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China's Competitive Performance: A Threat To East Asian Manufactured Exports?

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There is growing concern in Southeast and East Asia about the competitive threat posed by China's burgeoning exports, exacerbated by its accession to the WTO. The threat is not confined to labour-intensive products but spans the whole technological and skill range. At the same time, China is rapidly raising its imports from the region, and it is not clear whether its burgeoning exports will damage its neighbours. We examine the dimensions of China's competitive threat in the 1990s, benchmarking competitive performance by technology and market, and finds that market share losses are so far mainly in low technology products, with Japan being the most vulnerable market. We analyse market share changes and highlight product groups that are directly or indirectly exposed to a competitive threat. We examine intra-regional trade and find that China and its neighbours are raising high technology exports in tandem: the nature of the international production systems involved lead to complementarity rather than confrontation. China is thus acting as an engine of export growth for its neighbours in terms of direct trade. However, this will change as China moves up the value chain and takes on the activities that have driven East Asian export growth.

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Introduction

Concern about China's competitive threat is widespread (in developed economies like US as well as developing ones like Mexico), but is strongest in East and Southeast Asia. China's burgeoning exports – backed by cheap and productive labour, a large stock of technical manpower, huge and diversified industrial sector, attractiveness to foreign investors, pragmatic use of industrial policy, and, now, freer access to world markets under WTO – lead to apocalyptic visions of export losses.[2] China is most threatening to neighbours that rely primarily on low wages for their export advantage. However, as it upgrades its export structure, the more advanced economies (Singapore, Hong Kong, Korea and Taiwan) also fear for their competitiveness. The current hollowing out of their low-end manufacturing may soon extend to complex production, design, development and related services. Domestic markets are also threatened by China, but so far most attention seems to have been on exports.

Offsetting this threat are the promise of the giant Chinese market (WTO accession is only one of several initiatives to liberalize regional trade) and the potential for collaboration with it in exporting to the rest of the world. Trade within the East Asian region is flourishing. China is a growing importer from the region of natural resources that it does not possess. It is also raising imports of manufactured products. Its advanced neighbours are selling it sophisticated consumer and producer goods, and using it as a base for processing exports to third countries. The multinational companies (MNCs) that now account for around half of Chinese exports (and far more of its high technology exports, UNCTAD, 2002) are incorporating China into production systems spanning the region ('fragmentation' and 'segmentation' are used to describe this phenomenon[3]), so promoting considerable intra-firm trade with other regional bases. China's own enterprises are likely to specialize with respect to regional counterparts and so raise intra-industry trade in differentiated products. Perhaps worryingly for competitors in other regions, such integration can lead China to complement regional competitiveness as a whole, rather than substitute its exports for those of its neighbours.

It is difficult to assess, however, whether complementarity between China and the regional economies will fully offset its competitive threat. The dynamics and complexity of the interactions make it impossible to quantify the outcome, even to predict broad directions.[4] The basic issue is whether China's higher wage neighbours can move into more advanced export activities or functions rapidly enough to permit continued export expansion. If they can, they can continue with export-led growth. If they cannot, they will suffer export deceleration and/or a shift in specialization towards primary products or slow-growing segments of manufactured exports. The outcome, in other words, will depend on the relative growth of technological and other capabilities in Chinese and regional enterprises, with the former having such advantages as lower wages, larger scale economies, greater industrial depth, pools of technical skill and a proactive government. However, as East Asian

[2] For instance, according to *The Economist* (2003), "[China] is already by far the biggest garment exporter in the world, with average wages in the industry of 40 cents an hour – less than a third of, say, Mexico's. Now that China belongs to the World Trade Organization, moreover, it will benefit from an agreement to eliminate quotas completely by 2005. As a result, according to estimates by the World Bank, China's share of world garment exports will increase from about 20% today to 50% by the end of the decade. Shoes, semiconductors and televisions are expected to follow. China already makes over half of the world's shoes, and Malaysia frets over the exodus of electronics factories from Penang … to Guangdong and the Yangtze delta … Comparisons are made with Manchester during the Industrial Revolution. China, it is said, is becoming the 'workshop of the world'. Andy Xie, an economist with Morgan Stanley in Hong Kong, reckons that by 2005 China's exports could have exceeded those of Japan. He also thinks that China has a lot to do with deflation in other countries, because it causes price wars and pushes down profit margins of companies elsewhere. China's industrialization, he says, "devalues manufacturing assets outside China"." The local media in the East Asian region regularly carries such dire predictions.

[3] See, for instance, Arndt and Kierzkowski (2001) and Dicken (1999). Segmentation in the context of East Asia is explored by Borrus *et al.* (2000), Lemoine and Unal-Kesenci (2002) and Ernst (2000, 2001) and Ernst and Kim (2002).

[4] Most studies analyze the impact of China's WTO accession on its neighbours rather than its competitive threat to their exports, but several do touch on this aspect as part of the assessment. See, for instance, Ianchovichina *et al.* (2003), Ianchovichina and Martin (2001), Lall and Albaladejo (2002), Li (2002), Rasiah (2002), Shafaeddin (2002) and Wook and Hongyul (2002). A few attempts have been made to quantify the effects using CGE (computable general equilibrium) models, for example by Ianchovichina *et al.* (2003). However, their quantitative results must be treated with considerable caution; they are based on several simplifying and static assumptions on demand and supply elasticities, technological change, structural shifts, factor movements, production efficiency and so on.

countries differ widely in these factors (Lall, 2001), they face different kinds and intensity of competitive threat. The nature of the threat depends, moreover, on the organisation of the production and marketing system: independent local firms are likely to compete more directly than affiliates of the same MNC spread over different countries in an integrated system.

This paper does not try to measure China's competitive threat or its effects, but to map relative export performance in the 1990s by technology and destination and so assess where the threat appears most intense. We focus on major East Asian exporters[5] and on exports to third markets, but we also analyse complementarities between China and East Asia, particularly in electronics, the region's largest export and the one where MNC systems dominate. As the 1990s predate China's WTO accession, we do not go into the implications of this accession; however, the analysis of competitive trends has implications for the evolution of future trade by the region as liberalization grows.

Background on Chinese export performance

Chinese manufactured exports grew by 16.9% per annum over 1990-2000, compared to 6.4% for the world, 12.0% for all developing countries and 10.3% for the rest of East Asia. Its share of world manufactured exports rose from 1.7% to 4.4% over the decade and continued rising rapidly.[6] Thus, by 2002 China accounted for 5.1% of world merchandise exports; it was then the fifth largest exporter (after USA, Germany, Japan and France, and ahead of the UK). China's share of developing world manufactured exports rose from 11% to 20% over the 1990s and of the East Asian region excluding China from 18.7% to 41.8%. Its export gains (see below) spanned the entire technological spectrum, and were most dynamic in the complex end of the range, in products that have recently driven the export growth of the rest of East Asia.

This export surge is likely to be sustained for some time to come. China has 'spare capacity' in that its per capita exports are still relatively small,[7] wages are much lower than in its main neighbours and it has large reserves of cheap and disciplined labour (though drawing it into exports will involve the cost of building links with the interior).[8] More importantly, its advantages are not static (confined to cheap labour); they are upgrading rapidly. China is investing heavily in technology and advanced skills; for example, the share of the relevant age group enrolled in tertiary education rose from 9 percent in 1997 to 13 percent in 2000 (UNESCO website). It is exploiting the scale offered by its giant market to become competitive in capital-intensive activities beyond the reach of many neighbours. It is using its diverse industrial base to deepen local content. It is drawing in export-oriented FDI at an impressive rate, using its market attractions to induce investors to raise local R&D and linkages; till now it has been able to impose performance requirements of the type soon to be banned under WTO rules.

WTO accession may constrain China's ability to use industrial policy (Nolan, 2001) but it will also open up new export opportunities, particularly in textiles and garments.[9] Accession may also enhance

[5] 'East Asia' here covers eight countries: the four mature Tiger economies (Hong Kong, Singapore, Korea and Taiwan) and the four 'new Tigers' (Malaysia, Thailand, Philippines and Indonesia). Although trade data are now available for 2001, we stop at 2000 for two reasons. First, the 2001 export data do not cover all countries in the region. Second, there was a significant slowdown in world trade in 2001, with dips in important exports from the region (see WTO data below). Thus, the 1990s are likely to give a better picture of long-term trends, which are likely to resurface as the recession ends.

[6] China's share of global export market grew even faster after 2000 (not covered here). In 2001, China's total exports grew by 7 percent (WTO, 2003), when global exports fell by 4 percent, exports by 'developing Asia' fell by 7 percent and by leading 'IT traders' in Asia fell by 13 percent. Merchandise exports by other developing regions also fell in 2001: Latin America declined 3 percent, Middle East 7 percent and Africa 6 percent. At the country level, all major exporters in East Asia apart from China recorded falls: Hong Kong (domestic exports) 15%, Korea 13%, Taiwan 17%, Singapore (domestic exports) 16%, Malaysia 10%, Thailand 7%, Philippines 16% and Indonesia 9%. In 2002, when world trade grew by 4 percent, China's merchandise exports rose by a massive 22 percent, compared to 6 percent for all developing countries, 10 percent for developing Asia and 7 percent for Asian 'IT traders' (WTO, 2002).

[7] Thus, in 2000, per capita manufactured exports in China came to $185, as compared to $20,003 in Singapore (after deducting re-exports), $3,607 in Korea, $6,582 in Taiwan, $4,117 in Malaysia, $944 in Thailand and $488 in the Philippines. China was, however, well ahead of India with $38.

[8] Most labour reserves are in the interior provinces of the country, but there are also some in the coastal areas where workers are being made redundant by restructuring state-owned enterprises. Tapping both these reserves would require large investments, say in physical infrastructure, training (and retraining) and institution building.

[9] China will not gain immediately from the abolition of Multi-Fibre Arrangement (MFA) quotas in 2005, as it is subject to special transition arrangements in US and EU markets up to 2007 (Ianchovichina *et al.* 2003). Other exports will also not

its domestic competitiveness: it will improve the investment climate for FDI, make imported inputs cheaper (for enterprises outside special export regimes) and induce faster restructuring of domestic enterprises (Ianchovichina et al, 2003, and Lemoine and Unal-Kesenci, 2002).

