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**CHINA'S EMERGENCE AS THE WORKSHOP OF THE WORLD**

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## *Abstract*

China's emergence as a major exporter of manufactures is well-known. Less well-known perhaps is the rapid transformation towards manufactures of other countries that were poor in 1980. The rapidity of this transformation suggests that common factors, such as vertical specialization in production, may have played an important role. We examine the transformation of China's exports relative to those of India and other low-income exporters. We find that the share of manufactures rose rapidly in each case, and that the most rapid growth was in relatively skill-intensive manufactures. A key part of China's export growth came from the emergence of new exports, which occurred rapidly in the 1980s, and less rapidly in the 1990s. In India, by contrast, this process did not begin until the 1990s. Reductions in protection in China and India disproportionately reduced the cost burden on manufactures and agricultural processing. Textiles and clothes are an important special case, with the outcome very heavily distorted by protection imposed under the Multi-Fiber Arrangement. Because of the abolition of those quotas, expansion of China's exports of these products after 2005 is likely to be very rapid, relative to other, more skill-intensive goods.

## CHINA'S EMERGENCE AS THE WORKSHOP OF THE WORLD

Since the beginning of the reform era, China has become a manufacturing powerhouse. From a desperately poor and nearly autarchic country, China has been able to grow rapidly and to greatly increase her openness to the world. Associated with this export growth has been a rapid shift in the composition of her export basket from natural resource-based products to manufactures. Further, the composition of these manufactures has shifted rapidly, from simple, labor-intensive products to a much more diversified basket of products, including many high-technology products. Producers in other countries are becoming concerned about the seemingly unstoppable momentum of this export machine, and policy attention has begun to focus on ways to restrain the competitiveness of Chinese exports—including in 2004 the campaign by the United States and Japan for a sizeable revaluation of the Chinese currency.

Less well known is the fact that many other developing countries, including India, have also made major changes in the structure of their trade. Although growing considerably less rapidly than China, the other countries that were low-income in 1980 have also fundamentally transformed the patterns of their trade. Agriculture and natural resources have declined sharply in importance as sources of export revenues, and the increasing share of manufactures has included a rising share of high-technology products. When evaluating the performance of China's export powerhouse, it seems important to compare it with developments in other countries at broadly similar levels of development.

A comparison of developments in the trade patterns of China and other members of the low-income class of 1980 seems likely to identify factors that distinguish China's performance from that of other low-income countries. We begin therefore by examining some of the key developments in the exports of China and other low-income countries. Because India, like China, looms so large in this group, and because it has been extensively studied, we consider it separately throughout the paper.

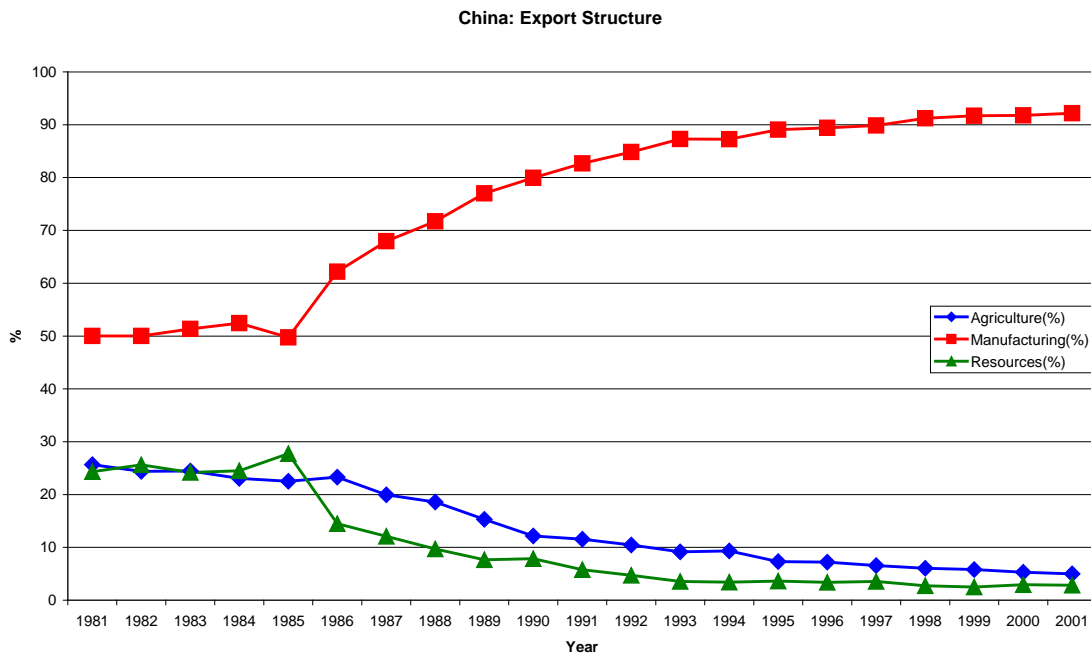
After examining the developments in export patterns, we turn to an analysis of the factors that have helped China to achieve its remarkable export performance. These factors clearly included the liberalization of trade and investment policies that were so central to the reforms, and the reforms of domestic enterprises and institutions needed to respond to the changes in incentives created by these reforms. Where possible, we contrast the developments in China with the corresponding changes in our "control" group of low income countries.

We conclude with a short discussion of internal market barriers in China. While these barriers are clearly detrimental to China's economic development, their impact on international trade is uncertain. Young (2000) even argues that they may have spurred China's international trade as a substitute for thwarted trade between China's regions.

## Developments in the Export Patterns of China and Other Developing Countries

In 1980, China had already moved far from the traditional stereotype of a developing country dependent solely on exports of primary commodities and dependent on imports of manufactures, a theme repeated even in recent textbooks on economic development (Todaro 1994). At this stage, manufactures made up 50 percent of China's exports, as against 24 percent from resource-based products, and 26 percent from agriculture. As is shown in Figure 1, however, the share of manufactures in China's exports grew very rapidly from about 1985, and exceeded 92 percent of total merchandise exports in 2001.

**Figure 1. The share of manufactures in China's exports has risen rapidly**

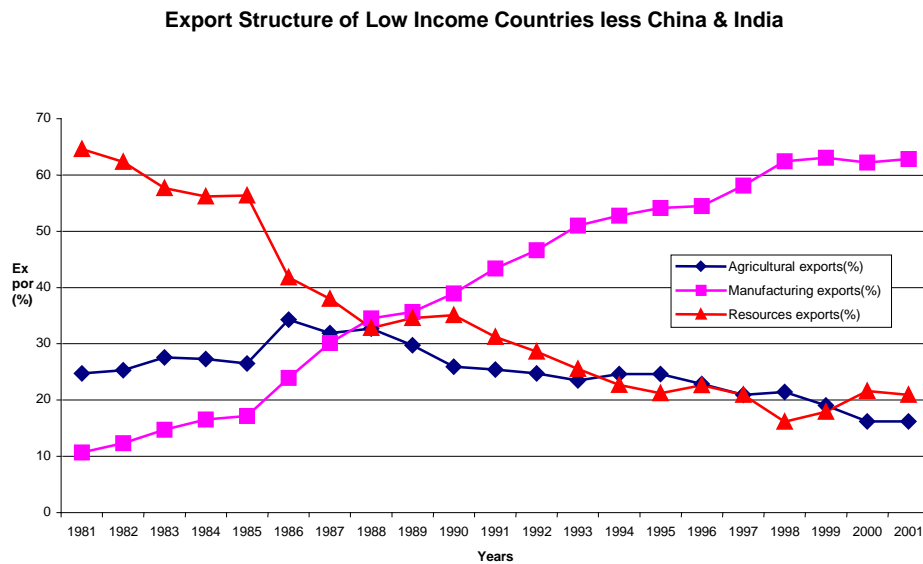


The decline in the importance of resource-based products in China's exports has been dramatic, with agriculture accounting for only 5 percent of total exports in 2001, and natural resource-based products less than 3 percent. Part of this change was due to a sharp decline in China's exports of petroleum, which accounted for almost 22 percent of merchandise exports in 1980 but less than one percent in 2001.

