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The Giant Sucking Sound: Is China Diverting Foreign Direct Investments
from Other Asian Economies?

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Abstract

Is China taking direct investments away from other Asian economies? Theoretically, a growing China can add to other countries' direct investments by creating more opportunities for production-networking and raising the need for raw materials and resources. At the same time, the extremely low Chinese labor costs may lure multinationals away from other Asian sites when the foreign corporations consider alternative locations for low-cost export platforms. In this paper, we explore this important issue empirically. We use data for eight Asian economies (Hong Kong, Taiwan, Republic of Korea, Singapore, Malaysia, Philippines, Indonesia and Thailand) from 1985 to 2001 and control for the determinants of their inward direct investment. We then add China's inward foreign direct investment as an indicator of the "China Effect". Due to issues of simultaneity, we use a random effects simultaneous equation model to estimate our coefficients. We have three results: (1) The level of China's foreign direct investment is positively related to the levels of these economies' inward direct investments; (2) the level of China's foreign direct investment is negatively related to the direct investments of these economies as shares of total Asian foreign direct investments; (3) The China effect is not the most important determinant of the inward direct investments of these economies. Policy and institutional factors such as openness, corporate tax rates and corruption can be more important.

1. Introduction

In recent years, China has become a favorite destination for foreign direct investment. In fact in 2002, foreign direct investment in China reached US$53 billion which was larger than the amount received in the United States. For 2003, despite the problems associated with SARS (Severe Acute Respiratory Syndrome), China received US$54 billion worth of foreign direct investment.

China is seen to be on its way to become "the factory of the world". Most of China's Asian neighbors seem to be very worried about such prospects. Several Asian governments have publicly noted that the emergence of China has diverted direct investment away from their economies. Policymakers throughout the region are convinced that the rise of China has contributed to the "hollowing out" phenomenon, with foreign and domestic investors leaving their countries and investing in China instead. This in turn has led to continued loss of manufacturing industries and jobs, further weakening the vitality of these economies.[1]

In this paper, we would like to examine *empirically* the question of whether China has diverted foreign direct investment away from a group of Asian economies. The economies we shall consider include Hong Kong, Taiwan, Republic of Korea, Singapore, Malaysia, Indonesia, Philippines and Thailand. The research strategy is to control for the standard determinants of foreign direct investment and then add a proxy to represent "the China effect". We then would investigate the sign, significance and magnitude of such a "China effect".

The organization of this paper is as follows. In the next section, we shall provide a survey of the relevant policy issues and the current literature. In section 3, we shall set up the econometric model to be estimated. In section 4, we present and discuss our results. Section 5 concludes.

2. Literature Review and Policy Concerns

It is not hard to find various analysts, commentators and policymakers in Asia who has voiced concerns about the emergence of China and that China is adversely affecting direct investment flows into their economies. In November 2002, Singaporean Deputy Prime Minister Lee Hsien Loong (who has since become the Prime Minister of Singapore) commented that "Southeast Asian countries are under intense competitive pressure, as their former activities, especially labor-intensive manufacturing, migrate to China. One indicator of this massive shift is the fact that Southeast Asia used to attract twice as much foreign direct investment as Northeast Asia, but the ratio is reversed." (ChinaOnline November 14, 2002). According to KOTRA, the state-run trade and investment promotion agency of Republic of Korea, the rate of foreign direct investment in most Asian countries is falling as global investors are being drawn to invest in China (Republic of Korea Times August 27, 2002). World Economic Forum director for Asia, Frank J. Richter, said if the Asian countries do not take prudent and pragmatic steps to be as competitive as China, the foreign direct investment flows into these economies would be adversely affected (New Straits Times-Management Times March 9, 2002). Furthermore, Taiwan's Vice Premier Lin Hsin-I said that facing the rapid rise of the

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[1] The trade and investment relationship between China and the Southeast Asian economies is expected to intensify since China and the Association of Southeast Asian Nations (ASEAN) signed an accord on November 29, 2004 aimed at creating a free-trade area by 2010.

Mainland Chinese economy, Taiwan would have to take effective measures to increase its competitiveness. Taiwan has to implement the "go south" policy to encourage Taiwan to switch their investments from the Mainland to Southeast Asian countries (Taiwanese Central News Agency November 21, 2002).

What determines foreign direct investment flows into the Asian and other economies? Is there a "China effect"? To get some insights as to what methodology we should pursue, we now look at some relevant academic literature.

Brainard (1997) empirically examines the determinants of the ratio of U.S. export sales to total foreign sales (the sum of export sales by sales by foreign affiliates) by industry. She uses a framework of focusing on factors that favor concentration of production (i.e. favoring exports) vs. proximity to overseas customers (i.e. favoring sales by foreign affiliates). The explanatory variables include freight costs to the export market, tariffs of the host country, per capita gross domestic product, corporate tax rates, measures of trade and foreign direct investment openness, measures of plant scale economies and corporate scale economies. She also added a dummy representing whether a country has a political coup in the last decade. In her random effects estimation, almost all the variables have the right signs and are significant. The major exception is the corporate tax rates, which has the opposite sign as predicted.