Table 1 shows China's merchandise exports in the 1990s. Manufactured products are grouped into the four main technological categories proposed by Lall (2000): RB (resource based), LT (low technology), MT (medium technology) and HT (high technology).[10] These categories are disaggregated into 9 sub-categories to show different technologies and competitive advantages.

gain much from WTO accession as they already enter developed country markets on equal terms with competitors; the main exception is Mexico, with the preferential treatment it receives under NAFTA. However, NAFTA privileges should also decline over time as tariffs come down for the trading bloc. A substantial part of Chinese exports (around 55 percent in 2000) that operates under the duty-free regime will not gain from liberalization (Lemoine and Unal-Kesenci, 2002).

[10] *Resource-based* products include processed foods, tobacco and wood products, refined petroleum products, dyes, leather, precious stones and organic chemicals. They may be simple and labor-intensive (e.g. simple processed leather) or capital, scale and skill-intensive (e.g. petroleum refining). Competitive advantage here generally (but not always) arises from the availability of natural resources. *Low technology* products include textiles, garments, footwear, other leather products, toys, simple metal products, simple plastics, furniture and glassware. These products have stable, well-diffused technologies largely embodied in capital equipment, with low R&D expenditures and skill requirements, and low economies of scale. Labor costs tend to be a major element of cost and products to be undifferentiated, at least in the mass-produced (non-fashion) end of the scale. However, there is an important 'high end' in LT where design, brands and quality matter more than price; high wages are not a competitive disadvantage here. *Medium technology* products are heavy industrial goods like automobiles, industrial chemicals, machinery and standard electrical and electronic products. They have complex but not fast-changing technologies, with moderate R&D expenditure but advanced engineering and design and large scales of production. Barriers to entry tend to be high, not only because of large capital requirements, but also because of strong 'learning' effects in operation, design, and, in certain products, product differentiation. *High technology products* include complex electrical and electronic products, aerospace, precision instruments, fine chemicals and pharmaceuticals. The most innovative ones call for large R&D investments, advanced technology infrastructures and close interactions between firms, universities and research institutions. However, many HT activities, particularly electronics, have simple assembly processes where low wages are an important competitive factor. The high value-to-weight ratio of these products allows discrete processes to be segmented and located across long distances. In general, low technology industries spend less than 1% of sales on R&D, medium technology ones between 1 and 4% and high technology ones over 4%.

Table 1: China's exports in the 1990s

	Values (current US$ m.)			Growth rates p.a. (%)		
	1990	1995	2000	1990-1995	1995-2000	1990-2000
Total Exports	**60,805.5**	**147,634.5**	**247,579.2**	**19.4%**	**10.9%**	**15.1%**
Primary	**12,762.1**	**14,850.5**	**18,332.1**	**3.1%**	**4.3%**	**3.7%**
Manufactured	**48,043.4**	**132,784.0**	**229,247.0**	**22.6%**	**11.5%**	**16.9%**
Resource based	6,849.7	16,495.9	21,814.0	19.22%	5.8%	12.3%
Agro-based	2,895.9	7,780.0	9,422.5	21.9%	3.9%	12.5%
Mineral-based	3,953.7	8,715.9	12,391.5	17.1%	7.3%	12.1%
Low technology	24,934.0	69,037.3	102,860.3	22.6%	8.3%	15.2%
Fashion cluster	18,318.2	45,778.4	63,908.1	20.1%	6.9%	13.3%
Other LT	6,615.7	23,258.9	38,952.2	28.6%	10.9%	19.4%
Medium technology	12,939.6	27,859.7	48,566.1	16.6%	11.8%	14.1%
Automotive	3,762.5	1,669.5	4,270.0	-15.0%	20.7%	1.3%
Process	3,307.0	10,706.7	14,240.3	26.5%	5.9%	15.7%
Engineering	5,870.2	15,483.5	30,055.7	21.4%	14.2%	17.7%
High technology	3,320.1	19,391.1	56,006.7	42.3%	23.6%	32.7%
Electronic	2,278.5	16,037.4	49,689.6	47.7%	25.4%	36.1%
Other HT	1,041.6	3,353.7	6,317.1	26.4%	13.5%	19.8%

Source: Calculated from the UN Comtrade data.

China's export growth rate declined over the 1990s and halved for manufactured products (reflecting a general slowdown in world trade), but remained high. LT products, and within it the 'fashion cluster' (textiles, clothing and footwear), comprised the largest group, expectedly in view of their labour-intensive nature. However, the structure of exports shifted towards medium and high technology products; the fashion cluster grew relatively slowly and lost ground (Figure 1). The machinery sector broadly defined (MT engineering and HT electronics) was the fastest growing activity.[11] The automotive sector lost ground but this is likely to be temporary; the industry is expanding capacity rapidly and improving technology – once domestic demand is satisfied it is likely to enter exports.

[11] The bulk of Chinese MT exports consist of engineering products ($30 of the $48 billion), consisting of a diverse range of goods like electrical relays and switches ($3.4 billion), household electrical products ($4.5 billion), radios ($3.0 billion), gramophone and recording machines ($2.9 billion), sanitary, heating and plumbing equipment ($2.2 billion) and many others. The 18 percent annual growth of engineering exports over the decade would appear to be the product of a massive upgrading of myriad local enterprises along with the entry of multinational producers. It probably also reveals the restructuring and reorientation of large state-owned enterprises (Nolan, 2001).

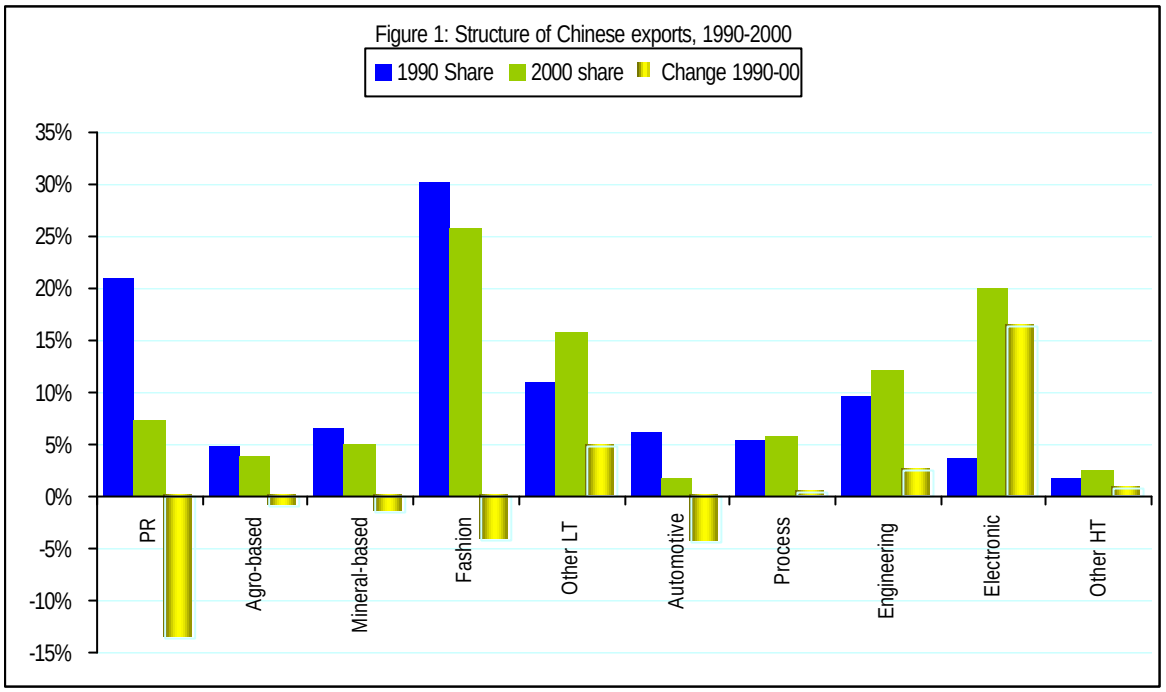


Table 2 shows the technology structure of Chinese manufactured exports and that of its neighbours. The structure upgrades (from 'simple' to 'complex' products) in all economies except for Hong Kong, where there is an increase in the (already high) share of LT products. The highest share of simple products, however, is in Indonesia, while the highest share of complex products is in the Philippines, the former because of the weight of RB products and the latter because of a jump in HT (semiconductor) exports. The share of MT (heavy industry) products is likely to be a better indicator of the maturity and depth of industry than HT products, since the latter may represent the simple assembly of electronics without much local value added. By this measure, Korea has the deepest manufacturing sector and Hong Kong the least. There is also qualitative evidence suggesting that in the HT category, the greatest local depth is in the mature Tigers (Korea and Taiwan, followed at some distance by Singapore) and the least in the Philippines (see Lall, 2001, for analyses of export profiles in the various East Asian economies).

China starts the 1990s with a high weight of LT products, second only to Hong Kong, but rapidly moves into complex products, in particular HT. A large part of this is simple assembly but there is considerable deepening of local content and even design and development activity, faster than seen in countries like Malaysia, Thailand or the Philippines (Lemoine and Unal-Kesenci, 2001). Competent local suppliers are emerging in clusters of HT activity, and the government is, as noted, pressing foreign firms (that account for the bulk of HT exports) to set up local R&D facilities.

