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Foreword

Manufacturing exports from India have not taken off even though India has several advantantages in manufacturing, including engineering skills (process, product, quality and capital), a growing domestic market, a raw material base and a large pool of skilled labour. The Confederation of Indian Industry (CII), therefore, requested McKinsey & Company to conduct a joint study to assess the potential for manufacturing exports from India and what it will take to capture the opportunity.

The conclusions of the study, which are quite inspiring, highlight that India has the potential to increase manufacturing exports from US$40 billion in 2002 to US$300 billion by 2015. This amounts to an annual growth of 17 per cent, as compared to the historical growth of 11 per cent. The report lays out an aspiration for India: that it should aim to expand its manufacturing sector gross domestic output from US$360 billion in 2002 to US$1.4 trillion by 2015. The combined impact of domestic and export-led growth will increase Gross Domestic Product (GDP) growth rate by 1 per cent per annum, create around 25 million jobs in manufacturing, and drive the creation of two or three times as many jobs in allied sectors (e.g., construction, education and entertainment) due to the multiplier effect.

As the report highlights over and over again, this is not a forecast. It is an assessment of what is possible if Indian companies step up their performance, multinational companies (MNCs) capitalise on the Indian opportunity and the government helps remove barriers to export-led growth.

There is a real opportunity for a few world-class Indian companies to emerge in every sector. These companies will adopt new and different business models. To execute these business models successfully, companies will need to build a global mindset, world-class scale, world-wide marketing capability, global/regional operations and the ability to manage a global talent pool. Current market leaders in several sectors will need to step up their performance considerably to emerge as winners.

MNCs have historically not tapped into India's full potential. This report highlights the fact that MNCs can develop India as the primary alternative sourcing hub to China. This will allow them to tap into the advantages India offers in skill-intensive industries and to avoid the risks inherent in single-country sourcing. As government reforms unfold and the domestic market expands, MNCs will have the opportunity to participate in what promises to emerge as one of the world's largest economies.

Finally, the government will need to play an important role in providing a significant boost to manufacturing-led exports. It will have to stimulate domestic demand through reduction in indirect taxes and import duties; de-bottleneck ports and accelerate power sector reforms; encourage the creation of manufacturing clusters; and accelerate labour reforms and facilitate skill development.

This report is intended to continue the debate on transforming manufacturing in India that the earlier CII-McKinsey report *Learning from China to Unlock India's Manufacturing Potential* had initiated. I hope that the findings of this study will be used to catalyse this debate.

Many people contributed to this effort. Several CII members (both Indian companies and MNCs), overseas MNC managers, industry experts and government officials spent time with the McKinsey engagement team, sharing experiences and debating ideas.

Several McKinsey partners, including Michael Fernandes, Ramesh Mangaleswaran, Asutosh Padhi, Ranjit Pandit, Shirish Sankhe and Vipul Tuli provided overall direction. Ramnath Balasubramanian, Kuldeep Jain, Prafulla Krishna and Shashank Luthra led the study on a day-to-day basis, supported by Preeti Arora, Uma Khan, Sunali Rohra, Aseem Sood and Jeanne Subramaniam. Rajat Bhargava, Saikiran Krishnamurthy and Sarena Lin provided expertise on specific topics.

I would like to extend my appreciation to everyone who helped us in our effort.

Jamshyd N. Godrej

Chairman

CII Manufacturing Council

Executive Summary

In the past, India did not really tap into its manufacturing exports potential to the fullest. Going forward, however, 'Made in India' could indeed become the next big manufacturing exports story. The global trend to manufacture and source products in low-cost countries (LCCs)* is likely to gather strength over the next ten years, particularly in the skill-intensive industries where India has a significant competitive advantage. If India were to take advantage of this trend, manufacturing exports from India could increase from US$40 billion in 2002 to US$300 billion by 2015, leading to a share in excess of 3.5 per cent in world manufacturing trade. Along with robust domestic demand growth, this is likely to create about 25 million new jobs in manufacturing and add 1 per cent to India's GDP growth rate. Achieving this acceleration in manufacturing exports will require that Indian players adopt a global mindset, carefully select product segments and rapidly build marketing front-ends; that MNCs proactively develop India as one of their top three sourcing hubs; and that the government implement key reforms in taxation, power and labour to help unlock India's manufacturing potential.

MANUFACTURING OFFSHORING TO LCCs WILL GROW WITH SKILL-INTENSIVE INDUSTRIES DRIVING THE SECOND WAVE

Manufacturing offshoring from LCCs is a well-established trend, with US$1,300-US$1,400 billion worth of manufacturing goods exported from LCCs in 2002. Furthermore, while world trade grew at 6 per cent in 2002, LCC exports increased by nearly 13 per cent. Labour-intensive industries (toys, apparel and footwear) and select skill-intensive industries (computer hardware and consumer electronics) constituted the first wave of this offshoring.

Going forward, the offshoring wave will encompass skill-intensive industries such as auto components, specialty chemicals and industrial electronics. As a result, offshoring to LCCs is expected to increase from the current US$1,400 billion to US$4000-US$4,500 billion by 2015. The skill-intensive sectors will drive most of this

increase. In the US, for example, the share of skill-intensive industries will rise from 55 to 70 per cent of total offshoring to LCCs.

Four factors will drive this growth: continuing margin pressure on players in home markets; the emergence of a strong supplier base in LCCs; explosive demand growth in LCCs; and the dismantling of regulatory barriers by the World Trade Organisation (WTO).

INDIA HAS THE POTENTIAL TO CAPTURE US$300 BILLION IN MANUFACTURING EXPORTS BY 2015

In 2002, China's manufacturing exports were US$300 billion, Taiwan's US$145 billion, Mexico's US$140 billion, Malaysia's US$78 billion and Thailand's US$55 billion. India lagged far behind, with US$40 billion in exports. If the current trend in manufacturing exports as a percentage of overall GDP continues, India's share will be limited to as little as 1.2 per cent.

Despite a modest start, India can – and should – aspire to become one of the three largest exporters of manufactured goods among LCCs by 2015. This will require growing manufacturing exports from US$40 billion in 2002 to US$300 billion by 2015, and consequently increasing India's share of world manufacturing trade from the current 0.8 per cent to as much as 3.5 per cent by 2015.

The aspiration, though bold, is attainable. India has several advantages in skill-intensive industries such as auto components and pharmaceuticals, where the next set of offshoring opportunities will arise. Apart from just low wage rates, these advantages include engineering skills (process, product and capital engineering), established raw material bases and a mature supply base.

In-depth assessment shows that out of this US$300 billion of total manufacturing exports, US$70-US$90 billion could be captured from just four sectors – apparel, auto components, specialty chemicals and electrical and electronic products. India's current exports in these sectors are US$10 billion.

In apparel, global trade will grow from US$200 billion to over US$300 billion by 2015. Of this, India can grow its exports to US$25-US$30 billion from the current US$6 billion by 2015.

In auto components, LCC offshoring is ßpoised to take off and could reach US$345 billion by 2015. India should, in fact, aspire to capture between US$20 and US$25 billion and 6 per cent of world trade by 2015.

In electrical and electronic products, world trade already amounts to US$1 trillion and countries such as China, Taiwan, Malaysia and Thailand all have a significant lead. LCC offshoring is expected to increase from the US$345 billion that it is today to US$600 billion by 2015. Of this, India should be able to capture US$15-US$18 billion, leading to a share of 1-2 per cent of world trade.

In specialty chemicals, offshoring to LCCs is low (less than US$30 billion in 2003) but could increase to US$110-US$120 billion. India's chemical, engineering and cost innovation skills could, then, make India a top two LCC exporter with US$12-

US$15 billion exports in this segment. Several Indian companies are already leading the charge in areas such as pharmaceutical intermediates.

India can achieve these goals if Indian companies, the central and state governments and MNCs move to capture the opportunity.

INDIAN COMPANIES WILL NEED TO SIGNIFICANTLY STEP UP THEIR PERFORMANCE

The vast majority of Indian manufacturing companies today are largely domestic market-focused and sub-scale, and pursue mostly undifferentiated business models. A few companies, however, are taking the initiative to grow globally and have achieved a measure of success. For India to fully capture the potential from manufacturing exports, the export focus needs to get broad-based across sectors.

In order to be successful, Indian companies will need to adopt a global mindset to build scale; acquire market access rapidly, including using inorganic routes such as acquisitions where required; strengthen design and innovation skills; build a global or regional operating footprint; and master the ability to manage a world-class talent pool and organisation. These actions will form the foundation for ambitious global growth and will need to be supported by a judicious choice of market segments and business models.

In apparel, the dismantling of quotas in early 2005 will create a unique opportunity for India because MNC buyers want to build an alternative to China. India has the potential to become a top two exporter among LCCs. To achieve this, apparel companies need to choose between 'operational excellence' and 'design and innovation'. Operational excellence-led companies will compete on the basis of lower costs and will be distinctive in their economies of scale (4,000- to 5,000-machine factories), and sourcing of fabric and labour productivity. Best practices in operations and quality enhancement measures will ensure their success. Players competing through design and innovation will be characterised by innovative fabric R&D, close relationships with supplier mills, relationships with retailers' design departments and a good understanding of fashion trends.

In auto components, leading Indian auto companies are already seeing a significant acceleration in demand. More Indian companies can capture this opportunity if they specialise in components where they can build world-class competitiveness (e.g., metal forming-based components); rapidly build front-ends in developed markets for marketing; and create an environment of relentless, continuous improvement at the back-end. For India and other countries with similar markets, these players should go beyond components and build integration capabilities to deliver complete sub-assemblies and systems.

In electrical and electronic products, Indian companies can choose to focus on: (a) manufacturing only; (b) manufacturing and design; and (c) manufacturing, design and branding. Given the trend towards outsourcing of design and India's strengths in both manufacturing and design, it is suggested that Indian companies focus on the second model – design and manufacturing. Success for Indian companies in this sector will require an aggressive mindset focused on establishing cost- or capabilities

based-leadership, selecting the right product segments based on access to technology, attractiveness and India's inherent strengths; and locking in customers and technology through innovative approaches.

In the specialty chemicals segment, winning Indian companies can adopt one of two business models: 'low-cost producers' (offering products at the lowest cost and to exact specifications driven by scale, process and capital engineering skills, privileged access to feedstock and chemical knowledge) or 'application developers' (providing products customised for specific end-use applications). In this segment, only those companies that continuously climb the experience curve through process innovation, capital engineering and selected backward integration in advantaged feedstock are expected to win the game eventually. A few Indian companies have already started ascending this curve.

THE GOVERNMENT NEEDS TO REMOVE FOUR BARRIERS TO EXPORT-LED GROWTH

Providing a significant boost to manufacturing-led exports should be recognised as one of the nation's most important economic priorities. To achieve this aspiration, the government will need to act decisively. It will need to:

- **Stimulate domestic demand by reducing indirect taxes and import duties:** China's success in manufacturing is built on a strong domestic market, through the systematic lowering of indirect taxes from over 30 per cent to a Value Added Tax (VAT) of 17 per cent. In India, too, the government should replace all indirect taxes on goods such as excise, state and central sales tax, octroi and entry tax with a single nationwide VAT. It should also reduce tax levels from their current 25-30 per cent to 15 per cent of the retail price (similar to China) and duties on all imports to a single rate of 10 per cent over the next two or three years.
- **De-bottleneck ports and accelerate power reforms:** Well-functioning ports and low-cost, uninterrupted power are critical to India's export competitiveness. India's ports today are already at saturation point with container capacities of 43 million tonnes being fully utilised. The container capacity requirements for exports alone are expected to be 120-150 million tonnes by 2015. The government needs to take the lead in making public investment in additional capacities (over and above currently planned expansions), continuing with planned privatisation of operations and further reducing customs clearance times to one or two days (as has China) from the current one or two weeks. For power, state governments need to implement the Electricity Act by defining access charges for third-party supply of industrial power and by pushing for privatisation of distribution.
- **Encourage the development of several manufacturing clusters:** Clusters in the form of special economic zones (SEZs) with special economic systems and policies are a key feature of China's success in manufacturing. In India, a lot more needs to be done before the SEZs can be considered world class. It is suggested that the government permit sales to the Domestic Tariff Area

(DTA) by charging import duties on inputs and excise/sales taxes on output. This will level the playing field for companies inside and outside the SEZ. In addition, permitting greater flexibility in the use of contract labour, simplifying administrative procedures and extending SEZ-like benefits to existing clusters will be important.

- **Accelerate labour reforms and facilitate skill development:** Even a communist country such as China is much more flexible in its labour laws than India. To make Indian manufacturers globally competitive, the government should allow the use of contract labour for all activities (not just those of a temporary nature), repeal Section 5B of the Industrial Disputes Act (which mandates that companies with more than 100 workers obtain state government approval to rationalise their workforces) initially for all new investments and recruitment, and minimise the number of onerous inspections. To meet the industry's need for larger numbers of technically qualified people (1.7 million technicians required every year till 2015 as compared to the current ITI output of 700,000), the government should set up a private-public sector partnership to revamp the ITIs and encourage private sector investment in vocational training.

MNCs CAN DEVELOP INDIA AS A MANUFACTURING HUB FOR SKILL-INTENSIVE INDUSTRIES

MNCs have historically failed to tap into India's full potential in manufacturing. Yet, there are several recent, lesser-known examples of MNCs (e.g., Siemens and ABB in electrical and electronic products; Toyota and Cummins in auto components) beginning to see signs of success. For MNCs, India could become either a dominant sourcing and manufacturing base in its own right (in auto components, custom-based and non-electronic products), or an alternative sourcing hub to China to avoid the risks inherent in single-country sourcing (e.g., in apparel).

Apart from proactively developing India-sourcing strategies, MNCs need to make two key adjustments to their approach in India: make upfront commitment and invest in building supplier capability (e.g., through strong supplier development teams based in India); and evaluate creative options to overcome current issues (e.g., co-investments in supplier capacity creation through advance purchase agreements). Further, as government reforms unfold and the domestic market expands, MNCs will have the opportunity to participate in creating a market in what promises to emerge as one of the world's largest economies.

THIS MANUFACTURING TRANSFORMATION COULD CREATE ABOUT 25 MILLION JOBS FOR INDIA BY 2015

Manufacturing exports cannot grow from US$40 billion in 2002 to US$300 billion in 2015 unless domestic manufacturing grows from US$320 billion to US$1,100 billion. The combined effect will help expand India's overall manufacturing sector output from US$500 billion to US$1,400 billion by 2015.

This will lead to a sustainable increase of 1 per cent per annum in GDP. In addition, it will create about 25 million jobs in manufacturing by 2015 and possibly two or three times this number in the allied sectors (e.g., construction, education and entertainment) due to the multiplier effect. Manufacturing as a percentage of GDP will grow from 16 to 21 per cent.

* * *

The US$300 billion in manufacturing exports alluded to in this report is an aspiration, not a forecast. This aspiration, though stretched, is achievable. It will all depend on how Indian companies transform their mindsets and operations; how MNCs proactively build aggressive India-sourcing strategies based on India's competitive advantages; and how the government breaks down the barriers that currently impede export-led growth. The economic benefits that could be gained from attaining these goals is extremely exciting – just as the thought of allowing the status quo to remain is dreadfully depressing.

* This includes countries with wage rates less than a third of the US: India, China, Thailand, Poland, Mexico, Turkey, Brazil, Indonesia, Russia, Philippines, South Africa, Malaysia and Taiwan

Introduction

India's recent success in services offshoring is now well known. In contrast, India's competitiveness in manufacturing exports is little understood, both within the country and outside. Has India already missed out in manufacturing exports? As a late mover behind other Asian economies such as China, Taiwan, Thailand and Malaysia, what can India do to leapfrog these countries? What needs to be done to capture this opportunity? How will the opportunity play out sector by sector?

To study these and other related issues, McKinsey & Company conducted a study on behalf of the CII. The objective of the study was to answer four questions:

- What should India's export aspirations be, given global offshoring trends, actions of other countries and India's competitiveness as compared to these other countries?
- What does Indian industry need to do differently to capture export opportunities?
- How can MNCs capitalise on the offshoring opportunity India offers?
- What are the barriers to export-led growth that the government needs to remove?

To answer these questions, the team conducted several analyses. First, it analysed offshoring trends across different manufacturing sectors to understand the pace of and drivers behind offshoring. Second, it assessed India's competitiveness in exports vis-a-vis other LCCs. Third, the team shortlisted four sectors for a more detailed study, which included a mix of skill-intensive industries (auto components, specialty chemicals, electrical and electronic products) and labour-intensive industries (apparel). These sectors make up a third of the export potential.

In addition, the team drew upon the findings of earlier studies by McKinsey & Company, notably *India: The Growth Imperative* (conducted by the McKinsey Global

Institute) and *Learning from China to Unlock India's Manufacturing Potential* (a CII-McKinsey Report).

The study included detailed profiling of offshoring trends, comparisons of competitiveness across different LCCs, discussions with leading economists and MNCs in India and a synthesis of multiple sources of data.

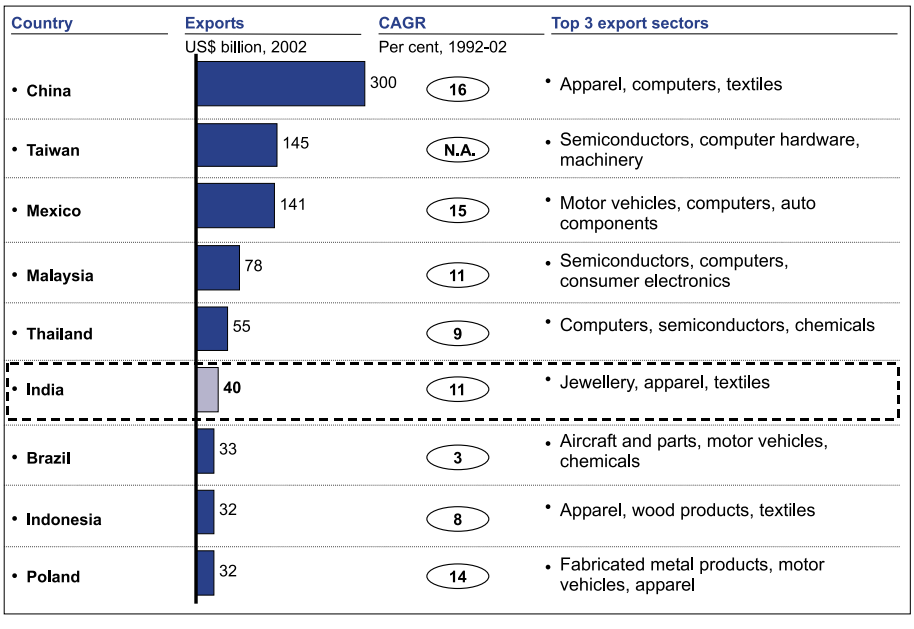
This report sets out the conclusions of the study. It encompasses:

- Manufacturing Export Aspirations (Chapter 1);
- Opportunities and challenges in four sectors taken up for detailed study: Apparel (Chapter 2); Auto Components (Chapter 3); Electrical and Electronic Products (Chapter 4); and Specialty Chemicals (Chapter 5);
- Imperatives for the Government (Chapter 6).

1. Manufacturing Export Aspirations

India's manufacturing exports have lagged behind those of other LCCs. In 2002, India's total exports of manufactured products were US$40 billion – behind China (US$300 billion), Taiwan (US$145 billion), Mexico (US$141 billion), Malaysia (US$78 billion) and Thailand (US$55 billion) (Exhibit 1.1). Manufactured exports were 8 per cent of India's GDP; again behind all these countries (Exhibit 1.2).

Exhibit 1.1
INDIA HAS THE POTENTIAL TO STRENGTHEN ITS CURRENT POSITION AMONG LCC EXPORTERS



Source: World Development Indicators; World Trades Database; World Bank; McKinsey analysis

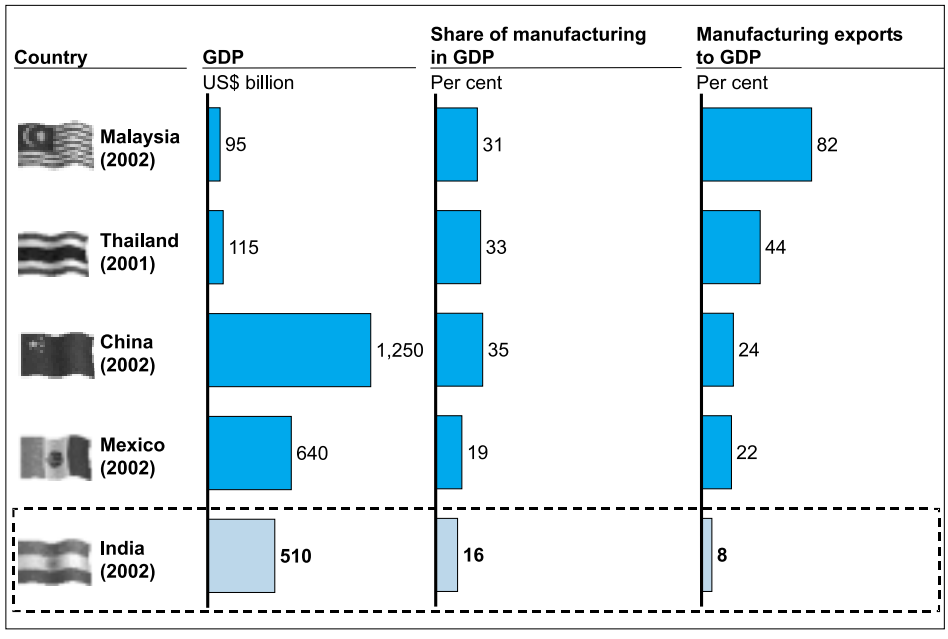
Not surprisingly, there is a feeling across Indian industry that India is fast losing out in manufacturing exports and will be unlikely to build the strength and stature that it has established in services offshoring. This chapter attempts to shatter the myth

that Indian manufacturing cannot be competitive in exports.

India has a real opportunity to benefit from the growth in global offshoring of manufacturing, particularly in the skill-intensive industries where India has a natural advantage, and emerge as one of the three largest exporters among LCCs with US$300 billion in manufacturing exports by 2015. While there are a few barriers that need to be removed both at the company level and the economy level, an attempt has been made to paint a picture of what could be possible if the industry and the government work together to remove these barriers.

Four reasons support the belief that India can fundamentally change trajectory in

Exhibit 1.2
INDIA'S EXPORTS AS A SHARE OF GDP LAG BEHIND THOSE OF OTHER LCCs



Source: World Development Indicators; McKinsey analysis

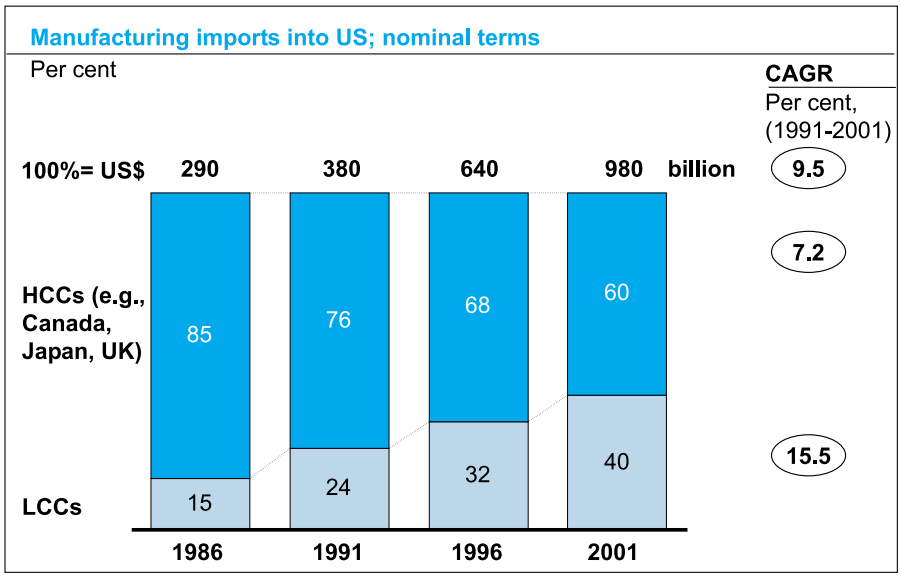
manufacturing exports. First, the next wave of offshoring is expected to take place in skill-intensive industries and India has an advantage in this segment. Second, global buyers are increasingly recognising the perils of single-country sourcing and are looking for alternatives to China. Third, India's intrinsic advantages in manufacturing extend well beyond low labour wage rates. India's real strengths are its engineering skills and an emerging culture of operational excellence among the winning companies, both of which are valued by global buyers in skill-intensive sectors. Finally, almost all the factors that constrain India's competitiveness in a wide range of sectors can be addressed through appropriate reforms.

