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# Economic Development in China and Its Implications for East Asia

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China is presenting a serious economic challenge to the global economy. It has been among the fastest-growing economies in the world over the past two decades, and developed countries have become so nervous about Chinese success in international markets that they took years to work out adequate safeguard measures before accepting China in the World Trade Organization (WTO) in 2002. More recently, OECD countries have been applying strong pressure to China to revalue its currency in order to reduce its export competitiveness on international markets. The perceived "Chinese Threat" is feared even more among developing countries in general and Asian developing countries in particular, due to the potential "overwhelming" competitiveness of China in international markets in the area of trade and investment.

Is this perception well grounded on facts? In this paper, we attempt to address this issue in the case of East Asia using three empirical approaches. First, we consider the changing overall trade patterns and competition between China and Korea and China and Thailand, as case studies in competition with the New Industrialized and ASEAN economies. Second, we estimate the overall changes in the structure of Chinese comparative advantage to OECD markets over time and correlate them with those of selected East Asian countries. Third, we use an econometric gravity model to gauge whether or not China (and Thailand, as a representative country) has really made a difference in the determinants of inward direct foreign investment.

## I. Introduction

Rapid economic development in China and its emergence as a major exporter of manufactured goods since the late 1970s has had two major effects on its neighboring Asian economies. First it is now a major importer of goods from those economies. Second it has become a serious competitor for market share in their major trading partners such as the United States, the European Union, and Japan (e.g., Song 2000).

South Korea (henceforth Korea) is a case in point that demonstrates clearly this dual effect of China's rapid economic development on its neighboring economies. Bilateral trade between the two countries has grown steadily in both volume and variety of goods traded. Between 1989 and 2001, for instance, Korea's merchandise exports to China grew from $1.3 to $18.2 billion while China's merchandise exports to Korea increased from $472 million to $12.5 billion (UNCOMTRADE). This expansion in bilateral trade is a sign that economic growth in post-reform China has had a positive effect on the Korean economy.

For economies such as Korea, China's rapid industrialization has also had the negative effect of displacing their exports in third-country markets.[1] Comparative advantage in many, especially labor-intensive, manufacturing industries has now shifted from those countries to China while they have yet to develop new areas of comparative advantage (Abe and Lee 2001, Kim and Lee 2002). Indeed, Korea's present perceived dilemma has been portrayed as a "nutcracker" situation, as it has lost its comparative advantage in many of its manufacturing industries while it is yet to gain a comparative advantage in technologically more advanced industries (Booz-Allen & Hamilton 1997). Obviously, this nutcracker situation will be only temporary and short-lived if Korea succeeds in gaining a comparative advantage in new areas that will sustain its economic growth. Otherwise it will persist over the long run with adverse consequences for the Korean economy.

The emergence of China as an economic power also has had both a positive and a negative effect on the Taiwanese economy. Between 1995 and 2003 China's share of Taiwan's exports grew from 16.0 to 24.6 percent, and China is now Taiwan's largest export market. But it has been argued that China's economic growth also has had a negative effect on Taiwan's economy by siphoning off capital and management expertise from Taiwan (Chen 2004). Singapore is another case where China has provided expanding markets for exports while taking away markets and foreign direct investment from it at the same time (Liu 2004).

While China's economic growth has benefited Japan in that its trade with China has been expanding rapidly, it has at the same time created some concern, if not fear, in Japan. For Japan, however, the situation does not appear as dire as for Korea and Taiwan because its economy is more advanced than the latter two. It will be long before China catches up with Japan, if it ever does, and there will be enough time for Japanese firms to focus on producing highly-specialized high-tech products and initiate new approaches to management, production, and distribution (Abe 2004). It is rather the resource-rich ASEAN countries, whose factor endowments and stage of economic development are more similar to China than those of the Newly Industrialized Economies (NIEs) and Japan, that appear to be more vulnerable.

Hence, rapid economic development in China has certainly created concern in East Asia as this brief survey of arguments in the literature points out. It is inevitable that when a large economy such as China starts developing rapidly it creates serious effects, both positive and negative, on smaller neighboring economies. Whether the effect will turn out to be largely positive or negative will depend not only on the ability of smaller economies to adjust to the changes brought about by its giant neighbor but also on the latter's willingness to facilitate the adjustment with policies such as freer access to its markets.

In this paper we examine the effect that rapid economic development in China has brought about in East Asia and, in particular, consider recent evidence as to whether its emergence as a global powerhouse has been or will be detrimental to the growth prospects of the region. For this purpose we have chosen Korea as a representative economy of the NIEs and Thailand as that of the near-NIEs. These two economies provide a comparative perspective as Korea is more advanced than Thailand in manufacturing. In section II we specifically examine the trends and characteristics of Korea's overall export structure for 1986-2001 to gauge the extent to which China's export structure has "caught up" with that of Korea. We show that exports from China have in fact displaced considerably Korean exports to Japan and the United States, Korea's two major trading partners. We also investigate the trends and characteristics of China-Korea bilateral trade. We show that their bilateral trade has increased more rapidly than their respective trade with the rest of the world and that there is an increasing amount of intra-industry trade between the two countries. In Section III we provide a more aggregated analysis of Thai and Chinese trade in an East Asian comparative context. While the analysis is suggestive it underscores the same general trends that we find in the Korean case. Section IV examines explicitly the structure and similarity of trade of Chinese and East Asian exports; it estimates

the degree to which they are competitive by calculating changes in Spearman rank correlation coefficients over time. In Section V we attempt to capture any potential "investment diversion" to China with a simple model of foreign direct investment (FDI). Section VI concludes the paper.

## II. Changing export structure of China and Korea

### a. Overview

For an overall picture of changes in the export structure of China and Korea we first examine the sectoral distribution of their exports at the 1-digit Standard International Trade Classification (SITC) level, using the United Nations trade statistics (UNCOMTRADE). We find that in 1986-2001 China, and Korea to a lesser extent, went through a major change in their export structure (Table 1).

<Table 1 here>

In 1986, manufactured goods (SITC6), mineral fuels (SITC3), food and live animals (SITC0), and crude material (SITC2) accounted for close to 90 percent of China's exports, indicating that China's comparative advantage was then mainly in simple manufactured goods and raw materials. By 2001, however, China made a significant change in its export structure with machinery and transport equipment (SITC7), miscellaneous manufactured articles (SITC8), and manufactured goods (SITC6) together accounting for 85 percent of its total exports. The first two sectors increased their export share from 1.77 and 4.22 percent in 1986 to 35.65 and 32.54 percent in 2001, respectively—a clear sign that China was becoming rapidly industrialized, making a significant change in its export structure in only 15 years. What is noteworthy is that the most dramatic change in the export structure took place during the five-year period of 1986-91.

Korea has also experienced changes in its export structure, albeit not as drastic as in China over the same time period. In 1986, three manufacturing sectors—SITC7, SITC8, and SITC6—together accounted for 89.14 percent of Korea's exports, a sign that by 1986 Korea had become a highly industrialized economy. By 2001, the share of exports of the last two sectors dropped significantly to 7.44 and 18.11 percent from 31.97 and 23.59 percent in 1986, respectively, while the share of SITC7 increased from 33.58 to 57.43 percent. These are signs that Korea's comparative advantage has been shifting from low-wage, labor-intensive to capital-intensive and technology-intensive manufacturing industries.

The above analysis of changes in the export structure, which is based on the one-digit SITC sector classification, provides us with a rough measure of the change in comparative advantage that has taken place in China and Korea but says little regarding what might have brought about the change. Is it a change in factor endowments or an improvement in technology that has brought about the change? The data based on the one-digit SITC classification are too aggregate to provide an answer to this question. The SITC8 sector (miscellaneous manufactured articles), for instance, includes labor-intensive, low technology products such as apparel, footwear, and toys as well as high technology products such as photographic apparatus and medical instruments. The SITC6 sector (manufactured goods) also covers a diverse set of products that range from labor-intensive textile fabric to resource-based rubber and aluminum and capital-intensive tube and pipes.

