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Abstract

This paper examines the FDI and exchange rates nexus in the context of one FDI source and two host countries. It focuses on the effect of exchange rates on the relative FDI inflows between the two host countries. The theoretical analysis shows explicitly that the relative FDI inflows are a function of the relative real exchange rate. In particular, if one host country devalues its currency against that of the source country more than the other does, FDI into the country will be expected to increase relatively while FDI into the other decrease. The theoretical inference is examined with Japanese FDI in 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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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) suggest that the depreciation of the dollar substantially promoted FDI into the US. The researches (Goldberg and Klein, 1997; Bayoumi and Lipworth, 1998) focusing on the experiences of Southeast Asian economies also show that bilateral real exchange rates are one of FDI determinants in those economies. Based on the analysis of Japanese FDI in China's manufacturing, Xing (2006) concluded that the Chinese Yuan's cumulative devaluation significantly enhanced the direct investment from Japan.

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) reach a conclusion that, a devaluation in the currency of FDI host country against that of source country will enhance the inflows of FDI, through both production cost and the relative wealth channels. However, the existing literature solely concentrated on how exchange rates affect direct investment flows between the source and the host countries and ignored the impact of the devaluation on FDI received by other host countries, which competing for FDI from the same source. Actually, there exists no theoretical study examining the mechanism through which the devaluation/revaluation of a FDI host country's currency affects the FDI flowing into its rival countries.

Exchange rates influence not only FDI flows between source and host countries, but also the distribution of FDI between host countries competing for FDI from the same source country. Multinational enterprises (MNEs) usually invest directly in many

foreign countries. Given other factors affecting FDI, such as market size, growth, labour skills levels, political and economic stability and the regulatory framework constant, if a host country devalues its currency against that of FDI source country 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 the devaluation should be higher in the country which devalues its currency more, therefore strengthening its competitiveness for FDI and leading to higher level of FDI inflows.

Moreover, when MNEs consider whether to relocate their production facilities or outsource their production, they compare not only their home countries with potential foreign locations, but also compare all possible foreign countries with each other. If reducing production costs are the major reasons for relocating the production facilities and investing directly abroad, the decision will be only 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 those potential host countries, correspondingly affecting 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 strengthen a country's competitiveness for FDI. Examining the competition between China and ASEAN-4 for FDI from Japan, Xing and Wan (2006) empirically showed that the Chinese Yuan's cumulative devaluation is one of the reasons causing the shift of Japanese FDI from the ASEAN-4 to China.

Early theoretical models are generally not suitable for analyzing this kind of interactions between FDI recipients. This paper attempts to fill the gap in the literature. Within one FDI source country and two host countries framework, 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 evidences based on Japanese FDI in Asia. The reminder of the paper is organized as follows. The section 2 of the paper 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 major findings of the paper and policy implications.

2. A Model of FDI Distribution and Exchange Rates

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

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

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

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

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

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

where Q^0 represents the original production capacity of the two subsidiaries; r_A and r_B are capital rents in countries A and B respectively, both measured in local currencies; w_A and w_B denote labour wages in the two countries, also in the local currencies; L_A and L_B are required labour inputs in the two factories. $e_{yen/\$A}$ is the nominal exchange rate between Japanese yen and the local currency \$A, the currency of country A. It is the value of \$A in terms of the yen. Higher/lower $e_{yen/\$A}$ indicates an appreciation/depreciation of the local currency \$A. Similarly, $e_{yen/\$B}$ represents the nominal exchange rate between Japanese yen and country B's currency \$B. It measures the value of \$B in terms of the yen.

The cost minimization renders the following 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 logarithm on both sides, and collecting terms yield

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

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) gives

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

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

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

where r_J and w_J denote capital rent and labour wage in Japan, $(e_{yen/\$A}r_A / r_J)$ stands for the real exchange rate between the yen and \$A, measured in capital prices. Similarly, $(e_{yen/\$A}w_A / w_J)$ represents the wage in country A relative to the wage in Japan. It is also the real exchange rate between the yen and \$A, but defined in terms of wages. In essence, $\left(\frac{e_{yen/\$A}r_A / r_J}{e_{yen/\$B}r_B / r_J}\right)$ is the ratio of real exchange rate between the yen and \$A to the real exchange rate between the yen and \$B.² 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 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. Therefore, a change in the real exchange rate can be resulted from any

² In fact, it is the real exchange rate between \$A and \$B.

combination of those three variables: nominal exchange rates, capital prices and wages. Thus, the impact on FDI due to differentials in capital rents and wages between two recipient countries is also incorporated in the model. We summarize the theoretical result in proposition 1:

Proposition 1

When two countries compete for export-oriented FDI from the same source country, if one country's currency depreciates more against the currency of the source country than that of its rival, its FDI stock will increase relatively.