Table 2: Technology structure of manufactured exports by China and its East Asian neighbours

	China		**Korea**		**Taiwan**		**Singapore**		**Hong Kong**	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
RB	**14.3%**	**9.5%**	**7.1%**	**11.7%**	**6.9%**	**4.4%**	**27.8%**	**14.9%**	**4.2%**	**4.5%**
LT	**51.9%**	**44.9%**	**40.0%**	**17.1%**	**41.3%**	**23.8%**	**9.6%**	**6.5%**	**55.5%**	**58.9%**
MT	**26.9%**	**21.2%**	**31.3%**	**34.0%**	**26.1%**	**25.5%**	**23.4%**	**17.4%**	**19.5%**	**9.4%**
HT	**6.9%**	**24.4%**	**21.6%**	**37.1%**	**25.7%**	**46.3%**	**39.1%**	**61.2%**	**20.8%**	**27.2%**
'Simple'	66.2%	54.4%	47.1%	28.8%	48.2%	28.2%	37.4%	21.4%	59.7%	63.4%
'Complex'	33.8%	45.6%	52.9%	71.1%	51.8%	71.8%	62.5%	78.6%	40.3%	36.6%
	Malaysia		**Thailand**		**Indonesia**		**Philippines**			
	1990	2000	1990	2000	1990	2000	1990	2000		
RB	**31.9%**	**13.1%**	**24.2%**	**18.4%**	**54.2%**	**33.7%**	**37.6%**	**6.5%**		
LT	**14.8%**	**9.6%**	**40.1%**	**21.5%**	**32.6%**	**31.3%**	**33.7%**	**11.9%**		
MT	**18.0%**	**17.8%**	**15.1%**	**23.8%**	**11.3%**	**17.5%**	**12.9%**	**11.6%**		
HT	**35.3%**	**59.4%**	**20.6%**	**36.3%**	**1.9%**	**17.4%**	**15.8%**	**70.0%**		
'Simple'	46.7%	22.7%	64.3%	39.9%	86.8%	65.0%	71.3%	18.4%		
'Complex'	53.3%	77.2%	35.7%	60.1%	13.2%	34.9%	28.7%	81.6%		

Source: UN Comtrade database.

Note: 'Simple' products are RB+LT, 'complex' products are MT+HT.

3. Some preliminary indicators of the competitive threat

One preliminary indicator of the competitive threat of China to its neighbours' exports is the evolution of export structures: greater similarity would indicate that China is entering into similar areas of specialization and so posing a greater threat. At the broad technological level, it does appear that the Chinese export structure is rapidly coming to resemble that of its neighbours.[12] While its labour costs remain much lower, there is a diversity of competitive products emerging from more advanced sectors and from assembly activity in its special economic zones. However, most East Asian economies have a much higher share of HT products in 2000 than China.

This comparison is very highly aggregated. A more detailed comparison of export structures for all 230 products at the SITC 3-digit level shows more clearly which countries are most similar to China. Table 3 presents the correlation coefficients between Chinese and regional export structures.

In 2000, the structure of Chinese exports was most similar to that of Taiwan in 1990, with significant similarities also to Korea and Hong Kong in 1990. The most similar structures in 2000 were those of Hong Kong, Taiwan and Thailand, the least similar those of Indonesia and the Philippines. In general there was a rise in the correlation coefficients with most countries between 1990 and 2000, the exceptions being Hong Kong and Indonesia. Again, the implication is that the competitive threat from China was likely to be growing.

[12] By contrast, the structure of South Asian exports (dominated by India, the economy most similar to China in Asia) is relatively stagnant. Thus, in 1990, 67.7 percent of South Asian exports consisted of RB and LT products (compared to 66.2 percent for China); by 2000 the figure had risen to 70.3 percent while for China it had fallen to 54.4 percent..

Table 3: Correlation between Chinese and regional export structures (3-digit)

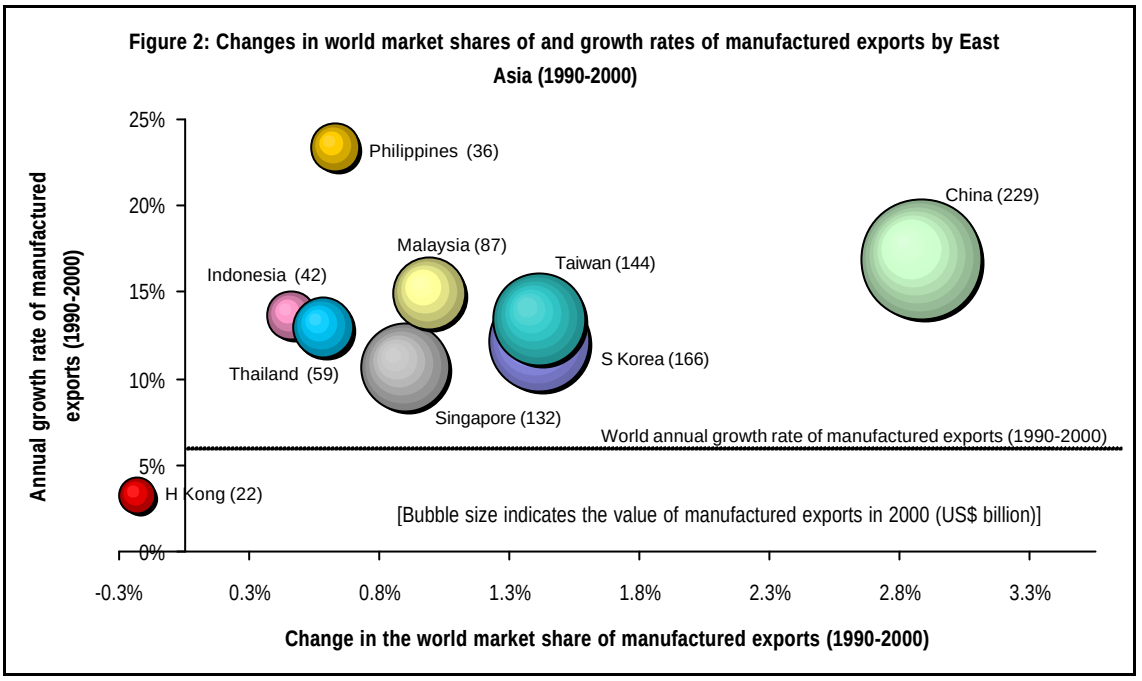
	China 1990	China 2000
Korea 1990	0.380	0.643
Korea 2000	0.074	0.429
Taiwan 1990	0.341	0.832
Taiwan 2000	0.052	0.527
Singapore 1990	0.101	0.420
Singapore 2000	0.016	0.414
Hong Kong 1990	0.560	0.672
Hong Kong 2000	0.487	0.538
Malaysia 1990	0.278	0.243
Malaysia 2000	0.067	0.442
Thailand 1990	0.300	0.523
Thailand 2000	0.134	0.512
Indonesia 1990	0.382	0.074
Indonesia 2000	0.379	0.330
Philippines 1990	0.228	0.379
Philippines 2000	0.025	0.329

However, specialization in similar products only shows the potential for competition, it does not demonstrate that competition actually exists. The product categories (at the 3-digit level) are very broad and each is likely to include products that do not compete with each other.[13] Even if the products were comparable, it is possible that countries specialize in differentiated versions and so avoid direct competition. Even in the same product, countries may complement each other by performing different functions within an integrated production system; that this certainly happens within East Asia is shown below.

4. Relative market shares

The normal measure of firm-level competitive performance is changes in market share; this measure is also applied to countries in competitiveness analysis, benchmarking relative export shares in global or more specific markets against the relevant competitors. The direction and extent of the changes in market share can also indicate the competitive impact of particular countries on others. Figure 2 shows the results of such an exercise for China and its neighbours for total manufactured exports in world markets. We later consider changes in each technological category for the world as a whole and for major export markets. Figure 2 also provides other data besides market share – it shows the value of manufactured exports and growth rates for the 1990s for each country. The growth rate of world manufactured exports is indicated for comparison.

[13] However, a more detailed analysis (at the 5 digit level) by Ianchovichina *et al.* (2003) gives similar results to ours. These authors find a trend for the Chinese structure to grow generally more similar to those of four countries (Cambodia, Lao PDR, Indonesia and Thailand, with the exception of Indonesia. Interestingly, their correlation coefficients for the two countries in common with our analysis (Indonesia and Thailand) are not very different: in 1999 they find a correlation of 0.302 with Indonesia and 0.491 with Thailand, while we get 0.330 and 0.512 respectively in 2000.

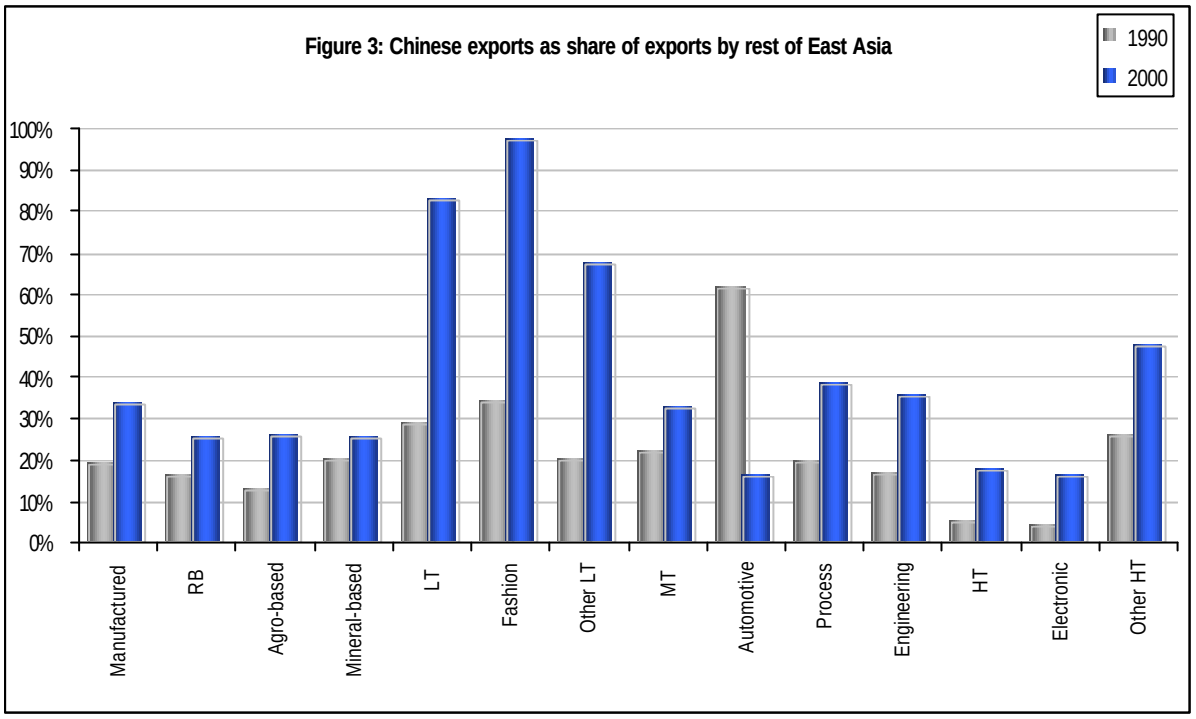


Exports by all countries in the region except Hong Kong grow faster than the world average. China is now the largest exporter in the region, followed by Korea, Taiwan and Singapore,[14] and second fastest growing one after the Philippines. Because of its size, China has the largest increase in world market share. Since most other countries also raise market shares it does not appear at first sight that China has eroded their competitiveness. This does not preclude the possibility that they may have grown even faster in China's absence, but this cannot be assessed without a general equilibrium exercise to set up the counterfactual. Such an exercise, in turn, may not provide very realistic results, as it would need to make numerous simplifying assumptions on underlying structural factors like technological capabilities, the development of skills, the sourcing strategies of MNCs and so on.