Gastanaga, Nugent and Pashamova (1998) focus on policy reforms in developing countries as determinants of foreign direct investment inflows. They employ both ordinary least squares as well as panel estimations. The expected rates of growth, the corporate tax rates, the degree of corruption and the degree of openness to foreign direct investment are all important determinants of foreign direct investment flows into these

economies. Hines (1995) and Wei (1997) both examine the impact of institutional factors on foreign direct investment. By employing a corruption index, Hines shows that after 1977, U.S. foreign direct investment grew faster in less corrupt countries. Wei (1997) uses OECD direct investment data and shows that both corruption and tax rates have negative effects on foreign direct investment flows. Wei's estimations are cross-sectional.[2]

3. The Empirical Model

In this section we provide an econometric model to estimate the impact of China on the inward direct investments of various Asian economies. The economies we examine include Hong Kong, Singapore, Taiwan, Republic of Korea, Thailand, Malaysia, Philippines and Indonesia. The years examined in this analysis are from 1985 to 2001. The strategy here is to control for all the standard explanatory variables of foreign direct investments in the Asian economies. But we add an additional variable representing the China factor. To proxy for the China factor, we choose the level of the inflow of China's foreign direct investment. Obviously Chinese inward foreign direct investment can also be dependent on the inward direct investment of these Asian economies as well as the standard explanatory variables. In order to capture such a reciprocal relationship between the inflow of FDI in China and that in other Asian economies, the FDI equation for both the Asian economies and China are estimated simultaneously.

The basic regression model for inward foreign direct investment for Asian countries and for China are written as a linear specification of the following form:

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[2] Other related literature includes Bao, Chang, Sachs and Woo (2002), Fung, Iizaka and Siu (2003), Zhang and Song (2001), etc.

$$\ln(AFDI_{i,t}) = \alpha_0 + \alpha_1 \ln(CHINA\_FDI_t) + \beta_1 \ln(AGROWTH_{i,t}) +$$

$$\beta_2 \ln(ACORRUPT_{i,t}) + \beta_3 \ln(ADUTY_{i,t}) + \beta_4 \ln(AGOV_{i,t}) +$$

$$\beta_5 \ln(AWAGE_{i,t}) + \beta_6 \ln(AOPEN_{i,t}) + \beta_7 \ln(AILLIT_{i,t}) + \beta_8 \ln(ACPTAX_{i,t}) +$$

$$\beta_9 \ln(ATEL_{i,t}) + \beta_{10} \ln(AINCOME_{i,t})$$

$$\ln(CHINA\_FDI_t) = \gamma_0 + \delta_1 \ln(AFDI_{i,t}) + \rho_1 \ln(CGROWTH_t) + \rho_2 \ln(CCORUPT_t) +$$

$$\rho_3 \ln(CDUTY_t) + \rho_4 \ln(CGOV_t) + \rho_5 \ln(CWAGE_t) + \rho_6 \ln(COPEN_t) +$$

$$\rho_7 \ln(CINCOME_t)$$

where the subscript "i" and "t" stands for country i at period t and the variables used in this analysis are defined below.

$AFDI_{i,t}$: the level of inward foreign direct investment in the ith Asian economies in year t.

$CHINA\_FDI_t$: inward foreign direct investment into China in year t.

$AGROWTH_{i,t}$: growth rate of GDP of country i at time t.

$CGROWTH_t$: growth rate of GDP of China at time t.

$ACORRUPT_{i,t}$: an index of corruption of county i at time t.

$CCORRUPT_t$: an index of corruption of China at time t.

$ADUTY_{i,t}$: import duty of country i at time t.

$CDUTY_t$: import duty of China at time t.

$AWAGE_{i,t}$: average wage in manufacturing of country i at time t.

$CWAGE_t$: average wage in manufacturing of China at time t.

$AOPEN_{i,t}$: the share of exports and imports in GDP of country i at time t.

COPEN $_t$: the share of exports and imports in GDP of China at time t.

AILLIT $_{i,t}$: the percentage of people who are illiterate of country i at time t.

ATAX $_{i,t}$: corporate tax rate of country i at time t.

AGOV $_{i,t}$: an index of government stability of country i at time t.

CGOV $_t$: an index of government stability of China at time t.

ATEL $_{i,t}$: number of telephone mainlines per 1,000 people of country i at time t.

AINCOME $_{i,t}$: per capita GDP of country i at time t.

CINCOME $_t$: per capita GDP of China at time t.

The independent variables examined in the analysis are believed to exert an influence on inward foreign direct investment in each country of Asia and China by changing the investment environment through institutional and policy changes, and economic conditions.

The main variable that we shall examine in this paper is the proxy for the China effect *CHINA_FDI*. There are at least two aspects that we should consider here. First, in examining which low-wage export platform to locate, multinationals may choose between investing in China vs. investing in another Asian country, say Thailand. In this case, the MNEs will study the whole host of factors, including wage rates, political risks, infrastructure, etc. that would make a country desirable as a site for low-cost production. Investing in China will then reduce the FDI in Thailand. The sign of CHINA_FDI, according to this argument is negative. We shall call this the "*investment-diversion effect*".