Without considering capital depreciation, FDI flows are the only variable leading to the change in the stock. Further, the major concern on the distribution of FDI among host countries primarily concentrates on FDI flows rather than its stock. It is convenient to derive the relationship between relative FDI flows and relative real exchange rate.

Corollary 1:

When two countries compete for export-oriented FDI from the same source country, if one country's currency devalues more against the currency of the source country than that of its rival, 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

$$\log\left(\frac{K_A^0 + k_A^*}{K_B^0 + k_B^*}\right) > \log\left(\frac{K_A^0 + k_A}{K_B^0 + k_B}\right) \quad (12)$$

Equation (12) implies that

$$\frac{K_A^0 + k_A^*}{K_B^0 + k_B^*} > \frac{K_A^0 + k_A}{K_B^0 + k_B} \quad (13).$$

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

$$(K_A^0 + k_A)e_{yen/\$A}r_A + (K_B^0 + k_B)e_{yen/\$A}r_B = \lambda\alpha(Q^0 + \Delta Q) \quad (14)$$

$$(K_A^0 + k_A^*)e_{yen/\$A}(1-\delta)r_A + (K_B^0 + k_B^*)e_{yen/\$A}r_B = \lambda\alpha(Q^0 + \Delta Q) \quad (15)$$

Subtracting (14) from (15) yields

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

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

Thus, the only possibility is

$$k_A^* - k_A > 0 \quad (17)$$

As the capital to labor ratio in each factory depends only on wage and capital rent, not the exchange rate, the 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, we must have

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

This implies that

$$k_B > k_B^* \quad (18)$$

Combining inequality (17) and (18) yields

$$\frac{k_A^*}{k_B^*} > \frac{k_A}{k_B} \quad (19)$$

QED.

Equation (19) indicates that relative FDI flows model is also an increasing function of

relative real exchange rate, i.e. $\frac{k_A}{k_B} = f\left(\frac{e_{yen/\$A}P_A / P_J}{e_{yen/\$B}P_B / P_J}\right)$ and $f' < 0$.

3. Econometric Analysis

The simple theoretical mode 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 argument. In the empirical analysis, Japan is considered as FDI source country; China and the ASEAN-4: Indonesia, Malaysia, the Philippines and Thailand, the major recipients of Japanese FDI, are the host countries. The ASEAN-4 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 the direct investment from Japan. Further, 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.

Before we perform the econometric analysis, we utilize charts to scrutinize the possible correlation between relative FDI and bilateral real exchange rates. Figures 1 to 4 illustrate the time trend of the relative Japanese FDI in China's manufacturing industry compared with that in Indonesia, Malaysia, Philippines, and Thailand respectively from 1981 to 2003. Particularly, in each figure, the ratio of annual Japanese FDI in China's manufacturing industry to that of an ASEAN-4 country is depicted over the period. In addition, in each of the figure, the dynamics of the corresponding real exchange rate index in the same period, for instance in Figure 1 the real exchange rate index between the Yuan and the Rupiah, is illustrated. Higher index means the Chinese yuan devalues against the currencies of ASEAN-4. All figures reveal that there exist a substantial correlation between the relative FDI and the real exchange rate index. The real devaluation of the Chinese yuan against ASEAN-4's currencies was associated with rising relative FDI into China, and vice verse.

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

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

where subscript C stands for China, J for Japan and i for Indonesia, Malaysia, the 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 consisting of control variables and ε is the error term.

The independent variable $\left(\frac{e_{yen/\$i} p_i / p_J}{e_{yen/yuan} p_C / p_J}\right)_{t-1}$, the relative real exchange rate is

the focal point of the analysis, of which the 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 the ASEAN-4 appreciates relatively more against the Japanese Yen than the Chinese Yuan. Considering the complexity and the duration of decision making on FDI, we employ the one-period lagged value of the relative real exchange rate in the model. According to the theoretical prediction, the coefficient of the relative real exchange rate is expected to be negative and significant.

