Trade in East and Southeast Asia and Global Foreign Direct Investment

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Abstract: In this paper, we first highlight the extent of trade in parts and components in various East and Southeast Asian economies, including China. We hypothesize that various sources of foreign direct investment will independently enhance international trade of parts and components as well as trade in capital goods in East and Southeast Asia. We run regressions relating foreign direct investment from the United Kingdom, the United States, Germany and Japan to trade in East and Southeast Asia. We show that foreign direct investment from Japan has the largest positive effect on trade in East and Southeast Asia, followed by Germany.

Keywords: foreign direct investment, international trade

JEL classification: F1

1. Introduction

International trade in parts and components has attracted increasing attention from academics and policymakers (Dean, Fung and Wang 2008, 2011, Mitsuyo and Kimura 2013, Chen, Cheng, Fung and Lau 2009). Most researchers believe that production networks are facilitated by trading activities of multinationals with their factories and affiliates located in different countries (Aminian, Fung and Iizaka 2007). So far, few research papers empirically estimate to what extent foreign direct investment (FDI) affects various types of trade. There are even fewer articles focusing on how various sources of FDI determine activities of production network.

In this paper, we make an attempt to empirically estimate the impact of various sources of FDI on production sharing activities. In the next section, we focus on highlighting how FDI coming from United Kingdom, the United States, Germany and Japan will affect trade in parts and components as well as trade in capital goods. We also focus on particularly trade in East and Southeast Asian economies.

In the next section, we selectively highlight trade in parts and components between China and various East Asian economies. In section 3, we provide estimation equations concerning the determinants of trade in parts and components and trade in capital goods. We add FDI as the additional explanatory variable. Given that FDI will be endogenous, we provide a two-stage regression. In section 4, we conclude.

2. Trade in Parts and Components in Asia

In this section, we show the linkages between China and other Asian-Pacific economies. The methodology is to isolate from international trade statistics (COMTRADE) and focus on data that constitute parts and components (see Ng and Yeats 2001, Ng 2003, Fung and Garcia-Herrero 2014). This methodology ignores the iterated use of parts and components in the domestic economy. But using input-output tables to capture such effects can also generate problems due to potential inaccurate input-output coefficients for developing economies.

The following tables highlight the imports and exports of parts and components related to China and other Asian Pacific economies, including South Korea, Japan, Taiwan and Australia.

Traditionally, the major production networks include electronics, telecommunication equipment, textile and clothing, automobiles as well as furniture. As we can see in the above tables, imports and exports between trading partners in the Asia/Pacific involve all of these networks. The volume of trade tends to be dense, except for Australia. In relation to China, the imports and exports of parts and components for Australia are much smaller compared to those for Japan, Taiwan or South Korea.

Table 1. Top 10 Exports of Parts and Components from China to South Korea 2010

SITC	Parts & Components	Exports (US$ Million)	% of Parts & Components
764	Parts of telecommunication equipment	9,012	39
776	Parts of electronic components	4,465	20
65	Textile yarn, fabrics & made-up materials	2,594	11
772	Parts of switchgear	1,348	6
691	Parts of structure in iron and steel	1,099	5
759	Parts of office and adding machinery	1,009	4
784	Parts and accessories for motor vehicles	886	4
88411	Parts of unmounted optical elements	237	1
7139	Parts of internal combustion engines	192	1
7239	Parts of construction machinery	190	1

Source: Computations based on UN COMTRADE Statistics.

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Table 2. Top 10 Imports of Parts and Components by China from South Korea 2010

SITC	Parts & Components	Imports (US$ Million)	% of Parts & Components
776	Parts of electronic components	33,432	57
764	Parts of telecommunication equipment	5,128	9
759	Parts of office and adding machinery	4,131	7
772	Parts of switchgear	3,876	7
65	Textile yarn, fabrics & made-up materials	2,309	4
784	Parts and accessories for motor vehicles	2,275	4
88411	Parts of unmounted optical elements	2,042	3
7133	Internal combustion piston engines	1,417	2
7239	Parts of construction machinery	878	1
81242	Parts of lighting fittings and base metals	526	1

Source: Computations based on UN COMTRADE Statistics.