The payoff is large and makes the journey worthwhile. The combined impact of accelerated domestic and exports growth will improve GDP growth by one per cent per annum and create 25 million jobs in manufacturing by 2015. The rest of this chapter describes the underlying rationale and expected benefits from accelerating India's manufacturing exports.

SKILL-INTENSIVE INDUSTRIES WILL DOMINATE THE NEXT WAVE OF MANUFACTURING OFFSHORING

Across the world, manufacturing imports from LCCs are growing faster than imports from high-cost countries (HCCs). In the US, for example, manufacturing imports from LCCs grew at twice the pace (15 per cent) of imports from HCCs. As a result, imports from LCCs grew from only 15 per cent of all US imports in 1986 to nearly 40 per cent by 2001 (Exhibit 1.3).

Exhibit 1.3
IMPORTS FROM LCCs HAVE GROWN AT DOUBLE THE PACE OF IMPORTS FROM HCCs – US EXAMPLE



Source: World Development Indicators; US Department of Foreign Trade; McKinsey analysis

In several sectors, imports from LCCs already account for a majority of consumption in developed economies. They include labour-intensive sectors (e.g., toys, apparel, textiles, footwear and jewellery) and some skill-intensive sectors (e.g., domestic appliances, computer hardware and consumer electronics).

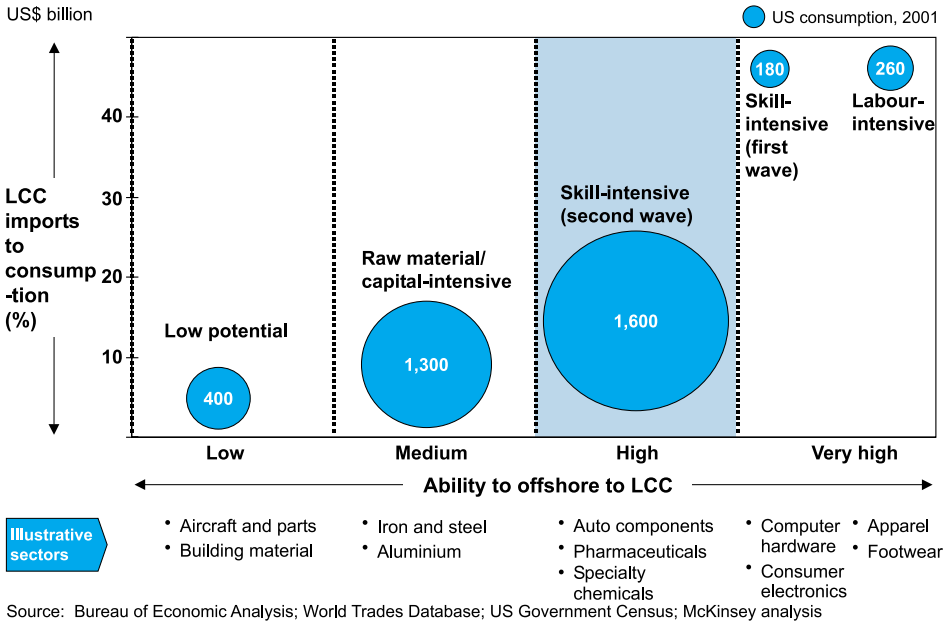
Looking across sectors, it is evident that the extent of manufacturing offshoring within a sector is dependent on two factors: (a) The intrinsic benefits from off-shoring, for which the extent of value added in the final product is a proxy; and (b) the ability to offshore a product to an LCC, which is a function of the technology content within a product, its 'shippability' and the availability of a mature supply base in LCCs.

Applying these criteria to all sectors to establish likely trends in offshoring reveals two things. The established trend within the labour-intensive and the skill-intensive first-wave sectors will continue. And, more importantly, there will be a new and important trend towards offshoring in a new set of skill-intensive sectors, which include auto components, pharmaceuticals, machinery, telecom equipment and fabricated metal products (Exhibit 1.4).

The skill-intensive second-wave sectors are three times larger (US consumption

amounting to US$1.6 trillion) than the labour-intensive and skill-intensive first-wave sectors (US consumption amounting to US$440 billion). LCC exports account for less than 10 per cent of current consumption in these sectors. In the past, several factors have constrained offshoring within these sectors, most notably the lack of

Exhibit 1.4
THE NEXT WAVE OF OFFSHORING WILL BE DRIVEN PRIMARILY BY SKILL-INTENSIVE SECTORS – US EXAMPLE



Source: Bureau of Economic Analysis; World Trades Database; US Government Census; McKinsey analysis

mature supply bases in LCCs.

However, several factors will accelerate the growth of offshoring in these sectors:

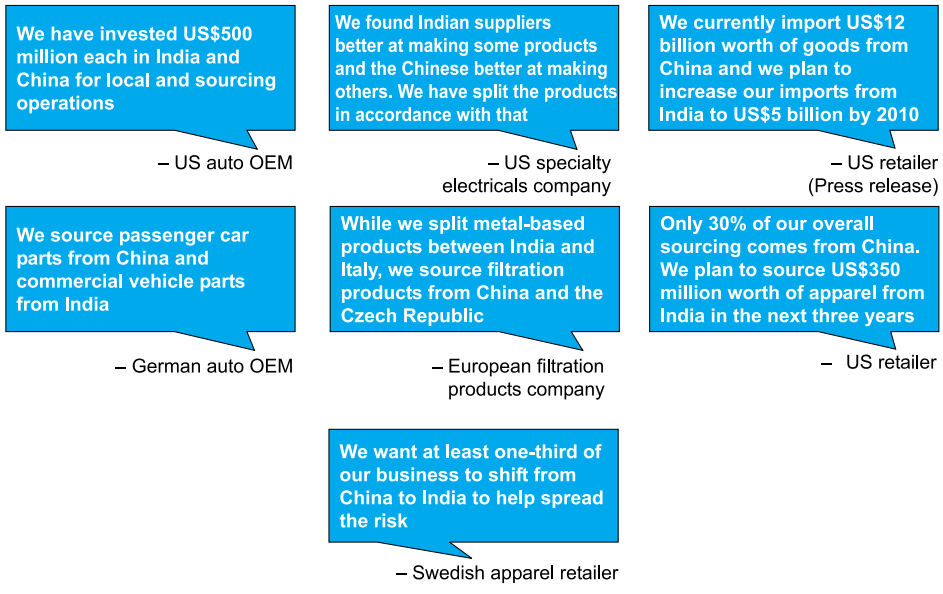
- **Continuing margin pressure on players in home markets:** In automobiles, for example, customers are demanding higher and better functionality at the same prices. Similarly, players in specialty and fine chemicals are facing unprecedented low profitability in their home markets.
- **The emergence of a strong supplier base in LCCs:** In auto components, for example, LCC suppliers have been working with North American, European and Japanese OEMs, meeting their stringent global standards to serve the home market for over 15 years. In electronic manufacturing, several large contract manufacturers have shifted en masse to Asia.
- **Accelerated demand growth in LCCs:** Rising demand in LCCs has boosted the creation of new local manufacturing capacity in several sectors, e.g., chemicals, telecom and power equipment.
- **WTO-induced dismantling of regulatory barriers:** Regulatory change driven by WTO rules – for example, the dismantling of quotas or the reduction of tariffs in textiles and apparel – is likely to stimulate exports and could change competitive advantage in some sectors, such as apparel, in India's favour.

The growth in offshoring in skill-intensive second-wave sectors represents a significant opportunity for India. As noted in the CII-McKinsey report, *Learning from China to Unlock India's Manufacturing Potential*, India has strong intrinsic capabilities in these sectors, which account for nearly 40 per cent of its manufacturing output. India has the opportunity to export not only to the rest of the world but also to China in some of these sectors.

MNCs ARE RECOGNISING THE RISKS OF SINGLE-COUNTRY SOURCING

Five years ago, most discussions with MNCs indicated a focus on China as a low-cost sourcing base, with India rarely finding a mention. More recently, although China continues to dominate offshoring discussions, MNCs are increasingly recognising that single-country sourcing is fraught with risk (Exhibit 1.5). There are at least three reasons why MNCs are seeking to diversify their sourcing footprint

Exhibit 1.5
MNCs HAVE BEGUN TO RECOGNISE THE ADVANTAGES OF SOURCING FROM BOTH INDIA AND CHINA



Source: Press releases; interviews

within LCCs:

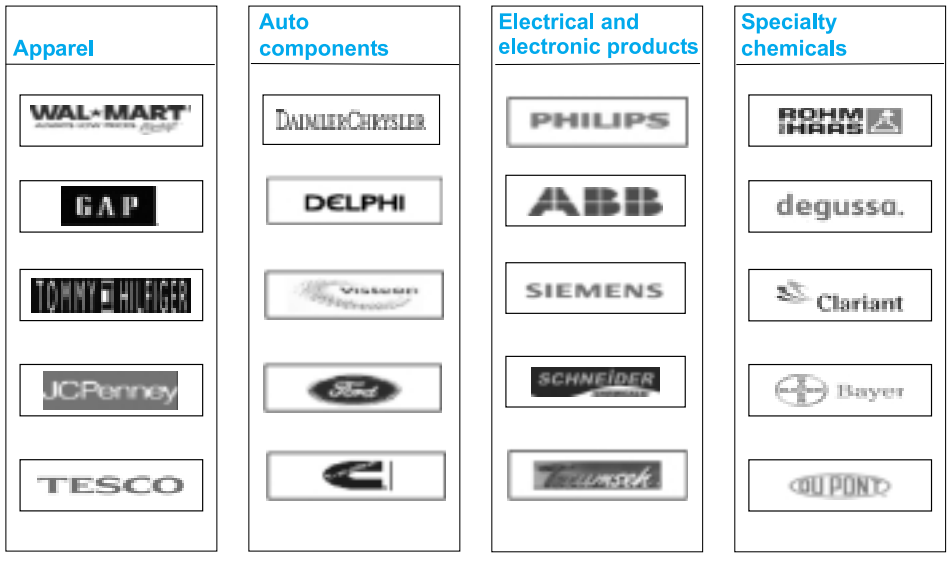
- **Reduced availability and higher pricing of key inputs:** A rise in labour costs (say, due to rising wages as standards of living improve); currency risk due to changes in foreign exchange rates and hikes in freight and logistics charges can easily wipe out a significant portion of the cost advantage that any one country offers. Building a diversified sourcing footprint reduces the overall exposure to such increases.
- **Macro-economic and country-level risks:** Interruptions to business continuity and travel, political and macroeconomic instability and legal risks such as piracy of intellectual property are other perils in single-country sourcing.

- **Regulatory risks:** Government-imposed conditions such as hikes in taxation or policy changes can also disrupt manufacturing and sourcing. The decline of Mexico's Maquiladoras (100 per cent export-oriented zones) is a case in point. Changes in US government policy, which extended the favourable trading conditions granted to Mexico under the North American Free Trade Agreement (NAFTA) to Caribbean basin nations and to China, allowed these countries to overtake Mexico as the biggest exporters of textile and apparel to the US.

As awareness of these risks has spread, more and more MNCs have begun to evaluate India as a sourcing option (Exhibit 1.6).

Exhibit 1.6
SEVERAL MNCs HAVE STARTED SOURCING FROM INDIA

NOT EXHAUSTIVE



Source: Press releases; interviews

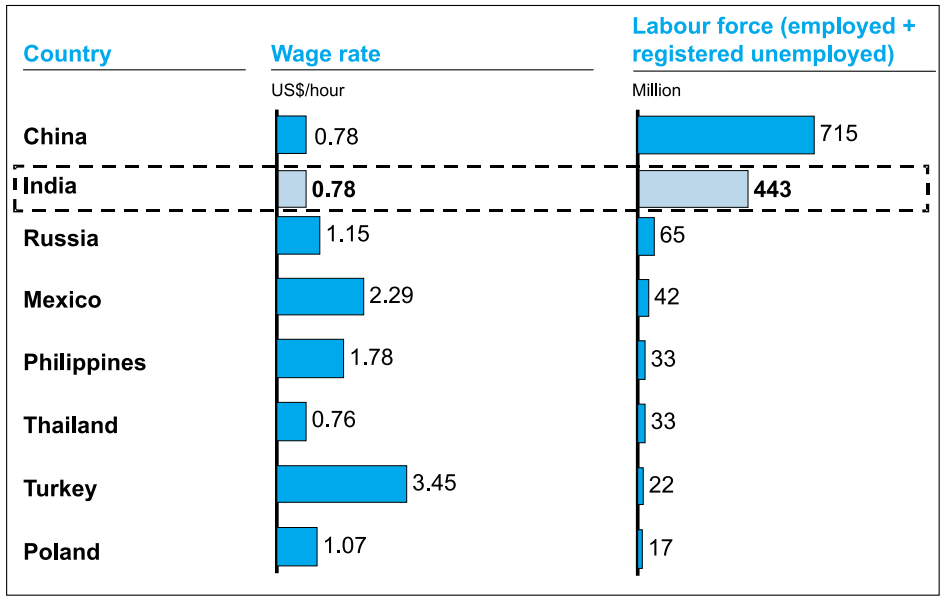
INDIA'S ADVANTAGES GO WELL BEYOND LOW LABOUR WAGE RATES

India has four distinct advantages over and above low-wage workers: a large, low-cost and skilled workforce, a growing domestic market, raw material availability and the emergence of a mature supply base.

- **Large, low-cost and skilled workforce:** India has one of the world's largest labour pools (along with China). This large labour pool will limit increases in wage rates for the next 20 years (Exhibit 1.7). Furthermore, India has a high availability of engineers, producing over 400,000 every year, a close second to China's 490,000 and nearly 25 times Thailand's 17,000. In addition to engineers, India produces 850,000 graduates every year and over 70,000 diploma holders. As a result, India has strong engineering capabilities, whether it is in redesigning processes (e.g., reducing the cost of producing select bulk drugs by nearly 60 per cent), products, equipment or in ensuring high-quality production.

- **Growing domestic market:** While there exists significant potential to further expand domestic demand, India already has a large domestic market in several sectors, second only to China's in size among all LCCs (Exhibit 1.8).

Exhibit 1.7
INDIA AND CHINA HAVE THE LARGEST LABOUR FORCE AMONG LCCs

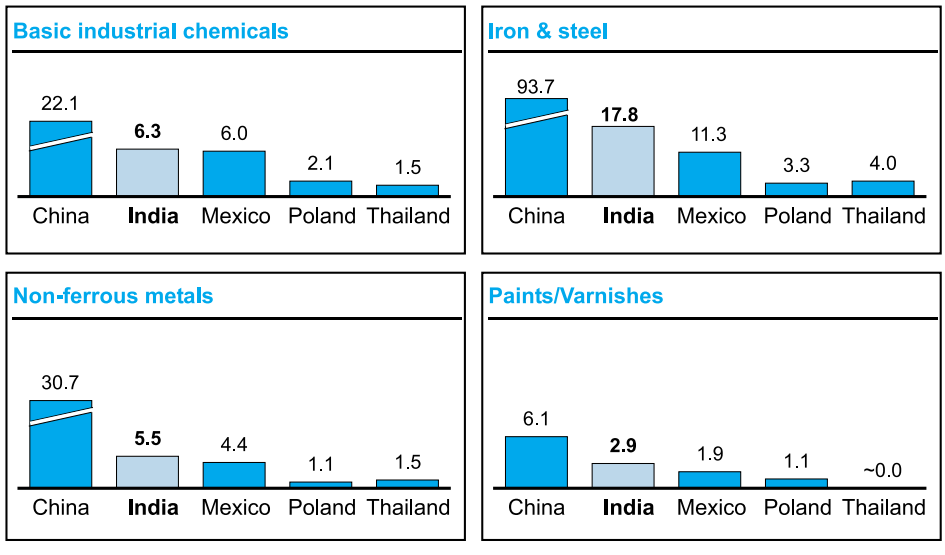


Source: World Competitiveness Yearbook, 2003; McKinsey analysis

- **Availability of raw material:** India has abundant raw material, e.g., cotton (India is the third-largest producer of cotton, accounting for 3 per cent of world output), ferrous raw materials (e.g., India has 5 per cent of world iron-

Exhibit 1.8
INDIA'S DOMESTIC MARKET SIZE IS LARGEST IN SEVERAL SECTORS AMONG LCCs EXCEPT CHINA
US$ billion, 2002

EXAMPLES



Source: Global insights

ore deposits and produces 3 per cent of the world's steel) and non-ferrous raw materials (e.g., it has 4 per cent of bauxite deposits and produces 3 per cent of the world's aluminium). Also, India has built strong supporting industries such as tools and capital goods, which provide equipment and related inputs.

- **Mature supply base:** In the past ten years, the liberalisation-driven restructuring of Indian manufacturing and the entry of global competition have led to the emergence of a mature supply base in several sectors. For instance, India meets world-class quality standards in auto components, and a large number of FDA-approved plants in Active Pharmaceutical Ingredients (APIs). In fact, there are 75 FDA-approved plants in India, the largest number outside the US.

Exhibit 1.9
THE COUNTRY EXPORT COMPETITIVENESS ASSESSMENT WAS BASED ON THREE FACTORS

Factors of competitiveness	Metrics
What are the **factor advantages** that the industry enjoys?	• Factor costs – Labour – Capital • Factor productivity – Labour – Capital • Factor availability – Skilled labour – Raw material
What are the **structural advantages** that the industry enjoys?	• Domestic industry maturity – Size – Growth • Presence in global markets – Supplier base – Current advantage
How favourable are the **government policies** that influence industry?	• Creating competitive environment • Demand stimulation – Taxation – Tariff protection • Enabling factors – Infrastructure – Labour reforms – Absence of bureaucracy

Source: McKinsey analysis

WITH REFORMS, INDIA CAN BE COMPETITIVE IN A WIDE RANGE OF SECTORS

Many industry experts believe that India cannot be competitive in a wide range of sectors, given the current policies that have impeded industry productivity. Bearing in mind that policies could well change, a more dynamic three-part framework (Exhibit 1.9) was used to compare India's competitiveness across nearly 35 manufacturing sectors against other LCCs. It assessed India's competitiveness in three parts: factor-based advantages, structural factors and government policies. (The methodology is described in the Appendix.)

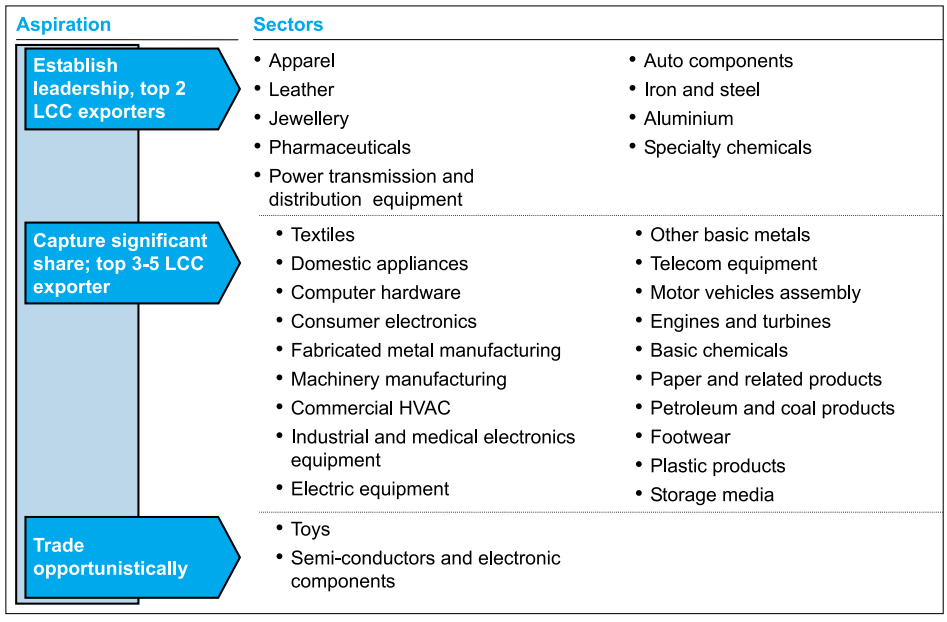
It was found that while factor-based advantages (size of workforce, skill levels and raw material availability) are difficult to change, structural factors and government policies can change easily. In fact, changes in policy drive changes in structural

factors.

The assessment reveals that India is well-positioned to emerge as the second-largest exporter among LCCs in nine sectors, and among the top five in various other sectors (Exhibit 1.10):

- **Sectors in which India can be the a top two exporter among LCCs:** In auto components, iron and steel, aluminium, pharmaceuticals, apparel, leather, power transmission and distribution equipment, specialty chemicals and jewellery, India can build on its existing strengths to become a top two exporter among LCCs.

Exhibit 1.10
INDIA CAN BE COMPETITIVE IN MULTIPLE INDUSTRIES IF COMPANIES STEP UP PERFORMANCE AND GOVERNMENT IMPLEMENTS REFORMS



Source: McKinsey analysis

- **Sectors in which India can establish a top 3-5 position among LCCs:** These sectors include textiles, domestic appliances, industrial machinery, computer hardware, consumer electronics, and telecom equipment. In these sectors, India has strengths similar to those in industries in which it could build a top two position. However, a modest starting position, a dependence on growth in domestic demand, and a more pronounced need for infrastructure will initially restrict growth.

This competitiveness assessment will not hold unless individual companies step up their performances and the government addresses the four main barriers that remain – low domestic demand, inadequate infrastructure, a lack of clusters and rigid labour laws.

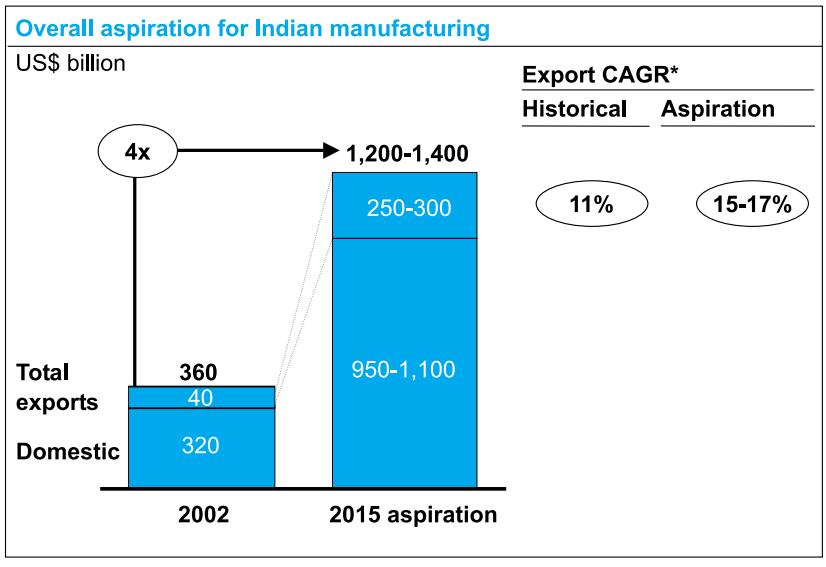
ACCELERATED MANUFACTURING WILL BOOST GDP AND CREATE JOBS

Building a strong export position will be difficult without strong domestic demand. Recommendations to boost domestic demand have been detailed in the CII-

McKinsey report referred to earlier.

This report recommends that India should aim to expand manufacturing sector output from US$360 billion in 2003 to US$1.4 trillion in 2015. This will involve a

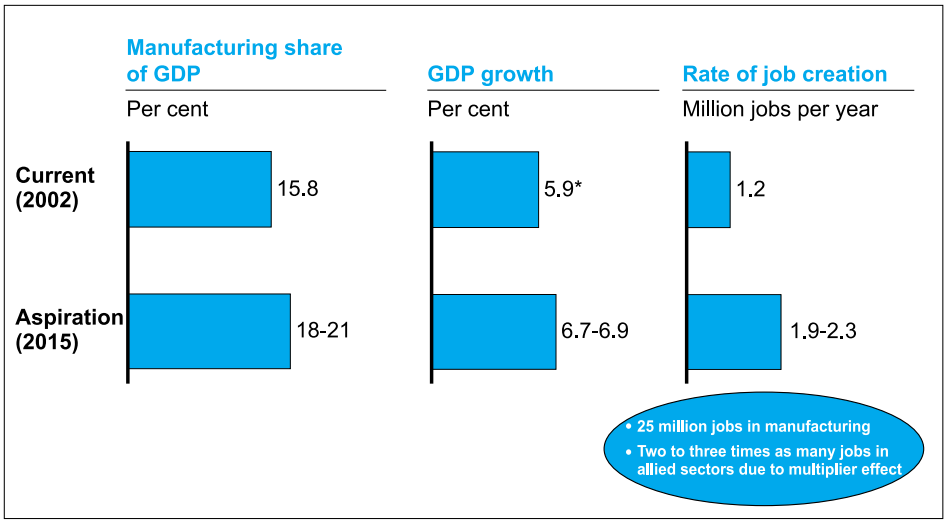
Exhibit 1.11
INDIAN MANUFACTURING SHOULD ASPIRE TO QUADRUPLE ITS CURRENT SIZE BY 2015



* Compounded Annual Growth Rate
Source: World Development Indicators; Department of Foreign Trade; McKinsey analysis

tenfold expansion of manufactured exports from US$40 billion to US$300 billion (CAGR of 17 per cent), while growing domestic output from US$320 billion to US$1.1 trillion (Exhibit 1.11).