To help us find an answer to the question of what may possible have brought about the change in export structure, we group products in terms of production technology. That is, following Lall (2000) we divide the products classified at the 3-digit SITC level into ten subgroups divided in terms of the level of production technology. This is done in two steps: first, the products are divided into five groups—primary products (PP), resource-based products (RB), low-technology products (LT), medium-technology products (MT), and high technology products (HT); and the latter four are then divided further into agriculture-based products (RB1), other resource-based products (RB2), textile/fashion cluster (LT1), other low-technology products (LT2), automotive products (MT1), process industries—chemical and basic metals—(MT2), engineering products (MT3), electronics and electrical products (HT1), and other high-technology products (HT2).

It is clear from Table 2 that changes in China's export structure are highly correlated with its increasing ability to produce technologically more sophisticated products. In 1986 a little more than a half of China's exports was in primary products such as crude petroleum, gas, vegetables, and rice, with low technology products and "advanced" products accounting for 25 and approximately 10 percent, respectively. But by 2001, China made a dramatic change in its export structure, achieving a remarkable increase in the export of medium and high technology products, especially in the export of engineering products (MT3) and electronics (HT1). Their combined share of exports increased from less than two percent in 1986 to more than 35 percent in 2001.

<Table 2 here>

China also increased exports from low-technology industries (LT1 and LT2) during the same period--albeit not as much as those from technologically more sophisticated industries--expanding their share of exports from 25 percent in 1986 to a little over 39 percent in 2001. These industries, which require relatively simple skills and compete mostly on price, have served as an engine of China's export growth during the 1986-2001 period, taking advantage of China's abundant supply of low-cost labor.

As noted above, China has rapidly increased its exports of electronics and other electrical products. Although they are classified as high-technology products, the nature of technology associated with their production in China is quite varied. While some of them require advanced technology and extensive R&D, others involve only simple labor-intensive processes. Furthermore, many of these products are only assembled at the foreign-owned or joint venture enterprises that are in China mainly to take advantage of its low-cost labor (Fung and Iizaka 2002). At present China may be able to export these products only with the help of foreign investors, but that does not mean that it will remain so for long. Given that FDI has enabled rapid catching-up industrialization in other parts of Asia (Yamazawa 1990), there is no reason why China will not be able to do the same and replicate the catch-up development achieved by Japan and the Asian NIEs.

In the case of Korea the most dramatic increase took place in the export share of electronics and electrical products (HT1), albeit not as much as in China. But unlike in the case of China this increase is from Korea's indigenous firms, an indication that they have acquired their own capability for producing high technology products. Also, as to be expected, the export share of textiles (LT1) and other labor-intensive products (LT2) decreased from a combined share of 43 percent to a little over 16 percent.

To further buttress the findings reported above we calculate revealed comparative advantage $(RCA)^2$ indices for China and Korea. With the usual caveat we take an increasing value of a country's RCA in a product as an indication that it is gaining a comparative advantage in that product, and conversely when the RCA is decreasing.

It is evident from Table 3 that between 1986 and 2001 China rapidly shed its comparative advantage in primary products (PP) while maintaining its comparative advantage in textiles (LT1) and gaining one in other labor-intensive products, a sign of a diversifying export structure. The increase of RCA indices in engineering products and electronics is also impressive. Although China did not have a

comparative advantage in engineering products (MT3), as indicated by an RCA of less than unity, and although it gained a comparative advantage in electronics and electrical products (HT1) only in 2001, the direction of change is clear: it is rapidly gaining a comparative advantage in these products.

<Table 3 here>

A comparison of changes in RCA for China and Korea suggests two points. One is that in terms of comparative advantage Korea is ahead of China in MT2, MT3 and HT1—a sign that in terms of manufacturing technology Korea is ahead of China. The other point is that China's gain in comparative advantage in LT2 appears exactly matched by Korea's loss in the same. Combined with the fact that China had achieved a strong comparative advantage in LT1 while Korea was losing it, this indicates that China is following Korea in the "catching-up product cycle" development (Akamatsu 1962, Yamazawa 1990).

With China catching up with Korea one would expect export competition to increase between the two with the exports from the former replacing those from the latter in many of the world's markets. Investigation of changes in the two countries' market shares in Japan and the United States confirm this expectation (Kim, Kim and Lee 2004). In Japan's ten major imports from China in 1987-2001 China made a significant increase in market share at the expense of Korea with the exception of SITC 77, 89, and 75. This apparent displacement in Japan of Korea's exports by China's exports took place mostly in labor-intensive, low-technology and raw material industries—the industries in which Korea no longer holds a strong comparative advantage. This displacement, however, is not limited to those industries: even in the market for telecommunication and sound recording products (SITC 76) China increased its market share by 27 percentage points between 1987 and 2001 while Korea lost its market share by about 20 percentage points.

A similar displacement took place in the United States, another major trading partner for both China and Korea. In the ten major U.S. imports from China it made a significant gain in the market share at the expense of Korea with the exception of SITC75, 76, and 77. This displacement of Korea's exports by China's exports took place, as to be expected, in labor-intensive low-technology industries. What is, however, interesting (and also puzzling) is that unlike in Japan Korea does not appear to have lost its U.S. market share to China in SITC76 (telecommunication and sound recording products), keeping its market share steady at about 10 percent.

**b. China-Korea bilateral trade: trends and characteristics**

While Korea has been losing its market share to China in third-country markets the bilateral trade between the two has been increasing. Although this increase is to be expected as concomitant to China's expanding international trade, we ask here whether economic development in China has had more than the "average" effect on the China-Korea bilateral trade. To answer this question of whether the increase in the China-Korea bilateral trade was greater than the average growth of their respective trade with the rest of the world, we calculate export- and import- intensity indices for China and Korea, respectively.[3] These indices are calculated for 1987 and 2001 and are reported in parenthesis in Tables 4 and 5.

In 1987 China's export-intensity index with respect to Korea was less than one, indicating that China exported a smaller share of its exports to Korea than its average for the rest of the world. But in 2001 China's export-intensity index with respect to Korea increased significantly. China's import-intensity index with respect to Korea moved in a manner similar to its export-intensity index. Korea's export-intensity with respect to China increased from zero to 2.77 over the period while its import-intensity index moved in a similar direction. These increases in export- and import-intensity indices indicate that bilateral trade between the two countries has expanded faster than their respective trade with the rest of the world.

<Tables 4 and 5 here>

When two economies become similar to each other in terms of factor endowments and technology at higher levels of economic development, there is a tendency for intra-industry trade between them to expand relative to their inter-industry trade. With China converging with Korea with respect to export structure we would thus expect intra-industry trade between the two to expand over time.

To find out whether there was in fact such an expansion of intra-industry trade between China and Korea we calculate the intra-industry trade index, based on Grubel-Lloyd.[4] The index takes a value between zero and one, with zero indicating that the country either exports or imports the good in question and one indicating that it simultaneously exports and imports an equal amount of the same good, thus being engaged fully in intra-industry trade. To calculate the index we use the trade data based on the SITC4-digit classification (more than 1,000 industries), a classification disaggregate enough to give a meaningful measure of intra-industry

trade. We then take a weighted average of the indices thus calculated, the weight being the trade share of each industry, to calculate the intra-industry trade index for the entire country and for a few select manufacturing sectors.

<Table 6 here>

The figures in the row with the heading of "Total Trade" in Table 6 report the intra-industry trade index of total global trade of China and Korea for four different years. We find that there was an upward trend in the index for the two countries' global trade. That is, between 1987 and 2001 the index increased from 0.25 to 0.38 for China and from 0.29 to 0.44 for Korea. The figures for the sectoral index show, however, that this upward trend was by and large due to an increase in intra-industry trade in SITC6 in the case of China and SITC5, 7 and 8 in the case of Korea. This is not surprising, given that intra-industry trade is of greater importance in manufacturing industries, in which product differentiation and scale economies are more prevalent than in other sectors of the economy and given the convergence in the export structure of China to Korea reported above.

