

Intra-regional trade and the role of Mainland China

by Joanne Cutler, Kevin Chow, Carrie Chan and Unias Li of the Research Department

A key risk surrounding regional growth prospects concerns the magnitude of the slowdown on Mainland China. One channel through which the Mainland economy affects other East Asian economies, including Hong Kong, is trade. This article examines the trends in Asian exports since the mid-1980s, drawing implications about the regional impact of slower growth on the Mainland.

The article concludes that the dependence of Asian economies on demand outside the region remains high, and has risen for the Mainland. If the Mainland authorities are successful in avoiding a hard landing and the slowdown in growth is concentrated in domestic demand components, then the impact of the policy-induced slowdown on the Mainland on regional exports will likely be limited.

I. Introduction

A key risk surrounding regional growth prospects at present concerns the magnitude of the slowdown occurring on the Mainland. One important channel through which the Mainland economy affects other East Asian economies is trade. Other channels may also be important, but are beyond the scope of this paper. Intra-regional trade has expanded dramatically over the past two decades and the Mainland has played a pivotal role. This has increased the inter-linkages among regional economies, both in terms of supply chains and in trade in final products. This paper examines the trends in Asian exports since the mid-1980s and the factors driving these, looking in particular at the role of Mainland China.

This is important in the context of the policy-induced slowdown underway on the Mainland. The growth slowdown is expected to be concentrated in domestic demand components, mainly fixed

investment and real estate. It may lead to an increased focus on export-led growth to sustain economic development as the economy re-balances. There are issues about the impact of this on Asian economies. Will it undermine recovery in the region? Which economies have the most to lose or gain? What will be the effects on the Hong Kong economy given its high degree of openness and its entrepôt role for the Mainland?

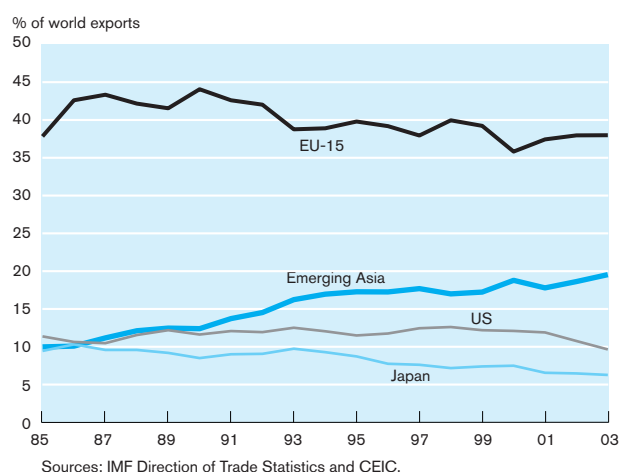
The paper is organised as follows. Section II reviews the trends in Asia's trade flows over the past two decades and discusses the factors driving these. Section III examines the evidence for greater production-sharing among Asian economies and assesses whether this has occurred along the lines of comparative advantage. Section IV looks at the competition among Asian economies in developed markets outside the region and the region's dependence on external demand. Section V concludes.

II. Trends in Asia's trade flows

Asia's share of world exports of merchandise goods has doubled over the past two decades from 10% to 20% for emerging economies, and from 20% to 26% including Japan (Chart 1).¹ By contrast, the US and Euro area have experienced stable or declining world market shares. The region's share of world imports of merchandise goods has risen by less, although this partly reflects the impact of the Asian financial crisis on regional domestic demand growth and imports (which fell sharply but have since resumed an upward trend).

CHART 1

World export share of main trading blocs

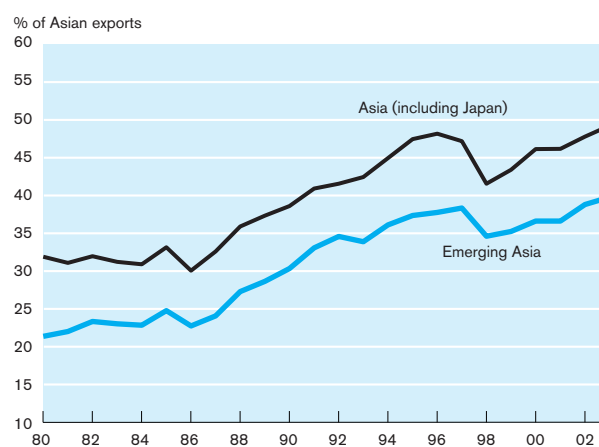


Over the same period, there have been significant movements in intra-Asian trade flows, which have grown at an average annual rate of 14%, almost double the growth rate of world exports of 7.5%. This is faster than the growth of intra-regional trade among other trading blocs, such as NAFTA and the EU-15.² As a share of Asian economies' exports, intra-regional trade rose by 16 percentage points,

from 33% to 49%, and from 26% to 40% excluding Japan (Chart 2). The Asian financial crisis interrupted this upward trend, causing a sharp contraction in intra-regional trade flows, although these have since recovered to their pre-crisis level (it appears to have had less of an effect on world export shares).

CHART 2

Intra-regional trade



Intra-regional trade flows are shown in more detail in the trade matrix for the years 1985, 1995 and 2002 (Table 1). There are several notable trends. There has been a sharp increase in the share of Asian exports to Mainland China, from 6% in 1985 to 12% in 2002. This is especially true for the Newly-Industrialised Economies (NIEs), whose share of exports to the Mainland rose from 1% to 10% over the period, with the largest gains in Taiwan (from 1% to 29%), Korea (from 0% to 15%) and Hong Kong (from 26% to 39%). Singapore has shown less of an increase, from 1% to 5%. By contrast, the Association of South East Asian Nations (ASEAN)³ economies have played a relatively small role in the

¹ Asia is defined as Japan, Mainland China, the NIE-4 (Hong Kong, Singapore, South Korea, and Taiwan) and the ASEAN-4 economies (Indonesia, Malaysia, the Philippines, and Thailand).

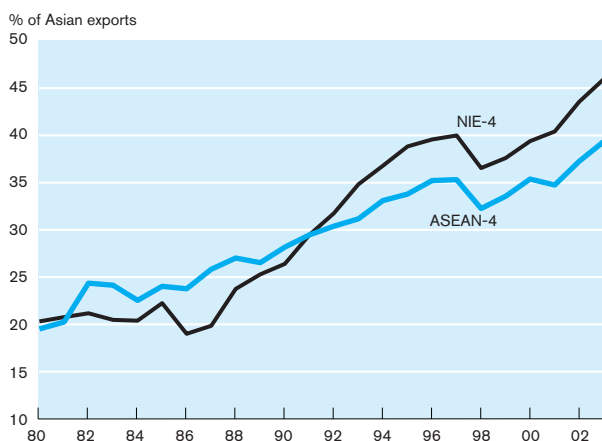
² See Ng and Yeats (2003).

³ ASEAN-4 refers to Indonesia, Malaysia, Philippines and Thailand in the paper.

expansion of intra-regional trade (Chart 3), with exports to the Mainland rising by just four percentage points, from 1% to 5%, over the period.

CHART 3

Intra-regional trade: NIEs versus ASEAN-4



Sources: IMF Direction of Trade Statistics, UN Comtrade statistics and CEIC.

In the other direction, the share of the Mainland's exports to Asian economies has declined from 59% in 1985 to 46% in 2002. This reflected a seven percentage-point fall in the share of the Mainland's exports to Japan and a smaller decline in the share to emerging Asian economies. However, as we shall see later, the share of Mainland's exports to developed economies outside the region has increased sharply. These trends are consistent with the Mainland's emergence as a regional production base, importing intermediate products from other Asian economies for processing and export to the developed markets of the US and Europe.