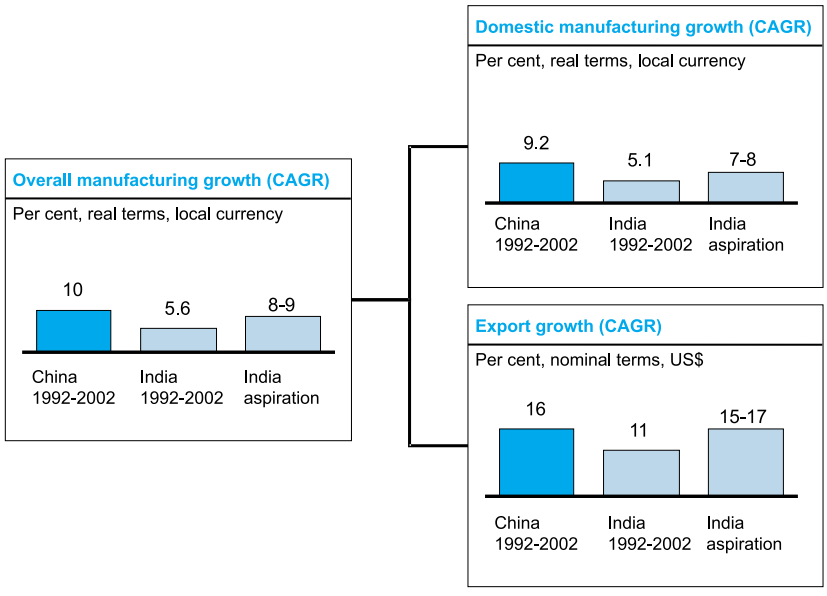
Exhibit 1.12
ACHIEVING DOMESTIC AND EXPORT ASPIRATION WILL HELP BOOST GDP GROWTH AND JOB CREATION



* Compounded average growth between 1992 and 2002
Source: World Development Indicators; McKinsey analysis

The combined impact of domestic and export-led growth will have remarkable results: a sustainable increase of 1 per cent a year in GDP growth, the creation of 25

Exhibit 1.13
INDIA'S ASPIRATIONS, THOUGH AGGRESSIVE, ARE COMPARABLE WITH WHAT CHINA HAS ALREADY ACHIEVED



Source: Economist Intelligence Unit; World Development Indicators; China Statistical Yearbook, 2001; India National Account Statistics; McKinsey analysis

million jobs in manufacturing (Exhibit 1.12), and two or three times as many jobs in allied sectors (e.g., construction, education, entertainment) due to the multiplier effect.

These aspirations are aggressive. However, they are similar to what China has already achieved over the last decade. China has grown overall manufacturing at 10 per cent from 1992 to 2002; India's aspiration is 9 per cent. Similarly, China has already achieved 16 per cent growth in exports from 1992 to 2001; the aspiration for India is 17 per cent (Exhibit 1.13).

* * *

Offshoring to LCCs is set to grow rapidly. Although India's starting position is modest, it is not too late to stake a claim and make India a top three exporter of manufactured goods among LCCs by 2015. Whether India succeeds will depend on how well companies, both Indian and multinational, gear up to capture the opportunity, and how aggressively the government pursues reforms. ■

2. Apparel

A window of opportunity to expand apparel exports will open for India in January 2005. If India does the right things – aggressively reforming policy and enhancing operational and design skills in industry – it can seize the opportunity to become the second-largest exporter of apparel among LCCs by 2015. This would result in apparel exports growing from US$6 billion in 2002 to US$25–30 billion by 2015.

The opportunities in apparel exports can be summarised as follows:

- Global trade in apparel is already high (US$200 billion in 2002) and growing at 1.5 per cent per annum. It will expand still further after the dismantling of the Multi Fibre Arrangement (MFA)* regime in 2005, at 3-5 per cent a year, to exceed US$300 billion by 2015.
- If companies step up their performance and reforms are passed, India can grow apparel exports from US$6 billion in 2002 to US$25–30 billion by 2015 and emerge as the second-largest LCC exporter in apparel. This would require India to grow exports at 12-13 per cent a year against a historical average of 6 per cent.
- Most Indian companies today lack scale, operational expertise and effective organisational practices. To capture large export opportunities, Indian companies will need to significantly enhance their performance by pursuing one of two business models: operational excellence-led (lowest cost, global operations, world-scale factories) or design and innovation-led (innovative fabric, fashion trend-driven). Those who pursue neither could become low-cost contract manufacturers or aggregators, who will survive but will have to struggle for profitability.
- The government needs to continue the reform process. It especially needs to

* This allows developed countries to restrict imports from developing countries by imposing quotas (see box: India as a Primary Alternative to China).

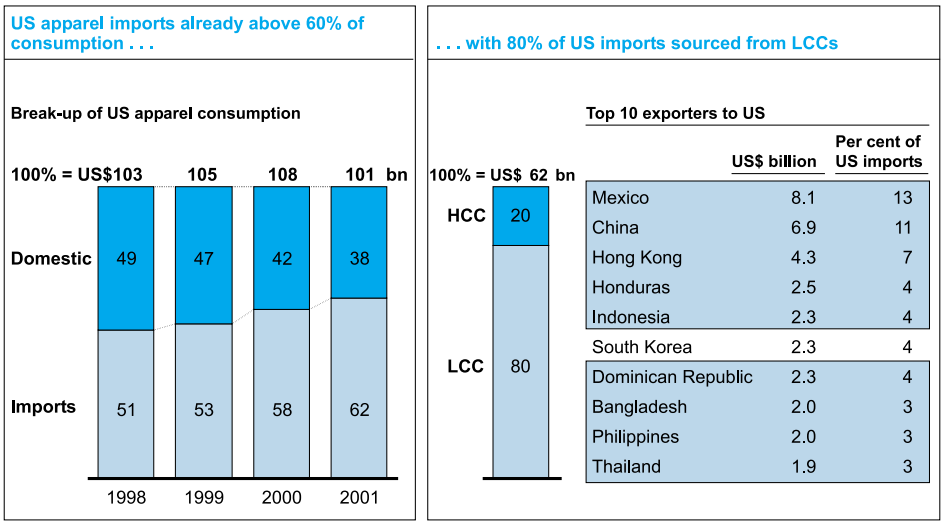
focus on improving port capacity and turnaround times, allowing flexibility in contract labour, continuing the reform of the textile sector, signing bilateral trade agreements with the US and the European Union (EU) and driving the creation of full-scale integrated apparel parks.

The rest of this chapter describes each of these points in greater detail.

APPAREL OFFSHORING WILL INCREASE AFTER THE DISMANTLING OF THE MFA REGIME IN 2005

Apparel offshoring exceeded US$200 billion in 2002 and has been growing at 1.5 per cent annually. By 2001, imports accounted for over 60 per cent of US apparel consumption, with 80 per cent being sourced from LCCs (Exhibit 2.1). Globally,

Exhibit 2.1
APPAREL WAS AT THE FOREFRONT IN THE FIRST WAVE OF OFFSHORING – US EXAMPLE



Source: US Bureau of Economic Analysis; US Office of Textile and Apparel; US Department of Foreign Trade; McKinsey analysis

China is the largest apparel exporter with annual exports of over US$42 billion in 2002 and a growth rate of over 8 per cent (Exhibit 2.2).

Going forward, cost pressures on retailers and the dismantling of the MFA regime will accelerate apparel offshoring growth from 2 per cent to 3-5 per cent per year. This will mean a minimum of US$300 billion in world trade in apparel by 2015.

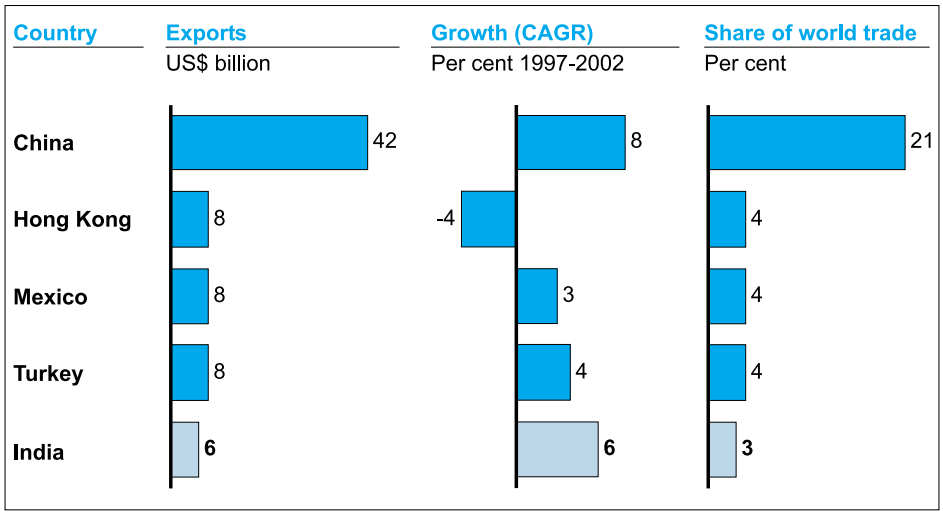
Cost pressure on retailers will continue and further boost offshoring

The global apparel value chain has disintegrated. Today, retailers, branded players and buying houses focus on marketing and retailing, while manufacturing has been offshored to players in LCCs.

There are three types of buyers: (a) retail buyers comprising mass-market stores like Wal-Mart and mid- to high-tier retail stores like Saks Fifth Avenue; (b) branded

players consisting of labels like Gap, Levi's and Nike, which began by manufacturing in-house but have subsequently moved to a model of sourcing products and selling them under their own brand names; (c) buying houses like Li and Fung, which

Exhibit 2.2
INDIA IS CURRENTLY THE FIFTH LARGEST LCC EXPORTER OF APPAREL
2002



Source: UN International Trade Statistics; McKinsey analysis

procure products for a large number of small retailers and brands.

The increasing dominance of mass-market retailers, whose main proposition is sustained low prices across all products, has led to price declines in the US of 12-15 per cent in major apparel categories such as men's shirts and women's tops. During the last decade, the share of discounters (e.g., Wal-Mart) and vertically integrated specialty stores (e.g., Nike) grew by around 10 per cent, with the result that they now command a share of almost 40 per cent in both the US and Europe. These retailers' large and growing market shares in apparel retailing – Wal-Mart alone accounts for 13 per cent of the market – make them very influential importers. To sustain low prices, these value retailers will increasingly have to rely on cost efficiencies and continuous cost reduction in sourcing.

Dismantling of MFA will remove further barriers to apparel offshoring

In 1994, under a WTO agreement, the developed countries agreed to dismantle the MFA that governed world trade in clothing. MFA-imposed quotas on apparel-exporting regions are expected to be removed over ten years, and in four stages, to allow importers and exporters to adjust to the situation. Further, all quotas are to be phased out by 1 January 2005.

In 2005, one of two scenarios will be played out. Regardless of which one emerges, apparel offshoring is likely to increase from 1.5 per cent to over 3 per cent a year.

- **Scenario 1: Complete freeing up of imports.** The US and the EU allow free

imports of all categories of apparel from any originating country and impose duties to differentiate between the products of these countries. This could lead to a 4.5 per cent annual increase in world trade, which would mean US$330-US$350 billion in value.

- **Scenario 2: Transitional measures against market disruption.** Under this scenario, the US and the EU exercise WTO-granted rights to impose transition safeguard mechanisms. This enables the US and the EU to limit China's export growth in these categories to approximately 7.5 per cent. The impact of such a scenario would be a 3 per cent annual increase in world trade to US$280-US$300 billion in value terms by 2015. This is the more likely scenario.

INDIA HAS THE POTENTIAL TO BECOME THE SECOND-LARGEST EXPORTER AMONG LCCs

India has the potential to grow apparel exports from US$6 billion in 2003 to US$25-US$30 billion by 2015 and emerge as the second-largest apparel exporter among LCCs, with 8-10 per cent of world trade. This would require growing exports at 12-13 per cent a year, as against a historical average of 6 per cent.

This goal may be ambitious, but it is reachable. China's share of world trade today is already 20 per cent and its apparel exports amount to US$42 billion. Analyses indicate that China could grow its apparel exports further and capture 40-50 per cent of world trade if rapid liberalisation takes place. This would imply an aspiration of over 20 per cent annual growth for the Chinese apparel sector.

Despite this, there is ample room for Indian apparel exports to grow, particularly by entering previously overlooked segments. Globally, the apparel market can be segmented into two categories:

- **Basic segments:** These include men's shirts, trousers, suits, coats and innerwear; women's skirts, trousers, tops and innerwear; and infant wear. They account for an estimated 70-75 per cent of world trade in garments. Demand can be forecast for these categories, hence buyers place orders in big lots. Cost is the biggest factor in selecting a supplier. Efficient sourcing, large-scale operations, quality control and efficient supply chain management are required for successful manufacturing.
- **Value-added segments:** These include women's dresses, women's coats and jackets, and accessories such as ties. Consumer demand is relatively difficult to forecast and orders are usually placed in small lots according to seasonal sales trends. Short lead times, high quality and creative design are critical. An ability to suggest design inputs, a skilled workforce, quick turnaround and low-cost but high-quality production are needed for the successful manufacture of these garments.

Indian apparel makers and foreign buyers have recognised India's competitiveness and started producing value-added garments and accessories such as women's tops and embroidered products. But they have been unable to leverage India's potential in

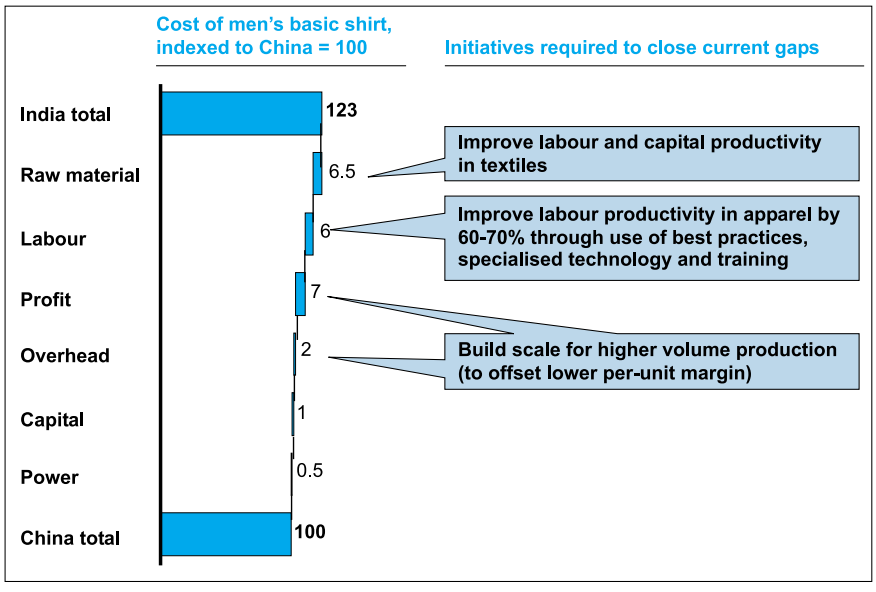
basic segments such as men's shirts, and men's and women's trousers. Traditional buyers and Indian companies have persisted in seeing India as being competitive in high-skill-intensive products, while China leads in large-scale basic garments.

To become the second-largest exporter among LCCs, competing in the value-added segment will not suffice. Indeed, Indian companies can become as competitive as their Chinese counterparts in the basic segment by improving scale and productivity (Exhibit 2.3).

There are several factors that make India attractive as a sourcing hub in both the

Exhibit 2.3

IMPROVING LABOUR PRODUCTIVITY AND SCALE WILL ALLOW INDIA TO COMPETE WITH CHINA IN BASIC GARMENTS



Source: CII McKinsey report: *Learning from China to Unlock India's Manufacturing Potential*; interviews; McKinsey analysis

basic and value-added segments:

- **Alternative to China:** Discussions with over 40 large retailers have indicated that they expect India to emerge as a winner along with China and Pakistan after the dismantling of the MFA (Exhibit 2.4). They expect to eventually source up to 50 per cent of their needs from China. India is expected to benefit the most from this need of brand owners to avoid putting all their eggs in one basket (see box: India as an Alternative to China).
- **Design skills:** With the establishment of training institutions such as the National Institute of Fashion Technology (NIFT), many high-quality designers, who are able to create modern designs and interact with buyers, are emerging. This is a distinctive strength that Indian companies have not yet exploited. NIFT, which produces nearly 1,000 graduates a year, has strengthened its capabilities through partnerships and collaborations with the Fashion Institute of Technology, New York; Info Design, Paris; and the National Institute of Design, Ahmedabad; among others. The centre promotes design skills in India through courses that range across the

INDIA AS A PRIMARY ALTERNATIVE TO CHINA

World trade in textiles and garments has been governed by the MFA since 1974. It allows developed countries to restrict imports from developing countries by imposing export quotas on specified items. The quotas are agreed upon each year. Exporting countries allocate licences to firms to export a certain proportion of each quota.

To bring trade in textiles and apparel in line with the rules of the WTO, an agreement was reached to phase out the MFA by 2005 at the Uruguay Round of GATT* negotiations (1986 to 1994). The agreement's main provision is to eliminate quotas by 2005 according to an agreed-upon timetable.

China, India and Pakistan will benefit the most from quota elimination, with India likely to emerge as a major alternative to China, states a US International Trade Commission report, *Textiles and Apparel: Assessment of the Competitiveness of Certain Foreign Suppliers to the US Market*. China already dominates world trade in textiles and apparel and is expected to become the 'supplier of choice' for US importers after 2005. But further expansion of its apparel exports could be constrained if the US and other importing countries apply a provision against 'import surges' from China contained in the country's protocol of accession to the WTO.

In any case, to mitigate the risk of sourcing from only one country, US importers plan to expand trade with other LCCs, particularly India. Stating that India is regarded as a major alternative source to China, the report says: 'Retailers and apparel suppliers acknowledged that India is likely to remain competitive after quota removal because of its large, relatively low-cost labour force, a large domestic supply of fabrics, and the industry's ability to manufacture a wide range of products. Retailers described Indian firms as innovative, particularly in design functions.' The report describes Pakistan as a competitive supplier of cotton goods but with a more limited product range than India's.

*The General Agreement on Tariffs and Trade, a precursor to the WTO

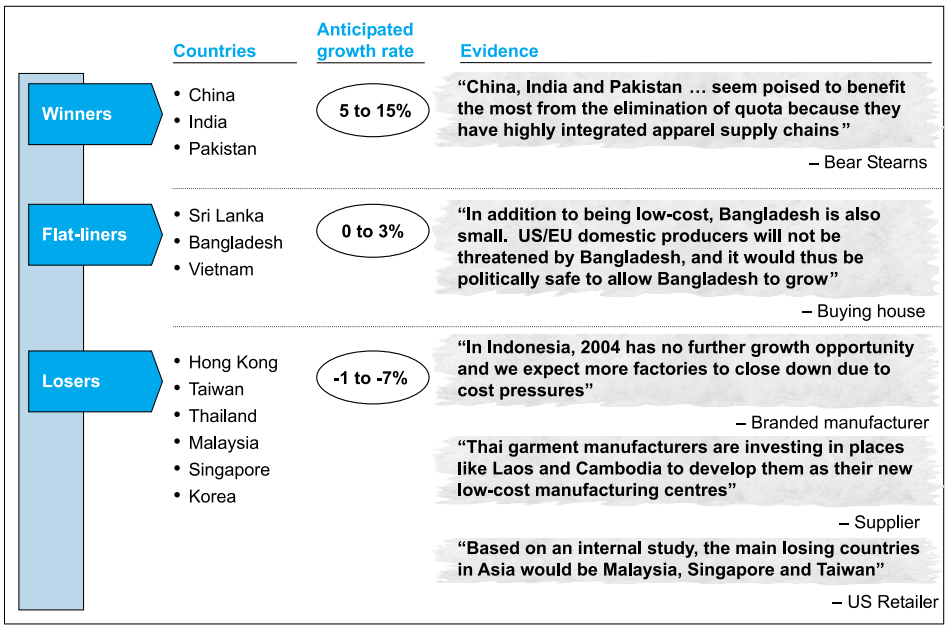
spectrum of fashion, including fashion design (international trends in garments, pattern-making and cutting); fashion technology (new production methods, use of IT in production); and communication (styling and design in visual merchandising).

- **Raw material advantage:** India enjoys a considerable advantage in raw material as the world's third-largest producer of cotton, second-largest exporter of cotton textiles among LCCs and fourth-largest exporter of synthetic yarn and fabric among LCCs (Exhibit 2.5). Cotton fabric exports exceeded US$860 million in 2001 and cotton yarn exports exceeded US$1 billion in the same year. However, this advantage is somewhat offset by sub-scale weaving and fabric processing units, with more than 95 per cent of

fabric produced by small-scale power loom and handloom units. Most of this is 'grey' fabric; processed fabric amounts to only 30 per cent of total production in India compared to 57 per cent in China.

- **Skilled labour:** The wide availability of skilled labour in India is a clear

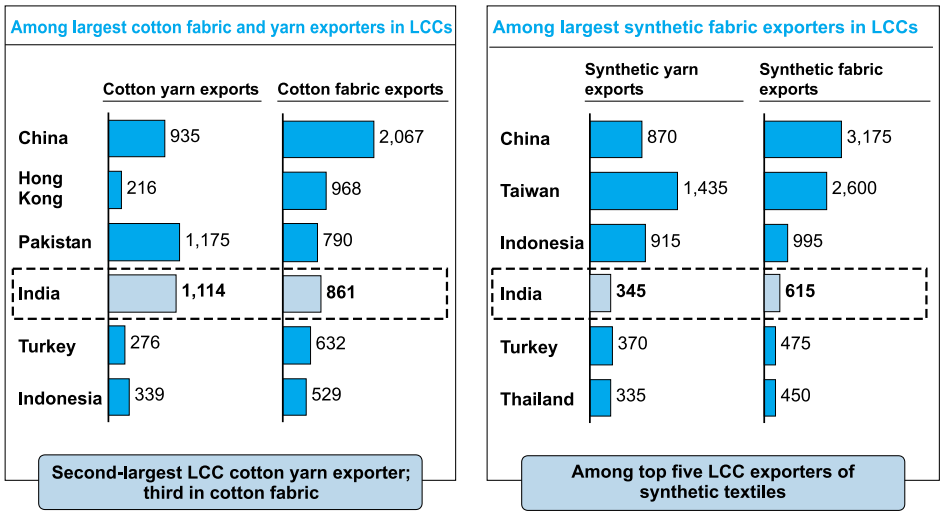
Exhibit 2.4
CHINA, INDIA AND PAKISTAN ARE LIKELY TO BE LONG-TERM WINNERS



Source: McKinsey-DHL analysis

differentiator for the country and explains why value-added garments are the current focus of exporters. The country is rich in traditional apparel-making

Exhibit 2.5
INDIA HAS A SIGNIFICANT ADVANTAGE IN BOTH COTTON AND SYNTHETIC FABRIC
US$ million, 2001



Source: World Trades Database; Ministry of Foreign Trade; McKinsey analysis

skills, with many traditional workers adept at value-adding tasks such as embroidery, mirror work and beading, and at making complex garments.

- **Emerging clusters:** Garment manufacturing clusters are emerging in India and the development of new apparel parks is proposed. Established clusters in India include Tirupur, which contributes 50 per cent of India's knit exports, most of it through vertically integrated factories; multiple clusters in Gujarat, including its Surat Apparel Park housing over 100 large and medium units; and Delhi, with a large number of factories producing value-added garments. Although these clusters are yet to achieve world-class standards compared to Chinese clusters, their emergence is a step in the right direction.

Success will hinge on efforts by Indian companies and the government to remove key barriers. These include low labour productivity, sub-scale factories and delays caused by inadequate port infrastructure.

The average productivity levels in Indian plants are 50 per cent lower than those of their Chinese counterparts. This productivity gap is caused by poor organisational practices, small scale, low investments in technology and inadequate training. Foreign investment is still insufficient and can therefore not drive the productivity improvements that can be seen in other sectors.