The figures in the column under the heading of "Bilateral Trade" report the index for bilateral intra-industry trade between China and Korea. It is clear that for China intra-industry trade with Korea is much less important, albeit on an upward trend, than its intra-industry trade with the rest of the world. The same is true for Korea.

Product differentiation and scale economies are the standard explanations given for intra-industry trade. There is, however, another reason why it may have expanded between China and Korea, that is, an increasing international fragmentation of production processes. As noted earlier, studies have shown that many of China's exports of high-technology products are from foreign-owned or joint venture firms that are in China to take advantage of its low-cost labor. These firms are basically assembly operations that put together imported parts for sale outside of China, and since many of these imports and exports are in the same SITC groups they would be reported as intra-industry trade. Between 1987 and 2001 there indeed was an increase in parts trade between China and Korea, indicating an increasing fragmentation of production processes and an expansion of production networks (Kim, Kim and Lee 2004). In SITC75 and 76 groups, especially, the parts trade was significantly more than 50 percent of trade in those sectors.

As noted earlier, many Korean firms have invested in China to manufacture products for export markets. Some of the exports are to Korea and others are to third-country markets, and what appears to be a competitive relationship between China and Korea is in fact a relationship based on partnership between the two countries to the extent that the exports from China are produced by Korean affiliates. For instance, the loss of a market share in Japan and the United States by Korean exporters to Chinese exporters may be in part a displacement of exports from Korea by exports from Korean affiliates in China.

**III. Is Thailand losing out to China?**

Has the emergence of China as a major presence on international markets harmed the prospects of the Thai economy? To answer this question we first examine the structure of Chinese and Thai trade with the two largest import markets in the world, the United States and the European Union (EU). We do this in the context of the changing patterns of other East Asian exports to these markets as well.

Table 7(a) and (b) give details of Chinese and Thai exports to two principal markets, the United States and the EU, at the 1-digit SITC level for selected years in 1990-99 for the United States, and every year in 1995-1999 for the EU.[5] We also include other NIE and ASEAN markets—including a reproduction of the Korea data—for comparison.

<Table 7a and b here>

For both Chinese and Thai exports, it is evident that the United States is by far the larger export market of the two. In 1999, total Chinese and Thai exports to the United States came to $82 and $14 billion, respectively, compared to $53 and $10 billion to the EU. Moreover, the growth rate of Chinese exports to the United States has been far greater in recent years, with exports to the U.S. market growing by about two-thirds in 1995-99 and to the EU by about just over one-half. The respective Thai export growth rates to the U.S. and EU markets over the same period were far less impressive, at approximately one-fifth to both markets.[6] In fact, the increase in Chinese exports to the United States over the 1990s, from $16 billion to $82 billion, is nothing short of spectacular.

With respect to the composition of trade, we focus on the U.S. market, which is by far the largest although most of the same conclusions hold for the EU market as well. In 1990, Chinese exports to the United States were dominated by SITC8

(miscellaneous manufactures), 62 percent of the total, with SITC7 (electrical and non-electrical machinery and equipment) coming in a distant second with 16 percent. Over the 1990s, these two categories continued to be dominant, but the share of the latter doubled to 32 percent while the share of the former fell to 52 percent. As SITC7 tends to include more sophisticated product lines than SITC8, this trend has often been cited as an indication of a growing sophistication of Chinese exports. The same general structural change in exports is also evident in the EU market, though it is somewhat less pronounced over the 1995-99 period.

Thai exports to the United States experienced less structural change but in the same direction: SITC7 was only slightly less important than SITC8 in 1990 (a 31 percent share versus 32 percent) but came to dominate by 1999, accounting for 45 percent of total exports, as opposed to only 27 percent in the case of SITC8. Again, we note the same trend in the EU market.

Hence, looking merely at general changes in export structure at the 1-digit level of aggregation, we find that, while Chinese and Thai export structures were quite different in 1990, by 1999 they had converged considerably. This exercise thus suggests that China is indeed becoming an increasing competitor with Thailand in its key export markets. In fact, in 1990 the value of Chinese exports of SITC7 goods came to about $2.6 billion in comparison with to $1.7 billion in the case of Thailand. By 1999, the respective figures were $26 billion and $6 billion; hence, Chinese exports of SITC7 products to the United States were over four times greater than Thai exports, despite being a lower share of the total.

This result is consistent with the conclusions of the analysis of Korea's trade in the preceding section. It is also borne out in Table 7(a) and (b) for the other East Asian countries.

However, as was noted in the context of the China-Korea relationship above, a 1-digit SITC level of aggregation is fairly high and can lead to misleading conclusions as SITC7, as discussed above, includes both labor- and capital-intensive products. Thus, in the following section, we attempt to gauge competition at a lower level of aggregation.

We briefly examine the structure of imports of China and Thailand from the United States and the EU.[7] In the case of U.S. exports, SITC7 products were the most important in both Chinese and Thai markets over the 1990-99 period, coming to 54 and 61 percent, respectively, and in each case the share increased (though only slightly in the case of Thailand). Chemical exports constituted the second most important category in the case of both markets. Hence, like the structure of their

exports, the Chinese and Thai import structures have been increasing in sophistication and in areas in which intra-industry trade tends to be more important. Indeed, given the "globalized" nature of the SITC7 category and the diversity of products in terms of factor intensity, the rising share of electronics in total imports and exports reflects the increasing international fragmentation of production processes (in fact, there is no doubt a good deal of "double counting" in these numbers, in which SITC7 imports serve as inputs to SITC7 exports).

## IV. Correlation between Chinese and East Asian Exports to OECD Markets

Are Chinese and East Asian exports to major markets highly correlated? Has the correlation between the two increased over time? These questions would seem to be the most essential in gauging to what extent China competes with Thailand in their major markets and whether or not this competition has become more intense over time. In the cases of Korea (aggregate and disaggregate) and Thailand (aggregate), the answer appears to be in the affirmative. But does it hold at a highly disaggregated level, and has it been increasing over time?

In order to address these questions, we use disaggregated trade data at the 5-digit SITC level for individual years over the 1995-1999 period, using data gleaned from the OECD, *International Trade Statistics 2003*, CD-Rom. The technique we use is the Spearman rank correlation coefficient (SRCC), which is a non-parametric estimate of the rankings of two series (in this case, the ranking of export structures to various markets) with the domain of negative one (perfect negative correlation) to one (perfect correlation), with zero implying no correlation. We calculate these statistics for exports to the OECD as a group as well as to principal individual markets for 1999, 1997, and 1995.[8] The results are summarized in Table 8.

<Table 8 here>

The picture that emerges tends to support the conclusions reached in the preceding analysis albeit to differing degrees and with additional caveats. For exports to the OECD as a whole, in 1999 Chinese exports were correlated to the highest degree with Taiwan (0.473), Thailand (0.446), and the Philippines (0.443). It is impossible to state whether or not these values are high in terms of magnitudes, but at such a high level of disaggregation they are nevertheless impressive (the number of observations for each country falls in the range of 1600-2100 commodities). To give an idea of the aggregation bias we carried out the same

exercise on the basis of 3-digit SITC; the SRCC statistics rise then to 0.73, 0.72, and 0.64 for Taiwan, Thailand, and the Philippines, respectively.[9] This underscores the importance of disaggregated trade analysis in the context of the increased globalization of production processes, a point that was underscored as well in the preceding discussion on Korea.

Moreover, these SRCC estimates appear to be rising over time. In all cases of exports to the OECD as a whole, the correlation coefficients have been rising since the mid-1990s.

At the individual OECD market level, the highest correlations between Chinese and East Asian exports emerge in the U.S. market, which is the largest for the majority of these countries, followed by exports to the EU, Japan, and Korea. In most cases, the magnitudes of the SRCC estimates are smaller, but there is a far less consistent positive trend in the SRCCs relative to the overall OECD estimates. For example, in the case of the U.S. market, SRCC estimates were actually lower in 1999 than in 1995 for all East Asian partners save Taiwan, which, not coincidentally, also has the highest degree of correlation with Chinese exports.

