Patterns of OFDI: Comparing Japan's and China's Emergence on the Global Scene

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Abstract: This paper compares patterns of outward foreign direct investment (OFDI) for Japan and China over similar periods of their integration into the global economy. From a statistical perspective, China's recent pattern of OFDI flows (2004 to 2010) differ from Japan's OFDI flows during a similar period of growth and emergence onto the world scene (1976 – 1982).   While acknowledging that the world economy is a much different place today than it was in 1982, we nevertheless argue that these differences in OFDI flows constitute an important component in any understanding of the nature of development followed by these two important Asian economies.

JEL classifications: F2, F3

Keywords: China, Japan, OFDI

1.   **Introduction**

The three and one-half decades from 1976 to 2010 witnessed the emergence of two

important Asian economies – Japan and China – onto the world scene in distinct episodes.

During roughly the first half of this period, Japan's gross domestic product as a percentage

of world gross domestic product grew from about 10% to 18%. During the second half of the

period, China's aggregate output similarly grew in international importance – from only

about 2% of world GDP to almost 10%. There are both similarities and difference in these

two cases; this paper focuses on one area specifically – outward foreign direct investment

(OFDI). A full understanding of OFDI flows is important to any discussion about the paths

of development followed by these two important Asian economies.

We focus specifically on two seven-year periods – 1976 to 1982 for Japan and 2004 to

2010 for China. We contend that these periods represent similar points in the trajectories

of these two economies as their relative importance to the world economy grew. A simple

comparative analysis using a gravity model indicates that the nature of their OFDI was

different during these periods of significant growth. Section 2 summarizes this comparison,

while section 3 explores theories explaining the observed differences and offers some

conjectures about the future pattern of Chinese OFDI. Section 4 offers some general

conclusions.

2.   **Preliminary Comparisons**

Tables 1 and 2 compare patterns of OFDI flows by geographic region for Japan and China

over the two relevant time periods. Three features stand out. First, China's OFDI to Hong

Kong dominates its overall OFDI during this period. Second, Japan's growth in OFDI

progressed at a steadier rate than did China's, which exhibits a notable jump from 2006 to

2007. Third, there are clear differences in the composition of these two countries' OFDI

over these periods. For example, Japan's flows to North America between 1976 and 1982 were a far more important component of its OFDI (ranging from 24.9% to 41.1%) than were China's between 2004 and 2010 (ranging from 3.7% to 15.4% of its non-Hong Kong OFDI).[1] Futhermore, almost 36% of China's OFDI between 2004 and 2010 went to Africa and Oceana, while for Japan between 1976 and 1982 the comparable figure was about 12%. Of course, this difference could be due, in part, to the increasing relative importance of these areas to the global economy since the 1980s. Nevertheless, such differences raise interesting questions about the nature and causes of OFDI for these two economies during similar periods of emergence onto the global scene.

   To further investigate the nature of possible differences in the patterns of OFDI flows, we fit the two country's respective OFDI data to a gravity model, simplifying an approach employed in previous research on related subjects (Cheng and Ma, 2007). In traditional use, a gravity model analysis posits that bilateral trade flows between two countries, i and j, $F_{i,j}$ are based on the economic sizes of (M_i and M_j measured as GDP values) and distance between ($D_{i,j}$) the two economies. The functional relationship takes the form:

$$F_{ij} = G\frac{M_i M_j}{D_{ij}}$$

When expressed in natural logs, this relationship takes the form:

$$lnF_{ij} = C + lnM_i + lnM_j - lnD_{ij}$$

where the constant term, C, replaces lnG.   In our analysis, one of the economies in the model is always either Japan or China; hence we exclude M_i from the model when

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[1] The data also show that a larger proportion of China's OFDI to North America went to Canada, compared to Japan's over the relevant period, whose North American OFDI was dominated by OFDI to the United States.

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estimating parameters. Looking solely at China's OFDI, Cheng and Ma (2007, specific page #), fitted a similar regression based on the gravity model:

$$\log(FDI_{i,t}) = \alpha + \beta_1 \cdot \log(GDP_{i,t}) + \beta_3 \cdot \log(PGDP_{i,t}) + \beta_2 \cdot \log(dist_i) + \beta_4 \cdot Chineselang_i$$
$$+ \beta_5 \cdot Border_i + \beta_6 \cdot Landlock_i + \beta_7 \cdot Island_i + \beta_8 \cdot Dummy_t$$

where FDI_{it} stands for China's FDI flow to (or FDI stock in) economy i in year t, $GDPit$ and $PGDP_{it}$ stand for the host economy's real GDP and per capita real GDP, respectively; $dist_i$ stands for the distance between the economy's capital and Beijing, $ChineseLang_i$ is a dummy variable for the use of the Chinese language, $Border_i$ stands for its sharing a common border with China, $Landlock_i$ indicates that it is a landlocked economy's, and $Island_i$ indicates that it is an island economy.

