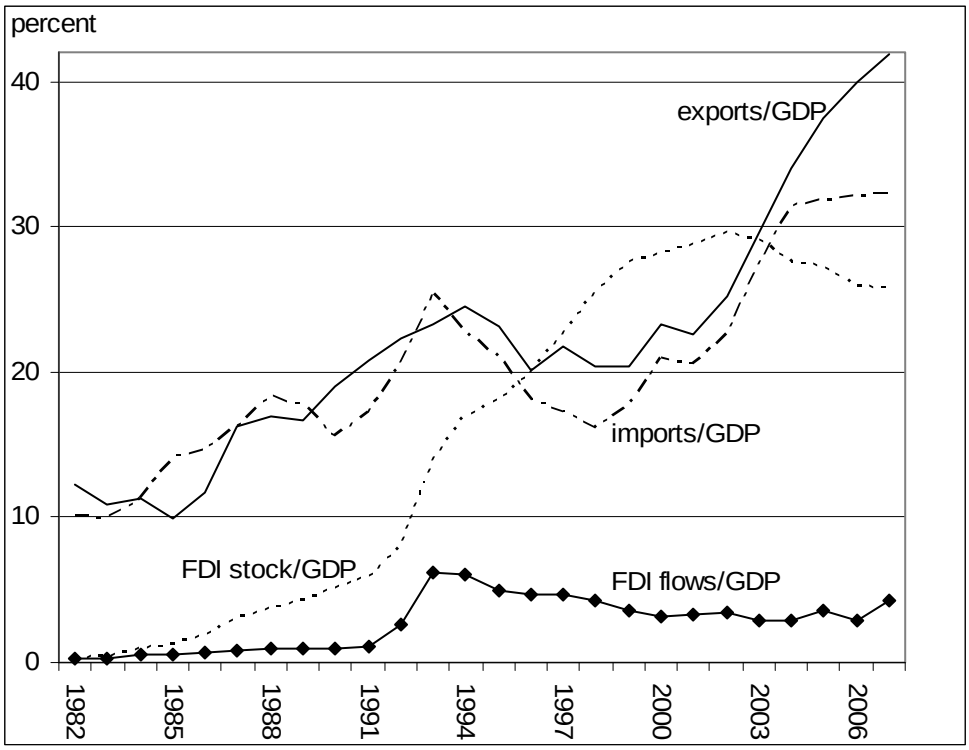
JEL Classification: F21, F23

Contents

1. INTRODUCTION

The People's Republic of China's (PRC) economic reforms, begun in the late 1970s and progressing through its entry into the WTO in 2001, have allowed it to participate more fully in international commerce and to benefit from economic growth. The PRC's rapid economic growth has been outpaced only by its even more rapid increases in international trade participation and receipt of foreign direct investment (FDI). As Figure 1 shows, the PRC's FDI inflows relative to Gross Domestic Product (GDP) have grown from 0.2% in 1982 to a high of 6.3% in 1993, then back down to 4.3% in 2007. The accumulated stock of FDI from 1982 rises particularly rapidly relative to GDP from the early 1990s to early 2000s, from only 8% in 1992 to a peak of almost 30% in 2002 before dropping modestly to 25.8% in 2007. Similarly dramatic growth has occurred in exports and imports relative to GDP, with the export share rising from 12.3% to 41.9% and the import share from 10.1% to 32.3% between 1982 and 2007. The rapid growth in the PRC's GDP, trade, and FDI made it the fourth largest economy, the third largest trading country, and the largest FDI recipient in the world in 2007.[1]

Figure 1: The PRC's FDI and Trade Relative to GDP, 1982–2007



GDP = gross domestic product, FDI = foreign direct investment.

Sources: The World Bank, World Development Indicators (available: http://publications.worldbank.org/WDI/ [accessed January 2009]).

The PRC's rapid economic growth and international integration have captured a lot of media attention and cocktail party theorizing as to the causal relationships within the PRC as well as possible impacts on the PRC's major trade and investment partners, such as Japan and the United States (US). In this paper, we jump on this bandwagon, but with a sobering examination of the available data from all three countries. We assess the FDI relationships between Japan, the PRC, and the US by analyzing data on FDI stocks and flows across the

[1] GDP rankings from IMF and World Bank data, trade rankings combine export and import totals based on World Trade Organization data, and FDI rankings based on OCO Global data.

three countries along with data on the operations of Japanese and US affiliates in the PRC. We attempt to weigh the importance of these bilateral FDI relationships relative to other bilateral relationships for each country and we analyze the industrial composition of the three countries' investment relationships. Although the direct investment relationship between Japan and the US is still much larger than that between either country and the PRC, popular interest in the growth of the PRC's investments prompts investigation into those investments. We look for similarities and differences between Japanese and American multinationals in their approaches to investment in the PRC by examining operating data from their affiliates. We find evidence that Japanese affiliates in the PRC are more concentrated in manufacturing industries and are more export-oriented than their US counterparts, but that difference is shrinking.

2. RELATED LITERATURE

One branch of related literature has sought to explain possible relationships between international trade and FDI. The traditional Heckscher-Ohlin (H-O) theorem of trade helps in explaining the PRC's trade pattern. With the largest population in the world and relatively low wages, the PRC has comparative and even absolute advantage in manufacturing labor-intensive products relative to most of its trading partners. As the PRC has increasingly integrated into the world economy over the past three decades, it has evolved into a major exporter in most categories of labor-intensive goods, as predicted by the H-O theorem. Based on the same H-O framework, early theoretical analyses also predict product trade and international capital movements act as substitutes (Mundell 1957). This framework indicates an increase in a country's inward FDI flows will dampen its trade growth.

More recent theories that incorporate multinational enterprise production into models of international trade develop two different hypotheses to explain the relationship between FDI and trade flows. In vertical integration models such as Helpman (1984), the primary incentive for FDI is to seek lower production costs in the host country and then to export goods produced or processed by the firm's foreign affiliates. This type of FDI inflow will increase a host country's trade, primarily through increased exports.[2] On the other hand, a host country's trade is predicted to decrease in horizontal integration models (Horstmann and Markusen 1992) where FDI inflows substitute for imports. In this case, firms move the production of their exportable products to the host country to economize on firm-level economies of scale, avoid trade barriers, and reduce transportation costs.

Gu, Awokuse, and Yuan (2008) and Xing (2007) examine the recent relationship between trade and FDI for the PRC. Gu, Awokuse, and Yuan (2008) use disaggregated manufacturing sector data for 1995–2005 to conclude that the PRC's FDI inflows have statistically significant and positive effects on the PRC's total exports, but these effects differ across industries. With trade data from 1980 to 2004, Xing (2007) investigates to what extent FDI promoted intra-industry trade between the PRC and its major trading partners; Japan and the US. The analysis indicates that Japanese direct investment in the PRC performed a significant role in enhancing intra-industry trade between Japan and the PRC. However, there is no such evidence found for the US direct investment in the PRC. Therefore, the effect of inward FDI on the PRC's economy can be different for different industries and source countries.

Another branch of the literature has produced descriptive analyses focused typically on a particular bilateral relationship or on a particular country's international linkages. For example, Branstetter and Foley (2007) provide an example of the former, with a focus on PRC-US FDI linkages.[3] They attempt to debunk several misconceptions regarding US

[2] Imports of intermediate inputs also may increase in vertical integration models.

[3] Fung, Lau, and Lee (2004) provides an earlier extensive examination of US investment in the PRC.

investment in the PRC by pointing out that US FDI in the PRC is not large, is not very export-oriented, does not replace investment elsewhere, and does not exploit increased technology levels in the PRC. The Japan-PRC relationship is examined in research such as Cassidy and Andreosso-O'Callaghan (2006), which identifies spatial determinants of Japan's FDI in the PRC.

Lipsey (2000) differs from the previously mentioned literature by focusing on the activities of US and Japanese manufacturing affiliates in East Asia rather than on FDI flows. He finds that US affiliates in East Asia were more export-oriented than were Japanese affiliates in East Asia in 1977, but that the US affiliates became less export-oriented over time while the Japanese affiliates became more export-oriented up to 1995. Since Lipsey's study used data from 1977 as a starting point, the focus of his study was on the four so-called newly industrializing economies—Hong Kong, China, the Republic of Korea, Singapore, and Taipei,China—and four members of the Association of South East Asian Nations (ASEAN)—Indonesia, Malaysia, the Philippines, and Thailand. His results for American and Japanese affiliates located in these other East Asian economics will be compared with our results for affiliates in the PRC later in this paper.