Indian garment manufacturing also suffers from a lack of scale. Indian plants are much smaller than the average Chinese plants – large Indian plants typically have 1,000 machines compared to China's 5,000-machine plants. Indian manufacturers often fragment capacity by setting up several small plants to pre-empt labour strife.

Finally, while ongoing highway development is helping to significantly improve road transport, issues at Indian ports – such as inefficient cargo handling and delayed customs clearance – remain major impediments.

These issues can be addressed if companies step up their performance and the government implements the required reforms. These are discussed in the next two sections.

INDIAN COMPANIES NEED TO STEP UP PERFORMANCE AND ADOPT ONE OF TWO WINNING BUSINESS MODELS

Most Indian companies today lack scale, operational expertise and efficient organisational practices. Capturing export opportunities will be impossible with the current capability and mindset of Indian companies. The situation calls for radical change.

To win, Indian companies must choose between two business models: operational excellence, and design and innovation. Alternatively, some players may choose to become aggregators (i.e., buying agents) while many small players could remain contract manufacturers (i.e., provide very low-cost extra capacity to larger players).

Operational excellence

Players competing on this basis offer lowest-cost, full-package manufacturing from

sourcing of fabric to final delivery of garments. They are distinctive in their economies of scale (4,000- to 5,000-machine factories), fabric and other input-sourcing skills and high-labour productivity. Best practices in operations and quality-enhancement measures ensure the success of these players.

Companies distinguished by operational excellence are large and have global operations. Sales typically exceed US$500 million. Key products are in basic segments such as men's shirts, men's and women's trousers, and key customers are mass-market retailers such as Wal-Mart, Carrefour and Target. They maintain close relationships with multiple customers and manufacture globally at multiple low-cost production centres in countries such as China and India. They also source globally, with sourcing offices in key fabric centres such as Hong Kong, China, Thailand and Indonesia. Such companies employ global manufacturing talent.

Companies seeking to compete through operational excellence need to build strengths in the following dimensions:

- **Mindset:** Develop a mindset of global (in addition to domestic) leadership.
- **Manufacturing scale:** Build scale by investing in world-scale plants and establish a global footprint by investing or acquiring facilities in other LCCs such as China.
- **Operations:** Improve labour productivity through training, adopt best-in-class technology and best practices, and recruit expatriate managers to enhance factory operations when required.
- **Supply chain:** Streamline fabric procurement by establishing sourcing offices in foreign locations and build or gain access to strong outbound logistics.
- **Customer management:** Build long-term partnerships with key customers to maximise capacity utilisation.

Design and innovation

Players competing on this basis are characterised by innovations in fabric and an ability to offer a range of readymade designs to customers. Their distinctiveness lies in innovative fabric R&D, close relationships with supplier mills, close relationships with retailers' design departments and a good understanding of fashion trends.

Companies characterised by design and innovation are medium-to-large players focusing on mid- to high-end garment segments. Sales typically exceed US$500 million. Key product categories are in value-added segments such as women's tops, suits and coats. Buyers include mid- to high-end fashion retailers such as Tommy Hilfiger, Banana Republic and Liz Claiborne. Close relationships are maintained with these customers, especially with their design teams. Logistics capabilities are typically excellent, with manufacturing centres located in Asian LCCs or close to the main markets, e.g., Mexico, the Caribbean and Eastern Europe. A research unit for fabric innovation and a global design talent base are typically maintained.

Companies wishing to succeed through design and innovation will need to build the following capabilities:

WINNING THROUGH OPERATIONAL EXCELLENCE: LUEN THAI

Luen Thai, a Hong Kong-based apparel manufacturer, is an example of success through operational excellence. Luen Thai has always had the stated focus of finding the lowest-cost location to manufacture apparel and has now expanded to provide additional value-added services to its customers. It has built scale and a global footprint through various steps such as investing US$100 million in a 30,000-worker facility in China, setting up manufacturing locations in China, Vietnam, Cambodia and the Philippines and acquiring a US-based firm for better access to customers in the US and Europe. It has obtained control over its supply chain by backward integration into textiles and the building of capabilities to provide logistics support to its customers as well. Its focus on operations is evident from its effort to obtain ISO 9002 certifications (currently in 11 out of 18 plants), introduction of a 'cost of quality' concept to reduce wastage in leftover fabrics, and a 'rethinking and renewal framework' to ensure efficient resource allocation and continuous improvement. The firm develops its employees by providing training after assessing their needs; evaluates performance using internal and external benchmarking; and demonstrates that it cares by establishing a code of conduct for compliance with employee rights, following ethical practices and improving living conditions for employees. As a result of all these actions, Luen Thai has emerged as one of the world's largest apparel manufacturers with sales of US$600 million and is a trusted partner of world-class retailers.

- **Innovation:** Establish an R&D unit for fabric innovation and develop close relationships with fabric suppliers to support innovation.
- **Design:** Set up design units in fashion centres such as New York and Milan to quickly grasp fashion trends and hire professional designers to inculcate best practices in design.
- **Customer access:** Acquire units in Mexico/Eastern Europe/the Caribbean for faster access and proximity to customers.
- **Logistics:** Develop a strong supply chain network to ensure quick turnaround of time-sensitive products.
- **External relationships:** Work with design schools such as NIFT to develop suitable course content.

Aggregators

On the other hand, aggregators offer sourcing services throughout the value chain of design and product development; identification of sourcing options; production planning, quality control and assurance; logistics; after-sales service; and marketing. Since most large buyers such as Wal-Mart prefer to work directly with suppliers in LCCs, and the market share of these large buyers is constantly increasing, aggregators will be under relentless pressure.

WINNING THROUGH DESIGN AND INNOVATION: TAL APPAREL

An innovation-led approach has allowed TAL Apparel, another Hong Kong-based firm, to emerge as the world's largest manufacturer of dress shirts. With current sales of US$600 million, TAL Apparel manufactures in Thailand, Taiwan, Malaysia, Hong Kong and China. Key customers are Tommy Hilfiger, Ralph Lauren, JC Penney and Liz Claiborne. The firm's innovations include the development of pucker-free technology that ensures sharp shirt seams, 'no iron' wool, and shrinkage- and fade-resistant knits. Design offices in New York and Dallas develop new styles. Features of its efficient supply chain include direct collection of point-of-sale data from JC Penney stores, automatic order generation and dispatch to factory for production, and direct shipping of orders from factory to stores. As a result, TAL Apparel makes one out of eight dress shirts sold in the US and has reduced inventory at JC Penney from six months to three.

Contract manufacturers

Most Indian manufacturers today operate as contract manufacturers. While players can survive by following this approach, the aspirations for the industry cannot be achieved unless large, successful players emerge, who adopt one of the first two business models: operational excellence or design and innovation.

There is increasing evidence of Indian companies preparing themselves to capture the post-2005 opportunity, irrespective of which business model they intend to follow. This includes capacity expansions, consolidations and design development.

A leading exporter is opening a new 1500-machine factory with special software tracking technology to record productivity. This would be India's largest factory. A South India-based exporter is consolidating its factories to enable it to handle large runs. It has already reduced its number of factories from 34 to 17, and plans to further reduce them to less than five. A Delhi-based export company has set up its own processing capacity, which meets 40 per cent of its requirement.

But they still have a long way to go. Players will need to make a clear decision about the business model to adopt. They should keep in mind the distinctiveness required to succeed in the chosen business model and build the requisite capability in operations excellence and design.

THE GOVERNMENT WILL NEED TO CONTINUE REFORMS

Over the last five years, government policy has become very supportive, with the government making an effort to remove many of the barriers hindering the sector's growth. First, the manufacturing of readymade garments has already been dereserved from the small-scale sector and 100 per cent Foreign Direct Investment (FDI) now allowed in garments. This enables companies to build large-scale plants without incurring any export obligation. Second, the removal of excise duty exemptions for small-scale garment units, the extension of CENVAT (Central Value Added Tax – levied as excise on manufacture of goods) to the entire textile value chain, and the

inclusion of power looms in the tax net have levelled the playing field for large and small manufacturers. Third, proposals to allow contract labour in export units, on a piece-rate basis, are expected to give manufacturers the flexibility to hire employees in line with seasonal production.

Finally, developments such as the bilateral agreement with Thailand, the Technology and Upgradation Fund, and rationalisation of import duties have facilitated access to synthetic fabric, ensured domestic supply of quality fabric, increased access to technology and enabled fabric sourcing at competitive prices. The government has also acted to reduce procedural complexities linked with exports. An Exim Bank study reported a reduction in transaction costs for textiles/garment exporters from 15 per cent of export revenue in 1998 to 3-10 per cent in 2002-03.

Reforms need to continue at the same pace over the next few years to ensure that the remaining barriers are removed. All the issues highlighted in Chapter 6 apply to apparel. For example, though import duties on fabrics and garments have already been reduced from 40 per cent in 1998 to 25 per cent in 2004, duties need to be further reduced to 10 per cent.

Four additional issues that are of specific relevance to the apparel industry are described below:

- **Development of the textile sector:** The competitiveness of the apparel manufacturing industry is closely linked to its upstream and downstream sectors, i.e., textiles and retail. The domestic availability of fabric helps reduce the lead time taken for procurement and ensure control over quality. India already possesses a very strong cotton and synthetic textile base, being among the top LCC exporters. However, the textile industry is beset with problems of poor technology, small scale and lack of processing capacity, resulting in poor-quality domestic fabric. As a result, most large apparel exporters prefer to import fabric, despite the higher lead time involved. To revitalise the textile sector and capitalise on India's inherent advantages, the government must focus on developing policies that encourage investment in process houses and on upgrading the power loom sector.
- **FDI in retail:** The presence of a strong domestic retail sector can serve as a testing ground for manufacturers to test new designs and collections. While there is evidence that some organised retailers are emerging, the restriction on FDI in this sector and the absence of large retailers have prevented the market from reaching higher levels of sophistication. As a result, even the potentially large domestic market has not really benefited apparel manufacturers. This potential can be unlocked by removing the restrictions on FDI in retail.
- **Trade agreements:** Bilateral free-trade agreements with the US and the EU should be pursued in order to better compete with other LCCs (such as Sri Lanka) that have signed such agreements.
- **Development of apparel parks:** Across India, many state governments have already taken the initiative to establish parks in Hyderabad, Surat, Kanpur

and Kerala. Integrated apparel parks should contain the following elements: power plants, common water treatment, processing and laundry facilities, training centres to accelerate skill development, connectivity to ports and highways, and logistics centres for consolidation of shipments.

* * *

The dismantling of the MFA in 2005 will open up a window of opportunity for Indian companies. What India makes of this opportunity will depend on how well individual companies can metamorphose from contract manufacturers into manufacturers characterised by operational excellence or design and innovation, and how aggressively the government pursues reforms. ■

3. Auto Components

Silently and almost unnoticed, a revolution has been underway in India's auto components sector. A few first movers have already experienced success in growing their businesses outside India. Capturing the full offshoring opportunity could put India in pole position in the race to serve the global auto components industry. In doing so, they could capture US$20-25 billion in exports by 2015.

Opportunities in this industry can be summarised as follows:

- Globally, innovation and cost pressures in large, developed markets will drive further offshoring. Components worth almost US$3,200 per car (US$345 billion in total opportunity) could be sourced from LCCs by 2015 (vs US$600 per car and US$65 billion in total today).
- India is well-positioned to capture US$20-US$25 billion in exports by targeting the skill-intensive commodity and technology categories. This is because it has inherent advantages in engineering skills and the emerging capability for continuous improvement when compared with other LCCs. This would require growing India's share of global auto-component trade from 0.5 per cent today to 5-6 per cent by 2015.
- Indian companies will need to adopt a global mindset and rapidly build scale; create marketing and engineering front-ends outside India; develop continuous improvement capability; and learn to manage a global talent pool. In addition, Indian companies should carefully select components for their global forays based on the engineering advantages that India offers.
- MNCs should harness India's low costs and highly developed engineering skills to make India one of their top two low-cost sourcing bases. In the longer term, this will also allow them to tap into the domestic market.
- The Indian government should lower duties and indirect taxes to stimulate domestic demand. This will provide the necessary scale for Indian auto-

component manufacturers to compete with their LCC counterparts in the global markets.

The rest of this chapter describes these points in more detail.

OFFSHORING OF AUTO COMPONENTS IS POISED TO TAKE OFF

Offshore sourcing of auto components has remained limited thus far. The US, for example, imported only 8 per cent of total consumption from LCCs in 2001 with around 80 per cent of this coming from near-shore Mexico.

However, offshore sourcing of auto components will experience a quantum leap in the next ten years. Analysis suggests that LCC exports are likely to increase from an estimated US$65 billion in 2002 to over US$345 billion by 2015. Innovation and cost pressures in large, developed markets and the emergence of capable supplier bases in LCCs will drive this trend.

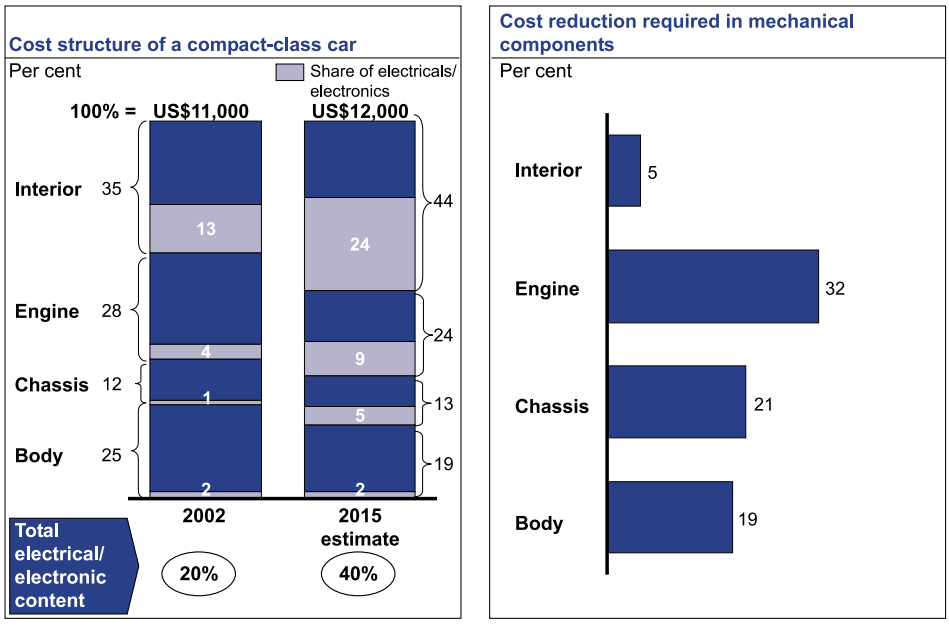
- **Innovation and cost pressure in developed markets:** Consumer prices of automobiles are expected to remain static over the next ten years, while costs are expected to rise due to consumer desire for new features and the need to comply with higher environmental and safety standards. For example, the inflation-adjusted price of the basic Volkswagen Golf stayed almost constant from 1990 to 2002, even though its standard equipment was enhanced with airbags, anti-lock braking system (ABS) and a more powerful engine.

  In addition, electronic content is likely to rise from 20 per cent of total car cost in 2002 to 40 per cent by 2015. To meet customer needs for better features without an increase in price, OEMs will have to reduce the cost of mechanical parts by up to 30 per cent (Exhibit 3.1). One of the several responses to this type of severe cost reduction pressure will be for OEMs and tier 1 suppliers to increase sourcing from LCCs. McKinsey research indicates that up to US$3,200 per car (an estimated 25 per cent of the cost of a car) can be globally sourced across different segments (Exhibit 3.2) (see box: The global sourcing opportunity).

- **Emergence of credible LCC supplier bases:** The growing presence of multinational OEMs in LCCs and attendant demands for high quality standards have already improved supplier capabilities. In India, for example, almost all global OEMs (General Motors, Toyota, Ford, DaimlerChrysler and Honda) entered the market after it was opened to FDI. Today, most of the manufacturing operations of these players have achieved indigenisation levels of 70-90 per cent, or will soon do so. In a sample of over 400 Indian suppliers, 80 per cent have ISO 9000 certification, 50 per cent have QS 9000, 10 per cent have ISO 14001 and 8 per cent have TS 16949. Moreover, apart from the Japanese, only Indian auto-component makers have won the prestigious Deming award. Once supplier capability to meet stringent OEM standards for the domestic market is established, global OEMs and tier 1 suppliers will begin to offer LCC suppliers the opportunity to serve their global operations as well.

The impact of these trends is already apparent. Indian auto-component exports have grown at 23 per cent per annum in the past five years to reach US$1 billion by 2003-04.

Exhibit 3.1
INCREASING ELECTRONIC CONTENT WILL INCREASE THE PRESSURE TO REDUCE COSTS OF MECHANICAL COMPONENTS



Source: McKinsey report: *HAWK 2015 — Knowledge-based changes in the automotive value chain*

INDIA COULD CAPTURE US$20-25 BILLION OF AUTO-COMPONENT EXPORTS BY 2015

The global auto-component industry is estimated to be US$1.2 trillion in value of parts consumed by OEMs per annum. As already discussed, LCC exports are likely to increase from an estimated US$65 billion in 2002 to over US$345 billion by 2015. Although India's exports are still small (US$1 billion in 2003-04), it could leverage this offshoring trend and the quality of its supply base to build a dominant top two position in auto-component exports by 2015.

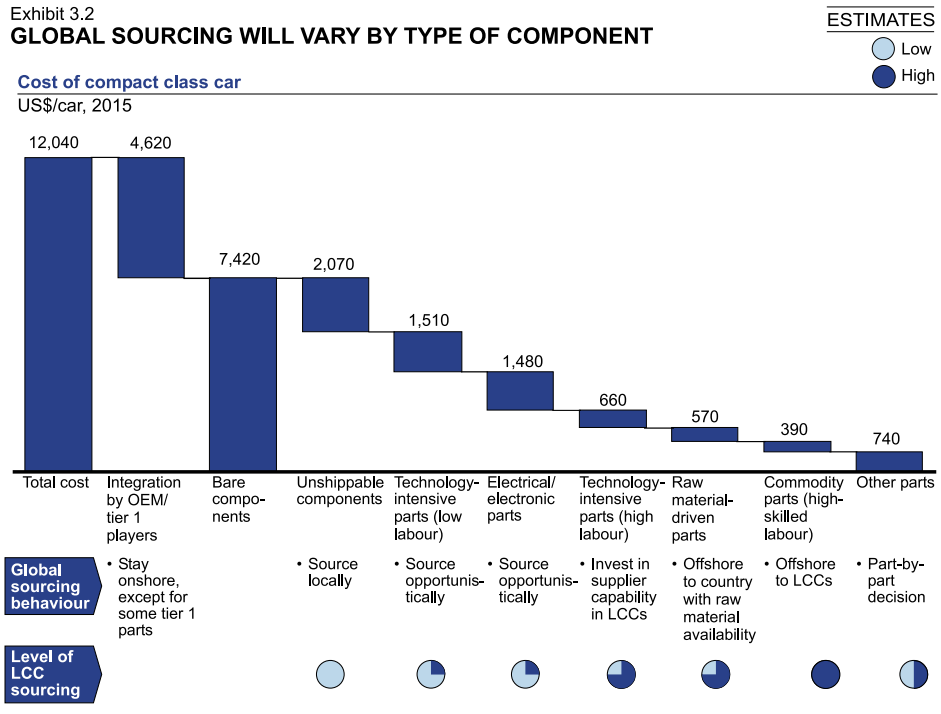
A top two position would help India achieve auto-component exports of US$20-US$25 billion by 2015. This would increase India's share of world auto-component trade from 0.5 to 5-6 per cent, and the share of LCC exports from 1.5 per cent to 6-7 per cent.

To achieve this aspiration, India's auto-component sector would need to grow at over 30 per cent a year over the next decade. This is difficult but can be done, as experience from other LCCs has shown. Auto-component exports from Thailand grew at 35 per cent between 1999 and 2003. China's exports growth between 1997 and 2002 was close to 30 per cent (Exhibit 3.3). More importantly, LCCs such as China, Thailand and Mexico – whom India will have to compete with – aspire to similar growth levels, if not higher. China, for example, aspires to grow automobiles and component exports at 50-55 per cent a year, worth US$70-US$100 billion by

2010.

Two underlying sources of advantage — engineering skills and continuous

Exhibit 3.2
GLOBAL SOURCING WILL VARY BY TYPE OF COMPONENT



Source: McKinsey analysis

THE GLOBAL SOURCING OPPORTUNITY

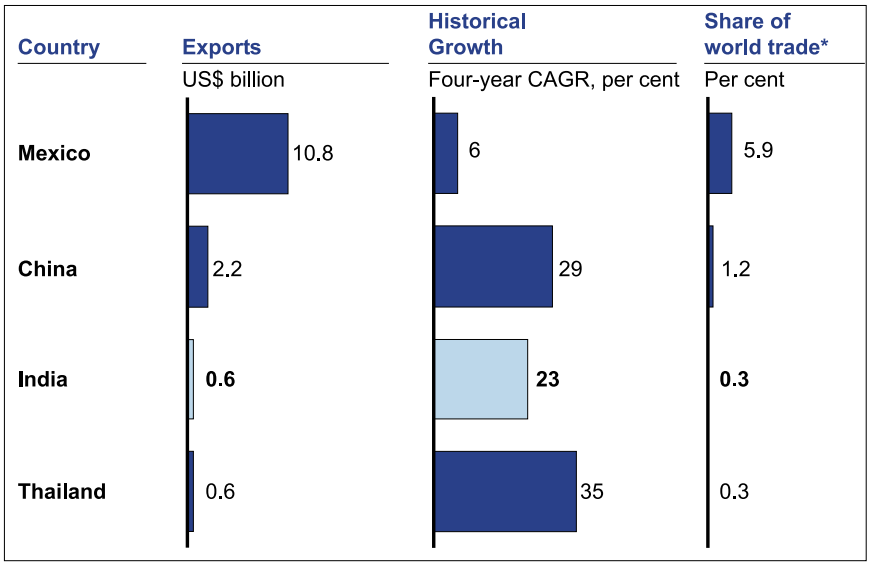
A compact class car typically costs the OEM US$12,000, out of which about US$6,700 is either the value added by the OEM (US$3,000) and tier 1/ tier 2 vendors during integration and assembly (US$1,700), or the value of the components that cannot be shipped due to their bulk (e.g., body in white) (US$2,000).

The remaining US$5,300 worth of components can be globally sourced over time and can be segmented based on differences in global sourcing behaviour of buyers. Five distinct segments emerge for mechanical parts: (1) technology-intensive (high-labour) parts such as calliper assemblies and integral wiring harnesses; (2) technology-intensive (low-labour) parts such as machined iron and aluminium castings; (3) commodity (skilled labour-intensive) parts such as motor harnesses and calliper housings; (4) raw-material-driven parts such as carpets and raw castings; and (5) other parts such as simple cylinder blocks and bought-out items. Electronics and electrical parts (e.g., stereo systems and electronic control units for engines) form a distinct sixth segment.

McKinsey analysis suggests that these six segments will witness different levels of global sourcing. Components worth approximately US$2,800 per car could be sourced globally in the next ten years. In addition, it is estimated that US$400 per car from the tier 1 value added of US$1,600 per car will also move to LCCs.

improvement capabilities – will power the growth of the Indian auto-component industry.

Exhibit 3.3
INDIA HAS A VERY SMALL SHARE OF THE GLOBAL AUTO-COMPONENT TRADE
2002



*Total world trade is US$185 billion
Source: World Trade Database; Ministry of Commerce, China; Thai Government releases; McKinsey analysis

- **Engineering skills:** India's long manufacturing history and education infrastructure have created strong engineering and design capabilities.
  - Process engineering: India's process engineering skills, such as redesigning manufacturing processes to make them more labour-intensive and less capital-intensive, allow it to substantially lower overall costs. In specific components, de-automation of the production process used in Western factories can reduce up to 20 per cent of overall manufacturing costs.
  - Product engineering: India's strengths include designing to lower costs or designing more quickly. Firms in India have lowered manufacturing costs by using design changes to optimise inputs. For example, the steering system of the Maruti Alto was redesigned so that its weight was lowered by 15 per cent. Through redesign, the stabiliser bar for another Indian car was reduced in weight by 40 per cent and in cost by 10 per cent.