It is useful to consider how large China, as an exporter, is in relation to its East Asian neighbours. Figure 3 shows this for 1990 and 2000 by technology categories and subcategories. China's presence is strongest in LT; it is overwhelming in the 'fashion cluster' (textiles, clothing and footwear) but also dominant in other LT products (toys, sports goods, simple metal products). It is also relatively strong in MT products, particularly process industries and engineering, but low in automotives (the only group where its share falls over time). It is relatively low in HT products, particularly electronics, but rising rapidly; it is stronger in other HT products (mainly pharmaceuticals).

We now consider world market share changes by technology. Table 4 shows the shares in 1990 and 2000 for all manufactured exports and by technology. Noteworthy features of the table are as follows.

[14] The UN trade data for Singapore include its re-exports, though they exclude them for Hong Kong. Trade figures from the Singapore government show that around 40 percent of total exports consists of re-exports, but we have not adjusted the figures here because of the lack of product level data for subsequent analysis.



China is the largest exporter of RB products in the region (and also in the developing world), Korea second and Indonesia third. Note that Singapore is also a significant player here, based on its large petrochemical facilities, but is losing market share rapidly.

China dominates the region's LT exports by 2000, though in 1990 it was at the same level as Korea and smaller than Taiwan. Taiwan and Korea remain major exporters of low technology products, but, expectedly in view of their high wages, have lost market shares. The composition of their LT exports has changed as they move increasingly into heavier products like textiles for processing (into apparel) in China. Hong Kong remains an important exporter, but is the only country in the region to suffer a decline in absolute export values.

Table 4: World market shares by technology

	China		Korea		Taiwan		Singapore		Hong Kong	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Resource based	1.3%	2.5%	0.8%	2.3%	0.8%	0.7%	2.6%	1.3%	0.2%	0.1%
Low technology	4.9%	12.0%	4.9%	3.3%	5.2%	4.0%	0.9%	1.0%	3.0%	1.5%
Medium technology	1.2%	2.7%	1.8%	3.2%	1.6%	2.1%	1.1%	0.9%	0.5%	0.1%
High technology	0.7%	4.1%	2.8%	4.5%	3.4%	4.9%	4.0%	5.9%	1.2%	0.4%
All mfrs	1.9%	4.7%	2.1%	3.4%	1.6%	3.0%	1.9%	2.7%	0.6%	0.5%

	Malaysia		Thailand		Indonesia		Philippines		
	1990	2000	1990	2000	1990	2000	1990	2000	
Resource based	1.3%	1.3%	0.8%	1.3%	1.2%	1.7%	0.3%	0.3%	
Low technology	0.6%	1.0%	1.4%	1.5%	0.8%	1.6%	0.3%	0.5%	
Medium technology	0.4%	0.9%	0.2%	0.8%	0.1%	0.4%	0.1%	0.2%	
High technology	1.6%	3.7%	0.7%	1.5%	0.0%	0.5%	0.1%	1.9%	
All mfrs	0.8%	1.8%	0.7%	1.2%	0.5%	0.7%	0.2%	0.7%	

Source: Calculated from UN Comtrade database

In MT products, China is the largest gainer in market shares, with its 2000 export values just behind Korea and ahead of Taiwan. It some ways this may be the most impressive aspect of China's export prowess. Medium technology products come from complex, heavy industry and competitiveness is

not generally based on cheap semi-skilled labour or by assembly operations but on broad-based industrial capabilities. The bulk of China's MT exports in 2000 consist of engineering products ($30 out of $48 billion), consisting of diverse goods like electrical relays and switches ($3.4 billion), household electrical products ($4.5 billion), radios ($3.0 billion), gramophone and recording machines ($2.9 billion), sanitary, heating and plumbing equipment ($2.2 billion) and many others. The 18 percent annual growth rate of engineering exports over the decade suggests a massive upgrading of local enterprises (including state-owned firms, Nolan, 2001) and also the entry of multinational producers.

By 2000 China was the fourth largest HT exporter in the region, coming after Singapore, Taiwan and Korea. Note, however, that the Singapore figure includes re-exports, and reducing it by 40% (the average of re-exports to national exports) takes it to fifth place, behind China and Malaysia. China is the biggest gainer in market share in HT during the decade and overtakes longer-established export platforms like Malaysia, Thailand and the Philippines. However, all East Asian countries, with the exception of Hong Kong, maintain export growth rates above the rapid global growth rate for HT exports.

The general picture that emerges is one of broad-based export expansion by China spanning the entire technological spectrum, but with a massive presence in low technology products. However, the growth of market shares is fastest in the high technology products that have driven a significant part of recent East Asian export growth. To analyse the possible competitive impact of China we now explore market shares by finer classifications of product and market.

5. Market share changes in major developed country markets

We analyse market shares of China and its neighbours in three major markets: Japan, the US and West Europe, according to technology categories (Annex Table 1). In terms of value, the most important market for China in 2000 is the US ($49 billion), followed by Japan ($36 billion) and West Europe ($38 billion). However, the rest of the world is almost as large a destination for Chinese exports as these together ($106 billion in 2000) and within this the rest of East Asia is larger than any major OECD market by itself ($74.6 billion). We return to Chinese trade with East Asia below.

The competitive position of each country can be analysed in terms of the market share in 1990 and 2000 and the change over the decade. The annex table shows the following:

Total manufactured exports: China does best in Japan, followed at some distance by the US. In common with most neighbours, its market share gain is weakest in West Europe. Korea loses market shares in both Japan and US, while Taiwan loses only in the US. Hong Kong's loses market shares in all markets, particularly in the US and Japan. Like Taiwan, Singapore loses only in the US. The new Tigers gain share in all markets. With the exception of Indonesia, with a rather tepid performance, the others all gain most share in the Japanese market.

Resource based products: China again leads the region in terms of market share increases, with a pattern similar to that for total exports. However, Korea has a large gain in Japan, in contrast to Taiwan and Singapore, which lose shares; the latter two also lose in the US. Thailand is a big gainer in Japan while Indonesia and the Philippines lose out in the US.

Low technology products: China's massive market share gains are again concentrated in Japan. The four mature Tigers generally suffer losses in market share, but Singapore sees an increase in Japanese market share. The best overall performance among the new Tigers is by Indonesia.

Medium technology products: While the Chinese pattern of success recurs, the new Tigers make significant gains in Japan and Korea incurs a significant loss. Taiwan and Singapore suffer losses in the US market.

High technology exports: Taiwan again diverges from Korea in its performance in Japan, the former showing the second largest gain in the group (after China) and the latter the largest loss. In the US market, the situation is reversed, with Singapore joining Taiwan in losing market shares. Among the new Tigers, Malaysia and the Philippines are the big gainers in Japan, but the other two also benefit significantly. The Philippines is the second largest winner in the group in the US market.

In sum, China's main market share gains in the developed world are concentrated in Japan (though the US accounts for a larger dollar value of export growth). This is also true of its neighbours with the exceptions of Korea and Indonesia (Hong Kong was an all-round loser). To the extent that we can interpret market share changes to be causally related to China's export surge, it would seem that the mature Tigers suffered the most from Chinese competition. The largest such loss is in low technology products, which is to be expected, but this not take into account the growth of LT exports by Korea and Taiwan to China. The relatively low gains by the lower-income new Tigers in LT may also reflect the impact of Chinese competition – without the offsetting increase in exports of intermediates to China. We now turn to a different

6. Matrix of competitive effects

The main problem in this analysis is, as noted, inferring causal relationships from export and market share data. One way forward is to examine different combinations of market share changes for China and competing countries (Table 5); this does not allow a quantification of the effects but it points to the direction of the effect.[15]

Table 5: Matrix of competitive interactions between China and East Asian neighbours in exports

		Chinese export market shares	
		Rising	**Falling**
Neighbours' export market shares	**Rising**	A. No ostensible competitive threat from China, unless the Chinese growth is faster, and may hold back the growth of regional exports.	B. No competitive threat from China in period under consideration. The threat is reverse, from the region to China.
	Falling	C. Possible competitive threat from China, unless regional market shares were declining in the absence of Chinese entry and China allows high wage countries to extend their competitive advantage by placing operations there.	D. No ostensible competitive threat from China. Both parties lose competitive advantage in export markets.

There are thus five combinations of competitive outcomes:

Partial threat: Both China and its neighbour raise WMS but China grows faster than its neighbour, raising the possibility that its growth is retarding the growth of the other. The threat is called 'partial' because of its ambiguous nature. For instance, it may be that China is actually complementing its neighbours' exports within integrated production systems and in its absence the growth may have been lower.

[15] Ianchovichina *et al.* (2003) use a different methodology to analyze the impact of Chinese accession to the WTO (they do not consider the Chinese competitive threat before the accession). For four ASEAN countries, Indonesia, Thailand, Cambodia and Lao PDR, they look at 'key exports' to particular markets (US and Japan). They pick at the SITC 5-digit level products that form a significant share of imports by the selected market in which China also has a large market share and distinguish products whose unit values are close together. This approach permits a more detailed analysis – though perhaps too detailed to capture product competition at a realistic level – but does not take account of dynamic market share changes that this paper considers the essential criterion of competitive threat.

No threat: Both parties gain market share, with China growing slower than its neighbour. Again, it is possible that Chinese entry boosts export growth by the neighbour.

Direct threat: China gains market share and the neighbour loses. This is the most direct indicator of a competitive threat available from WMS figures, though again there is a caveat. Chinese exports may be undertaken by firms relocating from the neighbour losing market share: while the neighbour loses direct export competitiveness, its enterprises extend their competitive advantage and benefit the home country by promoting exports of intermediates and related design and marketing activities and remitting dividends.