Our preliminary analysis indicated that the additional variables added little explanatory value to the basic model, so we fit our data to a parsimonious version of a gravity model, with only the distance between the two countries and the partner county's GDP as right-hand side variables. For both countries, our data are a balanced panel of annual data ($n = 65$, $t = 7$ for Japan, $n = 58$, $t = 7$ for China). The source of OFDI data in both cases are official government published statistics (see note to Table 1). For GDP, we use IMF annual data. We employed two estimation strategies: period fixed effects and period fixed effects with random cross section effects.[2]

1) The first specification, with fixed effects in period and no effects in cross-sections, involves estimation of the following equation:

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[2]In selection of estimation strategies, we employed a Hauseman Test (which tests the validity of the assumption of random effects), and Redundant Fixed Effects – Likelihood Ratio Test (which tests the validity of the assumption of fixed effects). Two conclusions led to our use of the estimation strategies reported here:
  1) The p-value of the null hypothesis of fixed effects in period being redundant was 0.0000, so we reject the null at 1% level. Therefore the assumption of peiod fixed effects seems valid.
  2) The p-value of the null hypothesis of the existence of random effects in cross-section was 0.068, so we can only reject the null at 10% level. As a result, there may be some random effects in cross-sections.

$$\log\left(OFDI_{i,t}\right) = \beta_0 + \tau_t + \beta_1 \cdot \log\left(GDP_{i,t}\right) + \beta_2 \cdot \log\left(dist_i\right) + \mu_{i,t}$$

where τ_t is the dummy variable for fixed effects in period (LSDV model).

2) The second specification, with fixed effects in period and random effects in cross-sections, involves estimation of the following equation:

$$\log\left(OFDI_{i,t}\right) = \beta_0 + \tau_t + \beta_1 \cdot \log\left(GDP_{i,t}\right) + \beta_2 \cdot \log\left(dist_i\right) + v_i + \mu_{i,t}$$

$w_{i,t} = v_i + \mu_{i,t}$, where $v_i \sim IID\left(0, \sigma_v^2\right)$ and $\mu_{i,t} \sim IID\left(0, \sigma_\mu^2\right)$. In this specification the v_i are assumed to be independent of $\mu_{i,t}$ and $\log\left(GDP_{i,t}\right)$ which are also independent of each other for all i and t. The components of $Cov\left(w_{i,t}, w_{j,s}\right) = E\left(w_{i,t}, w_{j,s}\right)$ are $\sigma_v^2 + \sigma_\mu^2$ if i=j and t=s and σ_v^2 f $i = j$ and $s \neq t$.

Tables 3 and 4 present these results. Turning first to the estimation results on Chinese OFDI data, it seems reasonable to conclude that the host economies' GDP is positively related to OFDI, while the distance between China and the economy exerts a negative impact on attracting China's OFDI. These results correspond to a priori expectations of a gravity model. Although the overall explanatory value of the model, as measured by the R^2 (0.2933 in Model 1 and 0.3602 in Model 2, respectively) seems low, it is somewhat higher than similar estimation results in Cheng and Ma (0.2816 fin their Table 3). Furthermore, the parameters are estimated with a high degree of precision, with all of the estimators statistically significant at 1% level of confidence.

Turning next to the estimation results on Japan's OFDI, the results seem to indicate that Japan's OFDI flows during the relevant period were much less dependent on the size and distance of a partner economy. Nevertheless, the parameters do have the expected signs, and are estimated with a high degree of precision. Table 5 presents a two-sample test of means to testing the hypothesis that the estimators from Japan's and China's regression models are statistically equal. According to the decision rules shown in the table, we rejected the null hypothesis on all the estimators. Thus these tests are consistent with a

view that China's recent pattern of OFDI flows differs considerably from Japan's period of export-oriented growth.