3. DESCRIPTIVE ANALYSIS OF FDI

We have collected available data from Japan, the PRC, and the US to assess the current state of FDI linkages across the three countries. The FDI data is organized first at the country level and then at the industry level. After examining the FDI data, we analyze data collected by the American and Japanese governments on the overseas activities of foreign-invested firms. This data includes industry-level employment and sales data for the multinational firms.

3.1 Country Analysis

We start the country-level FDI analysis with bilateral FDI data that allows us to examine the relative importance and trends of the three target countries in each other's FDI portfolios. Table 1 shows US FDI stocks abroad from 1982–2007 in the top row, followed by FDI shares by region or country destination in subsequent rows. The last three columns in the table show the average annual growth rates in FDI stocks by destination. By region, Canada has seen a major decline in its role as a destination for US FDI, with 20.9% in 1982 but only 9.2% in 2007. Europe experienced the largest percentage gains in US FDI stock shares, from 44.5% in 1982 to 55.6% in 2007, while Latin America and other Western Hemisphere countries increased from 13.6% to 16.9% and Asia and the Pacific rose from 13.6% to 16.3%, which were similarly modest increases. The PRC's share of US FDI stocks has grown from below 0.1% to 1.0%, while Hong Kong, China's share has increased from 1.4% to 1.7%. Combining the PRC's share of US FDI stocks with Hong Kong, China's share produces a 2.7% share total in 2007, which puts the PRC above four of the European countries listed but below six European countries, Canada, and Japan as a host of US FDI. The leading hosts of US FDI stocks were the United Kingdom with 14.3% and the Netherlands with 13.3% in 2007.

Table 1: US FDI Stocks Abroad by Destination, 1982–2007

Destination	**1982**	**1985**	**1990**	**1995**	**2000**	**2005**	**2006**	**2007**	Growth* 1982–1990	Growth* 1990–2000	Growth* 2000–2007
(Millions USD, historical-cost basis)											
All Economies Total	207,752	238,369	430,521	699,015	1,316,247	2,241,656	2,454,674	2,791,269	9.54	11.82	11.34
(Shares by destination, %)											
Canada	20.9	20.1	16.1	11.9	10.1	10.3	9.4	9.2	6.03	6.66	9.93
Europe	44.5	45.6	49.9	49.3	52.2	54.0	54.6	55.6	11.11	12.34	12.33
Austria	0.3	0.2	0.3	0.4	0.2	0.5	0.7	0.7	8.92	9.94	32.41
Belgium	2.7	2.4	2.2	2.7	1.4	2.2	2.1	2.0	6.90	6.62	17.16
France	3.6	3.3	4.5	4.8	3.2	2.7	2.5	2.5	12.65	8.32	7.00
Germany	7.4	7.2	6.4	6.3	4.2	4.5	3.9	3.8	7.52	7.23	9.88
Ireland	1.0	1.6	1.4	1.1	2.7	2.5	2.9	3.1	14.25	19.80	13.48
Italy	2.1	2.6	3.3	2.4	1.8	1.1	1.1	1.0	15.91	5.26	2.76
Luxembourg	0.5	0.3	0.4	0.8	2.1	3.6	3.9	4.1	5.59	32.29	22.24
Netherlands	3.3	3.2	4.4	6.0	8.8	10.7	11.4	13.3	13.88	19.70	18.11
Switzerland	6.2	6.7	5.8	4.5	4.2	4.5	4.7	4.6	8.71	8.23	12.68
United Kingdom	13.3	14.3	16.9	15.2	17.5	15.7	15.3	14.3	12.90	12.24	8.13
Latin America and Other Western Hemisphere Countries	13.6	12.8	16.6	18.8	20.3	16.9	17.4	16.9	12.34	14.08	8.50
Africa	3.1	2.6	0.8	0.9	0.9	1.0	1.0	1.0	-6.94	12.54	12.88
Middle East	1.7	1.9	0.9	1.0	0.8	0.9	1.0	1.1	1.37	10.62	15.27
Asia and Pacific	13.6	14.8	15.0	17.6	15.7	16.8	16.5	16.3	10.90	12.34	11.86
PRC	0.0	0.1	0.1	0.4	0.8	0.8	1.0	1.0	28.04	41.18	14.25
Hong Kong, China	1.4	1.5	1.4	1.7	2.1	1.6	1.7	1.7	9.86	16.32	8.13
Japan	3.1	4.0	5.2	5.3	4.3	3.6	3.8	3.6	17.07	9.71	8.58

*Growth indicates average annual growth rate of investment (not shares)

Notes: Balance of payments transactions (and associated positions) between parents and affiliates are recorded against the country of the foreign affiliate with which the US parent had a direct transaction even if the transaction may reflect indirect claims on, liabilities to, or income from indirectly held affiliates in third countries.

Source: Authors' analysis of data from the US Bureau of Economic Analysis (available http://www.bea.gov/international/index.htm#omc [accessed October 2008]).

As shown in the last three columns of Table 1, the PRC had the fastest growth for US FDI stocks in the 1980s and 1990s, with average annual growth rates of 28% and 41%, respectively. In part, this reflects the very low initial FDI stocks in 1982 (49 million USD) and in 1990 (354 million USD), the smallest of any of the individual countries listed. From 2000 to 2007, however, three other countries and one region recorded faster average annual growth in US FDI stocks than the PRC's growth of 14%. These countries and region are Austria at 32%, Luxembourg at 22%, the Netherlands at 18%, and the Middle East at 15%.

Data from the Bank of Japan provides Japan's FDI stocks abroad from 1996–2007, as shown in the top row of Table 2. Subsequent rows show the shares of Japan's FDI stocks by region or country of destination. By region, Asia's share of Japan's FDI stocks has declined from 30.6% in 1996 to 24.3% in 2007, while North America's share has declined from 37.8% to 33.6%. Western Europe has recorded the strongest share gains, from 18.4% to 26.7%, followed by Central and South America with a share increase from 4.6% to 10.0%. The Asia regional losses are concentrated mainly in Hong Kong, China and the ASEAN countries of Indonesia, Singapore, and Thailand. In contrast, the PRC's share of Japan's FDI stocks has more than doubled over the 11-year period from 3.1% to 6.9%. The only other country with a larger percentage increase in Japan's FDI stock shares is the Netherlands, with a jump from 3.3% to 11.7%. By 2007, Hong Kong, China and the PRC combined hosted 9.1% of Japan's total FDI stock abroad. Only the US (31.9%) and the Netherlands (11.7%) hosted larger shares of Japan's FDI.

Table 2: Japan FDI Stocks Abroad by Destination, 1996–2007

Region and Country	1996	2000	2002	2004	2005	2006	2007	Growth* 1996–2000	Growth* 2000–2007
(100 million yen)									
All Economies Total	299,986	319,933	364,776	385,808	456,054	534,760	618,584	1.62	9.88
(Shares by destination, %)									
Asia	30.6	17.7	19.1	20.6	22.7	23.9	24.3	-11.37	14.97
PRC	3.1	3.1	4.1	5.4	6.4	6.7	6.9	1.57	23.08
Taipei,China	1.6	1.3	1.2	1.7	1.7	1.7	1.7	-3.36	14.12
Republic of Korea	1.3	1.5	1.7	1.5	1.5	1.4	1.4	4.64	8.92
Hong Kong, China	3.6	2.3	1.8	1.8	2.1	2.4	2.2	-8.89	8.94
Singapore	4.4	3.2	3.4	3.0	3.0	3.2	3.2	-6.37	10.06
Thailand	6.1	1.7	2.1	2.7	3.0	3.3	3.6	-26.00	22.27
Indonesia	6.6	1.7	1.8	1.8	2.0	1.7	1.5	-27.61	8.04
Malaysia	2.2	1.4	1.3	1.1	1.2	1.7	1.5	-8.87	10.51
North America	37.8	49.7	46.1	39.5	40.2	36.3	33.6	8.80	3.90
US	36.5	47.5	44.6	38.3	38.7	34.8	31.9	8.55	3.79
Canada	1.4	2.2	1.6	1.3	1.6	1.5	1.8	14.88	6.09
Central and South America	4.6	7.5	5.9	7.2	8.5	8.7	10.0	14.82	14.40
Oceania	4.1	3.6	3.9	4.1	3.3	3.1	3.6	-1.08	9.62
Western Europe	18.4	20.3	23.7	27.4	23.8	26.4	26.7	4.15	14.27
Germany	1.6	1.5	1.5	1.9	1.6	1.6	1.7	-0.76	12.43
United Kingdom	7.9	7.8	8.6	7.2	6.3	7.0	5.9	1.49	5.43
France	0.6	1.1	1.8	3.5	2.9	2.9	2.3	19.04	21.81
Netherlands	3.3	6.0	7.5	9.8	8.9	10.1	11.7	18.27	20.91
Belgium and Luxembourg	2.3	1.4	2.1	2.7	2.2	2.4	2.9	-10.36	21.50
Eastern Europe and Russia	0.1	0.1	0.2	0.4	0.5	0.5	0.5	14.53	35.21
Middle East	0.4	0.3	0.3	0.3	0.4	0.5	0.6	-5.04	21.04
Africa	0.2	0.3	0.4	0.4	0.3	0.6	0.7	14.24	26.06

*Growth indicates average annual growth rate of investment (not shares).

