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Exchange rate policy and the relative distribution of FDI among host countries

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Yuqing Xing*

Exchange rate policy and the relative distribution of FDI among host countries

Abstract

This paper examines the FDI-exchange rate nexus in the context of one FDI source and two host countries. It focuses on the effect of exchange rates on relative FDI inflows between the two host countries. The theoretical analysis shows explicitly that relative FDI inflows are a function of relative real exchange rates. In particular, if one host country devalues its currency against that of the source country more than the other does, FDI into the former country will be expected to increase relative to the other country. The theoretical inference is examined with Japanese FDI in manufacturing industries of China and ASEAN-4 (Indonesia, Malaysia, the Philippines and Thailand). The empirical results generally support the theoretical conclusion, suggesting that the real devaluation of the Chinese Yuan undercut FDI into the ASEAN-4.

Keywords: FDI, Exchange rate, China, ASEAN-4
JEL classification: F14, F23, F31

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Yuqing Xing

Exchange rate policy and the relative distribution of FDI among host countries

Tiivistelmä

Tässä tutkimuksessa käsitellään suorien ulkomaisten sijoitusten ja valuuttakurssin yhteyttä tapauksessa, jossa suoria sijoituksia virtaa yhdestä maasta kahteen eri maahan. Mallissa käsitellään tapausta, jossa suhteelliset sijoitusvirrat näihin kahteen maahan riippuvat valuuttakursseista. Teoreettisten tulosten mukaan suhteelliset sijoitusvirrat ovat selvästi riippuvaisia kohdemaiden reaalisten valuuttakurssien kehityksestä. Jos yksi sijoitusten kohdemaa devalvoi valuuttaansa enemmän kuin toinen, se saa enemmän suoria sijoituksia kuin tämä toinen maa. Mallin teoreettisia tuloksia testataan aineistolla, joka käsittää japanilaisten teollisuusyritysten suorat sijoitukset Kiinaan ja ns. ASEAN4-maihin (Indonesia, Malesia, Filippiinit ja Thaimaa). Empiiriset testit tukevat mallin teoreettisia ennustuksia, ja Kiinan juanin reaalinen heikkeneminen on vähentänyt suoria sijoituksia ASEAN4-maihin.

Asiasanat: suorat sijoitukset, Kiina, ASEAN4

1 Introduction

It has been recognized in the literature that exchange rates affect foreign direct investment, and the impact is significant, especially in the short-run. Empirical studies on FDI in the U.S. (e.g., Klein and Rosengren, 1994; Dewenter, 1995; Blonigen, 1997) conclude that the depreciation of the dollar substantially promoted FDI into the US. Studies (Goldberg and Klein, 1997; Bayoumi and Lipworth, 1998) emphasizing the experiences of Southeast Asian economies also show that bilateral real exchange rates are one of the FDI determinants for those economies. Based on analysis of Japanese FDI in China's manufacturing, Xing (2006) argues that the cumulative devaluation of the Chinese Yuan significantly enhanced Japanese direct investment into China.

All of the theoretical studies on the nexus of FDI and exchange rates (e.g., Kohlhagen, 1977; Cushman, 1985; Froot and Stein, 1991; Benassy-Quere, 2001) concluded that a devaluation of the FDI host country's currency against that of source country will enhance inflows of FDI, through both the production cost and relative wealth channels. However, the existing literature concentrates solely on how exchange rates affect direct investment flows between FDI source and host countries and ignore the impact of devaluation on FDI into other host countries which compete for FDI from the same source. There is in fact no theoretical study that investigates the mechanism by which devaluation/revaluation of a FDI host country's currency impacts FDI flows into its rival countries.

Exchange rates influence not only FDI flows between source and host countries, but also the distribution of FDI among host countries competing for FDI from the same source country. Multinational enterprises (MNEs) usually invest directly in many foreign countries. Given other factors determining FDI, such as market size, growth, labour skills, political and economic stability and the regulatory framework constant, if a host country devalues its currency against that of the FDI source country by more than its rival countries, the devaluation will reduce its local production costs in terms of foreign currency more, thus making it more attractive for MNEs. In other words, from the point of views of foreign investors, the wealth and production cost effects associated with devaluation should be greater in the country which devalues its currency more, therefore strengthening its competitiveness for FDI and leading to a higher level of FDI inflows.