## V. Econometric Gravity Model: The Case of China and Thailand

In order to determine whether or not China has had the "investment diversion" on other East Asian economies we would need to have a model of the determinants of investment inflows to individual East Asian countries and then test the hypothesis that the emergence of China has had a negative effect on FDI inflows to other East Asian economies. We are not able to take this approach due to data limitations.[10] Instead, we estimate the determinants of outward investment from major FDI-source countries (the United States, France, Germany, and Japan) and test the hypothesis of whether or not China or Thailand constitutes a special case. We do this by running regressions for outflows from each of those countries and for outflows from them as a group (controlling for country fixed effects). In the case that China does not present a special case and hence has no statistical influence on these flows, we will be able to draw the (conditional) conclusion that its FDI inflows from the four countries has not been at the expense of other host countries.

The econometric procedure we use is called the "gravity model," in which FDI inflow to a country in a given year is commonly posited as a function of GDP of the source country (a proxy for "size"), *per capita* income[11] (a proxy for "wealth"), and the distance between the two countries.[12] In our approach, we add additional variables to the standard gravity model to find out how trade might affect

FDI inflows and how China (and Thailand) might individually affect these flows, holding all other influences constant. The latter we are able to include in the individual regressions in the form of binary ("dummy") variables. We add the trade variable in order to capture the "trade-investment nexus": indeed, the literature has revealed a strong positive statistical link between trade and investment flows, which is consistent with what theory would predict.[13]

We begin by running these regressions for major sources of FDI, that is, the United States, Japan, France, and Germany, for 1982-1999.[14] Given data reporting problems we have a different set of countries and years for each OECD country.

<Table 9a here>

The results, reported in Table 9(a), are generally consistent with what we would expect in terms of the standard gravity-model variables. The adjusted $R^2$s vary considerably across the regressions, from 0.78 (Japan) to 0.21 (US). The range is consistent with what one normally finds in other gravity models of this sort. Size does make a positive difference in the case of Japanese and German FDI outflows (though the magnitudes are small); while the estimated coefficients are also positive for U.S. and French FDI, they are not statistically significant at the 90 percent level. The wealth variable also demonstrates heterogeneity across countries, being significant and positive for U.S. FDI, significant and negative for German FDI, and insignificant for the others. As FDI theory does not suggest any particular sign on this variable at the aggregate level, these results come as no surprise.[15] The same is true regarding the distance variable. It may, for instance, be correlated with cultural differences and, hence, at the margin is negatively correlated with FDI. Or, alternatively, it may be positively correlated with FDI if the motivation for investment is to reduce transactions costs such as transportation costs associated with exports. This ambiguity shows up in our data with distance positively correlated with Japanese and French FDI but negatively correlated with U.S. FDI.

Trade is the only variable in the regression that is consistently positive and statistically significant (at the 99 percent level) across all regressions. The correlation between trade and FDI clearly bears out the trade-investment nexus. It is, however, most noteworthy that neither the Chinese nor the Thai binary variable is statistically significant at the 90 percent level of confidence; that is, the country variable does not explain any of the variance in the FDI outflows of the source countries beyond what is explained by the other independence variables. We may

thus reject the hypothesis that China has diverted investments from other East Asian economies.

In Table 9(b), we include all of the outflows from the four FDI source countries in a panel. While the adjusted $R^2$ of only 0.16 is lower than for the individual markets, the trade, size, wealth and distance variables are all statistically significant regressors and are of the expected sign. With respect to the country fixed effects, using the United States as the benchmark country, we find that only French FDI outflows are statistically significant (at the 99 percent level of confidence). As was the case in for the individual countries, however, neither the Chinese nor the Thai binary variable is statistically significant.

<Table 9b here>

## VI. Conclusion

How China's economic development will affect its neighboring economies in the long run is obviously difficult to tell. In the short- or intermediate-run they will be confronted with the problems of structural adjustment as China's industry develops, forcing them out of many of the sectors in which they now have a comparative advantage. Clearly, the challenge for the small neighboring economies is to develop new areas of comparative advantage that will help them achieve sustained economic growth while benefiting from China's economic growth.

In Korea the government has selected a number of industries such as digital TV and next-generation mobile phones as the new industries that will lead the country's economic growth (Chun 2003). It is not clear, however, what specific measures the government can provide to promote those industries. Industrial policies such as those used to promote the heavy and chemical industries during the 1970s will be, we suspect, no longer appropriate for the Korean economy, which has become too big and too complex for such policies to be effective. Barring such policies, the government's role will be limited to providing public goods and social infrastructure, especially to promote high-value service industries, and keeping the capital and labor markets flexible and efficient.

The history of world economic primacy shows that the economies that once held the position of economic primacy subsequently declined for reasons that were generally unique to each case. In the case of Venice, for example, which held a world commercial leadership in 1550 but declined to insignificance some years

before 1700, the factors that led to its decline included the competition from Portugal in spices, Britain in woolens, and the Netherlands and Britain in shipping; the rigid attitude of guilds and workers; and a leveling off of productivity (Kindleberger 1996, p.65). Spain and the Low Countries, whose economic growth followed that of Venice, also had a similar fate but for reasons of their own. Although what brought about the fall from the position of world economic primacy differed from case to case there appears to have been one factor common to all. That is, in all those economies rigidity eventually took over the vitality and flexibility that they once had had (Kindleberger 1996, p.36). It may have been some uncontrollable external factors that triggered the downfall, but it was the inability to adapt to and successfully deal with the external changes that ultimately brought that about. And that is a lesson that China's small neighboring countries must learn from the history of world economic primacy: if their economic growth ever falters it will be not because of rapid economic development in China, which is anyway beyond their own control, but because of the loss of vitality and flexibility in their economies. This does not mean, however, that China does not have the responsibility to help them facilitate structural change by keeping its doors open for their exports. China has an opportunity to exercise this responsibility when considering various regional trading arrangements.

As is well known, in recent years there has emerged a clear trend towards regional trading arrangements as international commercial policy tools. Regionalism is not new to the global marketplace. In fact, Europe has been using it for the past 50 years, both as a means of integrating its internal market and as a means of foreign commercial policy with non-partners, but what is new is its scope and geographic comprehensiveness. In particular, Asian countries, which had generally shunned preferential trading arrangements in the past (ASEAN is a minor exception), began to jump on the regionalism band-wagon in the early 2000s. For instance, before 2000 Japan and Korea had no reciprocal preferential trading arrangements but now have a free-trade area arrangement with Singapore (2002) and with Chile (2004), respectively. A great number of additional accords are at various stages of negotiation. China has become an active member in exploring free-trade areas (FTAs) with a variety of potential partners. For example, it has expressed interest in creating an FTA with ASEAN by 2010 (including a system of "early harvest" products which would be liberalized much sooner), and there are many discussions regarding a possible "ASEAN+3 FTA" (ASEAN, China, Japan, and Korea) and bilateral arrangements. [16]

China certainly has a number of commercial-policy strategies it can adopt and their effects on the East Asian economies would vary. Lee *et al.* (forthcoming) addresses this issue using a computational general equilibrium model which undertakes various scenarios of such initiatives including: (a) unilateral Chinese trade liberalization; (b) an ASEAN-China FTA; (c) an ASEAN-Japan FTA; (d) an ASEAN+3 FTA; (e) an ASEAN+China+EU FTA; (f) a China-Japan-US FTA; and (g) global free trade. Their estimates are presented in Table 10.

The results are interesting. First, clearly China itself would do better to negotiate the reductions in its trade barriers rather than do so unilaterally; it gains the most through global free-trade and various FTAs. Second, as China will obviously lose out if other FTAs that exclude it are negotiated in the region (e.g., ASEAN-Japan), and these FTAs *are* being negotiated, it also has an incentive to go this route as a defensive strategy. Third, when China enters into an FTA that excludes an East Asian partner, there tend to be fairly significant negative effects on the latter. A China-Japan-US FTA, for example, would significantly hurt the NIEs and, especially, ASEAN while generating fairly significant benefits to China (second only to global free trade). This is a reflection of many of the micro results we have presented in this study: trade competition between China and East Asia has been increasing and, hence, these countries are more vulnerable to trade diversion. Given that the NIEs and ASEAN generally gain fairly substantially when they are included in an agreement in China, this would suggest that East Asia should continue to be inclusive rather than exclusive in their regional initiatives.