Notes: From 2005 onwards, "Direct Investment/Liabilities/Equitiy Capital" includes capital reserves. From the end of 2006, the method for compiling the direct investment position has been changed. Refer to "Change in the Method for Compiling Direct Investment Position" (25 May 2007) (available http://www.boj.or.jp/en/type/release/nt_cr07/ntbop17.htm [accessed October 2008]).

Source: Authors' analysis of data from the Bank of Japan (available http://www.boj.or.jp/en/theme/i_finance/bop/index.htm#dip [accessed October 2008]).

The last two columns of Table 2 show the average annual growth rates of Japan's FDI stocks abroad in the late 1990s and 2000s. The PRC received most of its increase in FDI stocks from Japan during the 2000s, with average annual growth of 23%, just above Thailand's growth rate of Japanese FDI stock of 22%. The growth rate for Thailand comes after a period from 1996–2000 of FDI losses of 26% on average annually, probably due to the Asian financial crisis. Japan's FDI stocks in Hong Kong, China experienced a less severe decline of 8.9% on average annually during the late 1990s, then a similar average annual increase during the most recent seven-year period.

Having examined the FDI data from the perspective of the investing countries, we now turn to the host country perspective. The data for Table 3 is published by the PRC's Ministry of Commerce and is available for FDI inflows by investment source for a few major investors.[4] As seen in Table 3, the growth in FDI inflows into the PRC was particularly rapid during the 1990s, with average annual growth rates of almost 28%. Branstetter and Foley (2007) note that these statistics are heavily influenced by official restrictions on direct investments from Taipei,China that prompt investment routing through Hong Kong, China or tax havens such as the Cayman Islands, the preference among some advanced country investors to invest in the PRC through Hong Kong, China-based affiliates, and the likelihood that many other investments purportedly from Hong Kong, China are actually PRC investors seeking to qualify for preferential treatment offered to multinational enterprises. For these reasons, interpreting the statistics at the individual investor country level is somewhat suspect. The investment shares by country shown in Table 3 indicate that both Japan and the US have decreased in relative importance as investors in the PRC, with Japan's share falling from 11.7% to 6.6% between 1986 and 2006 and the US share falling from 14.5% to 9.4% during the same time period. However, for the reasons mentioned above, these shares may exclude other investment that occurred through Hong Kong,China or tax havens. From the PRC's perspective, the Japan and the US are behind only Hong Kong,China and the EU as reported sources of FDI inflows into the PRC.

[4] To parallel the Japanese and US data in Tables 1 and 2 we would like to have PRC data for FDI stocks, but we were not able to find the stock data by source countries across time, so we used the available data on FDI flows.

Table 3: The PRC's FDI Inflows by Investment Source, 1986–2006

Source	**1986**	**1990**	**1995**	**2000**	**2002**	**2004**	**2005**	**2006**	Growth* 1986-1990	Growth* 1990-2000	Growth* 2000-2006
(US$ millions in realized FDI value)											
Total	**2,244**	**3,487**	**37,521**	**40,715**	**52,743**	**60,630**	**72,406**	**69,468**	**11.65**	**27.86**	**9.31**
(Shares by Investment Source, %)											
Hong Kong, China	59.2	53.9	53.5	38.1	33.9	31.3	24.8	29.1	9.06	23.49	4.54
Taipei,China	NA	6.4	8.4	5.6	7.5	5.1	3.0	3.1	NA	26.30	-1.20
Japan	11.7	14.4	8.3	7.2	7.9	9.0	9.0	6.6	17.58	19.20	7.89
US	14.5	13.1	8.2	10.8	10.3	6.5	4.2	9.4	8.74	25.40	6.93
EU	8.0	4.2	5.7	11.0	7.0	7.0	7.2	9.8	-4.69	40.70	7.15
Others	6.6	8.0	15.9	27.4	33.3	41.0	51.8	42.0	17.27	44.64	17.40

NA = data not available.

*Growth indicates average annual growth rate of investment (not shares).

Source: Author's analysis of Ministry of Commerce of the PRC FDI statistics (available http://www.fdi.gov.cn/pub/FDI_EN/default.htm [accessed November 2008]).

In sum, the PRC has seen very strong growth in its FDI stocks from Japan and the US in recent years, but the growth has been from low initial values so the PRC still hosts only small portions of their worldwide investments. Both investing countries have larger stocks of FDI in each other than they have in the PRC as of 2007. Of the US FDI stocks in 2007, 2.8% was invested in the PRC, including Hong Kong, China while 3.6% was invested in Japan. For Japan's FDI stocks, an enormous 31.9% was invested in the US and only 9.1% was invested in the PRC, including Hong Kong, China. The PRC plays a larger role in Japan's FDI abroad than in the US FDI abroad, probably due in part to its closer proximity to Japan. The breakdown of FDI by industry may help explain these different patterns of investment, a topic covered in the following section.

3.2 Industry Analysis

Tables 4.1 and 4.2 show shares of US FDI flows by industry of affiliates for Japan and for the PRC for 1999–2007. The US FDI flows to Japan were dominated by the finance and insurance and information industries in 1999, with 44.0% and 22.6% shares, as shown in Table 4.1. By 2007, these industries contributed smaller shares of 21.0% and 7.7%, respectively, while holding companies contributed 59.1%.[5] The contributions of manufacturing industry affiliates to US FDI flows to Japan has fluctuated widely over the nine years, with a high of 36.6% in 2000 and a low of -385.6% (i.e., capital inflows from affiliates) in 2003. The large capital inflows recorded from affiliates in other manufacturing, chemicals, and primary and fabricated metals, along with depository institutions, may have been caused in part by the yen's appreciation in 2003. Overall, non-manufacturing affiliates received the vast majority of US FDI flows to Japan over the 1999–2007 period.

[5] The category holding company (nonbank) is included in the BEA industry breakdown from 2003 onward only. Borga and Mataloni (2001) describe the increased popularity of US FDI in holding companies and the impact of this trend on the BEA survey data in a technical note on pages 23-25.

Table 4.1: US FDI Flows to Japan, Shares by Industry, 1999–2007

	1999	2000	2001*	2002	2003	2004	2005	2006	2007
Food	0.4	-3.6	-0.6	0.2	1.2	0.5	-0.6	-0.3	0.2
Chemicals	2.3	-6.8	-12.5	5.9	-102.7	-3.8	16.3	3.2	-0.7
Primary and fabricated metals	0.1	-0.3	-0.5	-0.1	-28.3	2.0	0.7	0.0	-0.1
Machinery	2.1	5.4	-0.2	-1.5	19.7	-0.1	4.1	0.2	0.7
Computers and electronic products	3.4	13.5	17.0	4.6	39.9	0.8	6.3	8.6	2.0
Electrical equipment, appliances, and components	0.4	0.9	0.1	0.1	9.0	0.8	-2.0	0.6	0.4
Transportation equipment	2.2	19.0	8.7	1.7	7.6	1.7	4.6	0.7	0.2
Other manufacturing	(D)	(D)	(D)	(D)	-332.2	13.6	6.1	6.7	4.2
Manufacturing Total	**10.3**	**36.6**	**10.4**	**50.2**	**-385.6**	**15.4**	**35.6**	**19.7**	**6.9**
Mining	0.0	(D)	(D)	(D)	(D)	(D)	(D)	0.0	(D)
Wholesale trade	6.5	41.3	2.6	0.4	34.3	13.0	10.9	0.8	1.1
Information	22.6	0.5	-10.8	1.0	99.3	7.0	(D)	(D)	7.7
Depository institutions	1.4	0.9	3.1	-2.9	-49.3	-4.6	-5.4	-1.0	-0.7
Finance (excluding depository institutions) and insurance	44.0	9.8	140.4	41.0	338.4	43.8	46.3	53.4	21.0
Professional, scientific, and technical services	(D)	(D)	-23.7	6.7	96.2	9.0	-8.2	11.3	1.7
Holding companies (nonbank)	NA	NA	NA	NA	6.0	0.9	(D)	(D)	59.1
Utilities	0.0	0.0	0.0	0.0	NA	NA	NA	NA	NA
Other industries	(D)	(D)	(D)	(D)	(D)	(D)	(D)	13.4	3.2
Non-Manufacturing Total	**89.7**	**63.4**	**89.6**	**49.8**	**485.6**	**84.6**	**64.4**	**80.3**	**93.1**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

D = data suppressed to avoid disclosure of data from individual companies, NA = data not available.