Furthermore, when MNEs consider whether to relocate their production facilities or outsource their production, they compare not only their home countries with potential for-

eign locations but also all possible foreign countries with each other. If reducing production costs is the major reason for transferring production facilities and investing directly abroad, the decision will be solely about selecting some locations from all possible foreign countries. Hence, currency devaluation or revaluation in one recipient country, says China, could alter relative comparative advantage between the potential host countries and thus change FDI flows to other countries, even if exchange rates remain unchanged between these other countries and the source country. Further, there is keen competition for FDI among developing countries. Exchange rate policy could explicitly or implicitly serve as an instrument to reinforce a country's FDI competitiveness. Examining the competition between China and ASEAN-4 for FDI from Japan, Xing and Wan (2006) empirically show that the Chinese Yuan's cumulative devaluation is one of the reasons causing the shift of Japanese FDI from ASEAN-4 to China.

Early theoretical models are not generally suitable for analyzing such interactions between FDI recipients. Considering imperfect competition and product differentiations, Zhao and Xing (2006) use a three country model to analyze currency devaluation and global production allocations of MNEs and infer that global production allocation is influenced by relative currency valuations, suggesting implicitly that FDI distribution may also be affected by the currency devaluation. Their study does not, however explicitly derive a direct linkage between exchange rates and FDI distribution over host countries. This paper attempts to fill the gap in the literature. Within the framework of one FDI source country and two host countries, this paper investigates how the exchange rate policy of one host country impacts relative FDI between the two host countries. In addition, it provides empirical evidence based on Japanese FDI in Asia. The remainder of the paper proceeds as follows. Section 2 develops a model of FDI allocation and exchange rates. Based on the model, the relative FDI between the two host countries is derived as an explicit function of the relative real exchange rate. The econometric analysis for testing the conclusion of the theoretical model is presented in section 3. Finally, section 4 summarizes the major findings of the paper and policy implications.

2 A model of FDI distribution and exchange rates

Assume that a Japanese MNE has one factory with capital stock K_A^0 in country *A*, and one factory with capital stock K_B^0 in country *B*, both producing homogeneous products for exports to Japan.[1] Assume that the production technology employed in these two factories is identical and is represented by a standard Cobb-Douglas production function

$$y = \gamma K^{\alpha} L^{\beta},$$

where *y* denotes output, *K* and *L* capital and labour inputs respectively, and $(\alpha + \beta) < 1$ [2] The MNE plans to use direct investment to increase its total production capacity by ΔQ to meet rising demand in Japan. Let k_A and k_B denote the additional FDI for the two factories. The optimal allocation of k_A and k_B between country *A* and *B* can be defined by the following cost minimization:

$$\text{Minimize } e_{yen/\$A}(r_A k_A + w_A L_A) + e_{yen/\$B}(r_B k_B + w_B L_B) \qquad (1)$$

$$\text{Subject to } \gamma(K_A^0 + k_A)^{\alpha} L_A^{\beta} + \gamma(K_B^0 + k_B)^{\alpha} L_B^{\beta} = Q^0 + \Delta Q$$

where Q^0 stands for the original production capacity of the two subsidiaries; r_A and r_B are capital rents in countries *A* and *B* (measured in local currencies); w_A and w_B denote labour wages in the two countries (in local currencies); and L_A and L_B are the required labour inputs in the two factories. $e_{yen/\$A}$ is the nominal exchange rate between the Japanese Yen and the local currency of country *A*, *$A*, i.e. the yen-value of one unit of *$A*. Higher(lower) $e_{yen/\$A}$ indicates appreciation (depreciation) of the local currency, *$A*. Similarly, $e_{yen/\$B}$ represents the nominal exchange rate between the Japanese Yen and country *B*`s currency *$B*. It measures the value of *$B* in terms of the Yen.

[1] The assumption of exports to other overseas market such as the USA or EU does not change the results

[2] If the technology is constant returns to scale, the MNE will produce only in the country with the lower unit production cost. If the devaluation of the other country makes its unit production cost lower, the MNE will allocate all its new investment to this country.

Cost minimization renders the first order conditions (FOC)

$$e_{yen/\$A} r_A - \lambda\gamma\alpha (K_A^0 + k_A)^{\alpha-1} L_A^{\beta} = 0 \quad (2)$$

$$e_{yen/\$B} r_B - \lambda\gamma\alpha (K_B^0 + k_B)^{\alpha-1} L_B^{\beta} = 0 \quad (3)$$

$$e_{yen/\$A} w_A - \lambda\gamma\beta (K_A^0 + k_A)^{\alpha} L_A^{\beta-1} = 0 \quad (4)$$

$$e_{yen/\$B} w_B - \lambda\gamma\beta (K_B^0 + k_B)^{\alpha} L_B^{\beta-1} = 0 \quad (5).$$

Rearranging equations (2) and (4), taking the logarithm of both sides and collecting terms yields

$$\log(e_{yen/\$A} r_A) = \log(\lambda\gamma\alpha) + (\alpha - 1)\log(K_A^0 + k_A) + \beta \log L_A \quad (6)$$

and

$$\log(e_{yen/\$A} w_A) = \log(\lambda\gamma\beta) + \alpha \log(K_A^0 + k_A) + (\beta - 1)\log L_A . \quad (7)$$

Using (6) and (7) to eliminate log L_A, we obtain

$$(1-\alpha-\beta)\log(K_A^0 + k_A) = -[(1-\beta)\log(e_{yen/\$A} r_A) + \beta \log(e_{yen/\$A} w_A)] + M , \quad (8)$$

where $M = \log(\lambda\gamma) + (1-\beta)\log\alpha + \beta\log\beta$.