Intra-regional trade flows to and from Japan are a mirror image of those for the Mainland. The share of Japan's exports to emerging Asia has risen sharply, from 24% to 42%, with the largest increases to the NIEs and ASEAN-4. By contrast, the share of

emerging Asian exports to Japan has fallen sharply, from 17% to 11%, with the largest decline for the ASEAN-4 economies, from 31% to 15%, compared with a decline for the NIE-3⁴, from 12% to 9%. Most of this decline occurred between the mid-1980s and mid-1990s, suggesting that it largely reflects the bursting of the asset price bubble in Japan, which dramatically reduced the growth of domestic demand and imports.

Factors explaining the growth of intra-regional trade

There are many reasons why emerging Asian economies tend to trade disproportionately with each other, including lower transport costs, similarity in demand and economies of scale in production.⁵ Hong Kong and Singapore take advantage of their location, and have built expertise and facilities to specialise in operating as 'middle-man' for international trade in the region. In 2003, a high proportion of their trade, 93% for Hong Kong and 45% for Singapore, consisted of imports for re-export to their final destination with little or no processing. Given this tendency to trade with each other, there are several explanations for the fast growth of intra-regional trade over the past two decades.

First, most governments in emerging Asia have pursued export-led growth strategies, supported by macroeconomic policies such as exchange rate stabilisation and microeconomic measures to promote particular industries. Most importantly, they have avoided imposing import restrictions, particularly for capital and intermediate goods used in production, which has probably helped to promote production-sharing among regional economies. Export growth has also been helped by worldwide efforts to reduce barriers to trade.

⁴ NIE-3 refers to Korea, Singapore and Taiwan in the paper, while NIE-4 includes Hong Kong.

⁵ See Deardorff (1984) for a survey of the empirical literature on the determinants of trade flows.

Secondly, emerging Asian economies have grown faster than the world average over the past two decades leading to high import demand. Between 1985 and 2002, the average annual rate of growth was 7.8%, compared with 3.4% for the world economy. Zebregs (2004) notes that emerging Asia's exports may grow faster than the rest of the world's because (i) its export markets grow relatively fast (the "market distribution effect"), (ii) demand for the commodities which it exports grow relatively fast (the "commodity effect") and (iii) other residual factors capturing changes in technology, factor endowments as well as trade policies (the "competitiveness effect"). He finds that the "market distribution effect" has been the dominant factor explaining the strong growth of emerging Asia's exports relative to world exports since the early 1990s, while the commodity and competitiveness effects have played a minor role.⁶

Thirdly, many studies have documented the increase in production-sharing around the world and especially among Asian economies.⁷ This is the process whereby different stages of production are undertaken in different economies, with labour-intensive processes, such as assembly operations, located in lower-wage economies. As defined by Ng and Yeats (2003):

"production-sharing involves the development of specialised (often) labour-intensive activities within vertically integrated international manufacturing activities."

Production-sharing allows each economy to specialise according to its comparative advantage, as determined, for example, by its factor endowments, technological advancement and the education and skills of its workers, thereby lowering production costs. The reduction in shipping charges in recent decades and the innovation and widespread adoption of new information and communications

technologies during the 1990s has helped to reduce the costs of managing production processes across many economies.

A fourth important factor driving intra-regional trade is the opening-up of the Mainland as a result of the economic reforms undertaken since 1978 and its emergence as a world trading power. Appendix 1 documents the main reforms to the Mainland's export sector. The key ones were the gradual removal of mandatory export planning and restrictions on the retention of foreign exchange earnings in the 1980s, the unification of the exchange rate in January 1994, which led to a 50% depreciation of the official rate and an effective devaluation of around 7%, and, more recently, China's accession to the World Trade Organisation, completed in December 2001.

There is evidence that these reforms have increased market incentives to export. Cerra and Saxena (2002) study the behaviour of China's exports between 1986 and 2001 to estimate price elasticities across a wide range of major export products. In a market-driven economy, the supply of exports should respond positively to the price at which these goods can be sold in foreign markets. However, the authors find that the price elasticity of exports has a perversely negative sign over the sample period, 1985-2001. This changes to a positive sign over the second half of the sample period, 1994-2001, which they interpret as evidence of the success of export reforms in increasing market incentives and encouraging suppliers to respond to price signals. With regard to China's WTO membership, Ianchovichina and Martin (2001) estimate that this will reduce tariffs in manufactures from almost 25% in 1995 to around 7% in 2005, with the most dramatic falls occurring in the textiles and apparel, automobiles, electronics and petrochemicals sectors. China's share of world exports is estimated to rise to 6.8% by 2005, compared with 4.8% had China not joined.

⁶ Although Zebregs cautions that the apparently small "commodity effect" may be because it is only possible to do the analysis at a relatively low level of product disaggregation.

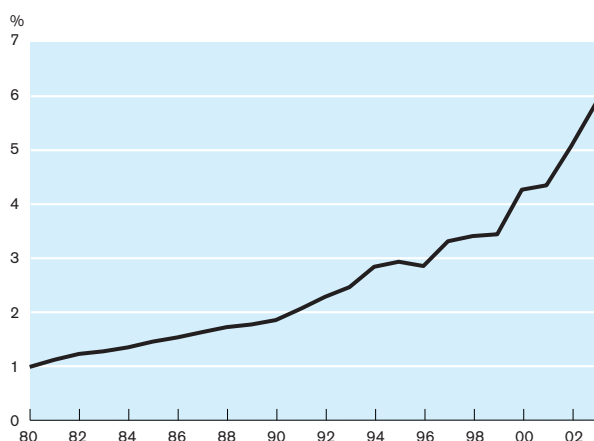
⁷ See Ng and Yeats (2003) and Zebregs (2004).

Role of Mainland China

The increase in market incentives has resulted in an increase in the world market share of the Mainland's exports, which rose from 3% in the mid-1990s to 6% in 2003 (Chart 4). At the same time, Mainland China has played a large role in the expansion of intra-regional exports. Exports to the Mainland from other regional economies accounted for over one-quarter (27%) of the increase in intra-regional trade between 1985 and 2002. Most Asian economies experienced fast growth in their exports to the Mainland during 2002-03, especially the NIEs, Japan, Thailand and the Philippines (Chart 5). For Taiwan, Hong Kong⁸, Korea and Japan, this translated into a high contribution to total export growth reflecting the high share of their exports to the Mainland. For the other economies, the share of exports to the Mainland is still reasonably low.

CHART 4

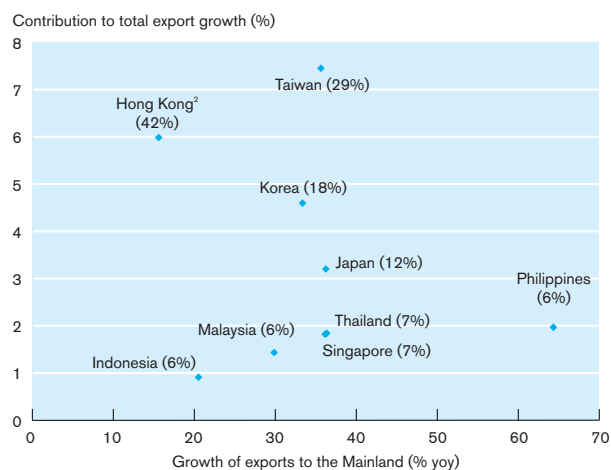
Mainland's share of world exports



Source: IMF Direction of Trade Statistics.

CHART 5

Growth of exports to the Mainland and their contribution to total export growth¹ (average 2002-03)



Notes: 1. Figures in parenthesis indicate the share of exports to the Mainland in total exports in 2003.

