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China's Role as Engine and Conduit of Growth

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Abstract

This paper assesses China's role in Asia as an independent engine of growth and as a conduit of demand from the industrial countries. We provide both macroeconomic and microeconomic evidence. The macroeconomic analysis focuses on the impact of U.S. and Chinese demand on the output of the Asian economies by estimating growth comovements and VARs. The results suggest an increasing role of China as an independent source of growth. The microeconomic analysis decomposes trade into basic products, parts and components, and finished goods. We find a large role for parts and components trade consistent with China also playing an important role as a conduit.

Keywords: China, engine, conduit, trade, integration, production fragmentation, displacement.
JEL classifications: E32, F10, F40

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1 Introduction

China is now a global economic force. Its economy ranks as the fourth largest in the world, it accounts for about $7\frac{1}{2}$ percent of world exports, and it had the third largest inflow of foreign direct investment (FDI) – behind only the United Kingdom and the United States – in 2005. The rapid emergence of China on the global economic scene has important implications for the other economies in Asia. First, China's burgeoning economic size makes it a key potential market for other countries, suggesting that the country may increasingly be an independent source or engine of growth for the region. Second, China's increasing integration into the world economy and its large low-cost labor force is reportedly facilitating greater fragmentation of production across countries in the region. This fragmentation can contribute to a more efficient allocation of resources, but would still leave the region largely dependent on demand for finished goods from industrial countries. In this case, China may simply be a conduit of growth.

In this paper, we take the view that these two possibilities are not mutually exclusive and that China may be increasingly serving as both an engine and a conduit of growth. The objective of the paper is to gather new evidence on the evolution of the role of China in the region. We provide both macroeconomic and microeconomic evidence. Our macroeconomic evidence focuses on studying the reliance of the other emerging Asian economies on external demand from China versus external demand from the United States, which gets at China's role as an independent engine of growth. The microeconomic evidence focuses on analyzing in detail the structure of Asian trade in order to directly document the role of China as a conduit.

In our macroeconomic analysis, we first find, using rolling regressions, that since the beginning of the decade, there has been a substantial increase in the comovements of GDP growth of many Asian economies with China, controlling for growth in the United States. Moreover, we also find that China's demand for imports is an important independent factor influencing growth in several emerging Asian economies. Using a VAR model for several emerging Asian economies, we assess the relative contributions to a country's economic growth of external demand shocks from the United States and from China. We find that, since the early 1990s, positive demand shocks from China lead to statistically significant increases in the GDP growth of many Asian economies. Korea, Singapore, Taiwan, and Thailand are particularly responsive to movements in Chinese import demand, accounting for roughly 25 percent of output fluctuations in these countries. Moreover,

our VAR indicates that for Korea, Singapore, Taiwan, and Thailand, demand shocks from China are at least as important as those from the United States. In contrast, GDP growth in Indonesia, Malaysia, and the Philippines is mostly unresponsive to changes in China's demand.

The macroeconomic picture is consistent with the hypothesis that China is playing an increasing role as an independent engine of growth for the region. However, as discussed earlier, this does not necessarily preclude rising Asian trade with China from also reflecting the fragmentation of the production process across the region, with China being responsible for the assembly of finished goods destined to industrial countries. To address these issues, we study the structure of Asian trade in detail by product and document the extent to which exports of the rest of emerging Asia to China consist of parts and components, whose demand is a derived-demand from the industrial countries, versus finished goods.

Specifically, we use highly disaggregated trade data based on the Standard International Trade Classification (SITC, Rev 3) to assemble a complete dataset of trade in basic products, parts and components, and in manufactured finished goods. Our dataset covers each of the SITC 0-8 categories, including the following ones for manufacturing: chemical products (SITC 5), manufactured goods (SITC 6), machinery and transport equipment (SITC 7), and miscellaneous manufactured articles (SITC 8).[1] Our dataset clearly indicates the importance of product fragmentation in emerging Asia. We find that imports of parts and components accounted for roughly 50 percent of East Asian imports of manufacturing goods between 1995 and 2005. The corresponding number for exports is 45 percent. As we discuss below, these are significantly higher numbers than have previously been reported in several studies.

Thus, our results also suggest that China's role as a conduit is important. The large and growing role of China as an assembler of parts and components into final goods is clearly evident in the data. Compared with ten years earlier, China's surplus on finished goods has ballooned, from $25 billion in 1995 to nearly $170 billion in 2005. Over the same period, its deficit on parts and components trade has widened by about $40 billion. Trade in parts and components constitute a growing share of China's trade, indicating its mounting importance in East Asia's production chain. The share of parts and components in China's total manufacturing exports nearly doubled between the same time period, rising from 15 percent in 1995 to 28 percent in 2005. China's imports of parts and

[1] An alternative but complementary approach is to use input-output tables to measure the share of imported inputs in Chinese exports, which is the approach taken by Dean, Fung, and Wang (2006), following Hummels, Ishii, and Yi (2001).

components are even more sizable: in 2005, 40 percent of China's manufacturing imports consisted of parts and components, up 25 percent from a decade earlier. We find that it is largely the more advanced Asian countries (Japan and NIEs) that are shipping parts and components to China. In contrast, countries such as Malaysia and the Philippines have only small surpluses with China in this category.

Our more exhaustive documentation of trade in parts and components reveals that previous studies considerably underestimated the extent of product fragmentation in the region. For instance, Ng and Yeats (1999) uses SITC (Rev-2) and proxy for product fragmentation with trade in components of manufacturing equipment (a subgroup of SITC 7). They report that parts and components of manufacturing equipment constituted 20 percent of East Asian exports of manufacturing goods in 1996. Using the more detailed SITC Revision 3, Athukorala (2003) documents trade in parts and components in the miscellaneous goods' sector (SITC 8) in addition to that in the machinery and transport sector (SITC 7). Athukorala calculates that East Asia exports of parts and components accounted for 28 percent of East Asian manufacturing exports in 2003, which is roughly 40 percent less than what we find.

Our paper also attempts to use the detailed dataset to shed some light on the often-repeated view that China is "displacing" or "crowding out" other emerging Asian economies in export markets. Our work in this area represents an extension of the analysis in Ahearne et al (2006), for example, which only focused on changes in U.S. market shares of exports from various emerging Asian economies. We do regression-based analysis on highly disaggregated exports to all markets, as opposed to just U.S. markets. We find evidence that increases in China's market shares of low- and mid-technology manufacturing products are having a significant negative impact on exports from some other East Asian economies, but not in the high-technology category. However, this does not necessarily mean that these countries are losing out to China, as they may be responding by upgrading the quality of their exports or moving to sectors in which they can better compete, including becoming a part of the chain in fragmentation trade.

The balance of the paper is organized as follows. Section 2 begins with a simple growth accounting exercise to document the relative importance of domestic demand and net exports in various Asian countries. The section then looks at cross-country linkages using the rolling regressions and a VAR model that attempt to delineate the relative roles of external demand from the United States and external demand from China. In section 3, we describe our trade dataset, documenting

in detail the extent of product fragmentation, and consider the structure of exports in the region. Section 4 concludes.

2 Reliance on External Demand

In this part of the paper, which focuses on aggregate data, we consider the following questions: How reliant are the key emerging Asian economies on external demand and has this reliance changed over time? What is the relative importance of China and the United States as a source of external demand for emerging Asia, and has their relative importance changed over time?

These questions are relevant for understanding the role of China as an engine of growth. For example, if the contribution of domestic demand to growth was increasing in emerging Asia, these countries would be less reliant on both the United States and China to generate their growth. On the other hand, if external demand remains important, and if China is becoming more of an engine of growth, we would expect to see that, keeping fixed U.S. demand, demand from China should have a significant impact on growth in these economies in recent years.

2.1 Growth Accounting

We begin with the size of exports and a growth accounting exercise to first establish the broad stylized facts. As shown in table 1, the ratio of real exports to GDP is sizable for most of the emerging Asian countries, with the exception of India, ranging in 2005 from just under 40 percent for China to about 180 percent for Hong Kong and nearly 250 percent for Singapore, reflecting the role of these island economies as trade hubs.[2] The ratio is lower for India (20 percent), and for comparison purposes the ratio for the industrial countries of Japan and the United States were 14 percent and 11 percent, respectively. The table also shows that the importance of exports has been rising in recent years for all of these countries, in some cases quite substantially.

Table 2 shows the extent of the average accounting contribution of real net exports to GDP growth over two periods, 1995-2000 and 2000-2005. In the first period, the net export contribution ranges from a negligible amount in India to over 4 percentage points in Malaysia. In China, the contribution of net exports was 1.8 percentage points, or nearly 20 percent of the total growth. In the second period, the contribution is significant for all of the newly industrialized economies (Hong

[2] Note that in the case of China the ratio uses nominal U.S. dollar values, rather than real values.

Kong, Taiwan, Korea, and Singapore), ranging, as can be seen from column 3, from explaining about a third of the growth in the case of Korea to more than accounting for the total growth in the case of Singapore. In all the NIEs, except Korea, the relative contribution of net exports to growth has increased in the second period. In China, the fraction of growth accounted for by net exports fell to 9 percent in the second period, although it has increased sharply over the past two years.

Interestingly, the contribution of real net exports to growth is small or negative in the second period for the less-developed emerging Asian economies (ASEAN-4 and India). Nonetheless, GDP growth rates during this period were quite respectable in most of these countries, reflecting the importance of domestic demand. Thus, not all of the countries are dependent to a high degree on net exports as drivers of growth. Somewhat paradoxically, it is the less-developed countries in the region that are showing less dependence on net exports, at least in an accounting sense. This leaves open the possibility that they will turn back to the more export-dependent model that appears to be still followed by the more-developed NIEs.

2.2 Aggregate Cross-Country Linkages

2.2.1 Growth Comovements

If China was becoming more of an engine of growth for Asia, we would expect to see changing patterns of cross-country linkages in economic growth rates at the aggregate level. In particular, keeping fixed the growth rates of traditional engines of growth for the Asian economies, such as the United States, we would expect to see an increased correlation of growth with China.

There is a fair amount of literature on how cross-country linkages in growth have shifted over time. Much of this literature pertains to the experience of industrialized countries – see for example, Doyle and Faust (2005). Some authors, such as Kose, Prasad, and Terrones (2003), have also included the experience of developing countries, including those in Asia, to look at how increased trade integration has affected the synchronization of business cycles across countries. However, that work uses data only through 1999 and is, therefore, not recent enough to take into account the full effects of the emergence of China.

We used rolling regressions to estimate the contemporaneous correlation of each country's real GDP growth with U.S. and/or Chinese real GDP growth.[3] Two sets of regressions were run: the

[3] Ahearne et al (2006) also run somewhat similar regressions. However, their work focuses on comovements of Chinese and other emerging Asian economies' exports, rather than the growth comovements we consider here. They also do not run rolling regressions, but instead look at a one-time structural break in the comovement in 2001, the

first were done over a ten-year period, starting in 1970:Q1-1980:Q1 and moving forward by one quarter, with the last regression ending in the third quarter of 2006. We also ran rolling regressions that added one quarter to the sample for each successive regression, keeping the starting date fixed. For each country we ran three of each type of regression: one with both U.S. and Chinese GDP growth on the right-hand side, one with just U.S. growth, and one with just Chinese growth. Because of difficulties seasonally adjusting the data for some countries, especially China which does not have an official quarterly real GDP level series, we used four-quarter growth rates in the regressions. Standard errors were calculated using the Newey-West method. These regressions were done for Hong Kong, Taiwan, Japan, Korea, Singapore, Malaysia, India, Indonesia, the Philippines, and Thailand.

The results we report are for the fixed sample-length regressions that included both U.S. and Chinese growth. They are shown in charts 1-4, which plot the coefficients for China and the United States, along with 95-percent confidence bands. The results suggest that in recent years, Chinese growth has become considerably more important for most countries. However, in some cases, its importance is declining. The pattern is most striking for Thailand, where the coefficient on Chinese growth is insignificant until around 2000, when it rises to about 1.7 and becomes significant, before falling back to 1.3 by the end of the sample. Over the same time period the coefficient on U.S. growth in the Thai equation becomes negative and insignificant, after having been positive and significant earlier in the sample. The other less-developed countries, including India, all also show a substantial increase in the coefficient on Chinese growth at the end of the sample, and it becomes significant in most cases. However, the results for the coefficient on U.S growth differ among countries. For Malaysia and India the coefficient becomes negative and insignificant in the late 1990s. It then becomes positive again for Malaysia, but remains insignificant. For the Philippines and Indonesia, the coefficient becomes positive and significant in the second half of the 1990s, but it then falls off again.

The more developed countries also show an increase in the coefficient on Chinese growth at the end of the sample, although it is not significant for Hong Kong and Korea. The coefficient on U.S. growth also generally increases at the end of the sample, although it is significant only for Singapore and Taiwan.

By and large, these results suggest that Chinese growth is becoming more important for the

year of China's accession to the WTO.

region, while U.S. growth is becoming less important, particularly for the less-developed countries. U.S. growth remains quite important for Singapore and Taiwan, and to a lesser extent for Hong Kong, but it appears to matter much less for Korea and Japan. Our analysis of detailed trade data is expected to shed some insight into what industries are driving these patterns.

2.2.2 Vector Autoregressions (VARs)

The changing patterns of growth comovements are interesting and informative and lead us to try to more specifically identify U.S. and Chinese demand shocks for the goods of the other emerging Asian economies. We do so through a VAR model. However, the sample size requirement precludes us from examining structural breaks in the importance of these shocks. Rather we assess the relative contributions of shocks to U.S. import demand and shocks to Chinese import demand for growth in various emerging Asian economies from 1993:Q2 to 2006:Q4, the period over which China has made great strides in its degree of trade openness.

Specifically, we estimate a three-variable structural VAR empirical model for each of several major emerging Asian economies, consisting of the following variables: domestic real GDP growth, growth of U.S. real imports from the country, and growth of Chinese real imports from the country. To obtain U.S. real imports from a given emerging Asian economy, nominal imports in U.S. dollars from that economy are deflated by the U.S. import price index. Chinese imports from a particular emerging Asian economy include imports from both mainland China as well as Hong Kong, since it can be difficult to separate direct trade with Hong Kong from indirect trade with mainland China occurring through Hong Kong. Because of a lack of an appropriate import price deflator for China, we use the producer price index (PPI) as a proxy. Chinese nominal imports are deflated by the PPI and those for Hong Kong by the Hong Kong implicit deflator for imports.

To identify the U.S. demand and Chinese demand shocks a Cholesky decomposition based on the ordering U.S. real imports, Chinese real imports, and domestic growth is used. Note that according to the Cholesky decomposition, a variable is contemporaneously affected by those variables coming before it in the ordering and contemporaneously influences but is not contemporaneously influenced by those variables coming after it in the ordering. This ordering makes some sense because the emerging Asian economies can be considered to be small open economies, which would take as given U.S. and Chinese incomes and the world prices of the goods their exports – which would be the main determinants of U.S. and Chinese demand for their goods. Given the small open economy

assumption, we also make the system block recursive with even the lagged values of domestic growth not feeding back into the U.S. and Chinese variables.

We estimate the reduced form VAR (with the appropriate choice of lag length based on statistical criteria) and then retrieve the structural VAR using the identification assumptions. We compute, for each country, dynamic responses of domestic growth to positive shocks to growth of U.S. and Chinese imports (impulse responses). These are then accumulated to give the effects over time on the level of domestic output. The responses of the level of domestic output to a one standard-deviation shock to U.S. and Chinese import growth (which, of course, are also shocks to exports to the U.S. and Chinese a for the viewpoint of these countries) are shown in chart 5 for the NIEs of Korea, Singapore and Taiwan. Their 90 percent confidence bands based on Monte Carlo simulations (5,000 replications) are also shown.