Similarly, it can be shown that

$$(1-\alpha-\beta)\log(K_B^0 + k_B) = -[(1-\beta)\log(e_{yen/\$B} r_B) + \beta \log(e_{yen/\$B} w_B)] + M . \quad (9)$$

Subtracting (8) from (9) yields

$$(1-\alpha-\beta)\log\left(\frac{K_A^0 + k_A}{K_B^0 + k_B}\right) = \{(1-\beta)\log\left(\frac{e_{yen/\$B} r_B}{e_{yen/\$A} r_A}\right) + \beta \log\left(\frac{e_{yen/\$B} w_B}{e_{yen/\$A} w_A}\right)\} . \quad (10)$$

From equation (10), it is straightforward to derive the explicit relationship between relative real exchange rates and relative FDI between country *A* and *B*:

$$\log(\frac{K_A^0 + k_A}{K_B^0 + k_B}) = -(1-\alpha-\beta)^{-1}\{(1-\beta)\log(\frac{e_{yen/\$A} r_A / r_J}{e_{yen/\$B} r_B / r_J}) + \beta \log(\frac{e_{yen/\$A} w_A / w_J}{e_{yen/\$B} w_B / w_J})\}, (11)$$

where r_J and w_J denote capital rent and wage in Japan and $(e_{yen/\$A} r_A / r_J)$ denotes the real exchange rate between the Yen and \$A, measured in capital prices. Similarly, $(e_{yen/\$A} w_A / w_J)$ denotes the wage in country *A* relative to the wage in Japan. It is also the real exchange rate between the Yen and *$A*, defined in terms of wages. In essence, $(\frac{e_{yen/\$A} r_A / r_J}{e_{yen/\$B} r_B / r_J})$ is the ratio of real exchange rate between the Yen and *$A* to the real exchange rate between the Yen and *$B*.[3] Equation (11) shows that relative FDI in country *A* (in logarithm) is a decreasing function of (the weighted sum of) the two relative real exchange rates. The real exchange rate, as defined above, is widely used in the empirical literature. The equation (11) suggests that, as long as the currency of a recipient country appreciates more than the currency of its rival country, its relative FDI will decrease and be diverted to its rivals.

The weighted real exchange rate comprises nominal exchange rates, capital rents and wages. Changes in the real exchange rate can derive from any combination of those three variables: nominal exchange rates, capital prices and wages. Therefore, the impact on FDI due to differentials in capital rents and wages between two recipient countries is also incorporated into the model. We summarize the theoretical result in proposition 1:

Proposition 1

If two countries compete for export-oriented FDI from the same source country and one country devalues its currency against the currency of the FDI source country more than its rivale does, its FDI stock will increase relatively.

Without considering capital depreciation, FDI flows are the only variable leading to a change in the stock. Usually, concerns of the distribution of FDI among host countries

[3] It is also the real exchange rate between \$*A* and \$*B*.

concentrate on FDI flows rather than FDI stock. It is convenient to express the similar relationship in terms of FDI flows.

Corollary 1:

If two countries compete for export-oriented FDI from the same source country and one country devalues its currency against the currency of the source country more than its riavle does, its FDI inflows will increase relatively.

Proof: Suppose that country A devalues its currency to $e^*_{yen/\$A} = (1-\delta)e_{yen/\$A}$ $(0<\delta<1)$ while country B holds its exchange rate at $e_{yen/\$B}$. Let (k^*_A, k^*_B) be the equilibrium distribution of the additional FDI at $(e_{yen/\$A}, e^*_{yen/\$B})$ and (k_A, k_B) the equilibrium allocation of FDI flows at $(e_{yen/\$A}, e_{yen/\$B})$. According to equation (11), we have

$$\log(\frac{K^0_A + k^*_A}{K^0_B + k^*_B}) > \log(\frac{K^0_A + k_A}{K^0_B + k_B}) \tag{12}$$

which implies that

$$\frac{K^0_A + k^*_A}{K^0_B + k^*_B} > \frac{K^0_A + k_A}{K^0_A + k_B} \quad . \tag{13}$$