Structure variables, such as market size, GDP growth, openness, political stability, etc. are often emphasized as major factors determining FDI (Agarwal, 1980; Caves, 1982). For controlling the effect of those structure variables on the relative FDI inflows, relative GDP, relative openness, GDP growth difference and a dummy variable assessing the impact of the Asian financial crisis, are included in the estimations.

We estimate equation (20) for each of the ASEAN-4 countries separately. In each of the estimation, a panel data covering nine manufacturing sectors (food, textiles, pulp and paper, metal, chemicals, electronics, machinery, transport equipment, and others) from 1981-2003 is used. Not all of the countries started to receive Japanese direct investment in 1981 and the data availability over time horizon also differs across

sectors. The number of observations varies across the countries. All FDI data are from the monthly statistics published by the Japanese Ministry of Finance. Growth rate, GDP, and openness are retrieved from the World Bank's *World Development Indicators*. Real exchange rates are collected from IMF's *International Financial Statistics* and calculated by the author using normal exchange rates and GDP deflators.

Both fixed effects model and random effects model are estimated for each of the ASEAN-4 countries so that sector specific effects are considered in the estimations. Table 1 tabulates the estimates of the fixed effects models and table 2 that of the random effects models. The Hausman test for comparing the random effects and fixed effects estimators are 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. For that reason, the following discussion is based on the estimates of the random effects models.

According to the table 2, the estimated coefficient of the independent variable

$$\left(\frac{e_{yen/\$} p_i / p_J}{e_{yen/yuan} p_C / p_J} \right)_{t-1}$$

for Indonesia is -0.91 and significant at 10 percent; for Malaysia is -2.68 and significantly at one percent; for Philippines is -1.93 and significant at five percent; for Thailand is -1.60 and significant at one percent. Those results imply that the relative real exchange rate is one of the significant factors determining the relative FDI between China and the ASEAN-4. For all ASEAN-4 countries, their FDI inflows from Japan were negatively affected by the relative valuation of their currencies against the Chinese yuan. In particular, if the Chinese yuan experienced a higher real devaluation against the Japanese yen than the currencies of the ASEAN-4, relatively more FDI will flow into China while less into Indonesia, Malaysia, Philippines and Thailand. Alternatively, if the currencies of the ASEAN-4 devalue in real term more against the Japanese yen than the Chinese Yuan, China will expect to receive relatively less FDI. Consequently, the currency devaluation of a FDI receipt will not only affect

its own FDI inflows, but also FDI into other host countries, even the later'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 supporting the hypothesis.

All variables except for GDP growth in equation (20) are in logarithm. The estimated coefficients of the relative real exchange rate gauge the elasticity of the relative FDI to the relative real exchange rate. Except for Indonesia, the responses of the relative FDI between China and the other three ASEAN countries are elastic. Specifically, the elasticity of relative FDI between Malaysia and China is the highest. A one percent real devaluation of the Chinese Yuan against the Malaysia Ringgit would result in a relative 2.68 percent increase (decrease) in FDI into China (Malaysia). For Thailand and Philippines, a one percent real devaluation of the Chinese Yuan against their currencies would correspondingly bring about a 1.60 percent and 1.93 relative decrease in their FDI inflows from Japan. Only for Indonesia, the responses are inelastic. A one percent real appreciation of Rupiah relative to the Chinese Yuan will lead to only 0.91 percent decrease in its FDI inflows from Japan.

Regarding the control variables, the estimated coefficients of relative GDP is positive and statistically significant in all of the regressions, suggesting that the relative market size also influence the distribution of FDI. Except for Malaysia, the estimated coefficients of the openness are positive and significant at five percent, suggesting that higher level of openness leads to relatively more FDI inflows. The GDP growth rate difference is significantly positive at five percent level for Indonesia, Malaysia and Thailand. The estimates are consistent with conventional theory of FDI: higher growth rate attracting 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 summy variable for Thailand is 2.13 and significant at one percent and for Indonesia 0.35 and significant at 10 percent. The results imply 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). The Japanese MNEs invested relative more after the crisis to acquire cheap assets caused by the sharp currency depreciation. On the contrary, the estimated coefficient of the dummy vairbale is -1.02 and significant at 10 percent, indicating that the relative inflow of FDI in the Philipines was weakend by the crisis.