3.   Discussion of Differences

We speculate first on the factors influencing China's OFDI. Since China is a developing country that has historically and generally been short of capital and foreign exchange, its outward FDI deserves some explanation. Because China is itself a low-cost production base, cost minimization is not a major motivation of China's FDI overseas. Other possible influences on China's OFDI include support of market expansion; securement of sources for inputs, including natural resources; technological and brand asset seeking; and furtherance of government objectives. Early thinking on the subject focused on the first two of these factors (Zhan, 1993; Zhan, 1995; McDermott and Huang, 1996).

Market expansion. According to the analysis from UNCTAD , Chinese firms that export are investing abroad either to support their exports, to service their markets through OFDI, or to expand their market presence. In international markets that China has considerable trade surpluses with (e.g. the United States), OFDI may increasingly become an alternative vehicle to supply those markets. As part of such a strategy, Chinese firms are also buying local distribution networks. Moreover, as the UNCTAD also pointed out, sluggish domestic demand in China and excess industrial productive capacity since the late 1990s in certain industries (especially in machinery and electronic appliances) have encouraged Chinese firms to look for growth opportunities abroad (E-brief, 2003, 5).

Natural resources. As China is a developing country with an average annual GDP growth rate of approximately 10%, it requires a large amount of natural resources to maintain the fast pace of growth. The need for dependable access to natural resources abroad has become stronger, which has encouraged Chinese firms to invest in oil, gas and mining activities in resource-rich countries. The 2007 United

Nations report, for example, stated that China is one of the major capital providers for developing countries in Africa (UNCTAD, 2007). The intention of China's acquisitions of operations in the area of natural resources have drawn considerable attention from the media and policians.

Overseas technological and brand assets seeking. Part of China's OFDI that is made by Chinese multinational corporations (MNCs) has flown into developed countries, and its absolute value keeps rising. The motives for such investment include access to technology and other strategic assets such as brand names, as well as access to different markets. The aspiration to go abroad to build or acquire international brand assets and advance product development has also become a major factor in multinational operations. With growing financial reserves, Chinese MNCs have gone on a buying spree abroad to acquire assets whose prices may have been depressed by the current global economic downturn. Related examples are acquisitions made by companies such as Lenovo and TCL, which have been mentioned in the previous section.

Governmental encouragement policies. The government has encouraged Chinese firms to invest abroad to secure the supply of resources to meet the growing demand at home and to transfer matured technologies in which Chinese firms have a comparative advantage (e.g. electronics, textile and garment processing industries). The Chinese government has also supported small and medium-sized Chinese enterprises as they expanded into international markets. Provincial administrations such as Guangdong and Shanghai have also actively encouraged their domestic enterprises to invest abroad. The Ministry of Commerce has already implemented policy measures, including a relaxed approval system for outward FDI. As of December 2002, China had signed bilateral investment treaties with 103 countries and double-taxation treaties with 68 countries in order to facilitate its OFDI abroad. The Export-Import Bank of China, through its financing facilities, has also played an important role in supporting Chinese outward investment. Other measures to encourage Chinese firms to invest abroad include easier access to loans from commercial banks, foreign exchange rate manipulation and preferential policies such as corporate income tax exemption (E-brief, 2003, 6).

From statistical perspective, China's recent pattern of OFDI flows differs a lot from a period of Japan's export-oriented growth that, in other respects, looks comparable. The results may due to several reasons. First, unlike Japan, China doesn't have a fully opened economy because of its capital control policy, and this may have imposed restrictions on the direction and amount of outward investment. Besides, Japan's manufacturing sector (e.g. autos, electronics) accounted for a large portion of its OFDI during the period. One interpretation of this phase of Japan's development might focus on the fact that Japan's labor cost during the 1980s were already quite high relative to its export partners. Japan, unlike China, was not a low-cost production base. Hence China focused its investment more on other sectors such as business services and banking because it did not need to diversify its manufacturing base internationally as labor cost advantages disappeared.

Moreover, other reasons such as cultural and political issues may have also affected the patterns of OFDI growth of these two countries. Since 1979, the government has encouraged Chinese firms to invest abroad, as part of its "Open Policy". This type of outward investment was viewed as an important means of securing the supply of resources to meet the growing demand at home, strengthening economic relations with neighboring countries, and transferring matured technologies in which Chinese firms have a comparative advantage (e.g. electronics, textile and garment processing industries). The Chinese government has also supported small and medium-sized Chinese enterprises as they expanded into international markets. Provincial administrations such as Guangdong and Shanghai have also actively encouraged their domestic enterprises to invest abroad. The Ministry of Commerce has already implemented policy measures, including a relaxed approval system for outward FDI (E-brief, 2003, 6). On top of this, in order to prevent excessive capital outflows at the expense of domestic investment, the Chinese government has taken actions controlling the direction of OFDI. For instance, as Zhan stated, the Government "favored investments in kind (equipment, know-how and raw materials) to avoid excessive capital outflows". The government also encouraged resource and market-seeking OFDI as they would

generate benefits for the domestic economy (Zhan, 1995, 3). Unlike the fact that China's outward investment has always been part of the government's development scenario, Japan's OFDI growth was primarily driven by the independent wills of each Multi-National Company, which might have caused the difference of the OFDI patterns of the two countries.