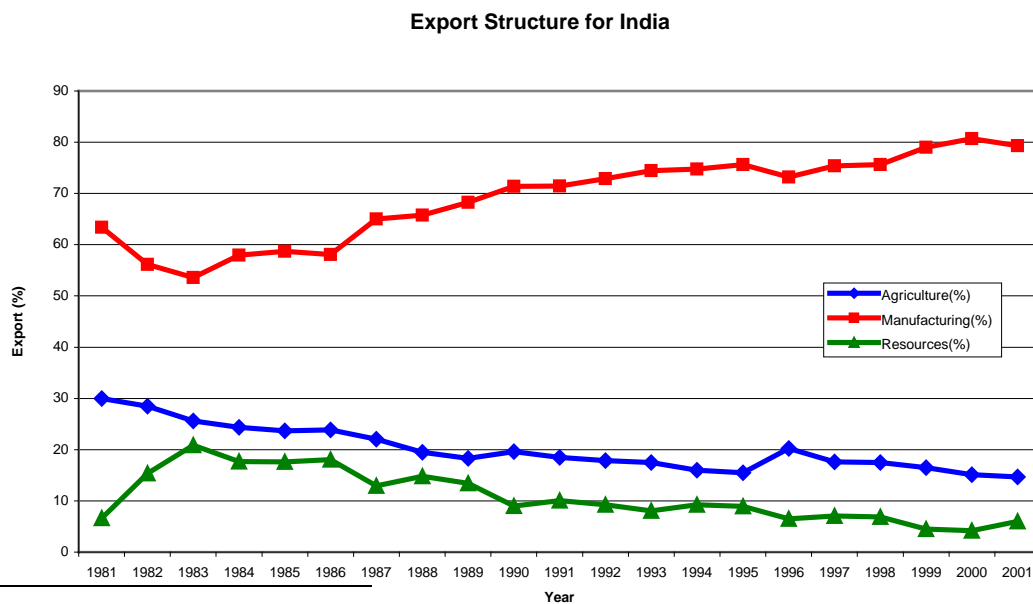
The decline in the importance of agricultural and resource-based products in China's exports may not seem surprising, particularly to those who are aware of China's limited endowments of agricultural land and natural resources. However, similarly dramatic

changes have been going on in other low-income countries. As is evident from Figure 2, the share of manufactures in the exports of all low-income countries (excluding China and India) has risen sharply, from only 10 percent in 1981 to over 60 percent in 2001. To avoid selection bias, the group of low-income countries presented in this and subsequent graphs was selected based on countries having income levels below \$1000 in 1981, rather than at the end of the period<sup>1</sup>. Seen in the light of this 50 percentage point increase, the increase of 40 percentage points in the share of manufactures exports from China seems somewhat less remarkable.

**Figure 2. The importance of exports of manufactures rose in low-income countries.**



**Figure 3. India's export structure changed, but less rapidly**

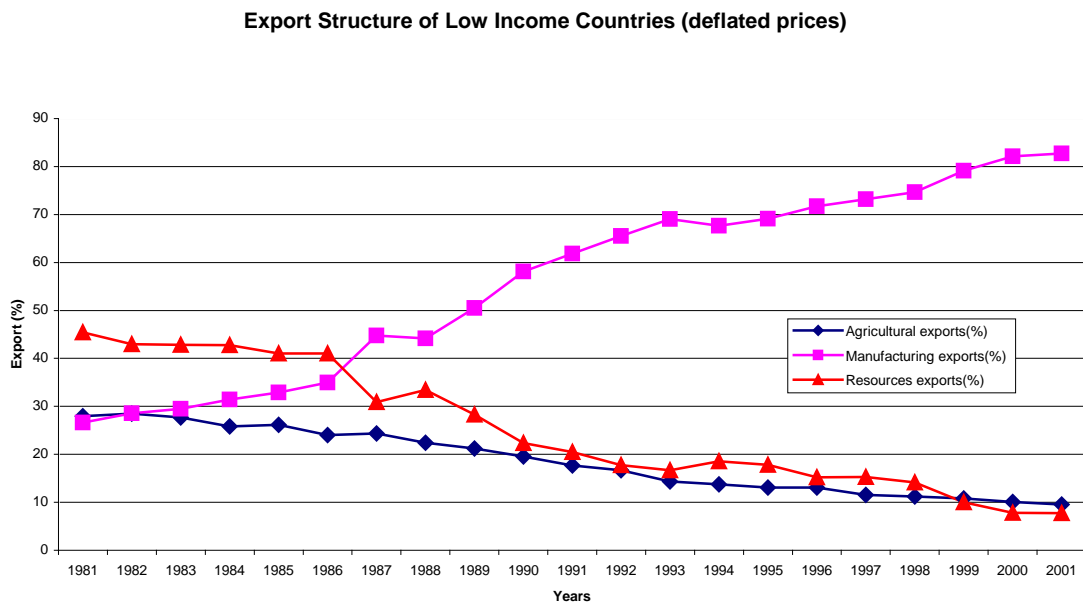


<sup>1</sup> The classification of countries by income is based on the World Bank's World Development Report 1982, with \$1000 (dollars of 1981) as the limit between low-income countries and middle-income countries. The industrialized countries are considered a separate group (World Bank 2003). For a list of countries, see Annex 1.

The export pattern for India also shows a pronounced shift over the period, although at a rate that is slower than for China or for the other low-income countries, and with a decline in the early years of the sample. In India's case, agricultural exports remained relatively important, accounting for more than 15 percent of exports in 2001.

Over the period of the analysis, the real price of oil and other energy products fell substantially. However, the decline in the share of natural resource exports is not greatly diminished if we deflate each series by a deflator in order to express them as quantity shares at base prices. When we do this for the low-income countries as a group, for which group exports of resources were important in 1981, we find relatively little change in the overall pattern. Most importantly, the rapid growth in the share of manufactured exports is an apparently robust result. To guard against the possibility that the results for the low-income group as a whole were driven by just a few countries, we also examined developments in the simple average of manufactured export shares for these countries, and found that it increased from 25 percent to more than 50 percent.

**Figure 4. Changes in commodity prices do not greatly affect the broad pattern.**



When we look beyond the product aggregates to obtain an indication of changes in the structure of developing country exports, and particularly in the technology level of their exports, we find that there have been substantial changes within each of these aggregates.

**Table 1. Export growth by sector and technology level, 1981-2001**

Sector	China	India	Low-Income less China and India	World
	%	%	%	%
Primary products	6	6	1	2
Resource-based manufactures				
Agricultural	12	10	7	6
Other	10	11	4	5
Low-technology manufactures				
Textiles	16	10	14	8
Other	21	12	16	8
Medium-technology manufactures				
Automotive and components	23	12	22	8
Process industry products	12	17	14	7
Engineering products	26	11	21	8
High-technology manufactures				
Electronic	38	17	21	13
Other	20	18	10	9
Total	16	10	13	7
Note: Product definitions kindly supplied by WTO. Data analysis undertaken in the World Bank's WITS system using partner trade data from UN COMTRADE.				

China's export growth over the period has been explosive, at 16 percent per year more than double the world growth rate, and fast enough to double every four and a half years. Within China's exports, however, the rate of growth has varied considerably, with primary products growing at 6 percent per year and, at the other extreme, electronic products growing at 38 percent per year over the period. The results presented in Table 1 make clear that the expansion of manufactured exports from China and other low-income countries has not been simply an expansion of traditional low-technology products. Exports of low-technology manufactures such as textiles and garments did grow much more rapidly than world trade as a whole. However, the gap between the export growth rates of the low-income countries was generally greater for medium- and high-technology products than for the simpler manufactures. China's performance on electronic products was truly extraordinary, with export growth of 38 percent per year being almost three times the world average, and more than twice India's. However, the other low-income countries came much closer to China's performance in areas like automotives and components, and engineering products, and India outperformed China in process-industry products, and came close in the "other high-technology" category.

At the end of the period, the export pattern of each of our three groups looked entirely different from the situation in 1981. This is evident for each of our country groups (Table 2). For China, the most important export sector in 1981 was primary products, with a 36 percent share - now just a 5 percent share. Resource based manufactures declined too, so that these two sectors that had a 54 percent share in 1981 now have just a 12 percent share in exports. In 2001, the first place is taken by textile industry with a constant share of 25 percent. A close second is high-technology manufactures – the electronics sector's share rose from 1 percent to 22 percent. Within high-technology manufactures electronics



is also a big winner for the other low-income countries, going from 2 percent to 22 percent. Primary products still have the largest share for these countries, but it declined from 74 percent to 27 percent. We also notice a rising share for textiles, from 4 percent in 1981 to 19 percent in 2001. For the low-income countries less China and India, and especially for China, the dynamic change in the pattern of exports is marked by a significant increase in the export share of sectors with more complex technologies. For India we see a decrease in the share of primary products, from 29 percent to 14 percent, compensated mainly by an increase in the share of non-agricultural resource based manufactures, from 22 percent to 27 percent. Compared with China, the pattern of Indian exports seems to be stable, with the weight on low-technology and resource-based manufactures and primary products<sup>2</sup>.