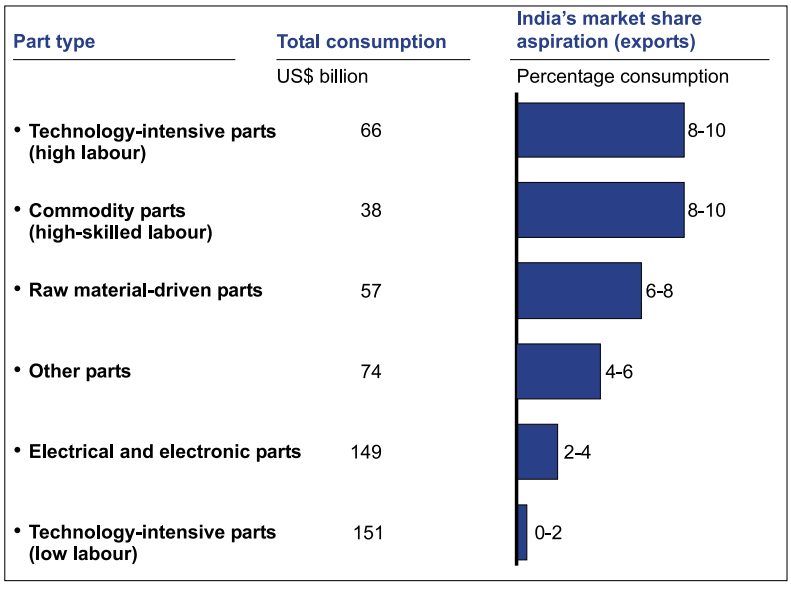
    Faster design development has reduced development costs and lead times. For instance, Indian suppliers designed a steering system within six months for an automotive OEM, after the OEM had tried to develop a similar system in other LCCs for over four years with no success.
  - Capital engineering: India's advanced tooling and machining industry has enabled indigenisation of capital equipment and reduced capital costs. In the case of a leading Japanese OEM, capital re-engineering has resulted in costs 20 per cent lower than those in other LCCs. Similarly, it has been observed that reductions in cost of refurbishment through programming

and engineering skills can create up to 85 per cent savings in some cases.

- **Continuous improvement capability:** This is an emerging strength in India, with several leading suppliers already using operational excellence programmes and a cost-conscious mindset to create continuous cost improvements. An Indian brake linings company, for example, is now among the world's top five brake lining manufacturers through a continuous effort to achieve operational excellence. Between 1995 and 2001, the firm reduced raw material cost to 26 per cent of sales from 52 per cent, the scrap rate to 1.75 per cent from 8 per cent, and customer rejections to 500 parts per million from 12,000. Similar successes have been seen at other auto-component players. This trend will continue to spread as more auto-component makers become aware of and are exposed to best-in-class continuous improvement practices.

These two strengths could help India build strong positions in many segments. For instance, India could gain an 8-10 per cent share of global consumption in the technology-intensive (high labour) and commodity parts (high-skilled labour) segments. In select raw material-intensive categories, especially iron- and aluminium-based components, India can build a 6-8 per cent global share. In other categories and in capturing components currently supplied by tier 1 vendors, India's share will be limited (2-6 per cent global share) and may largely be driven by captive operations of large OEMs and tier 1 suppliers (Exhibit 3.4).

Exhibit 3.4
INDIA SHOULD BUILD A STRONG POSITION IN THE TECHNOLOGY AND COMMODITY SEGMENTS WHICH REQUIRE SKILLED LABOUR
2015



Source: Global Insights; McKinsey analysis

INDIAN SUPPLIERS SHOULD FOCUS ON BECOMING PRODUCTION SPECIALISTS

SUCCESSFUL GROWTH MODELS IN THE GLOBAL AUTO-COMPONENT INDUSTRY

- **Integration:** Integrators go beyond supplying individual components and offer either modules (physical assembly of a set of parts) or systems (bringing together components that collectively perform a function, e.g., air-conditioning systems).

  Integrating components into modules or systems requires that a lot be spent on development and often dictates a complete restructuring of the production process. Also, suppliers that integrate, greatly increase their warranty responsibility. This could create significant liability in the event of a recall. To win with this model, suppliers need module/system integration capabilities within product development and high levels of transaction efficiency, apart from robust mechanical skills.

- **Innovation:** Innovation involves generating value by transforming superior know-how into new technology. Innovators apply the development and production skills that they learn with each innovation to other areas. Innovations in airbags, for example, can be applied to making seatbelt pre-tensioning devices since their release mechanisms require similar pyrotechnic expertise. Along with design and image, the ability to increase the product's value for the customer in the form of a constant stream of new ideas is often the decisive factor in creating competitive advantage. Winning innovators will be characterised by strong electronic capabilities and innovation in product development.

- **Specialisation:** Suppliers taking the specialisation approach concentrate on a narrow field of expertise and use their superior knowledge to capture the maximum value in that field. Specialisation typically requires focusing on a product or production process. Product specialists understand customer expectations for a product and aim to meet these expectations through mastery over the product. Production specialists, in contrast, concentrate on achieving best practice in the development and production of components through processes that they master. An instance of this includes metal forming processes to make conventional mechanical components. Indian suppliers are well-positioned to win as specialists: apart from low labour costs, superior engineering enables process, capital and operating efficiencies; and the operation-excellence mindset beginning to emerge in select Indian companies makes for continuous improvement.

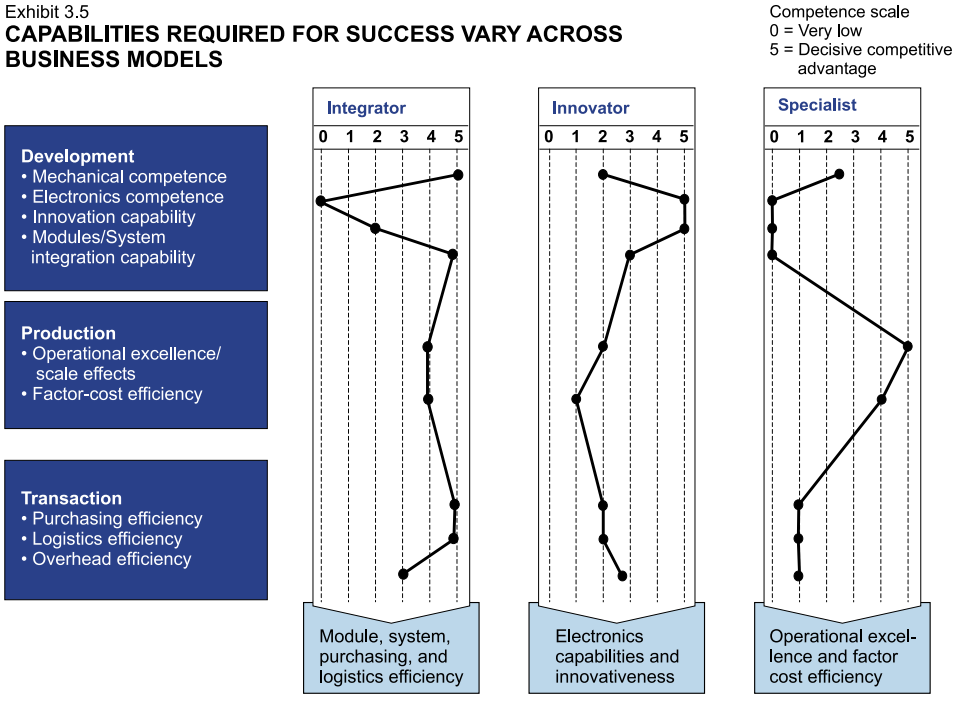
FOR GLOBAL MARKETS

There are three generic models for growth within the global automotive supplier industry: integration, innovation and specialisation (see box: Successful growth models in the global auto-component industry). The capabilities required to succeed vary dramatically across models. Integrators need skills in mechanical engineering,

integrating systems and interfaces; innovators require expertise in electrical and electronic capabilities and strong innovation ability; specialisation calls for operational excellence and factor cost efficiency (labour, capital and raw material) (Exhibit 3.5).

To succeed globally, Indian suppliers should become 'production specialists',

Exhibit 3.5
CAPABILITIES REQUIRED FOR SUCCESS VARY ACROSS BUSINESS MODELS



Source: McKinsey report: *HAWK 2015 — Knowledge-based changes in the automotive value chain*

competing through large-scale, low-cost manufacturing of components based on competence in a single process (e.g., metal-forming processes such as forging, casting, extrusion, etc.).

Winners could aspire to build revenues in excess of US$700 million in ten years, for which they will need to take six sets of actions:

- **Select components based on distinctive capabilities:** Players should choose components where they can control factor costs (raw material, capital and wages); provide required levels of interaction on engineering and design to customers; and sustain continuous improvement rates that deliver ongoing cost reductions.
- **Adopt an aggressive mindset and rapidly expand scale:** In chosen areas, players should aggressively build scale and establish customer relationships before the bulk of the value is captured by MNC suppliers setting up back-end operations in India. To rapidly acquire customers, players could take one of three routes.
  - Acquire small- to medium-sized firms in the US and Europe: Apart from clear cost leadership in current operations, players choosing this approach should be comfortable with post-merger management and have the ability

to build and maintain a global talent pool. Several Indian suppliers are beginning to adopt this approach (e.g., Bharat Forge's recent acquisition of Carl Dan Peddinghaus' plants in Germany, Sundram Fasteners' acquisition of Dana Spicer's forging unit in the UK).

- Relocate auto-component plants in the US and Europe to India: Success in this approach requires the ability to protect volumes and minimise price erosion in the process of offshoring. Typically, players pursue firm asset purchase and buy-back arrangements with the current owners of the assets. Again, some Indian players are beginning to adopt this approach as well (e.g., the Anand Group's relocation of Haldex's manual brake adjuster plant to Nashik and Omax Auto's relocation of Delphi's Dayton transmission shaft facility to Bangalore).
- Undertake contract manufacturing in collaboration with bigger component suppliers: This option delivers higher volumes but lower margins than the previous two options. To pursue contract manufacturing on a sustainable basis, Indian suppliers would need to lock in a partner to achieve significant cost or non-cost advantages (e.g., efficient supply chain, innovation through design). The Rane Group, which manufactures steering columns for TRW, is an example of a contract manufacturer.

It is also possible that players pursue a combination of the approaches outlined based on products and markets. For example, a company may simultaneously explore acquisitions and asset purchase in the North American market, while forging a non-compete contract manufacturing arrangement for identified parts for the European market.

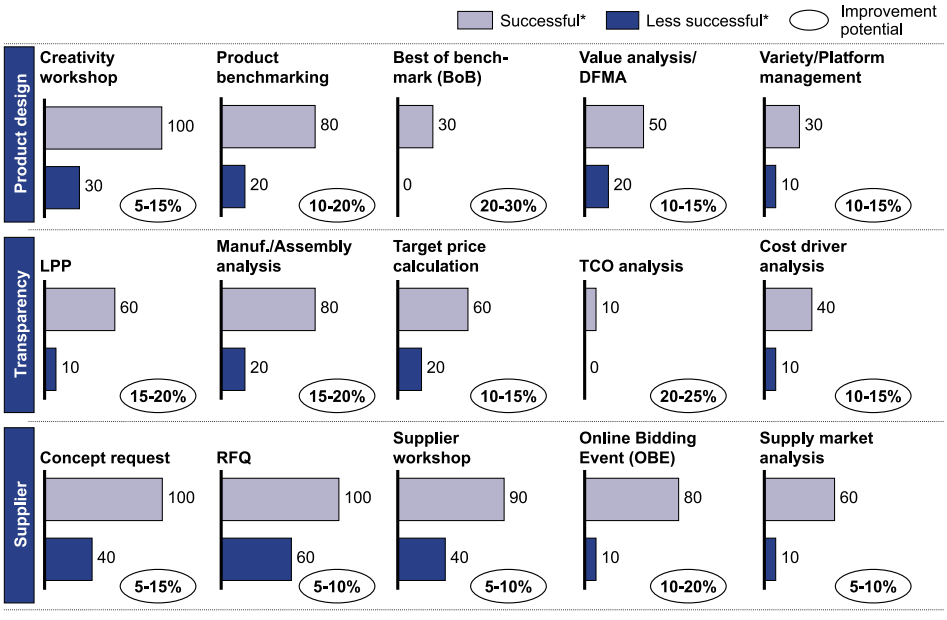
With greater outsourcing from OEMs to tier 1 suppliers, Indian companies should prepare to deal with the latter as well (e.g., Borg-Warner for powertrains). Indian suppliers should reflect on the implications of this underlying trend in their customer acquisition strategy.

- **Achieve operational excellence:** Indian manufacturers are already well able to meet the initial cost reduction targets and quality criteria. In metal-formed parts, for example, India's landed cost can be up to 40 per cent lower than that in Europe. However, buyers in this industry expect continuous improvement in cost and quality. This, in turn, requires operational excellence in manufacturing, purchasing and in the supply chain. There are several tools to enhance operational performance, ranging from optimising product design processes and increasing cost transparency, to ensuring optimal contract terms with suppliers. While the relevance of the tool varies and has to be adapted to the individual company, McKinsey experience suggests that successful auto-component companies use optimisation tools three times more than less successful companies[1] (Exhibit 3.6).
- **Build frontline Engineering & Design (E&D) capability:** An effective front-end engineering base is crucial for three reasons: driving ongoing cost

reduction for in-production parts already offshored; gaining customer confidence to prise additional parts away from existing onshore suppliers; and supporting the customer during the design stage to reduce costs for future parts. These engineering front-ends can either be created by acquiring entire companies or by hiring local engineers and supporting them with an engineering back-end from India.

- **Build a global talent pool:** Suppliers will need to invest in marketing personnel in local markets and manage a global talent pool. Managing

Exhibit 3.6
SUCCESSFUL AUTO COMPONENT COMPANIES USE OPTIMISATION TOOLS THREE TIMES AS OFTEN AS OTHERS



* Based on ROS and CAGR
Source: McKinsey report: *HAWK 2015 — Knowledge-based changes in the automotive value chain*

diversity, attracting high-quality local talent, managing global compensation and revamping performance management and career tracks are issues that Indian suppliers will need to resolve to win.

- **Create a global operating footprint:** While engineering skills and continuous improvement capabilities are critical to differentiating India from other LCCs, Indian companies need to improve their delivery and transition management (i.e., moving part volumes from an onshore supply base to an offshore location without disrupting final production). Often, an inability to meet customer demands in these areas is exacerbated by a poor supply chain. Likewise, a lack of vibrant domestic demand limits supplier willingness to create significant additional capacity ahead of demand. While the government should help stimulate domestic demand and improve infrastructure, winning Indian suppliers should act on their own as well and build an operating footprint that goes beyond India, say to China and Thailand, and build world-scale capacities in each location.

For India and markets with similar characteristics, winning Indian suppliers should also adopt an 'integrator' strategy to develop integrated modules or systems. Such

markets are those that have similar end-customer demands (e.g., similar levels of price sensitivity) and therefore a need for a design philosophy that differs from that prevalent in developed markets.

This dual strategy, of being a specialist for global markets and an integrator for India and similar markets, will not only allow players to generate higher returns in the short term, but also build capabilities to compete as an integrator in the global markets in the longer term.

Not all Indian suppliers, however, will win with the strategy just described. Indian suppliers that are unable or unwilling to pursue such a two-pronged global growth strategy could, through alliances, pursue contract manufacturing with an MNC or with winning Indian players for the international markets or stay focused on the domestic market.

MNCs SHOULD DEVELOP INDIA AS A TOP TWO SOURCING HUB

Several MNCs are beginning to discover India's strengths in auto-component manufacturing. All these companies acknowledge India's engineering capability and emerging continuous improvement capabilities as strong differentiators and have plans to increase both sourcing and manufacturing in India.

Volvo plans to buy parts worth US$1 billion annually from India. DaimlerChrysler has set up seven joint ventures for manufacturing components in India and plans to source components worth US$110 million from India over the next two years. Ford sources components amounting to almost US$40 million in value from India, in addition to exporting vehicles. Toyota is commencing commercial production of automobile transmissions for export in June 2004. Cummins buys components worth US$80 million per year from Indian suppliers, sources complete engines from India and expects to double this amount over the next three years.

However, MNC buyers express two inter-related challenges in accelerating sourcing from India: the absence of scale players that can fulfil their volume requirements; and the absence of robust domestic demand as one of the inhibitors to Indian suppliers building scale. The scale challenge, particularly in the context of low near-term growth in Indian domestic demand, will require creative solutions. MNCs could, for instance, co-invest in capacity creation through advance purchase agreements.

Toyota is one example of an MNC that has effectively leveraged the Indian advantage. It has made the most of India's competitiveness in manufacturing by localising the content of the Qualis and the Corolla. Localised content now accounts for 74 per cent of the costs of the Qualis and 55 per cent of the cost of the Corolla. Unlike other players, Toyota has so far co-invested upwards of US$175 million in six joint ventures in India to develop scale in manufacturing operations. Toyota has already gone beyond sourcing components from India and today also sources transmission assemblies from India for its global operations.

THE GOVERNMENT WILL NEED TO STIMULATE DOMESTIC DEMAND

The four actions highlighted in Chapter 6 are all important and relevant to this sector. Boosting domestic demand by lowering tax rates and import duties should be among the government's most important priorities in this sector.

In 1995, China's domestic car production was 300,000 units, about the same as India's 280,000. But by 2003, China had overtaken India to produce over 2 million cars while India was still making only 730,000. Industry forecasts suggest that at the current pace of reforms China will produce 4 million cars in 2008 while India will produce only 1.5 million. With such an advantage in domestic demand, auto-component players in China have a scale advantage, as also access to MNC customers investing in large domestic markets. Not only will this make India's export aspirations difficult to achieve, Indian auto-component makers could come under attack in the domestic market as well.

It is therefore extremely important that the government proactively stimulate growth in domestic demand by reducing taxes, enabling import competition and accelerating the building of good-quality roads. To illustrate, the total tax incidence on a passenger car manufactured in India is 23 per cent of the price paid by the consumer, as compared to 15 per cent in China.

* * *

Although India's current auto-component exports are modest, the sector is beginning to accelerate export growth and has significant untapped potential. Whether India makes the most of the opportunity in increased offshore manufacturing and sourcing of auto components will depend on how well Indian and foreign companies build on the inherent advantages India offers and how aggressively the government acts to promote domestic demand and help fill potential gaps in competitiveness. ■

1 The categorisation into 'successful' and 'less successful' is based on an index according to which successful companies increase their sales at a compound annual growth rate of 13 per cent on an average and earn an annual return on sales of 6.5 per cent.

4. Electrical and Electronic Products

The world market for electrical and electronic products is valued at US$770 billion and roughly half of all manufacturing takes place in LCCs. LCC exports were estimated to be US$345 billion in 2001. There is a feeling that India, with US$1.3 billion in exports in 2003, has lost the race to countries like Taiwan and China, whose exports exceeded US$50 million. This need not be so. Despite a late start, India can leverage its advantages in custom-made and non-electronic segments to capture US$15-18 billion a year in exports by 2015. However, it can do so only if the government changes its policy, if Indian companies adapt new and different business models and if MNCs tap into India's potential in selective segments.

The key findings of the study are as follows:

- Offshore manufacturing and sourcing of electrical and electronic products is already very large (US$1.1 trillion in 2001). LCC exports were estimated to be US$345 billion in 2001. Going forward, they are expected to increase by at least 4 per cent and grow to US$600 billion by 2015.
- Despite a late start, India can leverage its engineering skills and existing ecosystems (i.e, the presence of high-quality suppliers and relevant technology partners with established, self-sustaining relationships that are mutually beneficial) to secure 2.5-3 per cent of the LCC share of exports by 2015. This means that exports will amount to US$15-18 billion a year with a CAGR of 20-22 per cent.
- Unlike Taiwan and China, India's strengths lie mainly in custom-based manufacturing (e.g., industrial actuators and sensors) and non-electronic parts (e.g., power assemblies, cables, connectors). Given the trend towards outsourcing of design, the potential for value creation and India's design strength, it is suggested that Indian companies focus on *both* design and manufacturing (as opposed to manufacturing alone).
- MNCs can develop India into a manufacturing hub, particularly for custom-

made and non-electronic products. This will provide them with the access and insight to tap into the demand potential the domestic market will eventually offer.

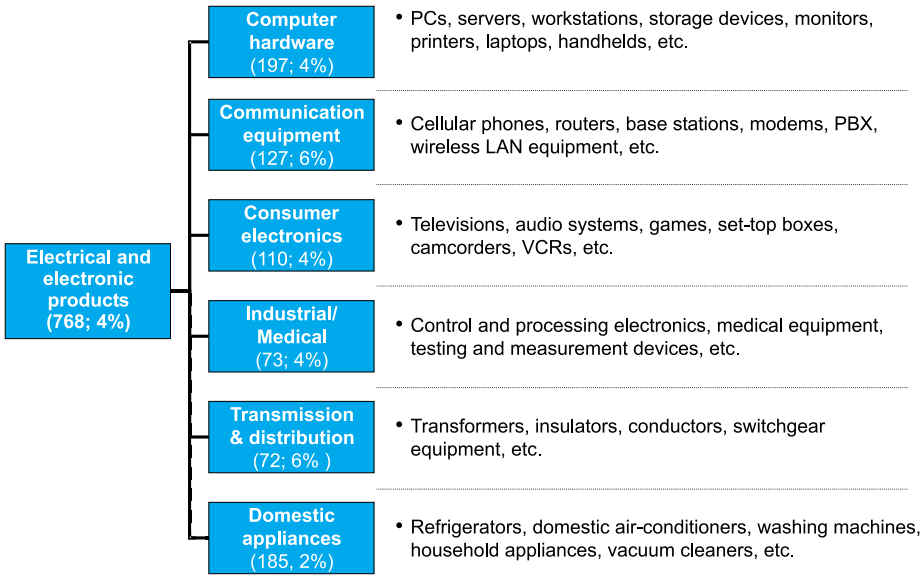
- The government needs to increase India's attractiveness as a manufacturing and sourcing hub by stimulating domestic demand and encouraging the creation of manufacturing parks.

The rest of the chapter describes these findings in detail.

OFFSHORING OF ELECTRICAL AND ELECTRONIC PRODUCTS TO LCCs WILL INCREASE FURTHER

The global electrical and electronic products industry is worth US$770 billion[1] (Exhibit 4.1). The industry is characterised by a disaggregated value chain, because of which global trade in this sector exceeded US$1.1 trillion in 2001. Exports from

Exhibit 4.1
THE ELECTRICAL AND ELECTRONIC SEGMENT INCLUDES SIX SUB-SECTORS
(Global revenues in US$ billion, 2002; Expected CAGR% 2002-07)



Source: Electronic Trends Publications, 2003; Goulden reports

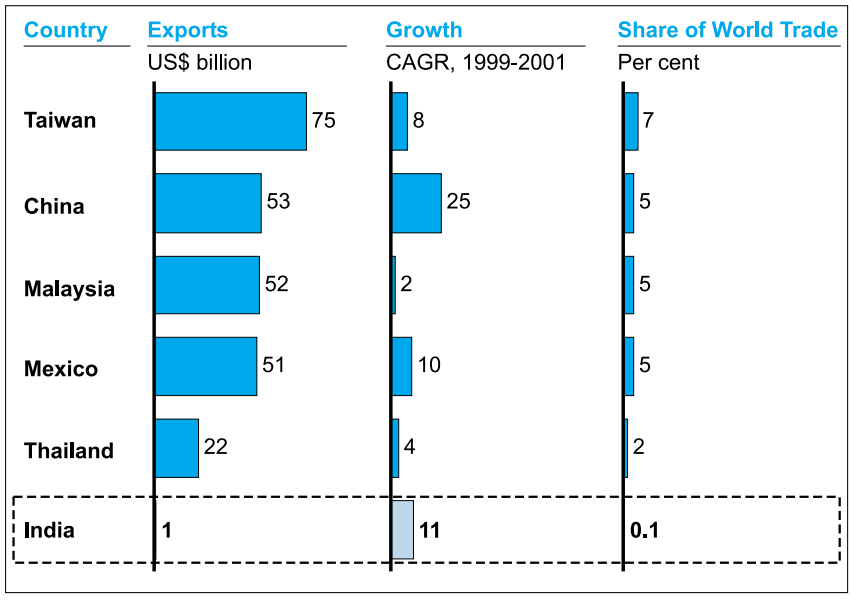
LCCs are estimated to drive 31 per cent of world trade amounting to US$345 billion. China, Taiwan, Malaysia and Mexico have each built exports exceeding US$50 billion (Exhibit 4.2).

Despite such high levels of existing offshoring, offshoring to LCCs will only increase in the future. Offshore manufacturing and sourcing has so far focused on the consumer electronics and computer hardware sub-sectors. However, a comparison of the value added to sales ratio for other sub-sectors (which is a good indicator of the amount of benefit to be gained by offshoring to LCCs) indicates that other sub-sectors will also significantly benefit from offshoring. For example, although the industrial medical electronics sub-sector in the US has a higher value added to sales ratio than computer electronics, it currently imports only 23 per cent of total

consumption, while the latter imports 64 per cent (Exhibit 4.3).