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**Endnotes**

[1] The situation in which Korea now finds itself with respect to China parallels that in which Japan was before the 1940s. According to Howe (1996), Akamatsu Kaname characterized the Japanese economy as being challenged by the "newly industrializing economy" of China but lagging behind the West. Akamatsu saw Japan's situation as a transitional phase that required both the domestic and international processes of adjustment but was made difficult by the West with its entrenched trading position in East Asia.

[2] A country's RCA in a given commodity is measured as the country's share of the world's exports of that commodity divided by the country's share of the total exports of the world. An RCA value for a product greater than one is taken to mean that the country has a comparative advantage in that product. Since it is calculated using the actual trade values that may be "distorted" by tariffs and nontariff barriers, it may not be a true measure of a country's comparative advantage. However, if we can assume that the level of trade barriers has not changed over the period that we consider, then changes in RCA can be taken to indicate changes in comparative advantage.

[3] The export-intensity index is calculated as the share of country j in the total exports of country i normalized by country j's share in the total world imports (excluding country i). If the index is greater than one, country j's share of country i's total exports is greater than its share of total world imports (excluding country i), indicating that country i is more dependent on country j for its exports than the average for the rest of the world, and conversely if it is less than one. The import-intensity index is calculated as country j's share of the total imports of country i normalized by its share of total world exports (excluding country i). Thus if this index is greater than one, country j's share of country i's total imports is greater than its share of total world exports (excluding country i), indicating that country i is more dependent on country j for its imports than the average for the rest of the world is, and conversely if it is less than one.

[4]The intra-industry trade index is measured as one minus the ratio of the absolute value of exports minus imports over exports plus imports of a given industry.

[5] We begin in 1995 for the EU, as it is the year of the EU enlargement to include Austria, Sweden, and Finland. The data include all 15 member-states.

[6] It is important to note, however, that this period is dominated by the financial crisis of 1997.

[7] These data are taken from Plummer (2003).

[8] Additional estimates for 1996 and 1998 are available from the second author upon request.

10 SRCC estimates at the 3-digit and 4-digit SITC level, not reported here, are available from the second author upon request

[10] In particular, such an approach would require annual data based on balance-of-payments derived FDI flows, which would lead to severe limitations on degrees of freedom in the model.

[11] International trade theory suggests that *per capita* income between countries is correlated positively with trade.

[12] Gravity models are extremely common in the empirical trade literature and are also becoming increasingly common in the empirical FDI literature (e.g., Lee and Roland Holst 1999, Kreinin and Plummer 2002). They have been criticized, however, for having a poor theoretical foundation, in particular, for not having any price variables when price plays a central role in neoclassical trade theory. Deardorff (1995) has shown that gravity-like equations can be derived from certain specifications of the Heckscher-Ohlin model as well as additional theoretical trade models. Others have also supported their theoretical and empirical credentials (e.g., Frankel 1997 and Rose 2004).

[13] The problem with this approach, however, is the simultaneity issue: it is not clear if trade determines FDI or conversely. Theory would predict both; moreover, our own Granger causality tests (not reported) would confirm this. However, there is no clear way of addressing this issue econometrically for it is difficult to envision an appropriate instrumental variable for trade.

[14] Due to data restrictions, we include 1982-1995 for Japan.

[15] For example, if the primary motivation for FDI were to seek out low-cost labor, then one would expect a negative correlation. However, as the majority of FDI is between developed countries, clearly a good deal of FDI is undertaken for different reasons, e.g., market access, oligopolistic practices, etc., all of which might predict a positive correlation with wealth.

16 China signed a joint statement in October 2003 to pursue a free-trade area with Japan and Korea (Kawai 2004).

<**Table 1> Sectoral Distribution of Total Exports (share in total exports, %)**

| | SITC0 Food and Live Anim-als | SITC1 Bevera-ges and Tobacco | SITC2 Crude Material | SITC3 Mineral Fuels, Etc | SITC4 Animal Veget-able Oils Etc. | SITC5 Chemi-cals and Related Product s | SITC6 Manuf-actured Goods | SITC7 Machinery and Transport Equipment | SITC8 Miscell-aneous Manufa-ctured Articles | SITC9 Not classi-fied |
|---|---|---|---|---|---|---|---|---|---|---|
| **China** | | | | | | | | | | |
| 1986 | 19.16 | 0.26 | 16.63 | 24.45 | 0.70 | 4.36 | 28.45 | 1.77 | 4.22 | . |
| 1991 | 10.28 | 0.74 | 4.84 | 6.62 | 0.21 | 5.36 | 20.51 | 19.36 | 31.06 | 1.03 |
| 1996 | 6.76 | 0.89 | 2.66 | 3.93 | 0.25 | 5.85 | 19.33 | 23.35 | 36.84 | 0.15 |
| 2001 | 4.80 | 0.33 | 1.55 | 3.16 | 0.04 | 4.97 | 16.73 | 35.65 | 32.54 | 0.22 |
| **Korea** | | | | | | | | | | |
| 1986 | 4.52 | 0.28 | 0.97 | 1.87 | 0.01 | 3.08 | 23.59 | 33.58 | 31.97 | 0.14 |
| 1991 | 2.98 | 0.16 | 1.37 | 2.10 | 0.00 | 4.39 | 22.76 | 41.70 | 24.17 | 0.36 |
| 1996 | 2.09 | 0.16 | 1.24 | 3.00 | 0.02 | 6.98 | 21.14 | 52.08 | 9.17 | 4.13 |
| 2001 | 1.47 | 0.20 | 1.05 | 5.34 | 0.01 | 8.22 | 18.11 | 57.43 | 7.44 | 0.74 |

Source: UN COMTRADE data

**<Table 2> Distribution of Total Exports by Technological Category (share in total exports,%)**

| | PP | RB1 | RB2 | LT1 | LT2 | MT1 | MT2 | MT3 | HT1 | HT2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **China** | | | | | | | | | | |
| 1986 | 50.93 | 5.78 | 8.05 | 20.99 | 4.35 | 0.39 | 5.26 | 1.55 | 0.39 | 2.30 |
| 1991 | 18.11 | 4.44 | 5.82 | 31.35 | 11.42 | 6.74 | 5.08 | 10.13 | 4.09 | 1.64 |
| 1996 | 9.99 | 5.24 | 5.59 | 30.18 | 15.52 | 0.94 | 5.94 | 11.17 | 12.59 | 2.34 |
| 2001 | 6.92 | 3.86 | 5.03 | 24.71 | 14.96 | 1.55 | 5.06 | 13.22 | 21.84 | 2.15 |
| **Korea** | | | | | | | | | | |
| 1986 | 4.38 | 3.90 | 3.88 | 28.45 | 14.76 | 4.47 | 9.90 | 14.60 | 13.72 | 1.56 |
| 1991 | 3.21 | 3.19 | 4.24 | 22.82 | 11.57 | 3.67 | 12.39 | 16.77 | 20.25 | 1.26 |
| 1996 | 2.38 | 3.45 | 5.41 | 10.76 | 8.22 | 8.98 | 12.58 | 16.09 | 26.70 | 1.08 |
| 2001 | 2.27 | 3.19 | 8.18 | 9.22 | 7.44 | 10.17 | 9.87 | 17.60 | 30.04 | 1.04 |