China under threat: China loses market share and its neighbour gains.

Mutual withdrawal: Both China and its neighbour lose market share, with neither apparently posing a threat to the other, and suggesting a loss of competitiveness for the region as a whole

This exercise indicates the direction of possible competitive effects but does not take into account the effects of complementarities with other countries, either by integration into MNC systems or by the shift of export activities from losing countries. There is another complication: complementarity within MNC systems need not exclude direct competition in the longer term. While the common governance imposed by the MNC can contain direct competition between affiliates, it does not prevent the parent from searching for the most economical sites and shifting production and services between them. There is thus likely to be intense competition between affiliates for more export activity and for higher value functions. This competition need not be confined to the affiliates directly engaged in production but may include local suppliers or subcontractors that may compete for larger sales (or to become direct exporters themselves).[16] If China captures larger shares of integrated MNC activity over time and add greater local value, the balance of gains from complementarity will shift in its favour, eroding competitiveness in neighbours with weaker capabilities. Moreover, as it moves up the technology ladder further, it can also adversely affect activities in the more advanced Tigers.

It is not possible to capture such nuances with market share data; however, the competitive matrix does provide useful information. Disaggregating the different competitive effects by technological category adds further insights, allowing us to differentiate between possible effects on neighbours at different levels of development. For instance, Chinese export threat in low technology activities is likely to (indirectly) benefit the more industrially advanced neighbours that are losing their wage advantage but to damage less industrialized ones that cannot move readily into design, marketing or intermediate manufacture while relocating facilities in China. A threat in high technology activities is likely to be more complementary to all economies concerned, high and low wage, but again the threat of shifts within integrated systems is likely to appear quicker for countries without advanced capabilities or deep local content.

Table 6 shows the values of exports by East Asian economies according to the nature of the threat revealed by market share comparisons. There are significant differences across countries in the magnitude of the Chinese threat. There is a general decline in the share of exports under direct threat from China and a rise in the share under partial threat. The exception is Malaysia where the direct threat grows over time. Hong Kong is the most severely threatened in direct terms, with China taking market share from Hong Kong in most of the products it exports: a clear sign that the latter is losing its former entrepot role as exporters in China establish direct links overseas. Malaysia and Korea follow some distance behind, but in very different product segments from Hong Kong (below). The least threatened economy has been the Philippines; most of its exports, in the HT category, grew faster than China's. Figure 4 shows the shares of total exports by each in the partial and direct threat categories in 1990 and 2000.

[16] In an interesting paper on global value chains and local suppliers in East Asia, Sturgeon and Lester (2002) argue that integrated production systems are becoming more 'open', relying increasingly on unrelated but tightly linked suppliers to provide larger ranges of products and services. A major development is the rise of contract manufacturers that undertake the entire procurement, manufacturing and logistical functions for lead firms, which then specialize in the design, R&D and marketing functions, a trend that has gone furthest in the electronics industry. The competitive challenge for newly industrializing countries is then to foster the growth of large suppliers and contract manufacturers; in East Asia, only the three mature Tigers have the technological capabilities but China is likely to emerge in this arena soon.

Table 6: China's potential competitive threat to East Asia: Matrix of world market share (WMS) changes, 1990-2000

(US$ million and percentages)

	Singapore		**Hong Kong**		**Taiwan**		**Korea**	
Category	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**
Values								
Partial threat	17,366.6	54,779.9	472.7	1,933.6	17,213.1	50,343.3	16,820.1	47,730.6
No threat	6,630.3	43,416.1	0.1	138.6	10,779.0	58,300.2	12,201.2	71,945.8
Direct threat	25,340.1	31,821.5	27,037.5	19,984.0	36,169.4	33,933.2	33,099.3	44,622.1
China under threat	1,192.2	4,605.2	34.6	103.6	2,002.3	5,073.0	1,126.8	4,962.6
Mutual withdrawal	1,175.3	948.5	519.1	311.6	672.4	607.7	1,372.6	1,144.8
	51,704.4	135,571.1	28,064.0	22,471.4	66,836.1	148,257.4	64,620.1	170,405.9
Distribution								
Partial threat	33.6%	40.4%	1.7%	8.6%	25.8%	34.0%	26.0%	28.0%
No threat	12.8%	32.0%	0.0%	0.6%	16.1%	39.3%	18.9%	42.2%
Direct threat	49.0%	23.5%	96.3%	88.9%	54.1%	22.9%	51.2%	26.2%
China under threat	2.3%	3.4%	0.1%	0.5%	3.0%	3.4%	1.7%	2.9%
Mutual withdrawal	2.3%	0.7%	1.8%	1.4%	1.0%	0.4%	2.1%	0.7%
	Malaysia		**Thailand**		**Indonesia**		**Philippines**	
	1990	**2000**	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**
Values								
Partial threat	13,980.2	54,996.7	9,487.3	41,282.2	5,814.4	29,794.0	1,711.4	16,675.0
No threat	3,686.8	4,825.3	1,714.3	10,653.4	1,445.8	6,581.9	403.5	16,797.3
Direct threat	3,160.7	27,888.4	9,102.7	10,116.4	9,478.4	12,306.5	1,922.8	2,182.2
China under threat	6,561.3	6,178.3	1,466.2	4,104.6	1,437.2	5,501.4	367.0	1,361.3
Mutual withdrawal	1,915.3	3,436.6	941.4	893.3	7,373.2	7,514.6	1,178.8	901.3
	29,304.2	97,325.3	22,711.9	67,050.0	25,549.0	61,698.4	5,583.6	37,917.2
Distribution								
Partial threat	47.7%	56.5%	41.8%	61.6%	22.8%	48.3%	30.7%	44.0%
No threat	12.6%	5.0%	7.5%	15.9%	5.7%	10.7%	7.2%	44.3%

Direct threat	10.8%	28.7%	40.1%	15.1%	37.1%	19.9%	34.4%	5.8%
China under threat	22.4%	6.3%	6.5%	6.1%	5.6%	8.9%	6.6%	3.6%
Mutual withdrawal	6.5%	3.5%	4.1%	1.3%	28.9%	12.2%	21.1%	2.4%

Categories: Partial threat: Both parties gain world market shares (WMS) but China gains more than regional neighbour

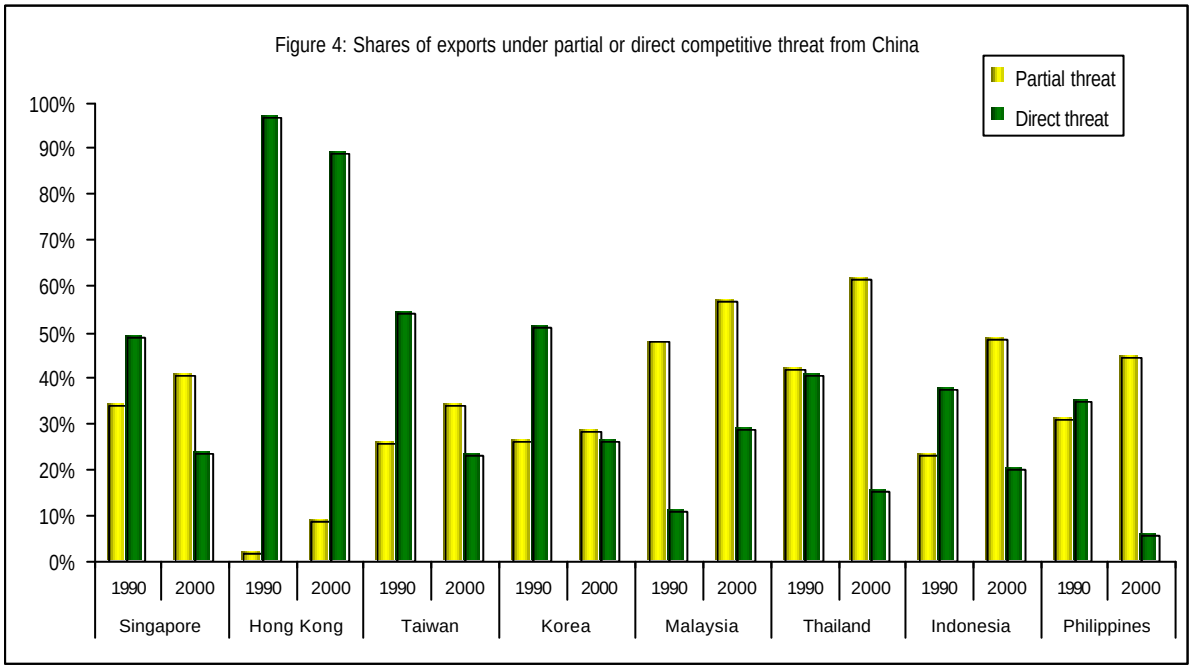
No threat: Both parties gain WMS but China gains less than regional neighbour

Maximum threat: China gains WMS and neighbour loses

China under threat: China loses WMS and neighbour gains

Mutual withdrawal: Both China and neighbour lose WMS

The 'no threat' category, where both sides gain market share and China gains less than its neighbour, is very large (one third or more) for the mature Tigers apart from Hong Kong and the Philippines. The share of this category is relatively small (5-6 percent) in Malaysia and Thailand, supporting the general impression that these economies, with high wages but highly dependent on MNC dominated assembly activities, have most to fear from China. The Philippines may also fall into this category as China builds up its semiconductor export capability in the near future.



The 'China under threat' category, where China loses market share and the other country gains, is fairly small but growing for the mature Tigers. It is larger for the new Tigers but falling except for Indonesia. The 'mutual withdrawal' category, where both sides lose market share, is also fairly small and falling; Indonesia, where it is 12 percent of total manufactured exports, is again the exception.

The technology composition of manufactured exports under 'direct threat' is shown in Annex Table 2. There are, as expected, major differences in the competitive impact by technology.

RB: Indonesia is the most threatened in the RB group (with veneers and plywood the most important affected product) and Hong Kong the least. Singapore (refined petroleum products), Korea (petroleum products) and the Philippines (wood products and preserved fruits) also have significant proportions of their threatened exports in this category. However, there are differences between the countries. Indonesia suffers an actual drop in export values of veneers and plywood while Singapore and the Philippines suffer only a loss of market share with rising export values. Moreover, China is a much

smaller exporter in these products than its neighbours, so the relative loss of the latter does not accrue only to China – there are players in other regions involved that the analysis does not capture.

