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CONTAGION IN EAST ASIA**

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***INTERNATIONAL MACROECONOMICS  
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## ABSTRACT

### Competition, Complementarity and Contagion in East Asia\*

This paper explores to what extent the magnitude and speed of the contagion effects that materialized in East Asia in the second half of 1997 may have had 'real' underpinnings, in the sense that the pattern of production, consumption and trade increased the vulnerability of East Asian countries to external shocks. Two major possibilities are investigated using available disaggregated data on intra- and extra-regional trade and direct investment: that Asian economies compete extensively with each other on world markets; or, to the contrary that Asia is best regarded as an integrated economy with countries specializing in complementary production. The data provide greater support for the latter hypothesis.

JEL Classification: F14, F15, F42

Keywords: East Asia, financial crisis, contagion, regional economic integration, interdependence

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## NON-TECHNICAL SUMMARY

The magnitude and speed of the contagion effects that materialized in East Asia in the second half of 1997 have attracted much attention. This paper asks to what extent the observed contagion may have had 'real' underpinnings, in the sense that the pattern of production, consumption and trade increased the vulnerability of East Asian countries to external shocks. In particular, we explore two major possibilities that are relevant in this connection: the 'competition-cum-export similarity' story or the 'Asia Inc.' story, which puts greater emphasis on regional integration and specialization in complementary production structures.

The competition story posits that Asian economies have specialized in similar export bundles. In a longer-term perspective, the competition story hinges importantly on the emergence of China as a major exporter to world markets. An implication is that given a major devaluation by one country, others are forced to follow in order not to lose export market share. The complementarity story is based on the 'flying geese' model: the observed expansion of intra-regional trade and geographically cascading investments in recent decades, with labour-intensive production gradually moving from Japan to the 'newly industrialized economies' of Hong Kong, Korea, Singapore and Taiwan, then on to South East Asia and most recently to China and Vietnam. Japan plays a key role in this story, as an important source of technology, financial capital, capital goods and a large market for East Asian output. Contagion here is driven by the interdependence of East Asian economies.

The evidence reviewed tends to assign a large role to China and Japan for the genesis of the crisis and to the extent and depth of intra-regional integration in its spread. Rising competition from below (China, India, Vietnam) and from above (Japan), both on trade and on investment, put pressures on many of the East Asian economies. China's entry into global markets marked a major change in the 'flying geese formation'. Increased competition on lower end producers affected mostly the poorer countries (Indonesia, Malaysia, Thailand) and pushed them all to move (in some cases prematurely) up the technology ladder, resulting in high demands for investment, including foreign direct investment (FDI). Competition for capital therefore became fiercer.

More recently, the depreciation of the yen increased competition for higher end products, pushing many East-Asian countries to scramble back towards medium skill products. Pressure from Japan is likely to be a major real side factor underlying the Asian crisis. The Yen depreciated by 35% between its peak in 1995 and mid-1997. This adds up to a serious competitive shock, especially for the newly industrialized economies (NIEs). It is also of the same order of magnitude as the subsequent depreciations of Korea, Malaysia, the

Philippines and Thailand. The continuing slow growth macro environment in Japan reduces demand for Asian output, putting further pressure on producers. These developments have extended the flying geese formation to lower wage countries, but they have also reduced growth opportunities for the countries in the middle range.

The evidence reviewed in this paper suggests that complementarity of trade and investment flows in the region is more significant than the extent to which East Asian countries compete in similar export products. In principle this should act as a stabilizer in the medium term, as the competitiveness of the Asia Inc. 'joint product' on world markets is enhanced following the depreciation of national exchange rates. In the short run this positive effect was swamped by aggregate demand effects and will not operate unless credit constraints diminish. Export volumes from the region expanded substantially in 1998, however, rising by over 20%, suggesting that this effect may be beginning to operate. Most of this flow is going to the rest of the world, not East Asia, where aggregate imports are expected to decline by some 5% in 1998. Given the historical importance of intra-regional trade, the concern then is about the health of the Japanese and Korean economies. Without a resumption in growth and continued movement towards an information and service based economy in the richer economies in the region, the adjustment process will be severely impeded.

## **COMPETITION, COMPLEMENTARITY AND CONTAGION IN EAST ASIA**

### **I. Introduction**

The magnitude and speed of the contagion effects that materialized in East Asia in the second half of 1997 has attracted much attention. This paper asks to what extent the observed contagion may have had “real” underpinnings, in the sense that the pattern of production, consumption and trade increased the vulnerability of East Asian countries to external shocks. In particular, we explore two major possibilities that are relevant in this connection: the “competition-cum-export similarity” story or the “flying geese-cum-Asia Inc.” story which puts greater emphasis on regional integration and specialization in complementary production structures.

The competition story posits that Asian economies have specialized in similar export bundles. In a longer term perspective, the competition story hinges importantly on the emergence of China as a major exporter to world markets. An implication is that given a major devaluation by one country, others are forced to follow in order not to lose export market share. The complementarity story is based on the recent experience of Asian-wide growth based on intra-regional trade and geographically cascading investments. In the past two decades, labor intensive production gradually moved down from Japan, first to the tigers—the “newly industrialized economies”(NIEs) of Taiwan, Singapore, Hong Kong and Korea—then on to the dragons (Thailand, Indonesia, Malaysia, and the Philippines), and most recently to China and Vietnam. As a result East Asia became more integrated, its growth path generated by a constant process of industrial upgrading, in turn driven by a rapidly expanding stock of skills and real assets. In the process, the region also became more interdependent. A key role in this story is played by Japan, as an important source of technology, financial capital, capital goods, and a large market for East Asian output (both tradables and “nontradables” such as tourism or real estate). Here, contagion could also occur, but it is driven by the interdependence of East Asian economies.

In reality, both competition and complementarity are likely to operate simultaneously. In particular, while the emergence of China and other labor intensive producers is likely to hurt producers of relatively unskilled products in the region, it also offers huge potential for mutual gains from trade with the recently industrialized countries, which are already rich in skills and

capital, but where labor costs have been rising. In the longer run, the emergence of China on world markets pushes up the return to education and creates incentives for other East Asian countries to move up the quality ladder faster. Indeed, in the absence of new entrants from below, the process of growth convergence—very rapid in this region—would soon exhaust gains from trade due to dissimilarities; further trade growth would increasingly have to be based on product differentiation and intra-industry trade. As long as complementarities dominate, the region remains vulnerable to risks of failures in its higher rungs—in particular, a serious slowdown in Japan would have strong ripple effects on the whole group of countries below, encroaching on production capacity already in place in the rungs directly below, and ultimately, destroying growth opportunities all the way to the poorest country of the formation.

The premise of this paper is that the strong financial regional contagion in East Asia must have been due, at least in part, to a complex set of real-side links between the various countries of the regions. Strong regional competition and/or complementarities would both transmit shocks and lead to regional contagion. But the ripple effects would be of a different nature, and the policy instruments needed for stabilization would be different. A better understanding of the prevailing production/ investment/ consumption/ finance relationships could help us gauge the “fundamentals” behind the financial veil of the crisis.<sup>1</sup>

The objective of the paper is to make an initial attempt to explore what the available data reveals regarding the relative importance of competition vs. complementarity. It is structured as follows. In Section II we first lay out the two main real-side “stories.” In Section III, we attempt to obtain a better understanding of the changing pattern of trade and investment in Asia by looking at the cross-country co-variation in the various aggregates. In Section IV, we explore the structure of Asian trade and in Section V, that of the investment flows. Section VI presents our conclusions about the relative importance of the various contagion channels.

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<sup>1</sup> Much of the analysis that has emerged addressing the causes of the financial and currency crisis in East Asia has focused on domestic variables, in particular the mis-match between liberalization of short term capital flows in the absence of solid regulatory supervision of domestic banks and presence of a peg to an appreciating US dollar. Given perceptions that financial systems would be bailed out (moral hazard), this induced large-scale unhedged borrowing in foreign currency. Once the domestic currency began to depreciate significantly, fears of sovereign financial insolvency led to a complete collapse. See Corbett and Vines (1998) for a detailed discussion and references to the literature. We abstract from financial dimensions of the crisis and contagion.

## II. Real Side Stories

Several real side stories focusing on the “fundamentals” can be proposed in an attempt to understand recent developments in East Asia. These stories attempt to either explain the genesis of the crisis (a common cause would explain the similarities in countries performances), or to propose reasons why the crisis has created contagion effects in the rest of the region once it started. Many of these stories can be collapsed into two archetypes, one that emphasizes competition between Asian countries, and the other that emphasizes their complementarity. The first posits that the various Asian economies are fierce competitors in world markets, and that none can afford to let the others get a lead through devaluation. The second model of the “flying geese formation” posits instead a strong form of complementarity.<sup>2</sup> This model would lead to a different interpretation of the crisis, one where the internal weaknesses experienced by Japan play a key role. In contrast, with global competition for investment flows and market share rising, the first model questions the competitiveness of many countries of the region. Different stories emphasize different types of competition:

- The rise of low-wage producers -- China, India, and Vietnam -- must have hurt mainly Asian low-wage producers (mainly the ASEAN countries) in world export markets. Here, there is a particular emphasis given to the 1994 (alleged) devaluation of the yuan (Bergsten, 1998). To be relevant from a policy and contagion perspective, it is necessary that emerging competitors are large enough to pose a credible threat to “traditional” East Asian suppliers. In principle, China is a big enough player to be a threat. Whether its rapid export growth of the last decade has in fact come at the detriment of East Asian dragons is an empirical question.
- Medium skill countries are often mentioned as victims of the revival of major Latin American economies, trade diversion resulting from NAFTA, and the emergence of former COMECON nations as exporters. At the higher end of this range, medium-skill industries in the NIEs (and to a lesser extent the ASEAN countries) must have been badly hurt after 1995 by the sharp devaluation of the Yen, which reduced their competitiveness relative to producers of similar goods in Japan.

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<sup>2</sup> The term “flying geese” is due to Akamatsu (1962). It originally referred to graphs representing the share of a particular industry in national product as it evolved over time in a particular country. These graphs exhibit a series of inverse-U curves associated with industries of increased sophistication. For example, Japan started with textiles, which rose and then fell, being replaced by chemicals, which also rose and fell, and so on (Kwan, 1997).