Table 3. Top 10 Exports of Parts and Components from China to Japan 2010

SITC	Parts & Components	Exports (US$ Million)	% of Parts & Components
764	Parts of telecommunication equipment	6,663	24
65	Textile yarn, fabrics & made-up materials	4,098	15
776	Parts of electronic components	2,601	10
759	Parts of office and adding machinery	2,580	9
772	Parts of switchgear	2,420	9
784	Parts and accessories for motor vehicles	1,795	7
82122	Furniture	884	3
691	Parts of structure in iron and steel	687	3
82119	Parts of chairs and seats	407	1
7239	Parts of construction machinery	403	1

Source: Computations based on UN COMTRADE Statistics.

Tabel 4. Top 10 Imports of Parts and Components by China from Japan 2010

SITC	Parts & Components	Imports (US$ Million)	% of Parts & Components
776	Parts of electronic components	18,545	32
784	Parts and accessories for motor vehicles	7,790	13
772	Parts of switchgear	7,638	13
759	Parts of office and adding machinery	3,813	7
764	Parts of telecommunication equipment	3,758	6
65	Textile yarn, fabrics & made-up materials	3,146	5
88411	Parts of unmounted optical elements	1,980	3
7139	Parts of internal combustion engines	1,364	2
7239	Parts of construction machinery	1,296	2
8749	Parts of instruments and accessories	934	2

Source: Computations based on UN COMTRADE Statistics.

Table 5. Top 10 Exports of Parts and Components from China to Taiwan 2010

SITC	Parts & Components	Exports (US$ Million)	% of Parts & Components
776	Parts of electronic components	3,966	37
764	Parts of telecommunication equipment	2,156	20
772	Parts of switchgear	1,156	11
759	Parts of office and adding machinery	782	7
65	Textile yarn, fabrics & made-up materials	508	5
88411	Parts of unmounted optical elements	490	5
78539	Parts of carriages and cycles	316	3
784	Parts and accessories for motor vehicles	197	2
7499	Parts of other non-electric machinery	96	1
7169	Parts of rotating electric motors	79	1

Source: Computations based on UN COMTRADE Statistics.

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Table 6. Top 10 Imports of Parts and Components by China from Taiwan 2010

SITC	Parts & Components	Imports (US$ Million)	% of Parts & Components
776	Parts of electronic components	41,440	73
772	Parts of switchgear	3,813	7
65	Textile yarn, fabrics & made-up materials	3,074	5
759	Parts of office and adding machinery	2,515	4
764	Parts of telecommunication equipment	1,978	3
88411	Parts of unmounted optical elements	1,832	3
7369	Parts of machine tools for metal industry	300	1
81242	Parts of lighting fittings and base metals	285	1
7499	Parts of other non-electric machinery	210	0
784	Parts and accessories for motor vehicles	130	0

Source: Computations based on UN COMTRADE Statistics.

Table 7. Top 10 Exports of Parts and Components from China to Australia 2010

SITC	Parts & Components	Exports (US$ Million)	% of Parts & Components
764	Parts of telecommunication equipment	1,195	21
65	Textile yarn, fabrics & made-up materials	924	16
776	Parts of electronic components	807	14
691	Parts of structure in iron and steel	501	9
625	Rubber tires for wheels	403	7
784	Parts and accessories for motor vehicles	265	5
759	Parts of office and adding machinery	212	4
82122	Mattress supports and cushion for furniture	199	3
772	Parts of switchgear	199	3
81242	Parts of lighting fittings and base metals	190	3

Source: Computations based on UN COMTRADE Statistics.