2. See footnote 8 in the main text.

Sources: IMF Direction of Trade Statistics, UN Comtrade statistics and CEIC.

Although the growth rate of exports to the Mainland has been high during 2002-04, it is not unprecedented. During the 1994-95 boom on the Mainland, Asian economies also experienced exceptionally fast growth in their exports to that economy (Table 2). The difference in this cycle is that exports to the Mainland account for a higher share of Asian economies' exports, so that their contribution to total export and GDP growth is much more significant. For example, exports from the NIE-3 to the Mainland contributed 3.5 percentage points to the growth of total exports between 2001 and 2003, more than accounting for the growth of total exports of 2.9%. This is substantially higher than the contribution of one-seventh in the first half of the 1990s. Similarly, for Japan and Hong Kong, the contribution of exports to the Mainland more than accounted for overall export growth between 2001 and 2003. Even for the ASEAN economies, where the share of exports to the Mainland is only 5%, these accounted for around one-half of total export growth between 2001 and 2003 compared with an almost negligible contribution in the earlier periods.

⁸ Export data for Hong Kong include re-exports, which account for over 90% of total exports in 2003. If only domestic exports and the value-added margins from re-exports are included, export growth to the Mainland and its contribution to total export growth will be 1.6% and 0.4 percentage point in 2002-03.

TABLE 2

Growth and contribution of Asia's exports to Mainland China

		Growth of exports, by value	Growth of exports to Mainland, by value	Contribution of exports to Mainland to export growth	Memo item: Contribution of exports to Mainland to GDP growth
		(%)	(%)	(% points)	(% points)
1986-1990	Japan	10.3	-12.3	-0.6	-0.1
	HK ¹	22.5	23.0	5.3	5.1
	NIE-3	17.7	38.4	0.5	0.2
	ASEAN-4	14.1	25.9	0.5	0.1
1991-1995	Japan	9.0	29.8	0.9	0.1
	HK ¹	16.0	23.3	6.6	7.5
	NIE-3	14.4	53.0	2.0	0.8
	ASEAN-4	17.6	25.6	0.6	0.2
1996-2000	Japan	1.9	7.5	0.4	0.0
	HK ¹	3.5	4.4	1.5	1.7
	NIE-3	5.4	13.8	1.2	0.6
	ASEAN-4	6.9	11.9	0.3	0.2
2001-2003	Japan	0.2	24.9	2.2	0.2
	HK ¹	3.7	10.6	4.1	5.0
	NIE-3	2.9	25.3	3.5	1.7
	ASEAN-4	2.3	25.7	1.2	0.6

Note: 1. Export data for Hong Kong include re-exports, which account for over 90% of total exports in 2003. If only domestic exports and the value-added margins for re-exports are included in the calculation, total export growth and contribution of exports to the Mainland to overall export growth will be -4.5% and zero respectively in 2001-03.

Sources: IMF Direction of Trade Statistics and UN Comtrade statistics.

III. Production-sharing in Asia

As a precursor to discussing the evidence for greater production-sharing among Asian economies, it is worth looking briefly at the commodities that have dominated intra-regional trade growth. Trade in manufactures has been a key driver of the increase in intra-regional trade since the mid-1980s, rising by around ten-fold compared with a five-fold increase in Asia's exports of manufactures to the rest of the world (Table 3). The share of manufactures in Asia's exports currently accounts for 86% of Asian economies' total exports, up from 60% in the mid-1980s. Within broad groups, trade in "transport and machinery" goods has shown the fastest growth, doubling its share of regional exports from 26% to 50%. Electronic products have grown particularly rapidly. The share of "electronic microcircuits" in regional exports rose by over 10 percentage points to 12% between the mid-1980s and 2001, while the

shares of parts of office machinery rose from 1% to 6% and telecommunications equipment rose from 1% to 3%.⁹ Japan is the largest exporter of transport and machinery equipment, accounting for one-quarter of regional exports, while Mainland China is the largest importer, accounting for one-fifth of regional imports.

Importance of trade in intermediate goods

If production-sharing has been the main driver of intra-regional trade in Asia, we should expect to see faster growth in trade in intermediate goods than in finished manufactured goods among regional economies. There are some data on intermediate goods trade for the Mainland, Hong Kong and Korea, although data are not standardised across economies, making comparisons difficult.

⁹ See Table 12.1 of Ng and Yeats (2003).

TABLE 3

Asia's global and intra-regional trade for parts and components and other major product groups

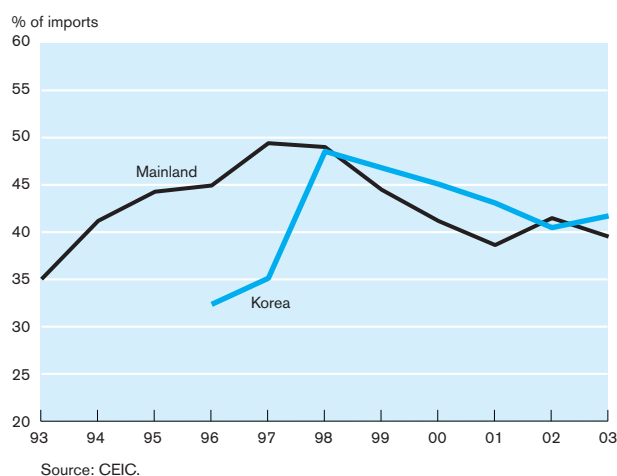
Year	All items	Foods and feeds	Agricultural materials	Mineral fuels	Ores and metals	All manufactures	of which:			of which:
							Chemicals	Transport & Machinery	Other manufactures	Parts and components
Value of exports to Asia in terms of US\$ million										
1984	110,992	8,888	5,655	25,081	3,201	66,391	6,516	28,595	31,280	8,457
1988	197,831	15,920	9,383	17,207	6,832	146,253	14,513	64,616	67,124	23,940
1992	332,906	21,883	8,968	27,540	7,603	263,444	22,944	120,991	119,509	42,258
1996	557,338	30,899	11,889	35,521	13,174	459,287	41,057	248,477	169,753	82,487
2001	711,284	26,353	12,701	41,515	14,573	614,444	60,405	352,196	201,843	123,715
Value of exports to the world in terms of US\$ million										
1984	347,247	20,916	10,442	34,480	5,485	268,948	12,853	138,958	117,138	32,983
1988	563,168	30,172	15,694	21,505	9,275	476,607	25,570	253,374	197,662	73,106
1992	792,063	39,063	14,310	34,213	10,010	684,126	39,071	372,509	272,546	108,885
1996	1,157,622	51,710	19,170	43,275	17,313	1,010,745	67,289	591,553	351,880	178,547
2001	1,374,300	43,664	30,762	53,825	22,744	1,290,354	96,532	731,494	462,329	270,330
Annual growth rate of exports to Asia (%)										
1996-2001	5.0	-3.1	1.3	3.2	2.0	6.0	8.0	7.2	3.5	8.4
1992-2001	8.8	2.1	3.9	4.7	7.5	9.9	11.4	12.6	6.0	12.7
1988-2001	10.3	4.0	2.4	7.0	6.0	11.7	11.6	13.9	8.8	13.5
1984-2001	11.5	6.6	4.9	3.0	9.3	14.0	14.0	15.9	11.6	17.1
Annual growth rate of exports to the world (%)										
1996-2001	3.5	-3.3	9.9	4.5	5.6	5.0	7.5	4.3	5.6	8.6
1992-2001	6.3	1.2	8.9	5.2	9.5	7.3	10.6	7.8	6.0	10.6
1988-2001	7.1	2.9	5.3	7.3	7.1	8.0	10.8	8.5	6.8	10.6
1984-2001	8.4	4.4	6.6	2.7	8.7	9.7	12.6	10.3	8.4	13.2
Share of each product group in Asia's intra-regional exports (%)										
1984	100.0	8.0	5.1	22.6	2.9	59.8	5.9	25.8	28.2	7.6
1988	100.0	8.0	4.7	8.7	3.5	73.9	7.3	32.7	33.9	12.1
1992	100.0	6.6	2.7	8.3	2.3	79.1	6.9	36.3	35.9	12.7
1996	100.0	5.5	2.1	6.4	2.4	82.4	7.4	44.6	30.5	14.8
2001	100.0	3.7	1.8	5.8	2.0	86.4	8.5	49.5	28.4	17.4

Source: Ng and Yeats (1999) updated with 2001 data using UN Comtrade database.