Source: UN COMTRADE data

**<Table 3> Revealed Comparative Advantage by Technological Categories**

| | PP | RB1 | RB2 | LT1 | LT2 | MT1 | MT2 | MT3 | HT1 | HT2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **China** | | | | | | | | | | |
| 1986 | **3.28** | 0.72 | 0.84 | **3.04** | 0.51 | 0.04 | 0.59 | 0.10 | 0.04 | 0.46 |
| 1991 | **1.28** | 0.57 | 0.73 | **4.21** | **1.27** | 0.77 | 0.67 | 0.62 | 0.36 | 0.28 |
| 1996 | 0.77 | 0.67 | 0.75 | **4.13** | **1.75** | 0.11 | 0.77 | 0.72 | 0.85 | 0.50 |
| 2001 | 0.57 | 0.59 | 0.68 | **3.81** | **1.75** | 0.17 | 0.72 | 0.86 | **1.28** | 0.34 |
| **Korea** | | | | | | | | | | |
| 1986 | 0.28 | 0.49 | 0.40 | **4.13** | **1.73** | 0.47 | **1.11** | 0.92 | **1.48** | 0.31 |
| 1991 | 0.23 | 0.41 | 0.54 | **3.06** | **1.29** | 0.42 | **1.62** | **1.03** | **1.77** | 0.22 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 0.18 | 0.44 | 0.72 | **1.47** | 0.93 | **1.05** | **1.64** | **1.03** | **1.80** | 0.23 |
| 2001 | 0.19 | 0.49 | 1.10 | **1.42** | 0.87 | **1.13** | **1.40** | **1.15** | **1.77** | 0.16 |

Source: Computation based on UN COMTRADE data

<Table 4> Destination of Exports as Percentage of Total Exports, % (export intensity)

| Chinese Export | Destination | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Japan | Korea | HK | ASEAN | Other Asia | USA | Other America | Europe | Africa | Oceania |
| **1987** | **16.21** | **0.01** | **34.93** | **6.06** | **5.43** | **7.66** | **2.26** | **15.17** | **1.46** | **0.91** |
| | (2.87) | (0.00) | (19.07) | (2.06) | (1.61) | (0.48) | (0.38) | (0.25) | (1.11) | (0.67) |
| **2001** | **16.89** | **4.70** | **17.49** | **6.91** | **7.16** | **20.43** | **4.33** | **18.33** | **1.82** | **1.53** |
| | (2.65) | (1.83) | (4.74) | (1.21) | (1.60) | (0.95) | (0.60) | (0.40) | (2.81) | (1.12) |
| Korean Export | China | Japan | HK | ASEAN | Other Asia | USA | Other America | Europe | Africa | Oceania |
| **1987** | **0.00** | **17.84** | **4.66** | **4.20** | **7.13** | **38.90** | **5.52** | **16.39** | **1.77** | **1.74** |
| | (0.00) | (3.16) | (2.55) | (1.43) | (2.12) | (2.43) | (0.92) | (0.27) | (1.34) | (1.29) |
| **2001** | **12.09** | **10.97** | **6.28** | **10.94** | **11.00** | **20.84** | **7.71** | **15.21** | **2.35** | **2.19** |
| | (2.77) | (1.75) | (1.74) | (1.95) | (2.50) | (0.99) | (1.08) | (0.34) | (3.70) | (1.64) |

Source: Computation based on UN COMTRADE data

**<Table 5> Origin of Imports as Percentage of Total Imports, % (import intensity)**

| Import of China | Origin | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Japan | Korea | HK | ASEAN | Other Asia | USA | Other America | Europe | Africa | Oceania |
| **1987** | **23.31** | **0.02** | **19.43** | **5.00** | **3.20** | **11.13** | **6.10** | **24.19** | **0.39** | **3.65** |
| | (2.52) | (0.01) | (9.92) | (1.49) | (1.71) | (1.12) | (0.81) | (0.39) | (0.34) | (2.57) |
| **2001** | **17.57** | **9.60** | **3.87** | **9.53** | **16.67** | **10.76** | **4.40** | **19.45** | **1.02** | **2.58** |
| | (2.31) | (3.38) | (1.07) | (1.39) | (2.94) | (0.78) | (0.54) | (0.40) | (2.51) | (1.82) |
| Import of Korea | China | Japan | HK | ASEAN | Other Asia | USA | Other America | Europe | Africa | Oceania |
| **1987** | **0.00** | **33.29** | **0.97** | **6.99** | **8.46** | **21.36** | **5.19** | **13.34** | **0.87** | **4.02** |
| | (0.00) | (3.59) | (0.49) | (2.08) | (4.51) | (2.15) | (0.68) | (0.22) | (0.76) | (2.81) |
| **2001** | **9.43** | **18.88** | **0.87** | **11.28** | **20.65** | **15.90** | **3.69** | **13.27** | **0.62** | **4.54** |
| | (1.92) | (2.53) | (0.25) | (1.68) | (3.72) | (1.18) | (0.46) | (0.28) | (1.55) | (3.26) |

Source: Computation based on UN COMTRADE data

**<Table 6> Intra-Industry Trade Index**

| | | China's trade with world | Korea's trade with world | Bilateral trade between China and Korea * |
|---|---|---|---|---|
| **Total** | **1987** | **0.25** | **0.29** | **0.00** |
| | **1991** | **0.35** | **0.34** | **0.10** |
| | **1996** | **0.34** | **0.44** | **0.28** |
| | **2001** | **0.38** | **0.44** | **0.34** |
| **Non-Manufacturing** | 1987 | 0.14 | 0.15 | 0.00 |
| | 1991 | 0.24 | 0.12 | 0.00 |
| | 1996 | 0.30 | 0.30 | 0.08 |
| | 2001 | 0.20 | 0.15 | 0.08 |
| **Manufacturing** | | | | |
| SITC5 | 1987 | 0.32 | 0.30 | 0.00 |
| | 1991 | 0.31 | 0.39 | 0.21 |
| | 1996 | 0.30 | 0.47 | 0.16 |
| | 2001 | 0.33 | 0.50 | 0.17 |
| SITC6 | 1987 | 0.26 | 0.46 | 0.00 |
| | 1991 | 0.34 | 0.43 | 0.13 |
| | 1996 | 0.43 | 0.42 | 0.27 |
| | 2001 | 0.46 | 0.41 | 0.29 |
| SITC7 | 1987 | 0.33 | 0.36 | 0.00 |
| | 1991 | 0.55 | 0.44 | 0.20 |
| | 1996 | 0.43 | 0.49 | 0.51 |
| | 2001 | 0.53 | 0.53 | 0.56 |
| SITC8 | 1987 | 0.24 | 0.12 | 0.00 |
| | 1991 | 0.22 | 0.21 | 0.26 |
| | 1996 | 0.19 | 0.49 | 0.37 |
| | 2001 | 0.19 | 0.57 | 0.33 |