The second aspect is the production and resource linkages between a growing China and the rest of Asia. In manufacturing, this takes of the form of further specialization and growing fragmentation of the production processes. An investor sets up factories in both China and Thailand to take advantage of their respective competitiveness in distinct stages of productions. Components and parts are then traded among China and other Asian economies. An increase in China's FDI is then positively related to an increase in Thailand's FDI. A different but complementary argument is that as China grows, its market size increases and its appetite for minerals and resources also rises. Subsequently, foreign firms rush into China to produce in China and to sell in China. At the same time, other multinationals also invest in other parts of Asia to extract minerals and resources to export to fast growing China in need of a whole spectrum of raw materials. This line of reasoning leads one to predict that the sign of CHINA_FDI to be positive. We call this effect the "*investment-creation effect*". Theoretically we cannot determine a prior the net effect of investment-creation and investment-diversion for China. It is thus important to examine this issue empirically, as we attempt to do in this paper.

A substantial literature has developed confirming empirically the importance of the size of the host market and the growth factor measured by GDP per capita or GDP growth. The foreign investors that target the local market are assumed to be more attracted to the country with higher growth rate of GDP as it indicates a larger potential demand for their product. The effect of the variable on their investment incentive therefore is assumed to be larger than the effect on those who are not market-seekers. Furthermore, for the foreign investors who operate in industries characterized by

relatively large economies of scale, the importance of the market size or it's growth is magnified. This is because they can exploit scales economies only after the market attains a certain threshold size. As the variables (the growth of GDP and per capita GDP) are used as indicators for the market size and the potential for the products of foreign investors, the expected signs for these variables are positive.

Since the cost of labor is a major component of the cost function, various versions of the wage variables are frequently tested in the literature. A high nominal wage, other things being equal, deters inward foreign direct investment (FDI). This must be particularly so for the firms which engage in labor-intensive production activities. Therefore, conventionally, the expected sign for this variable is negative. However, there are no unanimous empirical results for the effect of labor cost on the investment incentives. While some studies have shown no significant role of labor costs, others have shown the positive relationship between labor costs and FDI. The latter result is often attributed to a level of labor productivity or quality of human capital that may be reflected in the wage variables.

The level of human capital is demonstrated to be an another important determinant of the marginal productivity of capital. It has been shown in various studies that skill-related variables are host country specific. When a host country is more appealing to labor-intensive foreign investment that requires a relatively lower level of skills, the importance of the human capital variable tends to be small. On the other hand, labor skills can be a more significant factor for a host country, in which more capital- and technology intensive investment projects are concentrated. In this analysis, we utilize illiteracy rate as a proxy for the level of human capital.

We examine the hypothesis that better developed regions with a superior quality of infrastructure are more attractive to foreign firms relative to others by including in our regressions the proxy, the number of telephone mainlines per 1000 people.

We also examine the significance of institutional factors in the determination of FDI by incorporating the level of corruption and the stability of each government. Corruption can discourage FDI by inducing a higher cost of doing business. Hines (1995) shows that FDI from the United States grew more rapidly in less corrupt countries than in more corrupt countries after 1977. Wei (1997) presents alternative explanation of the large negative and significant effect of corruption on FDI. Unlike taxes, corruption is not transparent and involves many factors that are more arbitrary in nature. The agreement between a briber and a corrupt official is hard to enforce and creates more uncertainty over the total questionable payments or the final outcome. Wei demonstrates that this type of uncertainty induced by corruption leads to a reduction in FDI. Political stability of a government can be another important factor to foster the inflow of FDI. Uncertain political environments and their related risks can impede FDI inflows in spite of favorable economic conditions. Since the indices of corruption and instability assign higher scores to less corrupt or more stable country, the expected signs of the variables, *ACORRUPT* and *AGOV*, are positive.

Also included in the analysis are policy-related variables, tariff barriers proxied by import duty, corporate tax rates, and openness to foreign trade. The effect of tariffs on the behavior of multinational enterprises (MNEs) is methodologically demonstrated by Horst (1971). He predicts that in the face of higher tariffs imposed by the host countries, other things being equal, MNEs will increase its production abroad and decrease its

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exports. More recent models highlight the effect of tariffs on FDI within the context of vertical and horizontal specialization within MNEs. A typical vertical FDI can be characterized by individual affiliates specializing in different stages of production of the output. The semi-finished products in turn are exported to other affiliates for further processing. By fragmenting the production process, parents and affiliates take advantage of factor price differentials across countries. Horizontal specialization on the other hand, involves each affiliate' engagement in similar types of production. A typical horizontal FDI can be associated with market-seeking behavior and is motivated to avoid trade costs. Choosing between engaging in horizontal FDIs or exporting would involve calculating the trade-off between trade costs and economies of scale.