Using FOCs (2) and (4), together with the production constrain, we obtain

$$(K^0_A + k_A)e_{yen/\$A}r_A + (K^0_B + k_B)e_{yen/\$A}r_B = \lambda\alpha(Q^0 + \Delta Q) \tag{14}$$

$$(K^0_A + k^*_A)e_{yen/\$A}(1-\delta)r_A + (K^0_B + k^*_B)e_{yen/\$A}r_B = \lambda\alpha(Q^0 + \Delta Q)\,. \tag{15}$$

Subtracting (14) from (15) yields

$$r_A[k_A^* - k_A]e_{yen/\$A} = r_B(k_B - k_B^*)e_{yen/\$B} + \delta r K_A^0 e_{yen/\$A} + \delta r_A k_A^* \quad . \tag{16}$$

If $k_A^* - k_A \le 0$, we must have $(k_B - k_B^*) < 0$, which contradicts to (13).

Thus the only possibility is that

$$k_A^* - k_A > 0 \tag{17}$$

As the capital to labour ratio in each factory depends only on wage and capital rent, and not the exchange rate, inequality (17) implies $L_A^* > L_A$.

Therefore

$$\gamma(K_A^0 + k_A^*)^\alpha (L_A^*)^\beta > \gamma(K_A^0 + k_A)^\alpha (L_A)^\beta$$

Considering the output constraint, it must be that

$$\gamma(K_B^0 + k_B^*)^\alpha (L_B^*)^\beta < \gamma(K_B^0 + k_B)^\alpha (L_B)^\beta$$

which implies that

$$k_B > k_B^* . \tag{18}$$

Combining inequality (17) and (18) yields

$$\frac{k_A^*}{k_B^*} > \frac{k_A}{k_B} \tag{19}$$

QED.

Inequality (19) indicates that relative FDI flows is an increasing function of relative real exchange rate, i.e. $\frac{k_A}{k_B} = f(\frac{e_{yen/\$A} p_A / p_J}{e_{yen/\$B} p_B / p_J})$ and $f' < 0$.

3 Econometric analysis

The simple theoretical model in section 2 shows unambiguously that relatively more real devaluation will stimulate more inflows of FDI. In this section, we use data to empirically appraise the theoretical result. In the empirical analysis, the FDI source country is Japan, and the host countries are China and the ASEAN-4 (Indonesia, Malaysia, the Philippines and Thailand), which are the major recipients of Japanese FDI. The ASEAN-4 countries had been the major destinations of Japanese FDI. Since the middle of 1990s, however, the emerging China has replaced the ASEAN-4 as the most popular destination of Japan's direct investment. Meanwhile China's exchange rate regime and the exchange rate policies of the ASEAN-4 have experienced fundamental changes in the last two decades. The dynamics of FDI distribution between and the exchange rate policies of China and the ASEAN-4 provide a reasonable basis for the exercise. Moreover, Japanese FDI in ASEAN-4 and China has been export-oriented. Japanese affiliated manufactuers in those countries export more than 60 per cent of their products to overseas markets (Xing and Wan, 2006).

Before we perform the econometric analysis, we utilize figures to scrutinize the possible correlation between relative FDI and bilateral real exchange rates. Figures 1-4 illustrate the time trends of the relative Japanese FDI in China's manufacturing industry compared with that in Indonesia, Malaysia, Philippines, and Thailand respectively, from 1981 to 2003. In each figure, the ratio of annual Japanese FDI in China's manufacturing industry to that of a particular ASEAN-4 country is depicted over the period. In addition, each figure displays the dynamics of the corresponding real exchange rate index in the same period. For instance, Figure 1 shows the real exchange rate index between the Yuan and the Rupiah. A higher index number means depreciation of the Chinese Yuan against the currencies of ASEAN-4. All figures reveal that there exists a substantial correlation between relative FDI and the real exchange rate index. Real devaluation of the Chinese Yuan against ASEAN-4's currencies was associated with rising relative FDI into China, and vice versa.

Following the theoretical results in section 2 and the methodology applied by Xing and Wan (2006), we specify the following econometric model:

$$\log(\frac{FDI_{Ji}}{FDI_{JC}})_t = \alpha + \beta_1 \log(\frac{e_{yen/\$i}\, p_i / p_J}{e_{yen/yuan}\, p_C / P_J})_{t-1} + \gamma' z + \varepsilon_{it} \qquad (20)$$

where subscript *C* stands for China, *J* for Japan and *i* for Indonesia, Malaysia, Philippines, or Thailand. FDI_{Ji} denotes Japanese direct investment in country *i*; e denotes nominal exchange rates and p price levels; z is a vector of control variables and ε is the error term.