**Table 2. Export share by sector and technology level, 1981-2001 for China, India and Low-income countries other than China and India (percentages)**

Sector	China		India		Low-income countries less China & India	
	1981	2001	1981	2001	1981	2001
Primary products	36	5	29	14	74	27
Resource-based manufactures						
Agricultural	6	3	3	3	8	8
Other	12	4	22	27	9	6
Low-technology manufactures						
Textiles	25	25	31	29	4	19
Other	9	20	6	8	1	5
Medium-technology manufactures						
Automotive and components	0	1	1	1	0	1
Process-industry products	6	2	2	5	1	3
Engineering products	3	14	4	4	0	6
High-technology manufactures						
Electronic	1	22	1	3	2	22
Other	1	2	1	3	0	1

Note: Product definitions kindly supplied by WTO. Data analysis undertaken in the World Bank's WITS system using partner trade data from UN COMTRADE.

Such broad, sweeping changes across the developing world requires an explanation that goes substantially beyond the changes in any one country.

<sup>2</sup> We analyze the export of non-service products. One of the most dynamic sectors for India was exports of software and related services, which experienced average annual growth of 22 percent (1990-2000) or 47 percent (1995-2000) and has a share of more than 16 percent of India's total exports (UNCTAD 2002).

## *Why did such rapid increases in manufacturing exports occur?*

A number of factors were clearly involved in the observed rapid increases in the importance of manufactured exports from low-income countries. Some of these factors have reflected changes in national policies, but changes of this magnitude must surely also reflect changes in the global environment for exports from developing countries. One key development has certainly been improvements in transport and communications that, in conjunction with developing-country reforms, allowed the production chain to be split into components, with developing countries playing a key role in global production sharing. Another has been the ability of countries to enter new product lines, and so avoid the deteriorating terms of trade so feared by many earlier thinkers on development.

### Global production sharing is creating new opportunities

Much of the change in developing-country export patterns, and particularly the rise in high-technology exports, is associated with the phenomenon of global production sharing (Deardorff 2001; Hummels, Ishii, and Yi 2001). Production sharing requires reliable transportation, communication, and other services to allow production to be split into discrete stages, each undertaken in the countries best suited to it. Labor-intensive stages of production, for example, are done in labor-abundant countries. Potentially, production sharing can greatly expand the range of activities in which developing countries can participate—holding out the promise of increasing employment and reducing poverty.

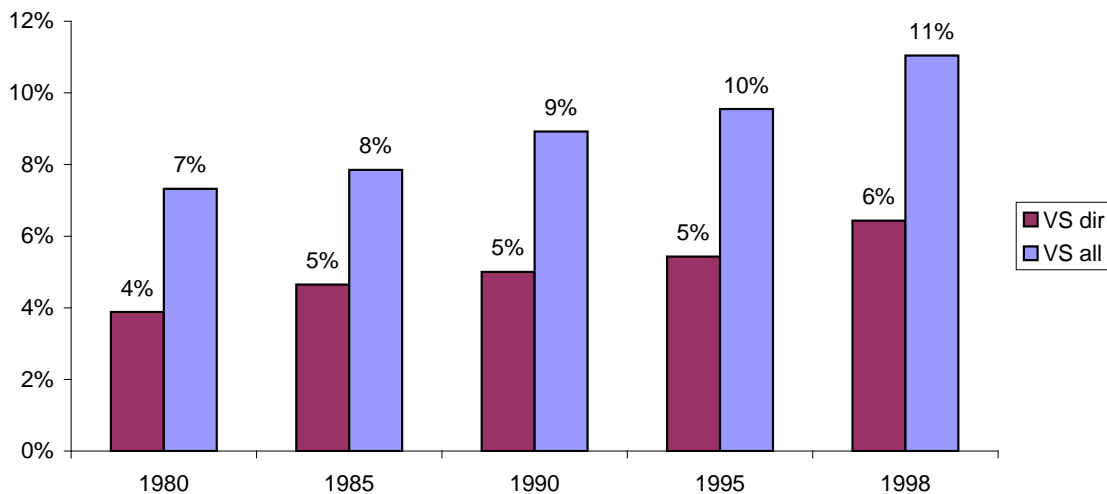
Of course, breaking the once-rigid linkages between stages in the production process makes it more difficult to interpret the implications of the shift to manufactures—particularly high-technology products. In many cases, developing countries undertake only those production activities that require low-skilled labor—a low-tech part of the production of products such as textiles and clothing, and of high-tech commodities. However, the buoyant demand for such commodities helps offset the relatively stagnant demand for some traditional agricultural commodities.

The move to global production sharing heightens the importance of timely, efficient, and low-cost transportation. Even quite small differences in transport costs and the timeliness of transportation services can have quite dramatic consequences for incomes in countries. Hummels (2001) estimates that an increase of one day in the time taken to deliver a good is equivalent to an increase of 0.8 percent in the cost not just of transportation, but of the good itself. Redding and Venables (2001) conclude that differences in transport costs in a world of global production sharing may account for a large proportion of the observed differences in incomes between countries. In a world of global production sharing, countries must pay transport costs to get their inputs, and to market their outputs. If value added is a small share of output value, then transport costs have enormous leverage on the residual returns available to pay workers and owners of capital. For example, if value

added is 20 percent of the gross output value in the absence of trade costs, then a transport cost of 10 percent of output to ship products out and an equal cost to bring components in would essentially wipe out all returns to productive factors.

To gain an idea of the potential impact of global production sharing on China and India,<sup>3</sup> we have calculated indexes of vertical specialization of the type developed by Hummels, Ishii, and Yi (2001).<sup>4</sup> These indexes show the share of imported inputs embodied in each unit of goods exported -- either directly or after indirect use of imported inputs is taken into account. Although imperfect -- they do not allow for differences between export- and domestically-oriented sectors in their use of intermediate inputs -- these measures provide a structured assessment of the extent of and trend in production sharing. Two sets of results are presented in each figure. The lower bars estimate direct use of imported intermediates in exports, while the higher bars represent direct plus indirect use.

**Figure 5. Vertical Specialization in India**

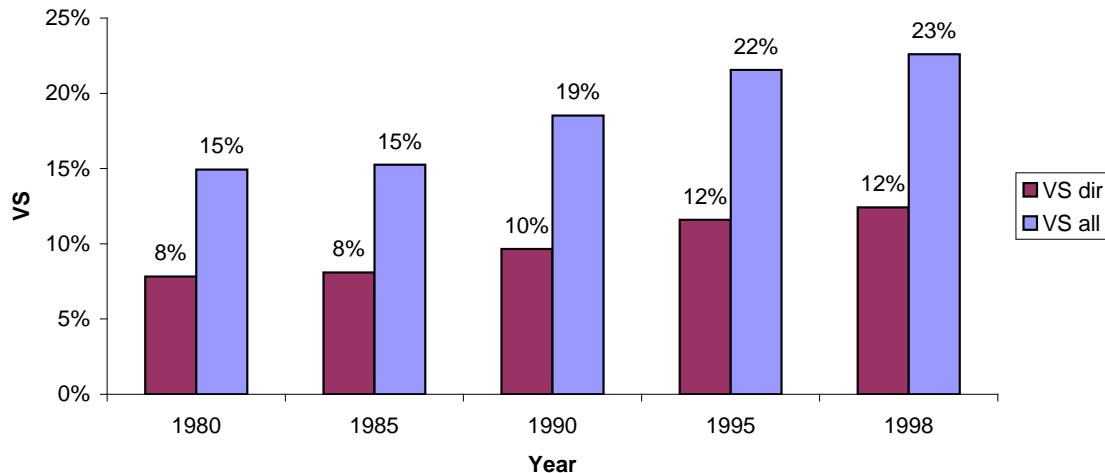


<sup>3</sup> Such an index is probably not very meaningful for a composite group such as the low-income countries.

<sup>4</sup> Following Hummels, Ishii, and Yi (2001) we use the VS (Vertical Specialization) index. For direct effects

for the country  $k$ :  $VS_k = \frac{\mathbf{uA}^M \mathbf{X}}{X_k}$  where  $\mathbf{u}$  is a  $1 \times n$  vector of 1's,  $\mathbf{A}^M$  is the  $n \times n$  imported coefficient matrix,  $\mathbf{X}$  is an  $n \times 1$  vector of exports,  $n$  is the number of sectors, and  $X_k$  is the sum of exports across the  $n$  sectors. We may add the indirect effects to the index:  $VS_k = \frac{\mathbf{uA}^M [\mathbf{I} - \mathbf{A}^D]^{-1} \mathbf{X}}{X_k}$ , where  $\mathbf{I}$  is the identity matrix and  $\mathbf{A}^D$  is the  $n \times n$  domestic coefficient matrix.