Notes: Shares are based on capital outflow data reported without a current-cost adjustment; negatives represent capital inflows except for 2001 shares.

*The all industries total for 2001 is -4.7 billion USD so positive (negative) shares represent capital inflows (outflows).

Source: Authors' analysis of US Bureau of Economic Analysis data (available http://www.bea.gov/international/index.htm#omc [accessed October 2008]).

In contrast, US FDI flows to the PRC have tended to favor manufacturing industries, as shown in Table 4.2. The contribution has varied over the years with a high of 83.6% in 2001 and a low of 28.9% in 2005, but it rebounded to a 56.8% contribution in 2007. Among manufacturing industries, computers and electronic products and chemicals contributed the largest shares in 2007 with 25.9% and 12.9%, respectively. Among non-manufacturing industries, other industries (14.4%) and wholesale trade (13.2%) were the only industries with contributions above 6% in 2007.

Table 4.2: US FDI Flows to the PRC, Shares by Industry, 1999–2007

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Food	2.9	0.4	2.3	10.1	7.9	2.2	1.1	2.4	1.2
Chemicals	1.9	-2.6	-3.0	17.0	19.7	10.5	17.7	12.0	12.9
Primary and fabricated metals	2.4	-2.2	-1.0	-1.6	-1.2	1.4	6.8	8.2	3.4
Machinery	-4.1	1.7	0.4	7.1	0.5	2.9	-2.4	5.1	8.3
Computers and electronic products	33.2	65.8	40.8	-21.7	-37.2	25.2	0.5	13.8	25.9
Electrical equipment, appliances, and components	0.1	4.2	40.5	2.9	7.6	1.9	12.8	-0.9	0.9
Transportation equipment	20.3	0.9	-0.2	11.3	34.1	8.2	-19.3	9.7	0.8
Other manufacturing	NA	NA	NA	NA	6.0	20.4	11.6	10.6	3.3
Manufacturing—total	**64.8**	**73.3**	**83.6**	**51.3**	**37.4**	**72.8**	**28.9**	**61.0**	**56.8**
Mining	-2.6	23.9	28.5	-37.4	24.3	13.1	4.1	-17.7	0.1
Wholesale trade	6.8	5.6	8.7	25.9	29.5	0.9	23.1	4.9	13.2
Information	-0.2	1.7	-1.2	0.5	4.3	1.0	8.5	4.5	2.4
Depository institutions	-2.7	-0.1	4.8	18.7	6.8	2.9	8.2	22.6	1.6
Finance (excluding depository institutions) and insurance	-0.1	0.9	-2.8	(D)	(D)	1.0	8.8	-0.8	4.2
Professional, scientific, and technical services	10.4	-3.2	-6.4	23.0	2.4	2.9	1.4	3.2	2.1
Holding companies (nonbank)	NA	NA	NA	NA	-4.2	3.6	-2.0	8.5	5.3
Utilities	5.9	-1.3	-5.8	5.9	NA	NA	NA	NA	NA
Other industries	17.7	-0.7	-9.5	(D)	(D)	1.6	19.0	13.9	14.4
Non-Manufacturing Total	**35.2**	**26.7**	**16.4**	**48.7**	**62.6**	**27.2**	**71.1**	**39.0**	**43.2**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

D = data suppressed to avoid disclosure of data of individual companies, NA = data not available.

Notes: Shares are based on capital outflow data reported without a current-cost adjustment; negatives represent capital inflows.

Source: Authors' analysis of US Bureau of Economic Analysis data (available http://www.bea.gov/international/index.htm#omc [accessed October 2008]).

Tables 5.1 and 5.2 are comparable to Tables 4.1 and 4.2, but the focus shifts to Japan's FDI flows by industry for the PRC and the US for 1989–2004. As shown in Table 5.1, the manufacturing affiliates' share of Japan's FDI flows to the US varied over a relatively narrow range between 24% and 38%, except for a large jump to 60% in 2002 and 2003. This volatility reflects the influence of large investments made in particular years, specifically in electrical industries in 2002 and in chemical industries in 2003. Japanese investments in affiliates in the service, transportation, and real estate industries also appear to be particularly volatile from year to year.

Table 5.1: Japan's FDI Flows to the US, Shares by Industry, 1989–2004

Fiscal Year	1989	1990	1992	1994	1996	1998	2000	2002	2003	2004
Food	1.7	1.3	2.8	1.7	0.7	2.5	1.1	1.1	0.6	6.2
Textile	0.4	0.2	0.4	0.3	0.1	0.4	0.3	0.2	0.0	0.7
Lumber and pulp	0.4	0.3	0.2	0.0	0.9	0.3	0.1	0.1	NA	NA
Chemical	3.8	4.6	2.9	7.6	2.9	5.9	8.6	13.6	30.6	4.7
Metal	3.3	1.9	2.5	1.4	2.8	4.5	1.5	1.6	5.1	11.0
Machinery	1.7	2.6	2.2	4.9	2.0	2.9	6.1	4.6	2.5	2.1
Electrical	8.3	9.0	5.1	4.9	14.7	15.0	9.3	30.0	14.8	3.9
Transport	4.1	2.0	4.1	2.0	8.9	3.3	3.8	8.0	4.3	7.3
Others	3.5	2.5	7.1	3.8	4.2	2.3	1.3	0.9	2.2	2.0
Manufacturing Total	**27.1**	**24.3**	**27.4**	**26.6**	**37.0**	**37.2**	**32.1**	**60.0**	**60.2**	**37.9**
Farming and forestry	0.2	0.1	0.3	0.0	0.3	0.1	0.0	NA	NA	NA
Fishery	0.0	0.1	0.0	0.0	0.0	NA	0.3	0.2	NA	NA
Mining	0.5	0.7	0.5	0.2	1.4	0.7	0.6	1.8	0.2	0.8
Construction	0.9	0.6	1.3	0.7	0.7	1.5	0.5	0.0	0.4	NA
Trade	7.2	10.5	11.5	7.6	9.5	17.6	10.8	12.3	6.7	11.9
Finance and insurance	13.9	8.6	11.3	11.9	18.5	18.8	7.5	14.5	8.8	12.3
Service	22.0	32.8	31.4	27.2	10.8	8.6	6.3	4.0	8.5	18.1
Transportation	0.5	0.4	0.6	1.3	0.5	1.8	40.7	4.6	1.9	15.5
Real estate	26.4	21.8	15.7	24.3	21.2	13.7	1.1	2.4	13.1	3.4
Others	0.2	NA	NA	NA	NA	NA	NA	0.3	NA	NA
Non-Manufacturing Total	**71.9**	**75.5**	**72.5**	**73.3**	**62.9**	**62.8**	**67.8**	**40.0**	**39.7**	**62.1**
Branches	1.1	0.2	0.1	0.1	0.1	NA	0.1	0.0	0.0	NA
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

NA = data not available.

Source: Authors' analysis of data from Japan's Ministry of Finance, (available http://www.mof.go.jp/english/files.htm [accessed October 2008]).

Table 5.2: Japan's FDI Flows to the PRC, Shares by Industry, 1989–2004

Fiscal Year	1989	1990	1992	1994	1996	1998	2000	2002	2003	2004
Food	3.1	2.6	2.7	5.1	7.3	7.6	2.2	4.2	3.9	2.3
Textile	2.5	6.0	11.2	13.0	7.5	3.7	2.7	4.2	3.2	2.4
Lumber and pulp	0.3	0.4	0.3	0.4	1.6	0.7	0.5	1.2	0.2	1.2
Chemical	2.6	3.3	1.8	4.0	3.5	11.1	6.5	8.1	7.9	6.2
Metal	1.4	4.0	2.7	6.1	7.2	6.8	4.4	6.4	5.0	8.7
Machinery	9.8	14.5	4.7	5.1	11.3	8.3	8.5	8.9	11.2	9.4
Electrical	18.2	6.4	17.8	19.2	15.7	11.8	32.1	17.7	14.0	10.3
Transport	0.3	0.4	3.0	8.7	9.9	13.0	9.1	11.0	27.0	36.6
Others	8.9	8.8	16.4	10.8	7.9	12.3	10.7	17.8	5.7	5.7
Manufacturing Total	**47.0**	**46.4**	**60.7**	**72.4**	**71.9**	**75.3**	**76.8**	**79.5**	**78.1**	**82.8**
Farming and forestry	0.1	0.4	0.5	0.1	NA	NA	NA	NA	NA	NA
Fishery	1.3	1.3	1.2	0.3	0.2	NA	NA	NA	NA	0.1
Mining	1.1	5.6	0.2	NA	0.2	NA	NA	0.3	NA	0.0
Construction	0.9	2.1	0.7	3.0	2.4	5.9	0.3	0.5	4.6	NA
Trade	2.0	0.9	2.2	5.8	5.2	3.2	5.6	3.9	7.0	5.6
Finance and insurance	2.3	0.7	0.0	0.0	0.8	2.8	0.4	6.8	4.9	3.6
Service	40.1	38.9	20.5	8.0	10.1	7.0	15.0	1.8	2.3	3.0
Transportation	3.3	0.2	2.5	0.9	0.8	0.8	0.5	0.3	0.6	0.4
Real estate	1.9	2.8	6.1	5.4	6.9	3.3	1.3	0.2	0.4	0.3
Others	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Non-Manufacturing Total	**52.8**	**52.8**	**33.8**	**23.6**	**26.5**	**23.0**	**23.0**	**13.7**	**19.9**	**12.9**
Branches	0.2	0.8	5.5	4.1	1.6	1.6	0.2	6.8	2.1	4.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

NA = data not available.