The competition story is supported by the observed deterioration of the terms of trade of some Asian economies in 1996 (especially Korea) which was due in large part to a decline in world prices for major export commodities. Seemingly, this was driven by excess capacity and over-investment in particular sectors. For example, prices of semiconductors and computer components fell dramatically in 1996 (Dasgupta and Imai, 1997). A particular variant of these types of arguments is that competition in the region is very fierce in that East Asian countries have tended to specialize in very similar output bundles (DeRosa, 1995; Muscatelli et al., 1994). This in turn might help explain possible contagion effects arising from a financial crisis and associated exchange rate depreciation in any given Asian country.

Stories emphasizing complementarity are more complex to trace out precisely. In the past, and under Japan's leadership, the region integrated rapidly through strong intra-regional trade growth and large movements of capital. In the standard "flying geese" model, industries that first emerged in the leading country make their way over time into countries with lower levels of skills (from textiles to chemicals, iron and steel, electrical products, electronics, and automobiles). Both the labor and capital markets play an important role in this. As the labor markets tighten and wages rise, it becomes tempting to move labor-intensive industries to a neighboring country with cheaper labor, and to upgrade production by moving up the quality ladder. Rapid gains in education also played a key role in allowing this model to operate for two decades. In addition to well-functioning labor markets and a strong emphasis on education, the conditions that have facilitated this pattern of division of labor in the region include short distances, openness to trade and investment, and large disparities in incomes (Kwan, 1997).

From a "flying-geese" perspective, the countries of the region should be sensitive to the ripple effects emanating from the recent recession in Japan. Japan is the largest economy in Asia, an important market for the region, and the main source of foreign investment and finance. Since 1995, the Yen has been falling in the context of weak aggregate demand and a banking crisis. As a result, Japanese demand has fallen, and so have its investments in the region. The real effects of this add up to a large negative shock to the rest of the region, and one that is especially devastating, coming on the heels of a decade-long strong Yen (from the Plaza agreements in 1985 to 1995). The strong Yen, in contrast had accelerated de-industrialization in Japan and led to a rapid rise in

Japanese direct investments in the region (first in the NIEs, then in the ASEAN countries, and more recently, into China, India, and Vietnam).<sup>3</sup>

Putting the competition and complementarity stories back to back, it appears that the combined effects of the long term rise of China in international markets and the recent weaknesses in the Japanese economy may have added up to a strong pincer effect on the flying geese formation. Starting in the mid-80s, several Asian countries must have had strong incentives to expand their production structure and exports up the quality ladder (in some cases prematurely), under the dual pressure of rising low-skill production in China, and de-industrialization in Japan. This movement was facilitated by the availability of large capital flows, including from Japan itself, which were partly invested in this industrial upgrading. In many of the countries, the rapid growth of industry led to the emergence of domestic supply constraints in the early 1990s, such as inadequate skilled labor to move products upmarket, or excessive wage growth. It is in this context that the recent recession in Japan emerged. By creating strong competitive pressures from above, the resulting slow-down throughout the region must have squeezed the profitability of the new investments in manufacturing (and perhaps exposed their fragility), pushing all the newly industrializing countries into a scramble for the lower end of medium-skill industries, a market segment already heavily invested by the emerging economies of Latin America and Europe.<sup>4</sup>

Both competitive and complementary forces therefore operate simultaneously in transmitting the effects of a devaluation of one East Asian country to the rest of the region. It is useful to think of three channels of regional transmission of disturbances: a price effect, an income effect, and an investment effect.

*Price effects* A devaluation in one country of the region can affect the other countries in several ways. Lower prices are good for consumers, but their effect on local producers will depend on whether competition or complementarity dominates in production.

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<sup>3</sup> Note that these countries had pursued from the mid-80s to the mid-90s policies of pegging partially their nominal exchange rates to the US dollar. As the dollar appreciated, and new competition came on stream, a serious competitiveness problem may have emerged for some countries. However, this seems to have been compensated by a boom in regional exports to Japan. In addition, and especially in high skill economies such as Korea, exports to third markets became more competitive relative to Japan. McKibbin and Martin (1998) argue that real effective exchange rates of the countries most severely affected by the crisis did not appreciate significantly during the 1990-97 period.

<sup>4</sup> See Hoekman and Djankov (1997) on Eastern Europe; Primo Braga and Yeats (1994) on Latin America.

- If the two countries produce similar goods, competition will dominate, and there will be pressure on the domestic economy to devalue as well: the “price effect” is negative, and will be larger the more similar are export bundles.
- If the production structures are different and complementary, a devaluation by a partner can be good for the domestic economy because it enhances the competitiveness of their “joint” output. This will be especially the case if the domestic economy imports capital goods or intermediary goods from the devaluating economy. In this case we expect price effects to be positive and to be a function of the relative importance of intra-regional trade in intermediates and capital equipment. Complementarities will dominate trade relations when intra-regional trade is intra-industry, which is expected to be the case for rich/rich pairs of countries and rich/poor countries (because assembly work using sophisticated parts is usually done in the poorer countries). Complementarities in production are likely to be low in the relation between poor/rich and or poor/poor.<sup>5</sup>

*Income effects* A recession in one country reduces aggregate demand, and thus for final goods imports, and also affects over time demand for intermediate and capital goods. These effects will be larger the greater is the share of intra-regional trade in total trade, i.e., the larger are complementarities in consumption..

*Investment effects* If the affected country is rich (e.g., Japan), currency depreciation and slow or negative growth reduces FDI outflows towards the poorer countries and exports of complementary intermediate goods. Moreover, if the exchange rate remains at a significantly lower level or continues to fall for a protracted period, the country will become a more important competitor for richer economies on export markets (e.g., Korea). If the country is poor (e.g., Thailand) a devaluation makes it more competitive in attracting investments, especially for tradables, and consequently creates pressures on countries lower on the quality ladder to follow.

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<sup>5</sup> The impacts of devaluation mentioned here operate through the trade account. McKibbin and Martin (1998) note that the devaluations in East Asia occurred after the countries floated (or at the same time) and must be seen as endogenous. The impact on other countries’ exchange rates will then depend on the source of the exchange rate shocks. McKibbin and Martin argue that the devaluations were primarily the result of falls in investment demand in the countries, so that there is a capital account linkage to take into account as well. When investment demand falls in one group of countries, the exchange rate devaluation of the affected countries tends to put downward pressure on competitor’s exchange rates. However, the fall in world investment demand also pulls down world interest rates, tending to cause an appreciation of exchange rates in countries not experiencing investment demand shocks. When fed through a global CGE model, McKibbin and Martin find that the two factors were almost completely offsetting.

The trade and investment relationship between rich-poor country pairs will often be complementary; those between poor-poor pairs competitive; while in rich-poor cases the net effect is ambiguous. In a flying geese context complementary effects operate through FDI outflows from richer to poorer countries, with FDI being a channel for trade in goods and the transfer of technology.

The net effect of these effects therefore depends in part on how deeply regional economies are integrated on the consumption side (negative income effect) and on the production side (ambiguous “price” effect). With several countries of the region experiencing devaluation and recession, we would expect contagion to spread rapidly through the combined channels of increased competition, lower demand for imports, and less FDI. On the other hand, complementarity in production will provide a positive countervailing effect: regional devaluations make the regional product more competitive in the rest of the world, and therefore reduces the pressure on the home economy to devalue. However, these complementarities in production are unlikely to be effective in the short run in reducing the severity of the regional shock given the weak balance sheets in the financial sector (limiting financing for new growth opportunities), and the fall in FDI from Japan.

In what follows, we use the available data to explore the relative importance of the various effects at play.

### **III. Linkages between East Asian economies**

Correlations between macro aggregates can inform us regarding the relationships between China, Japan, and the rest of Asia. If China is a major source of competition for East Asia, this should be reflected in negative correlations between Chinese and other East Asian exports and high levels of export similarity. The same variables can also give a sense of the relative importance of the complementarity story. As Japan plays a central role in this connection, both as a source of demand and as a source of investment and technology, we also report measures of co-variation between Japan and the rest of East Asia.

In what follows, we focus on growth rates rather than levels. The reason is that the levels of the main aggregates move very much in parallel and are not very informative about differences among the countries. On the other hand, we suspect that structures have a more marked effects on

new activity. We look at the growth in GDP, consumption, investment, and exports. The results are displayed in Table 1 and Figures 1 to 4.

In Table 1, we report results from regressions of various variables in 7 East-Asian economies on similar variables in Japan and China, over the period 1970-95. No lags are used, but we have added time dummies to test for structural shifts in the elasticities (for the period 1980-89, and 1990-95). The graphs attempt to look in more detail -- admittedly, in a quite cavalier way -- at the change in these elasticities through time.<sup>6</sup> For ease of comparison, for each East Asian nation we stack correlations with Japan on top of those with China.

The results paint a complex picture with some strong characteristics. In the first panel of Table 1 and Figure 1, we have regressed the growth rates of the NIEs and the ASEAN countries on output growth in Japan and China. Remarkably, growth in Japan and China “explain” 50 percent of the variability of growth in the rest of Asia. Two patterns appear clearly:

Generally, Japan’s growth is associated positively with growth elsewhere in Asia. The effect appears to weaken over time (except in the case of Thailand where the elasticity rises to 2.3), and to turn negative in the cases of China and Hong Kong in the 1990s. In contrast, China’s growth is associated negatively — albeit weakly — with growth in most of Asia, and especially with the poorer and more labor intensive countries. The correlation is positive for Hong Kong only. These results are consistent with a picture of an expanding geese formation in the process of integrating China into the group, with strong growth in all countries, but negative correlations in the variations of these rates their trends, reflecting competition by China at the lower end followed by (ultimately creative) destruction in the leading countries.

In the second panel of Table 1 and Figure 2, we look at the structure of co-variations in investment growth rates among the countries of the region. China co-varies negatively with most countries of the region, including Hong Kong. These effects have risen sharply since the 1980s. With low wage countries (Philippines, Indonesia), the effects are now very large (elasticities close to 2). Conversely, Japan co-varies positively with most of the region. This suggests that China has increasingly become a competitor for investment in the region. In contrast Japan’s investments growth moves generally with that of the other countries, as would be predicted by the geese model for the formation’s leader.

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<sup>6</sup> The bars are drawn only when the respective R squares of these regressions are larger than 0.1.