**Figure 6. Vertical Specialization in China**



Production sharing in India increased by more than 50 percent since 1980 (figure 5). In China, even though production sharing began from a considerably higher level than in India, it also increased by almost 50 percent over the period to 23 percent (figure 6). Even so, the estimates understate the importance of global production sharing in China, where policy has strongly favored the use of imported inputs in labor-intensive production of manufactures (Ianchovichina 2003), and where exports based on the processing of imported intermediates account for more than half of total exports. However, they highlight the substantial increase in the importance of the phenomenon in China over the period, and especially since 1987, when duty-free access was extended to a wide range of imported intermediates used in the production of exports.

And developing countries have expanded the range of products that they produce

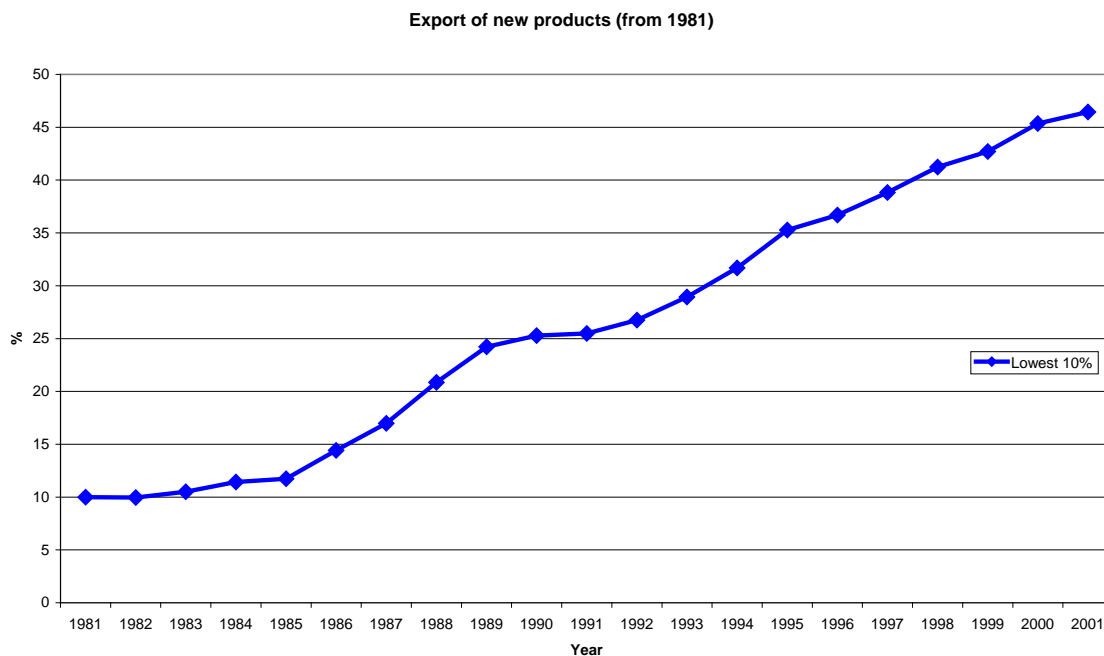
An important new strand of literature has focused attention on extensive margin growth in countries whose exports are growing rapidly. Kehoe and Ruhl (2002) find that a large part of the expansion in exports in countries undergoing liberalization and successful trade expansion comes from products that were not traded prior to liberalization. Hummels and Klenow (2002) point out that such growth may have the important advantage of allowing countries to escape the deterioration in the terms of trade that would be predicted by standard Armington-type trade models.

To gain some indication of whether this phenomenon has been an important feature of the export growth experience of China and India, we examined the extent to which expansion in the range of products produced has played an important role in the expansion of their exports. To do this, we followed the Kehoe-Ruhl approach of ranking commodities in descending order of export value (using 3 digit SITC commodities in our case), and focusing on the commodities at the bottom of the ranking, which collectively accounted for 10 percent of initial export value. As Kehoe and Ruhl note, this approach ensures that the export levels of these commodities are individually insignificant without introducing

the arbitrary -- and inherently discriminatory across countries -- cutoffs that are required when an absolute dollar value is used to define zero exports in the initial situation.<sup>5</sup>

When we examine the export performance of the least exported products from China in 1980, we find very rapid growth in exports of these products during the following 20 years. Figure 6 shows just how rapid, with their share rising from 10 percent of total exports to 45 percent. This aligns quite strongly with Kehoe and Ruhl's result that countries undergoing major liberalizations see the share of the bottom 10 percent of their exports rise to as high as 40 percent of their exports -- and suggests that China's liberalization in this period was quite profound. If we consider growth only in the first ten years, we find that the export share of these products rose from 10 percent to just over 25 percent in 1990. Much of this overall growth can be explained by just three categories of products: telecommunication equipment (SITC 764), automatic data processing machines (SITC 752) and accessories for automatic data machines (SITC 759). In 1981, the sum of their share of total exports was less than a tenth of a percent (0.096%). In 2001, the sum of their share of total exports was almost 15 percent.

**Figure 7. China: Growth due to exports of new products after 1981**

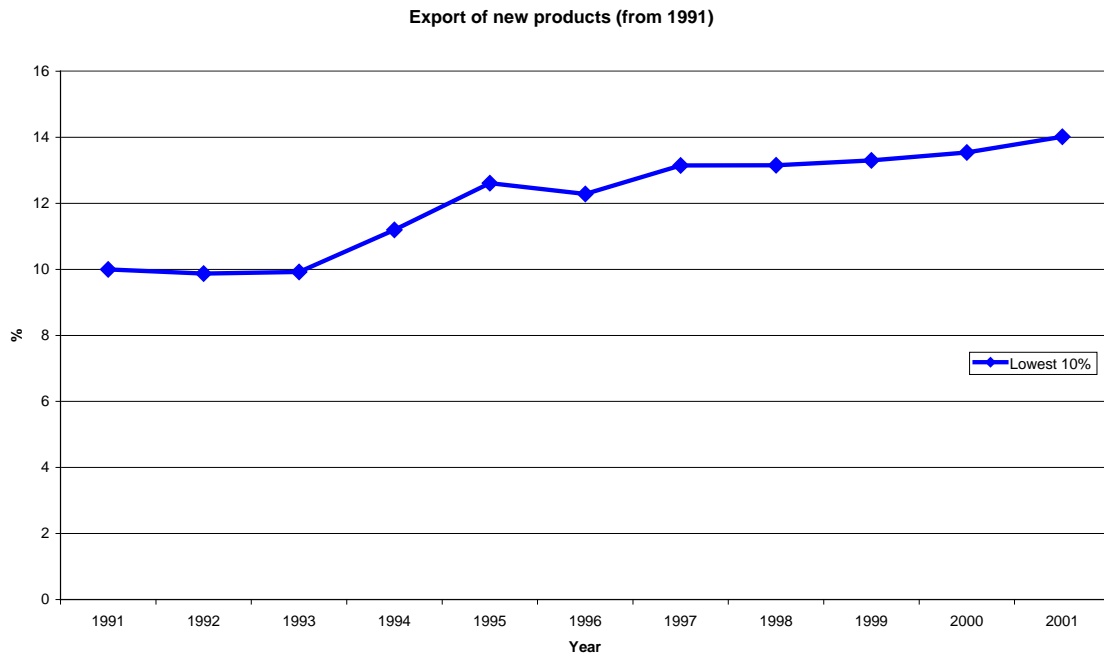


The growth of the products that were new after 1980 continued rising after 1990, with the share of these products in China's exports growing from 25 to 45 percent in 2001 (see Figure 7). However, the pace of innovation through the introduction of further new products appears to have slowed. If we focus on the products effectively not exported in 1990, we see that the share of these products rose from 10 percent to 14 percent in 2001 (see Figure 8). This suggests that the policy reforms undertaken in the 1980s may have been more influential in facilitating the introduction of new export products than the far-

<sup>5</sup> As Kehoe and Ruhl (2002) note, a cutoff of \$50,000 means something very different for China and for Nepal.