Source: Author analysis of data from Japan's Ministry of Finance (available http://www.mof.go.jp/english/files.htm [accessed October 2008]).

Table 5.2 shows Japan's FDI flows to the PRC with shares by affiliate industry. Unsurprisingly, the recent shares for manufacturing industries are particularly high, 82.8% of total investments in 2004. This share has grown steadily over time, from only 47.0% in 1989. Among manufacturing industries, the transport sector had the largest FDI share in 2004 with 36.6%, up from 0.3% in 1989. The non-manufacturing industries have declined in importance as targets of FDI in the PRC, from 52.8% in 1989 to only 12.9% in 2004. The services sector saw the largest individual share decline, from 40.1% to 3.0% over the same time period.

The data in Tables 4.1–5.2 show more similarities than differences in Japanese and US investment flows. Both investing countries tend to make most of their investments in the PRC in manufacturing affiliates, while making most of their bilateral investments in each other in non-manufacturing affiliates. One difference is that US investment in Japan is more concentrated in non-manufacturing than is Japanese investment in the US, while Japanese investment in the PRC is more concentrated in manufacturing than is US investment in the PRC. The industries that have consistently played a major role in Japan-US investment flows are finance and insurance for US investments and finance and insurance, service, and real estate for Japan's investments. For the PRC, US investment flows to computers and electronic products affiliates and chemical affiliates have been consistently high, while Japan's investment flows in the electrical, machinery, and transport sectors have been noteworthy.

The PRC's total FDI stocks and shares by industry for 1996–2007 are shown in Table 6.[6] The National Bureau of Statistics of the PRC changed the industrial classification in its Statistical Yearbook from 2004, so we have divided the data into 1996–2003 and 2004–2007 periods. This division roughly matches with the PRC's pre-WTO and post-WTO entrance since the PRC officially joined the WTO on December 11 2001 and there were some lags in policy implementations. [7] Manufacturing's share of FDI was 57.9% in 1996, increased fairly consistently to a high of 63.2% in 2006, then fell back to 58.3% in 2007. Unfortunately, the PRC's statistics do not allow us to break down the manufacturing sector into individual industries to see where changes may be occurring. Real estate had 19.4% of the PRC's FDI stocks in 1996, but its share fell to 13.4% by 2007. Social services had 6.6% of FDI in 1996, but this industry category was discontinued from 2004. In 2007, the only sector besides manufacturing and real estate with more than a 5% share of FDI was leasing and business services with 5.2%.

[6] Again, to maintain consistency in this section, we would prefer to show FDI flows for the PRC, but we have not been able to find this data. The US data from the BEA is available for FDI flows and stocks by industry, but for Japan we have located only FDI flow data by industry.

[7] Rose (2004) and Baier and Bergstrand (2007) find evidence that the effects of WTO accession and PTA formation are best measured with lagged indicators.

Table 6: FDI Stocks in the PRC by Industry, 1996–2007

Sectors	1996	1998	2000	2002	2003	2004	2006	2007	Growth* 1996–2003	Growth* 2004–2007
	(100 million US$)									
National Total	2,898.0	3,137.1	3,372.0	4,020.0	4,657.8	5,579.9	7,406.0	9,211.5	7.01	18.19
	(shares by industry)									
Manufacturing Total	**57.90**	**57.21**	**58.91**	**61.77**	**62.14**	**63.14**	**63.21**	**58.28**	**8.10**	**15.07**
Agriculture, forestry, livestock and fishing	1.48	1.48	1.40	1.30	1.32	1.45	1.43	1.28	5.28	13.48
Mining	0.55	0.53	0.42	0.42	0.40	0.43	0.47	0.45	2.08	20.16
Production and distribution of electricity, gas, and water	2.82	3.61	3.39	2.99	2.76	2.74	2.63	2.56	6.70	15.42
Construction	2.43	2.79	2.38	1.96	1.97	1.67	1.59	1.48	3.86	13.42
Transport, storage, post and telecommunications services	2.40	3.00	3.50	4.22	4.96	4.52	2.48	2.43	18.70	-3.85
Information, computer services, and software	NA	NA	NA	NA	NA	1.96	2.58	4.33	NA	53.89
Wholesale and retail trade and catering services	4.13	3.91	3.48	2.91	2.82	3.66	3.96	4.37	1.37	25.34
Financial intermediation	0.43	0.38	0.39	0.40	0.46	0.52	0.41	1.55	8.06	69.94
Real estate	19.45	18.40	16.63	12.90	12.45	11.25	12.42	13.41	0.40	25.32
Health care, sports, social welfare, education, culture, and entertainment	0.81	0.66	0.54	0.49	0.47	1.12	0.99	0.83	-0.90	6.77
Scientific Research polytechnic services, water management, environment and public facilities	0.30	0.35	0.79	1.31	1.64	2.33	2.69	2.99	36.55	28.32
Social services	6.60	6.48	6.69	6.22	5.99	NA	NA	NA	5.55	NA
Services to households and other services	NA	NA	NA	NA	NA	1.51	0.66	0.46	NA	-20.30
Leasing and business services	NA	NA	NA	NA	NA	1.46	3.04	5.25	NA	81.07
Others	0.70	1.20	1.46	3.12	2.61	2.23	1.42	0.33	29.14	-37.16
Non-Manufacturing Total	**42.10**	**42.79**	**41.09**	**38.23**	**37.86**	**36.86**	**36.79**	**41.72**	**91.90**	**84.93**
TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

NA = data not available. *Growth indicates average annual growth rate of investment (not shares).
Notes: Odd numbered years, except end years, dropped from table due to space constraints.
Source: Authors' analysis of data from PRC's National Bureau of Statistics, PRC Statistical Yearbook, 1997–2008 editions (available: http://www.stats.gov.cn/english/statisticaldata/yearlydata/ [accessed January 2009]).

Of the 16 industry categories shown for the PRC's FDI stocks in Table 6, nine had faster average annual growth in the 2004–07 period than in the 1996–2003 period, while only three industries had slower growth (four industries had missing data that precludes a comparison across the two time periods). Of the three industries with slower growth in the 2004-07 period, two fell from rapid positive growth to negative growth, while one dropped from 36.5% to 28.3% average annual growth (scientific research, polytechnic services, water management, and environmental and public facilities). Transport, storage, post, and telecommunications service had 18.7% annual growth in the early period but -3.8% growth in the later period while "other had 29.1% annual growth followed by -37.2% growth. The industries with the fastest average annual growth rates were leasing and business services (81.1%), financial intermediation (69.9%), and information, computer services, and software (53.9%), all between 2004 and 2007. The first and last of these three industry categories were added from 2004. Two other industries with noteworthy increases in annual growth are wholesale and retail trade and catering services and real estate. Both jumped from 1% or less annual growth in the early period to 25% annual growth in the later period. FDI in mining also jumped from 2.1% to 20.2% average annual growth between the two time periods.

In sum, from the late 1990s up to the present, the majority of FDI stocks (57–63%) in the PRC have been in manufacturing industries, followed distantly by real estate with 11–19%. US FDI flows to the PRC have been less concentrated in manufacturing while Japan's FDI flows have been more concentrated in manufacturing, particularly in transport, electrical, and machinery industries in the most recent years. US investments in the PRC have included significant flows to wholesale trade industries and other service industries recently. To compare Japanese and US investments in the PRC in greater detail, we turn now to operating data collected directly from these countries' foreign affiliates.