As can be seen from the left hand side panels in the chart, not surprisingly, a one-standard deviation shock to the exports of these countries to the United States has a significant positive effect on domestic output for each of these three economies.[4] For example, after a lag of one quarter, the effect on Korean real GDP is about 2 percent at an annual rate, on real output in Singapore is about 3 percent, and on real output in China is about 1 percent. Interestingly, the right hand panels show that a one standard-deviation shock to exports to China has about an equal initial effect, if not slightly bigger, as the U.S. shock on output in Korea, Singapore, and Taiwan.[5]

The effects of the same type of shocks on the ASEAN-4 economies are shown in chart 6. The effects of U.S. demand shocks on domestic GDP are clearly evident for Indonesia and Malaysia and even for Thailand, although with a lag. However, the Chinese demand shock does not appear to have a statistically significant effect on domestic output in the ASEAN-4, except for Thailand.[6]

How much of domestic growth fluctuations in these seven countries can be explained by the U.S. and Chinese demand shocks? The answer depends not just on the size of the impulse responses when given size shocks occur (shown in charts 5 and 6), but also on how often and, on average, what size shocks hit the economy. The variance decompositions, which measure the percentage of the forecast error variance of domestic output growth at various forecast horizons that is attributable

[4] Note that each country has a different empirical VAR model, so the size of a one standard-deviation shock to growth of exports to U.S. differs from country to country. The size of the shock ranged from 10 percentage points of annual growth to 21 percentage points of annual growth.

[5] The size of a one-standard deviation shock to growth of exports to China ranged from 16 percentage points of annual growth to 37 percentage points of annual growth. In each case, the size of the China shock was greater than the U.S. shock and this was especially true of the ASEAN4 countries.

[6] Note that Thailand is the country among the ASEAN-4 with closest geographical proximity to China.

to each of the shocks, provide the answer.

The results for the variance decompositions are reported in table 3. External shocks originating in the United States and China are quite important for these seven emerging Asian economies. Together, the two shocks account for about 20 percent to 50 percent of the forecast error variance of domestic output growth at a 1-4 quarter horizon in the NIEs of Korea, Singapore, and Taiwan. In the ASEAN-4, they account for less, from about 5 to 30 percent.

Looking at the two shocks individually, U.S. shocks account for up to 25 percent of the forecast error variance of growth in Korea and Singapore, but only up to about 12 percent of growth in Taiwan. Chinese shocks also account for about up to 25 percent of domestic growth fluctuations in Korea and Singapore, but significantly more than U.S. shocks of growth fluctuations in Taiwan, at up to 30 percent. For Indonesia, Malaysia, and the Philippines, Chinese demand shocks are not a major driving force behind domestic growth fluctuations, but U.S. demand shocks are. The case of Thailand is more like the NIEs with both U.S. demand shocks and Chinese demand shocks being important, with the latter more significant than the former.

Two main conclusions can be made from the structural VAR analysis. First, external shocks have been quite important over the past fifteen years or so for domestic output fluctuations in our sample of emerging Asian economies. Second, over the same period, Chinese demand shocks have been at least as important, if not more, as shocks originating in the United States in explaining domestic growth fluctuations in Korea, Singapore, Taiwan, and Thailand. Chinese demand has not played a significant part in explaining the growth of Indonesia, Malaysia, and the Philippines on the other hand.

3 Structure of Trade

From our macroeconomic analysis, it certainly appears as if Chinese output and Chinese import fluctuations are increasingly driving economic performance in emerging Asia. However, this increased correlation could reflect either stronger domestic demand in China or greater product fragmentation across the region, or both. To directly isolate the importance of trade fragmentation, we turn now to an analysis of the micro trade data. We decompose trade balances and exports into the three categories of basic goods, parts and components and finished manufacturing goods. Key features and implications of the parts and components trade are discussed. We then consider in

detail the structure of exports in the region focusing on the technological sophistication of exports, revealed comparative advantage in different countries, and the extent of displacement (by product) as a result of competition from China.

3.1 Trade Fragmentation

As noted earlier, an important potential explanation for the increase in intra-regional trade in the Asian region is fragmentation or vertical integration of production. By this process, Asian countries other than China specialize in production of intermediate goods in which they have comparative advantages and export them to China (sometimes through Hong Kong) for assembly and re-export. To assess this conjecture, we disaggregate the trade data into three categories: basic products, parts and components, and finished goods.

To the extent increasing vertical integration is an important factor driving the growth in regional trade, it would be reflected in a higher intra-regional trade in "parts and components" relative to trade in "finished goods". This has important implications for the question posed earlier in the paper – if the increased intra-regional trade in emerging Asia largely reflects derived demand, as a result of greater production fragmentation, then final demand may still predominantly be coming from the United States and other industrial countries with regional growth still very much related to the outcomes in these countries. China, in that case, would be acting mainly as a conduit to more efficiently channel the final demand that comes primarily from outside of Asia.

Distinguishing parts and components trade from other types of trade needs to be done at the 5-digit product level, as even the 3-digit level does not classify products finely enough. For example, SITC 727 consists of food processing machines and parts. SITC 72711, 72721, and 72722 include different types of food processing machines, while SITC 72722 and 72729 include parts for these machines. Unfortunately, not all of the categories can be separated so neatly. The separation is somewhat easier for SITC 7 (machinery and transport equipment) and SITC 8 (miscellaneous manufactured articles), as was done in Athukorala (2003) and Athukorala and Yamashita (2006) than for SITC 5 (chemicals and chemical products) and SITC 6 (manufactured goods). Although Athukorala and Yamashita noted that SITC 5 and SITC 6 also have significant parts and components categories, they did not attempt a separation for these categories. We have largely followed Athukorala and Yamashita's classification for SITC 7 and 8, although we have made some modifications. For instance, we moved ball bearings, piston engines, and various kinds

of pumps from finished goods to parts and components.[7]

With the exercise of some judgment, we also extended the separation to SITC 5 and 6. In addition, we examined SITC 0-4 and found a few categories that are classifiable as parts and components, i.e. synthetic fibers (this includes all of the 5-digit sub-categories of two 3-digit industries). The rest of the trade in SITC 0-4 is classified as basic products. We included the basic products category in our decomposition in order to have a more comprehensive picture of changes in the structure of trade. The comprehensive classification of trade into basic products, parts and components, and finished goods is an important contribution of this paper. A full description of each category is provided in the appendix.

3.1.1 The Composition of Trade Balances

As shown in table 4, the Asian region as a whole has a large and growing trade surplus with the world. This surplus is fairly widely shared, with the exception of Thailand, the Philippines, and India. Japan still accounts for a large share of the surplus, although it has declined over the past ten years.

China's surplus with the world in 2005 was entirely in manufactured finished goods (MFG), while it had trade deficits in both manufactured parts and components (MPC) and basic products (BP).[8] In contrast, the rest of the region (excluding India, which has a very different pattern of trade from the other countries in the region) had a surplus in both MFG and MPC in 2005. With China/Hong Kong, the rest of the region had a small deficit in MFG, a large surplus in MPC, and near-balanced trade in BP. With the rest of the world, it had a surplus, primarily in MFG. These patterns generally became more pronounced from 1995 to 2005. Thus, fragmentation trade for the region appears to play a much greater role with respect to China than with the rest of the world, and that its role is growing. These data also suggest that, at least in the aggregate, China is not a net source of demand for finished goods for the region.

Nevertheless, patterns of trade vary widely by country. The aggregate surplus of the rest of the region with China/Hong Kong ($113 billion) in 2005 was concentrated in the more advanced countries, mainly Taiwan ($45 billion), Korea ($37 billion), and Singapore ($17 billion). Japan

[7] Conversely, we decided that artificial body parts should more properly be categorized as finished goods.

[8] We have added together the trade balances of China and Hong Kong because of the substantial amount of Chinese trade that passes through Hong. For the other countries, we have added together their trade with China and Hong Kong.

had only a small surplus with China, all in MPC, along with a deficit in MFG. Japan does export a significant amount of finished goods to China, but its imports from China in that category are much greater, probably a result of its much higher level of income per capita.

Although the newly-industrialized economies (Taiwan, Korea, Singapore) all had large surpluses with China, as a group they had a deficit with the rest of the world (Singapore was the only one with a surplus with the rest of the world, which was smaller than its surplus with China). Almost 80 percent of these countries' surplus with China was in MPC, and it grew rapidly between 1995 and 2005. The surplus in MFG grew by a smaller amount, mainly for Taiwan and Korea. In contrast, Singapore had a surplus with China in BP, which includes its rapidly-growing biomedical sector, and this surplus increased between 1995 and 2005. This suggests that China is an increasingly important source of demand for these economies, even if not an independent one. However, the increase in finished goods and basic products exports may indicate that these economies are finding sources of demand in China that are not entirely part of the assembly trade, consistent with the evidence using aggregate data discussed in section 2.

In contrast, the ASEAN-4 countries as a group had only a small surplus with China in 2005, mainly in BP. They also had a smaller surplus in MPC and a deficit in MFG. One partial exception was the Philippines, whose trade balance with China went from a deficit of $1 billion in 1995 to a surplus of $\$2\frac{1}{2}$ billion in 2005, nearly all due to a swing in the parts and components category. This may imply that the Philippines is beginning to play a role more similar to that of the NIEs. Malaysia also had a small surplus in MPC with China in 2005. As a group the ASEAN-4 had a large surplus with the rest of the world, mainly in MFG, along with a smaller surplus in BP. They also had a large deficit with the rest of the world in MPC. This may suggest that these countries are more competitors than collaborators with China in regard to the rest of the world, but it also indicates that they have been relatively successful.

3.1.2 The Composition of Exports

Table 5 provides another perspective on these data, namely a comparison across time and trade with China/Hong Kong versus the rest of the world, of the ratio of parts and components to total exports for each of the countries in the region by technological category. The degree of vertical integration in the region is evident in the extent to which the ratio of parts and components to the total is generally considerably higher for exports to China than to the rest of the world. On

average, 61 percent of exports to China/Hong Kong were of parts and components, compared with 42 percent of exports to the rest of the world. The percentages were highest in textiles and electronic high-tech. Although the same pattern was evident in 1995, it became more pronounced over the ten-year period.

The pattern also holds across all of the countries, on average, although there are some differences among countries. For the Philippines, 80 percent of its 2005 exports to China/Hong Kong were of parts and components, compared with 56 percent of its exports to the rest of the world. The percentage of exports to China that were parts and components in 2005 was close to 70 percent for Taiwan, Korea, and Malaysia and near 60 percent for Japan and Singapore. In contrast, the percentage of exports to China that were parts and components was less than 50 percent for Thailand, India, and Indonesia.

In sum, the main suppliers of parts and components to China appear to be the more advanced countries, namely the NIEs and Japan, with some evidence that the Philippines and possibly Malaysia are moving more into this role. The NIEs show trade surpluses in both parts and components, and in finished goods (although smaller ones) with China. Japan's surplus in parts and components is largely offset by its imports of finished goods from China. The only countries with sizable surpluses with China in the finished goods categories are Korea and Taiwan. Overall, these data support China important role as a conduit.

3.2 Export Structure

The above evidence is supportive of the growing importance of parts and components in intra-regional trade in Asia and China's central role in this. We now go on to look at additional features of changes in the export structure, which might give some more information about how countries in emerging Asia are adjusting to the emergence of China. We consider three aspects of the export structure: changes in technological sophistication, changes in revealed comparative advantage, and by-product displacement of exports as a result of competition from China.

We use the classification introduced by Lall (2000) (as was done in Lee and Plummer (2005)). This includes ten categories, which are detailed in the appendix: primary products (PP); agro-based resource-based manufactures (RB1); other resource-based manufactures (RB2); low-technology textile manufactures (LT1); low-technology manufactures of other products (LT2); medium-technology automotive products (MT1); medium-technology process goods (MT2); medium-technology engi-

neering products (MT3); high-technology electronic products (HT1); and other high-technology products (HT2).

China's total merchandise exports quintupled between 1995 and 2005, and have increased from 11 percent of the region's exports in 1995 to 27 percent in 2005 (table 6). China accounts for 50 percent of the region's exports of textile products, almost 40 percent of other low-tech manufactures, and almost 30 percent of electronic high-tech. China has come to dominate regional exports even in several categories which comprise only small proportions of its own exports. For instance, China was the largest exporter in the region in dollar terms in 2005 of primary products, which (as shown in table 7) accounted for only $4\frac{1}{2}$ percent of its own exports, as well as agricultural resource-based manufactures ($3\frac{1}{2}$ percent of its exports).

The data in table 7 also make clear the extent to which China has moved up the value chain over the past ten years. In 1995, nearly half of China's exports were of low-tech textile and other manufactures, more than 20 percent were of primary products and resource-based manufactures, and 13 percent were of high-tech products. However, by 2005, the proportion of China's exports in the high-tech categories had risen to 33 percent. The share of low-tech manufactured exports had fallen to 32 percent. Primary and resource-based products accounted for about 13 percent of exports in 2005.

3.2.1 Index of Technological Sophistication

To measure the technological structure of exports, we introduce an index of technological sophistication (ITS), shown on the far right of table 7, that is higher the greater the percentage of each country's exports in the more technologically sophisticated categories. The index is constructed by assigning lower values to the lower-technology categories and higher values to the higher categories. The values assigned to each category are: 1 for primary products (PP), 2 for resource-based manufacturing (RB1 and RB2), 3 for low-tech manufacturing (LT1 and LT2), 4 for medium-tech manufacturing (MT1, MT2, and MT3), and 5 for high-tech manufacturing (HT1 and HT2). The percentage of exports in each category is then multiplied by the appropriate value, and these are summed and divided by 100. The resulting index ranges from 1 to 5, with higher values indicating greater technological sophistication. This allows us to compare the technological structure of exports both across countries and across time. It should be noted that the index is not a measure of the technological sophistication of the economy, but rather of the products that it exports.

Although a country needs to have the technological capability to produce higher-tech products, it may or may not specialize in them for export purposes, as many other factors affect comparative advantage.

China's increased exports of more technologically advanced products is reflected in an increase in its ITS from 3.1 in 1990 to 3.7 in 2005. This is still below the 4.0 value of the index for Hong Kong, Taiwan, Japan, and Singapore in 2005 and the 3.9 for Korea. However, the indexes for these countries have generally not changed much over the past ten years, suggesting that China is rapidly catching up. For Japan, the stagnation in the ITS has occurred as its export share has shifted from the electronic high-tech category where Chinese exports have been growing rapidly (consistent with reports that Japan has shifted production facilities for high-tech products to China) into the medium-tech automotive category where China is a much less important competitor. However, although exports of automotive products currently comprise the smallest share of China's exports at (less than 2 percent), they also are growing rapidly, with their share of the region's exports rising from $1\frac{1}{2}$ percent in 1995 to 7 percent in 2005. This suggests that China may become a more important competitor in this area in the future.

Korea also has seen a substantial increase in the share of its exports in the automotive category over the past ten years. This has been largely offset by a decline in the share of the low-technology categories. At the same time, the overall share of high-tech has risen, but the bigger increase has been in the HT2 category (non-electronic high-tech products), where China's share is smaller and growing less rapidly. On net, Korea's ITS has been unchanged over the period.

Taiwan's ITS rose from 3.8 to 4 over the period, along with a sharp increase in the share of its exports in the non-electronic high-tech category, where China is less dominant, from 1 to 6 percent. This may suggest an effort to find a niche separate from China. However, at the same time, the share of Taiwan's exports in the electronic high-tech category has continued to grow rapidly, and was up to almost 38 percent in 2004. Like China, Taiwan is increasingly moving out of low-tech textile manufactures.

Singapore's ITS dropped slightly over the period, as the share of its exports that are electronic high-tech products fell 4 percentage points, although it remains high at nearly 50 percent. The share of engineering products also has fallen. Offsetting these declines has been an increase in the share of non-agro resource-based manufactures, which includes Singapore's rapidly-growing biomedical sector. Singapore's share of regional exports of these products is now slightly larger than China's.

The Philippines' ITS is actually the highest for the region at 4.3, having risen significantly over the ten-year period. This has occurred as the percentage of the Philippines exports of primary products, resource-based manufactures and low-tech products have all plummeted, while electronic high-tech exports have soared. This may suggest an ability to compete with China, although it may also suggest greater vertical specialization, a point to which we return later.