LT: The threat in LT is greatest for Hong Kong, Taiwan, the Philippines and Thailand (over 50 percent of the total threat), with Korea following (nearly 40 percent). In Hong Kong, the main products are in the textile and clothing industry; in Taiwan, they include textile products along with toys, metal products and metal sheets; in the Philippines, furniture and clothing; in Thailand, footwear, textiles and clothing and jewellery; and in Korea, textiles and clothing as well as metal sheets. Unlike the RB products noted above, China is a much bigger exporter than its neighbours of textile and clothing products and toys (but not metal sheets). Thus, its growth in market share is likely to be causing the decline in the others'. However, there is a difference in impact. The three mature Tiger economies are increasingly using China to process their LT exports like apparel and toys, so their loss of market share to China is not very damaging. Less advanced neighbours are more directly affected, as they are themselves assembly sites for richer countries that are now shifting operations to China. Rather surprisingly, Indonesia is the least affected in the group in LT products despite being a major LT assembler; the reasons must be that it specializes in different products from China or that its low wages (relative to ASEAN neighbours) have allowed it so far to maintain market share. Malaysia and Singapore are also little affected in this category; they have low LT exports and, as higher wage economies, may have restructured into higher value products.

MT: None of the neighbours are strongly affected by China in this segment apart from Malaysia (37% of threatened exports) and Korea (27%). The main product affected in both is radio receivers: Malaysian exports declined from $3.5 billion in 1995 to $2.6 billion in 2000 and Korea's from $1.4 b. in 1990 to $0.6 billion in 2000, while China's rose from $1.4 billion in 1990 to $3.0 billion. Taiwan and Singapore have smaller losses (below 20% of threatened exports). In Taiwan, the main product involved is man-made fibres (where the absolute value of exports continues to grow), where China is emerging as a major exporter. In Singapore, the products are (again) radios as well as recording equipment, household electrical appliances and synthetic fibres; China is a major competitor in each of these products.

HT: Malaysia appears as the only country in the region with a major threat here: 77 percent of its vulnerable exports are in this category (worth $21 billion, comprising 41.5% of its total HT exports). The main products here are data processing equipment and its parts and accessories, where China is emerging as a major exporter, larger than Malaysia in equipment (SITC code 752) but still much smaller in parts and accessories (SITC code 759). Singapore, another major electronics exporter, is less exposed (24% of threatened exports); the threat is mainly in telecommunications equipment and parts, with China now exporting over double the value of Singapore. Thailand, Indonesia and the Philippines are not exposed in any HT product.

The analysis confirms that LT exports suffer most from Chinese expansion, but also suggests that the impact is broader and differs by country and product. It is useful, nevertheless, to reiterate some caveats. Threatened exports need not be products in which China's neighbours have declining exports – their loss of market shares may or may not involve lower export values. Moreover, the loss of share may not only be to China: the competitive impact of China would depend on its relative size as an exporter (it is significant only where China is large in that product; otherwise, the loss is to other players). Exploring these ramifications would involve far more detailed analysis by product and for all exporters; even then, tracing the full competitive impact of China may involve going beyond published data to product and firm-level investigation.

7. China's trade with its neighbours

Table 7 shows share of the East Asian region in Chinese exports and imports, Table 8 the values of its bilateral trade with each neighbour and the region, and Annex Table 3 the values and growth rates of exports and imports of its intra-regional trade. Some noteworthy points about such trade are:

Table 7: Share of East Asia in total Chinese exports and imports, 1990 & 2000

		Exports 1990	Exports 2000	Imports 1990	Imports 2000
Japan	**Total**	**9.4%**	**15.8%**	**15.9%**	**22.3%**
	RB	19.0%	24.7%	8.9%	11.2%
	LT	9.4%	18.0%	16.7%	22.3%
	MT	5.3%	9.7%	16.2%	28.2%
	HT	4.8%	13.6%	20.5%	22.5%
Korea, Taiwan & Singapore	**Total**	**4.7%**	**7.9%**	**7.8%**	**28.1%**
	RB	13.4%	11.8%	12.8%	20.9%
	LT	2.5%	4.8%	9.7%	36.0%
	MT	4.7%	10.1%	6.5%	34.5%
	HT	2.8%	10.2%	4.6%	22.5%
H Kong	**Total**	**50.6%**	**18.1%**	**29.8%**	**5.0%**
	RB	27.7%	12.3%	7.7%	2.4%
	LT	49.4%	18.4%	53.6%	9.0%
	MT	63.9%	14.8%	29.0%	4.0%
	HT	55.4%	22.7%	22.7%	5.5%
New Tigers	**Total**	**2.4%**	**3.3%**	**1.9%**	**6.6%**
	RB	3.8%	5.0%	7.8%	10.5%
	LT	1.5%	1.6%	0.6%	2.6%
	MT	3.3%	4.5%	1.3%	3.7%
	HT	2.6%	4.8%	0.1%	9.0%
Total East Asia	**Total**	**67.0%**	**45.2%**	**55.4%**	**62.0%**
	RB	63.8%	53.9%	37.1%	45.1%
	LT	62.8%	42.8%	80.6%	69.9%
	MT	77.2%	39.2%	53.0%	70.4%
	HT	65.6%	51.3%	47.9%	59.5%

The region is the single largest trading partner for China, accounting for over twice the share of exports sold to the US and over five times that sold to West Europe.

The importance of the region for Chinese exports has diminished over the 1990s while for imports it has grown substantially.

The role of Hong Kong as its main trading partner (but mainly as an entrepot) has declined dramatically, in exports from 51% to 18%, and in imports from 30% to 5%. The main Asian destination for exports is now Japan and the main source of imports the other mature Tigers (Singapore, Korea and Taiwan).

The 'new Tigers' (Indonesia, Malaysia, the Philippines and Thailand) are still relatively small trading partners for China, but their role has grown in both exports and imports. Malaysia has emerged as the largest trading partner of this group, the Philippines is the smallest. China's imports from these countries have grown particularly rapidly.

The highest value of China's regional trade (exports plus imports) in 2000 was with Japan, followed by the mature Tigers. The fastest growth of such trade over the 1990s was with the mature Tigers.

By technology, HT products were the largest and fastest growing category in total intra-regional trade. Since most HT trade is likely to be part of MNC integrated systems, complementarities between

China and its neighbors in this segment are more significant than direct competition. The largest deficit was in MT products, driven by Chinese imports of equipment and intermediates.

The region absorbs over half of China's exports of RB and HT products and provides 60 percent or more of its imports of LT, MT and HT products. As may be expected from the configuration of relative wages, Japan takes the largest share of LT exports and the new Tigers the smallest.

In terms of imports, Japan and the mature Tigers (without Hong Kong) play the most important roles, but there is a sharp rise in Chinese purchases of HT products from the new Tigers.

Table 8: China's net trade (exports minus imports) with East Asia in the 1990s (US$ m.)			
		1990	2000
Japan	**Total**	**-2,874.6**	**-3,531.6**
	RB	702.3	1,858.0
	LT	827.0	12,665.4
	MT	-3,097.9	-11,414.2
	HT	-1,306.1	-6,640.8
Korea, Taiwan & Singapore	**Total**	**-1,351.8**	**-31,991.8**
	RB	66.2	-3,999.1
	LT	-266.7	-4,546.0
	MT	-917.2	-14,836.3
	HT	-234.2	-8,610.5
H Kong	**Total**	**10,534.9**	**32,584.8**
	RB	1,383.0	1,932.8
	LT	7,441.2	16,533.8
	MT	1,496.7	4,909.7
	HT	214.1	9,208.4
New Tigers	**Total**	**270.3**	**-4,215.5**
	RB	-259.2	-2,217.8
	LT	327.6	981.7
	MT	125.9	72.9
	HT	76.2	-3,052.2
Total East Asia	**Total**	**6,578.8**	**-7,154.1**
	RB	1,892.3	-2,426.1
	LT	8,329.1	25,634.9
	MT	-2,392.5	-21,267.9
	HT	-1,250.0	-9,095.1
Total East Asia excluding Hong Kong	**Total**	**-3,956.1**	**-39,738.9**
	RB	509.3	-4,358.9
	LT	887.9	9,101.1
	MT	-3,889.2	-26,177.6
	HT	-1,464.1	-18,303.5

Over 1990-2000, China turned a significant trade surplus with the region into a large deficit. If Hong Kong is excluded, there was an initial deficit that grew about 10 times larger over the decade. By 2000, China was importing more from every developing neighbour (apart from Hong Kong and Singapore) than it was exporting to it. A large part of China's growth in regional trade involves, as noted above, the exchange of products and components for export processing aimed at other regions.[17] The bulk comes from the more advanced economies like Japan, Korea and Taiwan (Singapore also plays provides HT imports but is significantly smaller). However, such trade also increasingly

[17] These imports are largely by foreign affiliates, which accounted for 70% of 'processing' exports in 2000, up from 46% in 1994, according to Lemoine and Unal-Kesenci (2002), pp. 13-14. Around 80 percent of imports used in 'processing' trade come from the region: Hong Kong, Korea and Taiwan (41%), Japan (25%) and other East Asian countries (14%), *ibid*. p. 22.

involves the new Tigers, particularly those with well-established electronics industries like Malaysia (HT imports from Malaysia are now larger than from Singapore).

This reinforces the findings of other studies. For instance, Lemoine and Unal-Kesenci (2002) find, using Chinese data distinguishing different trade regimes, that four-fifths of Chinese exports of HT products – electronics, precision instruments and other machinery – consist of 'processing trade' (in special zones that allow duty free import of components for exports, with no local sales). Such processing trade has also played an important role in exports of other manufactures like apparel, chemicals, shoes, wood products and transport equipment. In 2000, 'processing trade' accounted for around 53% of total Chinese exports

In direct trade, therefore, China has acted more as an engine of export growth than as a competitive threat to most of its neighbours (the major exception being Hong Kong). Will this continue? This is difficult to predict. While China will certainly import more as it grows and exports, how this will affect its trade balances with its neighbours depends on their pattern of specialization of regional economies with respect to China and their competitiveness with respect to other exporters to China. Those that can enhance their skills, technological capabilities, supply chains, infrastructure and marketing strengths faster than China can maintain their exports to it and resist inroads by Chinese exports to their domestic markets. Those that cannot do so will be forced into lower value added activities and may suffer deteriorating trade balances with China. Similarly, those that keep ahead of competitors from other regions can win larger shares of its market; proximity and familiarity will help but only to a certain extent. Participation in integrated MNC systems – a large part of current trade surpluses with China – will not prevent shifts driven by changing competitive advantages; the common governance of MNCs can ease the adjustment but not prevent it. Needless to say, economies that 'adjust downwards' to Chinese expansion will also lose export markets in third countries as well as in China.