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Table 8. Top 10 Imports of Parts and Components by China from Australia 2010

SITC	Parts & Components	Imports (US$ Million)	% of Parts & Components
764	Parts of telecommunication equipment	77	26
7132	Internal combustion engines for vehicles	43	15
772	Parts of switchgear	30	10
79199	Parts of railway and tramway locomotives	25	9
7239	Parts of construction machinery	18	6
784	Parts and accessories for motor vehicles	17	6
65	Textile yarn, fabrics & made-up materials	15	5
776	Parts of electronic components	12	4
8749	Parts of instruments and accessories	6	2
7439	Parts of centrifuges and filters	6	2

Source: Computations based on UN COMTRADE Statistics.

3. Empirical Analysis

The gravity model has been widely applied in various FDI and international trade studies (Feenstra et al. 2001). The gravity equation in using cross-country data is written as:

$$X_{ij} = f\,(GDP_i, GDP_j, F_{ij}) \tag{1}$$

where X_{ij} is the value of the trade flow of goods from country i to country j, GDP_i and j are the GDP in country i and j, respectively, and F_{ij} is a set of factors that influence the trade flow. These factors include the physical distance between the two countries i and j, which is used as a proxy for transportation costs, a dummy variable that assumes the value 1 if i and j share a common language and 0 otherwise, a binary variable assuming the value 1 if i and j share a common land border and 0 otherwise, and a dummy variable assuming the value 1 if i and j have a free trade agreement and 0 otherwise.

The model is augmented in order to examine the economic impact of FDI inflow on the host country's trade. China, Hong Kong, Singapore, South Korea, Thailand, Malaysia, the Philippines, Indonesia and Japan are included in the estimation here for 1998-2006.

Of particular interest is the impact of FDI on the various forms of trade in East Asia. One possible specification issue for including FDI in the gravity analysis is the endogeneity problem. More specifically, the causal relationship between FDI and trade may be driven by unobserved common factors such as variation in government policy, technology, tastes etc. The strategy adopted here to deal with this issue is to estimate FDI at the first stage using various instrumental variables while in the second stage, bilateral trade in parts and components as well as bilateral trade in capital goods is estimated with the predicted value of FDI as the additional explanatory variable. The error term in the FDI equation then is uncorrelated with the error term in the trade equation.

The model predicts that FDI flow and bilateral trade flows between any two Asian countries as:

$$FDI_i = \alpha_0 + \beta_1 DIFPGDP_{ij} + \beta_2 DIFWAGE_{ij} + \beta_3 DUTY_i + \beta_4 CTAX_i + \beta_5 CORRUPT_i + \beta_6 GSTAB_i + \beta_7 LAW_i + \beta_8 TEL_i + \varepsilon_{ij} \tag{2}$$

$$T_{ij}=\gamma_0+\rho_1 GDP_i+\rho_2 GDP_j+\rho_3 DIST_{ij}+\rho_4 DMB_i+\rho_5 FDI_i+\delta_{ij} \quad (3)$$

where subscripts i and j refer to the reporting country and the partner country. The definition of the variables in the above equation is listed below. Annual data for the East and Southeast Asian countries from 1998 to 2006 are used in the estimation. Equation (3) is run on parts and components and capital goods separately. In addition, the impact of an each explanatory variable on bilateral import flows and export flows are examined separately.

FDI_i – the level of FDI stock in the reporting country.
$DIFPGDP_{ij}$ – the absolute value of the difference in per capita GDP between i and j.
$DIFWAGE_{ij}$ – the absolute value of the difference in wages between i and j.
DUTYi – import tariff of the host country.
$CTAX_I$ – corporate tax rate of the host country.
$CORRUPT_i$ – an index of corruption in the host country.
$GSTAB_i$ – an index of government stability in the host country.
LAW_i – an index of rule of law in the host country.
TEL_i – the number of telephone main lines per 1,000 people in the host country.
$DIST_{ij}$ – the geographical distance between the most important cities in i and j.
T_{ij} – the volume of exports or imports by country i to or from j in total trade, intermediate or final products.
GDP – gross domestic product.
DMB_{ij} – a dummy variable that is 1 if i and j share a common border and 0 otherwise.