The indexes for the other countries are generally lower. Malaysia's ITS was 3.7 in 2005, nearly the same as in 1995, as an increase in the share of primary product exports, which includes oil, partly offset the effect of an increase in the share of electronic high-tech products. Thailand's ITS has risen slightly, from 3.2 in 1995 to 3.4 in 2005, mainly reflecting a move from primary into medium-tech products, including an increase in the share of automotive product exports. Thailand's share of electronic high-tech products has risen a little, but it remains relatively low for the region at about 25 percent.

Goods exports of Indonesia and India are less technologically sophisticated than in the rest of the region; India's ITS is 2.7, little changed from 1995, with its largest percentage of exports in non-agro resource-based manufacturing. Indonesia's ITS is 2.3, with its largest export share in primary products. The share of low-tech textile manufactures has fallen, possibly reflecting increased competition from China.

In sum, the response of the other countries in the region to China's increasingly dominant presence, particularly in electronic high-tech, has varied considerably. Japan, Korea, and Thailand appear to have increasingly shifted toward production of automotive products, while Singapore has increased its presence in the non-agro resource-based manufactures market. Both of these are areas where China is relatively less active. Conversely, the Philippines has become increasingly specialized in the electronic high-tech category which currently comprises the largest share of China's exports. Taiwan and Malaysia also have increased the share of their exports in the high-tech categories, although Malaysia also exports natural resources. Exports of Indonesia and India have remained at the lower end of the tech scale, although they still face plenty of competition from China in those categories.

3.2.2 Revealed Comparative Advantage

To quantify the changes in export structure that have taken place in the region over the past decade, we computed indices of revealed comparative advantage (RCA) in production of goods

at the 5-digit SITC level for each country. RCA is usually measured for any product as the product's share in the country's total exports relative to the share of world exports of that product in total world exports, based on the idea that countries reveal what goods they have comparative advantage in by capturing a greater share of the world market. A value less than unity indicates revealed comparative disadvantage and a value greater than unity indicates a revealed comparative advantage. The results for the 5-digit codes were aggregated by technological category.

As shown in table 8, for the region on average, RCA is highest in electronic high-tech manufacturing and is also above one for low-tech textiles. There are some strong similarities among countries in the region, but also some important differences. Nine of the eleven countries have RCAs above one for HT1 and seven have RCAs above one for LT1. Five, including China, have RCAs above one for both categories. However, the region's RCA has been rising in HT1, while its RCA in LT1 has fallen.

As might be expected, China has increased its RCA in HT1 over the past ten years. Its RCA in LT1 has fallen over the same period, although it remains high at 2.3. Apart from these two categories, its only other RCA above 1 is in other low-tech manufacturing, and that also has fallen over the ten-year period. This may suggest that China is not quite the colossus as it is sometimes depicted–its areas of comparative advantage relative to the world are limited and gains over time in some areas have been offset by losses in others.

Both Hong Kong and Taiwan show quite a bit of similarity with China. Their areas of comparative advantage are the same and the relative sizes are similar for Hong Kong (this may reflect that fact that Hong Kong re-exports a large quantity of its imports from China). Taiwan's comparative advantage in electronic high-tech is still considerably higher than China's, although it is not rising as fast. Taiwan also has lost comparative advantage in low-tech manufacturing, although it has gained in medium-tech exports of chemicals and basic products, an area where China does not have comparative advantage.

Japan has lost comparative advantage in electronic high-tech, while increasing its comparative advantage in the medium-tech automotive and chemicals categories. Korea also has increased its comparative advantage in automotive and shown a smaller increase in electronic high-tech, but lost comparative advantage in the low-tech categories. The Philippines has shown an enormous increase in its comparative advantage in electronic high-tech, where it now has the highest RCA in the region. Singapore and Malaysia also have high RCAs in electronic high-tech, but their other

areas of specialization are primary products and agro resource-based manufacturing (Malaysia) and non-agro resource-based manufacturing (Singapore).

Thailand's areas of comparative advantage are similar to China's, although none of its RCAs are very large. Its highest RCA is in electronic high-tech, which is slightly larger than China's but growing much more slowly. Thailand also has an RCA above one in textile manufacturing, but it has fallen sharply over the ten-year period. On the other hand, Thailand has gained comparative advantage in agro-based manufacturing.

India, like China, has RCAs above one in both low-tech manufacturing categories, although its RCAs in both are higher than China's. It also has a large comparative advantage in non-agro resource-based manufacturing, and little presence in the electronic high-tech market. Indonesia's areas of comparative advantage are primary products, resource-based manufacturing, and textiles. These have been relatively little changed over the ten-year period.

In sum, an examination of the patterns of revealed comparative advantage again suggest that the response to China's growing importance has been far from uniform. Several of the more advanced countries (Japan, Korea, and Taiwan) have seen increases in their RCAs as one or more medium-tech category, where China is less dominant, while losing comparative advantage in China's high RCA categories of low-tech manufactures and high-tech electronic manufactures. Singapore has seen a similar realignment of comparative advantage away from electronic high-tech to non-agro resource-based manufactures. In contrast, Malaysia, the Philippines, and Thailand have all seen increases in the electronic high-tech category. However, the most important point may be that China's areas of comparative advantage may still be limited, suggesting that there is considerable room for other economies to carve out their own areas of specialization.

3.2.3 Displacement of Exports

The analysis of the previous subsection implies that as China's share of world exports in particular technological categories has increased, there has been a decline in the share of world exports elsewhere in the region for some countries but not for others. In this subsection, we more formally quantify the degree of displacement by country and by product category in response to competition from China. The possible existence of displacement needs not imply that these other countries are losing out to China, as they may have optimally responded either by shifting production resources toward sectors in which they can compete or by improving the quality of the goods they produce.

We measure degree of competition from China in terms of changes in its export share as follows:

$$V_{pt} = \frac{X_{china,pt}}{\sum_{c \ \epsilon \ world} X_{cpt}} \tag{1}$$

$X_{china,pt}$ is the value of export of product p by China, X_{cpt} is the value of exports of product p by country c. Thus V_{pt} measures the world share of China's export of product p at time t as a proxy for competition from China. In order to estimate the extent to which competition from China displaces exports of other countries in the region, we run the following Ordinary Least Squares (OLS) regression for each country in the region and by each technological category defined earlier:

$$\frac{X_{pt+1} - X_{pt}}{X_{pt}} = \alpha_0 + \sum \alpha_{1t} year_t + \alpha_2 \ln (X_{pt-1}) + \alpha_3 V_{pt-1} + \epsilon_{pt} \tag{2}$$

The dependent variable is the growth of each country's total exports for product p at the 5-digit SITC level.[9] We include yearly dummy variables to control for time effects. The parameter α_3 captures the displacement effect arising from competition from China. To the extent that competition from China is crowding a country out of a product market, the coefficient will be negative and statistically significant.

Table 9 presents the results. The sectors examined include HT1, HT2, MT1, MT2, MT3, LT1 and LT2, which have been already defined. The categories are as defined previously. An analysis of V_{pt} indicates that China's share has increased across all product categories between 1990 and 2005. When all the sectors are pooled, the estimated coefficient (α_3) is negative and statistically significant for 6 of the 9 countries, indicating that higher competition from China has resulted in lower export growth for these countries. For example, for Japan, a 1 percentage point increase in China's share has reduced Japan's export growth by 0.23 percent.

The results vary by product category. Competition from China has generally had little or no effect on export growth of other Asian countries in the HT1 and HT2 categories, consistent with the previous finding that China still has a relatively low RCA in these sectors. For Malaysia and Thailand, however, competition from China is beginning to adversely affect exports of HT2 products, a category in which these countries and China have similar levels of comparative advantage.

In the automotive category (MT1), competition from China was relatively nonexistent until

[9] Export values that are 0 are replaced by 0.001.

after 1995. Recently, China's share has risen to 9 percent of total world exports in 2005 from 1 percent in 1995. The regression results suggest that in response to the rise in China's share, there has been some crowding of exports of Japan and South Korea, two important auto producers. In Indonesia, however, the effect was positive, suggesting that the growth of Indonesia's exports in this category has increased. For the MT2 and MT3 categories where China's share has roughly tripled between 1990 and 2005, exports have shifted away from most of countries in the region, with the exception of Thailand. The effect is most pronounced for South Korea, but also Indonesia, Malaysia and India.

In the LT1 category where China's has the highest revealed comparative advantage, but where its competitiveness has risen the least, exports of other countries have generally not experienced noticeable displacements. Quite to the contrary, Indonesia and Singapore have experienced positive effects on export growth. For the LT2 category where competition from China has risen noticeably, export growth for India, Japan, South Korea and Singapore has registered significant displacements.

In sum, on aggregate, competition from China has risen and this has led to some displacement of exports from other countries in the region. The high-tech sector (HT1 and HT2) seem to have been unaffected thus far, although this could change as China increases its presence in this category. The displacement has been more pronounced in the mid-tech categories (MT1, MT2, and MT3), and to a lesser extent in the low-tech sectors (LT1 and LT2) where China's share was already high in 1990. These findings are consistent with the hypothesis that China has conquered low-tech industries, notably textiles, garments, and footwear, and is currently crowding out other countries in the mid-tech industries on its way up the value-chain. Of course, some countries may have upgraded the quality of their exports in response to competition from China, a subject for future research.

4 Conclusion

Assertions of the importance of China are ubiquitous both because of the current role China is playing as a world production center and because of the vast potential of Chinese consumers to boost world demand. Assessing to what extent China has become and independent source of demand for the region is a critical for understanding China's future role in the global economy. In this paper, we examine China's role in Asia both as an independent engine of growth and as a

conduit of demand from the industrial countries.

We begin by evaluating the impact of U.S. and Chinese demand on the output of the Asian economies by examining cross-country linkages. In particular, estimates of growth comovements suggest that, although for a number of countries U.S. growth remains important, the correlation with Chinese growth for many countries in the region is rising. We attempt to more specifically identify the impact of Chinese and U.S. demand shocks using structural VAR analysis. Our results indicate that external shocks have been quite important for the countries of the region over the past 15 years. Moreover, for a number of countries – Korea, Singapore, Taiwan, and Thailand – shocks to Chinese demand for their goods has been at least as important as shocks originating in the United States.

Next, we focus on China's role as a conduit by examining patterns in the micro trade data. To the extent that increasing vertical integration is an important factor driving the growth in regional trade, it would be reflected in a higher intra-regional trade in parts and components relative to trade in finished goods. Here we find a surge in regional parts and components trade over the past decade. This increase has been concentrated in trade between China and the newly-industrialized economies (Taiwan, Korea, and Singapore) with these countries running a significant surplus with China in parts and components. The ASEAN-4 countries ran only a small surplus with China and seemed less collaborators than competitors with China.

Other evidence from the micro trade data suggests that not only have countries increased their participation in fragmentation of the production process across the region in coordination with China, but they have also altered the product mix of their exports. Japan, Korea, and Thailand appear to have increasingly shifted toward the production of automobiles while Singapore has increased its presence in the bio-medical sector. For the ASEAN-4 countries, the rise of China appears to have had less impact either through trade in parts and components and product mix.

Our evidence suggests that China's growing importance in the global economy may be reflecting a transition in which it is serving both as an engine and as a conduit of growth.

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Table 1

Ratio of Real Exports to GDP

	1990	1995	2000	2005*
China**	0.14	0.19	0.23	0.37
Japan	0.08	0.09	0.11	0.14
India	0.07	0.11	0.13	0.20
NIE's				
Hong Kong	0.96	1.34	1.44	1.81
Taiwan	0.41	0.44	0.53	0.65
Korea	0.17	0.24	0.41	0.54
Singapore	1.83	1.87	1.96	2.43
ASEAN-4				
Indonesia	0.33	0.38	0.41	0.42
Malaysia	0.72	0.97	1.17	1.21
Philippines	0.30	0.43	0.46	0.46
Thailand	0.36	0.47	0.65	0.67
MEMO: US	0.08	0.10	0.11	0.11

*2004 for India.

** Real component data are not available for China, so the ratio uses nominal U.S. dollar values.

Table 2

		GDP Growth (%)	Contrib. of Net Exports to GDP Growth (% pts)	Relative Net Export Contrib.
		(1)	(2)	(2)/(1)
China*	1995-2000	9.6	1.8	0.2
	2000-2005	9.4	0.9	0.1
Japan	1995-2000	1.0	0.2	0.2
	2000-2005	1.5	0.3	0.2
India	1995-2000	5.8	0.1	0.0
	2000-2005	6.8	0.1	0.0
NIEs				
Hong Kong	1995-2000	4.1	1.8	0.5
	2000-2005	4.3	2.9	0.7
Taiwan	1995-2000	5.8	0.4	0.1
	2000-2005	3.1	2.0	0.7
Korea	1995-2000	4.6	2.2	0.5
	2000-2005	4.5	1.5	0.3
Singapore	1995-2000	6.4	0.5	0.1
	2000-2005	4.0	4.6	1.2
ASEAN-4				
Indonesia	1995-2000	1.1	2.0	1.8
	2000-2005	4.7	-0.2	-0.1
Malaysia	1995-2000	5.0	4.3	0.9
	2000-2005	4.5	0.0	0.0
Philippines	1995-2000	4.0	0.8	0.2
	2000-2005	4.5	-0.9	-0.2
Thailand	1995-2000	0.6	3.9	6.1
	2000-2005	5.0	-0.3	-0.1

*China has just started reporting growth contributions based on real expenditure components.

(See China Statistical Yearbook, 2006)

Table 3:
Variance Decompositions based on the estimated VAR

k (quarters)	**KOREA**: Percent of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	10.8	17.0*	72.1**
2	13.3*	20.6*	66.1**
3	25.5**	18.3*	56.2**
4	26.0**	24.2*	49.8**

NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 5 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).

k (quarters)	**SINGAPORE**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	2.6	19.2**	78.2**
2	20.1**	17.5*	62.3**
3	21.3**	20.6**	58.1**
4	24.4**	21.2**	54.4**

NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 7 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).

k (quarters)	**TAIWAN**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	6.3	24.3**	69.4**
2	10.2	26.2**	63.6**
3	11.1	29.9**	59.0**
4	12.3*	31.3**	56.4**

NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 4 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).

Table 3: (continued)
Variance Decompositions based on the estimated VAR

k (quarters)	**INDONESIA**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	8.9	1.8	89.3**
2	10.5	3.4	86.1**
3	12.9**	5.8	81.3**
4	14.1**	7.6	78.3**
NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 4 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).			

k (quarters)	**MALAYSIA**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	8.5	2.0	89.6**
2	14.4*	3.4	82.1**
3	20.3**	5.7	74.0**
4	20.4**	8.9	70.6**
NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 7 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).			

k (quarters)	**PHILIPPINES**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	3.4	2.2	94.4**
2	5.9	4.3	89.8**
3	8.2	6.7	85.1**
4	14.9*	8.8	76.3**
NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth; sample period 1993:2 to 2006:4, and 8 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).			

Table 3: (continued)
Variance Decompositions based on the estimated VAR

k (quarters)	**THAILAND**: Percentage of the k-step ahead forecast error variance of domestic output growth explained by:		
	Exports to U.S. Shock	Exports to China Shock	Other Shocks
1	2.0	8.9	89.1**
2	4.7	14.2*	81.1**
3	11.8	16.5**	71.7**
4	13.3*	17.3**	69.4**

NOTES: Results based on a 3-variable VAR consisting of growth of exports to U.S., growth of exports to China and HK, and domestic growth, sample period 1993:2 to 2006:3, and 3 lags. A '*' and "**" indicate statistical significance based on 90 percent and 95 percent confidence bands, respectively, computed from Monte Carlo simulations (5000 replications).