The MNEs, which set up vertical production networks may be encouraged to invest in a country with relatively low tariff barriers due to a lower cost of their imported intermediate products. Therefore, the expected sign of *ADUTY* is negative. In contrast, high tariff barriers induce firms engaging in horizontal FDI to replace exports with production abroad by foreign affiliates (Brainard, 1997; Carr, Markusen, and Maskus, 2001). This "tariff jumping" theory implies a positive relationship between *ADUTY* and FDI.

AOPEN is included to examine the importance of openness of an economy to international trade. The variable measures the degree of general trade restrictions of each country. Following the same line of reasoning above, a negative relationship between openness and market-seeking FDI is expected, and a positive relationship is expected for export-oriented FDI.

Another policy-related variable that can influence the host country's location advantage is the host country's corporate or other tax rates. The MNEs, as global profit maximizers, can be assumed to be sensitive to tax factors, since they have a direct effect on their profits. The evidence of significant negative influences of corporate tax rates are reported in previous studies by Wei (1997), Gastanaga, Nugent, and Pashamova (1998), and Hsiao (2001).

All variables are transformed into logarithms. Data sources and additional explanations of variables are given in Appendix A.

In our estimation, we assume for each FDI equation that there is the collection of factors that are omitted from the regression that are peculiar to each individual unit. Therefore, we estimate equations, which take the following form:

$$y_{it} = \alpha + \beta' x_{it} + \varepsilon_{it} + u_i$$

where the disturbance term, ε_{it} is associated with both time and the cross sectional units, and u_i is the random disturbance that is associated with ith country and is assumed to be constant through time. In another words, the country-specific constant terms are assumed to be randomly distributed across cross-sectional units.

The formulation of the model is then specified as follows.

$$\ln(AFDI_{i,t}) = \ln(AFDI_{i,t}) = \alpha_0 + \alpha_1 \ln(CHINA\_FDI_t) + \beta_1 \ln(AGROWTH_{i,t}) +$$

$$\beta_2 \ln(ACORRUPT_{i,t}) + \beta_3 \ln(ADUTY_{i,t}) + \beta_4 \ln(AGOV_{i,t}) +$$

$$\beta_5 \ln(AWAGE_{i,t}) + \beta_6 \ln(AOPEN_{i,t}) + \beta_7 \ln(AILLIT_{i,t}) + \beta_8 \ln(ACPTAX_{i,t}) +$$

$$\beta_9 \ln(ATEL_{i,t}) + \beta_{10} \ln(AINCOME_{i,t}) + u_i + e_{i,t}$$

$$\ln(\text{China\_FDI}_t) == \gamma_0 + \delta_1 \ln(\text{AFDI}_{i,t}) + \rho_1 \ln(\text{CGROWTH}_t) + \rho_2 \ln(\text{CCORUPT}_t)$$

$$\rho_3 \ln(\text{CDUTY}_t) + \rho_4 \ln(\text{CGOV}_t) + \rho_5 \ln(\text{CWAGE}_t) + \rho_6 \ln(\text{COPEN}_t) +$$

$$\rho_7 \ln(\text{CINCOME}_t) + v_i + w_{i,t}$$

The above simultaneous equation system is estimated by the two stage least squares.

4. Results

4.1 Regressions using Levels of FDI inflows

Table 1 shows the results from the first set of random-effects simultaneous regressions using the level of FDI inflows as the dependent variables. To avoid multicollinearity problem, variables that are highly correlated are not included simultaneously. Specifically, *AWAGE*, *AINCOME*, *ATEL*, and *AOPEN* will not all be included at the same time in the same specifications. For each of the dependent variables, there are five specifications. The first specification in column (1) includes *AWAGE* but not *ATEL* and *AINCOME*. In column (2), we look at the effect of *ATEL* and leave out *AWAGE*, and *AINCOME*. Column (3) examines *ATEL* by additionally excluding *AOPEN* due to its moderate correlation with *ATEL*. The effect of *AINCOME* is studied in column (4) and (5). Note that, in an attempt to keep variables in Asian and China equations consistent, when a particular variable of the Asian equation is of interest, we try to include that same variable in the China equation if that does not risk significant multicollinearity. For example, *ATEL* and *CTEL* are included when an attention is given to the effect of infrastructure.

1. Level of FDI

Table 1: Random-effects 2SLS (Level of FDI = the dependent variable)