**Table 1: Regressions on Macro Aggregates, 1970-95**

	ALL	HKG	KOR	SGP	MYS	THA	PHL	IND
<b>I. GDP growth</b>								
Constant	-	5.9	9.1	6.4	6.8	4.7	6.1	7.9
GDP growth rate: Japan	0.2 <sup>a/</sup>	1.3 <sup>c/</sup>	-	0.6 <sup>c/</sup>	0.7 <sup>c/</sup>	0.3 <sup>a/</sup>	-	-
Japan 80-89	-	-1.6 <sup>c/</sup>	-	-	-	1.5 <sup>c/</sup>	1.0 <sup>b/</sup>	-
90-95	-	-1.7 <sup>c/</sup>	-	-	-	0.5 <sup>a/</sup>	-0.9 <sup>c/</sup>	-
GDP growth rate: China	-	-0.4 <sup>c/</sup>	-	-	-0.3 <sup>c/</sup>	-	-0.2 <sup>a/</sup>	-
China 80-89	-0.2 <sup>b/</sup>	0.7 <sup>c/</sup>	-	-	-	-0.5 <sup>c/</sup>	-0.7 <sup>a/</sup>	-0.2 <sup>a/</sup>
90-95	-	0.4 <sup>b/</sup>	-	-	0.5 <sup>c/</sup>	-	-	-
R <sup>2</sup> = 0.51								
<b>II. Investment growth:</b>								
Constant	-	12.1	8.2	9.7	12.7	2.9	13.5	19.4
Japan	-	0.6 <sup>a/</sup>	-	-	-	-	-	-
80-89	-	-	-	-	-	-	1.6 <sup>b/</sup>	-
90-95	-	-	1.4 <sup>a/</sup>	1.3 <sup>a/</sup>	-	2.1 <sup>b/</sup>	-	-
China	-	-	0.5 <sup>c/</sup>	-	-	0.5 <sup>c/</sup>	-	-
80-89	-0.8 <sup>c/</sup>	-0.5 <sup>a/</sup>	-0.7 <sup>b/</sup>	-	0.6 <sup>a/</sup>	-0.7 <sup>b/</sup>	-0.6 <sup>c/</sup>	-1.6 <sup>c/</sup>
90-95	-	-	-0.6 <sup>a/</sup>	-	-	-	-0.5 <sup>a/</sup>	-
R <sup>2</sup> = 0.37								
<b>III. Exports growth</b>								
Japan exports	-	-	-	-	-	-	-	0.5 <sup>b/</sup>
80-89	-0.36 <sup>a/</sup>	-	-1.2 <sup>b/</sup>	-	-	-	-0.7 <sup>a/</sup>	-1.7 <sup>c/</sup>
90-95	-1.14 <sup>a/</sup>	-	-	-	-	-	-2.3 <sup>a/</sup>	-
Japan consumption	1.4 <sup>c/</sup>	1.6 <sup>b/</sup>	5.4 <sup>c/</sup>	-	-	-	-	2.6 <sup>c/</sup>
80-89	-	-	-5.6 <sup>c/</sup>	-	1.6 <sup>a/</sup>	-	-	-
90-95	-	-	-7.3 <sup>c/</sup>	-	-	-	-	-
China exports	-	-	-	0.2 <sup>a/</sup>	-	-	-	-
80-89	0.17 <sup>a/</sup>	-	-	-	-	-	0.7 <sup>b/</sup>	-
90-95	0.51 <sup>c/</sup>	-	-	-	0.5 <sup>a/</sup>	-	0.9 <sup>b/</sup>	-
China consumption	-1.1 <sup>b/</sup>	-1.0 <sup>a/</sup>	-3.7 <sup>c/</sup>	-	-	-	-	-1.3 <sup>a/</sup>
80-89	0.8 <sup>b/</sup>	1.5 <sup>c/</sup>	3.5 <sup>c/</sup>	-	-	-	-	1.1 <sup>a/</sup>
90-95	1.1 <sup>c/</sup>	1.6 <sup>c/</sup>	3.9 <sup>c/</sup>	-	-	-	-	1.9 <sup>c/</sup>
R <sup>2</sup> = 0.37								

Notes: a/ : significant at 5% level. b/ : significant at 10% c/ : significant at 20%.

Finally, we look at covariations in export growth (Table 1, panel 3; figures 3 & 4). These are regressed on two variables: (i) consumption growth in Japan and China, to measure aggregate demand effects, if any; and (ii) export growth in Japan and China to measure the competitiveness vs. complementarity of exports. As expected, increased consumption growth in Japan pulls up exports from most of the region, and especially the poorer countries, but since the 1980s Japan has a large negative effect on Korea. China's consumption growth too is associated in several cases with rising export growth, but here, the effect seems stronger with the more advanced countries.

Japanese export growth tends to be negatively related to export growth in the rest of Asia.

Competition between Japan and Korea seems particularly strong (with an elasticity of -1.2). These effects have increased a bit in the 1980s, and a lot in the 1990s. In contrast, the relation tends to be positive and larger over time between China and the rest of Asia.

This means that aggregate demand effects are likely to be large (at least in the short term), as would be expected among economies that are close together and open to each other. More important, the results corroborate the hypothesis of rising competition between Japan and the higher-end producers in the region, especially in the recent years. At the same time, and somewhat surprisingly, the results also suggest that in the relation with China, complementarity in trade dominates. Although China competes in the same range of products as some of the poor countries of the region, its large needs for imports makes complementarity a dominant force.

To summarize then, Korea appears to be competitive with Japan on the trade front, but its growth and investment rates are in sync with Japan, and it is highly dependent on Japan as a market—a worst case scenario given Japanese conditions. Thailand and Malaysia also appear highly dependent on Japan as a market and a source of capital. There are indications of increased competition with Japan, and decreased competition with China, presumably in parallel with an upgrading of production towards higher value-added products. Finally, labor intensive Philippines and especially Indonesia compete with China in attempting to attract investment flows. They also depend on Japan as a market and investor. In what follows we explore to what extent data on the composition and pattern of trade and investment flows in the East Asia region shed light on the factors that may underpin the conclusions suggested by the co-variation measures.

#### **IV. Patterns of Trade**

Three factors should be looked at to gauge the relative importance of competition and complementarity in trade relations: (i) aggregate demand—the extent to which East Asia is a destination for Asian-produced output; (ii) complementarities in production—the share of imported inputs that originates within the Asian region; and (iii) competition—the extent to which the composition of the export mix of East Asian countries is similar and there are incentives for countries (markets) to emulate a depreciation by one country in order to maintain relative market shares in export markets.

### *Demand linkages*

Intra-regional trade in East Asia is very substantial. If Japan is included, East Asia comes second after the EU in terms of the share of intra-regional in total trade. Intra-regional exports among East Asian countries accounted for almost 40% of total exports in 1996, up from 31.7% in 1990. If Japan is included the share of intra-regional trade rises to 51% (table 2). These high levels of intra-regional trade reflect an ongoing process of specialization between countries in the region, but has always been a distinct feature of East Asia. The intra-regional trade share was around 40 percent in the 1930s through the 1950s (Anderson and Francois, 1997, p. 18).

**Table 2: East Asia--Intra and Extra Regional Trade  
(share of total merchandise exports)**

	1990	1996	1997:2
Intra-Asia-9	31.7	38.5	39.4
Asia-9-Japan	14.5	13.1	11.8
Extra Regional	53.8	48.4	48.8

Source: IMF Direction of Trade. Asia-9 is China; Hong Kong; Indonesia; Korea; Malaysia; Philippines; Singapore; Taiwan; and Thailand.

The country with the lowest “dependence” on other Asia-9 as an export destination is the Philippines (25% of total exports); Singapore, Hong Kong, and Malaysia have the greatest dependence (40 to 45%) (table 3). China, Hong Kong, Malaysia, Philippines, Singapore and Thailand source more than 50 percent of their imports from East Asia, reflecting intense trade relations among pairs of countries. Abstracting from Hong Kong-China and Malaysia-Singapore—where geography and history explain the very intense trade relations that prevail, Japan-China is an important bilateral pair: 22 (11) percent of Chinese (Japanese) imports originate in Japan (China). Taiwan is also an important source of imports for China (13 percent of the total). Japan is particularly important as a source of products for Korea, Malaysia, Thailand and Taiwan. Some indicative comparisons: Hong Kong is as important as an export destination for Taiwan as the United States; Singapore ships as much to Malaysia as it does to the US; Thailand exports almost as much to Singapore as it does to Japan; China/Hong Kong is as important for Korea as the US market is; and Korea and Taiwan together buy almost as much from Japan as the 15 EU member countries. Japan is a major market for most of the East Asian economies, the exceptions being

Hong Kong and Singapore. China and Hong Kong are major export markets for Taiwan. With Japan, UN statistics suggest that these three countries absorbed half of Taiwan's exports in 1995.

**Table 3. Intra-Regional Exports by Country, 1995 (share of total exports, %)**

	China	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	Taiwan	Japan	East Asia
<b>China</b>	0.00	0.24	0.01	0.04	0.01	0.01	0.02	0.01	0.02	0.19	0.56
<b>Hong Kong</b>	0.27	0.00	0.01	0.01	0.01	0.01	0.05	0.01	0.03	0.05	0.47
<b>Indonesia</b>	0.04	0.04	0.00	0.06	0.02	0.01	0.08	0.02	0.04	0.27	0.58
<b>Korea</b>	0.07	0.08	0.02	0.00	0.02	0.01	0.05	0.02	0.03	0.14	0.45
<b>Malaysia</b>	0.03	0.05	0.01	0.03	0.00	0.01	0.20	0.04	0.03	0.13	0.53
<b>Philippines</b>	0.01	0.05	0.01	0.02	0.02	0.00	0.05	0.05	0.03	0.16	0.40
<b>Singapore</b>	0.02	0.09	0.01	0.03	0.19	0.02	0.00	0.06	0.04	0.08	0.53
<b>Thailand</b>	0.03	0.05	0.01	0.01	0.03	0.01	0.14	0.00	0.02	0.17	0.48
<b>Taiwan</b>	0.13	0.23	0.02	0.02	0.03	0.01	0.04	0.03	0.00	0.12	0.63
<b>Japan</b>	0.05	0.06	0.02	0.07	0.04	0.02	0.05	0.04	0.07	0.00	0.42
<b>E. Asia</b>	0.05	0.10	0.02	0.04	0.04	0.01	0.06	0.03	0.04	0.09	0.49

Source: United Nations, COMTRADE database.

All in all, the statistics clearly reveal a more complex pattern of trade than would be expected if the simple competitive model were to hold. Korea provides an illustration of how some countries in the region have come to rely more on East Asia as a market. Korean exports have grown at double digit rates for over two decades. Over time Korea's trade has been re-orientated away from exporting to the rest of the world (especially the US) towards other East Asian countries. As of the mid 1990s, the share of OECD countries in total Korean exports stood at around 50 percent, down from 80 percent as recently as 1987. Exports to developing East Asia had expanded from 12 to almost 40 percent over the same period. Giorgianni and Milesi-Ferretti (1997) document that this is not simply a reflection of slower growth or a decline in demand for Korean products. They conclude that Korea lost market share in OECD markets during the past decade to other East Asian economies including China, Hong Kong, Malaysia and Thailand. However, this was more than offset by booming exports to East Asia, which increasingly took the form capital goods. As of 1995, Japan and Hong Kong/China figured among Korea's largest trading partners. Consequently, Korea became much more dependent on the economic health of the region.