For the Mainland, intermediate imports for processing as a share of total imports rose sharply during the 1990s, from 35% to 50% in 1997, according to Customs data (Chart 6). The share declined following the Asian financial crisis and is currently around 40%.¹⁰ Further evidence of the increased importance of intermediate imports is given by the sharp increase in the Mainland's imports of electronics and information technology goods, following rapid foreign direct investment in these sectors since 1999, which rose by 50% in 2002. These include some final consumer goods, but inputs and components form the lion's share. Goldman Sachs calculates that the correlation between electronic exports to the Mainland and the Mainland's

CHART 6

Imports for processing, Mainland and Korea



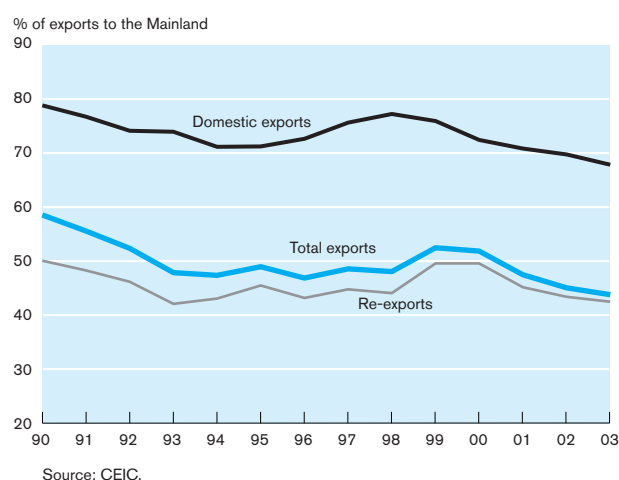
¹⁰ Ministry of Commerce data show that intermediate goods accounted for 73% of imports in the first five months of 2004. The difference may be because only a portion of intermediate goods are for processing and export, while the others are for domestic demand purposes, e.g. replacement parts.

own electronic exports is higher for Asian economies' exports than for the US or EU exports.¹¹ One explanation is that orders for electronic components go predominantly to Asia rather than OECD countries, perhaps reflecting the fact that Asian economies are the originators of outsourcing and assembly operations and provide much of the financing.

For trade between Hong Kong and the Mainland, statistics are available for the value of "outward processing", defined as raw materials or semi-manufactures exported from or through Hong Kong to the Mainland for processing with a contractual arrangement for subsequent re-importation of the processed goods into Hong Kong. Over 90% of Hong Kong's exports are re-exports, that is imports for (re) export with little or no value-added as they pass through.¹² Because Hong Kong serves as an entrepôt for Asian exports to the Mainland, the share of re-exports to the Mainland for outward processing is a potentially useful indicator of the importance of intermediate goods trade for the region as a whole. Over the past 10-15 years, around half of Hong Kong's entrepôt trade with the Mainland was related to outward processing activities, which is a significant portion (Chart 7). The share of Hong Kong's domestic exports to the Mainland for outward processing is much higher, at around 70% to 80%. This reflects the relocation of much of Hong Kong's manufacturing base to Southern China (for example, Guangdong province) and the maintenance of important supply chain linkages between the two regions. By major commodity group, machinery and electrical equipment has played a key role, accounting for one-third of total exports (domestic exports plus re-exports) related to outward processing.

CHART 7

Hong Kong's exports for outward processing



For Korea, the share of imports for export is around 40% to 45% (Chart 6), similar to the shares for the Mainland and Hong Kong. For the other Asian economies, the share of intermediate goods for processing and assembly needs to be estimated by making assumptions about the end-use of imports by commodity. Estimates suggest that this is around 50%¹³, broadly in line with the shares suggested by the analysis of the data available for the Mainland, Hong Kong and Korea.

Trade in parts and components

Data on trade in manufactured parts and components, an important element of intermediate goods exchange, are more complete and available from the United Nations database, UN Comtrade. These have been analysed extensively by Ng and Yeats (1999, 2003) and we draw on their work below. Around one-fifth of regional trade in manufactures is in parts and components rather than final goods. The growth has been fast, at an average annual rate of 17% between 1984 and 2001, accounting for one-fifth of the increase in intra-regional trade during the period (Table 3).

¹¹ See Goldman Sachs (2003).

¹² Re-exports are products which have previously been imported into Hong Kong and which are re-exported without having undergone in Hong Kong a manufacturing process which has changed permanently the shape, nature, form or utility of the product.

¹³ See page 64, Monetary Authority of Singapore (2003). These estimates relate to Emerging Asian economies, however, including Japan is unlikely to lower the figure because Japan is one of the largest exporters of parts and components for processing.

Japan accounts for around one-third of all regional exports of parts and components and is the single most important supplier of these products for all but two of the regional economies (Table 4). The exceptions are Hong Kong and Singapore, which import most of their parts and components from the Mainland and Malaysia respectively. Ng and Yeats (1999) show that component trade is concentrated in a relatively few items, with just four out of 60 SITC groups accounting for almost 85% of regional trade and little variation in the relative importance of the largest categories across Asian economies. Office machinery and telecoms equipment account for about two-thirds of this exchange.

Revealed comparative advantage

Greater production-sharing among Asian economies should, in principle, allow them to reap the gains from specialisation and trade. An important issue is whether the trade in intermediate goods has

expanded along the lines of comparative advantage, or whether other factors have been more important.

The Heckscher-Ohlin-Samuelson theory of international trade suggests that countries will tend to export those goods that use relatively intensively their relatively abundant factors of production. In its simplest form, labour (capital) abundant countries will export labour (capital) intensive goods because those goods will have the lowest factor prices giving exporting countries a comparative cost advantage. Applied to production-sharing operations, the theory predicts manufacturing stages that are labour-intensive in nature, like assembly operations, would be transferred from rich to poor economies where wage costs are relatively low. One problem with empirical tests of the theory is that factor endowments are not observable. This has led to the development of measures of "revealed" comparative advantage (RCA) to identify countries having factor endowments that make it advantageous for them to

TABLE 4
Intra-trade and trade balances in parts and components among Asian economies (2001)