The independent variable $(\frac{e_{yen/\$i}\, p_i / p_J}{e_{yen/yuan}\, p_C / p_J})_{t-1}$, i.e. the relative real exchange rate, is the focal point of the analysis. Its numerator is the real exchange rate between the Japanese Yen and the currency of an ASEAN-4 country, and the denominator the real exchange rate between the Japanese Yen and the Chinese Yuan. An increase in this variable means that the currency of a particular ASEAN-4 country appreciates relatively more against the Japanese Yen than does the Chinese Yuan. Considering the complexity and duration of decision making on FDI, we employ the one-period lagged value of the relative real exchange rate in the model. The underlying theory would predict that the coefficient of the relative real exchange rate is negative and significant.

Structural variables, such as market size, GDP growth, openness, political stability, etc. are often emphasized as major factors determining FDI (Agarwal, 1980; Caves, 1982). To control for the effects of those variables on relative FDI inflows, we include in the estimations relative GDP, relative openness, GDP growth difference and a dummy variable for the impact of the Asian financial crisis.

We estimated equation (20) separately for each of the ASEAN-4 countries. For each estimation, we used a panel data covering nine manufacturing sectors (food, textiles, pulp and paper, metal, chemicals, electronics, machinery, transport equipment, and others) for 1981-2003. Not all of the countries began to receive Japanese direct investment in 1981, and the data availability over time horizon also differs across sectors. The number of oberservations varies across the countries. All FDI data are from monthly statistics published by the Japanese Ministry of Finance. Growth rate, GDP, and openness were obtained from the World Bank's *World Development Indicators*. Real exchange rates were obtained from IMF's *International Financial Statistics* and calculated by the author using nominal exchange rates and GDP deflators.

Both fixed effects and random effects models are estimated for each of the ASEAN-4 countries, so that sector specific effects are taken into account. Table 1 tabulates the estimates of the fixed effects models and Table 2 those of the random effects models. The Hausman tests for comparing the random effects and fixed effects estimators were conducted for all estimates (Wooldridge, 2002). The Hausman statistics indicate that for all countries the sector specific effects are uncorrelated with the other independent variables. The random effects models are better choices, and so the following discussion is based on the estimates of the random effects models.

According to Table 2, the estimated coefficient of the independent variable $(\frac{e_{yen/\$i} p_i / p_J}{e_{yen/yuan} p_C / p_J})_{t-1}$ for Indonesia is -0.91 and significant at 10 per cent; for Malaysia is -2.68 and significantly at one per cent; for Philippines is -1.93 and significant at five per cent; for Thailand is -1.60 and significant at one per cent. Those results imply that the relative real exchange rate is one of the significant factors determining relative FDI between China and the ASEAN-4. For each ASEAN-4 country, FDI inflows from Japan were negatively affected by the relative valuation of its currency against the Chinese Yuan. In general, if the Chinese Yuan experiences a larger real devaluation against the Japanese Yen than did the currencies of the ASEAN-4, relatively more FDI will flow into China and less into Indonesia, Malaysia, Philippines and Thailand. Alternatively, if the currencies of the ASEAN-4 are devalued in real term more against the Japanese Yen than is the Chinese Yuan, China should expect to receive relatively less FDI. Consequently, currency devaluation by a FDI recipient will affect not only its own FDI inflows, but also FDI into other host countries, even if the latter's exchange rate with the currency of the source country is held constant. Those results are consistent with the theoretical argument and provide empirical evidence in support of the hypothesis.

All variables except GDP growth in equation (20) are in logarithmic form. The estimated coefficients of the relative real exchange rate represent the elasticities of relative FDI with respect to the relative real exchange rate. Except for Indonesia, the responses of relative FDI between China and other ASEAN countries are elastic, especifically for Malaysia. A one per cent real devaluation of the Chinese Yuan against the Malaysia Ringgit results in a relative 2.68 per cent increase (decrease) of FDI into China (Malaysia). For Thailand and Philippines, a one per cent real devaluation of the Chinese Yuan against their currencies would lead to 1.60 per cent and 1.93 relative decreases in their FDI inflows

from Japan respectively. Only for Indonesia, the responses are inelastic. A one per cent real appreciation of the Rupiah relative to the Chinese Yuan leads to a mere 0.91 per cent decrease in FDI flows from Japan to Indonesia.

Regarding the control variables, the estimated coefficient of relative GDP is positive and statistically significant in all of the regressions, suggesting that relative market size also influences the distribution of FDI. Except for Malaysia, the estimated coefficient of the openness is positive and significant at five per cent, implying that a higher level of openness leads to relatively more FDI inflows. The GDP growth rate difference is significantly positive at the five per cent level for Indonesia, Malaysia and Thailand. The estimates are consistent with conventional theory of FDI: higher growth rates attract more FDI. However, it is difficult to explain why the GDP difference for Philippines is negatively significant.