Going forward, exports from LCCs are expected to grow from the current US$345 billion to at least US$600 billion by 2015 (4 per cent annual growth). Three factors

Exhibit 4.2
INDIA LAGS BEHIND OTHER LCCs IN ELECTRICAL AND ELECTRONIC EXPORTS
2001

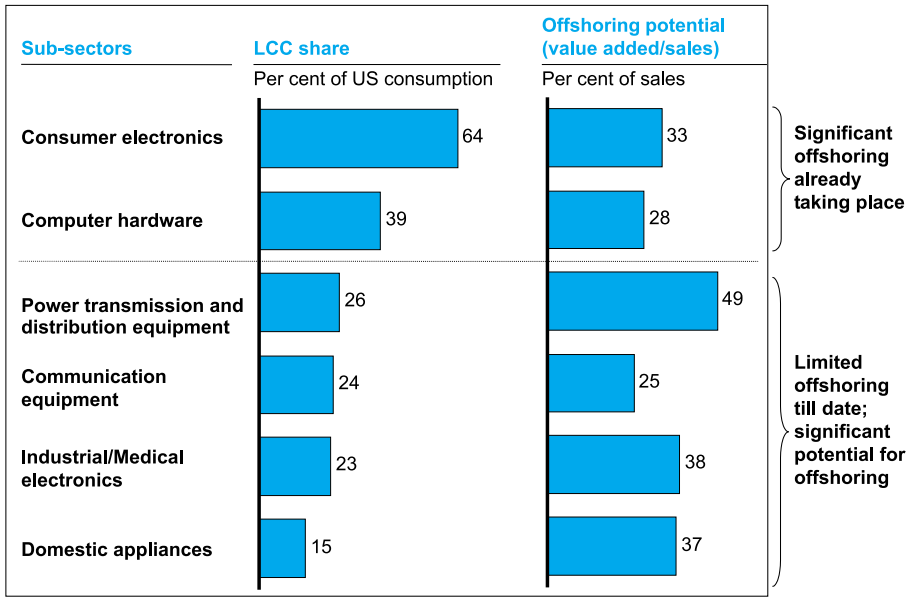


Source: World Trades Database; McKinsey analysis

will drive LCC offshoring, especially to Asia:

- **Rising demand in LCCs:** Asian markets for electrical and electronic products are large and growing. For example, in 2002, Asian countries

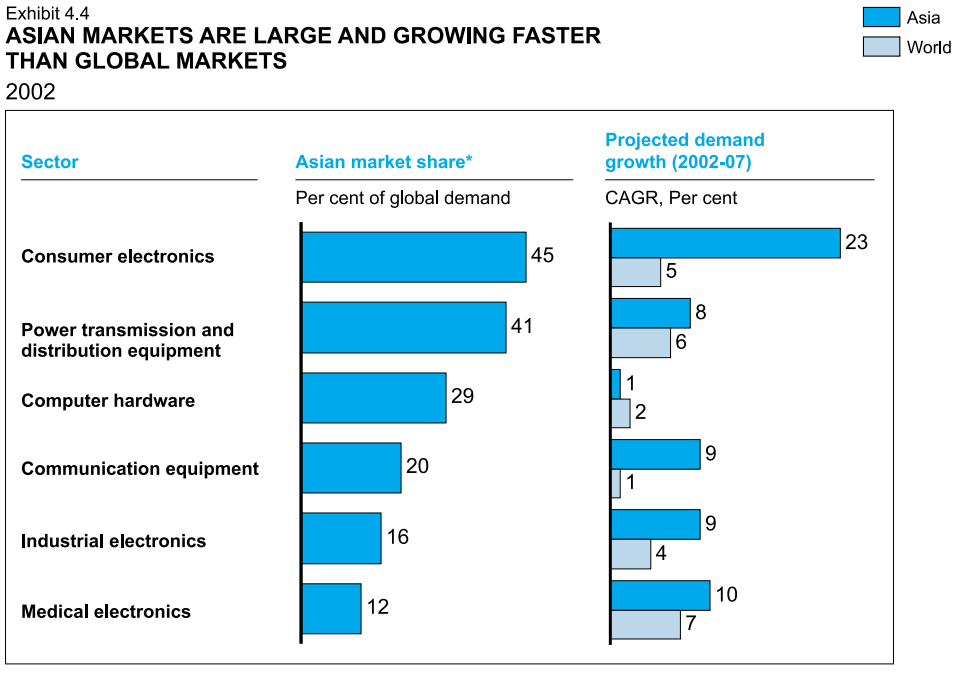
Exhibit 4.3
OFFSHORING POTENTIAL EXISTS IN ALL SUB-SECTORS – US EXAMPLE
2001



Source: World Trades Database; Bureau of Economic Analysis; McKinsey analysis

(excluding Japan) accounted for 45 per cent of the consumer electronics market, with demand growing rapidly at a compounded annual rate of 23 per cent compared to the world average of 5 per cent (Exhibit 4.4). These countries also accounted for 41 per cent of the power transmission and

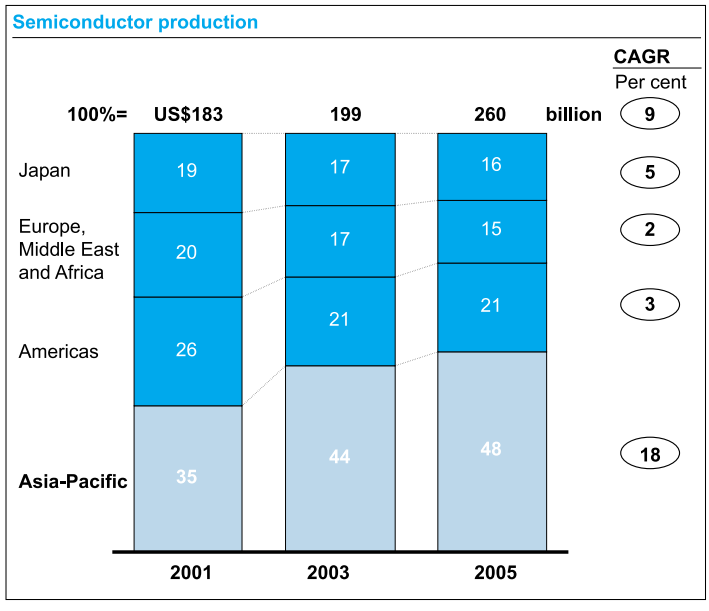
Exhibit 4.4
ASIAN MARKETS ARE LARGE AND GROWING FASTER THAN GLOBAL MARKETS
2002



* Excluding Japan
Source: Electronics Trends Publications, 2003; Morgan Stanley; Goulden reports

distribution equipment market, with a growth rate of 8 per cent compared to the world average of 6 per cent. This growing demand has led MNCs to show increased interest in Asia. For example, GE Medical Systems has moved its

Exhibit 4.5
THE SUPPLIER BASE IS SHIFTING TO ASIA – SEMICONDUCTORS EXAMPLE
Per cent

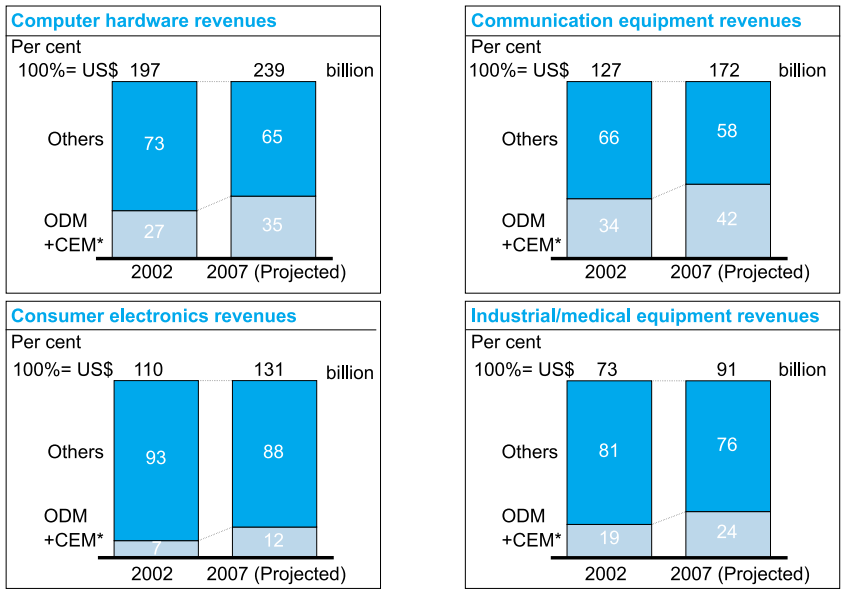


Source: Isuppli Corp

Asian operating centre from Japan to China and invested US$40 million in setting up an industrial park in the Beijing Economic-Technological Development Area. This has enabled China to become one of the world's top producers of CT scanners, meeting 25 per cent of total global demand every year.

- **Evolving LCC supplier base:** Asia (led by China) is becoming an increasingly important supplier base. This is driven by the mass migration of electronic assembly production to Asia by Contract Equipment Manufacturers (CEMs) and Original Design Manufacturers (ODMs). Virtually all large CEMs added new manufacturing capacity in China in 2002. This took total manufacturing capacity in China to over 15 million square feet – more than 60 per cent of all production capacity in Asia. This

Exhibit 4.6
ODMs AND CEMs ARE ESTIMATED TO INCREASE PENETRATION ACROSS SECTORS



*Original Design Manufacturers & Contract Equipment Manufacturers
Source: Electronics Trends Publications, 2003

migration has been accompanied by a parallel shift in component production. For instance, Asia's share of semiconductor revenue was 35 per cent in 2001 and is expected to reach 48 per cent by 2005 (Exhibit 4.5).

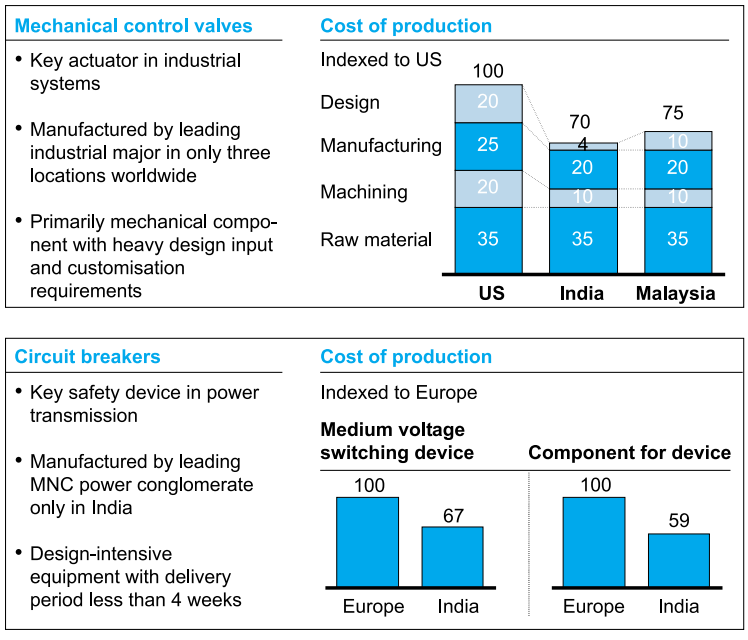
- **Ever-increasing outsourcing of manufacturing and design to ODMs and CEMs:** Continuing cost pressures and focused strategies have led to the outsourcing of more and more elements of manufacturing to ODMs and CEMs (Exhibit 4.6), who are adding to their capacity by outsourcing a majority of their new manufacturing to Asia. The outsourcing of design is becoming especially important. ODMs dominate select segments such as notebook computers and mobile phones since they enable Original Equipment Manufacturers (OEMs) to fill product portfolio gaps quickly and cheaply, and focus on highest value-added activities along the value chain, i.e., marketing and brand building. CEMs have also begun to provide higher

value-added services, such as product development as opposed to just cost savings in printed circuit boards (PCBs) and final system assembly. For example, Flextronics (a leading CEM) is investing in high-end design teams that design products from scratch as was done recently for a phone from Kyocera of Japan.

INDIA SHOULD ASPIRE TO CAPTURE US$15-18 BILLION IN ELECTRICAL AND ELECTRONICS EXPORTS BY 2015

Despite its modest starting position, India can rapidly capitalise on the advantages it has in this sector. In addition to low-cost labour, these advantages include highly developed engineering capabilities and a non-electronics ecosystem in India's

Exhibit 4.7
ENGINEERING ABILITY IS A KEY ADVANTAGE FOR INDIA



Source: Interviews

mechanical and electro-mechanical manufacturing base.

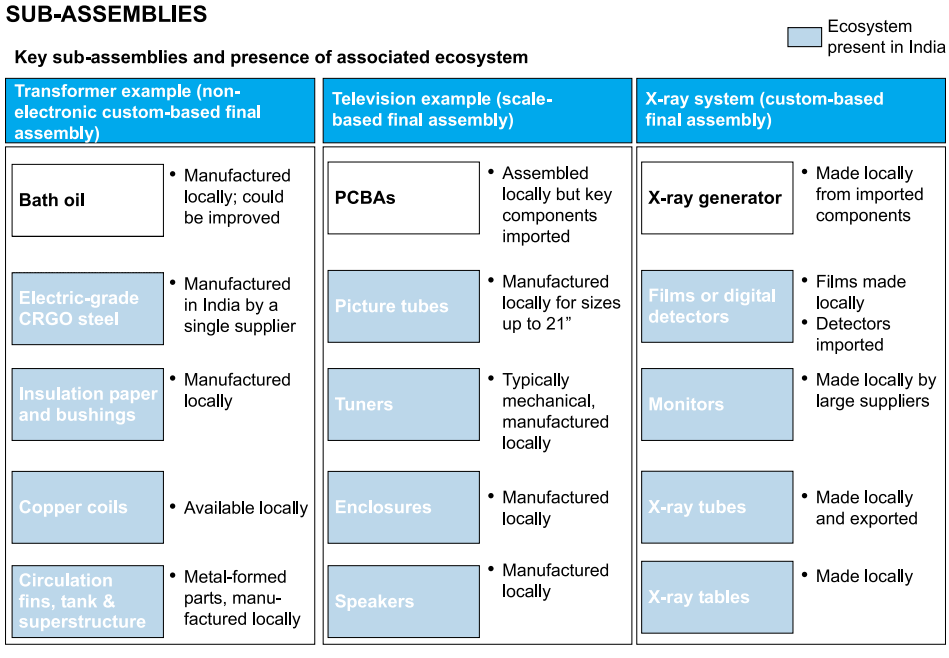
- **Engineering capabilities:** Leading Fortune 100 players have confirmed that their Indian operations, though small, are already reaching, if not exceeding, global cost and productivity benchmarks. Many products have been found to be 30 to 40 per cent cheaper in India than in the US or Europe (Exhibit 4.7). India's capabilities in the dimensions described below make this possible.
  - Process engineering: To illustrate, Indian process engineering skills have enabled higher asset utilisation at a German electrical conglomerate whose India plant maintains an uptime for capital machines that is 40 per cent higher than that of its German counterparts.
  - Product engineering: Product engineering abilities have led to strong

competitiveness in refurbishment. For example, Siemens (India) has redesigned medium- and high-voltage switches in power equipment for India. Similarly, Tata Honeywell has developed a temperature controller custom-built for Indian mall sizes and climate.

- Quality manufacturing: Another engineering strength in India is the ability to perform high-quality manufacturing. For instance, the specialised skills of operators in India enable the production of x-ray tubes (which are fairly complex sub-assemblies) by GE-BEL.
- Capital engineering: India has high capital engineering skills. A highly evolved tooling and machining industry has enabled indigenisation of capital equipment. Plant set-up costs are typically 20 per cent lower than those in other LCCs (some facilities are up to 35 per cent cheaper).

- **Ecosystem in non-electronic products:** Given the many elements in the manufacture and sale of an electrical or electronic product, a complete ecosystem is critical to competitiveness. While India lacks an ecosystem in electronics because of the absence of semiconductor fabrication and component manufacturers, it does have an ecosystem for non-electronic products. Such an ecosystem is visible across multiple examples of sub and final assemblies such as transformers, televisions and x-ray equipment

Exhibit 4.8
ECOSYSTEM IN INDIA IS PRESENT PRIMARILY FOR NON-ELECTRONIC SUB-ASSEMBLIES



Source: Interviews; McKinsey analysis

(Exhibit 4.8). The presence of a relevant ecosystem (i.e., availability of key raw material such as polycarbonate plastics, aluminium and acrylic) and an evolved tooling and machining industry allowed Indian firm Moser Baer to grow from Rs 100 million (approximately US$22 million) to over Rs 1.5

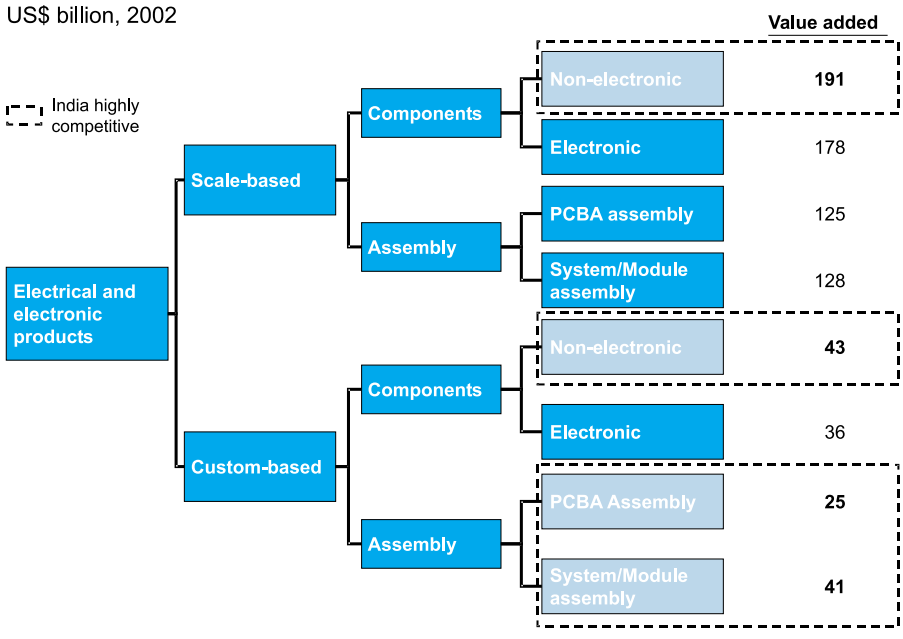
billion (approximately US$335 million) in just six years (1998 to 2004). Moser Baer is now the third-largest player in the world in optical disc manufacture with a global market share of 11 per cent. It manufactures for 10 out of the 12 leading OEMs, and launched its own brand in 2003.

Based on the volume of production, the manufacture of electrical and electronic products can be classified as either custom-based or scale-based. Custom-based manufacturing involves making low-volume products (thousands of units per annum) with a large amount of customisation as is typically required for industrial and medical electronics and power transmission equipment. Scale-based manufacturing involves making high-volume products (millions of units per annum) such as typically required for computer hardware, consumer electronics and domestic appliances.

India's engineering capabilities and ecosystems make it competitive in two distinct areas (Exhibit 4.9):

- **Custom-based manufacturing:** India has an existing advantage in custom-based manufacturing and assembly (e.g., transformers and industrial

Exhibit 4.9
INDIA CAN BE COMPETITIVE IN CUSTOM-BASED MANUFACTURING AND NON-ELECTRONIC PARTS
US$ billion, 2002



Source: Electronics Trends Publications, 2003; McKinsey analysis

equipment actuators). This is because of its design and engineering skills, and the availability of low-cost skilled labour. Besides, most custom-based products have a higher proportion of non-electronic components.

- **Non-electronic parts:** Currently, India's main advantage is in non-electronic products and in sub-assemblies because of the presence of an ecosystem. This could be either in custom-based or scale-based segments.

Fortunately, the segments where India is currently competitive are large (40 per cent

of total value added and worth approximately US$300 billion). LCC exports in these segments, currently US$115 billion, are projected to reach US$205 billion by 2015. Getting a 17-20 per cent share of the incremental exports will be sufficient for India to realise its aspirations.

India's engineering advantage and existing ecosystems are important inducements to make MNCs consider India a viable offshore manufacturing and sourcing hub. However, three issues must be addressed before the manufacture of electrical and electronic products can take off: low domestic demand, lack of geographical clusters and unreliable transportation infrastructure.

India's domestic market lags behind that of China in many sectors, constrained mainly by the higher retail prices that are a result of high indirect taxes and import duties. While efforts have been made to create manufacturing clusters for electrical and electronic products, severe limitations in the current SEZ policy (e.g., lack of access to the DTA) have resulted in limited success, with the result that companies stay geographically dispersed even where the ecosystem exists. As already described in a previous chapter, the capacity and turnaround times at ports are a key barrier since

Exhibit 4.10
INDIAN PLAYERS SHOULD ADOPT THE 'DESIGN AND MANUFACTURE' BUSINESS MODEL

Recommended for Indian players

Potential business models

	Manufacture	Design and manufacture	Design, manufacture and brand
Value proposition	• Lowest-cost producer for existing design	• Ability to convert specification into design or help design better products for OEM	• Deep understanding of end-customer needs; ability to design tailored products and manufacture at required cost on consistent basis
Key Success Factors	• Low-cost operations • Ability to manage OEM relationships • World-class manufacturing practices • High quality standards	• Design capabilities • Ability to manage OEM relationships • Lean and efficient supply chain management • Ability to manage global organisation	• Research and design skills • Brand management/ marketing skills • High customer responsiveness • Ability to manage global organisation • Short time-to-market
Examples	• Siemens and ABB source power transmission and distribution components from India	• Celetronix designs and manufactures power assemblies for leading computer hardware OEMs	• Moser Baer (world's third-largest and lowest-cost optical disc manufacturer) has recently started to promote its own brand globally

Source: McKinsey analysis

they reduce competitiveness. While these issues may be difficult to resolve, it is possible to do so through concerted company and government action.

INDIAN COMPANIES SHOULD FOCUS ON BOTH DESIGN AND MANUFACTURING

Companies such as Moser Baer, Celetronix and Samtel have proved that there is sufficient opportunity for Indian companies within custom-based and non-electronic (both scale- and custom-based) segments. Indian companies have three options to compete within these segments: (1) manufacture; (2) design and

manufacture; and (3) design, manufacture and brand (Exhibit 4.10). They could do all three but the difficulty in doing so increases progressively with the move from manufacturing towards branding.

Focusing on design and manufacture is a potentially attractive option for Indian companies for several reasons:

- Design capabilities are typically a bigger hook in attracting MNCs. For them, additional revenue from re-engineering a product to provide it at a lower cost or from designing a 'locally adapted' product is more attractive than shutting down an existing plant and shifting to India to achieve cost savings. India is already known for its engineering and design capabilities as proved by the multiple R&D bases MNCs have set up here. In addition, the incremental cost of setting up design shops is much less than that of setting up manufacturing plants, and the return on investment is typically much higher in the former.
- As described earlier, there is a global trend towards outsourcing of design. This provides Indian companies with a value proposition that goes well beyond low cost. Indian companies are likely to achieve greater success by adopting this approach, rather than simply through manufacturing.
- The 'design and manufacture' approach is also less risky than the 'design, manufacture and brand' approach. The latter requires significant investments and customer understanding, has high risk levels and could put Indian companies in direct competition with their potential customers.

Quanta is an example of growth through focus on design and manufacturing. Starting with the production of laptop computers in 1998, Quanta focused on design and cost-efficiency, and started commercial production of the first notebook computer and mass production of the ultra-slim notebook computer between 1990 and 1995. At this time it was producing only small pilot products for HP and Compaq (now acquired by HP). But from 1996 onwards, Quanta gained OEMs Dell, HP and Compaq as clients and formed Quanta Storage, Quanta Display and Quanta Network Systems to better manage work in different product segments. Quanta's model is to let clients manage the brand and focus on understanding client customer requirements, designing multiple models for approval, and then quickly ramping up production and managing the supply chain once approval is obtained. The firm's revenues reached US$4.3 billion in 2003 from only US$1 billion in 1998.

To succeed with the design and manufacture model, Indian companies will need to take the following actions:

- **Adopt an aggressive mindset:** They need to adopt an aggressive mindset towards establishing cost- or capabilities-based leadership, and develop a near-term strategy of quickly moving into design.
- **Select products judiciously:** Companies should start by selecting the right product segments based on access to technology, attractiveness and India's inherent strengths.