As we also mentioned in section II, Japan's flows to North America between 1976 and 1982 were a huge component of its OFDI, while China's OFDI mainly flowed into Hong Kong during recent years. As for Japan, we speculate (as have others) that this pattern of OFDI emerged in response to rising calls in its exporting markets to raise barriers to imports from Japan. For Japan, OFDI was a means of forestalling an outright protectionist response to its exports. In China's case, government promoted FDI in Hong Kong out of a belief that these investments would build confidence in the economic future of Hong Kong (Zhan, 1995, 4). Besides, the large Chinese MNCs favor investing in Hong Kong as it can serve as a springboard for further investment abroad (with its geographical proximity and easy trading policy).

For an important period in its economic development, China's pattern of OFDI exhibited interesting differences from Japan's pattern of OFDI over a similar period. In this respect, the two country's emergences on the global scene were notably different, and these differences shed light on the patterns of development followed by these two important Asian economies. Overall, one might expect that China's OFDI will continue to grow in the future, and it's possible that China's pattern of OFDI flows will take on features more like that of Japan's period of export-oriented growth as liberalization of capital movements continues, and as labor cost differentials between China and its trading partners diminish.

4.   Summary

We believe that our investigations here are generally consistent with a view that China's pattern of OFDI differs in many respects from Japan's pattern of OFDI during what may be characterized as its emergence on the global scene. Certainly access to foreign markets is one explanatory factor, but ensuring a stable

supply of resources (Zhan, 1995; McDermott and Huang, 1996) and geopolitical factors (Wang, 2002) may also play a more important role than was the case for Japan. We believe our investigations and analysis here are consistent with these views and provide an additional basis for understanding a key dimension of China's economic development, and perhaps may aid in understanding probable future features of that development.

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Table 1: Values and Shares of China's OFDI Flows by Region, 2004 – 2010
(millions of US$)

	2004		2005		2006		2007		2008		2009		2010	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Full Sample														
Asia	2,971	80.1%	4,455	77.8%	7,667	84.0%	16,527	75.7%	42,676	83.2%	39,805	85.7%	44,184	81.1%
Africa	296	8.0%	373	6.5%	513	5.6%	1,545	7.1%	5,418	10.6%	1,327	2.9%	1,983	3.6%
Europe	151	4.1%	394	6.9%	549	6.0%	1,504	6.9%	753	1.5%	1,017	2.2%	3,222	5.9%
Latin America	45	1.2%	39	0.7%	42	0.5%	289	1.3%	71	0.1%	300	0.6%	838	1.5%
North America	125	3.4%	264	4.6%	233	2.6%	1,228	5.6%	469	0.9%	1,522	3.3%	2,451	4.5%
Oceania	120	3.2%	202	3.5%	120	1.3%	727	3.3%	1,929	3.8%	2,450	5.3%	1,771	3.3%
Total	3,708		5,727		9,124		21,820		51,316		46,422		54,448	
Excluding Hong Kong														
Asia	342	31.7%	1036	44.9%	736	33.6%	2,794	34.5%	4,036	31.8%	4,205	38.9%	5,678	35.6%
Africa	296	27.4%	373	16.2%	513	23.4%	1,545	19.1%	5,418	42.7%	1,327	12.2%	1,983	12.4%
Europe	151	14.0%	394	17.1%	549	25.0%	1,504	18.6%	753	5.9%	1,017	9.4%	3,222	20/2%
Latin America	45	4.2%	39	1.7%	42	1.9%	289	3.6%	71	0.6%	300	2.8%	838	5.3%
North America	125	11.6%	264	11.5%	233	10.6%	1,228	15.2%	469	3.7%	1,522	14.1%	2,451	15.4%
Oceania	120	11.1%	202	8.8%	120	5.5%	727	9.0%	1,929	15.2%	2,450	22/6%	1,771	11.1%
Total	1,079		2,308		2,193		8,088		12,676		10,821		15,943	