Independent Variable	(1)[a]	(2)[b]	(3)[c]	(4)[d]	(5)[e]
CHINA_FDI	0.4725***	0.4961***	0.5684***	0.4907***	0.5182***
	(7.49)	(7.48)	(7.81)	(7.71)	(7.53)
AGROWTH	0.4543	0.6442	0.3867	0.5461	0.2643
	(0.58)	(0.82)	(0.44)	(0.69)	(0.31)
ACORRUPT	0.1417	0.1906	0.4767*	0.0659	0.4121
	(0.60)	(0.79)	(1.81)	(0.27)	(1.65)
ADUTY	0.0971	0.1375	-0.3904*	0.1142	-0.2109
	(0.47)	(0.67)	(-1.94)	(0.53)	(-0.95)
AGOV	0.1032	0.1160	0.0014	0.0631	0.0525
	(0.63)	(0.67)	(0.01)	(0.38)	(0.29)
AWAGE	-0.1635				
	(-1.41)				
AOPEN	0.9966***	1.0460***		0.8717***	
	(5.72)	(5.35)		(4.71)	
AILLIT	0.0509	0.0823	0.4864***	0.2158	0.5056**
	(0.29)	(0.47)	(2.72)	(1.26)	(2.92)
ACPTAX	-1.2869***	-1.3944***	-0.4384	-1.1889***	-0.4614**
	(-3.42)	(-3.55)	(-1.12)	(-3.10)	(-1.21)
ATEL		-0.1370	0.1809**		
		(-1.45)	(2.21)		
AINCOME				-0.0009	0.3097***
				(-0.01)	(2.92)
Constant	2.8792*	2.1280	1.2382*	1.7436	-0.0755
	(1.80)	(1.43)	(0.75)	(1.02)	(-0.04)
R^2	0.6919	0.6915	0.6136	0.6857	0.6272
F-test: p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	130	131	131	131	131

t-statistics are reported in parentheses. *, **, *** represent significant at the 10%, 5%, and 1% level, respectively.

Our main variable of interest *CHINA_FDI* is positive and highly significant in all specifications. A 10 percent increase in the FDI inflows to China would raise the level of FDI inflows to the East and Southeast (E&SE) Asian countries by about 5 to 6 percent depending on the specifications. Despite considerable concerns in policy circles that an increase in FDI flow to China is at the expense of other regional economies, this study shows that those economies can actually benefit from it. This may be linked to the production-networking activities among Asian countries as well as the increased resource demand by a growing China. The evidence of production-networking among China and other Asian economies can be found in the substantial two-way trade of intermediate and final goods in the same industries among those countries. The economic ties of mutual

dependence among them have been deepening rapidly since 1990s. The significance of the China effect in the level of FDI inflows to our group of Asian countries may reflect such interdependence. Thus our empirical study shows that an increase in China's FDI is positively and significantly related to FDI inflows in other Asian economies. This result is robust albeit an exclusion of Hong Kong in our regressions. Our central result here is then as follows: up to now the investment-enhancing effect dominates the investment diversion effect so that on net China is a positive force for FDI inflows into other Asian economies.

The effect of openness, denoted by the variable *AOPEN*, has an expected positive sign and is always significant in its inclusion. Openness captures the degree of both tariff and non-tariff measures including trade impediments. In contrast to the effect of tariff barriers proxied by *ADUTY*, the impact of openness to trade on the inflow of FDI is substantial. The results in Table1suggest that, all else being equal, the marginal effect of trade liberalization of the Asian countries on the inflow of FDI is approximately twice as large as that of the China effect. Trade impediments can take various forms such as local content requirements, technology transfer requirements, domestic sales and export requirements, and so on. Our results imply that reductions in this type of trade barrier can play a vital role in promoting FDI to those countries.

Corporate tax is another variable that is found to exert a large influence on the level of the inflows of FDI in this analysis. Although many countries offer various forms of tax incentives for foreign investors, corporate tax rates can be considered as one of the most influential tools to promote investment since it has a direct impact on the profitability of their investment projects.

Unlike many of the previous studies, the growth rate of GDP does not appear to play an important role in attracting FDI in this analysis. On the other hand, per capita income is found to be a significant factor only in equation (5). This seems to suggest that the foreign investors are more sensitive to the current market size than with market potential for their products.

Infrastructure in the form of communications infrastructure, as roughly measured by *ATEL*, is significant in column (3) but not (2) because *ATEL* is moderately correlated with *AOPEN*. Although communication infrastructure appears to be a favorable characteristic for the foreign investors, in terms of the magnitude, other key variables in the equation overshadow the effect of communications infrastructure.

Notwithstanding its insignificance in almost all of the specifications, *ADUTY* reveals its marginally negative effect on FDI in equation (3). Many of the countries examined are heavily involved in vertical specialization, particularly in electric and electronics industries, which can be evidenced in the share of two-way trade in the same industry in the total volume of trade among the nations. A reduction in tariff barriers can stimulate FDI in the host country by lowering the costs associated with intra-firm input trade.

Evidence of a relatively large positive effect of illiteracy on FDI found in equations 3 and 5 is puzzling. One reason for this relationship may be that FDIs in the region tend to seek out cheap labor, which the rate of illiteracy may pick up.

The degree of government stability and the index of corruption, *AGOV* and *ACORRUPT*, are found to be always negatively associated with the level of FDI. However, neither of the institutional factors appears to be an important factor. In other

words, corruption or government instability is unlikely to have significantly discouraged FDI in this group of countries.

Table 1 forms the basic core set of our empirical exercises. However to test alternative ways to judge our "China Effect", we perform several other tests in the following.