The foregoing focuses on regional shares in total trade, which does not take into account the size of partner country markets. Controlling for the size of import markets absorbing exports is important in determining whether trade flows are more concentrated within the region that would be “normal” given the region’s share of the world economy. One way to do this is to use export intensities as a measure of trade patterns. This is defined as  $XI = (X_{ij} / X_i) / (M_j / (M_w - M_i))$  where M and X are imports and exports of goods respectively, i is a reporting (or source) country, j a partner (importing) country; and w is the world. If this measure is greater than one, trade is more “intense” than would be expected. Export intensities of trade within the region are often significantly greater than one (table 4). For Japan and Korea, intensities for exports are above one for all East Asian partners. The same is true for the poorer countries, although with less uniformity. Japan and Korea are large markets for China, but the poorer East Asian economies are not. On average, export intensities within the region are about 2, and are particularly high for trade between Hong Kong and China, Hong Kong and Taiwan, and Malaysia-Singapore.

**Table 4. Export Intensity of Total Trade, 1996**

Reporter	JPN	CHN	HKG	TAI	IDN	KOR	MYS	PHL	THA	SGP	EAS	NAM	EU	WLD
JPN	na	1.82	1.47	2.95	2.44	2.34	2.32	2.80	2.94	1.81	1.58	1.39	0.37	0.93
CHN	2.92	na	5.44	0.91	1.09	1.70	0.59	0.96	0.57	0.94	2.15	0.94	0.33	0.97
HKG	0.75	10.2	na	1.53	0.84	0.42	0.76	1.70	0.83	1.76	1.86	1.36	0.44	0.96
TAI	1.69	0.19	5.80	na	1.96	0.79	1.67	2.40	1.67	1.50	1.99	1.24	0.35	0.98
IDN	3.77	1.51	0.83	1.63	na	2.30	1.48	2.02	1.16	3.48	2.29	0.74	0.40	0.99
KOR	1.77	3.26	1.95	1.37	2.96	na	1.87	2.17	1.47	1.41	1.78	0.93	0.31	0.97
MYS	1.94	0.87	1.49	2.03	1.82	1.06	na	1.73	2.86	7.84	2.21	0.96	0.35	0.99
PHL	2.62	0.59	1.09	1.62	0.83	0.64	2.25	na	2.70	2.32	1.71	1.83	0.43	0.99
THA	2.43	1.05	1.31	1.19	1.68	0.49	1.82	1.06	na	5.38	1.94	0.97	0.39	0.99
SGP	1.17	0.97	2.23	1.91	na	1.04	11.70	2.61	3.92	na	2.09	0.95	0.33	0.97
EA	0.98	1.23	1.96	1.48	1.38	1.18	2.16	1.74	2.72	0.98	1.45	0.90	0.28	0.75
NA	1.09	0.53	0.35	0.94	0.56	0.99	0.58	0.92	1.11	0.30	0.76	1.52	0.35	0.81
EU	0.19	0.20	0.17	0.18	0.31	0.19	0.19	0.18	0.33	0.12	0.19	0.24	0.98	0.61

Source: UN Comtrade database.

**Table 5: Share of intermediates in global imports of East Asian countries (1995)**

	<i>JPN</i>	<i>CHN</i>	<i>HK</i>	<i>TAI</i>	<i>IDN</i>	<i>KOR</i>	<i>MYS</i>	<i>PHL</i>	<i>THA</i>	<i>SGP</i>	<i>EA</i>	<i>NA</i>	<i>EU</i>	<i>World</i>	<i>EA/world</i>
JPN	..	3.6	0.4	2.2	1.5	2.5	1.7	0.7	1.5	0.8	15.2	15.7	7.3	46.3	32.8
CHN	17.4	..	4.5	9.7	0.8	7.2	1.4	0.2	1.0	1.3	43.6	9.8	11.5	76.6	56.9
HK	10.3	15.8	..	7.2	0.6	4.0	1.6	0.4	1.2	2.7	43.7	5.9	8.0	63.0	69.4
TAI	24.6	2.3	1.0	..	0.9	3.5	2.9	0.7	1.1	1.8	39.2	14.6	9.8	72.6	53.9
IDN	17.7	2.5	0.5	3.2	..	4.9	1.4	0.1	1.2	3.1	34.8	10.5	18.7	75.3	46.2
KOR	18.4	3.8	0.6	1.6	1.0	..	1.3	0.3	0.4	0.9	28.6	18.0	11.0	66.1	43.3
MYS	20.2	1.8	1.8	4.2	1.2	4.3	..	1.0	2.5	9.9	47.0	12.8	11.5	77.4	60.7
PHL	17.5	1.6	3.5	4.3	1.4	4.3	1.9	..	1.1	3.9	39.9	15.5	9.3	72.5	55.0
THA	24.7	2.2	1.1	3.5	0.6	2.7	3.4	0.7	..	3.7	42.9	10.0	11.8	75.5	56.8
SGP	14.2	1.9	2.1	3.3	..	2.5	10.1	1.0	2.9	..	38.2	12.4	10.4	65.4	58.4

**Table 6: Share of intermediates in total imports from East Asia, North America and the EU (1995)**

	<i>JPN</i>	<i>CHN</i>	<i>HK</i>	<i>TAI</i>	<i>IDN</i>	<i>KOR</i>	<i>MYS</i>	<i>PHL</i>	<i>THA</i>	<i>SGP</i>	<i>EA</i>	<i>NA</i>	<i>EU</i>
JPN	..	31.3	54.2	51.2	33.7	55.8	49.4	56.7	49.6	39.4	42.0	60.9	51.5
CHN	82.8	..	80.2	82.9	49.8	79.6	86.9	56.4	73.4	50.9	79.0	73.0	80.6
HK	75.9	42.4	..	89.2	71.9	84.3	71.6	73.0	75.3	51.0	59.0	69.8	72.2
TAI	91.0	77.2	64.4	..	49.6	88.9	81.8	87.4	65.7	67.4	84.0	69.8	60.1
IDN	89.4	67.6	77.7	83.4	..	87.0	74.8	69.9	45.9	46.9	76.4	77.0	87.2
KOR	84.9	63.8	83.7	86.0	36.3	..	63.8	72.0	52.1	53.0	74.5	73.8	77.0
MYS	80.2	72.9	76.1	81.3	66.2	89.5	..	93.8	74.4	75.0	78.7	77.6	77.6
PHL	80.2	71.3	83.2	86.5	70.0	83.4	77.7	..	58.1	74.9	78.5	76.1	83.1
THA	86.7	81.1	92.5	80.8	49.4	73.2	67.9	84.9	..	67.8	80.3	75.1	78.3
SGP	78.8	57.1	67.5	83.2	..	74.4	67.3	89.6	52.4	..	70.8	73.5	71.4

### *Complementarity*

Most of this intra-regional trade is in intermediates. These account for 65 to 75 percent of total imports of East Asian countries from the world (table 5).<sup>7</sup> Between 60 and 80 percent of total imports from East Asia by East Asian countries consist of intermediate inputs and parts (table 6). The import composition from East Asia is not much different from that from the rest of the world (e.g., North America and the EU), where intermediates are also the dominant type of product. What stands out, however, is that imports of intermediates from other East Asian countries represents 35 to 40 percent of global imports of East Asian economies. East Asia accounts for 55-60 percent of total imports of intermediates for China, Malaysia, Philippines, and Thailand, rising to 70 percent for Hong Kong (table 5, last column). Japan plays a major role in this connection: between 10 and 20 percent of global East Asian imports comprise intermediate inputs from Japan. East Asia accounts for fully one-third of Japan's total exports of intermediates to the world. Japan is much less important as a market for intermediates than it is a source of such products, but it is nonetheless quite significant for some countries (Indonesia, Philippines, Thailand—around 10 percent of their global exports) (Appendix Table 1). The share of intermediates in total exports to individual countries and regions indicates that intermediates are less important in exports to North America and the EU than to East Asia (Appendix table 2). These markets absorb a greater proportion of final goods (consumer products).

Export intensity numbers confirm the importance of trade in intermediates, using the same definition of intensity as before, but limiting the trade flows to intermediate products (table 7). The intensity of Japan's exports to East Asian economies is above one in all cases. China is less “dependent” on exports of intermediates to the region, having intensities above one primarily in richer country markets (Japan, Taiwan and Korea), and not being an intensive importer itself for most East Asian partners. Korea has high intensities of exports to the region, but the converse is not true—except for China and Japan, Korea is not an important market for intermediate exports from other countries. Other NIEs and ASEAN countries all have intensities above one as import markets for regional exports of intermediates. In general, the figures closely mirror those for total

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<sup>7</sup> Intermediate goods include raw and processed materials, chemicals, leather, fabric and textiles, parts and accessories. Consumer goods comprise processed foods, clothing, household durables, electronic equipment (VCRs, cameras, CD players, etc.), and cars, motorcycles and bicycles. Capital goods include machine tools,

trade reported in table 4, although on average they are somewhat higher, reflecting the importance of intermediates in total intra-regional trade. The data suggest there are strong complementarities between rich-poor pairs (viz. Japan's and Singapore's intensities with ASEAN countries), but that this is less so for poor-poor country pairs.