The independent variables included in equation (2) are assumed to exert an influence on inward foreign direct investment in each East and Southeast Asian country by altering the investment environment through institutional and policy changes, as well as economic conditions.

Two variables have been incorporated in this analysis that may influence the level of foreign production – the absolute difference of per capita GDP (DIFPGDP) and wages (DIFWAGE). The gap in per capita GDP and wages between a reporting country and a partner country should have a positive influence on FDI of the vertical type. Trade in parts and components can be very sensitive to cost differences between two countries. For production sharing to take place, additional coordination costs must be offset by a reduction in the production costs. Factor price differentials between countries allow at least one fragment to be produced more cheaply in another country (Deadorff, 2001). The gap in production costs between the two countries must be sufficiently large in order for production sharing to occur.

Policy-related variables, tariff barriers proxied by import duty and corporate tax rates have also been included. Multinationals, which set up vertical production networks, may be encouraged to invest in a country with relatively low tariff barriers due to lower costs of their imported components. Under such an arrangement, goods-in-process may cross multiple borders while they are being manufactured. Since an import tax may be imposed each time these parts cross a border, the effect of the lower tariff rate on the reduction in the cost of production of these goods can be magnified.

Another policy-related variable that can influence a host country's location advantage is the host country's corporate or other tax rates. As global profit maximizers, multinationals can be assumed to be sensitive to tax rates, since such factors have a direct effect on their profits. Evidence of significant negative influence from higher corporate tax rates on FDI have been reported in previous studies by Wei (1997), Gastanaga and others (1998) and Hsiao (2001).

Also included in equation (2) are institutional factors, the level of corruption, the stability of each government and the rule of law. Corruption can discourage FDI by inducing a higher cost of doing business. Hines (1995) showed that FDI from the United States grew faster in less corrupt countries than in more corrupt countries. Wei (1997) presented an alternative explanation of the negative and significant effect of corruption on FDI. Unlike taxes, corruption is not transparent and involves many factors that are more arbitrary in nature. An agreement between a bribing executive and a corrupt official is difficult to enforce and it creates more uncertainty over the total questionable payments. Wei demonstrated the fact that this type of uncertainty induced by corruption leads to a reduction in FDI. Political stability of a government and the sound rule of law can also be important factors in the inflow of FDI. Uncertain political environments and their related risks can impede FDI inflows despite favorable economic conditions.

The last variable, TEL, included in equation (2) is a proxy for the quality of infrastructure. As theorized by Jones and Kierzkowski (1990), production fragmentation is not costless. Unlike final goods, the parts and components produced among network member countries may cross multiple international borders. This incurs additional costs of transportation as well as costs of a wide variety of services associated with coordinating production, shipments, sales of final goods etc. Higher quality of infrastructure can reduce costs significantly.

We now turn to equation (3). The volume of trade in both intermediate and final products is expected to be positively related to the market size of the two countries concerned. The variable GDP captures the idea that larger countries trade more than small countries as they can offer more differentiated products to satisfy a wide variety of consumers. At the same time, for producers of both components as well as capital goods, the larger the market size of both exporting and importing countries due to the presence of economies of scale, the larger the volume of trade. According to the theory of production sharing outlined by Jones and others (2004), scale of production would determine the lengths to which the division of labor can proceed since the level of the workers' specialization increases as the scale of production rises. As Grossman and Helpman (2005) suggested, the variable can also be treated as a proxy for the "thickness" of the markets; this has a positive impact on the location of outsourcing, as the likelihood of the firms finding an appropriate partner in their search increases as the size of a country increases.