Table 4

Asian Trade Balances by Category (Billions of US$)

		Trade with World				Trade with China & Hong Kong				Rest of the World			
		Total	Parts/ Compon	Basic Products	Finished Goods	Total	Parts/ Compon	Basic Products	Finished Goods	Total	Parts/ Compon	Basic Products	Finished Goods
Asia	1995	65.3	55.8	-178.2	187.7	n/a				n/a			
	2005	224.7	86.5	-438.0	576.1								
Asia ex. China, HK & India	1995	75.7	95.8	-159.4	139.3	54.0	45.8	-2.7	10.8	21.8	50.0	-156.7	128.4
	2005	177.0	193.5	-296.0	279.6	112.7	117.3	1.4	-6.0	64.3	76.2	-297.5	285.6
China & Hong Kong	1995	-5.5	-38.8	-12.8	46.2	n/a				n/a			
	2005	94.0	-103.3	-106.9	304.2								
Japan	1995	106.8	130.7	-133.1	109.2	11.0	18.8	-7.4	-0.4	95.9	111.9	-125.6	109.6
	2005	79.1	141.1	-204.2	142.2	6.0	36.0	-9.3	-20.7	73.1	105.1	-194.9	162.9
India	1995	-4.9	-1.2	-6.0	2.3	1.0	1.1	0.0	-0.1	-5.8	-2.2	-6.0	2.4
	2005	-46.3	-3.6	-35.0	-7.7	-1.9	-0.7	3.8	-5.0	-44.5	-3.0	-38.8	-2.8
NIEs ex. Hong Kong	1995	-7.2	-13.3	-25.3	31.3	38.2	26.0	1.2	11.0	-45.4	-39.3	-26.4	20.3
	2005	59.9	27.5	-60.5	92.9	98.3	77.5	3.1	17.7	-38.4	-50.0	-63.6	75.2
Korea	1995	-10.1	9.2	-31.2	12.0	11.6	9.1	-0.7	3.1	-21.6	0.0	-30.6	8.9
	2005	23.2	34.9	-74.8	63.2	36.8	32.6	-2.0	6.1	-13.6	2.2	-72.8	57.0
Singapore	1995	-6.2	-9.3	-3.3	6.4	4.7	0.8	2.2	1.8	-11.0	-10.1	-5.5	4.6
	2005	29.6	18.4	-9.6	20.9	16.6	11.4	5.6	-0.4	13.0	7.0	-15.2	21.3
Taiwan	1995	9.1	-13.2	9.3	12.9	21.8	16.0	-0.3	6.1	-12.8	-29.2	9.6	6.8
	2004	7.1	-25.7	23.9	8.9	45.0	33.5	-0.5	12.0	-37.9	-59.2	24.4	-3.1
ASEAN-4	1995	-23.9	-44.0	21.4	-1.3	4.9	1.0	3.6	0.2	-28.7	-45.0	17.8	-1.5
	2005	38.1	-24.8	18.4	44.4	8.4	3.7	7.7	-3.0	29.6	-28.5	10.7	47.5
Malaysia	1995	-3.3	-12.4	9.5	-0.4	2.5	0.9	1.1	0.5	-5.8	-13.3	8.4	-0.9
	2005	26.4	-8.5	14.6	20.3	1.5	1.6	1.9	-2.0	24.9	-10.1	12.6	22.3
Thailand	1995	-14.3	-18.3	3.1	0.8	1.7	0.0	1.5	0.2	-16.1	-18.3	1.6	0.6
	2005	-8.1	-12.7	-6.5	11.2	2.6	0.2	2.6	-0.2	-10.7	-12.9	-9.1	11.4
Philippines	1995	-11.0	-6.2	-3.3	-1.6	-1.0	-0.5	0.0	-0.5	-10.0	-5.7	-3.3	-1.1
	2005	-8.2	-6.5	-7.1	5.4	2.3	2.3	-0.1	0.0	-10.5	-8.8	-7.1	5.4
Indonesia	1995	4.8	-7.1	12.0	-0.1	1.6	0.7	0.9	0.0	3.2	-7.8	11.1	-0.1
	2005	28.0	2.9	17.5	7.6	2.0	-0.4	3.3	-0.8	25.9	3.3	14.2	8.4

Table 5

Proportion of Exports that are Parts and Components, by Technological Category

(Percentage Points)

		Primary Products	Agro-based Manuf.	Other Resource-Based Manuf.	Textile, Garment and Footwear	Other Low Tech Manuf.	Automotive	Chemicals and Basic Metals	Engineering Products	Electronics and Electrical	Other High Tech	Total
		(PP)	(RB1)	(RB2)	(LT1)	(LT2)	(MT1)	(MT2)	(MT3)	(HT1)	(HT2)	
To China and Hong Kong												
Japan	1995	80.1	59.4	40.4	89.3	61.8	21.4	66.8	37.4	67.6	19.7	52.2
	2005	79.5	47.0	50.0	92.5	57.4	58.6	60.3	44.7	87.7	28.4	57.9
India	1995	7.1	30.1	90.0	85.7	34.6	99.2	48.6	56.9	64.7	0.7	76.0
	2005	13.1	17.7	47.5	80.3	54.3	83.1	66.8	53.0	63.9	7.4	46.4
Taiwan	1995	78.4	67.3	37.4	85.4	32.5	33.2	82.7	50.9	84.3	37.4	69.4
	2004	86.3	77.2	35.8	90.4	62.0	96.8	68.9	57.9	85.0	29.5	68.3
Korea	1995	64.1	75.6	44.1	91.0	53.1	14.9	88.2	26.9	84.9	14.8	68.8
	2005	87.0	71.0	37.1	82.2	74.6	80.4	62.4	52.7	74.5	73.0	67.6
Singapore	1995	56.3	13.4	3.7	59.7	13.3	87.8	42.0	37.6	56.2	19.6	36.9
	2005	41.5	14.6	9.3	74.9	7.3	91.7	58.8	60.1	82.7	43.0	59.2
Indonesia	1995	4.2	72.7	13.5	85.3	10.1	2.8	76.2	11.1	63.7	0.0	43.5
	2005	7.8	25.7	28.7	83.4	53.3	93.1	26.4	50.6	65.2	55.8	23.7
Malaysia	1995	18.5	36.3	20.4	85.3	8.9	85.6	70.5	26.0	72.0	14.2	47.3
	2005	16.6	13.1	27.4	65.9	34.9	74.9	67.3	57.0	85.8	29.7	63.9
Philippines	1995	18.5	18.4	9.8	30.2	14.2	4.7	74.4	56.5	85.7	1.1	33.4
	2005	51.1	33.9	11.3	45.1	53.8	99.3	71.2	68.5	86.6	41.2	80.4
Thailand	1995	1.3	11.4	81.3	70.9	19.1	95.8	75.9	37.9	69.7	15.7	38.2
	2005	2.3	50.9	53.1	85.0	54.0	68.4	81.4	64.9	48.8	76.5	48.0
Regional Sum	1995	37.9	50.7	39.2	86.5	47.4	26.6	76.8	38.2	71.0	21.4	56.2
	2005*	40.9	40.6	36.3	86.9	59.2	70.6	63.8	49.9	81.1	41.4	61.2
To the Rest of the World												
Japan	1995	76.2	71.4	60.4	82.5	47.9	27.8	39.6	44.6	66.3	24.3	47.5
	2005	76.1	75.6	59.3	82.3	50.6	20.9	37.4	42.9	73.7	30.5	42.7
India	1995	2.5	33.8	73.6	29.7	25.1	50.0	60.3	55.6	49.6	2.1	35.1
	2005	15.5	41.6	47.2	20.0	27.2	47.0	48.8	53.7	59.1	4.7	34.2
Taiwan	1995	27.7	22.9	35.6	48.5	19.7	63.8	73.3	43.3	62.0	19.3	47.3
	2004	27.5	57.8	20.1	66.1	31.9	65.1	68.4	50.9	64.5	21.5	53.1
Korea	1995	28.0	57.1	37.0	34.3	37.1	7.2	73.0	22.4	74.3	23.5	47.1
	2005	61.3	71.2	23.3	65.2	51.4	15.4	69.9	23.3	50.1	12.0	38.9
Singapore	1995	37.6	19.3	25.9	34.4	14.7	62.4	44.8	41.6	59.5	28.0	46.4
	2005	44.4	22.5	28.0	22.9	14.0	68.3	40.9	60.5	72.9	34.1	51.7
Indonesia	1995	4.4	54.2	7.7	17.2	13.0	71.9	64.5	17.9	66.5	12.5	22.4
	2005	8.5	35.5	11.7	24.5	15.0	74.0	56.2	49.1	55.5	40.5	25.1
Malaysia	1995	9.5	16.4	19.5	20.1	12.0	47.8	36.2	22.5	77.0	11.8	40.7
	2005	6.5	21.8	21.7	25.9	14.3	70.2	39.0	50.4	57.0	38.4	38.0
Philippines	1995	28.4	2.5	8.3	8.1	3.2	95.0	20.0	74.3	71.6	5.4	20.5
	2005	18.0	9.1	28.2	6.2	7.4	87.2	30.9	69.6	71.0	53.6	56.3
Thailand	1995	1.0	8.0	55.8	11.1	7.6	53.9	60.5	49.1	57.6	69.0	29.4
	2005	6.7	19.7	35.1	24.2	16.0	31.4	69.2	46.8	54.5	72.7	35.6
Regional Sum	1995	15.9	36.0	45.4	31.4	30.6	28.4	52.4	40.7	66.1	24.2	43.7
	2005*	17.8	41.0	35.6	35.2	34.9	23.9	49.2	43.2	64.8	29.1	42.1

Source: UN COMTRADE database, SITC Rev.3, except data for Taiwan which is from SourceOECD

*Includes Taiwan 2004 data.

Table 6

Percentage of Total Regional Exports to the World by Technological Category

(Percentage Points)

		Primary Products	Agro-based Manuf.	Other Resource-Based Manuf.	Textile, Garment and Footwear	Other Low Tech Manuf.	Automotive	Chemicals and Basic Metals	Engineering Products	Electronics and Electrical	Other High Tech	Overall
		(PP)	(RB1)	(RB2)	(LT1)	(LT2)	(MT1)	(MT2)	(MT3)	(HT1)	(HT2)	
China	1995	18.6	13.3	12.7	28.5	17.2	1.4	10.8	6.9	4.5	10.1	11.0
	2005	24.1	26.3	18.1	51.4	38.0	7.3	22.7	24.3	27.6	21.9	27.0
Hong Kong	1995	6.2	10.3	9.3	28.8	20.5	2.0	12.8	12.0	9.8	11.3	13.1
	2005	3.8	4.1	4.0	20.4	11.8	0.8	7.3	10.4	13.6	7.3	10.4
Japan	1995	6.6	14.5	26.5	3.3	23.4	78.9	31.5	50.3	34.5	50.2	32.9
	2005	5.7	13.3	14.7	2.2	16.0	61.6	25.4	33.7	13.5	30.1	21.1
India	1995	7.9	1.7	10.6	5.9	1.7	0.9	1.8	0.4	0.2	2.4	2.4
	2005	8.8	2.6	16.5	7.2	4.4	1.5	3.6	1.3	0.3	3.4	3.7
Taiwan	1995	4.6	6.9	4.2	9.3	13.3	4.6	11.5	6.5	10.4	4.3	8.4
	2004	3.4	3.1	4.1	4.2	8.9	2.9	9.5	4.8	7.7	11.2	6.2
Korea	1995	4.1	6.2	8.0	9.0	9.5	9.4	16.6	8.2	10.5	4.5	9.3
	2005	4.2	7.7	11.9	4.6	8.3	18.6	13.2	10.6	10.7	11.4	10.1
Singapore	1995	6.4	6.3	16.2	1.7	4.2	1.2	5.8	7.3	17.2	7.3	8.8
	2005	3.0	3.9	19.4	1.1	3.8	1.3	7.4	5.8	12.7	8.4	8.1
Indonesia	1995	21.3	12.8	5.5	4.4	2.3	0.3	2.7	0.8	0.5	0.6	3.4
	2005	22.4	13.2	4.0	3.5	1.8	0.6	2.4	1.2	0.8	0.3	3.0
Malaysia	1995	10.4	16.8	2.7	2.1	2.9	0.4	2.8	4.8	8.0	6.3	5.5
	2005	14.2	13.0	2.9	1.4	3.1	0.4	4.0	3.8	7.0	3.2	5.0
Philippines	1995	2.1	2.4	0.7	1.0	0.7	0.2	0.4	0.4	0.8	0.2	1.3
	2005	1.3	2.0	0.7	1.0	0.4	0.8	0.3	0.7	3.1	0.9	1.5
Thailand	1995	11.9	8.9	3.7	5.8	4.2	0.6	3.2	2.5	3.6	2.8	4.2
	2005	9.1	10.6	3.7	3.0	3.5	4.1	4.2	3.4	3.1	2.0	3.9

Source: UN COMTRADE database, SITC Rev.3, except data for Taiwan which is from SourceOECD

Table 7

Distribution of Total Exports to the World by Technological Category

(Percent of Total Exports)

		Primary Products	Agro-based Manuf.	Other Resource-Based Manuf.	Textile, Garment and Footwear	Other Low Tech Manuf.	Automotive	Chemicals and Basic Metals	Engineering Products	Electronics and Electrical	Other High Tech	Tech. Index*
		(PP)	(RB1)	(RB2)	(LT1)	(LT2)	(MT1)	(MT2)	(MT3)	(HT1)	(HT2)	
China	1995	9.6	5.9	5.9	30.7	16.2	1.0	6.9	10.8	10.8	2.2	3.1
	2005	4.4	3.4	5.0	17.9	14.0	1.9	5.7	14.4	30.6	2.7	3.7
Hong Kong	1995	1.6	1.2	1.8	1.0	0.2	6.2	16.6	32.4	38.5	0.6	3.6
	2005	0.6	0.3	0.8	0.3	0.0	4.8	12.1	52.3	27.7	1.1	4.0
Japan	1995	1.2	2.2	4.2	1.2	7.5	18.0	6.9	27.0	28.1	3.8	4.1
	2005	1.4	2.3	5.5	1.0	7.9	21.7	8.5	26.7	20.1	4.9	4.0
India	1995	19.5	3.6	23.3	30.2	7.6	2.8	5.4	2.9	2.1	2.5	2.5
	2005	11.9	2.5	34.0	18.6	12.1	3.0	6.6	5.9	2.3	3.1	2.7
Taiwan	1995	3.1	4.0	2.6	13.2	16.4	4.0	9.6	13.3	32.5	1.2	3.8
	2004	2.7	1.8	5.0	6.4	14.5	3.3	10.4	12.5	37.5	6.0	4.0
Korea	1995	2.5	3.3	4.5	11.8	10.7	7.5	12.8	15.5	30.1	1.2	3.9
	2005	2.1	2.7	8.8	4.2	8.2	13.1	8.8	16.7	31.7	3.7	3.9
Singapore	1995	4.2	3.6	9.7	2.4	5.1	1.0	4.8	14.6	52.6	2.1	4.1
	2005	1.9	1.8	18.7	1.3	4.8	1.2	6.4	11.8	48.7	3.5	4.0
Indonesia	1995	36.0	18.6	8.3	15.7	6.9	0.7	5.5	4.3	3.5	0.4	2.2
	2005	36.2	15.2	10.0	10.9	6.0	1.5	5.3	6.3	8.1	0.4	2.3
Malaysia	1995	10.9	15.2	2.6	4.6	5.6	0.5	3.7	15.5	38.7	2.8	3.6
	2005	14.2	9.3	4.5	2.7	6.3	0.6	5.5	12.4	42.4	2.2	3.7
Philippines	1995	15.4	14.9	4.7	14.4	9.6	2.2	3.7	8.2	26.4	0.5	3.2
	2005	4.3	4.7	3.7	6.4	2.9	3.9	1.2	7.3	63.7	2.0	4.3
Thailand	1995	16.3	10.5	4.5	16.7	10.5	1.1	5.4	10.3	23.0	1.7	3.2
	2005	11.7	9.7	7.2	7.2	9.2	7.5	7.4	14.1	24.4	1.7	3.4

Source: UN COMTRADE database, SITC Rev.3, except data for Taiwan which is from SourceOECD

* Technology Index is (1*PP + 2*RB + 3*LT + 4*MT + 5*HT)/100.