**Table 7: Intensity of Intermediate Goods Exports, 1996**

Reporter	JPN	CHN	HKG	TAI	IDN	KOR	MYS	PHL	THA	SGP	EA	NAM	EU	WLD
<b>JPN</b>	na	1.64	1.49	3.08	2.52	2.62	2.22	2.65	2.76	1.81	1.75	1.41	0.35	0.95
<b>CHN</b>	2.84	na	5.64	1.13	1.30	1.89	0.75	0.95	0.79	0.94	2.08	0.91	0.35	0.96
<b>HKG</b>	0.89	11.6	na	1.27	1.01	0.41	0.82	2.17	1.06	2.50	2.39	0.79	0.27	0.96
<b>TAI</b>	1.61	0.19	6.76	na	1.86	0.85	1.50	2.51	1.53	1.61	2.06	1.15	0.29	0.98
<b>IDN</b>	3.67	1.04	1.19	1.32	na	1.68	1.64	2.73	0.86	3.50	2.03	0.65	0.49	0.99
<b>KOR.</b>	1.97	3.28	2.45	1.51	3.12	na	2.05	2.22	1.31	1.57	1.98	1.00	0.26	0.97
<b>MYS</b>	2.17	0.93	1.57	2.18	1.45	0.87	na	1.71	2.20	7.89	2.19	0.93	0.34	0.98
<b>PHL</b>	3.19	0.36	1.07	1.52	0.85	0.62	2.47	na	3.10	2.76	1.78	1.77	0.46	0.99
<b>THA</b>	3.22	0.58	1.93	1.24	1.25	0.49	1.9	1.09	na	5.63	2.07	0.85	0.36	0.98
<b>SGP</b>	1.19	0.81	1.84	1.87	na	0.92	12.6	2.85	3.76	na	2.19	0.85	0.30	0.97
<b>EA</b>	0.89	1.15	1.99	1.54	1.45	1.23	2.14	1.75	2.41	1.07	1.47	0.88	0.25	0.73
<b>NA</b>	1.31	0.45	0.35	0.83	0.51	1.01	0.57	0.92	1.02	0.29	0.75	1.62	0.38	0.82
<b>EU</b>	0.21	0.20	0.19	0.17	0.29	0.20	0.17	0.19	0.30	0.14	0.20	0.29	0.97	0.62

Source: UN Comtrade database.

### *Competition?*

The foregoing suggests there are significant complementarities in trade in the region. They also illustrate that trade dependence is high, so that the vulnerability to demand shocks and what we called income effects earlier will be high. To what extent do the data support the hypothesis that East Asian countries are competing with each other for external markets? It has often been noted in this connection that countries in the region tend to have similar export structures. With the exception of Indonesia, which is an outlier because it is an important exporter of natural resource-

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power generation equipment, transport equipment, etc. A detailed concordance mapping the HS classification into the Basic Economic Classification of the UN is available from the authors on request.

based products, for each of the East Asian countries, two of the three countries with the most similar export structures in the mid 1980s were other East Asian countries (Noland 1997).<sup>8</sup> Export similarity rankings for 1995 are reported in table 8 for extra- and intra-regional trade. Japan, a high-income industrialized nation not surprisingly, has exports that are most similar to those of other OECD countries. Noteworthy, however, is that in intra-regional trade Singapore and Korea come in third place in terms of similarity. China's exports are more similar to those of Portugal and Italy than of other East Asian economies, while Tunisia is most similar to Hong Kong. These rankings clearly are driven by the importance of clothing exports for all these countries.

**Table 8: Export Similarity, 1995**

	Extra-regional trade			Intra-regional trade		
	Most similar:	2 <sup>nd</sup> most similar:	3 <sup>rd</sup> most similar:	Most similar:	2 <sup>nd</sup> most similar:	3 <sup>rd</sup> most similar:
<b>Japan</b>	Germany	U.S.	UK	Germany	US	Singapore/Korea
<b>China</b>	Portugal	Taiwan	Italy	Hong Kong	Taiwan	Italy
<b>Hong Kong</b>	Tunisia	China	Philippines	China	Taiwan	Japan
<b>Singapore</b>	Malaysia	Korea	Ireland	Malaysia	Japan	US
<b>Taiwan</b>	Singapore	Korea	Malaysia	Korea	Japan	Hong Kong
<b>Korea</b>	Japan	Philippines	UK	Taiwan	Singapore	Japan
<b>Malaysia</b>	Singapore	Philippines	Japan	Singapore	Philippines	Japan
<b>Philippines</b>	Malaysia	Korea	China	Malaysia	Singapore	Portugal
<b>Indonesia</b>	China	Portugal	Malaysia	Malaysia	Korea	Canada
<b>Thailand</b>	n.a.	n.a.	n.a.	n.a.	n.a.	N.A.

Source: UN COMTRADE, 3 digit SITC.

Correlations between export structures of East Asian countries in 1995 also reveal there is significant similarity for some country-pairs, although correlations for many country-pairs are relatively low (table 9). For some East Asian countries (Japan, China, Hong Kong, Indonesia) countries with the highest correlation ratios are outside the region (Appendix table 3). The correlations and similarity indices do not suggest that China is a major source of “competition” for East Asian countries—abstracting from Hong Kong, Chinese exports are highly correlated only with Indonesia (0.53) and the Philippines (0.54), and in extra-regional trade only (table 9). Indonesia too has very low correlations with the exports of other East Asian countries. For the

<sup>8</sup> The export similarity index is defined as  $XS(a,b) = \text{SUM}_i [\min(X_{ia}, X_{ib})] * 100$ , where  $X_{ia}$  and  $X_{ib}$  are the industry  $i$  export share in country  $a$ 's and  $b$ 's exports respectively which were calculated at the 4-digit SITC level for 10 East Asian countries and a sample of other 40 countries. The index ranges between 0 and 100, with 0 indicating

other countries, exports tend to be more similar, especially for intra-regional trade. In general, correlations are significantly higher for trade within the region than in rest of the world markets. While for some country pairs—e.g., Malaysia-Singapore—this is likely to reflect intra-industry trade (complementarity), for many there is certainly a strong competitive dimension as well. Countries such as Lao, Vietnam, and Taiwan clearly devalued for competitive reasons.

**Table 9: Export Share Correlations in intra-regional and extra-regional trade, 1996**

*Above the diagonal: correlations in world market; Below diagonal: correlations in regional market*

	JPN	CHN	HKG	IDN	KOR	MYS	PHL	SGP	TWN
JPN	1	0.15	0.06	0.01	0.78	0.43	0.38	0.44	0.48
CHN	0.29	1	0.85	0.53	0.35	0.40	0.54	0.26	0.41
HKG	0.63	0.81	1	0.72	0.23	0.31	0.58	0.16	0.25
IDN	0.17	0.20	0.34	1	0.18	0.34	0.31	0.10	0.16
KOR	0.80	0.35	0.69	0.28	1	0.67	0.72	0.50	0.55
MYS	0.77	0.36	0.69	0.37	0.78	1	0.82	0.76	0.74
PHL	0.73	0.32	0.64	0.14	0.76	0.92	1	0.64	0.65
SGP	0.79	0.36	0.66	0.32	0.79	0.91	0.88	1	0.94
TWN	0.81	0.43	0.70	0.32	0.90	0.77	0.72	0.76	1

Source: UN, 3-digit SITC (174 product categories).

Another way of investigating the competition hypothesis is to determine whether East Asian nations have been losing market share to each other in major markets. With the exception of Korea and Singapore, East Asian countries expanded their shares of world markets in 1995 and 1996. Greater international competition did emerge in major markets such as the US and EU, but this did not come at the “expense” of East Asia. For example, despite the fact that Central and Eastern European countries doubled or tripled their share of the EU market in products where East Asian economies are major suppliers (e.g., electrical equipment) from the 1 to 2 percent range to 6 or 7 percent, with the exception of Korea, East Asian market shares continued to rise in 1995-96.<sup>9</sup> This is not to say greater competitive pressures from new sources of supply is not affecting East

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complete dissimilarity, and 100 indicating identical export composition. This measure was first proposed by Finger and Kreinin (1979).

<sup>9</sup> In general, there is a pattern of shifting specialization among East Asian countries, with lower income countries expanding exports of labor intensive goods such as clothing and footwear and higher income Asian countries greatly expanding their exports of machinery and electronic products. But this is a longer term phenomenon that has been under way for many years.

Asian producers. Maintaining market share could clearly be a motivation underlying the competitive devaluations that were observed in 1997. Also, enterprises located in Poland, Hungary, the Czech Republic and Mexico are vigorous competitors; these countries have export structures that are very similar to those of higher-income East Asian countries (correlation coefficients are in the 0.8 range—not reported). Others such as Romania, Turkey and India are competing in sectors such as footwear and clothing.

## V. Direct Investment Flows

Investment flows have played an important role in the region during the 1990s. Led by private investors, capital flows to Asia expanded from \$20 billion to \$110 billion between 1990 and 1996. The extra flows accruing to the region represent nearly half of the increase in capital flows to all developing regions. The second closest receiving region was Latin America, where the flows grew more slowly, from \$12 billion to \$74 billion over the same period. Europe and Central Asia came third, with flows rising from \$10 to \$31 billion (table 10).

Intra-regional FDI flows have been a significant part of these flows. About half of the stock of FDI in East Asia is of East Asian origin--Japan and Hong Kong being the major outward investors (Anderson and Francois, 1997, p. 22). Frankel and Wei (1996) note that FDI into East Asian developing countries has been doubling every two years since 1987. Up to the mid 1980s, the US was the main investor in East Asia. Thereafter it was supplanted by Japan. Initially Japanese FDI was concentrated in Korea and Indonesia, mostly in activities such as clothing and electronics. In some cases, e.g., semiconductor investment in Malaysia, much of the output was exported to other East Asian nations (Encarnation, 1992). Starting in the second half of the 1980s, following the appreciation of the yen, Japanese FDI outflows accelerated, with an increasing share of the total in manufacturing going to East Asia (Kawai and Urata, 1998). As of 1990, Japan accounted for about one-third of the flow of FDI in Malaysia, Philippines, Indonesia, Korea, Taiwan, and Singapore (Rao, 1995). This was driven by production cost considerations, and exporting back to Japan was an important motive for many investors. These investments, coupled with increased competition in the low-skills products encouraged an upgrading of industries.

**Table 10: Net Private Long-term Capital Flows to Developing Countries by Country Group, 1990-96**

Country group or country	1990	1991	1992	1993	1994	1995	(US\$ billion) 1996 *
All developing countries	44.4	56.9	90.6	157.1	161.3	184.2	243.8
Sub-Saharan Africa	0.3	0.8	-0.3	-0.5	5.2	9.1	11.8
East Asia and the Pacific	19.3	20.8	36.9	62.4	71.0	84.1	108.7
South Asia	2.2	1.9	2.9	6.0	8.5	5.2	10.7
Europe and Central Asia	9.5	7.9	21.8	25.6	17.2	30.1	31.2
Latin America and the Caribbean	12.5	22.9	28.7	59.8	53.6	54.3	74.3
Middle East and North Africa	0.6	2.2	0.5	3.9	5.8	1.4	6.9
<hr/>							
Top country destination **							
China	8.1	7.5	21.3	39.6	44.4	44.3	52.0
Mexico	8.2	12.0	9.2	21.2	20.7	13.1	28.1
Brazil	0.5	3.6	9.8	16.1	12.2	19.1	14.7
Malaysia	1.8	4.2	6.0	11.3	8.9	11.9	16.0
Indonesia	3.2	3.4	4.6	1.1	7.7	11.6	17.9
Thailand	4.5	5.0	4.3	6.8	4.8	9.1	13.3
Argentina	-0.2	2.9	4.2	13.8	7.6	7.2	11.3
India	1.9	1.6	1.7	4.6	6.4	3.6	8.0
Russia	5.6	0.2	10.8	3.1	0.3	1.1	3.6
Turkey	1.7	1.1	4.5	7.6	1.6	2.0	4.7
Chile	2.1	1.2	1.6	2.2	4.3	4.2	4.6
Hungary	-0.3	1.0	1.2	4.7	2.8	7.8	2.5

Notes: Country groups are classified according to the World Bank's "Debt Reporting System".