Source: Computation based on UN COMTRADE data

* Based on data provided by Korea

**<Table 7a> Structure of Selected East Asian Exports to US**

| **China** | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
|---|---|---|---|---|---|---|---|
| 0 | Food | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 3 | Mineral Fuels | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 6 | Manu Goods | 0.10 | 0.09 | 0.10 | 0.09 | 0.09 | 0.10 |
| 7 | Mach/Equip | 0.16 | 0.19 | 0.26 | 0.27 | 0.28 | 0.32 |
| 8 | Misc Manuf | 0.62 | 0.66 | 0.58 | 0.58 | 0.57 | 0.52 |
| 9 | Comm NES | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Total | US$ billions | 16.261 | 33.673 | 48.506 | 54.396 | 62.532 | 81.776 |
| **Indonesia** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.09 | 0.08 | 0.07 | 0.09 | 0.10 | 0.09 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | Crude Mat. | 0.14 | 0.11 | 0.14 | 0.12 | 0.09 | 0.05 |
| 3 | Mineral Fuels | 0.27 | 0.10 | 0.09 | 0.07 | 0.05 | 0.06 |
| 4 | Anim/Veg Oils | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 |
| 5 | Chemicals | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 6 | Manu Goods | 0.16 | 0.15 | 0.12 | 0.11 | 0.12 | 0.13 |
| 7 | Mach/Equip | 0.01 | 0.11 | 0.16 | 0.18 | 0.20 | 0.24 |
| 8 | Misc Manuf | 0.30 | 0.43 | 0.39 | 0.40 | 0.41 | 0.39 |
| 9 | Comm NES | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| Total | US$ billions | 3.681 | 5.887 | 7.955 | 8.743 | 9.174 | 9.525 |
| **Malaysia** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.04 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 |
| 3 | Mineral Fuels | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| 4 | Anim/Veg Oils | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 5 | Chemicals | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 |
| 6 | Manu Goods | 0.04 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 |
| 7 | Mach/Equip | 0.61 | 0.73 | 0.78 | 0.76 | 0.77 | 0.80 |
| 8 | Misc Manuf | 0.18 | 0.17 | 0.13 | 0.14 | 0.13 | 0.11 |
| 9 | Comm NES | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 |
| Total | US$ billions | 5.496 | 10. 923 | 17.981 | 18.331 | 18.017 | 21.424 |
| **Philippines** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.11 | 0.08 | 0.06 | 0.05 | 0.04 | 0.04 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.04 | 0.03 | 0.04 | 0.04 | 0.03 | 0.01 |
| 5 | Chemicals | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 6 | Manu Goods | 0.05 | 0.03 | 0.03 | 0.03 | 0.02 | 0.03 |
| 7 | Mach/Equip | 0.29 | 0.39 | 0.47 | 0.55 | 0.63 | 0.66 |
| 8 | Misc Manuf | 0.47 | 0.44 | 0.38 | 0.31 | 0.25 | 0.23 |
| 9 | Comm NES | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| Total | US$ billions | 3. 623 | 5.176 | 7.364 | 8.496 | 10.436 | 12.353 |
| **Thailand** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.18 | 0.17 | 0.15 | 0.14 | 0.13 | 0.14 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.02 | 0.02 | 0.04 | 0.03 | 0.03 | 0.02 |
| 3 | Mineral Fuels | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| 6 | Manu Goods | 0.11 | 0.10 | 0.08 | 0.08 | 0.08 | 0.10 |
| 7 | Mach/Equip | 0.31 | 0.36 | 0.42 | 0.44 | 0.47 | 0.45 |
| 8 | Misc Manuf | 0.32 | 0.32 | 0.29 | 0.28 | 0.27 | 0.27 |
| 9 | Comm NES | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 |
| Total | US$ billions | 5.589 | 8.982 | 11.854 | 11.798 | 12.595 | 14.330 |
| **South Korea** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | Crude Mat. | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| 3 | Mineral Fuels | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 6 | Manu Goods | 0.12 | 0.11 | 0.10 | 0.10 | 0.11 | 0.11 |
| 7 | Mach/Equip | 0.40 | 0.51 | 0.68 | 0.68 | 0.68 | 0.69 |
| 8 | Misc Manuf | 0.44 | 0.32 | 0.18 | 0.16 | 0.15 | 0.14 |
| 9 | Comm NES | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| Total | US$ billions | 19.287 | 17.779 | 24.891 | 23.297 | 23.159 | 31.179 |
| **Taiwan** | | | | | | | |
| | | 1990 | 1993 | 1995 | 1996 | 1997 | 1999 |
| 0 | Food | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| 6 | Manu Goods | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 | 0.13 |
| 7 | Mach/Equip | 0.39 | 0.48 | 0.57 | 0.60 | 0.63 | 0.63 |
| 8 | Misc Manuf | 0.42 | 0.33 | 0.25 | 0.23 | 0.20 | 0.19 |
| 9 | Comm NES | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 |
| Total | US$ billions | 23.829 | 26.300 | 30.158 | 31.022 | 32.624 | 35.204 |

Source: Plummer (2003)

**<Table 7b> Structure of Selected East Asian Exports to EU**

| | | | | | | |
|---|---|---|---|---|---|---|
| **China** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |
| 3 | Mineral Fuels | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.06 | 0.05 | 0.05 | 0.05 | 0.04 |
| 6 | Manu Goods | 0.13 | 0.12 | 0.12 | 0.13 | 0.12 |
| 7 | Mach/Equip | 0.24 | 0.25 | 0.27 | 0.29 | 0.32 |
| 8 | Misc Manuf | 0.49 | 0.50 | 0.49 | 0.47 | 0.46 |
| 9 | Comm NES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | US billions | 34.326 | 37.995 | 42.362 | 46.859 | 52.683 |
| **Indonesia** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.08 | 0.08 | 0.08 | 0.07 | 0.07 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Bev/Tobacco | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2 | Crude Mat. | 0.10 | 0.12 | 0.11 | 0.10 | 0.09 |
| 3 | Mineral Fuels | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 |
| 4 | Anim/Veg Oils | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 |
| 5 | Chemicals | 0.02 | 0.02 | 0.02 | 0.03 | 0.02 |
| 6 | Manu Goods | 0.22 | 0.20 | 0.20 | 0.21 | 0.21 |
| 7 | Mach/Equip | 0.07 | 0.09 | 0.10 | 0.13 | 0.14 |
| 8 | Misc Manuf | 0.36 | 0.34 | 0.35 | 0.32 | 0.36 |
| 9 | Comm NES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | US billions | 7.975 | 8.970 | 9.430 | 9.993 | 9.323 |
| **Malaysia** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.08 | 0.07 | 0.07 | 0.05 | 0.05 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.04 | 0.04 | 0.04 | 0.06 | 0.05 |
| 5 | Chemicals | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 6 | Manu Goods | 0.07 | 0.06 | 0.06 | 0.06 | 0.05 |
| 7 | Mach/Equip | 0.61 | 0.63 | 0.65 | 0.67 | 0.69 |
| 8 | Misc Manuf | 0.13 | 0.13 | 0.14 | 0.12 | 0.12 |
| 9 | Comm NES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | US billions | 11.768 | 11.619 | 11.651 | 13.452 | 13.446 |
| **Philippines** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.06 | 0.05 | 0.04 | 0.03 | 0.03 |
| 1 | Bev/Tobacco | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.04 | 0.04 | 0.05 | 0.03 | 0.02 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.11 | 0.07 | 0.04 | 0.05 | 0.03 |
| 5 | Chemicals | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 6 | Manu Goods | 0.05 | 0.05 | 0.04 | 0.03 | 0.03 |
| 7 | Mach/Equip | 0.39 | 0.50 | 0.59 | 0.70 | 0.75 |
| 8 | Misc Manuf | 0.27 | 0.22 | 0.21 | 0.13 | 0.12 |
| 9 | Comm NES | 0.05 | 0.05 | 0.03 | 0.03 | 0.01 |
| Total | US billions | 3.028 | 3.803 | 4.240 | 6.158 | 6.008 |
| | | | | | | |
| **Thailand** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.16 | 0.17 | 0.15 | 0.15 | 0.14 |
| 1 | Bev/Tobacco | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.05 | 0.05 | 0.04 | 0.03 | 0.03 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 6 | Manu Goods | 0.16 | 0.14 | 0.14 | 0.14 | 0.13 |
| 7 | Mach/Equip | 0.32 | 0.37 | 0.39 | 0.41 | 0.44 |
| 8 | Misc Manuf | 0.29 | 0.25 | 0.24 | 0.23 | 0.23 |
| 9 | Comm NES | 0.01 | 0.00 | 0.03 | 0.02 | 0.00 |
| | | | | | | |
| Total | US billions | 8.474 | 9.419 | 9.493 | 10.218 | 10.449 |
| | | | | | | |
| **South Korea** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.06 | 0.05 | 0.06 | 0.06 | 0.04 |
| 6 | Manu Goods | 0.11 | 0.11 | 0.12 | 0.14 | 0.12 |
| 7 | Mach/Equip | 0.68 | 0.68 | 0.69 | 0.67 | 0.72 |
| 8 | Misc Manuf | 0.13 | 0.12 | 0.11 | 0.09 | 0.09 |
| 9 | Comm NES | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 |
| Total | US billions | 14.213 | 13.966 | 14.816 | 17.883 | 19.251 |
| **Taiwan** | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 0 | Food | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| 1 | Bev/Tobacco | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | Crude Mat. | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| 3 | Mineral Fuels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | Anim/Veg Oils | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | Chemicals | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 |
| 6 | Manu Goods | 0.15 | 0.14 | 0.14 | 0.15 | 0.13 |
| 7 | Mach/Equip | 0.62 | 0.66 | 0.66 | 0.67 | 0.69 |
| 8 | Misc Manuf | 0.18 | 0.17 | 0.17 | 0.15 | 0.16 |
| 9 | Comm NES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | US billions | 15.130 | 16.542 | 17.492 | 19.833 | 20.765 |