Exporter \ Importer	Mainland	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand	Japan	Total
Value of exports of parts and components (US\$ million)											
Mainland	0	1,542	313	2,442	1,267	342	759	3,279	952	8,292	19,188
Hong Kong	13,556	0	97	2,038	2,070	494	1,980	2,928	513	6,119	29,795
Indonesia	109	13	0	114	40	10	219	64	82	1,558	2,209
Korea	1,695	230	64	0	330	183	287	754	162	4,317	8,022
Malaysia	1,394	745	500	748	0	416	1,697	1,102	687	3,610	10,899
Philippines	170	502	26	788	259	0	804	523	256	3,683	7,011
Singapore	1,989	808	1,426	838	4,611	390	0	1,118	1,623	3,890	16,693
Taiwan	1,308	237	42	719	303	202	529	0	97	3,502	6,939
Thailand	1,030	153	139	486	729	625	490	363	0	3,714	7,729
Japan	5,587	238	500	1,728	1,086	1,229	766	2,866	1,230	0	15,230
All the above	26,838	4,468	3,107	9,901	10,695	3,891	7,531	12,997	5,602	38,685	123,715
Share of exporter in total imports of the trading partner (%)											
Mainland	0.0	8.0	1.6	12.7	6.6	1.8	4.0	17.1	5.0	43.2	100
Hong Kong	45.5	0.0	0.3	6.8	6.9	1.7	6.6	9.8	1.7	20.5	100
Indonesia	4.9	0.6	0.0	5.2	1.8	0.5	9.9	2.9	3.7	70.5	100
Korea	21.1	2.9	0.8	0.0	4.1	2.3	3.6	9.4	2.0	53.8	100
Malaysia	12.8	6.8	4.6	6.9	0.0	3.8	15.6	10.1	6.3	33.1	100
Philippines	2.4	7.2	0.4	11.2	3.7	0.0	11.5	7.5	3.7	52.5	100
Singapore	11.9	4.8	8.5	5.0	27.6	2.3	0.0	6.7	9.8	23.4	100
Taiwan	18.9	3.4	0.6	10.4	4.4	2.9	7.6	0.0	1.4	50.5	100
Thailand	13.3	2.0	1.8	6.3	9.4	8.1	6.3	4.7	0.0	48.0	100
Japan	36.7	1.6	3.3	11.3	7.1	8.1	5.0	18.8	8.1	0.0	100
Trade balance of the exporter											
Value (US\$ million)	7,650	-25,327	898	1,879	-204	-3,120	-7,736	6,058	-2,127	23,455	—
Share of exports (%)	28.5	-566.8	28.9	19.0	-1.9	-80.2	-102.7	46.6	-38.0	60.6	—

Source: Estimates by Ng & Yeats (2003).

specialise in producing particular products (Balassa, 1965). Specifically, a country, *i*, is said to have a revealed comparative advantage in production if its exports of a particular item, *j*, expressed as a share of its exports is higher than the share of world exports of item *j* in world exports:

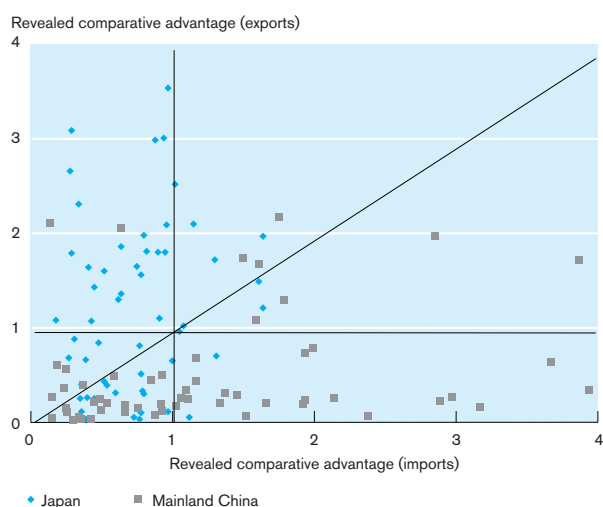
$$RCA_{ij} = \left(\frac{x_{ij} / \sum_j x_{ij}}{\sum_i x_{ij} / \sum_i \sum_j x_{ij}} \right)$$

where x_{ij} and $\sum_j x_{ij}$ are the value of exports of item *j* by country *i* and the world respectively, and $\sum_i x_{ij}$ and $\sum_i \sum_j x_{ij}$ are the value of total exports of country *i* and the world.

Ng and Yeats (1999, 2003) apply this concept to import data on parts and components to identify those economies that have a revealed comparative advantage in assembly operations. The basic intuition is that imports of parts and components do not generally have an end use in themselves, but are used in the assembly of finished manufactures. Therefore, if an economy has a high propensity to import these goods relative to the rest of the world, we can infer that it has a revealed comparative advantage in processing and assembly operations.

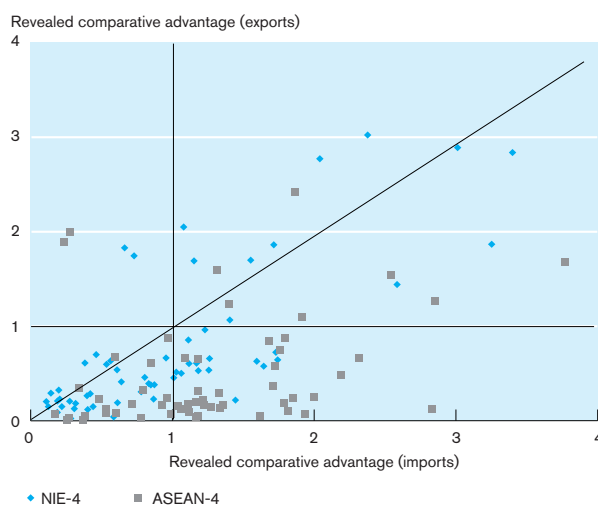
According to the theory, low-wage economies like the Mainland and ASEAN will tend to display a high propensity to import parts and components (relative to the rest of the world) and a low propensity to export the same items compared with higher-wage economies, such as Japan. Charts 8 and 9 show revealed comparative advantage measures for imports and exports, on the x and y-axis respectively, for different categories of parts and components for the Mainland versus Japan, and the NIEs versus ASEAN-4. If the theory is correct, it predicts a bunching of observations to the right of the 45-degree diagonal line for the relatively low-wage economies, indicating a high propensity to import components, and the mirror image for high-wage economies.

CHART 8
Comparison of RCA estimates:
Mainland China versus Japan



Source: Estimates by Ng and Yeats (2003).

CHART 9
Comparison of RCA estimates:
NIEs versus ASEAN-4



Source: Estimates by Ng and Yeats (2003).

As expected, the Mainland and ASEAN-4 have a revealed comparative advantage in the import and processing of more than half of the 60 parts and components categories identified here (for Indonesia, the figure is higher, at two-thirds). This is higher than the corresponding estimate of one-fifth for the production and export of these same items. The pattern is the opposite for Japan, which has a revealed comparative advantage in the production and export of over half of the product groups, three times higher than its corresponding estimate for import and processing.

Results are more mixed for the NIE-4 economies (Chart 9), with most of the observations scattered around the 45-degree diagonal line, especially for Hong Kong and Singapore, suggesting a high propensity to both import and export parts and components. These results may be affected by the special role of Hong Kong and Singapore as regional centres for trade, and the high proportion of re-exports in their trade flows. However, the importance of re-exports cannot explain their sizeable trade deficits in parts and components, as noted by Ng and Yeats (2003). This runs contrary to the idea that high-wage economies should be net exporters of parts and components. One explanation is that, following the Asian financial crisis, these economies took measures to upgrade the composition of their exports by encouraging the production of high-tech products. This strategy required increased imports of parts and components primarily of telecoms and office machinery and, in the case of Hong Kong, drew on the capabilities of high-tech areas within China. These categories accounted for 75% of Hong Kong's imports of parts and components from China in 2001.¹⁴ If the Mainland and Hong Kong's intra-regional trade is netted out, China including Hong Kong had a trade deficit in intra-regional trade in parts and components in 2001, which is consistent with the theory.

¹⁴ Similarly, it has long been recognised that Japan and Germany – both high wage economies – are major suppliers of finished goods that utilise US components, suggesting that the US has a comparative advantage in exporting high-tech components.