The distance variable is considered to be an important factor in explaining international trade since distance raises transportation costs, which is a trade-resistance factor that negatively affects the bilateral trade volume. In particular, transportation costs are considered to have a larger impact on decisions concerning production sharing, as each component that belongs to the same value-added chain may cross national boarder multiple times. Geographical proximity, on the other hand, promotes bilateral trade flows as it reduces transportation costs, information costs, cultural differences etc. Therefore, the expected sign of the variable is negative. In this paper, the great circle distance between the capital cities of the reporting country and the partner country is used.

The final variable is a dummy variable with regard to whether the importing country and exporting country are adjacent. The dummy variables may capture various factors that lead to reduced business transaction costs. For example, firms in adjacent economies are likely to have a better knowledge of business practices than producers from a different business environment. This familiarity certainly helps to reduce uncertainty. The knowledge of the business environment also helps to reduce the difficulty of finding an appropriate outsourcing partner in production networks. As the variable is assumed to capture additional proximity between trading partners that enhance trade, it is expected to be positively related to the amount of trade.

Except for the dummies, all variables are log-linearized. Sources for the variables are listed in the Appendix.

Table 9: Regression results for Exports

Explanatory Variables	Japan	Japan	US	US	Germany	Germany	UK	UK
	PC	CA	PC	CA	PC	CA	PC	CA
GDP Reporter	0.671*** (0.062)	0.728*** (0.063)	0.712*** (0.062)	0.867*** (0.062)	0.487*** (0.074)	0.686*** (0.077)	0.731*** (0.067)	0.849*** (0.067)
GDP Partner	0.726*** (0.057)	0.691*** (0.058)	0.712*** (0.060)	0.711*** (0.061)	0.770*** (0.055)	0.781*** (0.057)	0.776*** (0.059)	0.769*** (0.061)
DIST	-1.174*** (0.210)	-0.935*** (0.187)	-1.135*** (0.218)	-0.951*** (0.192)	-1.137*** (0.204)	-0.988*** (0.187)	-1.220*** (0.221)	-1.024*** (0.197)
DB	-0.141 (0.382)	0.291 (0.339)	-0.148 (0.394)	0.219 (0.346)	-0.100 (0.371)	0.240 (0.338)	-0.210 (0.401)	0.161 (0.356)
IFDI	0.666*** (0.106)	1.129*** (0.119)	0.399*** (0.072)	0.470*** (0.080)	0.422*** (0.058)	0.405*** (0.067)	0.188*** (0.052)	0.275*** (0.058)
LM	1%	1%	1%	1%	1%	1%	1%	1%
#Obs	643	643	643	643	643	643	643	643

Note: PC denotes parts and components
CA denotes capital goods
IFDI denotes instrumented foreign direct investment

Table 10: Regression results for Imports

Explanatory Variables	Japan	Japan	US	US	Germany	Germany	UK	UK
	PC	CA	PC	CA	PC	CA	PC	CA
GDP Reporter	0.593*** (0.066)	0.671*** (0.064)	0.648*** (0.063)	0.735*** (0.060)	0.328*** (0.075)	0.450*** (0.076)	0.623*** (0.068)	0.696*** (0.066)
GDP Partner	0.858*** (0.060)	0.805*** (0.059)	0.849*** (0.061)	0.797*** (0.060)	0.896*** (0.055)	0.854*** (0.056)	0.888*** (0.060)	0.834*** (0.059)
DIST	-1.059*** (0.239)	-0.797*** (0.194)	-1.037*** (0.231)	-0.764*** (0.186)	-0.987*** (0.214)	-0.754*** (0.186)	-1.082*** (0.235)	-0.816*** (0.192)
DB	-0.195 (0.435)	0.201 (0.352)	-0.217 (0.418)	0.174 (0.334)	-0.125 (0.389)	0.247 (0.336)	-0.254 (0.427)	0.130 (0.347)
IFDI	0.668*** (0.107)	0.880*** (0.121)	0.348*** (0.073)	0.469*** (0.078)	0.499*** (0.058)	0.539*** (0.066)	0.227*** (0.052)	0.325*** (0.057)
LM	1%	1%	1%	1%	1%	1%	1%	1%
#Obs	643	643	643	643	643	643	643	643