3.3 Multinational Enterprise Activities Analysis

Both the US Bureau of Economic Analysis (BEA) and Japan's Ministry of Economy, Trade, and Industry (METI) conduct detailed surveys of their firms' international activities. One noteworthy difference across these two surveys is that the BEA survey is more comprehensive in its coverage since reporting is mandatory for participating firms while the METI survey is not mandatory and generally posts response rates between 60–80% of recipients. To improve the METI data, Matsuura (2004) uses the METI firm-level responses to create a panel data set and he estimates missing values in each year based on each firm's responses in other years. He then aggregates the responses to industry and country levels and posts the data on a website maintained by the Research Institute of Economy, Trade, and Industry (RIETI).[8] The most recent updates to the RIETI website (June 2009) provide data on the employment and sales activities of Japan's Majority-Owned Non-Bank Affiliates (JMONA). This data can be directly compared with BEA data on US Majority-Owned Non-Bank Affiliates (USMONA).

Tables 7 and 8 present employment statistics of USMONA and JMONA in the PRC for selected years between 1990 and 2005. USMONA employed only 13,600 workers in the PRC in 1990 but this number grew to 521,800 by 2005, as shown in Table 7. The growth in employment was particularly rapid in the 1990–95 period, with 43% average annual growth, followed by average annual growth rates of 25% in 1995–2000 and 16% in 2000–05. The industry breakdown indicates an early concentration in manufacturing—with 75% of employment in 1990—that became stronger in the mid-1990s—with 90% in 1995—but then has weakened in recent years to only 60%, as the shares of employment in non-manufacturing sectors have grown. At the

[8] See Tanaka (2009) for a description of the RIETI data.

individual industry level, USMONA in electrical equipment, appliances, and components employed 52% of the total USMONA workforce in the PRC in 1995. This industry grouping later broke out a separate computers and electronic products grouping which had 28% of the USMONA workforce in the PRC in 2000, while electrical equipment, appliances, and components employed 15%. The top individual industry employer in 2005 was other non-manufacturing with 29%, followed by computers and electronic products with 21%.

Table 7: Employment by USMONA in the PRC, 1990–2005

Sectors	1990	1995	1998	2000	2001	2002	2003	2004	2005	Growth* 1990–1995	Growth* 1995–2000	Growth* 2000–2005
(Employment in thousands)												
All Industries Total	13.6	80.9	175.5	252.0	273.0	316.7	338.9	459.9	521.8	42.9	25.5	15.7
(Shares by industry, %)												
Food	2.9	2.8	2.8	3.0	3.3	3.1	3.1	3.0	3.3	41.9	27.0	17.6
Chemicals	8.1	11.6	9.0	9.6	9.6	8.6	7.4	6.7	7.5	53.6	20.7	10.3
Primary and fabricated metals	2.2	2.2	2.2	3.2	2.9	3.3	3.5	2.8	2.9	43.1	34.8	13.7
Machinery	(D)	8.3	10.3	7.0	7.6	6.7	6.5	5.8	6.4	NA	21.4	13.7
Computers and electronic products	NA	NA	NA	27.8	26.8	22.2	20.6	21.4	21.5	NA	NA	9.9
Electrical equipment, appliances, and components	(D)	52.3	41.9	15.4	15.4	13.1	12.1	8.3	7.9	NA	-1.7	1.3
Transportation equipment	0.0	0.1	3.2	3.9	3.6	3.6	4.2	3.6	3.5	NA	150.2	13.1
Other manufacturing	2.2	12.7	10.1	6.9	6.4	5.7	6.9	8.5	8.2	102.8	11.2	19.5
Manufacturing Total	**75.0**	**90.0**	**79.6**	**76.8**	**75.5**	**66.3**	**64.3**	**60.0**	**61.2**	**48.2**	**21.6**	**10.5**
Mining	NA	NA	NA	0.4	0.6	0.4	0.5	0.2	0.2	NA	NA	3.7
Utilities	NA	NA	NA	0.2	G	H	0.8	0.4	G	NA	NA	NA
Wholesale trade	(D)	3.5	3.1	3.6	4.2	7.4	7.5	5.1	4.9	NA	26.3	23.2
Information	NA	NA	NA	0.8	1.1	1.2	1.2	1.7	1.7	NA	NA	34.5
Finance (excluding depository institutions) and insurance	0.0	0.6	0.5	G	0.4	G	G	H	H	NA	NA	NA
Professional, scientific, and technical services	NA	NA	NA	1.7	1.4	1.5	1.3	1.3	1.5	NA	NA	11.8
Other non-manufacturing	**NA**	**NA**	**14.6**	**K**	**K**	**21.8**	**L**	**M**	**29.5**	**NA**	**NA**	**NA**
Non-Manufacturing Total	**25.0**	**10.0**	**20.4**	**23.2**	**24.5**	**33.7**	**35.7**	**40.0**	**38.8**	**19.0**	**48.5**	**28.2**

D = data in the cell have been suppressed to avoid disclosure of data from individual companies.

Notes: *Growth indicates average annual growth rate of employment (not shares). Size ranges are given in some employment cells that are suppressed. The employment (not share) size ranges are: G, 1,000 to 2,499; H, 2,500 to 4,999; K, 25,000 to 49,999; L, 50,000 to 99,999; M, 100,000 or more. The composition of the other categories show in in this table may change from one year to another; industry breakdowns for 1990–98 data were based on SIC industry coding and were matched when possible to NAICS industry groupings for 1999 data on. Note that the computers and electronic products industry was separated from the electrical equipment, appliances, and components industry only from 1999 onwards.

Source: Authors' analysis of data from the U.S. Bureau of Economic Analysis (available http://www.bea.gov/international/index.htm#omc [accessed October 2008]).

The data for USMONA presented in Table 7 can be compared with the data from JMONA shown in Table 8. In the PRC in 1990, JMONA employed more than three times as many workers as USMONA. By 2005, JMONA had less than twice as many employees as USMONA (967,100 versus 521,800). The growth rates for JMONA employment in the PRC were particularly strong in the early 1990s, with 46% average annual growth. Interestingly, JMONA also increased their concentration in manufacturing between 1990 and 1995, from 80% to 92%, but unlike their US counterparts, the concentration in manufacturing employment remained very stable in the 92–94% range through 2005. In 1990 among individual industries, JMONA employed the most workers in other manufacturing (26%), computers and electronic products (19%), and electronic and other electric equipment (16%). Only one of these three industries, computers and electronic products, saw its share of JMONA employment in the PRC grow through 2005, to 30%, making it the largest industry in terms of employment in that year. The second largest industry in terms of employment in 2005 was transportation equipment with a 19% share, followed by other manufacturing with 12%. In the transportation equipment sector JMONA recorded a rapid average annual growth rate of 82% between 1990 and 1995, while the average annual growth rate for all manufacturing industries combined was 50% during that period. In manufacturing JMONA continued rapid employment growth in the PRC with average annual growth rates of 46% from 1995–2000 and 40% from 2000–2005.

Table 8: Employment by JMONA in the PRC, 1990–2005

Sectors	1990	1995	1998	2000	2001	2002	2003	2004	2005	Growth* 1990–1995	Growth* 1995–2000	Growth* 2000–2005
	(Employment in thousands)											
All Industries Total	44.5	292.0	464.7	543.6	581.5	680.2	829.1	913.1	967.1	45.7	13.2	12.2
	(Shares by industry, %)											
Food and kindred products	2.6	4.4	5.8	7.0	7.6	3.9	3.2	2.8	3.4	61.3	24.6	-3.2
Chemicals and allied products	3.9	5.0	4.0	4.0	3.9	3.8	3.4	3.5	3.3	53.5	8.0	8.0
Primary and fabricated metals	3.8	4.1	4.5	4.8	4.5	4.0	3.8	4.2	3.6	48.1	16.8	5.9
Industrial machinery and equipment	5.6	6.4	8.2	9.1	9.1	10.3	9.9	10.1	10.2	49.8	21.5	14.8
Electronic and other electric equipment	16.3	9.2	11.1	11.3	11.8	11.0	11.2	11.0	10.8	29.9	18.1	11.3
Computers and electronic products	18.6	25.6	27.0	28.7	27.4	33.2	30.3	29.9	29.9	55.3	15.8	13.1
Transportation equipment	2.6	8.0	8.2	8.1	9.3	9.9	16.5	17.5	18.7	82.4	13.3	32.8
Other manufacturing	26.4	29.5	24.4	21.2	19.0	16.8	15.1	13.9	12.4	48.9	6.0	0.9
Manufacturing Total	**79.7**	**92.2**	**93.2**	**94.2**	**92.6**	**92.9**	**93.3**	**92.9**	**92.3**	**50.0**	**46.2**	**39.7**
Non-Manufacturing Total	**20.3**	**7.8**	**6.8**	**5.8**	**7.4**	**7.1**	**6.7**	**7.1**	**7.7**	**20.3**	**6.7**	**18.8**

*Growth indicates average annual growth rate of employment (not shares).