4 Concluding remarks

With a one FDI source and two host countries model, this paper examines systematically how the devaluation/revaluation of a host country affects relative FDI flows between the two FDI recipients. The theoretical analysis indicates that, the relative FDI inflows are a function of the relative real exchange rate. The host country devaluating its currency more against the currency of FDI source country than its rivals, expects to receive relatively more FDI. The paper contributes to the existing literature on the exchange rates and FDI nexus in two-folds. First, it provides a new framework for analyzing the interaction of FDI inflows and exchange rate policy between FDI host countries, rather than between FDI source and host countries. Second, it advances the existing literature by showing explicitly that the relative FDI inflows depends on the relative real exchange rates.

Examining Japanese FDI in China and ASEAN-4, we found that, besides conventional structure variables such as market sizes, GDP growth rate, openness, etc., the relative devaluation of the Chinese Yuan against the currencies of the ASEAN-4 also significantly determined the relative Japanese direct investment distribution between China and the ASEAN-4. Specifically, the relative devaluation of the Yuan resulted in more than a one percent relative drop in Japanese direct investment in Malaysia, Philipines and Thailand. The theoretical and empirical analyses of the

paper suggest that the relation between exchange rates and FDI is a multi-dimension issue. The exchange rate policy of one FDI host country, not only partially determines FDI flows into its own country, but also impacts substantially on FDI into other countries competing for the same source of FDI.

References

- Agarwal, J.P. (1980). 'Determinant of Foreign Direct Investment: A survey'. *Weltwirtschaftliches Archiv*, 116(4):739-73.
- Bayoumi, T. and G. Lipworth (1998). 'Japanese Foreign Direct Investment and Regional Trade'. *Journal of Asian Economics*, 9 (4): 581-607
- Benassy-Quere, A., L. Fontagne, and A. Lahreche-Revil (2001). 'Exchange Rate Strategies in the Competition for Attracting Foreign Direct Investment'. *Journal of the Japanese and International Economics*, 15: 178-98.
- Blonigen, B. A. (1997). 'Firm-Specific Assets and the Link between Exchange Rates and Foreign Direct Investment'. *American Economic Review*, 87 (3): 447-65.
- Caves, R. E. (1982). *Multinational Enterprises and Economic Analysis*, Cambridge, UK: Cambridge University Press.
- Cushman, D. O. (1985). 'Real Exchange Rate Risk, Expectation, and the Level of Direct Investment'. *Review of Economics and Statistics*, 67 (2): 297-308.
- Dewenter, K. L. (1995). 'Do Exchange Rate Changes Drive Foreign Direct Investment?' *Journal of Business*, 68 (3): 405-433.
- Froot, K. A., and J. C. Stein (1991). 'Exchange Rates and Foreign Direct Investment: an Imperfect Capital Market Approach'. *Quarterly Journal of Economics*, 106 (4): 1191-217.
- Goldberg, L. and M.W. Klein (1997) 'Foreign Direct Investment, Trade and Real Exchange Rate Linkages in Southeast Asia and Latin America,' NBER working paper, 6344.
- Klein, M. W. and R. Rosengren (1994), 'The Real Exchange Rate and Foreign Direct Investment in the United States: Relative Wealth vs. Relative Wage Effects'. *Journal of International Economics*, 36: 373-89.
- Kohlhagen, S. W. (1977). 'Exchange Rate Changes, Profitability, and Direct foreign Investment'. *Southern Economic Journal*, 44: 43-52.
- Krugman, P. (1998) "Fire-sale FDI," at <http://www.pkarchive.org>
- Wooldgridge, J. (2002). *Econometric Analysis of Cross Section and Panel Data*, Cambridge: The MIT Press.
- Xing, Y. (2006) 'Why is China so Attractive for FDI? The Role of Exchange Rate,' *China Economic Review*, forthcoming.
- Xing, Y. and Wan, G. (2006) 'Exchange Rates and Competition for FDI in Asia,' *The World Economy*, 29(4):419-34.