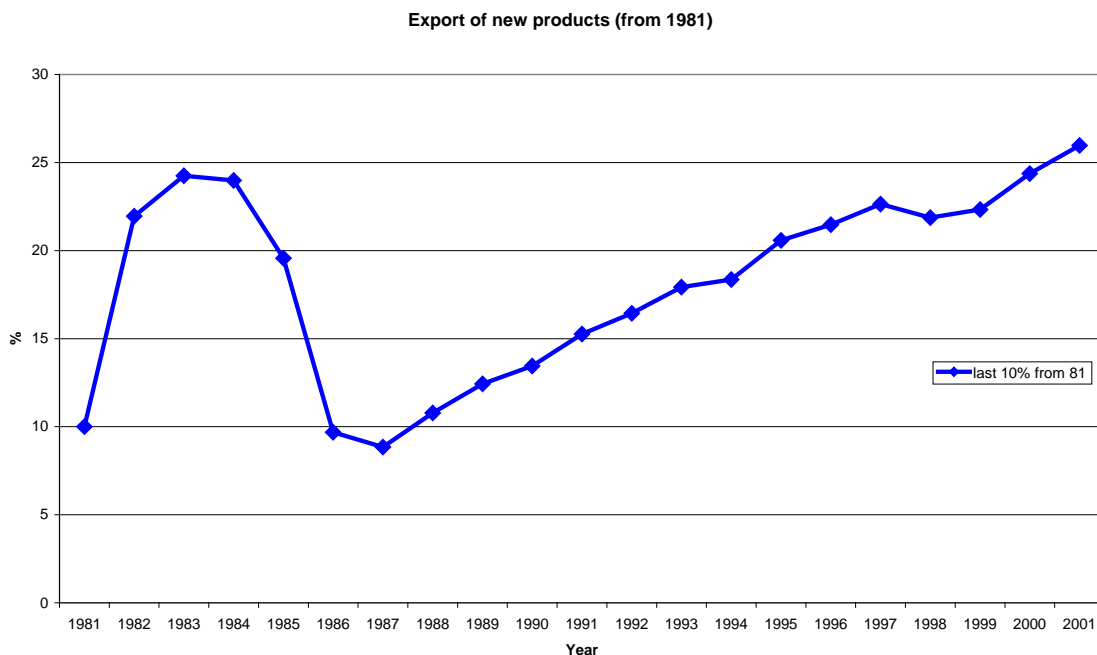
reaching reforms affecting non-tariff barriers, tariffs and exchange rate distortions (see Ianchovichina and Martin 2003) undertaken in the 1990s.

**Figure 8. China: Growth in exports of new products after 1990**



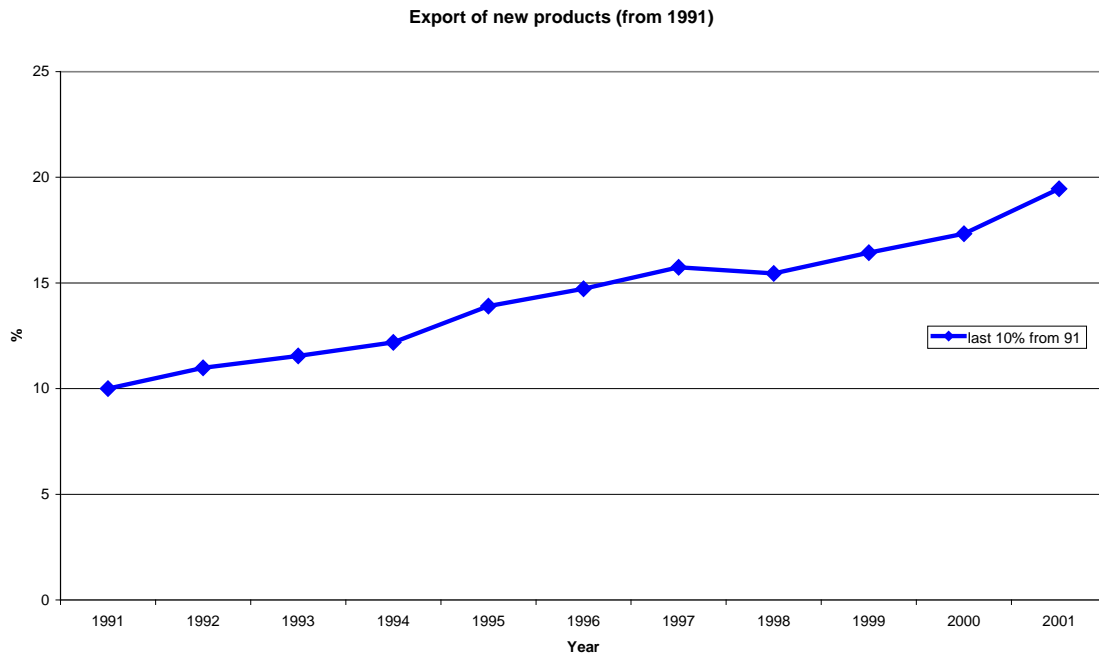
The introduction of new products in India's export basket proceeded much less smoothly than in China. After an initial surge in the early 1980s, the share of exports from products effectively not exported in 1980 fell back to its initial level (see Figure 9). Growth appears to have been largely the result of such special factors as the export of oil products, rather than of comparative advantage being acquired or unleashed as a result of reforms.

**Figure 9. India: Growth in exports of new products after 1980, % of total**



After 1990, the growth in exports of new products from India was much more rapid (see Figure 10). In this period, the share of exports accounted for by new products rose steadily, from 10 percent in 1990, to almost 20 percent by 2001. Further, the most important of these products in terms of their market share in 2001 were products such as chemicals (SITC 514, 515) and accessories for automatic data machines (SITC 759), which acquired a market share of almost 4 percent compared with a quarter of one percent in 1981. Allowing for the well-known difficulties involved in inferring the restrictiveness of trade policies, the evidence on emergence of new products from India still provides a tentative indication that true liberalization of the trade regime in India began after 1990, rather than 1980.

Figure 10. India: Growth in exports of new products after 1991, share of total (percent)



*What contributed to these large changes in trade patterns?*

Many factors have contributed to the large changes in the volumes, composition and value of exports from China, India and other low-income countries. One important factor has almost certainly been the dramatic changes in trade and foreign exchange policies in low-income countries, although it is frequently difficult to identify the turning points in trade regimes given the multiple, overlapping trade policy instruments designed to restrict trade.

## Trade policy reforms

The wave of trade policy reforms that have swept the developing world since the mid-1980s seems likely to have been an important influence on the increase in developing countries' participation in world trade in manufactures. As is well known, trade barriers bear ultimately on the sectors that cannot pass on the resulting costs, and particularly on exports, and there is every reason to expect that they will bear more heavily on manufactures, which frequently depend more on purchased intermediates than do agricultural or resource-based products.

The extent and pattern of the tariff reductions in China, India and the other low-income countries of 1980 shows some considerable divergences. The data on simple average tariffs presented in Table 2 show that China, India and the other low-income countries had very high tariffs in the mid 1980s.

**Table 3. Tariff rates and non-tariff barriers (NTB) frequency, 1981-2001**

Year	China		India		Low income	
	Simple Average Tariff	NTB Frequency	Simple Average Tariff	NTB Frequency	Simple Average Tariff	NTB Frequency
	%	%	%	%	%	%
1981	49.5	na	74	na	36	
1985	39.5	10.6	99	81	36	
1989	40.3	23.2	79	65	31	
1992	42.9	11.3	94	63	35	
1993	39.9		71*	99	27	31
1994	36.3		55*		27	
1996	23.6		38.6*		19	
1997	17.6		34.4*		19	
1998	17.5		40.2*	93.8	19	16.2
1999	17.2		39.6*		16	
2000	17.0		na		15	
2001	16.6	10	32.3		15	
Post-Accession	9.8	6.8	na	na	na	na

Sources: Ianchovichina and Martín (2003); UNCTAD (1994); UNCTAD TRAINS database. Srinivasan (2001)\*Including surcharges.

As is clear from Table 3, China made relatively little progress in reducing tariffs during the 1980s, and the incidence of NTBs actually rose over part of the period. Lardy (1991) estimated that the coverage of NTBs was considerably higher in the late 1980s than in the numbers reported by UNCTAD, and that the coverage of import licenses alone was approximately two thirds of all imports in the late 1980s.

To conclude that there was limited progress on trade reform in China during the 1980s, however, would ignore the nature of both the trade regime prior to the reforms and the reform process. The pre-reform Chinese trade regime was dominated by between 10 and



16 Foreign Trade Corporations (FTCs) with effective monopolies in the import and export of their specified product ranges (Lardy, 1991). Planned import volumes were determined by the projected difference between domestic demand and supply for particular goods, with export volumes set at levels necessary to finance planned imports.

Conventional trade policy instruments such as tariffs, quotas and licenses were of very limited importance in China's pre-reform system. Price-based measures such as tariffs were obviously unimportant since the planning system was based on quantity decisions rather than behavioral responses to prices. There was little need for quotas or licenses since the quantities to be imported could be controlled through the monopoly trading corporations.

Reform of China's trade regime had four major dimensions: increasing the number and type of enterprises eligible to trade beyond the initial handful of centrally controlled foreign trade corporations; developing the indirect trade policy instruments, such as tariffs, licenses, quotas, and duty exemption schemes, that were absent or unimportant under the planning system; reducing and ultimately removing distortion in the exchange rate; and reforming prices so that they could play a role in guiding resource allocation. These reforms of the trading system were inextricably linked with reform of the enterprise sector to replace direct regulation of enterprise outputs with indirect regulation through market-determined prices.