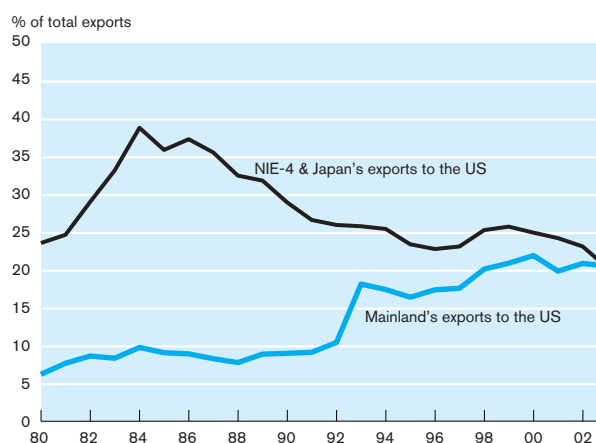
IV. Competition in developed markets

What does all of this imply for competition among Asian economies in third markets outside the region, mainly the US and Europe? It is well-documented that the Asian NIEs have come under intense competitive pressures from the lower-wage economies of ASEAN and the Mainland over the past two decades. This can be seen in shifts in the share of these economies' exports to the US, which for most is still the single most important export market (except Hong Kong and Taiwan where the Mainland has overtaken the US in importance).

Between 1985 and 2002, Asian economies' exports to the US as a share of total exports declined from 33% to 22%, and from 29% to 20% for emerging Asian economies (Table 1). The largest declines were among the NIE-3 whose aggregate export share to the US declined by a massive 20 percentage points, from 39% to 19% over the period. By contrast, the Mainland experienced a sharp increase in its export share to the US, which rose by 13 percentage points from 9% to 22% (Chart 10). It also managed to increase its export share to the EU-15, from 9% to 15%, although it is not clear that this was at the expense of other Asian economies' export shares which were reasonably stable over the period.

CHART 10

Asia's export share to the US: NIEs/Japan versus Mainland



Sources: IMF Direction of Trade Statistics, UN Comtrade statistics and CEIC.

Studies examining changes in competitiveness by industry suggest that the loss of competitiveness of the NIEs in merchandise trade has been widespread across many products and sectors.¹⁵ Bender and Li (2002) find evidence of a systematic shift in competitiveness away from the NIEs and in favour of the ASEAN-4 (and Latin American) economies over the period 1981-1997. The NIEs experienced a substantial decline in the number of sectors in which they had a revealed comparative advantage, while the ASEAN-4 experienced a rise. In general, the sectors in which the NIEs lost competitiveness were those in which the ASEAN-4 gained it. The authors concluded that “[d]espite East Asia’s strong growth in exports in the 1980s and 1990s, its export pattern is losing its comparative advantage to the lower-tier major ASEAN-4 and Latin American countries”.¹⁶

As noted in the above citation, the NIEs have experienced fast export growth even though their competitiveness in traditional markets has declined. This is consistent with the view that the NIEs have successfully switched their export strategies towards specialising in the export of high value-added components to low-wage economies for processing and assembly as competitive pressures for unskilled manufacturing processes have intensified. As noted earlier, NIEs exports have been a key driver of the growth of intra-regional exports.

China’s role: competitive or complementary?

Greater production-sharing among Asian economies tends to suggest that China’s emergence as a major trading partner has benefited regional economies rather than posed a competitive threat. Ahearne et al. (2003) examine this issue more formally by looking at correlations between the Mainland’s export growth and that of other emerging economies.¹⁷ The authors regress export growth of individual Asian economies

on the growth rate of world GDP, its own effective exchange rate and China’s exports using pooled GLS. All variables are in real terms and in annual changes:

$$Export_{it} = \alpha_0 + \beta_1 ForeignDemand_{it} + \beta_2 ER_{it} + \beta_3 ChinaExports_{it} + \varepsilon_{it}$$

where:

$Exports_{it}$ = Export growth of country i at period t

$ForeignDemand_{it}$ = World GDP, excluding country i at period t.

ER_{it} = Real effective exchange rate of country i at period t.

$ChinaExports_{it}$ = Exports of Mainland China’s.

ε_{it} = Error term for country i at period t.

The authors find a positive coefficient on China’s export growth after controlling for world income growth and competitiveness (although it is not significant), which they interpret as evidence of complementarity between exports of the Mainland and other emerging Asian economies. Their results are shown in the first column of Appendix 2. We have replicated their finding, using annual data between 1983 and 2003, including Japan and dummy variables for the Asian financial crisis, and excluding the lagged dependent variable. Our results are shown as equation 2, Appendix 2. We also experiment with a random effects model, which gives similar results to the fixed effects model (equation 3). Finally, we compute Seemingly Unrelated Regression Estimates to take account of possible heteroskedasticity across our sample, and the likelihood of contemporaneous correlation between export growth across different Asian

¹⁵ See Ahearne et al. (2003) and Bender and Li (2002).

¹⁷ See Ahearne et al. (2003).

¹⁶ The analysis uses the UNIDO (1999) database and the authors aggregate the 3-digit SITC codes covering 31 manufacturing sectors. Taiwan is not included in the database so the NIE data cover Hong Kong, Singapore and Korea only.

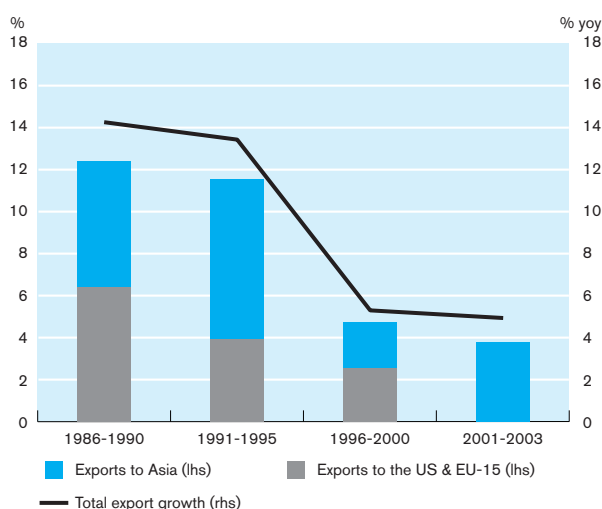
economies arising from common shocks or influences that are omitted from the regression (equation 4). Potentially, this yields more efficient regression estimates than the standard GLS models. The results are similar, suggesting that the finding of complementarity between the Mainland and regional exports is robust to different estimation procedures.¹⁸

Asia's dependence on foreign markets

Does the rise in intra-regional trade imply that Asia is less dependent on final demand in developed markets outside the region? For most Asian economies, the US remains the largest export market despite the high growth of exports to Mainland China. The exceptions are Hong Kong and Taiwan, where exports to the Mainland have overtaken the US. However, there have been important shifts in the relative importance of the contribution of exports to the US and Europe to total export growth in Asian economies over the past two decades. The contribution to growth of exports to developed markets outside the region has declined and that of intra-regional exports has risen (Chart 11). A similar pattern is observed for GDP contributions.

CHART 11

Contribution to Asia's export growth by destination



Sources: IMF Direction of Trade Statistics, UN Comtrade statistics, and CEIC.

¹⁸ If we shorten the sample period to 1988-2003 – when retention ratios were abolished on foreign exchange earnings of the Mainland's entities – the coefficient on the Mainland's exports is significant for Hong Kong and Taiwan.