Table 8

Revealed Comparative Advantage by Technological Category

(Share of country's exports of a product divided by country's share of world exports)

		Primary Products	Agro-based Manuf.	Other Resource-Based Manuf.	Textile, Garment and Footwear	Other Low Tech Manuf.	Automotive	Chemicals and Basic Metals	Engineering Products	Electronics and Electrical	Other High Tech
		(PP)	(RB1)	(RB2)	(LT1)	(LT2)	(MT1)	(MT2)	(MT3)	(HT1)	(HT2)
China	1995	0.62	0.51	0.61	3.19	1.23	0.08	0.67	0.51	0.56	0.37
	2005	0.25	0.37	0.38	2.32	1.07	0.15	0.54	0.65	1.46	0.29
Hong Kong	1995	0.23	0.45	0.51	3.63	1.65	0.13	0.89	1.00	1.36	0.46
	2005	0.15	0.21	0.31	3.39	1.23	0.06	0.64	1.02	2.65	0.35
Japan	1995	0.10	0.25	0.57	0.16	0.74	1.98	0.86	1.65	1.88	0.80
	2005	0.11	0.34	0.55	0.18	0.81	2.29	1.10	1.63	1.29	0.72
India	1995	1.63	0.41	3.16	4.07	0.75	0.31	0.68	0.18	0.14	0.53
	2005	0.95	0.38	3.56	3.38	1.29	0.33	0.88	0.37	0.15	0.47
Taiwan	1995	0.26	0.46	0.35	1.81	1.64	0.45	1.23	0.84	2.22	0.27
	2004	0.22	0.27	0.53	1.16	1.56	0.37	1.41	0.80	2.52	0.92
Korea	1995	0.21	0.37	0.61	1.58	1.06	0.83	1.60	0.95	2.01	0.26
	2005	0.17	0.41	0.93	0.78	0.88	1.45	1.19	1.07	2.13	0.57
Singapore	1995	0.35	0.40	1.30	0.31	0.50	0.11	0.60	0.89	3.51	0.44
	2005	0.14	0.26	1.89	0.23	0.50	0.13	0.83	0.73	3.14	0.52
Indonesia	1995	3.06	2.13	1.14	2.14	0.70	0.08	0.71	0.27	0.24	0.09
	2005	2.91	2.33	1.06	2.00	0.64	0.17	0.72	0.41	0.55	0.05
Malaysia	1995	0.92	1.72	0.35	0.62	0.55	0.06	0.46	0.96	2.61	0.60
	2005	1.13	1.40	0.46	0.49	0.66	0.06	0.73	0.78	2.81	0.32
Philippines	1995	0.80	1.04	0.39	1.20	0.58	0.15	0.29	0.31	1.09	0.07
	2005	0.34	0.73	0.39	1.17	0.31	0.43	0.17	0.47	4.28	0.30
Thailand	1995	1.37	1.19	0.62	2.26	1.05	0.13	0.69	0.64	1.56	0.36
	2005	0.93	1.46	0.75	1.30	0.97	0.82	0.98	0.89	1.62	0.25
Average	1995	0.87	0.81	0.87	1.91	0.95	0.39	0.79	0.75	1.56	0.39
	2005*	0.66	0.74	0.98	1.49	0.90	0.57	0.83	0.80	2.05	0.43

Source: UN COMTRADE database, SITC Rev.3, except data for Taiwan which is from SourceOECD

*Includes Taiwan 2004 data.

Table 9: Effect of Competition from China on Rest of Region's Exports with the Rest of the World Incl. Asia (Percent)

Estimation of α_3 in: $\frac{X_{pt+1}-X_{pt}}{X_{pt}} = \alpha_0 + \sum \alpha_{1t} year_t + \alpha_2 \ln(X_{pt-1}) + \alpha_3 V_{pt-1} + \epsilon_{pt}$

Sector	India	Indon.	Japan	Malaysia	Philip.	S. Korea	Sing.	Taiwan	Thai.
All HT, MT, LT	-0.16**	0.04	-0.23**	-0.25**	0.10	-0.37**	-0.18**	-0.282**	0.05
High-tech 1	-0.20	-0.08	-0.12	0.03	0.08	-0.16	0.02	-0.16	-0.18
High-tech 2	-0.02	-0.50	-0.24	-0.42*	-0.02	-0.32	-0.09	-0.04	-1.02**
Mid-tech 1	0.145	0.96*	-0.45**	-0.12	0.34	-0.43*	-0.76	0.71	0.04
Mid-tech 2	-0.32**	-0.51**	-0.10	-0.45**	0.01	-0.51**	-0.35**	-0.27**	-0.11
Mid-tech 3	-0.29**	-0.23*	-0.18**	-0.13*	-0.53**	-0.35**	-0.08	-0.21**	-0.04
Low-tech 1	0.09	0.42**	-0.02	-0.19	0.18	n.a.	0.24**	n.a.	n.a.
Low-tech 2	-0.23**	0.06	-0.20**	-0.20**	-0.02	-0.38**	-0.17**	-0.35**	0.02

$\frac{X_{pt+1}-X_{pt}}{X_{pt}}$: export growth of commodity p at the SITC-5 level at time t.

V_{pt} : China's export as a share of world exports of product p

Sample is annual data from 1990 through 2005. n.a. indicates no coefficient due to insufficient data.

*, ** indicates significance at the 10 and 5 percent levels, respectively.

Estimation include yearly dummy variables. Estimates of α_2 were all negative and statistically significant.

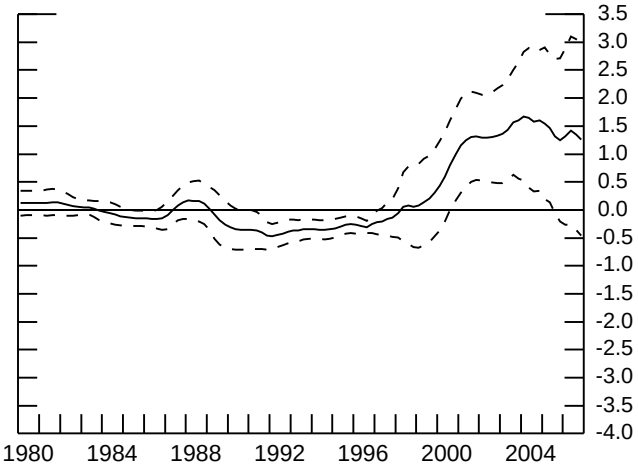
Adjusted-R2 generally varied between 0.03 and 0.20.

Chart 1

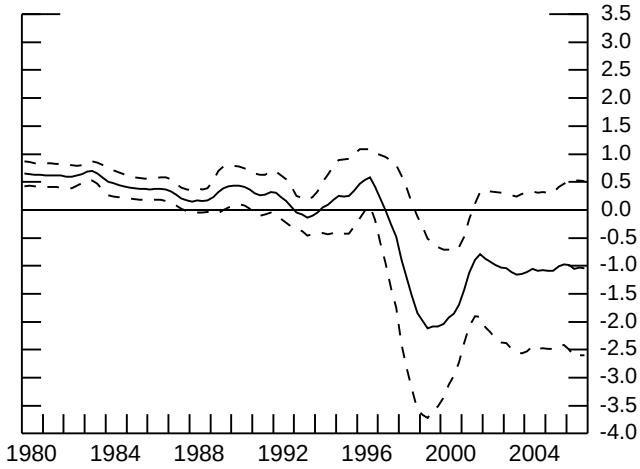
Coefficients from Growth Regressions*

Thailand

China

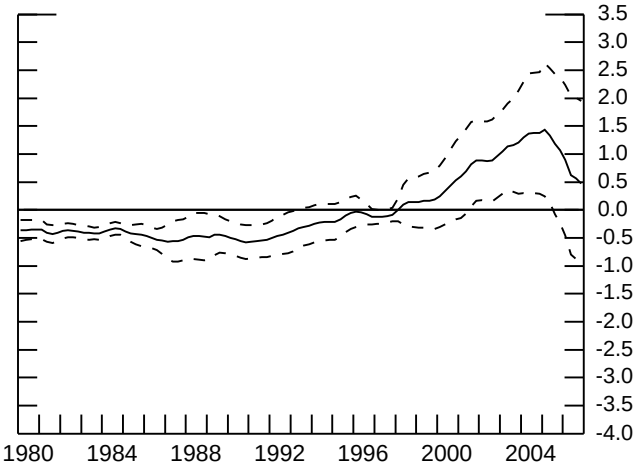


United States

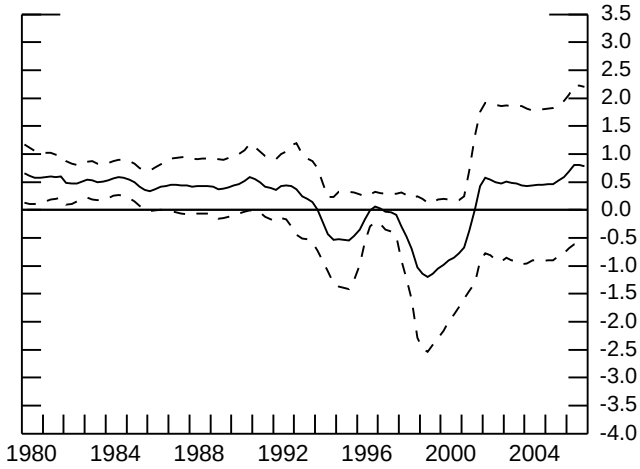


Malaysia

China

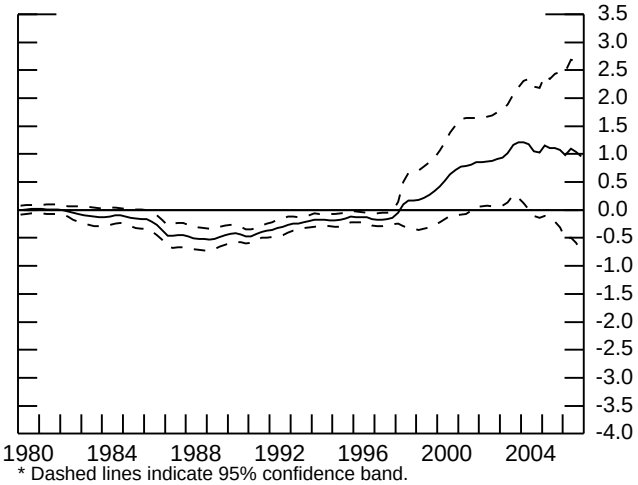


United States



India

China



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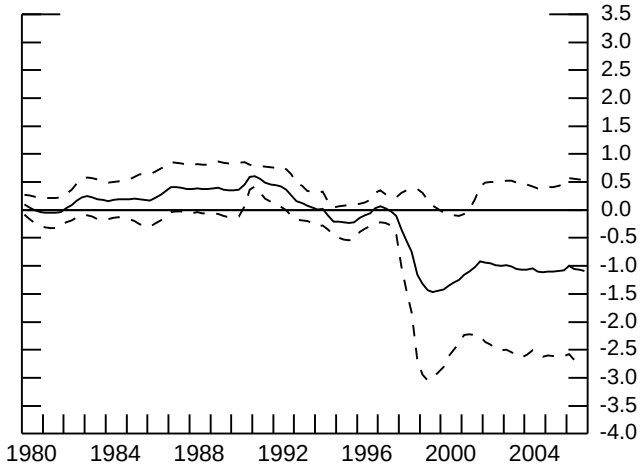


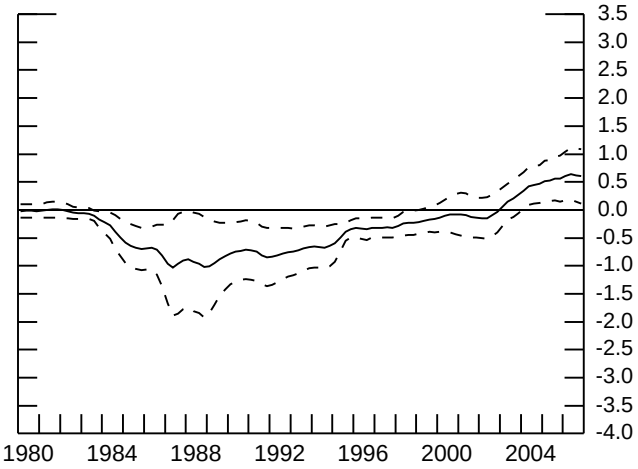
* Dashed lines indicate 95% confidence band.

Chart 2

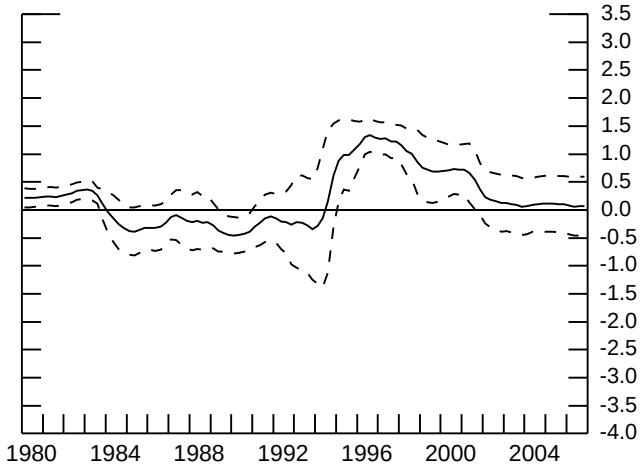
Coefficients from Growth Regressions (cont'd)*

Philippines

China

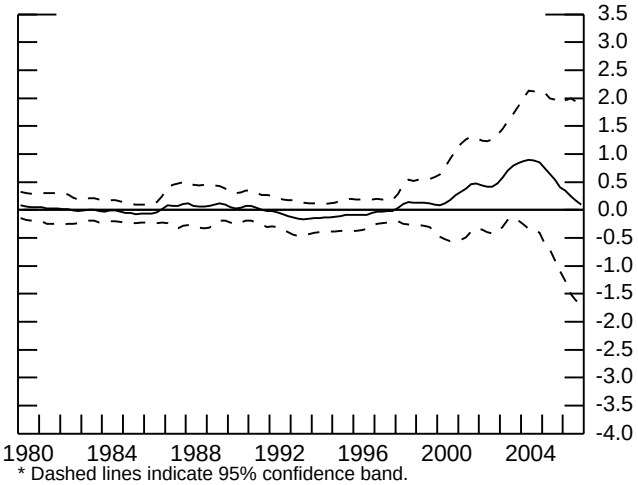


United States

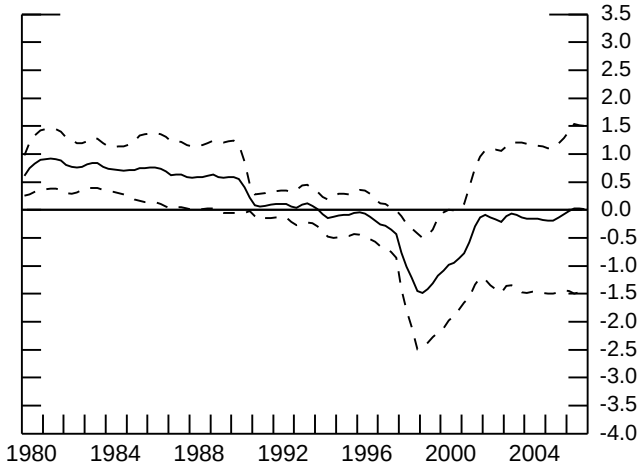


Indonesia

China



United States



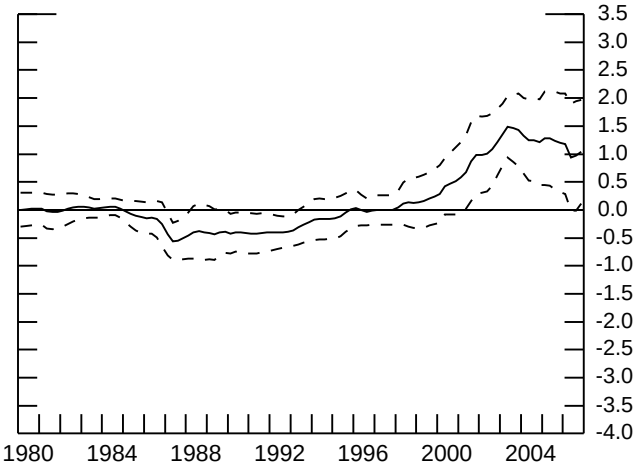
* Dashed lines indicate 95% confidence band.