The number of FTCs with trading rights was progressively expanded, with trading rights provided to branches of the FTCs controlled by the central government, and to those controlled by regions and localities, until there were thousands of these firms. Since 1984, these trading enterprises have been legally independent economic entities (Kueh, 1987) and state-owned trading enterprises of this type now appear to operate very much along commercial lines (Rozelle *et al.*, 1996). Joint ventures between domestic and foreign firms, and firms located in the special economic zones were also allowed to trade their own products relatively early during the reform process. At a later stage, large firms began to gain direct foreign trade rights.

An important feature of the reforms was the introduction of special arrangements for processing trade, such as duty exemptions and rebates of value added tax payments. Imports of intermediate inputs for use in the production of exports were almost completely liberalized, as were capital goods inputs for use in joint ventures with foreign enterprises. These categories of imports came to represent a very large share of total imports, with intermediate inputs into exports accounting for almost 44 percent of total imports in 1999.<sup>6</sup>

The primary transitional device used to reduce, and ultimately remove, distortions in both commodity prices and exchange rates was the two(or more)-tier pricing system. Under the two-tier pricing system for commodities, the plan price continued to operate for the quantity of the commodity that producers were contracted to supply. However, to stimulate output, producers were allowed to supply additional output at a secondary market price. The two-tier system for foreign exchange involved an overvalued official

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<sup>6</sup> Source: Customs General Administration, People's Republic of China.

exchange rate and a higher secondary-market rate, and distorted trade by discouraging both exports and imports (Martin, 1993; World Bank, 1994). Over time, the gaps between official and secondary market prices were narrowed or eliminated, and the two-tier system for foreign exchange was abolished with unification of the exchange rate in 1994.

Trade policy reform in India began in what was largely a market economy, and so did not require the complex transition to a market economy involved in China. However, the reforms required were enormous. A quarter of GDP was produced in public enterprises, and expansion of any firm involving over 50 workers required a licence (Joshi and Little, 1996). Certain sectors were reserved for small scale production. As in China, major domestic policy reforms were required before the enterprise sector could fully respond to world price incentives transmitted through the trade regime.

Bulk imports of many commodities were canalized through state enterprises similar in many respects to China's pre-reform FTCs, and all imports were either subject to licensing or prohibited during the 1980s. Imports of consumer goods were subject to an effective ban for long periods.

Srinivasan (2001) traces the process of reforming India's trade regime from the initial, major reforms in 1991. As in China, it involved removing the overvaluation of the currency, a process completed in 1993, and the abolition of the government monopoly on imports of commodities other than petroleum and agricultural products. Tariffs have been reduced but -- without the impetus provided by WTO accession -- not by nearly as much as in China. However, Pursell (2003) notes that WTO rules did require a substantial reduction of protection after India lost its battle to maintain quantitative restrictions for balance-of-payments purposes. Average tariffs in India are roughly twice as high as in China, and are likely to be three times as high after China's WTO accession commitments are phased in.

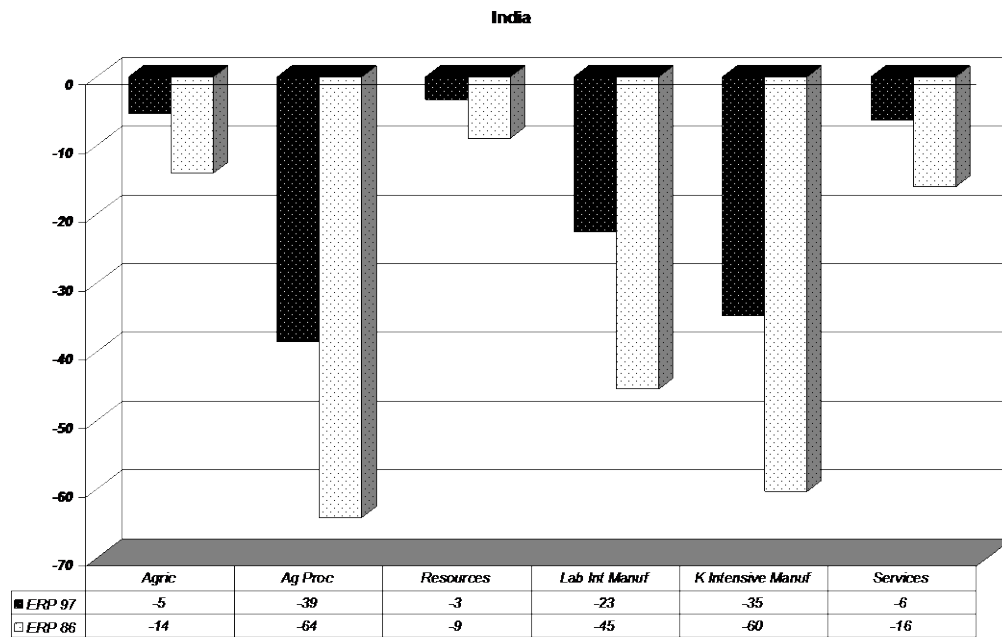
#### Trade liberalization and incentives for manufacturing exports

One important consequence of trade liberalization is a differential reduction in the burden imposed by protection on the manufacturing sector. The burden that tariffs impose on exports through intermediate input costs is illustrated for China and India in 1986, when estimated rates of average protection were first available for each country, and 1997 following large reductions in protection (figures 11, 12). The impact of protection on exports differs considerably between countries, but two key features are evident. First, agricultural processing and manufacturing (whether labor or capital intensive) for export are much more heavily taxed than are agricultural and resource commodities. Second, the rate of taxation has generally declined substantially since the mid 1980s, while remaining substantial for industrial products.

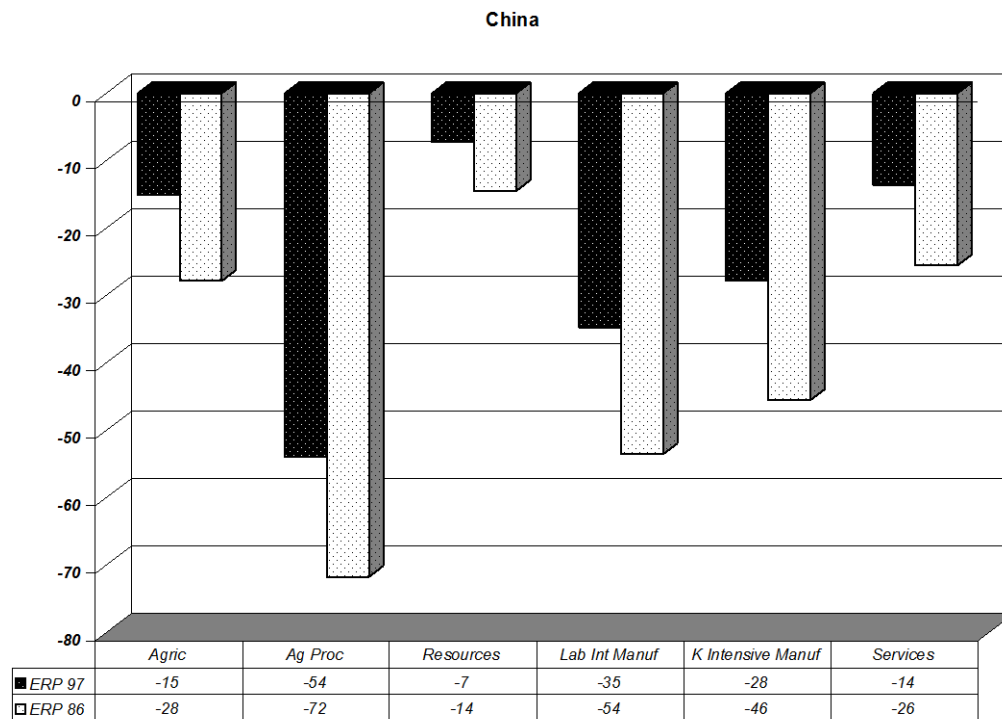
At the levels of protection prevailing in 1986, export activities in agricultural processing and in capital- or labor-intensive manufactures were taxed at essentially prohibitive levels in both India and China. In India, the taxes directly imposed by protection on agricultural processing and capital-intensive manufacturing averaged more than 60 percent.

(Nontariff measures, domestic licensing requirements, and exchange-rate distortions, if computed, would have further increased the effective tax rate.)

**Figure 11. Tariff tax exports in India**



**Figure 12. Tariff tax exports in China**



In China, the direct impacts of protection appear to have been on the same order of magnitude, with agricultural processing facing taxes of more than 70 percent and labor-intensive manufactures close to 60 percent. These problems were compounded by formidable obstacles to the expansion of domestic state-run firms, which were overcome in part by the emergence of an entirely new class of firms -- the township and village enterprises -- not subject to the constraints of the state-run firms.