Note: Data on 81 OFDI destination countries.
Source: China Ministry of Ministry of Commerce

Table 2: Values and Shares of Japan's OFDI Flows by Region, 1976 – 1982
(millions of US$)

	1976		1977		1978		1979		1980		1981		1982	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent
						Full Sample								
Asia	1,520	44.1%	1,091	39.0%	1,832	40.0%	1,106	22.2%	1,341	28.7%	3,430	38.4%	1,516	19.7%
Africa	266	7.7%	128	4.6%	212	4.6%	161	3.2%	133	2.8%	568	6.4%	478	6.2%
Europe	332	9.6%	220	7.9%	323	7.1%	490	9.8%	574	12.3%	797	8.9%	874	11,4%
Latin America	309	9.0%	351	12.5%	455	9.9%	597	12.0%	433	9.3%	1,016	11.4%	1,301	16.9%
North America	856	24.9%	838	29.9%	1,521	33.2%	2,046	41.1%	1,747	37.4%	2,686	30.1%	3,104	40.3%
Oceania	161	4.7%	170	6.1%	238	5.2%	580	11.6%	488	9.6%	428	4.8%	420	5.5%
Total	3,444		2,798		4,581		4,980		4,676		8,925		7,694	

Note: Data on 75 OFDI destination countries.
Source: Japan Ministry of Trade, http://www.jetro.go.jp/en/reports/statistics/

Table 3a: Regression Results of Gravity Model Analysis on China's OFDI Flows (2004-2010)

Estimators	Model 1: Period-F.E. Cross-Section-None	Model 2: Period-F.E. Cross-Section-R.E.
Constant	9.700688** (1.220172)	9.565575** (2.543426)
β_0 (log(GDP))	0.286700** (0.040526)	0.312589** (0.083351)
β_1 (log(Distance))	-0.939064** (0.135225)	-0.936693** (0.282592)
R^2	0.293281	0.360191
Hauseman Test p-value	Period: N.A. Cross-Section: N.A.	Period: N.A. Cross-Section: 0.0680
Likelihood Ratio Test p-value	Period: 0.0000 Cross-Section: N.A.	Period: 0.0000 Cross-Section: N.A.

Note: ** and * indicate significance at 1 and 5 percent level, respectively; standard deviations are provided in parentheses.

Table 3b: Regression Results of Gravity Model Analysis on China's OFDI Flows (2004-2010) – Excluding Hong Kong

Estimators	Model 1: Period-F.E. Cross-Section-None	Model 2: Period-F.E. Cross-Section-R.E.
Constant	7.5824** (1.198)	7.4723** (2.4098)
β_0 (log(GDP))	0.2740** (0.0388)	0.2964** (0.0772)
β_1 (log(Distance))	-0.7019** (0.1329)	-0.7006** (0.2678)
R^2	0.2857	0.3550
Hauseman Test p-value	Period: N.A. Cross-Section: N.A.	Period: N.A. Cross-Section: 0.0555
Likelihood Ratio Test p-value	Period: 0.0000 Cross-Section: N.A.	Period: 0.0000 Cross-Section: N.A.

Note: ** and * indicate significance at 1 and 5 percent level, respectively; standard deviations are provided in parentheses.

Table 4: Regression Results of Gravity Model Analysis on Japan's OFDI Flows (1976-1982)

Estimators	Model 1: Period-F.E. Cross-Section-None	Model 2: Period-F.E. Cross-Section-R.E.
Constant	8.711058** (2.548435)	8.929845 (5.426621)
β_0 (log(GDP))	0.621678** (0.079362)	0.595676** (0.166264)
β_1 (log(Distance))	-1.079670** (0.288469)	-1.095947 (0.615724)
R^2	0.179522	0.084309

Note: ** and * indicate significance at 1 and 5 percent level, respectively; standard deviations are provided in parentheses.

Table 5: Two-Sample Test of Means on Regression Results
from China's and Japan's Gravity Model Analysis

Estimators	z-score	Decision Rule (at 5% significance level)
Constant	-3.2910	Reject H_0
β_0 (log(GDP))	-32.3618	Reject H_0
β_1 (log(Distance))	9.7619	Reject H_0

Note: Based on comparison of parameter estimates in Tables 3b and 4.

Null hypothesis: H_0: $\beta_{i,\,China} - \beta_{i,\,Japan} = 0$

Alternative hypothesis: H_A: $\beta_{i,\,China} - \beta_{i,\,Japan} \neq 0$

(Mansfield 1983, 305-308)