Chart 3

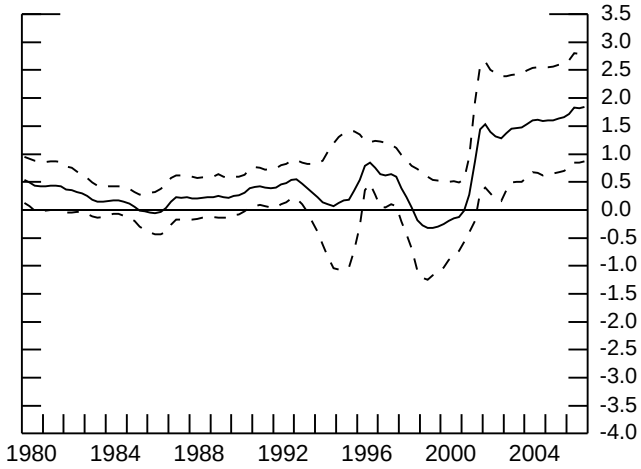
Coefficients from Growth Regressions (cont'd)*

Singapore

China

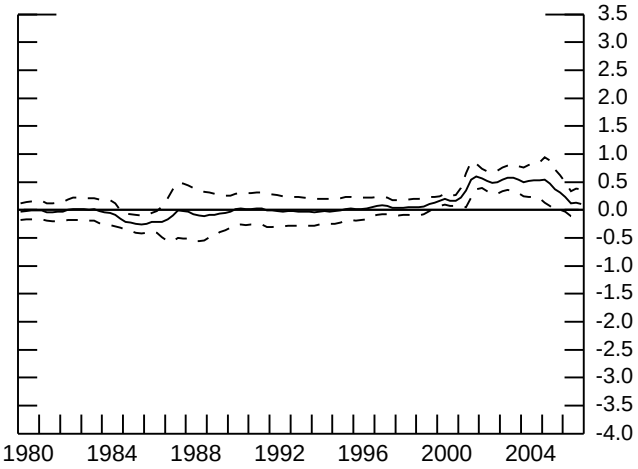


United States

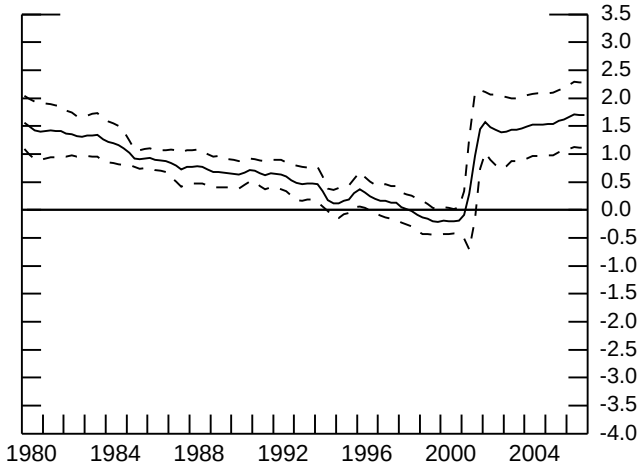


Taiwan

China

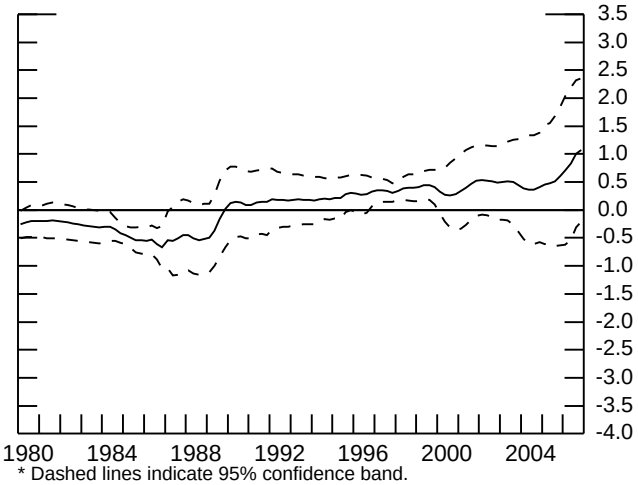


United States

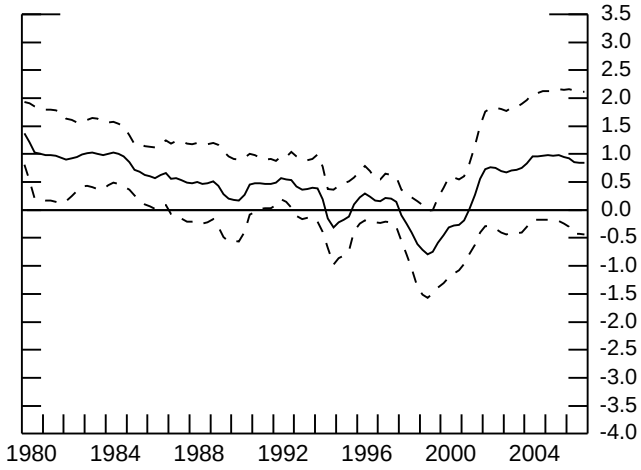


Hong Kong

China



United States



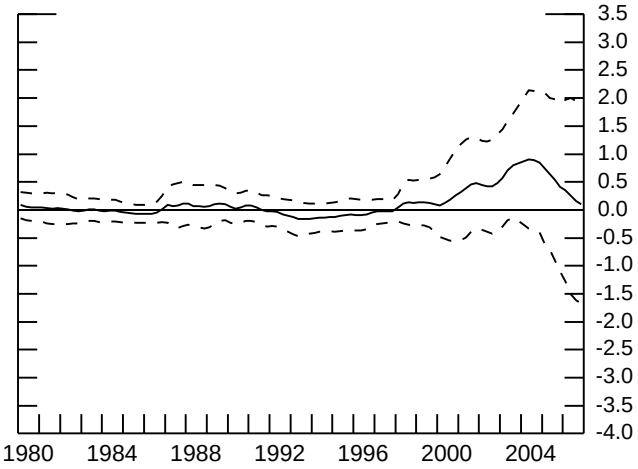
* Dashed lines indicate 95% confidence band.

Chart 4

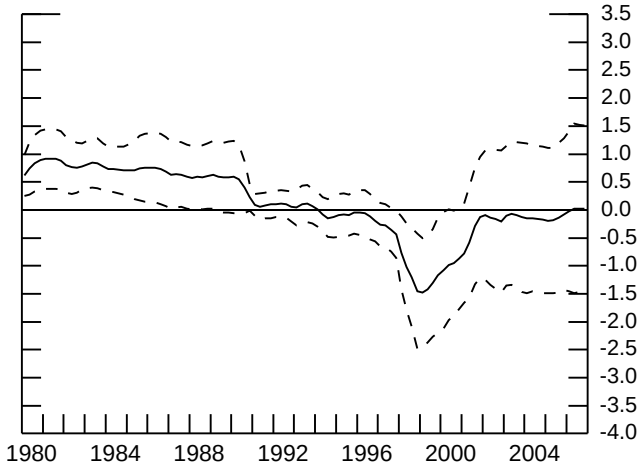
Coefficients from Growth Regressions (cont'd)*

Korea

China

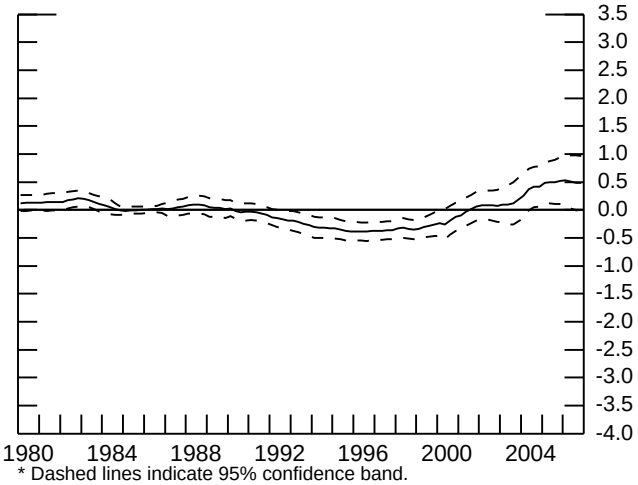


United States

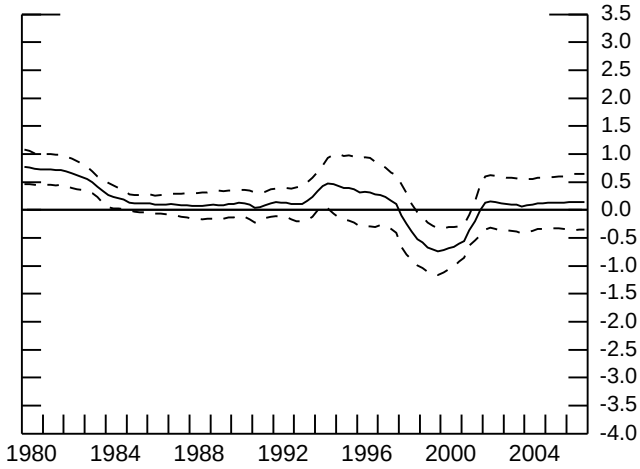


Japan

China



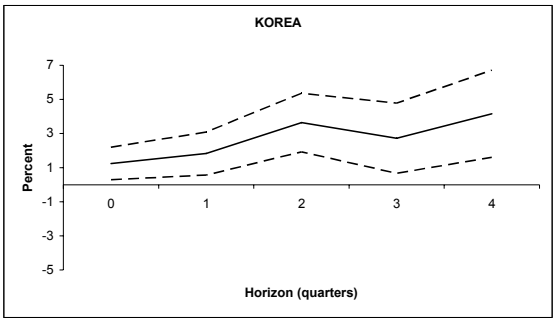
United States

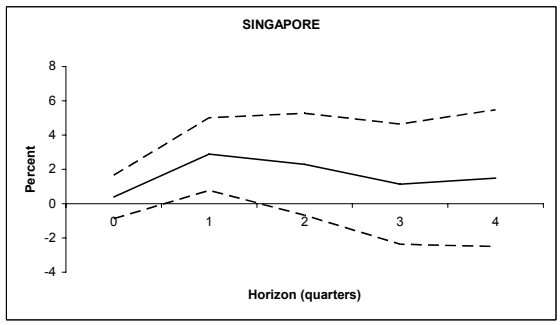


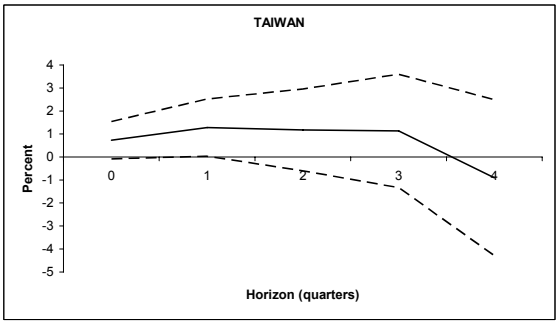
* Dashed lines indicate 95% confidence band.

Chart 5: Impulse Responses using structural VAR (NIEs)

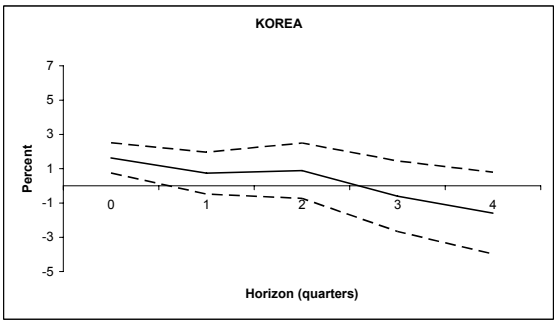
Impulse response of level of domestic output to one standard-deviation shock to exports to US

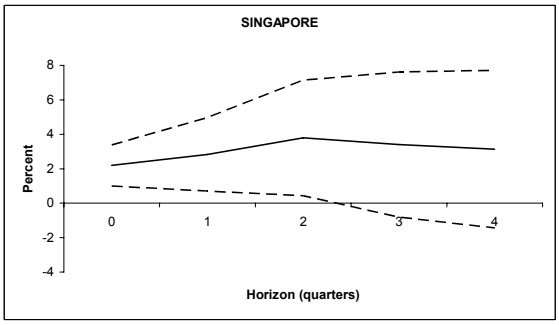






Impulse response of level of domestic output to one standard-deviation shock to exports to China





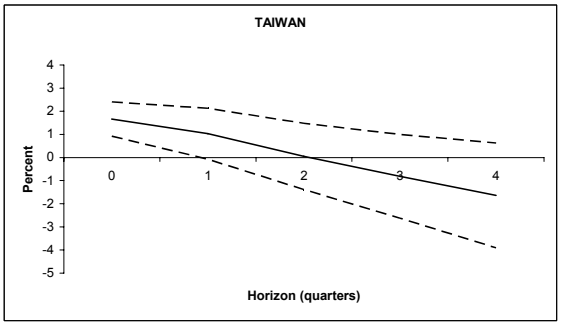
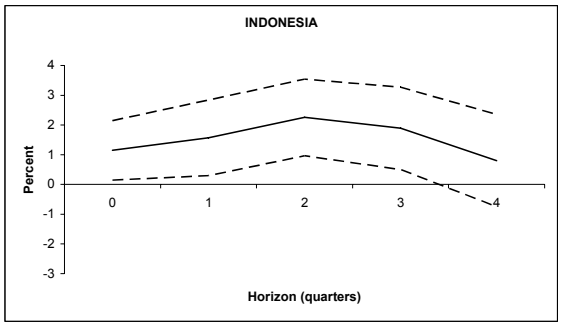
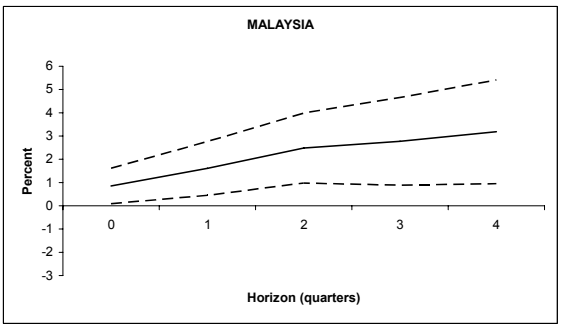
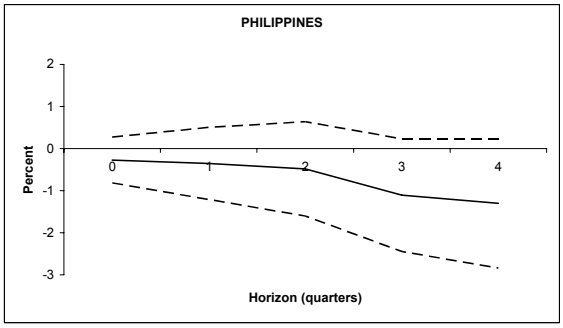


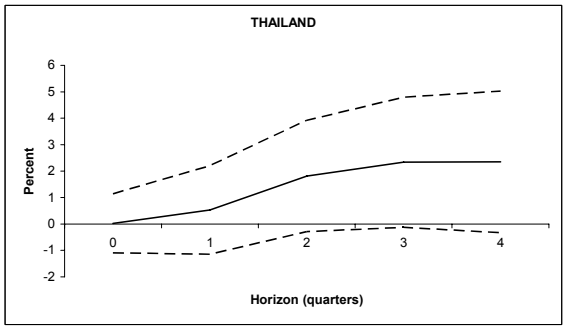
Chart 6: Impulse Responses using structural VAR (ASEAN4)

Impulse response of level of domestic output to one standard-deviation shock to exports to US