4.2 Regressions without Hong Kong

2. Without Hong Kong - Level of FDI
Table 2: Random-effects 2SLS (Level of FDI = the dependent variable)

Independent variables	(1) [a]	(2) [b]	(3) [c]	(4) [d]	(5) [e]
CHINA_FDI	0.4794***	0.5063***	0.5681***	0.5064***	0.5279***
	(7.29)	(7.36)	(7.48)	(7.60)	(7.33)
AGROWTH	0.5372	0.7329	0.2450	0.6113	0.1231
	(0.68)	(0.93)	(0.28)	(0.77)	(0.14)
ACORRUPT	0.3447	0.3499	0.5552**	0.2356	0.4711*
	(1.39)	(1.39)	(2.01)	(0.92)	(1.74)
ADUTY	0.0253	0.07801	-0.2907	0.0633	-0.0974
	(0.12)	(0.37)	(-1.32)	(0.28)	(-0.40)
AGOV	-0.2275	-0.2060	-0.1485	-0.2425	-0.0639
	(-1.06)	(-0.94)	(-0.61)	(-1.12)	(-0.28)
AWAGE	-0.1963				
	(-1.65)				
AOPEN	1.0261***	1.0620***		0.8830***	
	(5.48)	(4.99)		(4.37)	
AILLIT	0.0233	0.0808	0.5080***	0.2122	0.5310***
	(0.13)	(0.45)	(2.85)	(1.20)	(3.05)
ACPTAX	-1.5079***	-1.6033***	-0.2246	-1.3361***	-0.2188
	(-3.30)	(-3.33)	(-0.51)	(-2.82)	(-0.51)
ATEL		-0.1359	0.1795**		
		(-1.40)	(2.18)		
AINCOME				-0.0148	0.3014***
				(-0.12)	(2.78)
Constant	4.0785**	3.0912*	0.6266	2.5455	-0.8821
	(2.18)	(1.79)	(0.34)	(1.25)	(-0.43)
R^2	0.6546	0.6519	0.5648	0.6447	0.5792
F-test: p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	114	115	115	115	115

t-statistics are reported in parentheses. *, **, *** represent significant at 10%, 5%, and 1% level, respectively.

Investment from Hong Kong to China has increased dramatically since the early 1980s. Hong Kong is by far the largest foreign investor in China. However, it has been frequently said that a significant portion of the investment from Hong Kong to China originates from China itself or from countries outside Hong Kong.

Much of China's capital outflow that takes place either through legal or illegal channels to Chinese firms located in Hong Kong finds it's way back to China as FDI. This type of "roundtripping" of funds is mostly used to escape regulations such as barriers to trade or to gain eligibility to incentives available to only foreign investors (e.g. tax concessions). According to the World Bank (2002), round-tripping accounts for twenty to thirty percent of FDI in China. Hong Kong is also used as a stepping stone for investment to China. A large number of foreign firms use affiliates in Hong Kong to investment in China on their behalf.

To evaluate if the Hong Kong's peculiar position leads to the different results in our analysis, we eliminate Hong Kong from our sample countries and reexamine the panel analysis. The results are shown in Table 2.

Interestingly, we find that the results for all eight countries generally hold for the analysis without Hong Kong. The China effect has a significant positive effect on Asian FDI, confirming that there is no diversionary China effect in terms of the level of FDI inflow to its Asian neighbors. On the other hand, FDI inflow can be greatly promoted by reducing the level of corporate tax, and by increasing the degree of openness in international trade through lowering tariff and non-tariff barriers as well as abolishing various trade impediments. The importance of establishing a large market is also evidenced. Corruption appears to have a larger and more significant influence on FDI inflows when the panel is analyzed without Hong Kong. This may be attributed to the fact that Hong Kong demonstrates the lowest level of corruption on average among all countries examined. The importance of the variable may be higher among less corrupt economies.

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4.3. Regressions using Shares of Asian countries' FDI

The model in this section uses shares of FDI inflows to the Asian countries as the dependent variable in equation (1). Also note that the dependent variable in the China equation (2) is still the level of China FDI. We could also use China's shares of FDI of the Asian countries instead of the level of China FDI. However, between the years 1985 and 2001, China and these East and Southeast Asian countries accounted for 89% of total inflow of FDI to Asia. Then, an increase in the share of FDI inflow to China will almost ensure a reduction in the shares of FDI inflows to those eight economies. To avoid this, we continue to use the level of China FDI inflows so as to see how much of these increases divert the shares of the Asian FDI from those E&SE Asian countries.

Given that direct investment inflows into China and our eight Asian economies constitute the bulk of direct investment into Asia, it may not be entirely surprising to find out flows of China's inward foreign direct investment will affect the shares of our economies' foreign direct investment into the whole of Asia. Nonetheless it is still useful to actually estimate the impact. It is evident from our regressions that an incremental increase in FDI to China will undoubtedly deteriorate the FDI stance of the Asian countries in terms of their shares of FDI within Asia. A 10 percent increase in China's FDI causes the E&SE Asian shares of FDI to Asia to drop by about 2 to 3 percent. Although China does appear to take a bigger share of FDI at the expense of its neighboring countries, FDI promotion could come from the internal economic policy of each country such as the level of corporate tax and the degree of openness in foreign trade. The influence of openness on FDI is at least twice as large as that of the China effect and more than four times as large in equation (1), (2) and (4). Similarly, the

influence of corporate taxes on FDI can be more than three times as large as that of the China effect.