- **Lock in customers:** This can be done by taking over small companies, acquiring and developing a small R&D house and by entering into a joint venture with an MNC.
- **Build engineering capabilities (especially for custom-based segments):** This can be done by developing variants of product offerings, building expertise in higher-value and more complex components and by entering related product segments.
- **Continue to strive for operational excellence:** This will require keeping pace with changing technologies and regulations, and driving continuous improvement on all measures of productivity such as labour, capital and raw material.

Leading Indian players have begun to take some of these important steps but they still have a long way to go. Successful Indian companies in the sector such as Moser Baer, Celetronix and Samtel are all examples of companies with a growth-oriented, aggressive mindset.

Building sufficient scale and investing in anticipation of demand has helped Samtel retain a leadership position in the domestic as well as export markets. Moser Baer, besides expanding capacity, is continuously innovating new designs. It has made acquisitions outside India for market as well as technology access.

Celetronix designs and manufactures power assemblies (described as non-electronic custom-based) for leading OEMs. Its power assembly business has been built on design capabilities, and has attracted multiple manufacturing orders.

MNCs SHOULD SOURCE CUSTOM-BASED AND NON-ELECTRONIC PARTS FROM INDIA

MNCs should focus their India manufacturing and sourcing plans on custom-based parts and non-electronic components and sub-assemblies. Several MNCs are already manufacturing and sourcing successfully in India.

- ABB has decided to develop India as a low-cost sourcing and manufacturing hub for several products, including circuit breakers and magnetic actuators (custom-based, primarily non-electronic products). For example, ABB's India facility was the first to manufacture certain outdoor circuit breakers – all with local Indian talent. Not only was ABB able to achieve over 50 per cent cost savings, it managed to reduce the delivery period to two weeks from four, thus gaining a compelling advantage.
- Tata Honeywell has been able to redesign multiple automation products (custom-based) for India and sell them in similar markets worldwide. Specific examples include automation controllers for air-conditioning of cell sites, which were customised for the Indian climate. The change reduced costs by 20 per cent and created latent demand in the domestic as well as select international markets.
- Tecumseh, the world's leading manufacturer of compressors, manufactures

and exports compressors out of India. It exported US$20 million worth of compressors in 2003, and is the third-largest branded player in the domestic market. The Indian manufacturing facilities of Tecumseh in Delhi (1.5 million units per year) and Hyderabad (600,000 units per year) are the only ones in Asia.

- Siemens sources many power transmission and distribution equipment components (mainly castings and forgings) from India. These have typically resulted in 25-30 per cent savings over European and US costs.

Many more such stories are likely to unfold and India will offer MNCs a lot more than has currently been explored.

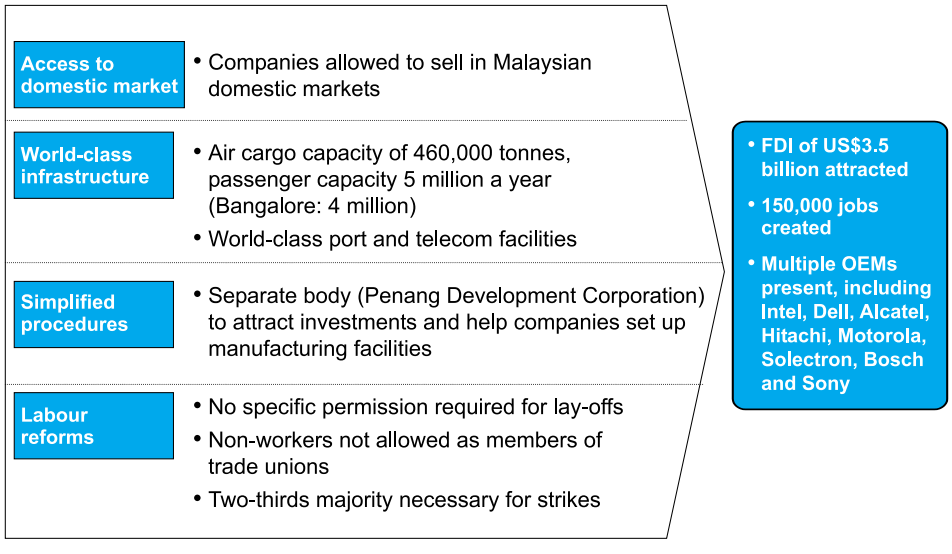
THE GOVERNMENT SHOULD STIMULATE DOMESTIC DEMAND AND DRIVE CLUSTER CREATION

The government will need to play an important role in ensuring that India can become globally competitive in the selected segments. The four imperatives mentioned in Chapter 6 (boosting domestic demand, driving improvements in infrastructure, encouraging the creation of manufacturing clusters, and accelerating labour reforms and skill development) are all greatly needed in this sector.

As stated earlier, boosting domestic demand and encouraging cluster creation should be the government's main priorities for this sector.

- **Boosting domestic demand:** Strong domestic demand is a key requirement for attracting MNCs. However, demand in India for electrical and electronic products is lower than it is in China. This is largely because of the higher retail prices in India driven by higher import duties and taxes. For example, the gross import duty (inclusive of customs duty, countervailing duty and

Exhibit 4.11
PENANG IN MALAYSIA IS A ROLE MODEL FOR GOVERNMENTS PURSUING CLUSTER DEVELOPMENT



Source: Press searches; interviews

special additional duty) on television components such as picture tubes, tuners and PCBAs is 45 per cent.

Latent domestic demand is being realised in products where reforms have led to aggressive competition and price cuts. For example, in mobile phones, the total cost of ownership declined by more than 27 per cent between 2002 and 2004. As a result, the number of subscribers being added per month increased by 64 per cent from 1.1 million to 1.8 million. India already has the largest mobile subscriber base after China, of nearly 35 million. The Indian handset market is set to grow from US$1.4 billion in 2003 to US$3.4 billion in 2004, with over 30 million handsets being sold in one year alone.

- **Driving creation of electrical and electronic manufacturing clusters:** As pointed out earlier, an ecosystem for custom-based and non-electronic parts exists in India. However, India lacks strong geographical clusters which enable co-location of various players to minimise lead times. In contrast, other countries have been very aggressive in creating geographical clusters. For example, the Malaysian government actively promoted the creation of a cluster in Penang by setting up world-class infrastructure (air cargo capacity of 460,000 tonnes and passenger capacity of 5 million people, compared to only 4 million passengers in Bangalore airport). Malaysia managed to attract over US$3 billion in FDI through blue-chip OEMs such as Intel, Dell, Motorola, Sony and Bosch (Exhibit 4.11). The key to promoting geographical cluster creation in India is to reform the SEZ policy. This would include providing access to the DTA, providing world-class infrastructure, simplifying administrative procedures and exercising flexibility in using contract labour.

Finally, the obsessive focus on low inventories in the electrical and electronic product manufacturing industry makes it very time-sensitive. India's inadequate port and airport infrastructure, coupled with poor customs procedures, cannot support such a requirement. The improvements required have been discussed in Chapter 6.

* * *

From almost a standing start, India has had an opportunity to rapidly grow exports in electrical and electronic products. Whether the opportunity will be captured will depend on how well MNC and Indian firms build on India's competitive advantages and how effectively the government stimulates domestic demand. ■

1 Excluding defense and automotive electronics, which amounts to US$75 billion

2 The presence of high-quality suppliers and relevant technology partners with established relationships that are mutually beneficial and self-sustaining

3 The gross percentage impact of Customs duty, Countervailing Duty and Special Additional Duty,

5. Specialty Chemicals

Offshoring of specialty chemicals from LCCs is currently low but is poised to take off. India has the potential to emerge as one of the top two exporters among LCCs. Opportunities in specialty chemicals offshore manufacturing can be summarised as follows:

- Offshore manufacturing and sourcing of specialty chemicals are currently quite low (10-15 per cent) but are expected to increase to 40-45 per cent because of the pressure of profitability on manufacturers and a shift of end-user demand to LCCs.
- Given its capabilities in chemistry, engineering and cost innovation, India has the potential to become the second-largest exporter among LCCs and increase exports from US$2 billion in 2003 to US$12-US$15 billion by 2015.
- To achieve this aspiration, Indian companies will need to build on India's strengths in engineering and chemistry by adopting one of two business models: low-cost producer or application developer.
- MNCs too have a unique window of opportunity in which to establish sourcing, manufacturing and research capabilities in India.
- The government should focus on promoting clusters and reducing feedstock import duties.

The rest of this chapter discusses these findings in detail.

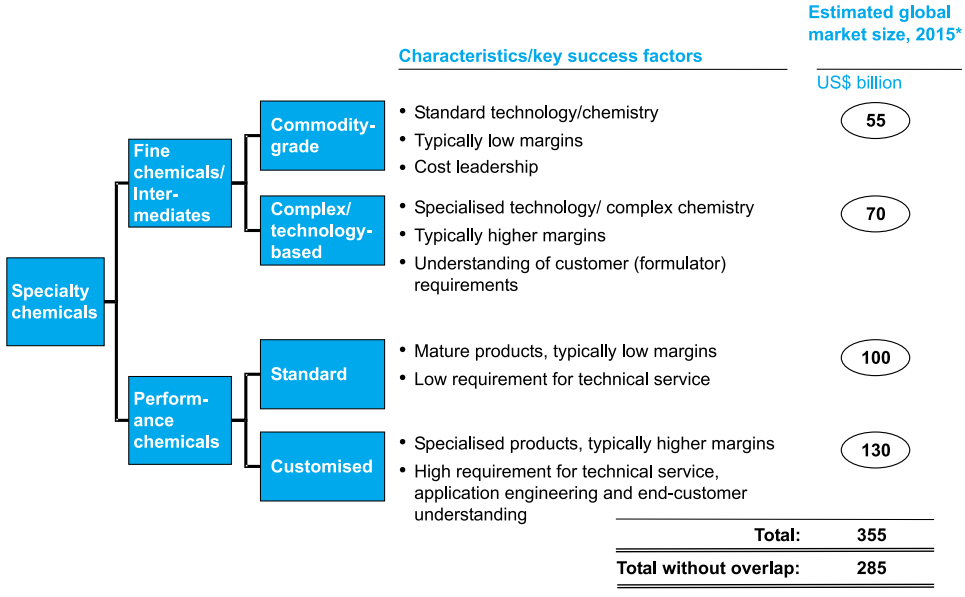
SPECIALTY CHEMICALS OFFSHORING IS CURRENTLY LOW BUT POISED TO TAKE OFF

The market for specialty chemicals consists of two segments: performance chemicals (finished products) and fine chemicals/intermediates. These segments can be further split into commodity grade and complex fine chemicals, and standard and customised performance chemicals, based on the production technology and their

maturity. Globally, specialty chemicals are estimated to be a US$215 billion market, and is expected to grow to US$285 billion by 2015 (Exhibit 5.1). The total addressable market that could be offshored to LCCs could amount to US$110-US$120 billion by 2015.

So far, offshore manufacturing and sourcing of specialty chemicals has not taken off. In the US, for example, less than 20 per cent of consumption across most

Exhibit 5.1
SPECIALTY CHEMICALS CAN BE SEGMENTED INTO PERFORMANCE CHEMICALS AND FINE CHEMICALS



*Includes overlap of ~US$70 billion of fine chemicals/intermediates that go into manufacture of performance chemicals
Source: SRI; interviews; McKinsey analysis

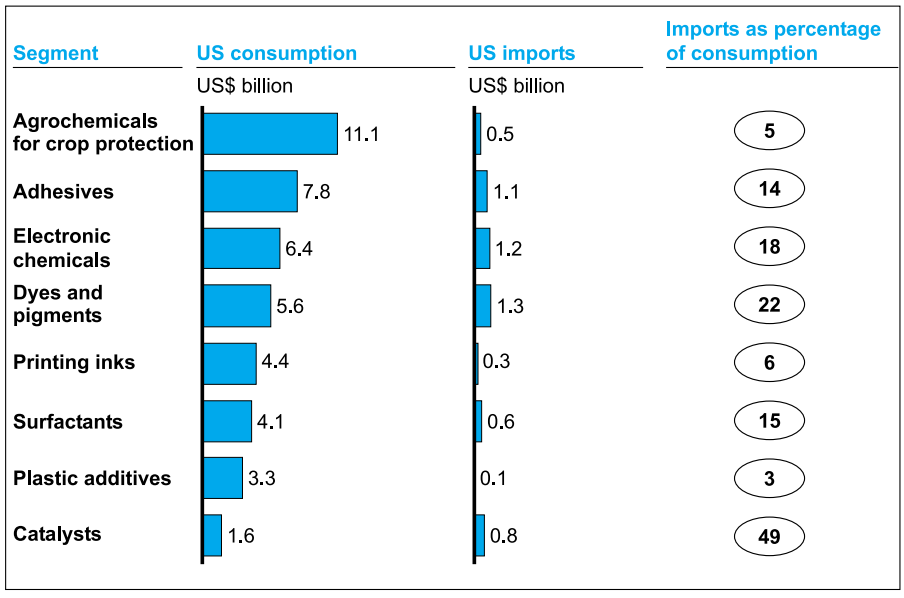
segments is met through imports (Exhibit 5.2). Moreover, LCCs have less than a 20 per cent share of world trade (Exhibit 5.3).

However, four trends are likely to change things in favour of offshore manufacturing and sourcing in LCCs over the next few years. These are:

- **Profitability pressure:** Manufacturers in developed markets are under considerable financial pressure, with profitability hitting an unprecedented low (Exhibit 5.4). Fine-chemical makers are particularly under pressure because of overcapacity, fragmentation and a lack of pricing control. To illustrate, the maturing of products and the expiry of product patents has led to a decline in price of 25-30 per cent in some active ingredients (e.g., Bifenthrin and Cypermethrin) used in pesticides.
- **Maturing supplier base in LCCs:** The emergence of low-cost producers in China and India has helped create a supply base that is becoming increasingly sophisticated in meeting importers' needs. For example, in organic pigments, the number of plants in China has almost tripled and the number in India has almost doubled over the last ten years. Correspondingly, China's pigment exports to the US grew nine times between 1993 and 2002 and India's eight times over the same period.

- **Shifting end-user demand:** A large number of specialty chemical-consuming industries are shifting to Asia. Major end-user markets such as pharmaceuticals, automotives, food and construction are expected to grow by

Exhibit 5.2
OFFSHORING IS CURRENTLY LOW IN MOST SPECIALTY CHEMICAL SEGMENTS (US EXAMPLE)
2001



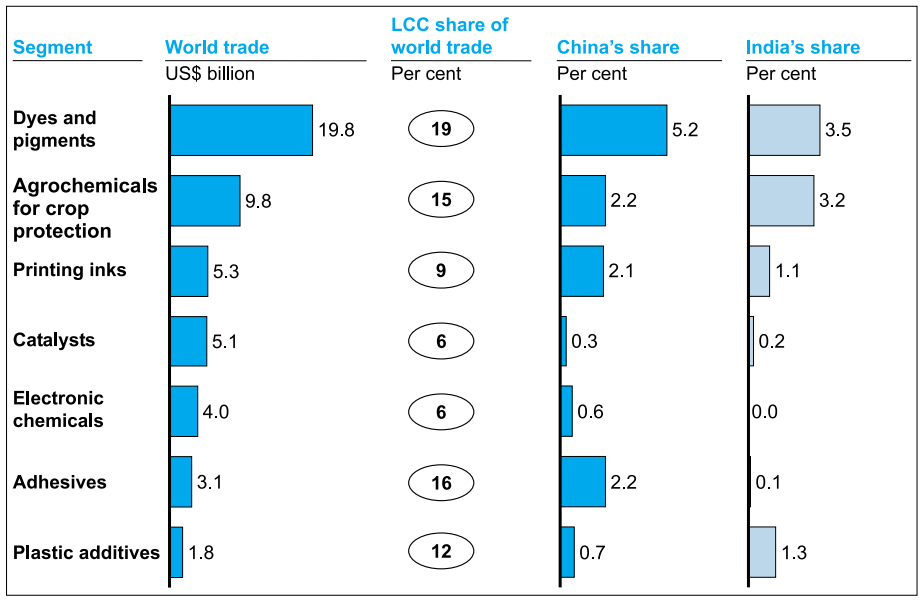
Source: American Chemistry Council; McKinsey analysis

5-10 per cent till 2010 in Asia, significantly faster than markets in the US and Western Europe (Exhibit 5.5).

- **Regulatory imperatives (in select segments):** Patents for a large number of

Exhibit 5.3
LCCs HAVE A LOW SHARE IN WORLD TRADE
2001

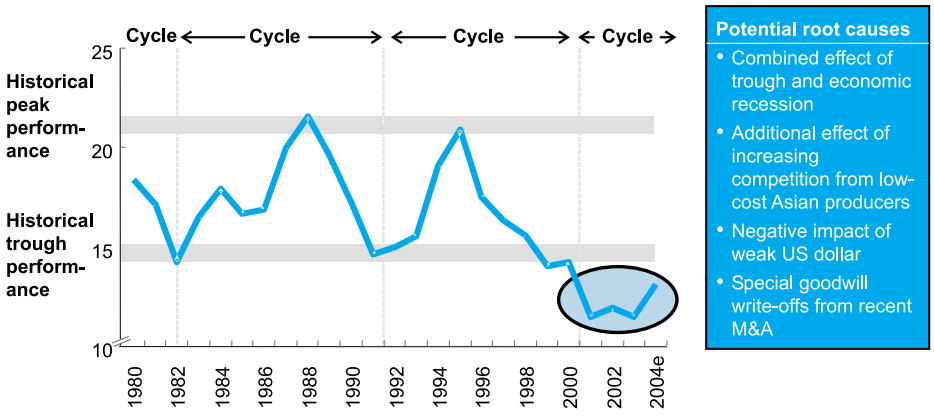
EXAMPLES



Source: World Trades Database; Chemixil; McKinsey analysis

drugs have expired in the US, and agro-chemical producers are likely to discontinue these products rather than re-register them. This will create a very significant opportunity for Asia in the generics market, especially since prices

Exhibit 5.4
GLOBAL CHEMICAL INDUSTRY PROFITABILITY HAS TOUCHED AN UNPRECEDENTED LOW
Median ROIC before tax of chemical industry,



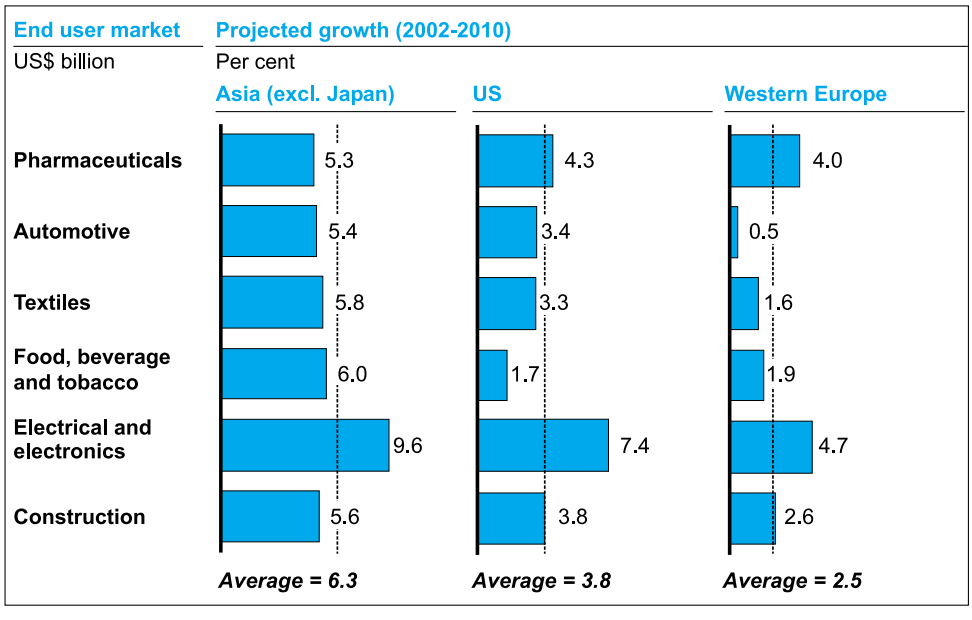
Source: McKinsey proprietary chemicals long-term performance database; BloombergI/B/E/S consensus analysts estimates

of generic drugs will be lower and will therefore encourage manufacturers to source from LCCs.

Consequently, MNC interest in LCCs is increasing, as is evident from new

Exhibit 5.5
ASIA IS LIKELY TO WITNESS FASTER GROWTH IN MAJOR END-USE INDUSTRIES

EXAMPLES



Source: Global insights; McKinsey analysis

investment and global sourcing announcements. Specialty chemicals firm Rohm and Haas has invested US$300 million in China and now has over 1,000 employees in 14 manufacturing locations there. The firm has also invested US$20 million in a manufacturing plant for adhesives, sealants and coatings in Taloja, India, which is a sourcing hub for parts of Asia. Germany's third-largest chemicals firm, Degussa, has 12 manufacturing companies in China and plans to invest an additional US$250-US$300 million in China over the next two years. It has manufacturing plants for fumed silica and construction chemicals in India as well. Other companies that have announced global sourcing plans include Bayer, Sun Chemicals, BASF, DuPont and Clariant.

INDIA HAS THE POTENTIAL TO EMERGE AS A TOP TWO EXPORTER AMONG LCCs

India has the opportunity to become the second-largest exporter among LCCs and grow exports from US$2 billion in 2003 to US$12-US$15 billion by 2015 (aspirational growth of 16-19 per cent compared to historical growth of 9 per cent). Of this, approximately US$5-US$6 billion could come from the export of APIs.

There are early signs that India can be an attractive supply base, especially in segments with high potential for cost reduction such as commodity-grade fine chemicals (surfactants, cosmetic chemicals, imaging chemicals) followed by complex fine chemicals (e.g., most APIs, technical-grade agrochemicals, fluorochemicals) and standard performance chemicals (e.g., medium-grade printing inks, vat and disperse dyes, plastic additives). However, a straightforward factor-cost advantage or feedstock availability alone will not endow competitiveness. This also calls for effective application of India's significant capability in engineering and chemistry to reduce process and capital costs. In addition, capturing this opportunity will require segment-specific capabilities such as flexible production, regulatory knowledge and customer understanding.

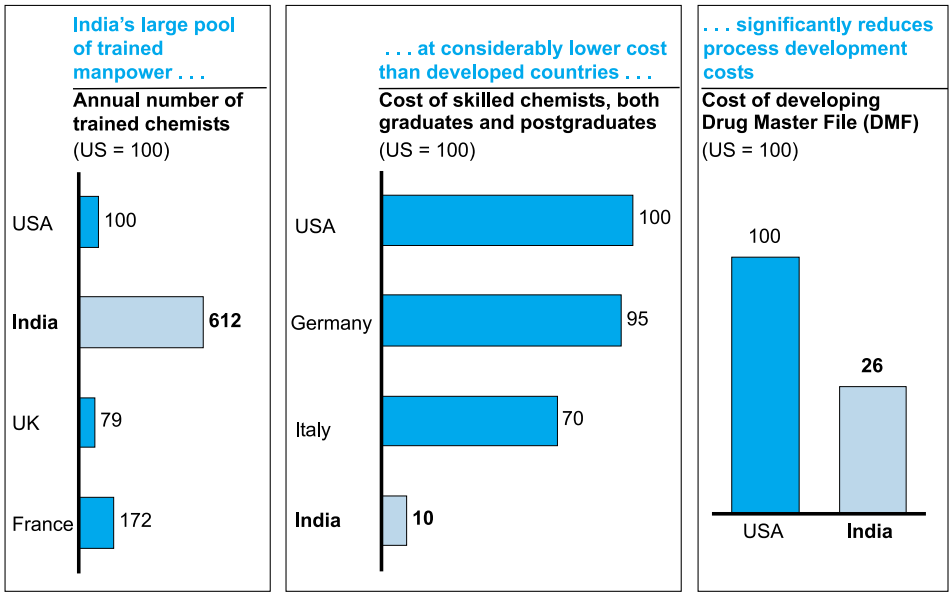
India's strengths in specialty chemicals are as follows:

- **Large pool of low-cost manpower:** A vast pool of low-cost, unskilled and skilled labour, critical in the production of labour-intensive, batch-processed chemicals is India's big advantage. It is extended by the availability of a large talent pool of low-cost engineers and chemists (Exhibit 5.6). Given the right manufacturing systems, this talent pool can translate into substantial cost savings. As the India head of a specialty chemicals MNC put it, 'We achieve European levels of labour productivity at our Indian plant, but at 20 per cent of the labour cost.'
- **Engineering innovation to achieve lower processing and capital costs:** A small but growing number of companies in India have begun to apply a high degree of innovation, primarily in process and capital engineering, to create cost advantages. As a result, select companies have begun to excel at producing and handling complex products at significantly lower costs than their overseas competitors, while maintaining the quality levels required by global customers. While most visible in labour-intensive or batch-produced intermediates – where India's competitiveness comes from the more

straightforward labour cost arbitrage – the cost differences are now also becoming visible in continuous or semi-batch processes.