Table 1. The Relative FDI and the Relative Real Exchange Rates: Fixed Effects Models

Dependent Variable FDI_{Ji} / FDI_{JC}	ASEAN-4 vs. China			
Independent Variables	Indonesia/China	Malaysia/China	Philippines/China ^a	Thailand/China
$(\frac{e_{yen/\$i} p_i / p_J}{e_{yen/yuan} p_C / p_J})_{-1}$	-0.66 (-1.15)	-2.44*** (-2.89)	-1.59** (-2.12)	-1.40*** (-4.07)
GDP_i / GDP_C	2.69** (2.18)	3.50*** (3.45)	3.32*** (6.13)	3.46*** (4.91)
$(g_i - g_C)$	0.07*** (3.93)	0.08** (2.41)	-0.04** (-2.25)	0.13*** (5.96)
$open_i / open_C$	1.66** (2.18)	-1.13 (1.18)	3.86*** (3.34)	2.22** (2.08)
Dummy	0.34 (1.47)	0.69 (0.43)	-0.98* (-1.85)	1.23*** (3.01)
Adj. R-squared	0.58	0.50	0.41	0.48
F-value	17.16	11.42	6.12	11.59
# 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. The Relative FDI and the Relative Real Exchange Rates: Random Effects Models

Dependent Variable FDI_{Ji} / FDI_{JC}	ASEAN-4 vs. China			
Independent Variables	Indonesia/China	Malaysia/China	Philippines/China ^a	Thailand/China
Constant	0.85 (1.34)	2.91* (1.85)	-0.85 (-2.26)	0.24 (0.34)
$(\frac{e_{yen/\$i} p_i / p_J}{e_{yen/yuan} p_C / p_J})_{-1}$	-0.91* (-1.78)	-2.68*** (-3.39)	-1.93** (-2.43)	-1.60*** (-4.78)
GDP_i / GDP_C	2.80*** (6.52)	3.48*** (3.67)	3.03*** (5.81)	3.43*** (4.86)
$(g_i - g_C)$	0.06*** (4.15)	0.07** (2.26)	-0.04* (-1.79)	0.13*** (5.74)
$open_i / open_C$	1.69** (2.54)	-1.10 (-1.01)	4.02*** (3.37)	2.13** (2.12)
Dummy	0.35* (1.68)	0.75 (0.93)	-1.02* (-1.77)	1.27*** (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: The Real Exchange Rate and the Relative FDI: China vs. Indonesia