Note: PC denotes parts and components
CA denotes capital goods
IFDI denotes instrumented foreign direct investment

Table 9 and 10 show the results of the estimations by random effect model. They highlight a positive and statistically significant influence of all countries' direct investment on trade in parts and components as well as in capital goods. The results indicate that FDI by all source countries cause both intra-regional bilateral exports and imports of parts and components as well as capital goods to increase among the

East and Southeast Asian countries. Thus inward FDI and trade in both parts and components and capital goods are complementary. On the import side, the result may be attributed to various trade liberalization policies and institutional changes that many East and Southeast Asian economies pursued during the 1990s to help generate greater openness for trade. For example, many East and Southeast Asian economies unilaterally eliminated their tariffs on capital and intermediate goods. In addition, duties on trade in information technology products were completely eliminated due to the Information Technology Agreement (ITA) of 1996. This is important because among the commodities actively traded in the East and Southeast Asian region, the leading category is electronics and telecommunication products. Regarding institutional changes, the establishment of Export Processing Zones (EPZ), where manufacturers can enjoy import duty exemption on imported inputs and capital goods as well as widespread use of duty drawbacks on imported intermediates used for exports, effectively reduces the impact of tariff barriers on trade.

An examination of the tables reveals that the magnitude of the coefficient of parts and components is far from homogenous. Japanese direct investment appears to have a very large effect on both intra-East and Southeast Asian bilateral exports and imports relative to FDI from other countries. Among the source economies, both Japan and Germany are more oriented towards manufacturing and engineering. Their FDI tend to exert the strongest effects on trade in parts and components as well as capital goods. The UK is the most service-oriented and has the smallest impact. The US is in between Japan and Germany on one hand and UK on the other.

On the export side, the impact of Japanese direct investment exerted on regional bilateral exports of parts and components is approximately 1.7 times as large as that of the U.S. direct investment. Relative to FDI from Europe, the coefficient for Japan is approximately 1.6 times, 3.5 time and 1.4 times as large as FDI from Germany and UK, respectively. Similarly, on the import side, the large difference exists between FDI from Japan and the rest of the countries. One possible explanation for the extremely small coefficient for UK may be the concentration of their FDI in Singapore and Hong Kong where a large part of FDI is absorbed in service sector instead of manufacturing sector. The domestic UK economy is almost 75% service-oriented.

Japanese manufacturing industries over time concentrated production of parts through their business networks in East and Southeast Asia in order to achieve scale economies. During the process, a cross-border division of labor by Japanese multinationals starts to expand from between Japan and East and Southeast Asia to between the East and Southeast Asian countries excluding Japan. The large impact of Japanese direct investment on Asian trade of parts and components may be attributed to this distinctive characteristic of Japanese direct investment.

International production networks formed by U.S. multinationals, particularly in the electronics industry has been described as more open relative to the Japanese networks. The U.S. networks often involve independent suppliers both local and other non-U.S. foreign affiliates in Asia. Compared to Japan, the relatively small coefficients for U.S. FDI can be explained by their networks' general characteristics. Regarding intra-Asian exports and imports of capital goods, the difference in the magnitude of the impact of Japanese direct investment relative to other FDI source countries is magnified in both exports and imports. The stark difference can partly be due to an extensiveness of Japanese machinery production in East and Southeast Asia and the fact that a wide range of goods that can be used as intermediate inputs in related industries is actually classified as "Capital Goods" in United Nations BEC. For our data, we use the United Nations Broad Economic Categories (BEC) to identify capital goods from the trade data.