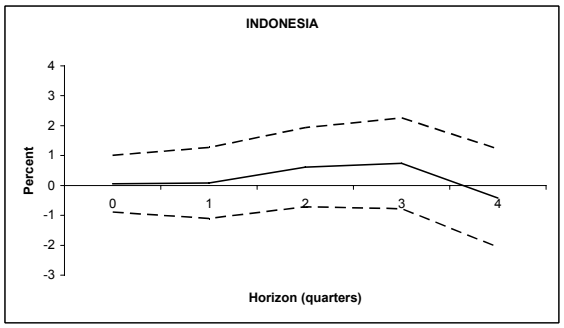


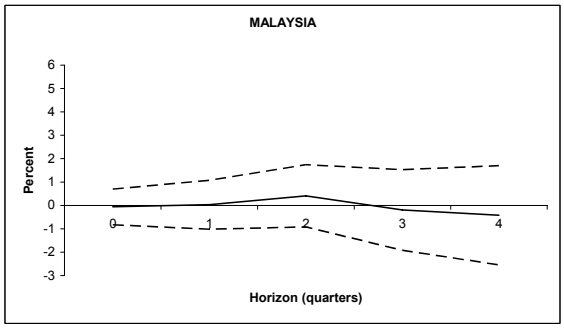


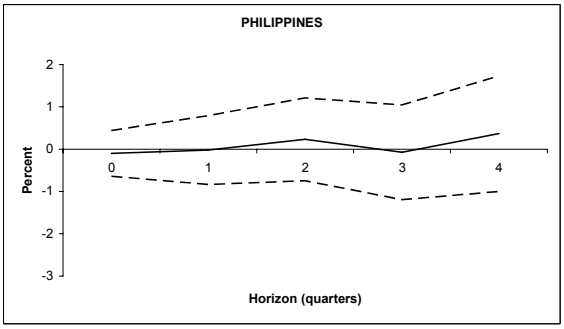


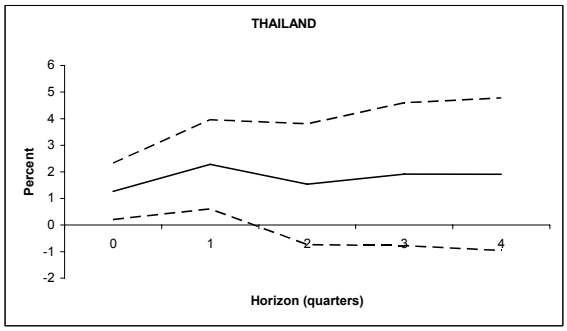


Impulse response of level of domestic output to one standard-deviation shock to exports to China









APPENDIX

DATA SOURCES

Goods imports and exports are taken directly from the United Nation's COMTRADE database for all countries but Taiwan. The interactive software for United Nation's COMTRADE allows the user to create country and commodity groups which automatically aggregate for specified goods and countries. Data for Taiwan was downloaded from SourceOECD using the site's interactive system. All commodity data presented is SITC Rev.3.

Number of SITC Rev.3 codes

10	1-digit SITC Rev.3 commodity codes.
261	3-digit SITC Rev.3 commodity codes.
1073	5-digit SITC Rev.3 commodity codes identified as parts and components.
763	5-digit SITC Rev.3 commodity codes identified as basic products, resources.
3212	5-digit SITC Rev.3 commodity codes total (not including SITC 9):

PP: 513

RB1: 365	RB2: 370	
LT1: 324	LT2: 440	
MT1: 53	MT2: 345	MT3: 531
HT1: 138	HT2: 133	

It is important to note that when data was downloaded at the 5-digit level, some 4-digit codes were also used. This only occurred when a 4-digit code was not followed by any 5-digit codes. For example, 69421 and 69422 are breakdowns of 6942, however, the nearby commodity code 6941 is not broken down to 5-digits. So when downloading, we used 6941, 69421 and 69422, but not 6942.

NOTES ON METHODOLOGY

Technological Categories

For technological categories, we followed the lead of Sanjaya Lall. Lall broke down SITC Rev.2 commodity codes at the three-digit level into ten technological groups: Primary Products (PP), Agro-based Manufactures (RB1), Other Resource-based Manufactures (RB2), Textile, Garment and Footwear (LT1), Other Low-technology Manufactures (LT2), Automotive (MT1), Process: Chemicals and Basic Metals (MT2), Engineering Products (MT3), Electronics and Electrical (HT1) and Other High-technology Goods (HT2). The items of SITC 9 are considered not classifiable. Using Lall's list we were able to correspond from SITC Rev.2 to SITC Rev.3. The list of these commodities along with descriptions can be found in this Appendix.

Fragmentation Categories

Goods were separated into basic products, parts and components, and finished goods by examining 5-digit commodity codes. SITC 0, 1, 3, 4 did not contain any 5-digit categories that were considered to be parts. SITC 2 had only a few (all of the 5-digit subcategories of SITC 232, 266 and 267). We largely followed Athukorala's paper for SITC 7 and 8. We used our own judgment to separate 5 and 6.

We define parts and components as intermediate goods, i.e. manufactured items which are combined with other items and materials to produce finished goods. Parts and components alone cannot be used as a finished good a majority of the time, but there are always exceptions to this. Finished goods, on the other hand, are all other goods requiring little or no processing before becoming consumable.

Our "Other" category consists of basic products, natural resources, food and beverages, etc. Similarly, construction materials like railroad tracks, pipes, pipeline, cement, etc and raw materials such as fertilizers are not likely to be manufactured into an exportable, finished good.

Some problems arise in distinguishing parts and components from finished goods. For example, ball bearings can be purchased by a consumer from a McMaster's catalog, but are usually purchased by industrial firms to produce machinery. Other commodities are not so clear-cut: for example 88115 includes photographic flashlight parts and accessories. As this category includes both parts used to manufacture photographic flashlights as well as final goods (accessories) purchased to complement a photographic flashlight, classifying it is difficult. In these situations, we consider what portion of the total value of the category likely consists of parts and components. If over half, then the commodity is classified as a part and component. Occasionally our search was aided by the word "parts" or "pts" in the commodity description, but this was not always the case. Another good method to distinguish parts from finished goods was to look at how a category is related to neighboring SITC codes. If the category in which we were interested contained parts of goods in nearby commodity codes, then the code could easily be classified as a part and component, otherwise the answer is more ambiguous. The process was far from perfect and leaves some room for refinement.

3-DIGIT PRODUCTS BY TECHNOLOGICAL CATEGORY: (SITC REV.3)

(PP) Primary Products:

001	LIVE ANIMALS EXCEPT FISH
011	BEEF, FRESH/CHILLD/FROZN
022	MILK PR EXC BUTTR/CHEESE
025	EGGS, ALBUMIN
034	FISH,LIVE/FRSH/CHLD/FROZ
036	CRUSTACEANS MOLLUSCS ETC
041	WHEAT/MESLIN
042	RICE
043	BARLEY GRAIN
044	MAIZE EXCEPT SWEET CORN.
045	CEREAL GRAINS NES
054	VEGETABLES,FRSH/CHLD/FRZ
057	FRUIT/NUTS, FRESH/DRIED
071	COFFEE/COFFEE SUBSTITUTE
072	COCOA
074	TEA AND MATE
075	SPICES
081	ANIMAL FEED EX UNML CER.
091	MARGARINE/SHORTENING
121	TOBACCO, RAW AND WASTES
211	HIDE/SKIN (EX FUR) RAW
212	FURSKINS/PIECES, RAW
222	OIL SEEDS ETC - SOFT OIL
223	OIL SEEDS-NOT SOFT OIL
231	NATURAL RUBBER/LATEX/ETC
244	CORK NATURAL/RAW/WASTE
245	FUEL WOOD/WOOD CHARCOAL
246	WOOD CHIPS/WASTE
261	SILK
263	COTTON
268	WOOL/ANIMAL HAIR
272	FERTILIZERS CRUDE
273	STONE/SAND/GRAVEL
274	SULPHUR/UNROASTD PYRITES
277	NATURAL ABRASIVES N.E.S.
278	OTHER CRUDE MINERALS
291	CRUDE ANIMAL MTERIAL NES
292	CRUDE VEG MATERIALS NES
321	COAL NON-AGGLOMERATED
333	PETROL./BITUM. OIL,CRUDE
342	LIQUID PROPANE/BUTANE
343	NATURAL GAS
344	PETROL./HYDROCARBON GAS
345	COAL GAS/WATER GAS/ETC
351	ELECTRIC CURRENT
681	SILVER/PLATINUM ETC
682	COPPER
683	NICKEL
684	ALUMINIUM
685	LEAD
686	ZINC
687	TIN

(RB1) Agro-based Manufactures:

012 MEAT NES,FRESH/CHLD/FROZ
016 MEAT/OFFAL PRESERVED
017 MEAT/OFFAL PRESVD N.E.S
023 BUTTER AND CHEESE
024 CHEESE AND CURD
035 FISH,DRIED/SALTED/SMOKED
037 FISH/SHELLFISH,PREP/PRES
046 FLOUR/MEAL WHEAT/MESLIN
047 CEREAL MEAL/FLOUR N.E.S
048 CEREAL ETC FLOUR/STARCH
056 VEG ROOT/TUBER PREP/PRES
058 FRUIT PRESVD/FRUIT PREPS
059 FRUIT/VEG JUICES
061 SUGAR/MOLLASSES/HONEY
062 SUGAR CONFECTIONERY
073 CHOCOLATE/COCOA PREPS
098 EDIBLE PRODUCTS N.E.S.
111 BEVERAGE NON-ALCOHOL NES
112 ALCOHOLIC BEVERAGES
122 TOBACCO, MANUFACTURED
232 RUBBER SYNTH/WASTE/ETC
247 WOOD IN ROUGH/SQUARED
248 WOOD SIMPLY WORKED
251 PULP AND WASTE PAPER
264 JUTE/BAST FIBRE RAW/RETD
265 VEG TEXT FIBRE EX COT/JU
269 WORN CLOTHING ETC
421 FIXED VEG OIL/FAT, SOFT
422 FIXED VEG OILS NOT SOFT
431 ANIMAL/VEG OILS PROCES'D
621 MATERIALS OF RUBBER
625 RUBBER TYRES/TREADS
629 ARTICLES OF RUBBER NES
633 CORK MANUFACTURES
634 VENEER/PLYWOOD/ETC
635 WOOD MANUFACTURES N.E.S.
641 PAPER/PAPERBOARD

(RB2) Other Resource-based:

281 IRON ORE/CONCENTRATES
282 FERROUS WASTE/SCRAP
283 COPPER ORES/CONCENTRATES
284 NICKEL ORES/CONCS/ETC
285 ALUMINIUM ORES/CONCS/ETC
286 URANIUM/THORIUM ORE/CONC
287 BASE METAL ORE/CONC NES
288 NF BASE METAL WASTE NES
289 PRECIOUS METAL ORE/CONC.
322 BRIQUETTES/LIGNITE/PEAT
325 COKE/SEMI-COKE/RETORT C
334 HEAVY PETROL/BITUM OILS
335 RESIDUAL PETROL. PRODS
411 ANIMAL OIL/FAT
511 HYDROCARBONS/DERIVATIVES
514 NITROGEN FUNCTION COMPDS
515 ORGANO-INORGANIC COMPNDS
516 OTHER ORGANIC COMPOUNDS
522 ELEMENTS/OXIDES/HAL SALT
523 METAL SALTS OF INORG ACD
524 METAL SALTS OF INORG ACD
531 SYNTH ORG COLOUR AGENTS
532 DYEING/TANNING EXTRACTS
551 ESSENT.OIL/PERFUME/FLAVR
592 STARCHES/GLUES/ETC.
661 LIME/CEMENT/CONSTR MAT'L
662 CLAY/REFRACTORY MATERIAL
663 MINERAL MANUFACTURES NES
664 GLASS
667 PEARLS/PRECIOUS STONES
689 MISC NON-FERR BASE METAL

(LT1) Textile, Garment, and Footwear:

611	LEATHER
612	LEATHER MANUFACTURES
613	FURSKINS TANNED/DRESSED
651	TEXTILE YARN
652	COTTON FABRICS, WOVEN
654	WOVEN TEXTILE FABRIC NES
655	KNIT/CROCHET FABRICS
656	TULLE/LACE/EMBR/TRIM ETC
657	SPECIAL YARNS/FABRICS
658	MADE-UP TEXTILE ARTICLES
659	FLOOR COVERINGS ETC.
831	TRUNKS AND CASES
841	MENS/BOYS WEAR, WOVEN
842	WOMEN/GIRL CLOTHING WVEN
843	MEN/BOY WEAR KNIT/CROCH
844	WOMEN/GIRL WEAR KNIT/CRO
845	ARTICLES OF APPAREL NES
846	CLOTHING ACCESSORIES
848	HEADGEAR/NON-TEXT CLOTHG
851	FOOTWEAR

(LT2) Other Low-tech Manufactures:

642	CUT PAPER/BOARD/ARTICLES
665	GLASSWARE
666	POTTERY
673	FLAT ROLLED IRON/ST PROD
674	ROLLED PLATED M-STEEL
675	FLAT ROLLED ALLOY STEEL
676	IRON/STEEL BARS/RODS/ETC
677	IRON/STEEL RAILWAY MATL
678	IRON/STEEL WIRE
691	IRON/STL/ALUM STRUCTURES
692	METAL STORE/TRANSPT CONT
693	WIRE PROD EXC INS ELECTR
694	NAILS/SCREWS/NUTS/BOLTS
695	HAND/MACHINE TOOLS
696	CUTLERY
697	BASE METAL H'HOLD EQUIPM
699	BASE METAL MANUFAC NES
811	PREFABRICATED BUILDINGS
821	FURNITURE/STUFF FURNISHG
892	PRINTED MATTER
893	ARTICLES NES OF PLASTICS
894	BABY CARR/TOY/GAME/SPORT
895	OFFICE/STATIONERY SUPPLY
896	ART/COLLECTIONS/ANTIQUES
897	JEWELLERY
898	MUSICAL INSTRUMS/RECORDS
899	MISC MANUF ARTICLES NES

(MT1) Automotive:

781 PASSENGER CARS ETC
782 GOODS/SERVICE VEHICLES
783 ROAD MOTOR VEHICLES NES
784 MOTOR VEH PARTS/ACCESS
785 MOTORCYCLES/CYCLES/ETC

(MT2) Chemicals and Basic Metals:

266 SYNTHETIC SPINNING FIBRE
267 MAN-MADE FIBRES NES/WAST
512 ALCOHOLS/PHENOLS/DERIVS
513 CARBOXYLIC ACID COMPOUND
533 PIGMENTS/PAINTS/VARNISH
553 PERFUME/TOILET/COSMETICS
554 SOAPS/CLEANSERS/POLISHES
562 MANUFACTURED FERTILIZERS
571 PRIMARY ETHYLENE POLYMER
572 STYRENE PRIMARY POLYMERS
573 VINYL CHLORIDE ETC POLYM
574 POLYACETALS/POLYESTERS.
575 PLASTIC NES-PRIMARY FORM
579 PLASTIC WASTE/SCRAP
581 PLASTIC TUBE/PIPE/HOSE
582 PLASTIC SHEETS/FILM/ETC
583 MONOFILAMENT RODS/STICKS
591 HOUSEHOLD/GARDEN CHEMCAL
593 EXPLOSIVES/PYROTECHNICS
597 OIL ETC ADDITIVES/FLUIDS
598 MISC CHEMICAL PRODS NES
653 MAN-MADE WOVEN FABRICS
671 PIG IRON ETC FERRO ALLOY
672 PRIMARY/PRODS IRON/STEEL
679 IRON/STEEL PIPE/TUBE/ETC
786 TRAILERS/CARAVANS/ETC
791 RAILWAY VEHICLES/EQUIPMT
882 PHOTOGRAPHIC SUPPLIES
883 CINE FILD DEVELOPED

(MT3) Engineering Products:

711 STEAM GENERATING BOILERS
713 INTERNAL COMBUST ENGINES
714 ENGINES NON-ELECTRIC NES
721 AGRIC MACHINE EX TRACTR
722 TRACTORS
723 CIVIL ENGINEERING PLANT
724 TEXTILE/LEATHER MACHINRY
725 PAPER INDUSTRY MACHINERY
726 PRINTING INDUSTRY MACHNY
727 FOOD PROCESSING MACHINES
728 SPECIAL INDUST MACHN NES
731 MACH-TOOLS REMOVE MTRIAL
733 MTL M-TOOLS W/O MTL-RMVL
735 METAL MACHINE TOOL PARTS
737 METALWORKING MACHINE NES
741 INDUST HEAT/COOL EQUIPMT
742 PUMPS FOR LIQUIDS
743 FANS/FILTERS/GAS PUMPS
744 MECHANICAL HANDLING EQUI
745 NON-ELECTR MACHINES NES
746 BALL/ROLLER BEARINGS
747 TAPS/COCKS/VALVES
748 MECH TRANSMISSION EQUMNT
749 NON-ELEC PARTS/ACC MACHN
762 RADIO BROADCAST RECEIVER
763 SOUND/TV RECORDERS ETC
772 ELECTRIC CIRCUIT EQUIPMT
773 ELECTRICAL DISTRIB EQUIP
775 DOMESTIC EQUIPMENT
793 SHIPS/BOATS/ETC
812 SANITARY/PLUMB/HEAT FIXT
813 LIGHTING FIXTURES ETC
872 MEDICAL/ETC INSTRUMENTS
873 METERS AND COUNTERS NES
884 OPTICAL FIBRES
885 WATCHES AND CLOCKS
891 ARMS AND AMMUNITION

(HT1) Electronics and Electrical:

716	ROTATING ELECTR PLANT
718	POWER GENERATING EQU NES
751	OFFICE MACHINES
752	COMPUTER EQUIPMENT
759	OFFICE EQUIP PARTS/ACCS.
761	TELEVISION RECEIVERS
764	TELECOMMS EQUIPMENT NES
771	ELECT POWER TRANSM EQUIP
774	MEDICAL ETC EL DIAG EQUI
776	VALVES/TRANSISTORS/ETC
778	ELECTRICAL EQUIPMENT NES

(HT2) Other High-tech:

525	RADIO-ACTIVE ETC MATRIAL
541	PHARMACEUT EXC MEDICAMNT
542	MEDICAMENTS INCLUDE VET
712	STEAM/VAPOUR TURBINES
792	AIRCRAFT/SPACECRAFT/ETC
871	OPTICAL INSTRUMENTS NES
874	MEASURE/CONTROL APP NES
881	PHOTOGRAPHIC EQUIPMENT

Other:

911	POSTAL PACKETS NOT CLASS
931	SPECIAL TRANSACTIONS NES
961	COIN NONGOLD NON CURRENT
971	GOLD NON-MONETARY EX ORE

1-DIGIT PRODUCTS BY SITC: (SITC REV.3)

0	FOOD & LIVE ANIMALS
1	BEVERAGES AND TOBACCO
2	CRUDE MATER.EX FOOD/FUEL
3	MINERAL FUEL/LUBRICANTS
4	ANIMAL/VEG OIL/FAT/WAX
5	CHEMICALS/PRODUCTS N.E.S
6	MANUFACTURED GOODS
7	MACHINERY/TRANSP EQUIPMT
8	MISCELLANEOUS MANUF ARTS
9	COMMODITIES NES

PRODUCTS BY USE:
(SITC REV.3)

Parts and Components:

232	RUBBER SYNTH/WASTE/ETC
266	SYNTHETIC SPINNING FIBRE
267	MAN-MADE FIBRES NES/WAST
511	HYDROCARBONS/DERIVATIVES
515	ORGANO-INORGANIC COMPNDS
516	OTHER ORGANIC COMPOUNDS
52	INORGANIC CHEMICALS
531	SYNTH ORG COLOUR AGENTS
532	DYEING/TANNING EXTRACTS
5331	COLORING PREPARATION NES
57	PLASTICS IN PRIMARY FORM
58	PLASTICS NON-PRIMRY FORM
611	LEATHER
613	FURSKINS TANNED/DRESSED
621	MATERIALS OF RUBBER
625	RUBBER TYRES/TREADS
62921	CONVEYOR/ETC BELTS "V"
62929	UH NON-CELL RUB ARTICLES
634	VENEER/PLYWOOD/ETC
6411	NEWSPRINT ROLLS/SHEETS
6412	UNCOATED PAPER/BOARD
6413	PAPER COATED/COLOURD ETC
6414	UNCOATED KRAFT PAPER
6415	KRAFT UNCOAT BULK NES
6416	BULK CORRUG ETC PAPER
6417	BULK PAPER ETC NES
64191	TAR-LAMINATED PAPER ETC.
64192	COMPOSITE PAPER BULK NES
64193	PAPER PULP FILTER BLOCKS
65112	CARDED WOOL YARN IN BULK
65113	COMBED WOOL YARN IN BULK
65115	COARSE HAIR YARN IN BULK
65117	CARDED WOOL BLEND YARN
65118	COMBED WOOL BLEND YARN
65121	COTTON SEWING THRD, BULK
65133	COTTON(>85%)YARN BULK
65134	COTTON(<85%)YARN BULK
6514	MAN-MADE SEWING THREADS
6515	SYNTH.FIL.YARN TEXT.BULK
65162	NYLON/POLYAM HI-TEN YARN
65163	SINGLE UNTW SYN YARN NES
65164	SINGL TWIST SYN YARN NES
65169	MULTI-FIL SYNTH YARN NES
65172	BULK TEXTURED ARTIF YARN
65173	BULK HI-TEN VISCOS RAYON
65174	BULK VISCO-RAYON <120T/M
65175	SINGLE ARTIF YARN NES
65176	MULTI-FIL ARTIF YARN NES
65177	ARTIF MONFIL >67 DECITEX
65182	SYN STAP(>85%)YARN BULK
65184	SYN STAP(<85%)YARN BULK
65186	ART STAP(>85%)YARN BULK
65187	ART STAP(<85%)YARN MIXT.
65188	SYN MONOF YARN>67DECITEX
65191	METALLIZED TEXTILE YARN
65192	SILK YARN NON WASTE,BULK
65193	SILK WASTE YARN IN BULK
65195	YARN ETC OF GLASS FIBRE
65196	FLAX YARN
65197	JUTE ETC YARN
65199	VEG FIBRE YARN NES,PAPER
652	COTTON FABRICS, WOVEN
653	MAN-MADE WOVEN FABRICS
654	WOVEN TEXTILE FABRIC NES
655	KNIT/CROCHET FABRICS
656	TULLE/LACE/EMBR/TRIM ETC
657	SPECIAL YARNS/FABRICS
6641	BULK/SCRAP GLASS
6643	DRAWN/BLOWN GLASS SHEETS
6644	FLOAT/POLISHED GLASS SHT
6645	CAST/ROLLED GLASS SHEETS
6647	TEMPR/LAMIN SAFETY GLASS
66481	VEHICLE REAR-VIEW MIRROR
6649	GLASS N.E.S.
667	PEARLS/PRECIOUS STONES
671	PIG IRON ETC FERRO ALLOY
672	PRIMARY/PRODS IRON/STEEL
673	FLAT ROLLED IRON/ST PROD
674	ROLLED PLATED M-STEEL
675	FLAT ROLLED ALLOY STEEL
676	IRON/STEEL BARS/RODS/ETC
678	IRON/STEEL WIRE
68	NON-FERROUS METALS
69129	STRUCTURES, PARTS ALUMNM

69243 IRN/STL COMP GAS TANKS
69244 ALUMINIUM COMP GAS TANKS
694 NAILS/SCREWS/NUTS/BOLTS
6994 SPRINGS AND LEAVES
7112 AUX PLANT FOR BOILERS
7119 PARTS FOR BOILERS/ETC
7128 STM TURBINE(712.1)PARTS
713 INTERNAL COMBUST ENGINES
714 ENGINES NON-ELECTRIC NES
716 ROTATING ELECTR PLANT
7189 ENGINES/MOTORS NES
71819 PARTS NES HYDRAUL TURBIN
71878 NUCLEAR REACTOR PARTS
72119 AGRIC MACHINE(7211)PARTS
72129 PTS NES OF MACHY OF 7212
72139 PTS NES DAIRY MACHINERY
72198 PARTS WINE/ETC MACHINES
72199 PTS NES AGRIC MACHINES
7239 EARTH MOVING MACH PARTS
72439 SEW MCH NEEDLES/FURN/PTS
72449 PTS NES TEXTILE MACHINES
72467 WEAVING LOOM PARTS/ACCES
72468 LOOM/KNITTER ETC PTS/ACC
72488 PARTS FOR LEATHER MACHNS
7249 WASHING/ETC MACHINE PART
7259 PAPER IND MACHINE PARTS
72689 PTS NES OF BOOKBIND MCHN
72691 TYPE-SETTING MACHN PARTS
72699 PRINTING PRESS PARTS
72719 CEREAL/DRY LEGM MACH PTS
72729 INDUS FOOD PROC MACH PTS
72819 PTS NES OF TOOLS OF 7281
72839 PTS NES OF MACHY OF 7283
7285 PARTS SPEC INDUST MACHNY
7359 METALWORK MACH-TOOL PTS
73719 FOUNDRY MACHINE PARTS
73729 ROLL-MILL PTS NES, ROLLS
73739 MTL WELD/SOLDER EQ PARTS
73749 PARTS GAS WELDERS ETC.
7412 NON-ELEC FURNACES/PARTS
74135 ELECT FURNACE/OVEN PARTS
74139 ELECT FURNACE/OVEN PARTS
74149 PTS NES INDUS REFRIG EQU
74159 AIR-CONDITIONER PARTS
74172 WATER PROC GAS GEN PARTS
7419 PARTS INDUS HEAT/COOL EQ
7422 PISTON ENG FUEL/WTR PUMP
7429 PUMP/LIQ ELEVATOR PARTS
74311 VACUUM PUMPS
74315 REFRIGERATOR COMPRESSORS
74345 FAN COOKER HOODS <120CM
7435 CENTRIFUGES
7438 PARTS FOR FANS/GAS PUMPS
7439 PARTS CENTRIFUGE/FILTERS
74419 PTS NES OF WORK TRUCKS
7442 PULLEYS/WINCHES/CAPSTANS
7449 LIFT/HANDLE MACHINE PART
74519 PTS NES OF TOOL OF 7451
74529 PACKING ETC MCHY PTS NES
74539 WEIGHNG MACH WTS,PTS NES
74568 SPRAYING MACHINERY PARTS
74593 ROLLING MACHINE PARTS
74597 AUTOMATIC VENDING MACH PTS
746 BALL/ROLLER BEARINGS
747 TAPS/COCKS/VALVES
748 MECH TRANSMISSION EQUMNT
749 NON-ELEC PARTS/ACC MACHN
7523 DIGITAL PROCESSING UNITS
759 OFFICE EQUIP PARTS/ACCS.
7649 TELECOMMS PARTS/ACCESS.
7712 ELECT POWER EQ NES/PARTS
772 ELECTRIC CIRCUIT EQUIPMT
7731 INSULATED WIRE/OPT FIBRE
7732 ELEC INSULATING EQUIPMNT
77423 X-RAY TUBES
77429 X-RAY ETC PARTS/ACCESS.
77549 ELECTR SHAVER/ETC PARTS
77579 PARTS DOM ELECT EQUIPMNT
77589 DOMEST EL-THERM APP PART
776 VALVES/TRANSISTORS/ETC
7781 BATTERIES/ACCUMULATORS
77829 PTS NES OF LAMPS OF 7782
7783 VEHICLE ELECTRIC EQU NES
77848 HAND ELEC-MECH TOOL PART
7786 ELECTRICAL CAPACITORS
77883 ELEC TRAFFIC CONTROL PTS
77885 ELECTRIC ALARM PARTS
77889 ELEC PARTS OF MACHY NES
784 MOTOR VEH PARTS/ACCESS
78535 PARTS/ACCESS MOTORCYCLES
78536 PARTS/ACCES INV CARRIAGE
78537 PARTS, ACCES CYCLES ETC

78689 TRAILER/SEMI-TRAILER PTS
79199 RAIL/TRAM PARTS NES
7929 AIRCRAFT ETC PARTS
81211 RADIATORS, PARTS THEREOF
81219 PARTS FOR C-HEAT BOILERS
8138 PORTABLE LAMP PARTS
8139 PARTS NES LAMPS/FITTINGS
82111 AIRCRAFT SEATS
82112 MOTOR VEHICLE SEATS
82119 PARTS OF CHAIRS/SEATS
8218 FURNITURE PARTS
84848 PARTS FOR HEADGEAR
87119 BINOC/TELESCOPE PART/ACC
87139 ELECTRON/ETC DIFFR PARTS
87149 MICROSCOPES PARTS/ACCESS
87199 PARTS/ACCESS FOR 8719
8724 MEDICAL FURNITURE, PARTS
87319 GAS/LIQ/ELEC METER PARTS
87329 METER/COUNTER PARTS/ACC.
87412 NAVIGATION INST PART/ACC
87414 SURVEY INSTR PARTS/ACC.
87424 PTS NES OF INST OF 8742
87426 MEAS/CHECK INSTR PART/AC
87439 FLUID INSTRUM PARTS/ACC
87449 PHYS/CHEM ANAL PARTS/ACC
87454 MECH TESTER PARTS/ACCS
87456 THERMOMETER ETC PART/ACC
87469 REGUL/CNTRL INST PART/AC
87479 ELEC/RAD METER PARTS/ACC
8749 INSTRUMENT PART/ACC NES
88114 CAMERA PARTS/ACCESSORIES
88115 FLASHLIGHT PARTS/ACCESS
88123 MOVIE CAMERA PARTS/ACC.
88124 MOVIE PROJECTOR PART/ACC
88134 PHOTO EQUIP NES PART/ACC
88136 PHOTO, CINE LAB EQUIP NE
88422 SPECTACLE FRAME PARTS
8843 OPTICL LENS/PRISM/MIRROR
88591 WATCH CASES, CASE PARTS
88592 WATCH STRAPS/BANDS METAL
88593 WATCH STRAP/BAND NON-MTL
88597 CLOCK CASES, CASE PARTS
88598 CLOCK/WATCH MMNTS UNASS
88599 CLOCK/WATCH PARTS NES
89124 CARTRIDGES/PARTS NES
89129 WAR MUNITIONS/PARTS
89191 PISTOL PARTS/ACCESSORIES
89193 SHOTGUN BARRELS
89195 SHOTGUN/RIFLE PARTS NES
89199 MILITARY WEAPON PART NES
8941 BABY CARRIAGES, PARTS NES
89423 DOLL PARTS/ACCESSORIES
8989 MUSICAL INSTR PARTS/ACC.
89935 CIG LIGHTER PARTS/ACCESS
89937 SMOKING PIPES AND PARTS
89949 PARTS NES UMBRELLA/CANES
89984 BUTTON MOULDS/PARTS
89986 SLIDE FASTENER PARTS
89996 PARACHUTES/PARTS/ACCESS.
89997 VACUUM FLASKS/ETC

Basic Goods, Food and Beverages, Natural Resources, etc:

0	FOOD & LIVE ANIMALS
1	BEVERAGES AND TOBACCO
21	HIDE/SKIN/FUR, RAW
22	OIL SEEDS/OIL FRUITS
231	NATURAL RUBBER/LATEX/ETC
24	CORK AND WOOD
25	PULP AND WASTE PAPER
261	SILK
263	COTTON
264	JUTE/BAST FIBRE RAW/RETD
265	VEG TEXT FIBRE EX COT/JU
268	WOOL/ANIMAL HAIR
269	WORN CLOTHING ETC
27	CRUDE FERTILIZER/MINERAL
28	METAL ORES/METAL SCRAP
29	CRUDE ANIM/VEG MATER NES
3	MINERAL FUEL/LUBRICANTS
4	ANIMAL/VEG OIL/FAT/WAX
56	MANUFACTURED FERTILIZERS
661	LIME/CEMENT/CONSTR MAT'L
662	CLAY/REFRACTORY MATERIAL
663	MINERAL MANUFACTURES NES
677	IRON/STEEL RAILWAY MATL

Finished Goods:

All other commodity codes not elsewhere specified (n.e.s.)