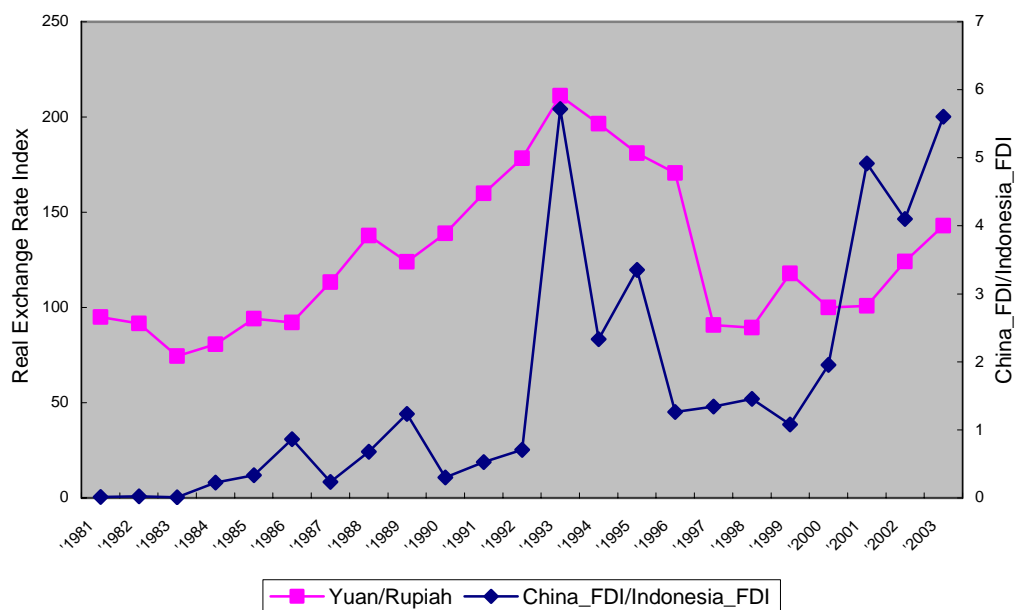


Figure 2: The Real Exchange Rate and the Relative FDI: China vs. Malaysia

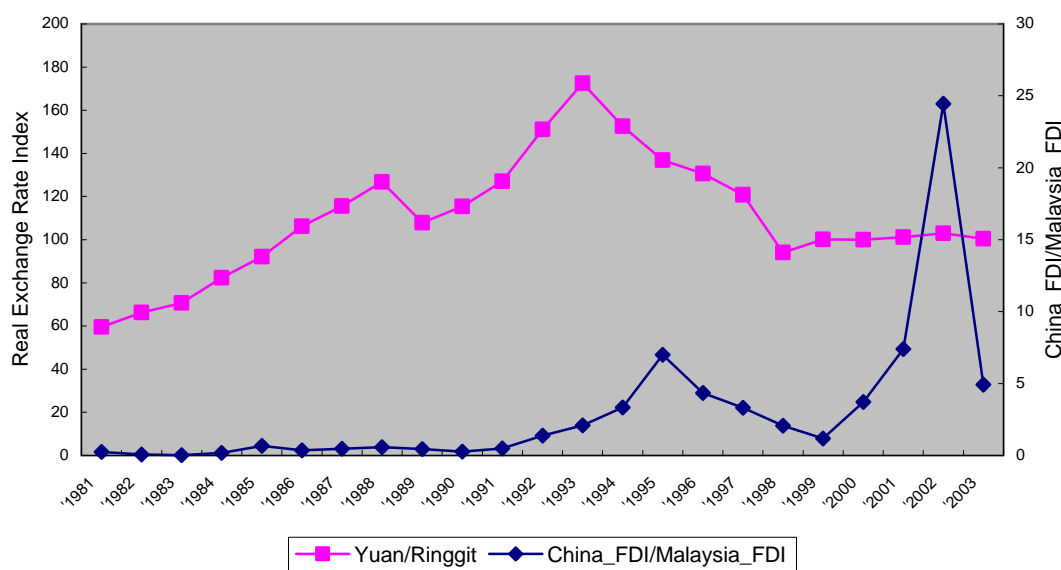


Figure 3: The Real Exchange Rate and the Relative FDI: China vs Philippines

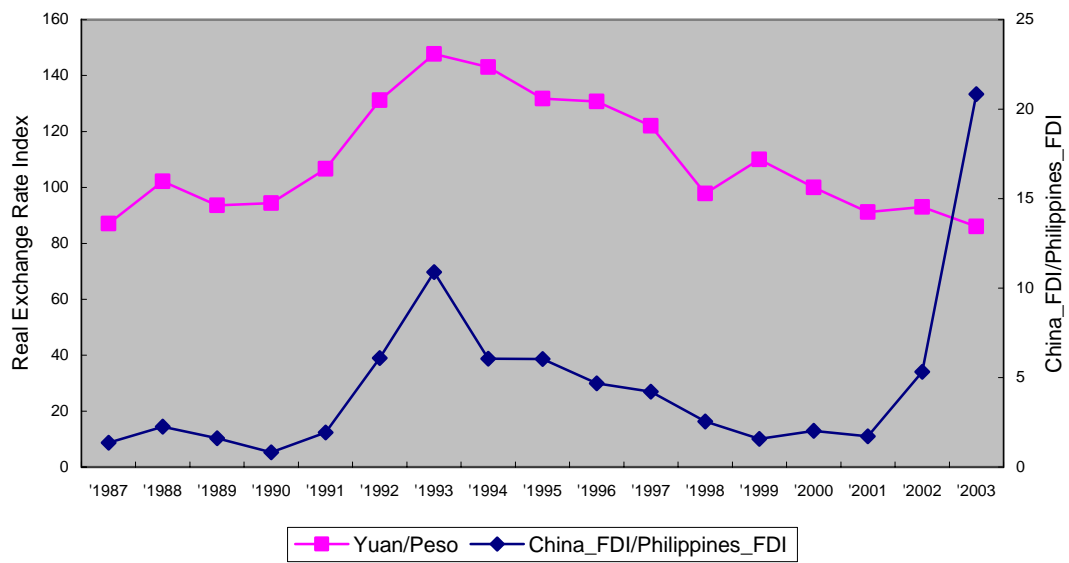


Figure 4: The Real Exchange Rate and the Relative FDI: China vs. Thailand

