

INDIA BETS ON TECHNOLOGY NICHES

Despite the reforms undertaken in the early 1990s, India still remains one of Asia's most closed economies. Its narrow manufacturing sector, along with a geographical location that has sidelined it from the dynamic processes of regional integration, have hardly favoured the evolution of its trade specialisations. Traditional exports in food and textiles run up against protectionism in international markets, but also suffer from a lack of competitiveness. The development of new sectors with high levels of human capital intensity is less stifled by domestic constraints. It also allows India to enter market niches in which world demand is dynamic, and in which it avoids head-on competition with China, in labour-intensive industries. As India has become the world's largest exporter of IT services and generic drugs its image for international investors is changing.

■ Belated Openness

In the early 1950s, a newly-independent India adopted a development strategy aimed at self-sufficiency and economic autonomy. As a result of its import substitution policy, India's share in international trade fell by two thirds between 1950 and 1973¹. Economic activity was tightly regulated and growth was weak. In the mid-1980s, partial deregulation and an expansionary fiscal policy stimulated growth but resulted in increased domestic and foreign debt. Against this background, several shocks² subsequently brought on a balance of payments crisis in 1991, which led the Indian government to embark on a new economic strategy. A stabilisation programme and structural reforms supported by the IMF were implemented to liberalise and open up the economy. In July 1991, the rupee was devalued by 24%. The external dimension of these reforms included a reduction in tariff and non-tariff protection, the introduction of convertibility for the rupee for current operations (1994) and the partial liberalisation of capital flows (1997), and lastly measures authorising and facilitating foreign direct investment.

The reforms of the 1990s enabled India to sustain a relatively high economic growth rate, though it did not accelerate it durably: between 1991 and 2002, annual GDP growth stood at 6%, only slightly faster than the 5.8% of the 1980s. Growth

then slowed as of 1997. But given its vast domestic market and limited exposure to international capital movements, the Indian economy has been relatively sheltered from international shocks (the Asian crisis in 1997-1998 and the slowdown in world growth in 2001). However, for the 1990s as a whole, the income gap between India and the rest of East Asia continued to widen (see Box).

Reforms have consolidated the openness of the Indian economy. Between 1990 and 2000, Indian exports rose by 9% per year, and imports by 7%. The country's present level of openness is close to those of the large Latin American economies, such as Brazil and Argentina, but India remains one of Asia's most closed economies (Graph and Table 1). Given that India's leaders have looked belatedly to a strategy of openness, this lag may turn out to be a simple matter of time. After all, China, which launched its economic reforms in 1979, was hardly more open at the end of the 1980s than India is today: at the time China's trade in goods and services represented 13% of GDP, compared to 14% of GDP for India presently. Tariff barriers in China were higher than they currently are for India, whose rates are amongst the highest in the world (Table 2). However, while economic liberalisation was strongly accelerated by China during the 1990s, Indian leaders do not appear to be committed to deepening reforms, as they seem to be more sensitive to the costs of adjustment than to the expected

1. The share of India's exports in international trade dropped from 1.9% to 0.6%, A. Maddison (2001), *The World Economy: A Millennial Perspective*, OECD.

2. The Gulf War led to a rise in oil prices and reduced remittances by emigrant workers. The slowdown in the world economy and the collapse of the Soviet market worsened India's trade deficit, while domestic political instability undermined the financing conditions of foreign debt.

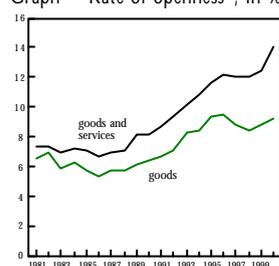
Table 1 — Degrees of openness of Asian economies

	Trade in goods and services as a % of GDP (2000)		FDI, in cumulative flows 1995-2000*	
	Exports	Imports	in % of GDP	as a % of GFCF
Malaysia	125.5	104.4	4.3	9.7
Thailand	67.0	59.0	2.0	6.1
Philippines	56.3	50.2	1.6	7.4
South Korea	45.0	42.2	0.2	0.5
Sri Lanka	39.7	50.5	1.4	3.2
Indonesia	38.5	30.7	0.7	2.6
China	25.9	23.2	4.2	10.9
Pakistan	15.5	19.1	1.0	6.0
Bangladesh	14.0	19.2	0.2	0.9
India	14.0	16.6	0.6	2.7

*Malaysia: 1995-1999; Sri Lanka: 1995-1998

Source: World Bank, *World Development Indicators*, 2002.