Source: Plummer (2003)

**<Table 8> Correlation of Chinese and Selected East Asian Exports to OECD Markets**

(Spearman Rank Correlation Coefficients, 5-Digit SITC, Selected Years)

| | | Thai | Phil | Malay | Indo | Korea | Taiwan |
|---|---|---|---|---|---|---|---|
| OECD | | | | | | | |
| | 1999 | 0.446 | 0.443 | 0.355 | 0.363 | 0.349 | 0.473 |
| | 1997 | 0.421 | 0.403 | 0.312 | 0.35 | 0.322 | 0.428 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1995 | 0.379 | 0.369 | 0.276 | 0.337 | 0.318 | 0.408 |
| US | | | | | | | |
| | 1999 | 0.400 | 0.362 | 0.279 | 0.3 | 0.227 | 0.438 |
| | 1997 | 0.419 | 0.406 | 0.312 | 0.324 | 0.215 | 0.435 |
| | 1995 | 0.401 | 0.369 | 0.317 | 0.404 | 0.268 | 0.427 |
| EU | | | | | | | |
| | 1999 | 0.307 | 0.352 | 0.214 | 0.241 | 0.148 | 0.336 |
| | 1997 | 0.305 | 0.318 | 0.198 | 0.236 | 0.131 | 0.296 |
| | 1995 | 0.294 | 0.327 | 0.200 | 0.224 | 0.135 | 0.289 |
| JAPAN | | | | | | | |
| | 1999 | 0.305 | 0.262 | 0.135 | 0.258 | 0.247 | 0.21 |
| | 1997 | 0.300 | 0.308 | 0.187 | 0.312 | 0.235 | 0.214 |
| | 1995 | 0.269 | 0.332 | 0.094 | 0.32 | 0.225 | 0.183 |
| Korea | | | | | | | |
| | 1999 | 0.131 | 0.127 | 0.041 | Insign | NA | Insign |
| | 1997 | 0.111 | 0.181 | 0.02 | 0.144 | NA | Insign |
| | 1995 | Insign | 0.123 | -0.159 | Insign | NA | -0.138 |

*Source:* OECD, International Trade Statistics, 2003;
Authors' Calculations.

*Note:* All coefficients are statistically significant at the 99% level unless specified as Insignificant (Insign).

**<Table 9a> Determinants of FDI: Are China and Thailand Special?**

| | Constant | Trade | Size | Wealth | Distance | China | Thailand | Adj. $R^2$ | Obs. |
|---|---|---|---|---|---|---|---|---|---|
| US FDI | 820.9* | 0.06** | 0.0001 | 2.51** | -0.08* | 66.1 | 320.4 | 0.21 | 414 |
| s.e. | 466.9 | 0.009 | 0.51 | 0.57 | 0.046 | 0.95 | 1138 | | |
| French FDI | -2696* | 0.77** | 0.01 | 2.49 | 0.18* | -320 | 154 | 0.27 | 697 |
| s.e. | 1277 | 0.05 | 0.02 | 1.83 | 0.08 | 2428 | 2427 | | |
| German FDI | -373 | 0.14** | 0.001** | -1.55* | 0.01 | -669 | 74.8 | 0.32 | 665 |
| s.e. | 372 | 0.02 | 0.00001 | 0.73 | 0.039 | 1023 | 1020 | | |
| Japan FDI | -778** | 0.16** | 0.00001* | -0.38 | 0.07** | -242.7 | -126.5 | 0.78 | 445 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| s.e. | 206.9 | 0.009 | 0.000004 | 0.24 | 0.019 | 409.9 | 394.9 |

Notes:

1. "**" and "*" represent statistical significance at the 99% and 90% levels, respectively.
2. US: 1982-99; Germany: 1982-99; France: 1982-99; Japan: 1982-95

**<Table 9b> Determinants of FDI from the Four Countries: Is China Special? (Panel Approach)**

| | Coefficient | Std. Error | |
|---|---|---|---|
| Constant | -793 | 498 | |
| Trade | 0.14** | 0.01 | |
| Size | 0.0003** | 6.00E-05 | |
| Wealth | 1.5* | 0.58 | |
| Distance | -0.06* | 0.03 | |
| CHINA | -642 | 909 | |
| THAI | -50.6 | 904 | |
| France | 2911.7** | 439 | |
| Germany | 488 | 440.3 | Country Fixed Effects |
| Japan | 4.11E+02 | 464.1952 | |

Notes:

1. "**" and "*" represent statistical significance at the 99% and 90% levels, respectively.
2. US: 1982-99; Germany: 1982-99; France: 1982-99; Japan: 1982-95

**<Table 10> Welfare Effects of Various Chinese Commercial Policy Initiatives**

**(Deviations in equivalent variations from the baseline in 2015)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Region | China Unilat | ASEAN-China | ASEAN-Japan | ASEAN plus 3 | ASEAN-China-EU | China-Japan-US | GTL |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (A) Absolute deviations ($1997 billions) | | | | | | | |
| China & Hong Kong | 73.3 | 34.8 | -3.0 | 102.3 | 74.1 | 105.3 | 134.8 |
| Japan | 13.5 | 1.4 | 18.2 | 66.3 | 4.8 | 77.3 | 116.1 |
| Korea | 5.0 | -0.4 | -1.2 | 30.1 | -1.9 | -4.3 | 29.1 |
| Taiwan | 5.6 | -1.5 | -0.7 | -5.4 | -2.8 | -5.5 | 12.7 |
| ASEAN[b] | 5.4 | 26.0 | 28.4 | 41.8 | 43.0 | -16.5 | 38.1 |
| United States | 13.8 | 0.8 | -1.4 | -0.9 | -2.9 | 60.6 | 70.9 |
| Canada & ANZ[c] | 1.2 | 0.2 | -0.4 | -0.2 | -0.6 | -2.9 | 17.3 |
| EU-15 | 16.9 | 3.9 | 0.2 | 6.8 | 127.9 | -0.3 | 165.9 |
| Rest of the world | 7.9 | -3.6 | -2.4 | -9.8 | -18.4 | -15.5 | 147.4 |
| World | 142.4 | 61.8 | 37.7 | 231.1 | 223.4 | 198.1 | 732.2 |
| (B) Percent deviations | | | | | | | |
| China & Hong Kong | 2.9 | 1.4 | -0.1 | 4.0 | 2.9 | 4.1 | 5.3 |
| Japan | 0.3 | 0.0 | 0.4 | 1.6 | 0.1 | 1.9 | 2.8 |
| Korea | 0.6 | -0.1 | -0.1 | 3.7 | -0.2 | -0.5 | 3.6 |
| Taiwan | 1.0 | -0.3 | -0.1 | -1.0 | -0.5 | -1.0 | 2.4 |
| ASEAN | 0.5 | 2.5 | 2.7 | 4.0 | 4.2 | -1.6 | 3.7 |
| United States | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.7 |
| Canada & ANZ | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 1.4 |
| EU-15 | 0.2 | 0.0 | 0.0 | 0.1 | 1.5 | 0.0 | 2.0 |
| Rest of the world | 0.1 | -0.1 | 0.0 | -0.2 | -0.3 | -0.3 | 2.4 |
| World | 0.4 | 0.2 | 0.1 | 0.7 | 0.6 | 0.6 | 2.1 |

[b] Only Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam are included in ASEAN. In the GTAP database, Brunei, Cambodia, Laos, and Myanmar are aggregated into the rest of the world.

[c] Canada, Australia, and New Zealand.

Source: Hiro Lee, David Roland-Holst, and Dominique van der Mensbrugghe, "China's Emergence and East Asian Trade under Alternative Trading Arrangements," ***Journal of Asian Economics***, Forthcoming 2004, Table 1.