Source: Author analysis of data from the Research Institute of Economy, Trade, and Industry (available http://www.rieti.go.jp/en/database/FDI2009/index.html [accessed June 2009])

The sales activities of USMONA and JMONA in the PRC can be compared using Tables 9 and 10. Table 9 shows the destination shares of USMONA in the PRC, with sales grouped by local sales, exports to the US, and exports to other countries for selected years from 1989–2005.[9] At the all industries level, in the PRC USMONA made 94% of their sales locally in 1989, but the local sales share fell to 78% in 1994 and then to 73% in 2005. Much of the shift in sales favored exports to other countries, with a rise in sales share from 5% to 19%, but exports to the US also had a rising share from less than 1% up to 8% of total sales. Manufacturing industries in aggregate show a similar decline in local sales share, from 88% in 1989 to 67% in 2005 and a corresponding rise in exports. At the individual manufacturing industry level, however, there is significant variation in the pattern of sales over time. USMONA in primary and fabricated metals reported local sales of 100% in 1989, 75% in 1994, back up to 97% in 1999, down to 88% in 2002, and then 73% in 2005. This industry showed the largest percentage point decline in local sales between 1989 and 2005, followed by the machinery sector with a local sales share decline from 82% to 64% over this period. Electrical equipment, appliances, and components also show a declining pattern of local sales, from 56% in 1994 to 39% in 2005, with sales shifting to favor exports to the US in 1999 and 2002, but shifting to favor exports to other countries in 2005. Only two industries, computers and electronic products and transportation equipment showed increases in their local sales share between 1999 and 2005, from 44% to 59% and 74% to 84%, respectively.

[9] The years 1989, 1994, and 1999 were chosen because the BEA conducted benchmark surveys in these years and final results from these surveys are available.

Table 9: Sales of USMONA in the PRC for Selected Years, 1989–2005

Sectors	Local Sales					Exports to US					Exports to Other Countries				
	1989	1994	1999	2002	2005	1989	1994	1999	2002	2005	1989	1994	1999	2002	2005
Food	NA	NA	97.8	83.7	90.8	NA	0.0	NA	1.6	0.7	NA	NA	2.2	14.7	8.5
Chemicals	93.6	92.7	89.2	90.3	88.0	2.1	0.4	0.6	0.5	2.5	4.3	6.9	10.1	9.3	9.5
Primary and fabricated metals	100.0	75.0	96.9	88.2	72.6	0.0	NA	1.0	NA	12.6	0.0	NA	2.1	NA	14.8
Machinery	82.4	NA	87.2	56.5	64.2	0.0	NA	4.1	5.9	8.1	17.6	2.9	8.9	37.7	27.7
Computers and electronic products	NA	NA	44.5	59.1	58.8	NA	NA	22.8	9.4	8.7	NA	NA	32.7	31.4	32.5
Electrical equipment, appliances, and components	NA	55.9	36.3	35.4	39.4	NA	21.5	43.4	41.2	25.3	NA	22.5	20.2	23.3	35.4
Transportation equipment	**(*)**	**(*)**	**74.3**	**NA**	**84.1**	**(*)**	**(*)**	**24.1**	**NA**	**4.0**	**(*)**	**(*)**	**1.6**	**8.2**	**11.8**
Manufacturing Total	87.6	75.4	63.1	66.1	67.4	0.8	10.6	16.3	9.2	8.2	10.7	13.9	20.6	24.7	24.4
Mining	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.0	39.6	8.7
Wholesale trade	100.0	75.6	94.8	89.9	88.9	0.0	0.3	5.0	3.3	4.9	NA	24.1	0.3	6.8	6.1
Information	NA	NA	100.0	NA	91.5	NA	NA	0.0	NA	6.2	NA	NA	0.0	0.0	2.3
Finance (excluding depository institutions) and insurance	(*)	89.9	NA	NA	NA	(*)	4.5	NA	NA	NA	(*)	5.6	NA	NA	NA
Professional, scientific, and technical services	NA	93.7	NA	NA	67.1	NA	0.8	NA	26.1	24.6	NA	5.6	0.2	NA	8.2
Utilities	NA	NA	100.0	100.0	100.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
Non-Manufacturing Total	**100.0**	**82.1**	**91.6**	**88.6**	**87.1**	**0.0**	**1.2**	**4.2**	**4.5**	**8.0**	**0.0**	**16.8**	**4.2**	**7.0**	**4.9**
All industries	**94.2**	**78.1**	**70.2**	**73.0**	**73.2**	**0.4**	**6.8**	**13.3**	**7.7**	**8.1**	**5.1**	**15.1**	**16.5**	**19.3**	**18.6**

NA = data not available due to disclosure concerns based on very small numbers of affiliates reporting or due to changes in industry classifications, * = zero total sales for this industry.

Notes: Years 1989, 1994, and 1999 are BEA survey benchmark years with final results available.

Source: Authors' analysis of data from the Bureau of Economic Analysis, U.S. Direct Investment Abroad: Balance of Payments and Direct Investment Position Data (available http://www.bea.gov/international/di1usdbal.htm [accessed November 2008]).

Unsurprisingly, among the non-manufacturing industries shown in Table 9, we see quite high local sales ratios over the entire time period since most of these industries are services. Unfortunately, many of the observations for individual industries are either not available, due to changes in industry classification, or suppressed due to disclosure concerns with small numbers of affiliates reporting. One interesting change is the decline in local sales for professional, scientific, and technical services from 94% in 1994 to 67% in 2005. For this industry, sales shifted to strongly favor exports to the US, which increased from less than 1% of sales in 1990 up to 25% in 2005. However, USMONA in these services industries contribute only a small share of the total sales by USMONA in the PRC. The total sales for USMONA in the PRC in these services industries were 914 million USD in 2005, approximately 1% of total sales for all USMONA in the PRC.

Table 10 shows the distribution of sales by JMONA in the PRC for selected years between 1989 and 2005. The sales shares suggest that in 1989 in the PRC JMONA were more export-oriented than USMONA. Half of JMONA sales went to export markets while only 6% of USMONA sales were exported. By 2005, 44% of JMONA sales were exported versus 27% for USMONA. For JMONA, the destination of their exports changed to favor Japan, which increased its share from almost 10% in 1989 to 24% in 2005. The share of sales exported to other countries fell from 40% to 19% over the same time period. The share of JMONA sales going to the local PRC market increased slightly, from 50% in 1989 to 56% in 2005. Comparing the manufacturing industry totals across JMONA and USMONA shows a similar pattern of very divergent patterns in 1989 but some convergence over time. In manufacturing in 1989 JMONA were export-oriented, with 53% of their sales exported, while USMONA were strongly oriented towards the local market, with only 12% of their sales exported. Over time, in manufacturing JMONA become somewhat less export-oriented (46% of sales exported in 2005) while USMONA become more export-oriented (33% of sales exported in 2005).

Table 10: Sales of JMONA in the PRC for Selected Years, 1989–2005

Sectors	Local Sales					Exports to Japan					Exports to other countries				
	1989	1994	1999	2002	2005	1989	1994	1999	2002	2005	1989	1994	1999	2002	2005
Food and kindred products	99.1	60.8	76.4	73.7	73.3	0.0	38.3	22.2	24.9	20.4	0.9	1.0	1.4	1.4	6.2
Chemicals and allied products	87.2	17.8	63.3	58.9	78.6	12.6	81.6	27.9	34.8	14.8	0.2	0.5	8.8	6.3	6.6
Primary and fabricated metals	91.9	21.8	73.4	78.4	72.3	8.1	34.8	18.5	14.7	11.8	0.0	43.4	8.1	6.9	15.8
Industrial machinery and equipment	96.4	10.7	43.9	43.6	47.0	3.1	30.1	25.4	34.6	32.2	0.5	59.2	30.7	21.8	20.7
Electronic and other electronic equipment	20.6	59.5	55.5	49.8	47.9	39.7	10.3	25.0	32.5	35.7	39.6	30.2	19.5	17.7	16.4
Computers and electronic products	11.1	18.2	31.3	30.9	33.0	3.4	24.1	26.0	31.6	33.2	85.4	57.7	42.7	37.6	33.8
Transportation equipment	NA	82.3	80.5	84.7	69.5	NA	3.7	10.9	9.6	26.0	NA	14.0	8.6	5.7	4.6
Other Manufacturing	37.3	26.0	41.4	50.1	52.1	52.1	59.6	46.8	42.0	38.1	10.7	14.3	11.8	7.9	9.7
Manufacturing Total	**46.8**	**37.4**	**50.0**	**51.3**	**53.6**	**14.3**	**30.3**	**26.1**	**28.9**	**29.6**	**38.9**	**32.3**	**23.9**	**19.7**	**16.8**
Non-Manufacturing Total	**56.0**	**31.9**	**45.1**	**61.1**	**63.3**	**1.5**	**12.7**	**23.0**	**17.8**	**10.4**	**42.5**	**55.4**	**31.9**	**21.0**	**26.3**

NA = data not available due to disclosure concerns based on very small numbers of affiliates reporting.