Graph — Rate of openness*, in %



*0.5 x (Exports + Imports)/GDP.

Source: CHELEM, authors' calculations.

benefits of further liberalisation. Indeed, India has adopted a path of integrating into the international economy which is markedly different to that of the Asian tigers and dragons, as well as China. This policy follows not just from political choices but also from structural factors.

2

Table 2 — Tariff protection in India — average, non-weighted rates in %

	1990	1999
All products	79.1	32.2
Primary products	69.9	30.5
Manufacturing products	80.3	32.4

Source: World Bank, *World Development Indicators*, 2002.

A Manufacturing Industry on the Sidelines of Globalisation

The low level of India's participation in international trade stems partly from the fact that its manufacturing sector, which is more open to trade, is quite narrow. Exports account for 47% of the value added in manufacturing, a similar level to China (51%). But the sector only makes up

16% of Indian GDP, which is very low compared to China (38%), or other large developing countries like Indonesia and Brazil (24-25%). Services, which drove growth during the 1990s, presently constitute half of India's GDP.

India's geographical location, which sidelines it from dynamic regional integration processes, is no doubt a factor in slowing down its opening up to the international economy. The neighbouring economies of South Asia have low levels of income and do not provide it with much demand³, and the SAARC (South Asian Association for Regional Cooperation), created in 1985 by seven South Asian countries including India, has not stimulated much trade⁴. India's foreign trade is principally directed to Europe (28%), East and South-East Asia (22%) and North America (16%). Trade with Europe is based on traditional complementarities (capital equipment goods against consumer goods) and is not especially dynamic. India has therefore not taken part in the international segmentation of production processes which have intensified trade between the economies of East and South-East Asia in the electrical and electronic sectors. Its manufacturing specialisations have evolved little⁵: of India's top ten areas of comparative advantage, eight were the same in 1980 and 2000, belonging to textiles and clothing, food & agricultural products, and jewellery⁶. India's move into more technology-intensive industries appears to be slow compared to other emerging Asian countries, when gauged in terms of the share in exports of products with high levels of skilled labour, capital and technology (Table 3). However, Indian high-tech exports reveal a different industrial strategy. They are concentrated in the chemical and pharmaceutical industries, in which India masters the whole production chain, whereas East and South-East Asian countries' exports are made up of electronic and telecommunication goods, assembled from imported component and parts.

Exports of food & agricultural products as well as textiles play a major role in Indian trade (Table 4). But in both these sectors, India faces protectionism in world markets. The liberalisation of the international trade in textiles could provide India with an opportunity to expand its market share⁷. However, India's textile sector may turn out to suffer from poor competitiveness if existing regulations, which aim to protect small firms, continue to restrain the industry's modernisation⁸. The competitiveness of Indian

3. S. Redding & A.J. Venables (2002), "Explaining Cross-Country Export Performance: International Linkages and Internal Geography", Centre for Economic Performance, *Discussion Paper*, September.

4. India also participates in the IOR-ARC (Indian Ocean Rim Association for Regional Cooperation) and the BIMST-EC (Bangladesh, India, Myanmar, Sri-Lanka, Thailand Economic Cooperation).

5. F. Lemoine & D. Ünal-Kesenci (2003), "Insertion internationale et transfert de technologies: le cas comparés de la Turquie, de l'Inde et de la Chine", *Revue Région et Développement*, No 17.

6. S. Chauvin & F. Lemoine (2003), "India: Economic Reforms and Integration in the World Economy", *CEPII Working Paper*, forthcoming.

7. Chadha *et al.* (2000), "Computational Analysis of the Impact on India of the Uruguay Round and the Forthcoming WTO Trade Negotiations", NCAER, May; M. Fouquin *et al.* (2002), "Mondialisation et régionalisation: le cas des industries textiles et de l'habillement", *CEPII Working Paper*, No 2002-08.

8. T.N. Srinivasan & S. Tendulkar (2003), *Reintegrating India with the World Economy*, Institute for International Economics.