Private flows include commercial bank lending guaranteed by export credit agencies.

\* : Preliminary.

\*\* : Country ranking is based on cumulative 1990-95 private capital flows received. Private flows include commercial bank loans guaranteed by export credit agencies.

Source: World Bank, *Global Development Finance*, 1997.

Malaysia vividly illustrates this. Since the mid-80s when FDI took off, Malaysia has transformed itself from an economy heavily dependent on exports of primary commodities, to newly industrialized economy highly competitive in manufacturing. Primary commodities dropped from 70 to 30 percent of exports, while the share of manufacturing goods rose from 30 to 70 percent. Similar, but less spectacular patterns are also observed in Thailand and to a lesser extent, in the Philippines and Indonesia.

As of the late 1980s, enterprises located in other rich Asian economies such as Taiwan, Hong Kong and Singapore also began to engage in outward FDI, driven in part by real exchange rate appreciation. Over the 1985-91 period, FDI inflows from Taiwan into ASEAN were roughly equal to those of Japan. Total East Asian (including Japan) FDI into ASEAN countries accounted for well over half of all inflows. Much of this went into electrical machinery, including electronics (Kawai and Urata, 1998). Most recently, in the period leading up to the crisis, intra-regional FDI flows shifted to China and Indochina, and ASEAN countries became sources of FDI. By 1996, China was attracting over \$50 billion, seven times more than in 1990, and more than half of the total capital inflows to the region for the fifth year in a row. Since the early 1990s, two-thirds of all FDI into China came from the NIEs; add a rising flow from Japan (which grew to \$5 billion in 1995), and the total rises to over 75 percent. It is reported that about 10-15 percent of FDI into China in the mid-1990s originated in ASEAN (Frankel and Wei, 1996, p. 31). To a large extent, these inflows represent investments for the production of local consumption goods, especially durables, and have been encouraged by China's preference for markets against technology type deals. But a large fraction has also been in export sectors, increasingly competing with ASEAN countries' products such as textiles and toys.

As in the case of trade flows there is a strong intra-regional bias in FDI flows. The intra-regional FDI intensity index for East Asia as a region (defined analogously to the trade intensity index) rose during the 1980s (Primo Braga and Bannister, 1994). There is a strong link between FDI and trade—both in components (inputs) and outputs (Urata, 1993). Frankel and Wei (1996) and Kawai and Urata (1998) fit gravity model type regressions including FDI as a regressor and conclude that FDI helps expand exports from the source country to the destination country. Kawai and Urata (1998) note that 40 percent of total procurement of foreign affiliates from Japan are intermediates. In the electrical equipment and electronics sectors the share is higher, averaging 50 percent. However, Rao (1995) also notes that 40-50 percent of components used by Japanese affiliates in East Asia are sourced from Japan, and that at least 25 percent of output was exported to regional destinations. Controlling for distance and per capita income differences, Primo Braga and Bannister (1994) regress measures of East Asian intra-industry trade on lagged Japanese FDI inflows, and find that such FDI has a statistically significant positive association with the level of intra-industry trade. They also find that intra-firm trade involving Japanese parent firms and

affiliates in East Asia is much more oriented towards “upstream” than “downstream” activities (trade flows from the affiliate to the parent are triple those going the other way).

Kimura (1997), using more recent and disaggregated data on Japanese FDI, argues that the role of Japan as a market for affiliate output is smaller than is often assumed. He concludes that much of the output of affiliates in East Asia is for the local market and for export to other Asian countries. In value added terms, almost 50 percent of affiliate output is for local consumption; about 40 percent or so is for East Asian consumption (including Japan). Kawai and Urata (1998) note that Japan accounts for a significantly larger share of sales of affiliates located in East Asia than those located elsewhere (16 percent instead of 1 to 3 percent). For precision and electrical machinery the ratios are much larger: 50 and 25 percent, respectively.

All of this is suggestive of relatively strong processing-type relationships between FDI into East Asia from other East Asian countries, in particular Japan: part of the complementary, intra-regional trade is connected to FDI. But it also reveals that much of the output of foreign affiliates in East Asia is oriented towards domestic and regional markets, increasing the sensitivity to macroeconomic developments in partner countries and at home. Over time, large shifts in the pattern and composition of FDI flows could have had significant implications for some East Asian countries. Unfortunately we do not have access to FDI data on a bilateral origin-destination basis analogous to trade. Aggregate Japanese data for East Asia as a destination reveals that FDI in manufacturing grew substantially in absolute terms between 1993 and 1995, but fell in 1996. FDI in services, in contrast, continued to expand through 1996, reflecting real estate-related investment (Appendix Table 5). No equivalent fall in manufacturing FDI outflows to the world is observed in 1996 (Appendix Table 4). This suggests that macro conditions in East Asia were playing a role in inducing a shift towards nontradables and away from tradables. Data for 1997 were not yet available at the time of writing.<sup>10</sup>

A noteworthy feature of the region’s trade with Japan during 1995-96 was a substantial decline in Japan’s imports from Korea (down 9 percent in 1996) and a large drop in East Asia’s imports from Japan (down 18 percent). Total imports by Japan from Asia grew in 1996 by 6 percent, making Korea’s weak export performance stand out even more.<sup>11</sup> This can reflect the

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<sup>10</sup> We are indebted to Professor Fukunari Kimura for providing data on Japanese FDI.

<sup>11</sup> Japanese imports from China, Philippines, and Thailand all increased in 1996 in the 10 percent range.

increasing competition in the high-end markets, as hypothesized above. More surprisingly, total Asian imports fell by only 3.5 percent in 1996, much less than the 18 percent decline in imports from Japan. Given the depreciating yen/appreciating dollar, this is difficult to understand. One possibility is that the decline in Japanese exports to East Asia in 1996 reflected the domestic slowdown in Japan, reducing demand for “processing services” in East Asia, which is reflected in a fall in components and materials shipped to East Asia. Another possibility is that the decline reflects the slowdown in direct investment in machinery and capital good sectors in East Asia.

## VI. Conclusions

Between June 1997 and the time of writing the currencies of the countries of region have fallen by 30-35 percent in the case of Korea, the Philippines, Thailand, and Malaysia and by 70 percent in Indonesia (but remained stable in China, Singapore and Hong Kong). Real side factors were an important factor in both the emergence and rapid spread of the crisis across East-Asia. The evidence reviewed in this paper tends to assign a large role to Japan and China for the genesis of the crisis, and to the extent of intra-regional integration in its spread. A number of channels were identified that have a cumulative negative impact: competition for markets, demand effects, and investment (FDI) effects.

Rising competition from below (China, India, Vietnam) and from above (Japan), both on trade and on investment, put pressures on many of the East Asian economies. China’s entry into global markets marked a major change in the flying geese formation. Increased competition on lower end producers affected mostly the poorer countries (Indonesia, Thailand, Malaysia). This pushed them all to move (in some cases prematurely) up the technology ladder, resulting in high demands for investment, including FDI. Competition for capital therefore became fiercer. More recently, the depreciation of the yen increased competition for higher end products, pushing many East-Asian countries to scramble back towards medium skills products. And the continuing slow growth macro environment in Japan reduced demand for Asian output, putting further pressure on producers. These developments have extended the flying geese formation to lower wage countries, but they have also reduced growth opportunities for the countries in the middle range.

It is difficult to argue that increased competition by China could have come as a surprise to the 1997 market. Some have argued that there the shock was due related to a devaluation in China.

But available data suggests that China's effective devaluation in 1994 was relatively small. This was because it involved devaluing an official rate whose relevance was limited. Effective export prices increased by only one-fifth of the nominal devaluation (or 10%), while leaving import prices unchanged. Since the unification, the real exchange rate has appreciated against the US dollar by some 20 percent.<sup>12</sup> The more recent entry by countries such as Vietnam and Lao may have had a greater impact in terms of competition for the poorer East Asian countries.

Pressure from Japan is likely to be a major real side factor underlying the Asian crisis. The Yen depreciated by 35 percent between its peak in 1995 and mid-1997. This adds up to a serious competitive shock, especially for the NIEs. It is also of the same order of magnitude as the subsequent depreciations of Korea, the Philippines, Malaysia, and Thailand, and suggests that the genesis of the crisis may be closely tied up with the realization of what the Japan crisis means for the rest of Asia in terms of what we have called price, income and investment effects. The recent depreciation of the yen will have been good for users of Japanese-produced inputs, but will reduce the incentive for outward FDI, reduce Japanese demand for imports and increase the export competitiveness of Japanese firms that produce similar goods to those of East Asian firms.

Complementarity of trade flows in the region is significant. In principle this should act as a stabilizer in the medium term, as the competitiveness of the Asia Inc. "joint product" on world markets is enhanced following the depreciation of national exchange rates. In the short run this positive effect was swamped by aggregate demand effects, and will not operate unless credit constraints diminish. However, export volumes from the region expanded substantially in 1998, rising by over 20 percent, suggesting that this effect may be beginning to operate. Most of this flow is going to the rest of the world, not East Asia, where aggregate imports are expected to decline by some 5 percent in 1998 (World Bank, 1998). Given the historical importance of intra-regional trade, the concern then is about the health of the Korean and Japanese economies. Without a resumption in growth and continued movement towards an information and service based economy in the richer economies in the region, the adjustment process will be severely impeded.

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<sup>12</sup> On this point see Hoekman and Martin (1998), and Liu et al. (1998).