The estimated coefficient of the dummy variable representing the Asian financial crisis is insignificant for Malaysia, indicating that the crisis did not mitigate Malaysia's relative FDI inflows. It is noteworthy that the estimated coefficient of the dummy variable for Thailand is 2.13 and significant at one per cent and for Indonesia 0.35 and significant at 10 per cent. The results indicate that, rather than dampened FDI inflows, the crisis actually enhanced the inflows for those two countries. The unconventional estimates could be explained by the "fire-sale" phenomenon (Krugman, 1998). Japanese MNEs invested relatively more after the crisis to acquire cheap assets due to the sharp currency depreciation. On the contrary, the estimated coefficient of the dummy variable is -1.02 and significant at 10 per cent for Philippines, demonstrating that the relative inflow of FDI in the Philippines was weakened by the crisis.

4 Concluding remarks

Within a framework of one FDI source and two host countries, this paper examines systematically how the devaluation/revaluation of a host country affects relative FDI flows between the two FDI recipients. The theoretical analysis reveals that relative FDI inflows are a function of the relative real exchange rate. Specifically, a host country devaluating its currency by more than its rivals against the currency of the source will receive relatively more FDI than the other host countries. This paper contributes to the existing literature on

the exchange rate-FDI nexus in two ways. First, it provides a new framework for analyzing the interaction of FDI and exchange rate policies of FDI host countries, rather than of FDI source and host countries. Second, it advances the existing literature by showing that the exchange rate policy of a host country not only influences its own FDI inflows but also FDI into other recipients, so that the FDI distribution among host countries is also determined by relative real exchange rates.

Examining Japanese FDI in China and ASEAN-4, we found that, besides conventional structural variables such as market size, GDP growth rate, openness, etc., the relative devaluation of the Chinese Yuan against currencies of the ASEAN-4 significantly impacted the distribution of Japanese direct investment between China and the ASEAN-4. In particular, a one per cent real devaluation in the Yuan resulted in a more than one per cent drop in Japanese direct investment in Malaysia, Philippines and Thailand. The theoretical and empirical results of the paper suggest that the relation between exchange rates and FDI is multi-dimensional. The exchange rate policy of one FDI host country influences not only its own FDI inflows but also substantially affects FDI into other countries competing for FDI from the same source.

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Table 1. Relative FDI and relative real exchange rate: Fixede effects models

Dependent Variable: FDI_{Ji} / FDI_{JC}				
Independent variables	Indonesia/China	Malaysia/China	Philippines/China	Thailand/China
$(\frac{e_{yen/\$i}\, p_i / p_J}{e_{yen/yuan}\, p_C / p_J})_{-1}$	-0.94*	-2.64***	-1.65**	-1.62***
	(-1.73)	(-3.13)	(-2.26)	(-4.80)
GDP_i / GDP_C	2.80**	3.41***	3.36***	3.46***
	(6.30)	(3.32)	(6.57)	(4.91)
$(g_i - g_C)$	0.06***	0.07**	-0.03*	0.13***
	(3.96)	(2.15)	(-1.89)	(5.70)
$open_i / open_C$	1.63**	-1.14	3.91***	2.11**
	(2.23)	(-0.98)	(3.62)	(2.01)
Dummy	0.38*	0.74	-0.10**	1.27***
	(1.64)	(0.84)	(-2.02)	(3.04)
Adj. R-squared	0.59	0.50	0.47	0.49
F-value	18.36	11.40	7.69	11.17
# of Obs.	177	163	128	179

Note: ***, ** and * indicate significance level at 1, 5 and 10 per cent respectively; numbers in parentheses are t-values. All standard errors are estimated with the White consistent estimator.

Table 2. Relative FDI and Relative Real Exchange Rate: Random Effects Models

Dependent Variable: FDI_{Ji} / FDI_{JC}				
Independent Variables	Indonesia/China	Malaysia/China	Philippines/China	Thailand/China
Constant	0.85	2.91*	-0.85	0.24
	(1.34)	(1.85)	(-2.26)	(0.34)
$(\frac{e_{yen/\$i}\, p_i / p_J}{e_{yen/yuan}\, p_C / p_J})_{-1}$	-0.91*	-2.68***	-1.93**	-1.60***
	(-1.78)	(-3.39)	(-2.43)	(-4.78)
GDP_i / GDP_C	2.80***	3.48***	3.03***	3.43***
	(6.52)	(3.67)	(5.81)	(4.86)
$(g_i - g_C)$	0.06***	0.07**	-0.04*	0.13***
	(4.15)	(2.26)	(-1.79)	(5.74)
$open_i / open_C$	1.69**	-1.10	4.02***	2.13**
	(2.54)	(-1.01)	(3.37)	(2.12)
Dummy	0.35*	0.75	-1.02*	1.27***
	(1.68)	(0.93)	(-1.77)	(3.06)
Adj. R-squared	0.37	0.34	0.23	0.48
F-value	20.12	16.44	7.26	28.06
# of Obs.	177	163	128	179

Note: ***, ** and * indicate significance level at 1, 5 and 10 per cent respectively; numbers in parentheses are t-values. All standard errors are estimated with the White consistent estimator.