Table 3 – Product composition of exports intensive in skilled labour, capital and technology* (% of manufactured exports of each country)

	India	Taiwan	Thailand	South Korea	Philippines	Malaysia	China
Total exports intensive in skilled labour, capital and technology	15	43	44	43	76	74	28
Basic pharmaceuticals	6	1	2	3	0	1	2
Pharmaceuticals	3	0	0	0	0	0	1
Paints, varnishes and dyes	2	1	0	1	0	1	1
Toiletries, soaps and perfumes	1	1	1	0	0	1	0
IT and office equipment, machinery, precision instruments	2	22	19	12	27	26	10
Electronic components	0	13	10	16	42	28	2
Telecommunications equipment	0	4	5	7	3	7	5
Consumer electronics	0	1	4	2	1	9	4
Optics, film and clock-making	0	1	2	1	2	1	3

* A definition of the group is given by the UNCTAD 1996, *Trade and Development Report* and S. Chauvin & F. Lemoine (2003), *op. cit.*

Note Products ranked related to their share in Indian exports.

Source CHELEM, authors' calculations.

textiles is based on the low cost of labour and of their principal raw material, cotton, as well as on the flexibility stemming from the decentralised organisation of production (sub-contracting). But this organisation also acts to sideline India from mass markets which require long production runs of standard quality goods⁹.

In agriculture, Indian policy is dictated by the concerns of food security, the living standards of the rural population (70% of the population) and feeding the very poor. Despite recent deregulation, the sector remains subject to numerous price and distribution controls. Food & agricultural exports are in decline. While India favours trade liberalisation that would provide it with greater access to developed country markets, it also invokes special and differentiated treatment given to developing countries so that it may protect its farmers with high tariffs, safeguard mechanisms and quantitative restrictions¹⁰.

Box

India is among the fifteen countries in the world which have experienced the highest growth rates over the last twenty years. Its relative situation has improved among the low income countries: India's GDP per capita was lower than the average for this group until 1990, but now exceeds the average by nearly 20% (at \$2300 in 2000). But in contrast to China, India still figures in this category, sharing most of its characteristics: a low level of literacy, high infant mortality, malnutrition affecting a large share of its population. India's

per capita income is only approaching the world average slowly.

Graph – GDP per capita as a % of the world average

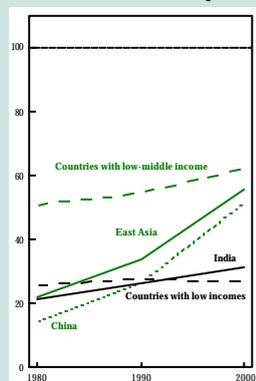


Table 4 – Sectoral Composition of Indian Exports

	1980	1990	2000
Textiles	28.0	31.6	29.6
Jewellery & other	8.1	14.7	16.8
Food & agricultural products	34.2	21.1	16.5
Chemical products	6.2	9.3	13.7
Machinery & transport equipment	12.2	10.6	12.1
Metallurgy	8.9	6.5	6.8
Energy	0.9	5.5	2.5
Pulp & paper, paper and cardboard	1.5	0.9	2.0
Total	100	100	100

Source: CEPII, CHELEM Database.

India's Human Capital Advantage

The development of new, human capital-intensive sectors (IT services, pharmaceuticals and biotechnology) appears to be less handicapped by internal constraints. This development also has the advantage of positioning India in markets with dynamic world demand, allowing the country to benefit from skilled labour resources and technological know-how.

Indian service exports experienced very strong growth in the second half of the 1990s. They were equivalent to a quarter of goods trade in 1990, rising to nearly half by 2000. This expansion was led by IT services (35% of total service exports in 2001). With 20% of world exports, India has thus become the world's leading exporter of IT services, ahead of Ireland and the United States (Table 5). It is a field in which India far outpaces China and is directly in competition with the developed countries.

India's competitiveness in IT services stems from its resources in English-speaking engineers and skilled labour, whose wage rates are very low compared to their western counterparts. Furthermore, this sector is less sensitive to the obstacles limiting competitiveness in other industries (infrastructural deficiencies and capital shortages), is little exposed to resistance from existing structures and is largely export-oriented¹¹. The bulk of IT service exports produced by Indian companies is linked to orders by foreign firms and the largest share of exports (70%) go to the United States. Networks of Indian engineers recruited by US firms during the 1980s, followed by the subcontracting of administrative, financial and logistical functions etc. during the 1990s have greatly favoured the dynamic growth of this sector, which was also able to meet demand generated by the YK2 bug and the adoption of the euro. Henceforth, India is seeking to accede to the market for on-site services by obtaining greater international mobility of persons through the WTO negotiating processes.