Notes: The manufacturing total for 1989 is calculated by treating the NAs for sales in transportation equipment as zeroes.

Source: Authors' analysis of data from RIETI (available http://www.rieti.go.jp/en/database/FDI2009/index.html [accessed June 2009]).

Looking at the individual industries in Table 10 shows significant variations over time. Among the manufacturing industries, electronic and other electrical equipment and computers and electronic equipment are the most important industries in terms of sales. Their sales pattern is extremely export-oriented initially but becomes less export-oriented over time. Electronic and other electrical equipment exported 79% of their sales in 1989 and computers and electronic equipment exported 89%, but these export numbers drop to 52% and 67%, respectively in 2005 as local sales grew, from 20.6% to 47.0% for electronic and other electrical equipment and from 11.1% to 33.0% for computers and electronic equipment. Among exports, the electronic and other electrical equipment industry maintained a fairly stable share of sales exported to Japan—40% in 1989 and 36% in 2005—while the share exported to other countries dropped from 40% to 16%. In the computers and electronic equipment industry, exports to Japan grew—from 3% in 1989 to 33% in 2005—while exports to other countries declined precipitously, from 85% to 34% in the same time period. Some of the other manufacturing industries showed the opposite trend, moving from selling the vast majority of their products in the local market to exporting significant shares.

The sales shares in Tables 9 and 10 indicate that in the PRC JMONA had a much stronger export-orientation relative to USMONA in 1989, but this gap has lessened in more recent years. Interestingly, Lipsey (2000) found a similar trend towards convergence but from opposite starting points when he examined Japanese and US manufacturing affiliates in other East Asian economies using data from 1977–1995. He found that US affiliates in East Asia tended to be more export-oriented than their Japanese counterparts in 1977. The US affiliates on average became slightly less exported-oriented between 1977 and 1995—with export shares of total sales falling from 57% to 54%—while Japanese affiliates became more export-oriented—with export shares that grew from 33% to 44%. The differences between our results and Lipsey's (2000) results suggest that Japanese and US multinationals have approached their investments in the PRC differently than they approached investments in other East Asian countries previously. At the individual industry and country level, Lipsey (2000) noted a lot of variance in export shares between 1977 and 1995 and more recent data on JMONA and USMONA activities in other East Asian economies confirms significant variance in export share levels and time trends.[10] Further comparisons of JMONA and USMONA activities in other East Asian economies versus their activities in the PRC will be deferred to future research.

4. CONCLUSIONS

We have analyzed the foreign direct investment (FDI) relationships between Japan, the People's Republic of China (PRC), and the United States (US) with available statistics from all three countries. At the country-level, Japanese and American investments in the PRC have grown very rapidly in recent years, but from low initial levels, so these investments in the PRC still represent less than 10% of outstanding FDI stocks for Japan and less than 3% for the US, even with Hong Kong, China investments included. Bilateral investment linkages between Japan and the US are stronger, with the US holding about 32% of Japan's FDI stocks and Japan holding almost 4% of US FDI stocks. From the PRC's perspective, Japan and the US fall behind only Hong Kong, China as sources of FDI inflows, with Hong Kong, China contributing almost 30%, while Japan and the US contribute about 7% and 9%, respectively, but these statistics are suspect due to "creative accounting" practices mentioned previously (Branstetter and Foley 2007).

At the industry level, US FDI flows to the PRC have been less concentrated in manufacturing than average for investors in the PRC while Japan's FDI flows have been much more concentrated in manufacturing, particularly in transport, electrical, and machinery industries

[10] Updated tables to match those in Lipsey (2000) are available by contacting the authors.

in the most recent years. US investments have included significant contributions from wholesale trade industries and other service industries in recent years, along with large FDI flows in both the computers and electronic products and chemicals industries. This difference in the industry distribution of FDI flows matches fairly well with the industry distribution of affiliate employment. US affiliates in other non-manufacturing industries and in computers and electronic products industries together employed half of the total workforce of US affiliates in the PRC in 2005, while Japanese affiliates in the computers and electronic products and transportation equipment industries together employed almost half of their workforce total in the PRC.

The differences in industry distribution of affiliates help to explain the observed differences in sales destinations of American and Japanese affiliates in the PRC at the aggregate level. American affiliates made the vast majority of their sales (73%) in the PRC's market while Japanese affiliates made just over half of their sales (56%) locally in 2005. The gap narrows if we focus on only manufacturing industries: 67% local sales for US affiliates versus 54% local sales for Japanese affiliates in 2005. We also observe a trend towards convergence as US manufacturing affiliates have moved from a local sales share of 88% in 1989 towards more export sales, and their Japanese counterparts have moved from a local sales share of only 47% towards more local sales. Some of the recent trends in the fragmentation of production and the possible differences between American and Japanese affiliates in their participation therein, as described in Dean, Lovely, and Mora (2009), may help in interpreting these sales trends. Lower trade costs associated with closer proximity to the PRC may prompt Japan’s multinationals to locate processing plants in the PRC. These plants use imported intermediate inputs from Japan to produce final manufactures primarily for export. Higher trade costs may lead US multinationals to invest in the PRC as a substitute for exporting to the PRC, with affiliate sales primarily targeted at the local market. These different strategies for FDI in the PRC based on proximity differences may become less important over time as the PRC’s economic growth, market development, and continuing trade liberalization become more important factors driving the behavior of foreign affiliates located in the PRC. Testing this hypothesis more fully would require foreign affiliate data from more than just Japan and the US, which we leave for future research.

REFERENCES

Baier, S. L., and J. H. Bergstrand. 2007. Do Free Trade Agreements Actually Increase Members' International Trade? *Journal of International Economics* 71: 72–95.

Borga, M., and R. J. Mataloni, Jr. 2001. Direct Investment Positions for 2000: Country and Industry Detail. *Survey of Current Business* 81: 16–25.

Branstetter, L., and C. F. Foley. 2007. Facts and Fallacies about U.S. FDI in China. National Bureau of Economic Research (NBER) Working Paper 13470. Cambridge, Massachusetts: NBER.

Cassidy, J. F., and B. Andreosso-O'Callaghan. 2006. Spatial determinants of Japanese FDI in China. *Japan and the World Economy* 18: 512–527.

Dean, J. M., M. E. Lovely, and J. Mora. 2009 (forthcoming). Decomposing China-Japan-U.S. Trade: Vertical Specialization, Ownership, and Organizational Form. *Journal of Asian Economics*.

Fung, K. C., L. J. Lau, and J. S. Lee. 2004. *U.S. Direct Investment in China*. Washington, DC: American Enterprise Institute Press.

Gu, W., T. O. Awokuse, and Y. Yuan. 2008. The Contribution of Foreign Direct Investment to China's Export Performance: Evidence from Disaggregated Sectors. Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Orlando, Florida.

Horstmann, I., and J. Markusen. 1992. Endogenous Market Structures in International Trade. *Journal of International Economics* 32: 109–129.

Helpman, E. 1984. The Factor Content of Foreign Trade. *Economic Journal* 94: 84–94.

Lipsey, R. E. 2000. Affiliates of U.S. and Japanese Multinationals in East Asian Production and Trade. In *The Role of Foreign Direct Investment in East Asian Development*, edited by T. Ito and A. O. Krueger. Chicago, Illinois: University of Chicago Press.

Matsuura, T. 2004. Estimating Economic Activity, Sales, and Procurements of the Overseas Affiliates of Japanese Multinational Firms (in Japanese), *Keizai Toukei Kenkyu*, 32(4): 1-16.

Mundell, R. 1957. International Trade and Factor Mobility. *American Economic Review* 47: 321–335.

Rose, A. K. 2004. Do We Really Know that the WTO Increases Trade? *American Economic Review* 94: 98–114.

Tanaka, K. 2009. Vertical Foreign Direct Investment: Evidence from Japanese and U.S. Multinational Enterprises, Global Center of Excellence Hi-Stat Discussion Paper Series 046. Tokyo: Hitotsubashi University.

Xing, Y. 2007. Foreign Direct Investment and China's Bilateral Intra-Industry Trade with Japan and the US. *Journal of Asian Economics* 18: 685–700.