Figure 1: Real Exchange Rate and Relative FDI: China vs. Indonesia

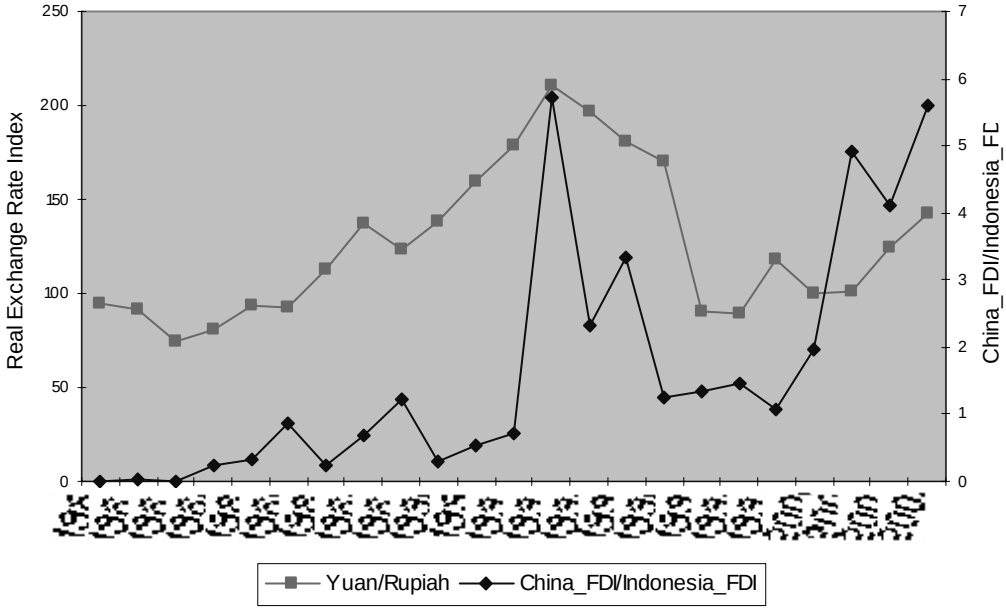


Figure 2: Real Exchange Rate and Relative FDI: China vs. Malaysia

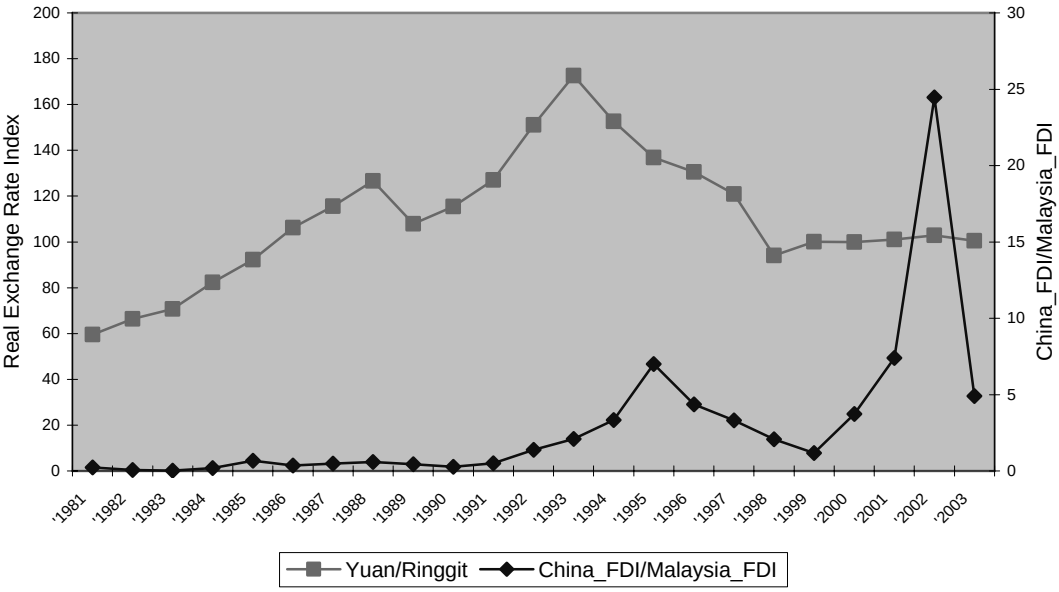