Although a very few agricultural processing and manufacturing activities that depended less on intermediate inputs might have been able to survive at average tariff rates of 100 percent (as in India), it seems highly likely that reductions in tariffs and non-tariff barriers of the type observed around the world between 1986 and 2001 (World Bank 2000) must have contributed to the great expansion of developing countries' manufacturing exports.

Reductions in average tariffs were complemented by the introduction of duty-exemption or drawback arrangements under which export producers obtained access to duty-free inputs for use in export production. These arrangements offer one way, legal under GATT, to reduce the burdens imposed by import duties. China has used them successfully to develop labor-intensive exports (Ianchovichina 2003; Ianchovichina and Martin 2003).

They are an imperfect solution to the problems created by protection, however. Whether introduced throughout the economy or in specific free-trade zones, such arrangements are administratively demanding. In many cases, particularly in Africa, they have failed to operate successfully (Madani 1999). Further, they tend to encourage firms to concentrate on production activities that add little value to imported inputs, rather than on activities more closely integrated with domestic production. Ianchovichina (2003) found that exporting activities had become much more import-intensive than other industries as a result of the incentives created by duty exemptions. Since one of the key lessons of the new economic geography is that there may be substantial gains from activities that encourage the development of backward -- as well as forward -- linkages (Amiti 2003), incentives favoring shallow processing activities may cause highly protected economies to miss many opportunities for growth. Reductions in overall tariffs are a much better alternative than duty exemption. Not only do they remove the incentive for unnecessarily shallow specialization, they also reduce the price of non-traded goods and factor inputs (Corden 1997), and further stimulate production for export.

Another problem with relying on duty exemptions rather than relatively low and uniform tariff rates is that their introduction reduces the pressure for more general reductions in protection, since exporters -- a potentially powerful force for tariff reduction -- no longer suffer the direct impact of protection (Cadot, de Melo, and Olarreaga 2002).

#### Accumulation of Human and Physical Factors

The changes in trade structure and in the technological complexity of exports suggest significant transformations in production capacity for China, India and other low-income

countries. Such an increase in competitive exports might be expected to require changes in the exporting countries' endowments of physical and human capital per worker. While we recognize the possibility that capital accumulation does not necessarily lead to its productive use (Pritchett 2000, 2001), a shift in the production structure to more capital and skill-intensive factors is difficult to envisage without adequate supplies of the resources needed to produce them.<sup>7</sup>

We look at the variation of investment as a percentage of GDP as a measure of change in physical capital (Table 4). In 1981, China had a high level of investment – 26 percent of GDP. In the next twenty years we see an almost continuous increase in the investment rate, to 38 percent of GDP. This high, and increasing, rate of investment and the resulting rapid accumulation of capital are reflected in exports by the rising importance of capital-intensive industries like electronics and machinery. This development presumably contributed to the much more rapid growth of more capital-intensive industries, and the relative decline of simpler activities in the primary sector. From Table 2 we see that in 2001 the electronic industry had almost caught up with the textile industry in terms of share in exports (22 percent versus 25 percent).

For India, the investment rate was lower, and rose by much less from 19 percent to 22 percent of GDP. The low-income countries started with investment of 20 percent of GDP in 1981 and ended with the same share in 2001. The decrease in investment in the 1980s is compensated by a surge in the 1990s. The shift toward more capital-intensive exports illustrated in Table 2 does not seem to be supported by investment data. From the experience of the low-income countries as a group, the likelihood is that reforms that freed up domestic capital and allowed effective utilization of foreign capital were more important than investment *per se*.

**Table 4. Investment as share of GDP (percent).**

Year	China	India	Low-income less China and India*
1981	26	19	20
1982	28	19	20
1983	29	19	18
1984	30	20	17
1985	29	21	17
1986	30	21	17
1987	31	21	18
1988	31	22	18
1989	26	22	18
1990	26	23	19
1991	27	22	20
1992	31	22	20

<sup>7</sup> Martin and Warr (1992), for example, show that the decline of agriculture in Indonesia can be explained better as a consequence of Rybczynski effects resulting from greater accumulation of capital than by the price change factors emphasized in the partial equilibrium literature.

Year	China	India	Low-income less China and India*
1993	37	21	20
1994	36	22	22
1995	35	24	22
1996	34	23	22
1997	34	22	20
1998	35	22	21
1999	36	22	20
2000	36	22	20
2001	38	22	20

\*Simple average across countries

We considered two indicators for human capital per worker, declines in the illiteracy rate (Table 5) and the average school years (Table 6) of the total population older than 15 years. The illiteracy rate in China was 32 percent in 1981 and only 14 percent in 2001. In the same period, the average years of schooling rose from 4.8 years to 5.9 years. This suggests an increase in human capital that is reflected in the shift in export structure toward more technologically complex exports. In India we see a slower decrease in illiteracy from 58 percent to 42 percent. The average years of schooling rose from 3.3 years in 1981 to 4.1 years in 2001. The low-income countries started from a relatively high level of illiteracy, 52 percent in 1981, and declined to 37 percent in 2001. In the same period, the average schooling years increased from 2.7 years to 3.4 years. It seems difficult to explain the increase in the technology intensity of exports from this group in terms of increased human capital. This suggests that changes in policies were probably more influential than accumulation of human capital in the growth of high technology exports from developing countries.

**Table 5. Illiteracy rate, adult total (percentage of people 15+)**

Year	China	India	Low income countries
1981	32	58	52
1982	30	57	52
1983	29	56	51
1984	28	56	50
1985	27	55	49
1986	26	54	48
1987	25	53	48
1988	24	52	47
1989	23	51	46
1990	22	51	45
1991	21	50	45
1992	20	49	44
1993	20	48	43
1994	19	48	42
1995	18	47	41
1996	17	46	41
1997	17	45	40

1998	16	44	39
1999	16	44	38
2000	15	43	38
2001	14	42	37

**Table 6. Average schooling years in the total population (>15 years)**

Year	China	India	Low-income Countries less China and India
1980	4.8	3.3	2.7
1985	4.9	3.7	3.0
1990	5.9	4.1	3.4

## **Textiles and Clothing**

Textiles and clothing trade warrants particular attention because of (i) its importance as an export for China, (ii) the peculiar structure of protection policies that have restricted the growth of China's exports of these goods, and (iii) the drastic reform of these policies that is imminent with the abolition of the quotas in January 2005. As is well known, exports of textiles and clothing to the industrial countries (and frequently to developing countries as well) are subject to particularly high tariffs, and also to a system of bilateral quotas that developed under the Multi-Fiber Arrangement (MFA).

While agreement was reached in the Uruguay Round to phase out the MFA quotas against developing country exports of textiles and clothing, this agreement (the Uruguay Round Agreement on Textiles and Clothing or ATC) did not apply to China until it acceded to the WTO. Following accession, China became eligible for the benefits of the gradual phase-in of textile products to GATT disciplines under the first three tranches of the ATC, and for the abolition of all remaining quotas from the first of January 2005. Although 51 percent of textile and clothing products had been integrated into GATT in accordance with the ATC by January 2002, this resulted in the abolition of only a few quotas, since the industrial countries were free to choose the products to integrate and typically chose products for which developing countries were not important producers.

Thus, the key turning point in the abolition of the textile and clothing quotas for China, and for other developing countries, will be January 1, 2005, when all textile and clothing products must be integrated under GATT rules. The industrial countries will still have the option of trying to restrict China's exports using a range of provisions under China's WTO accession agreement (see Bhattasali, Li and Martin 2003) including the special textile safeguard or the product specific safeguard in China's WTO accession agreement. In addition, they may target Chinese exports under antidumping actions (to which China is particularly vulnerable because of the non-market economy provisions -- see Messerlin 2003), or exports in general under the WTO provisions on safeguards or countervailing duties.

One indication of the extent to which China's exports have been restricted by the textile quota arrangements is provided by the export tax equivalents of the export quotas that apply against China. To gain an indication of the restrictiveness of the quotas, we obtained data on the transaction prices of the quotas in China, and on the unit value of the exports of these goods from China (which includes the price of the quota).<sup>8</sup> Since quotas are legally transacted in China, these quota prices should give a good indication of the extent to which the quotas restrict trade and act like an export tax. To put the restrictive effects of the quota into comparable units, we expressed their prices relative to the unit value of the exports net of the quota price, to obtain an estimate of their export tax equivalents.

The average measured export tax equivalents of the quotas are about 10 percent for textiles, and 22 percent for clothing. The export tax equivalents for clothing were generally much higher in 2002, despite the abolition of some of these quotas from the beginning of 2002. While the average rates of these quotas might not seem alarmingly high, the extent of their variation from product to product and from year to year is extraordinary. As shown by Francois and Martin (2004) and Martin, van der Mensbrugge and Manole (2003), such large variations in protection over time and across closely-related commodities are likely to greatly increase the cost of protection<sup>9</sup> If the industrial countries were attempting to provide technical assistance in the design of a costly form of protection, it would be difficult indeed to surpass the textile and clothing quotas as a case study.