The past may not be a reliable guide to the future in the analysis of competitiveness patterns when the underlying structural factors are subject to rapid change, as they are in this case.

8. Conclusions

China's export surge has raised grave concerns in the region. While some of the apocalyptic predictions may have been overdone, it is certainly possible that rapid export growth by such a massive entrant will adversely affects export growth in its neighbours. As this analysis shows, however, the outcome is complex. For a start, the rise in China's exports is matched by that in its imports – within the region its import growth outpaces its export growth. With appropriate restructuring of activities to match new competitive needs, its neighbours should be able to maintain high rates of export growth.

There are two main drivers of regional exports to China. The first is to meet its burgeoning demand for imported products: primary products and resource-based manufactures that it cannot produce, capital goods and intermediates for domestic-oriented production and more sophisticated consumer goods than its industry can currently provide. The second is to meet the needs of its export industries. This has two components: 'processing' activity in special economic zones that use imported inputs for export activities, and other exporters that also need imports. Processing activity is increasingly organized as part of integrated production systems, particularly its high technology segments, though some domestic oriented industries are also being plugged into this system as they realize scale and learning economies and become globally competitive. Both drivers are likely to continue into the foreseeable future, though their composition will change as Chinese and regional capabilities develop.

China's main market share gains in the 1990s in developed countries were in Japan (though the US accounted for larger values of export growth). In the developing neighbours, the mature Tigers suffered most, particularly in low technology products. The new Tigers were also affected by China's expansion of LT exports, resulting in low market share gains rather than in losses of share. However, if we take into account the fact that the mature Tigers were already losing competitiveness in LT products, and that a significant part of Chinese exports of such products is handled by their enterprises

and uses inputs made by them, their competitive loss appears much smaller. In fact, compared to a counterfactual where they lost to LT producers elsewhere, they are net gainers.

The main threat is to the less technologically advanced new Tigers that have much higher wages than China but lack the domestic capabilities to keep ahead of it in many areas where the latter poses a competitive challenge. They have low LT exports to China and face its LT exports in third markets. The abolition of the MFA will exacerbate the threat in textiles and apparel and it is not clear that they can move the quality, design and marketing scale sufficiently to retain a large niche here. The same applies to other LT products like footwear, toys and the like. However, the comparison of market share changes shows that the impact differs greatly by country. In LT, for instance, Thailand and Philippines seem much more affected in the 1990s than Indonesia.

China's threat in medium technology products is also growing. Over time it is likely to mount a serious competitive challenge in products like automobiles, machinery and simple electronics. Here the challenge will be equally to the new and the mature Tigers. In HT products the data suggest complementarity rather than competition between China and its neighbours. The region is being woven into a complex network of export production by leading electronics MNCs (and their first-tier suppliers and contract manufacturers). China is acting as an engine of growth for exports by region as a whole, sucking in imports from its neighbours to export to third countries or to feed into its neighbours' export activities.

However, it cannot be assumed that complementarities will continue to grow. China will compete fiercely within the integrated systems for larger exports, more sophisticated products and more valuable functions. It is not clear from the trade data which functions are being placed where, and how they are likely to evolve, but it is clear that only countries able to keep a technological edge over China will benefit. But there is an important strategic consideration that can limit the competitive impact of China – even if it is a more economical site than its neighbours. Global companies may not be prepared to rely on China (or any other country for that matter) for critical inputs beyond a certain threshold of risk. The threshold may vary by product and company, but risk diversification will always impose it at some level.

In sum, the competitive threat of China is not as its export surge in third markets suggests, nor is it negligible. How great it is, and how much cost it inflicts on its neighbours, depends on the activity and the ability of its neighbours to develop new capabilities. The threat is clearly largest in low technology products for countries that still depend on such products for their export earnings; however, it also exists for countries in high technology production systems that rely on low-end functions. It is least for countries that develop new capabilities (including not just skills and technologies but also infrastructure, institutions and governance structures) to overcome their wage disadvantage vis a vis China.

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Statistical annex

Annex Table 1: Market shares of China and East Asian neighbours in imports by main markets

		China			Korea			Taiwan			Singapore		
Importer	**Tech category**	1990	2000	Change	1990	2000	Change	1990	2000	Change	1990	2000	Change
Japan	RB	2.50%	8.86%	6.36%	3.01%	8.26%	5.25%	2.29%	1.17%	-1.12%	4.55%	2.07%	-2.48%
	LT	8.62%	34.95%	26.32%	19.93%	7.71%	-12.22%	9.58%	4.93%	-4.65%	0.88%	3.14%	2.26%
	MT	2.32%	8.90%	6.57%	5.88%	5.40%	-0.48%	4.86%	4.82%	-0.04%	2.06%	2.66%	0.60%
	HT	0.66%	8.96%	8.30%	9.26%	8.10%	-1.16%	5.07%	11.28%	6.21%	3.75%	6.50%	2.76%
	All Manufactures	**3.37%**	**14.37%**	**11.00%**	**8.22%**	**7.48%**	**-0.74%**	**4.86%**	**6.14%**	**1.28%**	**3.09%**	**3.91%**	**0.83%**
USA	RB	0.44%	1.73%	1.29%	0.78%	1.41%	0.63%	1.34%	0.46%	-0.88%	0.79%	0.54%	-0.25%
	LT	3.03%	11.87%	8.83%	9.78%	2.91%	-6.87%	11.34%	4.47%	-6.87%	1.30%	0.65%	-0.65%
	MT	0.19%	2.43%	2.24%	3.08%	3.00%	-0.08%	2.62%	1.82%	-0.80%	0.98%	0.54%	-0.44%
	HT	0.34%	4.02%	3.68%	5.43%	6.17%	0.73%	6.81%	6.03%	-0.78%	8.86%	6.59%	-2.26%
	All Manufactures	**0.90%**	**4.75%**	**3.85%**	**4.63%**	**3.63%**	**-1.00%**	**5.18%**	**3.36%**	**-1.82%**	**2.59%**	**2.27%**	**-0.33%**
W Europe	RB	0.31%	0.88%	0.57%	0.15%	0.28%	0.13%	0.18%	0.11%	-0.07%	0.27%	0.54%	0.27%
	LT	1.01%	4.14%	3.13%	1.51%	0.87%	-0.64%	1.38%	1.26%	-0.12%	0.34%	0.29%	-0.05%
	MT	0.12%	1.24%	1.12%	0.63%	1.47%	0.84%	0.51%	0.63%	0.12%	0.38%	0.24%	-0.13%
	HT	0.17%	2.18%	2.01%	1.03%	2.06%	1.03%	2.04%	2.75%	0.72%	1.74%	2.91%	1.17%
	All Manufactures	**0.37%**	**1.96%**	**1.59%**	**0.79%**	**1.28%**	**0.49%**	**0.90%**	**1.19%**	**0.29%**	**0.59%**	**0.99%**	**0.40%**
	Exporter	**Hong Kong**			**Malaysia**			**Thailand**			**Indonesia**		
Importer	**Tech category**	1990	2000	Change	1990	2000	Change	1990	2000	Change	1990	2000	Change
Japan	RB	0.27%	0.09%	-0.19%	2.93%	2.88%	-0.05%	1.46%	2.79%	1.33%	4.90%	5.01%	0.10%
	LT	3.36%	0.45%	-2.91%	0.62%	1.54%	0.91%	2.80%	3.11%	0.31%	1.40%	2.06%	0.65%
	MT	0.70%	0.09%	-0.61%	0.80%	3.14%	2.33%	1.56%	3.71%	2.15%	0.44%	1.47%	1.04%
	HT	0.78%	0.33%	-0.45%	3.00%	6.61%	3.62%	1.48%	3.45%	1.96%	0.16%	1.45%	1.29%
	All Manufactures	**1.09%**	**0.25%**	**-0.84%**	**1.99%**	**3.91%**	**1.93%**	**1.76%**	**3.27%**	**1.51%**	**2.32%**	**2.44%**	**0.12%**
USA	RB	0.14%	0.07%	-0.07%	0.31%	0.53%	0.22%	1.22%	1.17%	-0.05%	0.85%	0.61%	-0.24%
	LT	6.00%	2.52%	-3.48%	0.93%	1.02%	0.08%	2.07%	2.15%	0.07%	1.16%	1.92%	0.76%
	MT	0.71%	0.07%	-0.64%	0.42%	0.85%	0.42%	0.40%	0.45%	0.05%	0.03%	0.25%	0.21%

	HT	1.82%	0.35%	-1.47%	3.21%	4.67%	1.46%	1.43%	1.72%	0.29%	0.05%	0.36%	0.31%
	All Manufactures	**2.01%**	**0.66%**	**-1.35%**	**1.07%**	**1.91%**	**0.84%**	**1.13%**	**1.27%**	**0.14%**	**0.43%**	**0.68%**	**0.25%**
W Europe	RB	0.02%	0.02%	0.00%	0.36%	0.32%	-0.05%	0.35%	0.37%	0.02%	0.27%	0.63%	0.36%
	LT	1.45%	0.76%	-0.68%	0.28%	0.41%	0.13%	0.77%	0.77%	0.01%	0.46%	1.05%	0.59%
	MT	0.24%	0.02%	-0.21%	0.17%	0.38%	0.21%	0.07%	0.35%	0.28%	0.06%	0.15%	0.09%
	HT	0.55%	0.26%	-0.29%	0.48%	1.58%	1.10%	0.28%	0.74%	0.46%	0.02%	0.20%	0.18%
	All Manufactures	**0.51%**	**0.22%**	**-0.29%**	**0.29%**	**0.68%**	**0.39%**	**0.32%**	**0.53%**	**0.21%**	**0.19%**	**0.43%**	**0.24%**