This pattern is true for NIEs and ASEAN-4. Exports to the US and Europe made a zero or negative contribution to total export growth in 2001-2003, compared with an average contribution of around one-fifth between 1986 and 2000 (Table 5). By implication, the contribution of intra-regional exports to total export growth has risen. In 2001-2003, intra-regional exports more than accounted for the growth of total exports by value, contributing 2.4 percentage points in the case of Japan, 3.2 percentage points for the NIE-4 and 4.3 percentage points for ASEAN-4. As shown in Table 2, for the NIEs and Japan, most, if not all, of this was accounted for by the growth of exports to Mainland China.

For Mainland China, the opposite pattern is observed. The relative contribution of the Mainland's exports to the US and Europe to total export growth has increased, while that of intra-regional exports has declined. Between 2001 and 2003, the contribution to growth of exports to other regional economies versus exports to the US and Europe was about equal, each region accounting for around two-fifths of the 18.2% growth in total exports. In comparison, between 1986 and 2000, the contribution to growth of intra-regional exports averaged one-half, higher than the contribution of exports to the US and European markets, of one-fifth. Thus, Mainland China has become increasingly dependent on demand in developed markets outside the region.

We have also estimated the contribution of intra-regional exports to GDP growth in these economies, but this needs to be interpreted with caution for two reasons. First, they are in value terms and relate to exports only – the contribution of net exports will be much lower. Secondly, they are not in value-added terms. This is important for the Mainland since the value-added of goods imported for processing and assembly and re-export may be quite low.

Notwithstanding these caveats, there are some interesting points to note. For Mainland China, intra-regional exports accounted for a higher proportion of GDP growth between 2001 and 2003 than in earlier periods, even though their relative contribution to

TABLE 5

Contribution to Asia's growth of exports by destination

		Growth	Growth	Growth			Growth	Contribution	Contribution	Growth		
		of exports, by value	of GDP, by value	of exports to the rest of Asia, by value	Contribution to export growth	Contribution to GDP growth	of exports to the US, by value	to export growth	to GDP growth	of exports to EU-15, by value	to export growth	to GDP growth
		(%)	(%)	(%)	(% points)	(% points)	(%)	(% points)	(% points)	(%)	(% points)	(% points)
1986-1990	Mainland China	18.2	5.7	20.9	12.1	1.4	18.0	1.4	0.2	23.9	2.2	0.2
	Japan	10.3	18.3	15.0	3.7	0.4	6.8	2.5	0.3	21.3	3.3	0.4
	NIE-4	19.0	20.4	23.7	7.4	4.2	12.2	4.5	2.6	28.8	3.6	2.0
	ASEAN-4	14.1	8.6	13.3	6.8	1.9	13.6	2.7	0.7	21.2	3.2	0.9
1991-1995	Mainland China	19.2	13.5	17.1	9.5	1.7	38.9	4.4	0.8	25.9	2.8	0.5
	Japan	9.0	11.8	17.0	5.8	0.5	6.1	1.8	0.2	4.0	0.7	0.1
	NIE-4	14.9	14.0	20.5	8.4	4.4	9.0	2.1	1.1	12.4	1.8	1.0
	ASEAN-4	17.6	13.8	17.0	8.7	2.9	17.9	3.5	1.2	15.1	2.4	0.8
1996-2000	Mainland China	13.7	9.1	10.3	5.0	0.9	20.8	4.1	0.8	16.8	2.4	0.5
	Japan	1.9	-1.8	2.0	0.3	0.0	3.6	1.1	0.1	2.4	0.4	0.0
	NIE-4	4.4	2.1	5.3	2.3	1.4	5.9	1.3	0.8	5.7	0.8	0.5
	ASEAN-4	6.9	-0.7	7.6	3.6	2.0	7.7	1.6	0.7	6.7	1.0	0.5
2001-2003	Mainland China	18.2	9.3	15.1	7.0	1.7	16.4	3.4	0.8	22.5	3.4	0.8
	Japan	0.2	-2.7	5.7	2.4	0.2	-6.6	-2.0	-0.2	-1.8	-0.4	0.0
	NIE-4	3.1	2.0	6.5	3.2	1.9	-4.7	-1.0	-0.7	-0.3	-0.1	-0.1
	ASEAN-4	2.3	8.2	8.2	4.3	2.1	-4.9	-1.0	-0.6	-0.6	-0.1	-0.1

Note: Export data include re-exports.

Sources: IMF Direction of Trade Statistics and UN Comtrade statistics.

export growth declined. They accounted for around one-fifth (1.7 percentage points of 9.3%) of GDP growth compared with an average of one-sixth between 1986 and 2000. This reflects the rising share of exports in GDP. For Japan, although exports to other Asian economies, and particularly Mainland China, have grown exceptionally fast over the past few years, they have only made a small contribution to GDP growth. By contrast, for the NIEs, intra-regional exports have been a key driver of GDP growth and contributed 1.9 percentage points to GDP growth of 2.0% between 2001 and 2003 reflecting fast growth of exports to other regional economies, especially the Mainland, and their high share in GDP. Finally, for the ASEAN economies, intra-regional trade accounted for around one-quarter of GDP growth over the same period.

V. Conclusions

This paper has examined trends in Asian exports over the past two decades. The dominant trends have been an increase in Japanese and NIEs exports to other regional economies, especially to Mainland

China, and a decline in their exports to the developed markets of the US and Europe. The gap in exports to the US and Europe has been partly filled by the Mainland. These shifts are consistent with greater production-sharing among Asian economies, as evidenced by increased trade in intermediate goods.

Greater production-sharing has allowed Asian economies to reap the benefits of specialisation. Ng and Yeats (2003) argue that “*the evidence indicates that East Asia’s regional exports expanded along lines consistent with comparative advantage without any significant policy distortions*”. Analysis of intra-regional trade patterns in manufactured parts and components bears this out. The low-wage economies of the Mainland and ASEAN appear to have a “revealed” comparative advantage in processing and assembly operations. They have increasingly sourced components from relatively high-wage Asian economies that have turned their comparative advantage towards producing and exporting high value-added manufactured components.

Some of the growth in intra-regional trade represents a redirection of trade flows. Previously, the NIEs and Japan competed with low-wage regional economies in exporting finished manufactures to developed markets outside the region. Currently, they tend to focus more on supplying parts and components to lower-wage regional economies for processing and onward export outside the region. Thus, despite the sharp increase in intra-regional trade over the past two decades, the dependency of Asian economies on demand outside the region remains high, and has increased for the Mainland. For most economies, the US remains the largest export market, except Hong Kong and Taiwan, which have closer trade links with the Mainland.

Nevertheless, Mainland China has played a large role in the growth of intra-regional trade flows, and its slowdown could have a significant impact on other regional economies via slower export growth. That will depend on the magnitude of the slowdown and its composition. If the authorities manage to achieve a soft landing, which is concentrated in domestic demand components with exports holding up, the impact on regional growth may be limited. This reflects the continued high dependence of Asian exports on demand in the US and Europe. Of course, there are other channels through which a slowdown on the Mainland may affect regional growth which are beyond the scope of this paper, including changes in global commodity prices (and the impact on the terms of trade of regional economies) and in asset prices.