9. K.V. Ramaswamy & G. Gerffi (2000), "India's Apparel Exports: the Challenge of Global Markets", *The Developing Economies*, Vol. XXXVIII-2, June; World Bank (1999), "India: Cotton and Textile Industries: Reforming to Compete", *World Bank Report*, January.

10. From this point of view, India has recently been encouraged by several African countries to be the spokesperson for developing countries in the agricultural negotiations of the WTO (Tokyo, February 2003).

11. This contrasts with the Chinese IT sector which is largely geared to the domestic market. T. Tschang (2003), "China's Software Industry and its Implications for India", OECD Development Centre, *Technical Papers*, No 205, February.

Table 5 — Principal exporters of IT services (% of world exports)

	1999	2000
India	13.4	20.8
Ireland	18.7	17.9
United States	15.9	16.0
Germany	9.3	12.2
United Kingdom	12.7	12.1
Spain	7.0	6.7
BLEU	5.6	5.6
Japan	4.2	5.1

Ranked in descending order in 2000.

Source: CEPII, CHELEM database; India: Reserve Bank of India.

The success of this “high-end” integration into the world economy has encouraged India to replicate this strategy in other sectors, notably medicines and biotechnology¹², in which it also has a comparative advantage: highly-qualified personnel, integrated into international networks, high-quality public research institutions and powerful pharmaceutical companies. The latter have developed in the wake of legislation passed in the 1970s, which ended the application of international law on patents, replacing it by legislation aimed at facilitating the acquisition of foreign technology¹³. This has permitted India to become the world’s top exporter of generic medicines and for Indian companies to capture 65% of the local market in pharmaceutical products (compared to 25% in 1971)¹⁴.

In contrast to IT services, the development of these industries leans heavily on the large domestic market: the local pharmaceutical industry (including both national and foreign companies) meets 80% of the domestic demand for drugs and exports about one third of its production. The development prospects of this sector depend on the policy India will pursue in terms of protecting intellectual property rights. As a member of the WTO, India is committed to respecting the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs Agreement) by 2005, and a revision of India’s Patents Act of 1970 is currently under discussion.

Some producers are trying to slow down changes in legislation, fearing that it will weaken their competitiveness in the drugs market. Others, however, believe that change will allow India’s pharmaceutical industry to move beyond imitation to innovation, and that the country will expand its capacity for developing new products. India is especially active in international negotiations in promoting a loose interpretation of the TRIPs Agreement and the Doha declaration on the rights of countries facing public health emergencies. This allows these countries not only to produce drugs without patent permission, but also to import such drugs if they do not have the capacity to produce them. India could thus continue supplying such products to developing countries.

These new specialisations give Indian exports a potential to develop which traditional industries cannot provide. Indeed, services and pharmaceutical products are among the most dynamic sectors of world trade, and India’s market share in these industries is growing. Moreover, by specialising in such technology niches, India does not find itself in head-on competition with China, both in terms of exporting on world markets and for attracting foreign investments. The specialisation in areas that are intensive in human capital could provide India with a way of avoiding the risks associated with accelerated direct investment and output relocation to China, which might crowd out other countries exporting labour-intensive products¹⁵. Though limited so far, India’s technological successes may also modify favourably its international perception and stimulate the interests of foreign investors in a country which has been slow to modernise its traditional sectors but which has overtaken its competitors in a number of high-tech areas.

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12. J. Ruet, M.H. Zerah, A. Maria & P.N. Giraud (2002), *Biotechnology in India*, <http://www.cerna.ensmp.fr>

13. Under Indian legislation, patents protect production processes but not products. This permits reverse engineering whereby molecules can be reconstituted using production techniques that are different to the inventor’s technique.

14. MINEFH-DREE/Trésor (2002), “L’industrie pharmaceutique en Inde”, 27/09/, <http://www/dree.org>.

15. W.J.M. Mc Kibbin & W.T. Woo (2003), *The Consequences of China’s WTO Accession on its Neighbors*, Mimeo, <http://www.econ.ucdavis.edu/faculty/woo/woo.html>.

LA LETTRE DU CEPII

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PUBLISHER:
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CHIEF EDITORS:
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 DTP:
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WEB site: www.cepii.fr
 ISSN 0243-1947

CCP n° 1462 AD
 1^{er} Quarter 2003
 March 2003

Imp. ROBERT-PARIS
 Imprimé en France

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