	Exporter	**Philippines**		
Importer	**Tech category**	1990	2000	Change
Japan	RB	0.99%	1.01%	0.02%
	LT	0.38%	0.63%	0.25%
	MT	0.38%	1.85%	1.47%
	HT	0.27%	3.78%	3.51%
	All Manufactures	**0.60%**	**2.04%**	**1.45%**
USA	RB	0.56%	0.32%	-0.24%
	LT	0.81%	1.33%	0.52%
	MT	0.12%	0.31%	0.19%
	HT	0.39%	2.32%	1.93%
	All Manufactures	**0.41%**	**1.09%**	**0.68%**
W Europe	RB	0.14%	0.09%	-0.05%
	LT	0.13%	0.17%	0.03%
	MT	0.01%	0.10%	0.09%
	HT	0.06%	1.04%	0.98%
	All Manufactures	**0.07%**	**0.35%**	**0.27%**

Annex Table 2: Technology breakdown of manufactured exports directly threatened by China ($ m. and %)

(Products in which East Asian countries lost world market shares and China gained in 1990-2000)

Country and product	Values		Distribution	
Korea	**1990**	**2000**	**1990**	**2000**
RB	2,669.9	16,715.0	9.5%	30.7%
LT	17,394.3	21,743.3	61.6%	39.9%
MT	6,660.2	14,432.1	23.6%	26.5%
HT	1,507.2	1,583.3	5.3%	2.9%
Total	28,231.7	54,473.6	100.0%	100.0%
Taiwan	**1990**	**2000**	**1990**	**2000**
RB	3,034.5	4,797.0	10.8%	10.8%
LT	18,583.2	27,130.3	66.4%	60.9%
MT	5,030.0	11,763.3	18.0%	26.4%
HT	1,353.8	851.2	4.8%	1.9%
Total	28,001.7	44,541.9	100.0%	100.0%
Singapore	**1990**	**2000**	**1990**	**2000**
RB	11,605.0	15,262.8	48.8%	49.4%
LT	3,367.3	3,915.3	14.2%	12.7%
MT	4,659.1	4,329.6	19.6%	14.0%
HT	4,162.0	7,365.9	17.5%	23.9%
Total	23,793.4	30,873.6	100.0%	100.0%
Hong Kong	**1990**	**2000**	**1990**	**2000**
RB	893.4	509.1	3.3%	2.6%
LT	15,143.7	12,581.1	56.4%	63.5%
MT	5,140.8	1,714.1	19.1%	8.6%
HT	5,675.2	5,016.6	21.1%	25.3%
Total	26,853.1	19,820.8	100.0%	100.0%
Malaysia	**1990**	**2000**	**1990**	**2000**
RB	522.0	1,315.2	16.2%	4.7%
LT	756.5	1,930.1	23.5%	6.9%
MT	1,203.5	3,088.2	37.3%	11.1%
HT	743.0	21,463.7	23.0%	77.2%
Total	3,225.0	27,797.2	100.0%	100.0%
Thailand	**1990**	**2000**	**1990**	**2000**
RB	1,469.2	1,288.9	22.1%	16.7%
LT	4,384.6	5,127.2	65.9%	66.5%
MT	794.8	1,294.2	12.0%	16.8%
HT	-	-	0.0%	0.0%
Total	6,648.6	7,710.3	100.0%	100.0%
Indonesia	**1990**	**2000**	**1990**	**2000**
RB	4,332.7	4,390.4	87.5%	89.0%
LT	265.4	193.9	5.4%	3.9%
MT	354.7	347.1	7.2%	7.0%
HT	-	-	0.0%	0.0%
Total	4,952.9	4,931.4	100.0%	100.0%
Philippines	**1990**	**2000**	**1990**	**2000**
RB	626.7	485.3	40.9%	28.8%
LT	700.5	1,081.6	45.7%	64.2%

MT	204.3	118.6	13.3%	7.0%
HT	-	-	0.0%	0.0%
Total	1,531.5	1,685.5	100.0%	100.0%

Annex Table 3: China's trade with neighbours ($ m. and %)

Trading Partner	Category	Exports		Imports		Net Trade		Growth rate (1990-2000)	
		1990	2000	1990	2000	1990	2000	Exports	Imports
Korea	**Total**	**649.9**	**8,541.8**	**671.4**	**22,025.0**	**-21.5**	**-13,483.2**	**29.4%**	**41.8%**
	RB	281.5	1,436.7	89.7	4,285.5	191.7	-2,848.8	17.7%	47.2%
	LT	148.7	2,778.3	171.9	4,575.6	-23.2	-1,797.3	34.0%	38.8%
	MT	207.3	2,122.5	289.6	7,712.3	-82.3	-5,589.8	26.2%	38.8%
	HT	12.4	2,204.3	120.1	5,451.6	-107.7	-3,247.3	67.9%	46.5%
Taiwan	**Total**	**230.9**	**4,253.4**	**2,115.5**	**23,248.6**	**-1,884.6**	**-18,995.2**	**33.8%**	**27.1%**
	RB	44.2	368.3	222.7	1,318.5	-178.5	-950.2	23.6%	19.5%
	LT	66.2	1,081.1	690.0	4,692.6	-623.8	-3,611.5	32.2%	21.1%
	MT	105.1	1,539.1	1,036.2	10,484.6	-931.1	-8,945.5	30.8%	26.0%
	HT	15.4	1,265.0	166.7	6,752.9	-151.3	-5,488.0	55.4%	44.8%
Singapore	**Total**	**1,357.1**	**5,349.1**	**802.8**	**4,862.5**	**554.3**	**486.6**	**14.7%**	**19.7%**
	RB	594.1	775.4	541.1	975.5	53.0	-200.1	2.7%	6.1%
	LT	403.9	1,088.7	23.5	225.8	380.3	862.8	10.4%	25.4%
	MT	293.5	1,262.3	197.3	1,563.3	96.2	-301.0	15.7%	23.0%
	HT	65.5	2,222.7	40.7	2,097.9	24.8	124.8	42.3%	48.3%
Hong Kong	**Total**	**24,308.5**	**41,506.9**	**13,773.6**	**8,922.2**	**10,534.9**	**32,584.8**	**5.5%**	**-4.2%**
	RB	1,894.3	2,689.6	511.3	756.8	1,383.0	1,932.8	3.6%	4.0%
	LT	12,306.7	18,906.0	4,865.5	2,372.2	7,441.2	16,533.8	4.4%	-6.9%
	MT	8,267.4	7,176.8	6,770.7	2,267.1	1,496.7	4,909.7	-1.4%	-10.4%
	HT	1,840.1	12,734.5	1,626.0	3,526.1	214.1	9,208.4	21.3%	8.0%
Indonesia	**Total**	**192.3**	**2,283.7**	**157.1**	**2,373.9**	**35.2**	**-90.2**	**28.1%**	**31.2%**
	RB	54.9	397.6	34.2	1,703.9	20.7	-1,306.2	21.9%	47.8%
	LT	17.2	510.2	4.4	218.4	12.8	291.9	40.4%	47.8%
	MT	99.4	921.4	118.0	106.5	-18.6	814.9	24.9%	-1.0%
	HT	20.8	454.4	0.5	345.2	20.3	109.3	36.1%	92.3%
Malaysia	**Total**	**237.3**	**2,144.8**	**520.8**	**4,638.1**	**-283.5**	**-2,493.4**	**24.6%**	**24.4%**
	RB	55.0	256.0	405.5	929.4	-350.5	-673.4	16.6%	8.6%
	LT	86.2	471.9	14.8	175.1	71.5	296.8	18.5%	28.0%
	MT	79.9	442.8	94.7	820.3	-14.8	-377.5	18.7%	24.1%
	HT	16.3	974.0	5.9	2,713.3	10.4	-1,739.3	50.5%	84.6%
Philippines	**Total**	**112.8**	**1,273.1**	**62.4**	**1,433.4**	**50.4**	**-160.3**	**27.4%**	**36.8%**
	RB	40.5	183.2	31.3	110.2	9.2	73.0	16.3%	13.4%
	LT	25.6	381.3	4.7	12.7	20.8	368.7	31.0%	10.5%
	MT	35.0	274.2	25.9	126.0	9.1	148.2	22.9%	17.1%
	HT	11.7	434.3	0.3	1,184.5	11.3	-750.2	43.5%	128.9%
Thailand	**Total**	**613.3**	**1,931.3**	**145.1**	**3,403.0**	**468.2**	**-1,471.6**	**12.2%**	**37.1%**
	RB	108.7	255.4	47.3	566.6	61.4	-311.2	8.9%	28.2%
	LT	250.0	309.0	27.5	284.7	222.5	24.3	2.1%	26.3%
	MT	217.1	568.6	66.9	1,081.3	150.2	-512.7	10.1%	32.1%
	HT	37.5	798.4	3.4	1,470.4	34.2	-672.0	35.8%	83.5%
Developing East Asia (above 8 countries)	**Total**	**27,702.1**	**67,284.1**	**18,248.7**	**70,906.7**	**9,453.4**	**-3,622.5**	**9.3%**	**14.5%**
	RB	3,073.2	6,362.2	1,883.1	10,646.4	1,190.0	-4,284.1	7.5%	18.9%
	LT	13,304.5	25,526.5	5,802.3	12,557.1	7,502.1	12,969.5	6.7%	8.0%
	MT	9,304.7	14,307.7	8,599.3	24,161.4	705.4	-9,853.7	4.4%	10.9%
	HT	2,019.7	21,087.6	1,963.6	23,541.9	56.1	-2,454.3	26.4%	28.2%

Japan	**Total**	**4,492.4**	**36,277.9**	**7,367.0**	**39,809.5**	**-2,874.6**	**-3,531.6**	**23.2%**	**18.4%**
	RB	1,299.4	5,389.0	597.1	3,530.9	702.3	1,858.0	15.3%	19.4%
	LT	2,343.0	18,527.8	1,516.0	5,862.4	827.0	12,665.4	23.0%	14.5%
	MT	690.8	4,718.4	3,788.6	16,132.6	-3,097.9	-11,414.2	21.2%	15.6%
	HT	159.2	7,642.7	1,465.3	14,283.5	-1,306.1	-6,640.8	47.3%	25.6%