Also evident from the table is the much larger and significant effect of corruption than what we observed in Table 1. A one- percent decrease in the degree of corruption is associated with between 0.25 to 0.64 percentage increase in FDI shares, depending on the specification of the equation.

3. Share of FDI to Asia

Table 3: Random-effects 2SLS (country share of FDI to Asia = the dependent variables.)

Independent variables	(1) [a]	(2) [b]	(3) [c]	(4) [d]	(5) [e]
CHINA_FDI	-0.2544***	-0.2580***	-0.1974***	-0.2355***	-0.2127***
	(-4.45)	(-4.31)	(-3.05)	(-4.09)	(-3.47)
AGROWTH	0.4250	0.5296	0.2997	0.5123	0.2810
	(0.60)	(0.75)	(0.39)	(0.72)	(0.37)
ACORRUPT	0.3242	0.3913*	0.6411***	0.2490	0.5337**
	(1.52)	(1.79)	(2.73)	(1.14)	(2.40)
ADUTY	0.0093	0.0409	-0.4181**	0.0285	-0.2389
	(0.05)	(0.22)	(-2.33)	(0.15)	(-1.21)
AGOV	0.2103	0.2545	0.1574	0.1711	0.1622
	(1.41)	(1.63)	(0.92)	(1.13)	(1.00)
AWAGE	-0.1450				
	(-1.38)				
AOPEN	0.8312***	0.9072***		0.7172***	
	(5.27)	(5.14)		(4.28)	
AILLIT	0.1316	0.1153	0.4636***	0.2830*	0.5216***
	(0.83)	(0.72)	(2.91)	(1.83)	(3.38)
ACPTAX	-1.1312***	-1.2547***	-0.4255	-1.0379***	-0.4393
	(-3.32)	(-3.54)	(-1.23)	(-2.99)	(-1.29)
ATEL		-0.1430*	0.1322*		
		(-1.68)	(1.81)		
AINCOME				0.0049	0.2605***
				(0.05)	(2.75)
Constant	3.3251**	2.9793**	2.2319	2.2411	0.7423
	(2.30)	(2.22)	(1.52)	(1.44)	(0.46)
R^2	0.5688	0.5758	0.4805	0.5650	0.4985
F-test: p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	130	131	131	131	131

t-statistics are reported in parentheses. *, **, *** represent significant at 10%, 5%, and 1% level, respectivel

4.4 Regressions with Global Supply of FDI

4. Level of FDI with Global Supply of FDI

Table 4: Random-effects 2SLS (Level of FDI = the dependent variable)

Independent Variables	(1)[a]	(2)[b]	(3)[c]	(4)[d]	(5)[e]
CHINA_FDI	0.2979	0.2957	0.2184	0.1960	0.2024
	(2.690)***	(2.628)***	(1.842)*	(1.911)*	(1.866)*
AGROWTH	0.5820	0.6575	0.4322	0.5072	0.4413
	(0.773)	(0.881)	(0.545)	(0.680)	(0.571)
ACORRUPT	0.3713	0.4375	0.8022	0.3801	0.6258
	(1.503)	(1.716)*	(3.126)***	(1.553)	(2.686)***
ADUTY	0.0606	0.0867	-0.3388	0.0707	-0.1188
	(0.304)	(0.438)	(1.843)*	(0.347)	(0.592)
AGOV	0.0726	0.1183	0.0506	0.0707	0.0288
	(0.456)	(0.712)	(0.287)	(0.445)	(0.174)
AWAGE	-0.1168				
	(1.044)				
AOPEN	0.7905	0.8705		0.5858	
	(4.302)***	(4.405)***		(3.043)***	
AILLIT	0.2334	0.2021	0.5542	0.4112	0.6551
	(1.330)	(1.168)	(3.387)***	(2.405)**	(4.118)***
ACPTAX	-1.2000	-1.3238	-0.5793	-1.0496	-0.5823
	(3.321)***	(3.532)***	(1.625)	(2.875)***	(1.685)*
ATEL		-0.1282	0.1077		
		(1.423)	(1.392)		
AINCOME				0.0656	0.2720
				(0.579)	(2.816)***
OUTFLOW	0.4623	0.4482	0.7083	0.6260	0.7264
	(2.521)**	(2.460)**	(3.860)***	(3.581)***	(4.236)***
Constant	-1.6157	-1.6647	-4.3587	-3.8717	-6.3133
	(0.743)	(0.827)	(2.133)**	(1.713)*	(2.975)***
R-square	0.7206	0.7222	0.6819	0.7212	0.6975
F-test: p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	130	131	131	131	131

t-statistics are reported in parentheses. *, **, *** represent significant at the 10%, 5%, and 1% level, respectively.