The large impact of Japanese direct investment on the bilateral intra-Asian trade can best be understood by the wide range of offerings from Japan and from their affiliates in Asia many of which fall into "Capital Goods" classification. Japanese industries that invest widely in East and Southeast Asia include electrical and electronic machinery as well as household appliances and automobiles.

The coefficients for the standard variables, the GDP of both reporting and partner countries and the distance have the expected signs and are statistically significant at the 1% level for both parts and components and capital goods for all countries examined. The overall results for GDP are consistent with the hypothesis that larger countries are more likely to enjoy economies of scale and to export more, while at the same time importing more due to a higher capability of absorption.

Distance is found to be an important resistance factors for trade flows of both exports and imports of both modes of trade. Distance is likely to represent not only transportation costs, but also other costs incurred in delivering a good to the final user, such as telecommunications, local distribution, and regulatory costs. Lowering the costs of these service links that connect the two production blocks is crucial for countries to successfully be an integral party of production networks. The relatively large impact of the distance variable found in this study implies that high potential benefits for East Asian countries can materialize by reducing the level of trade costs. The adjacency dummy included to capture additional advantages arising from geographical proximity is not found to have significant influence on regional bilateral trade.

4. Conclusion

In this paper we highlight the importance of trade of parts and components in East and Southeast Asia. Our statistical analysis based on the gravity model shows that FDI from Japan, U.S., Germany and UK all play an important and *independent* role in enhancing the trade of parts and components as well as trade in capital goods in East and Southeast Asia. Does the national origin of FDI matter for the relationship between FDI and trade in parts and components? Our empirical studies show that Japanese direct investment in Asia has a particularly strong impact on both trade in parts and components as well as trade in capital goods relatively to FDI from US, Germany and UK. Investment from UK in particular has a relatively weak influence on trade. This may be due to the strong service-oriented economy in the UK. The impact of German FDI tend to be the second strongest since Germany is also blessed with a strong manufacturing and engineering sector. The U.S. is in between Japan and Germany on one hand and UK on the other.

With respect to capital goods, Japanese engineering and machinery sector continues to be a strong sector of the economy. Japanese affiliates are established abroad to import machinery from Japan or to manufacture and export some of the capital goods to other East and Southeast Asian economies. Capital goods are used to produce and export parts and components. For the case of Japan, trade in capital goods and trade in parts are both enhanced by Japanese multinationals and the two types of trade are positively correlated. In addition, FDI rather than local supply is needed both because of the quality of the machinery as well as the importance of safeguarding the intellectual property of such capital goods. Other complementary explanations of the significant influence of Japanese FDI on modes of intra-East Asian trade include the activities of the small and medium enterprises as well as other *keiretsu* suppliers that follow the Japanese multinationals when they go abroad (Fung 2002). In contrast, direct investments from US, Germany and the UK also facilitate trade in parts and components as well as capital goods. Without the *keiretsu* linkages, the US, German and UK multinationals may employ more local suppliers.

Appendix
Source of variables

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

CORRUPT: An index of corruption from the International Country Risk Guide by the PRS Group. It ranges from 0 to 6, with a higher number indicating a lower level of corruption.

GSTAB: An index of government stability from the International Country Risk Guide by the PRS Group. The range is from 0 to 12. A higher score means higher stability of a government.

Law: An index of Law and Order from the International Country Risk Guide by the PRS Group. It ranges from 0 to 6, where a higher number indicates a better system of law and order.

DUTY: Import duties are from the International Monetary Fund's Government Finance Statistic Yearbook.

WAGE: Average wages in manufacturing from the United Nations Common Database, LABORSTA and official country websites.

CPTAX: Corporate income tax rate, measured in percentage points, from *Worldwide Summary* by PricewaterhouseCoopers website.

TEL: Telephone mainlines (per 1,000 people) from World Development Indicators.

GDP: GDP in United States dollars are from EconStats.

PGDP: Per capita GDP are from EconStats.

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