Figure 3:Real Exchange Rate and Relative FDI: China vs Philippines

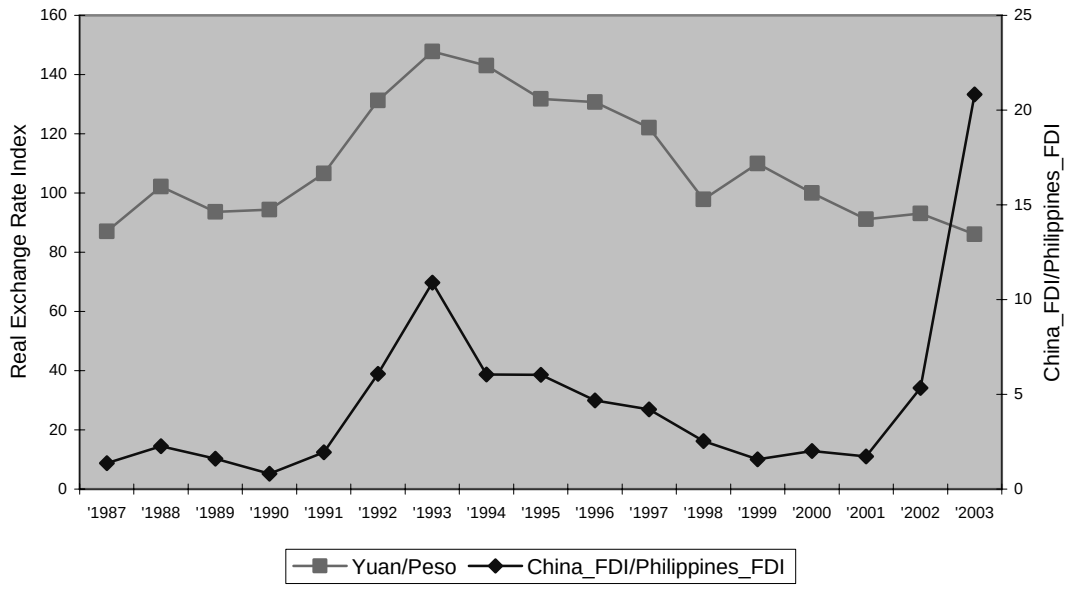
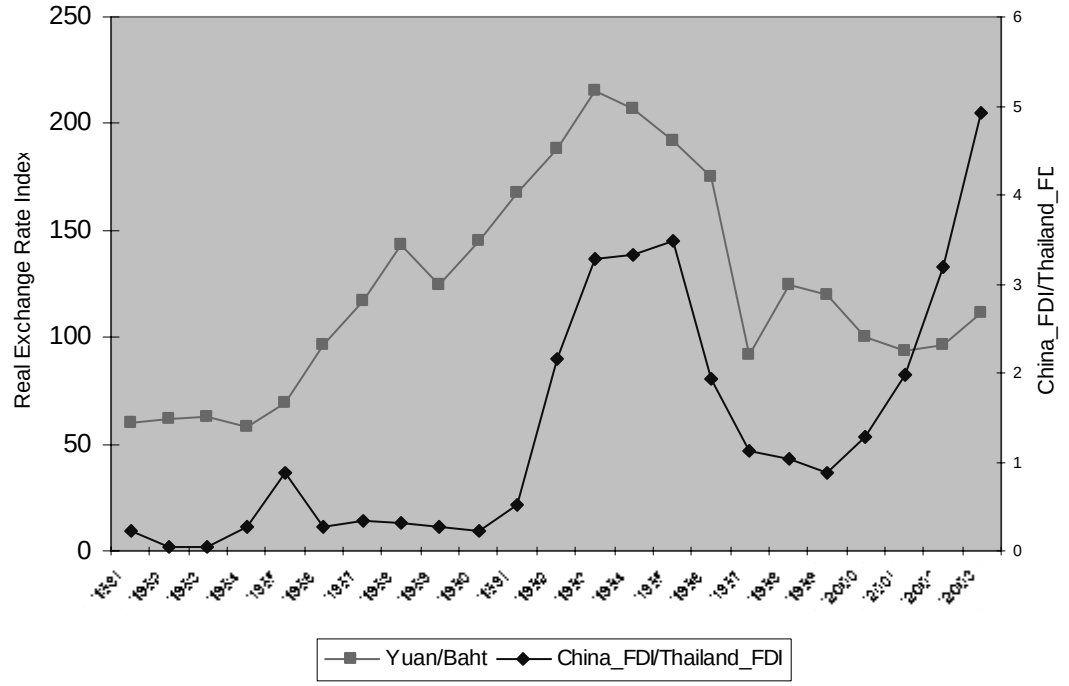


Figure 4: Real Exchange Rate and Relative FDI: China vs. Thailand



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