In Table 4, we add in an explanatory variable OUTFLOW, which is the total amount of global supply of FDI for each year. One potential criticism of our central finding that FDI in China is positively related to FDI inflows into other Asian economies is that such a positive correlation may arise simply because inflows to most economies are dictated by the global supply of capital of that year. If OUFLOW is larger in year t, inflows of FDI to China and other Asian economies are also likely going to rise. This then generates our result, which is not related to the "China Effect" we wish to investigate. To control for the supply-side effect of FDI and to isolate the estimation of the China Effect, we now run our panel simultaneous equation model with the addition of OUFLOW. As can be seen in Table 4, the coefficients representing the China Effect are still positive and significant. The magnitudes of the coefficients are, however, almost halved compared to those in Table 1. The variable OUTFLOW is also positive and significant and has a larger coefficient than the China Effect. Other variables that are significant include the corporate tax rates, openness and the degree of corruption. We confirm again that the China Effect is positive. As before, other determinants related to policy, institution and the global supply of capital have a stronger effect on the inflows of FDI into these Asian economies.

5. Conclusion

Is China diverting foreign direct investments away from other Asian economies? This is the paramount question on the minds of many academic researchers as well as

policymakers in Asia. Theoretically, the emergence of China can have both investment-creating effects as well as investment-diverting effects. In this paper, we examine this issue empirically.

We use data for eight Asian economies (Hong Kong, Taiwan, Republic of Korea, Singapore, Malaysia, Philippines, Indonesia and Thailand) from 1985-2001 and estimate the determinants of foreign direct investment inflows in these economies. The standard determinants we consider include GDP growth rates, the degree of openness, corporate tax rates, indices of corruption, degrees of government stability, illiteracy rates, per capita GDP, tariff rates, wage rates and proxies of infrastructure. To estimate the China Effect, we include in the econometric equations the levels of China's inward foreign direct investment. As China's foreign direct investment should also be dependent on foreign direct investment in other Asian economies and other similar policy and institutional factors. We use a random effects simultaneous equation model to estimate our coefficients, including the estimation of the coefficient on the China effect.

The main results of our paper are as follows. *First*, in terms of the levels of foreign direct investment flows, the China Effect is positive. In other words, foreign direct investments to our Asian economies are positively related to direct investment into China. *Second*, in terms of the shares of foreign direct investments, the China effect is negative. Thus while both the level of China's foreign direct investment and the levels of foreign direct investments of our Asian economies are increasing together, an increase in China's investment is associated with a decline in the shares of foreign direct investment of the Asian economies. *Third*, the China Effect is *not* the most important factor determining the inflows of foreign direct investments into these Asian economies.

Specifically, policy variables such as the lower corporate taxes and higher degrees of openness play a larger role in attracting investment. In some regressions, lower degrees of corruption also lead to higher inflows of foreign direct investment.

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Appendix A: Definition and source of variables.

AFDI and *CHINA_FDI*: Aggregate FDI inflows of each country, aggregate FDI inflows to Asia, and aggregate FDI to the world are from UNCTAD.

ACORRUPT and *CCORRUPT:* An index of corruption from International Country Risk Guide (ICRG) from the PRS Group. It ranges from 0 to 6, where a higher number means a lower level of corruption.

AGOV and *CGOV:* An index of government stability from International Country Risk Guide (ICRG) from the PRS Group. The range is from 0 to 12. A higher score means higher stability of a government.

ADUTY and *CDUTY:* Import duties are from IMF's *Government Finance Statistic Yearbook*.
AWAGE and *CWAGE:* Average wages in manufacturing; from UN Common Database, LABORSTA, and countries' official websites.

AOPEN and *COPEN:* Openness = (Export + Import)/ GDP. Export and Import data are from IMF's *Direction of Trade*.

AILLIT: Illiteracy rate is the percentage of people ages 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life; from *World Development Indicators*.

ACPTAX: Corporate income tax rate, measured in percentage points, from *Price Waterhouse'* s "Worldwide summary" book.

ATEL: Telephone mainlines (per 1,000 perople) from *World Development Indicators*.

AINCOME and *CINCOME*: per capita GDP = (GDP/population). GDP data are from EconStats. Population data are from *World Development Indicators*.

AGROWTH and *CGROWTH*: Measured in percentage point. Data are from EconStats.

AWAGE and *CWAGE* : Average wage in manufacturing; from UN Common Database, LABORSTA, and countries' official websites.

OUTFLOW: Total supply of FDI, from UNCTAD, *World Investment Report*

Appendix B : List of the Countries in Asia

Israel, Japan, Bahrain, Cyprus, Iran (Islamic Rep. of), Iraq, Jordan, Kuwait, Lebanon, Oman, Palestinian territory, Oatar, Saudi Arabia, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, China Hong Kong SAR, China Macao SAR, China (Taiwan Province of), India, Indonesia, Korea (Dem. People's Rep. of), Korea (Republic of), Lao People's Dem. Rep., Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam

Definition of Asia is from UNCTAD.