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**Appendix Table 1: Share of intermediates in global exports of East Asian countries, by destination (1995)**

	JPN	CHN	HK	TAI	IDN	KOR	MYS	PHL	THA	SGP	EA	NA	EU	World
JPN	..	4.2	4.5	5.4	2.0	6.0	3.1	1.6	3.6	3.7	34.3	17.9	9.6	68.3
CHN	7.0	..	10.8	1.3	0.6	2.8	0.7	0.4	0.7	1.2	26.0	7.4	6.0	44.4
HK	2.6	22.1	..	1.7	0.6	0.7	0.9	1.0	1.0	3.8	35.0	7.5	5.6	51.6
TAI	6.2	0.5	20.2	..	1.4	2.0	2.1	1.5	2.0	3.3	40.2	14.5	7.9	70.1
IDN	9.1	1.7	2.3	1.5	..	2.5	1.5	1.1	0.7	4.6	25.7	5.3	8.6	46.0
KOR	6.7	7.4	6.5	2.4	2.1	..	2.6	1.2	1.5	2.9	34.4	11.2	6.2	62.0
MYS	7.4	2.1	4.2	3.4	1.0	1.8	..	0.9	2.5	14.4	38.1	10.4	8.1	62.7
PHL	11.4	0.8	3.0	2.5	0.6	1.3	3.2	..	3.7	5.2	32.3	20.7	11.5	66.2
THA	9.1	1.1	4.2	1.6	0.7	0.8	2.0	0.5	..	8.5	29.8	7.9	7.3	52.1
SGP	3.6	1.7	4.4	2.6	..	1.7	14.1	1.4	3.9	..	34.2	8.5	6.5	55.8

**Appendix Table 2: Share of intermediates in total exports to East Asia, North America and the EU (1995)**

	JPN	CHN	HK	TAI	IDN	KOR	MYS	PHL	THA	SGP	EA	NA	EU
JPN	..	78.6	72.6	86.0	88.6	84.1	84.4	78.1	80.7	74.3	80.2	62.1	62.4
CHN	34.2	..	49.6	68.8	67.8	55.8	74.6	54.4	79.2	49.7	46.6	39.3	45.7
HK	48.2	76.2	..	53.0	79.9	56.8	73.4	80.8	84.6	81.2	71.5	27.4	32.0
TAI	52.5	89.0	87.4	..	85.0	85.0	83.0	90.2	82.1	83.5	78.3	59.1	58.1
IDN	35.2	41.2	70.5	45.8	..	37.7	67.1	76.5	43.8	51.4	44.1	36.7	55.4
KOR	54.2	81.0	83.3	84.7	83.5	..	89.7	77.7	70.8	76.4	74.1	60.4	50.3
MYS	55.4	86.9	71.1	82.9	63.8	58.1	..	76.4	62.1	70.2	67.2	55.0	59.2
PHL	63.2	52.3	69.8	76.1	86.7	72.2	95.4	..	97.2	87.1	74.2	58.1	69.0
THA	54.3	37.5	82.3	67.0	49.3	57.9	72.8	65.8	..	60.6	59.9	41.8	48.4
SGP	44.4	60.8	49.2	67.4	..	55.2	78.8	74.9	68.9	..	63.1	45.3	49.9

**Appendix Table 3: Correlations of Export Vectors, Top 9 countries, 1995 (N=48)**

JPN:	CHN:	HKG:	IDN:	KOR:	MYS:	PHL:	SGP:	TAI:	THA:										
GER	0.798	HKG	0.793	CHN	0.793	NOR	0.656	JPN	0.786	SGP	0.762	MYS	0.872	TWN	0.846	SGP	0.846	TWN	0.664
USA	0.793	TUN	0.767	TUR	0.768	HKG	0.558	MYS	0.752	KOR	0.752	SGP	0.777	MYS	0.762	MYS	0.694	SGP	0.630
KOR	0.786	ROM	0.699	TUN	0.763	EGY	0.540	SGP	0.691	TWN	0.694	KOR	0.771	KOR	0.691	KOR	0.669	HKG	0.606
GBR	0.780	PRT	0.694	PRT	0.683	CHN	0.390	TWN	0.669	JPN	0.605	TWN	0.739	IRL	0.690	USA	0.668	CHN	0.587
MEX	0.721	TUR	0.660	GRC	0.643	ROM	0.382	PHL	0.665	THA	0.550	HKG	0.580	USA	0.660	THA	0.664	MYS	0.550
FRA	0.710	THA	0.587	ROM	0.636	MEX	0.380	USA	0.598	USA	0.532	USA	0.550	JPN	0.645	GBR	0.643	KOR	0.491
ESP	0.661	POL	0.558	THA	0.606	TUN	0.371	GBR	0.583	GBR	0.489	JPN	0.548	THA	0.630	JPN	0.610	USA	0.467
CAN	0.654	ITA	0.539	IDN	0.558	PRT	0.369	THA	0.491	HKG	0.397	GBR	0.513	GBR	0.625	IRL	0.589	ITA	0.463
SGP	0.645	HUN	0.521	POL	0.551	ARG	0.351	FRA	0.468	NLD	0.376	NLD	0.498	NLD	0.596	NLD	0.559	GBR	0.462

Note: Philippines is based on SITC-3 digit export shares in 1995.

Source: Based on UN COMTRADE database SITC-4 digit exports (Rev. 1) in 1995.

**Appendix Table 4: Japanese FDI to the World (million yen)**

	1989	1990	1991	1992	1993	1994	1995	1996
<b>Manufacturing</b>								
food products	177843	121121	87187	67060	97273	133418	81102	82161
textiles	71238	116208	84508	55686	57728	67386	100804	68236
wood/pulp	72446	45408	42972	55856	40564	14817	35095	69768
chemical	280425	336346	220212	258389	204236	271526	207921	231991
basic metal	209843	153251	123855	107241	88501	107110	149809	275573
general machinery	235852	213715	175320	142800	136348	169652	180987	161982
electric machinery	600062	835828	314654	235690	313250	273421	518999	733740
transport equipment	273788	274064	271329	155815	109772	213637	193930	436279
others	255796	175861	371825	225245	228903	191612	354917	222362
Total	2177293	2271802	1691866	1303786	1276578	1442583	1823568	2282095
<b>non-manufacturing</b>								
agriculture/forestry	20047	22383	38304	18269	8540	15767	13352	15659
fishery	6175	8725	9854	11702	6524	21421	5390	11009
mining	168285	195844	136498	162512	109319	49288	103401	176848
construction	84767	43675	58725	69906	31574	36656	38464	36140
commercial	684601	903468	715028	478758	593407	458001	514852	538698
finance	2042419	1180119	681339	596192	726473	687194	527224	875960
service	1441931	1671605	737011	853467	410830	718080	1034950	455803
transportation	389204	316207	338892	222502	251598	272176	220552	202702
real estate services	1894204	1620987	1213662	667655	705488	539258	581284	699587
others	24861	1115	1390	0	1164	0	0	0
Total	6756494	5964128	3930706	3080967	2844922	2797846	3039472	3012410
branches	100081	116668	63590	46511	29864	40394	93760	114878
real estate	0	0	0	0	0	0	0	0
Grand total	9033879	8352686	5686163	4431265	4151365	4280824	4956800	5409383

**Note:** data are for fiscal years (March-April).

**Source:** Ministry of Finance of Japan, Monthly Statistics, vol. 548, December 1997.

**Appendix Table 5: Japanese FDI to East Asia (million yen)**

	1989	1990	1991	1992	1993	1994	1995	1996
<b>Manufacturing</b>								
food products	75181	17297	21609	9102	16019	25657	27009	31393
textiles	26026	43268	29723	29324	34729	51931	72807	40256
wood/pulp	8120	10919	4823	6593	9506	6480	10143	25812
chemical	38976	81659	79157	134504	46435	96307	61488	100378
basic metal	41270	33201	33464	34259	39380	51042	91833	106836
general machinery	46779	38672	34828	27875	50293	41007	77057	62483
electric machinery	124296	121881	119677	70220	101835	143850	238775	205907
transport equipment	18998	55142	25958	22068	30406	41605	82175	89654
others	54770	47540	51607	65558	89194	81744	120077	83910
Total	434420	449582	400850	399506	417800	539626	781363	746634
<b>Non-manufacturing</b>								
agriculture/forestry	2640	4984	3683	1866	2327	1947	4653	889
fishery	3049	2751	3137	8694	2593	16844	2993	9275
mining	28459	34147	35440	47476	30842	18747	25656	52188
construction	38110	14057	13047	21418	4949	17587	16037	17417
commercial	87931	178240	96950	99362	82343	62978	78706	89443
finance	142138	94319	108829	88664	79606	121112	73819	89126
service	147902	130446	70696	65656	58365	113153	58534	86237
transportation	52116	16591	13168	43201	32881	33995	31398	30233
real estate services	148600	94413	48829	33751	41796	52603	65643	100684
others	1146	890	40	0	0	0	0	0
Total	652096	570843	393823	410093	335706	438970	357444	475495
branches	13745	13867	16036	22031	13712	29770	53327	861213
real estate	0	0	0	0	0	0	0	0
Grand total	1100262	1034293	810711	831631	767219	1008374	1192136	1308344

**Source:** Ministry of Finance of Japan, Monthly Statistics, vol. 548, December 1997.

Figure 1

**Significant Beta (R-squared > 0.1) of GDP Growth with respect to GDP Growth of China (BGGC\_nnn) or Japan (BGGJ\_nnn)**