APPENDIX 1

Liberalisation of China's foreign trade

Date of reform	Measures
Pre-1978	Exporters supplied fixed quantities to 10-16 Foreign Trade Corporations (FTCs). Volumes were set at levels necessary to finance planned imports, to meet the shortfall of domestic production, at prices set by the government. Foreign exchange earnings were surrendered to the Central Bank, and any export losses were subsidised by the Central Government.
1984 reforms	<ul style="list-style-type: none"> Mandatory export planning reduced to 60% of exports, with procurement prices fixed by the FTC and target quantities assigned to the producing enterprises. For an additional 20%, value targets were assigned to the provinces; the remainder was non-planned. Local governments were granted the right to retain a share of foreign exchange earnings.
1988	<ul style="list-style-type: none"> Mandatory export planning sharply reduced. Retention ratios for foreign exchange increased for enterprises that exceeded their targets. Foreign exchange earnings could be sold at FEACs at a weighted average of official exchange rate and swap rate.
1991	Mandatory export planning abolished.
1994	<ul style="list-style-type: none"> Retention quota system abolished. January 1994: Exchange rate unified at prevailing swap rate leading to a 50% depreciation of the official exchange rate.
1992-1999	<ul style="list-style-type: none"> Reduction in the number of non-tariff barriers. Number of products subject to quotas and licenses fell from 1,247 tariff lines in 1992 to 261 in 1999, with larger than average cuts in the manufacturing sector. October 1997: Tariff reform which reduced average tariffs to significantly below 20%. Exemptions for processing trade and for foreign investment. 60% of imports were duty-free or subject to reduced tariffs in 2000 (China Customs authorities).
December 2001	<p>China completed World Trade Organisation entry.</p> <p>Implications:</p> <ul style="list-style-type: none"> Non-discrimination between suppliers in accordance with Most Favoured Nation principle. Abolition of non-tariff barriers to trade. Implementation of Intellectual Property regimes. Increased transparency of China's trade regime and provision for judicial review of administrative decisions (Protocol of Accession)

Sources: Ianchovichina and Martin (2001) and Zebregs (2004).

APPENDIX 2

Regression results

$Export_{it} = \alpha_0 + \beta_1 ForeignDemand_{it} + \beta_2 ER_{it} + \beta_3 ChinaExports_{it} + \varepsilon_{it}$				
	Equation 1 Ahearne et al. (2003) regression results for ASEAN-4 plus NIEs	Equation 2 Fixed effects estimation, including Japan	Equation 3 Random effects estimation	Equation 4 SUR estimation
• Growth of Mainland China's real exports	0.11 (0.08)	0.14 (1.58)**	0.08 (0.64)	
HK				0.06 (0.28)
Indonesia				-0.49 (-1.75)**
Japan				0.18 (1.25)*
Korea				0.19 (1.21)*
Malaysia				0.06 (0.28)
Philippines				0.13 (0.46)
Singapore				0.24 (1.12)
Taiwan				0.16 (0.70)
Thailand				0.36 (1.31)*
• Growth of world demand	3.13 (0.47)	2.06 (2.71)***	1.64 (1.63)**	
HK				2.45 (1.43)**
Indonesia				-2.65 (-1.18)*
Japan				1.42 (1.21)*
Korea				2.15 (1.55)**
Malaysia				0.77 (0.45)
Philippines				2.52 (1.04)
Singapore				3.03 (1.71)***
Taiwan				3.56 (1.79)***
Thailand				1.68 (0.73)
• Change in real exchange rate	-0.33 (0.10)	-0.28 (-3.34)***	-0.74 (-8.03)***	
HK				0.06 (0.37)
Indonesia				-1.01 (-5.65)***
Japan				-0.001 (-0.02)
Korea				-0.22 (-1.47)**
Malaysia				-0.11 (-0.84)
Philippines				-0.35 (-2.24)***
Singapore				0.04 (0.22)
Taiwan				-0.32 (-1.08)
Thailand				-0.40 (-1.34)*
• Lagged dependent variable	0.02 (0.07)			

- Notes:
1. t-statistics are shown in parenthesis.
 2. With regard to Ahearne et al. (2003), economies' fixed effects are not shown. For SUR model, economies' fixed effects and dummy variable estimates are also not shown in this table.
 3. Significance at 10%, 15% and 25% levels are indicated by (***), (**) and (*) respectively.

Sources: Export data are from IMF International Financial Statistics (IFS) and CEIC; world GDP data from the World Economic Outlook database; exchange rate data from JP Morgan.

APPENDIX 3

Notes on data issues

1. The data in this paper come from a variety of sources. We analyse trade flows using export rather than import data, mainly using IFS for total exports. For the trade matrix of exports among economies, we use IMF Direction of Trade Statistics (DOTS) for most economies up to 2002. For the 2003 figures, we took the growth rate of exports for each economy from the CEIC database, as 2003 data are not available in DOTS (CEIC and DOTS estimates show a similar growth rate for earlier years). Data on parts and components use United Nations Comtrade Statistics Database. For our empirical work, the data sources are given in the notes to the table in Appendix 2.
2. For Taiwan's exports by destination, which are not available from DOTS, we use trading partners' imports from Taiwan in UN Comtrade Statistics Database. It is noted that there is a large discrepancy between the Mainland's imports from Taiwan and Taiwan's exports to the Mainland (from the CEIC database), with the former much larger in size. We think that these figures may include some goods passing through Hong Kong (i.e. Hong Kong's re-exports). The difference is much smaller for Singapore, Thailand and Korea.
3. Export data for Hong Kong and Singapore include re-exports except where stated.

REFERENCES

- Ahearne, Alan G., John G. Fernald, Prakash Loungani and John W. Schindler (2003), "China and Emerging Asia: Comrades or Competitors?" *International Finance Discussion Papers*, No. 789.
- Balassa, Bela (1965), "Trade Liberalisation and Revealed Comparative Advantage", *The Manchester School of Economic and Social Studies*, Vol. 33, May.
- Bender, Siegfried and Kui-Wai Li (2002), "The Changing Trade And Revealed Comparative Advantages of Asian and Latin American Manufacture Exports", *Economic Growth Centre Discussion Paper*, No. 843.
- Cerra, Valerie and Sweta Chaman Saxena (2002), "An Empirical Analysis of China's Export Behaviour", *IMF Working Paper*, 02/200.
- Deardorff, Alan V. (1984), "Testing Trade Theories and Predicting Trade Flows", *Handbook of International Economics*, Vol. I, 468-513.
- Fernald, John, Hali Edison and Prakash Loungani (1999), "Was China the First Domino? Assessing Links between China and Other Asian Economies", *Journal of International Money and Finance*, 18, 515-535.
- Ianchovichina, Elena and Will Martin (2001), "Trade Liberalisation in China's Accession to the World Trade Organization", World Bank.
- Kim, Sun Bae, Adam Le Mesurier, Jonathan Anderson, Dick Li, Enoch Fung and Li Lian Lim (2003), "What is Driving Asia's Exports to China?", *Goldman Sachs Asia-Pacific Economics Analyst*, Issue No. 2003/01.
- Lau, Francis, Yik-ko Mo and Kim-hung Li (2004), "The Impact of a Renminbi Appreciation on Global Imbalances and Intra-Regional Trade", *Hong Kong Monetary Authority Quarterly Bulletin*, 3/2004.
- Lee, Young Sun (1986), "Changing Export Patterns in Korea, Taiwan and Japan", *Review of World Economics*, 122 (1), 150-163.
- Memedovic (1994), "On Theory and Measurement of Comparative Advantage", Tinbergen Institute Research Series, No.65 (Amsterdam: Thesis Publishers).
- Monetary Authority of Singapore (2003), *Macroeconomic Review*, 1/2003, 60-70.
- Ng, Francis and Alexander Yeats (1999), "Production Sharing in East Asia: Who Does What for Whom and Why?", *World Bank Policy Research Working Paper*, 2197
- Ng, Francis and Alexander Yeats (2003), "Major Trade Trends in East Asia: What are Their Implications for Regional Cooperation and Growth?", *World Bank Policy Research Working Paper*, 3084.
- Zebregs, Harm (2004), "Intraregional Trade in Emerging Asia", *IMF Policy Discussion Paper*, 04/1.