**Table 6. Textile and clothing export tax equivalents (percent)**

Category	Description	2001	2002
336	Cotton Dresses	15	191
340	Non Knit Shirts, Men and boys	20	143
641	Non Knit Blouses, Women	25	130
239	Baby Garments & Accessories	27	113
648	Slacks, etc. Women and girls	16	121
360	Pillowcases	4	133
647	Trousers, Mens Synthetic	19	114
326	Sateen Fabric	0	132
342	Cotton Skirts	28	94
345	Cotton Sweater	41	77
339	Knit Blouses	49	69
640	Non-Knit Shirts, Mens and Boys	30	85
635	Coats, Women and Girls	32	79

<sup>8</sup> Data on quota prices were obtained from [www.chinaquota.com](http://www.chinaquota.com) and data on import prices and conversion factors from the US Office of Textile Administration. The lowest accepted quota price bids for each month were used in the analysis on the grounds that the marginal bid should be the best indicator of the ruling market price. If average or peak bids are used, the export tax equivalents are frequently much higher.

<sup>9</sup> Francois and Martin (forthcoming) show that the squared mean of protection and the variance over time can be added to estimate the cost of inter-temporal variation of protection. Martin, van der Mensbrugge and Manole (2003) show that the cost of the highly variable protection under the CAP is two-and-a-half times what would be estimated using a standard, highly-aggregated model.



840	Synthetic Woven Shirts	15	94
315	Printcloth Fabric.	22	76
	Simple Average all items	10	25
	Standard deviation	13	37
	Average all Textiles	10	9
	Average all Clothing & Apparel	15	29

There are persuasive reasons to expect China to gain substantially from the removal of the MFA quotas -- assuming they are removed. One such reason is the apparently high export tax equivalents of the quotas. Where pairwise comparisons are possible -- as they are for Hong Kong, India and Pakistan -- the export tax equivalents of China's quotas generally appear to be higher than for its competitors.<sup>10</sup> Another, much simpler, index of the restrictiveness of each exporter -- the share of that supplier's exports shipped to non-quota markets -- also suggests that China's exports are strongly restricted by the quota regime. Numbers from COMTRADE for 2001 suggest that a staggering 80 percent of China's exports of WTO textiles and clothing goods are to markets other than the EU, the US and Canada. Although this number is probably considerably overstated because of the well-known problem that goods transshipped through Hong Kong are frequently identified as exports from China to Hong Kong, it is very much higher than for such other exporters as Hong Kong (27 percent), India (14 percent) and Thailand (22 percent).

Simulation analyses of the effects of abolishing the MFA quotas invariably show China as gaining, even though such analyses for developing countries frequently return mixed results (see, for example, Yang, Martin and Yanagishima 1997). For many countries, their efficiency gains in production plus the gains from higher prices on world markets are outweighed by the loss of quota rents.

One important feature of the adjustment of China's manufacturing sector to the abolition of quotas that appears to have received little attention to date is the likely relative shift of resources in China from other manufacturing activities into textiles and clothing. To investigate this question, we analyzed the impact of abolishing the textile and clothing quotas with a model that takes into account the duty-exemption arrangements that are so important for China's manufacturing exports (see Ianchovichina 2003 and Ianchovichina and Martin 2003). The results, reported in Table 7, suggest that China's exports of a range of commodities will likely fall as her exports of apparel and textiles rise sharply. These divergent trends in exports highlight the importance for policy makers in other countries of ensuring that their policies allow exporters to diversify into as wide a range of products as possible. Policy frameworks specialized to cater to textiles and clothing under, for instance, duty exemption arrangements will expose their economies to great risks.

**Table 7. Quota abolition in China will reduce exports of some other commodities.**

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<sup>10</sup> These competitors can take some comfort from the fact that the composition of their exports is very different from China's.

Sector	Anticipated change
	%
Apparel	125.7
Automobiles and parts	-22.8
Cotton	-8.6
Electronics	-10.6
Leather and shoes	-5.0
Metal products	-11.9
Textiles	41.9
Other manufactures	-14.1

## Internal Markets for Manufactures in China

A key element of the early economic reforms in China was the development of secondary markets for the exchange of materials between firms. A frequent characterization of the Chinese economy addresses the gap between the economic performances of coastal and inland provinces. More generally, a vast literature examines the variation in economic performance of China's provinces and the trade between them. There is an open debate on the level of protection affecting inter-provincial trade and the scarcity and the low quality of the relevant data fuel the discussions.

The changes in economic policy that started in 1978 reflect a decentralization of the economic decision-making power in favor of provinces and localities. At the same time, significant rigidities in the price structure (low prices for raw materials, high prices for finished products) provided incentives for provincial authorities to restrict trade so as to capture the associated rents (Young 2000). An entire strand of literature (reviewed in Young 2000 and Naughton 2000) describes the protective barriers erected by local governments in favor of local industries in the 1980's. Young argues that market fragmentation induced by rent-seeking activity continues even after the removal of rents and supported this claim with price and agricultural data mainly from *China Statistical Yearbook* (Young 2000).

Naughton (2000) disputed Young's results, arguing "it is extremely difficult to make robust conclusion about inter-regional trade ... from structural data alone". He used new data, the input-output tables compiled by China's provinces in 1987 and 1992, and found that in the 1990's, inter-provincial trade was large, and, comparing China with multinational entities like EU or ASEAN, he found that "China's provinces did not stand out as clearly autarchic economic units."

Poncet 2003 used provincial input-output tables from 1987, 1992 and 1997. She found that average provincial absorption of goods from other provinces decreased from 34 percent in 1987 to 20 percent in 1997. Poncet used a border-effect method for Chinese data and found an increase in the impediments to inter-provincial trade in China reflected by tariff equivalents that rose from 37 percent in 1987 to 51 percent in 1997, comparable with results from EU, OECD and Canada-US integration. Her results suggested an increase in market fragmentation in China.

A major new World Bank study of national market integration in China (World Bank 2004) concludes that local protectionism continues despite laws and exhortations at the national level, and requirements for an integrated market included in China's WTO commitments. These problems are seen as a consequence of structural features of the economy such as fiscal decentralization and dependence of local governments on local firms for their tax revenues. The study concludes that protectionist practices continue to influence judicial independence, government procurement, and intervention in the labor market. There are problems for manufactured goods such as automobiles, and in monopolized sectors such as alcohol production, but these barriers seem less important than those in government procurement and particularly in the labor market. Survey results suggest that barriers to market integration have declined during the past decade.

## **Conclusions**

China's emergence as a major exporter of manufactures is well-known. Less well-known perhaps is the rapid shift towards manufactures in the exports of other countries that were poor in 1980. The rapidity of this transformation suggests that common factors, such as vertical specialization in production, may have played an important role. We examine the transformation of China's exports relative to those of India and other low-income exporters. We find that the share of manufactures rose rapidly in each case, and that the fastest growth was in relatively skill-intensive manufactures. A key factor in China's export growth was the emergence of new exports, which occurred rapidly in the 1980s, and less rapidly in the 1990s. In India, by contrast, this process did not begin until the 1990s. Reductions in protection in China and India disproportionately reduced the cost burden on manufactures and agricultural processing. Despite their rapid growth, China's exports of textiles and clothing appear to have been considerably retarded by protection imposed under the Multi-Fiber Arrangement, implying that China's exports of these products after 2005 are likely to grow fast.

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## Annex 1

The classification of countries by income is based on World Development Report 1982, World Bank, with \$1000 (dollars of 1981) as the limit between low-income countries and middle-income countries. The group includes countries with no significant conflict during 1981–2001.

### Low-income Countries less China and India

Code	Country
BGD	Bangladesh
BEN	Benin
BTN	Bhutan
BOL	Bolivia
BFA	Burkina Faso(Upper Volta)
KHM	Cambodia
CMR	Cameroon
CAF	Central African Republic
TCD	Chad
EGY	Egypt, Arab Rep.
GHA	Ghana
GIN	Guinea
HND	Honduras
IDN	Indonesia
KEN	Kenya
LAO	Lao PDR
LSO	Lesotho
MDG	Madagascar
MWI	Malawi
MLI	Mali
MRT	Mauritania
MAR	Morocco
MMR	Myanmar
NPL	Nepal
NER	Niger
NGA	Nigeria
PAK	Pakistan
PNG	Papua New Guinea
PHL	Philippines
SEN	Senegal
LKA	Sri Lanka
SDN	Sudan
TZA	Tanzania
THA	Thailand
TGO	Togo
VNM	Vietnam
ZMB	Zambia
ZWE	Zimbabwe