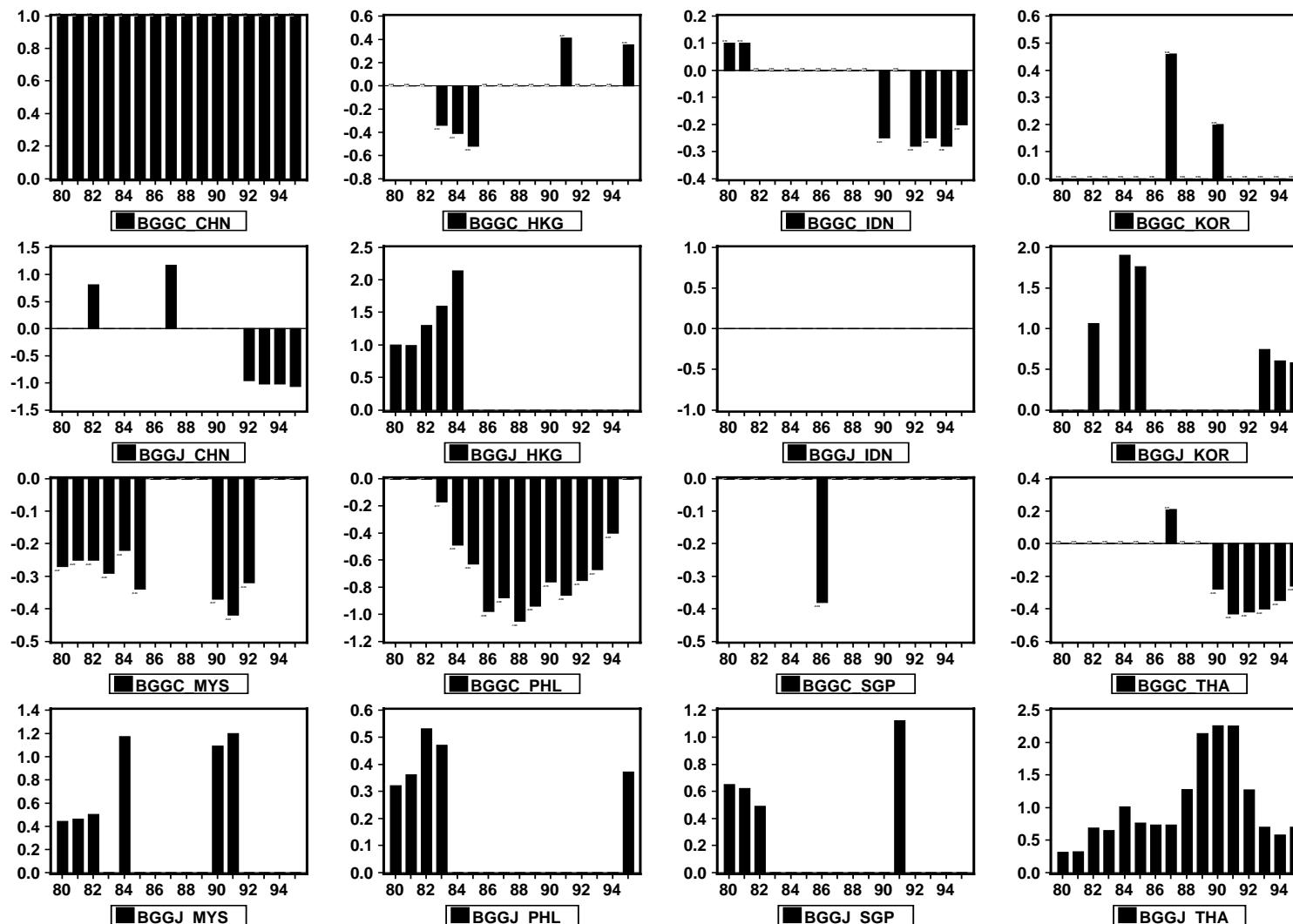


Figure 2

**Significant Beta (R-squared > 0.1) of Investment Growth with respect to Investment Growth of China (BIIC\_nnn) or Japan (BIIJ\_nnn)**

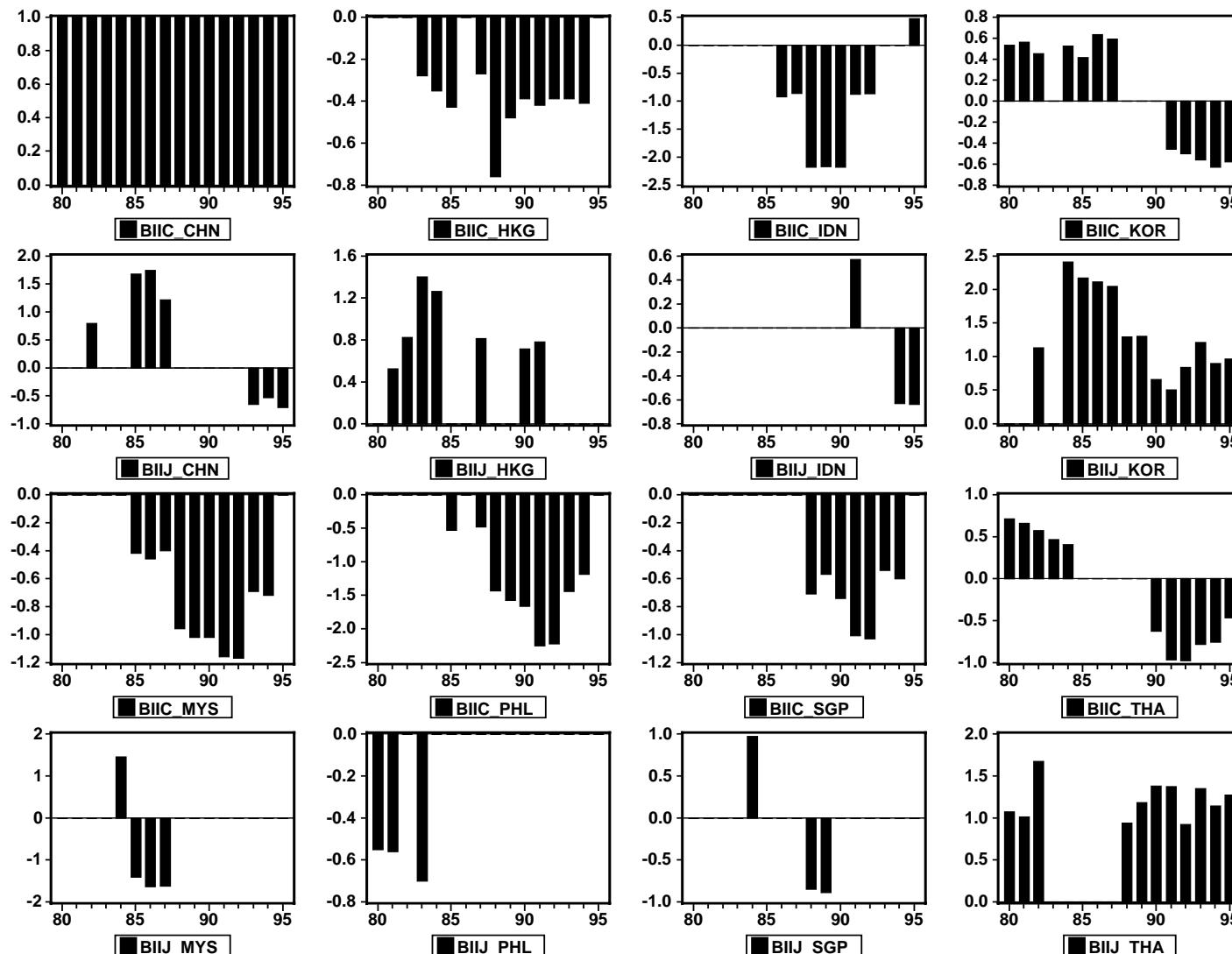


Figure 3

**Significant Beta (R-squared > 0.1) of GDP Growth with respect to GDP Growth of China (BGGC\_nnn) or Japan (BGGJ\_nnn)**

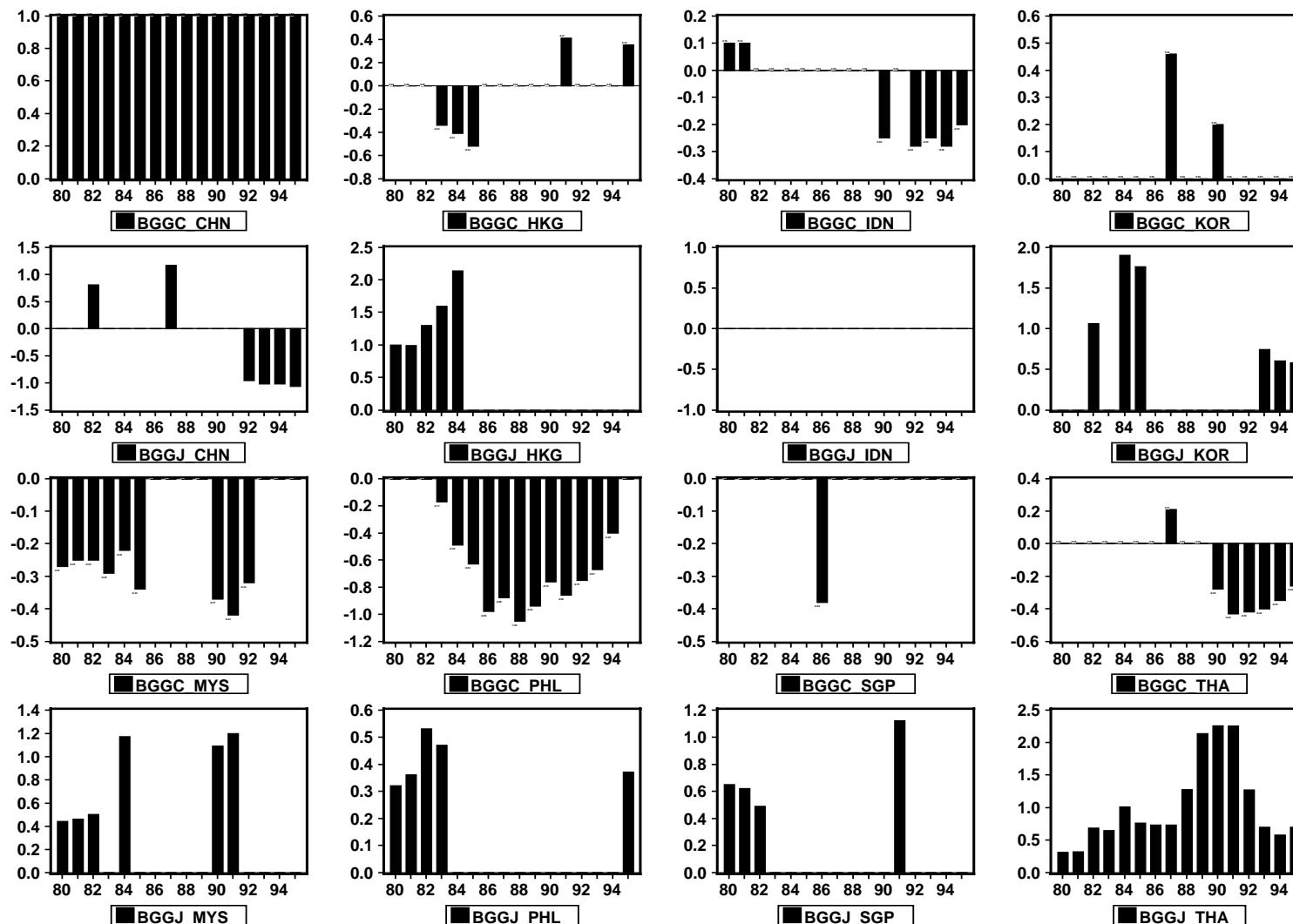


Figure 4

Significant Beta (R-squared > 0.1) of Export Growth with respect to Consumption Growth of China (BXCC\_nnn) or Japan (BXCJ\_nnn)