Several examples of these innovations exist. A few are described below:

Exhibit 5.6
INDIA OFFERS A LARGE, LOW-COST POOL OF TRAINED CHEMISTS



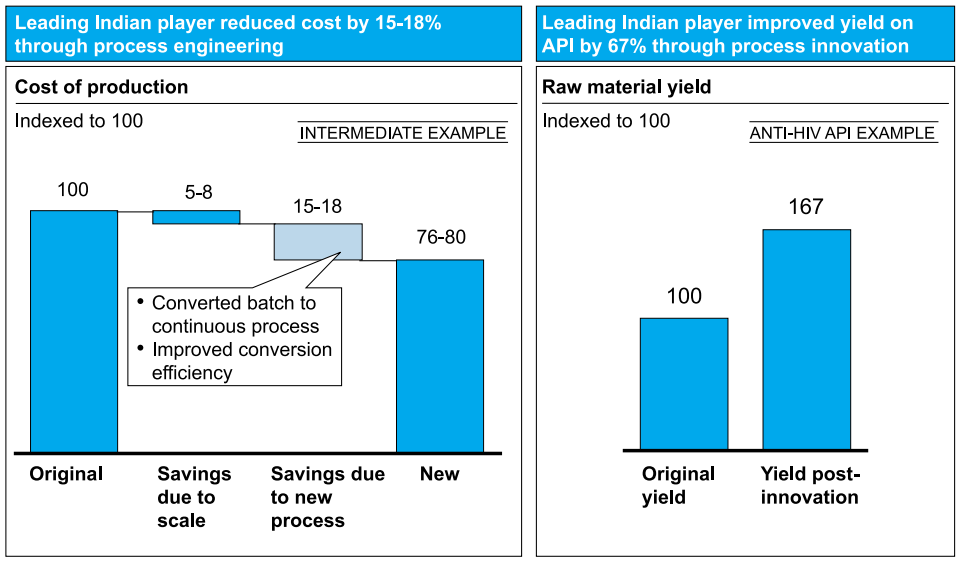
Source: The Division of Science Resources Statistics (SRS) of the National Science Foundation, US Institute of Applied Manpower Research, India; Eurostat; McKinsey analysis

- An Indian company was able to reduce the cost of production of an intermediate by 15-18 per cent by developing technology that enabled the conversion of batch operations to continuous processing. The conversion also scaled up the output from 5,000 tonnes per annum (TPA) to 10,000 TPA and increased product yield in the process (Exhibit 5.7).
- Several companies have been able to lower the cost of setting up a plant in India by 30-40 per cent by using low-cost, locally-fabricated equipment (Exhibit 5.8), while maintaining stringent environmental and safety standards. For instance, one player uses hoppers fabricated manually instead of having them precision-rolled using high-cost rolling equipment.
- An Indian company produces an intermediate used in making technical-grade agrochemicals at a cost 15-20 per cent lower than that in the US, even though labour is only 5 per cent of the cost (Exhibit 5.9). The savings come from process re-engineering, which lowers raw material costs through higher yields, cuts utility costs by lowering steam consumption; capital re-engineering, which reduced investment to 60-70 per cent of the US cost; as well as backward integration into a key raw material.
- An MNC in India produces an active ingredient used as an additive for petroleum, plastic and leather chemicals at nearly half the cost of that in the US, since labour is over 40 per cent of the product cost and the company's unit cost of labour is only 14 per cent of what it would be in the US

(Exhibit 5.10).

- An Indian producer of performance chemicals was able to reduce changeover

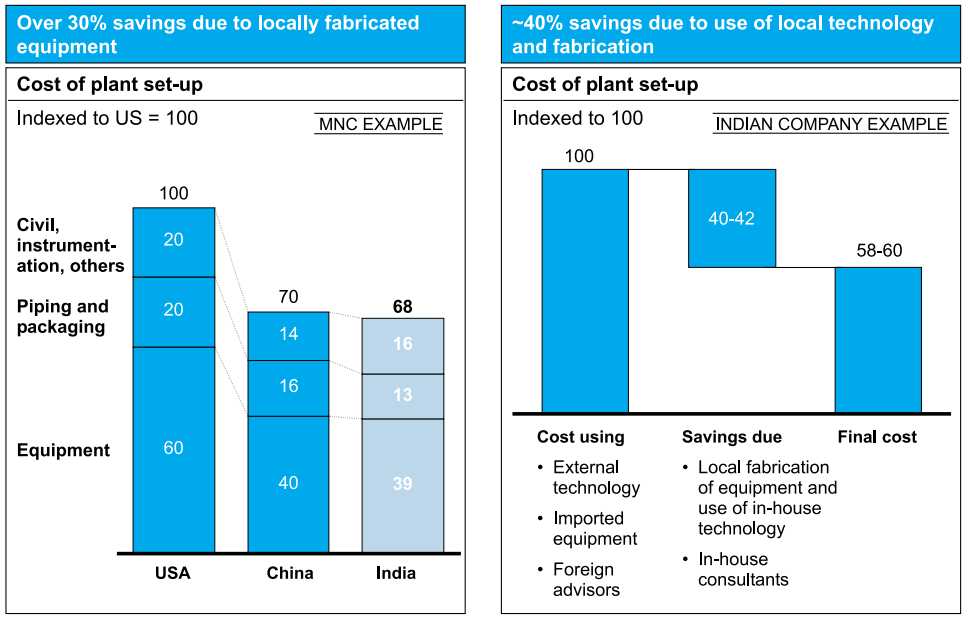
Exhibit 5.7
INDIAN COMPANIES LEVERAGE ENGINEERING CAPABILITIES FOR PROCESS INNOVATION



Source: Interviews; McKinsey analysis

time for a product from the typical eight to nine days required internationally, to two to three days, through innovations in plant design, giving them lower inventory costs and greater flexibility. The producer also gained a cost advantage of 30-40 per cent through complete backward

Exhibit 5.8
PLANT SET-UP COSTS ARE SIGNIFICANTLY LOWER IN INDIA



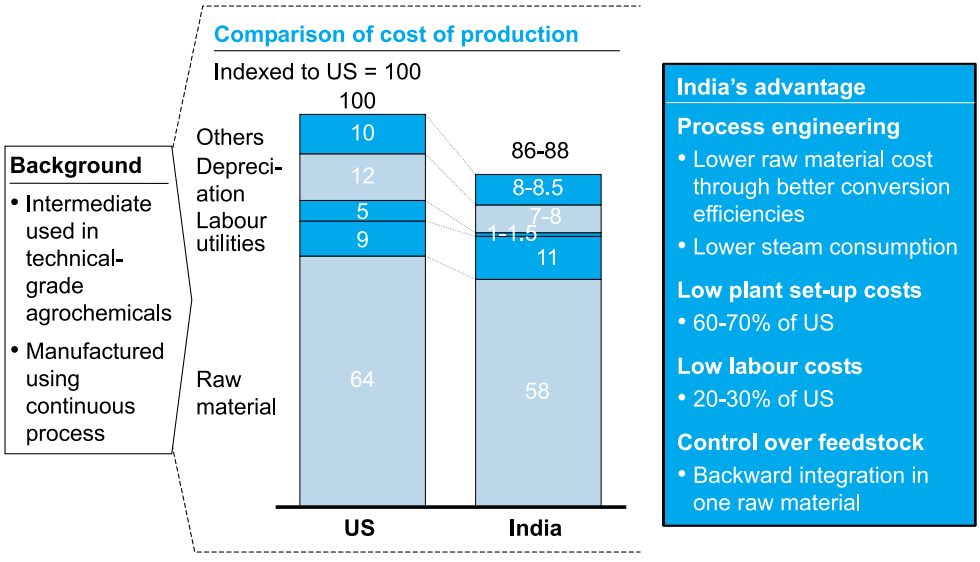
Source: Interviews; McKinsey analysis

integration into all raw materials.

- Other advantages include growing domestic demand in key segments such as customised performance chemicals (where demand is critical for

Exhibit 5.9
INDIAN COMPANIES LOWER PRODUCTION COSTS THROUGH ENGINEERING CAPABILITY

AGROCHEMICAL INTERMEDIATE EXAMPLE

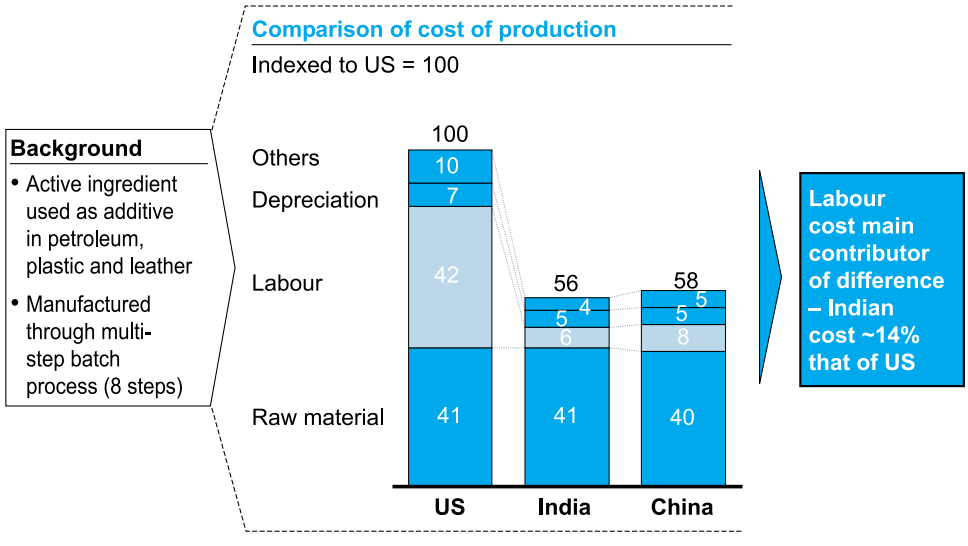


Source: Interviews; McKinsey analysis

competitiveness) and developing a greater understanding of regulation. In the past, demand for Indian textiles led to the establishment of the dye and dye intermediates industry. The story is being repeated today with advanced

Exhibit 5.10
INDIA IS COMPETITIVE IN LABOUR-INTENSIVE BATCH-PRODUCED CHEMICALS

PETROLEUM ADDITIVE EXAMPLE



Source: Interviews; McKinsey analysis

pharmaceutical intermediates growing as a result of production growth. Regulation is important for APIs and agro-chemicals, and is a strength for India due to good chemists who have honed their skills in an era of process patents.

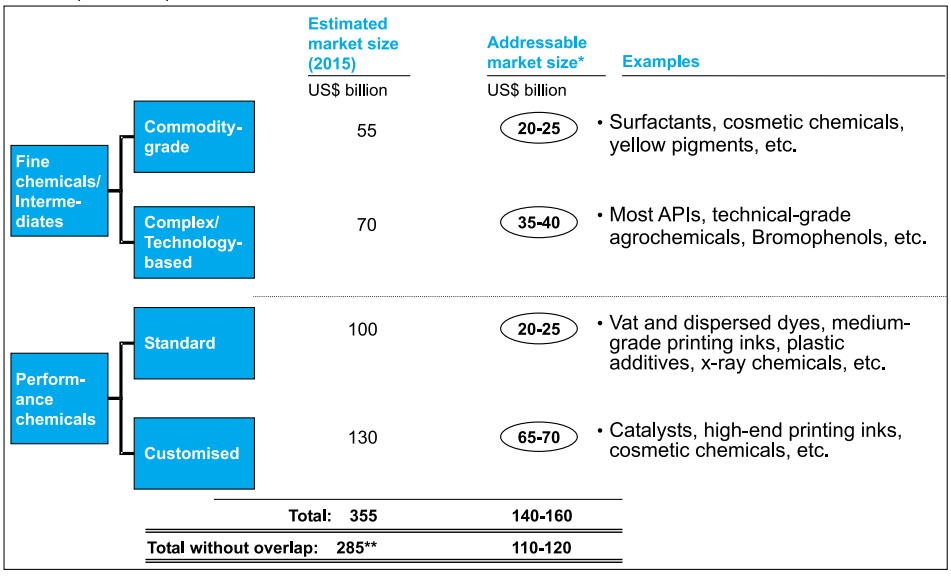
Using these inherent strengths and building capabilities for innovation, several companies have grown exports to a respectable level, established themselves on the world stage and are set to accelerate further. These include Jubilant (US$50 million), United Phosphorus (US$70 million), Micro Inks (US$55 million) and Atul Products (US$60 million).

Based on these strengths, the total addressable market for India could be US$110–US$120 billion by 2015 (Exhibit 5.11). This is based on the ability of the Indian or LCC workforce to add value either through innovations that reduce cost (cheaper labour, process innovations, capital re-engineering) or by acquiring a better grasp of technology or chemistry, or by building better customer understanding.

INDIAN COMPANIES CAN BECOME LOW-COST PRODUCERS OR APPLICATION DEVELOPERS

Companies in India should target opportunities in three groups of specialty

Exhibit 5.11
TOTAL ADDRESSABLE SPECIALTY CHEMICALS MARKET BY 2015 COULD BE US$110-US$120 BILLION ESTIMATES



Source: *Excludes overlap of approximately US$70 million of intermediates that go into manufacture and performance chemicals
SRI; interviews; McKinsey analysis

chemicals, which encompass the four segments described earlier. Successively higher levels of capabilities are required to succeed in each of these groups.

- **Commodity-grade fine chemicals (e.g., intermediates for imaging chemicals, surfactants, pigments):** The key requirement to succeed in this segment is a significant manufacturing cost advantage. India's low factor costs and engineering ability should help it compete in this segment.

- **Complex fine chemicals and standard performance chemicals (e.g., most APIs and agrochemicals, fluorochemicals, plastic additives like antioxidants, vat and disperse dyes):** The key capabilities required to succeed in these segments are either mastery of more complex chemistry and technologies or well-developed customer relationships. This, however, also makes them more difficult to compete in. India's talent pool of chemists, their understanding of regulation and technology and the growing end-user demand in select segments should facilitate competitiveness.
- **Customised performance chemicals (e.g., high-end printing inks and adhesives, catalysts, cosmetic chemicals):** This segment potentially has the highest value but it is also the most difficult to compete in since it requires the development of products and applications based on customer understanding. Only a few Indian companies will be able to capture this opportunity, and that too only through a combination of significant cost reduction at the back-end and good customer understanding at the front-end in order to provide customers with comparable service and quality at a lower price.

To succeed in any of these segments, Indian companies should adopt one of two business models: low-cost producer or application developer.

Low-cost producers

An ability to manufacture at 20-30 per cent lower costs while adhering to exact specifications is what sets low-cost producers apart. Success requires scale, process and capital engineering skills, cheap or privileged access to feedstock, chemical knowledge/access to technology and regulatory understanding. In addition, a continued preoccupation with continuous cost reduction and quality is essential.

It takes organisations a great deal of time and effort to master the innovations that can help reduce costs – typically three to seven years. Teams of chemists and engineers must be set up who then need time to develop the process innovations or identify the kind of capital re-engineering required. Several of these innovations and developments come through experimenting in and building a base in the domestic market. Furthermore, this approach is not easily scalable – making a new product requires the same time and effort to achieve cost reduction.

BASF is a good example of how a company can successfully build a low-cost position in bulk vitamins. It built scale by investing in world-scale plants in Korea and Germany, and acquiring a Japanese bulk vitamin business. A joint venture with North East Pharma in China has enabled the low-cost production of vitamins A, B, D and E with the capacity to produce around 50 per cent of world demand. Operational innovations such as integration of plants within a manufacturing facility and linkages between them through feedstock generation and energy transfers have enabled savings of US$600 million in a single site in Germany.

Although this model requires significant effort, it is perhaps the most relevant one for Indian companies, who can adopt it by leveraging India's engineering

SUCCEEDING AS A LOW-COST PRODUCER

Jubilant has built a low-cost position to become the second-largest producer of pyridines in the world. Jubilant entered the market in 1989, primarily focusing on serving the domestic market. Since 1995, it has gradually built up its capacity and, after 1999, focused on the export market.

Jubilant has achieved its current position through the following actions:

- **Feedstock control:** Backward-integrated to the molecule stage, gaining a high degree of control over raw material
- **Process innovation:** Developed low-cost, non-patent-infringing processes
- **Continuous process:** Converted from batch to continuous process to achieve economies of scale
- **Customer relationships:** Built long-term relationships with large end-consumer companies

Jubilant's exports of pyridines have grown at the compounded annual rate of 41 per cent (in volume terms) between 2000 and 2004.

capabilities. As described in the previous section, several companies in India are already well on their way to becoming low-cost producers.

Six factors are essential for succeeding as a low-cost producer:

- **Aggressive mindset:** Players must aspire to becoming one of the top global players in their respective segments. They will need to aggressively build scale and establish cost-leadership as fast as possible, continuously reducing costs to stay ahead of the competition, while maintaining quality at all times.
- **Careful product selection:** Indian companies should select products where the manufacturing process is amenable to cost reduction through innovation and where other players do not already have large, depreciated capacities. For instance, in an illustrative list of agrochemicals, Indian companies can manufacture products such as Metalaxyl (a low-cost substitute for a Syngenta-patented product and with a manufacturing process amenable to innovation) and Imidachloprid (offers opportunities for process innovation to reduce raw material consumption).
- **Scale:** Companies will need to build/acquire world-scale production capacities for economies of scale, or should focus on flexible production through multi-product plants for economies of scope (depending on the product selected).
- **Engineering skills:** Companies need to build three types of engineering skills: (1) process engineering to re-engineer processes and reduce raw material costs; (2) capital engineering to reduce costs of plant set-up, e.g., through local fabrication and design; (3) technology-related skills, i.e., an understanding of complex chemistries or access to specialised technology to

compete in the complex fine chemicals segment.

- **Access to feedstock:** Companies will need to gain privileged access to feedstock through either backward integration or strong relationships with external suppliers.
- **Understanding of regulation:** In some product segments, e.g., APIs and agrochemicals, companies can gain a competitive advantage by building or enhancing their understanding of regulations.

Jubilant is an example of an Indian low-cost producer (see box: Succeeding as a low-cost producer).

Application developers

Application developers provide products customised for specific end-use applications, i.e., they compete in the customised performance chemicals segment. However, success for Indian players will also require adopting a 'low-cost' producer model at the back-end to provide customers with similar quality and service at a lower price. Therefore, players will need low-cost intermediate production in addition to a clear understanding of customer needs, application R&D, sales and marketing and technical service capabilities. This model can be highly profitable but is also more challenging.

Ecolab, for instance, is a successful Western applications developer. With annual sales of US$3.2 billion, it develops cleaning solutions for institutional and industrial markets and has customers in 160 countries. It has built a strong position through frontline presence and application engineering, and provides customers with advice and support in formulations and mixing, and in optimising product use. Its eco-link service centre assists customers 24 hours a day. The firm has a pool of over 600 scientists, engineers and technical service experts, technical service centres in ten countries, and a direct link between sales and R&D for real-time troubleshooting. An 8,000-strong sales force is trained at the Ecolab University in facilities identical with those of customers. The firm also conducts extensive market research based on product development.

Similarly, Dainippon Inks demonstrates the efficiency of a combined application development and low-cost production model. It is the world's largest printing inks player through its subsidiary, Sun Chemicals (over US$4 billion in sales and 25 per cent market share in the US). The firm has separated R&D, manufacturing and distribution. It has eight R&D centres worldwide; and printing ink R&D units are operated by its divisions in the US, Europe and Asia. Manufacturing of intermediates such as resins is undertaken at plants in China and of pigments in China, Europe, the US and Japan. Sun operates its formulation units in over 200 sites across the US and Europe (including 150 in-plant sites). Distribution is conducted by an independent business, Vivitek, which also provides technical service and customer care.

Five important qualities will help ensure success as an application developer:

SUCCEEDING AS AN APPLICATIONS DEVELOPER

Micro Inks is one of the lowest-cost producers of ink in Asia and the twelfth-largest ink maker in the US. Founded in 1986, it focused on high-volume segments in the domestic market, assuming a leadership position with 30 per cent market share. In 2000, the firm began its international expansion, setting up a 100 per cent owned subsidiary in the US and later another in Europe for market access. At this time, the firm was re-branded Micro Inks to mark its new global identity.

Micro Inks achieved its current position by doing the following:

- **Backward-integrating:** It is the only printing ink company in the world to have integrated backwards into all its raw materials
- **Capital re-engineering:** Micro Inks reduced capital costs by 30-40 per cent through capital engineering
- **Formulating units in overseas markets:** A blending unit was set up in Chicago to serve the US market; and formulations units are planned in Europe and China in 2004
- **Employing local workforce:** The firm employs local workforce in overseas markets, with a 50-strong workforce in the US with expertise in sales, marketing, distribution and technical services

Micro Inks' exports have grown ninety-fold in five years, from US$70,000 in 1998 to US$60 million in 2003.

- **Judicious product selection:** Domestic market size, a fragmentation of the customer base and future market prospects are some of the criteria that drive product selection. In printing inks, for example, companies can target newspapers and the publishing segment (given the large size of this industry in India) and the packaging segment (which is of medium size but expected to grow rapidly). The currency segment is avoidable because it requires very high customisation, is a highly regulated market and has a single customer – the government. Targeting other products that have a seasonal demand (e.g., inks for calendars or metal decorations) is not advisable either.
- **Deep understanding of global customer needs:** Companies can build a deeper understanding of global customer needs by interacting closely with leading customers in the domestic market. Alternatively, they can acquire firms in the US and Europe for customer access, particularly where production can be relocated to India.
- **Application development skills:** Companies should invest in application R&D by setting up independent R&D centres. Successful companies should aim to dominate either a functional category (e.g., adhesives) or a specific end-user segment (e.g., construction chemicals).
- **Frontline presence:** Companies will need to develop centres for global sales

and marketing and to provide technical services. They will also need to set up formulation units close to customer plant locations. Winners will also have to develop the capabilities to attract and manage high-performing sales people in these locations. Frontline presence could be built through acquisitions (e.g., recent acquisitions by United Phosphorus in Europe and the US to gain customer access).

- **Low-cost intermediate production:** As explained earlier, low-cost intermediate production is important for Indian companies if they are to win market share from foreign players in their home market. Indian players could have an in-house, low-cost intermediate production back-end or set up privileged relationships with external suppliers.

Micro Inks is an example of an Indian company that has chosen the application developer route (see box: Succeeding as an application developer).

MNCs HAVE A UNIQUE WINDOW OF OPPORTUNITY TO SHAPE THE INDIAN SPECIALTY CHEMICALS MARKET

A significant part of the offshoring opportunity in specialty chemicals will be captured by MNCs relocating their manufacturing to India. Several companies have already announced aggressive plans to do so. Rohm & Haas and Degussa have already set up plants in India. Bayer, Clariant and Dupont have identified India as a key sourcing hub for intermediates. Sun Chemicals, too, has started sourcing ink intermediates from India.

MNCs have a range of opportunities spanning a variety of sourcing and manufacturing options that they could take advantage of.

- In commodity-grade fine chemicals, where reliable Indian producers are emerging, MNCs can establish arms-length sourcing relationships with one or more local producers.
- In complex fine chemicals, standard performance chemicals and intermediates for customised performance chemicals, where a greater control over technology or manufacturing practices is required, alliances may be more appropriate. In select cases it may also be attractive to establish majority- or fully-owned facilities.
- MNCs also have a unique opportunity in customised performance chemicals, where proprietary technology and customer insight could provide a launching pad for cost innovation. However, the more the customisation, the greater the likelihood of smaller volumes, and thereby the greater the ability to ramp up capacity in existing plants overseas.

Beyond manufacturing, MNCs have the opportunity to use India's engineering and R&D talent pool in conjunction with their existing R&D infrastructure to develop a compelling advantage. Options include re-engineering processes, optimising plant design, developing new products and creating customised grades in conjunction with technical salespersons onsite at global customers. General Electric, for instance, has nearly 2,000 employees at its research centre in Bangalore, where at least four of the

11 research laboratories are engaged in chemicals-related research and innovation. Similarly, Jai Research Foundation has established a research and testing facility with the most stringent global certifications at Vapi, Gujarat.

Given the current stage of evolution that offshoring is at, MNCs have an opportunity to be early movers among their peers. While this entails some risks and requires additional effort in terms of developing suppliers and internal processes, it will allow them to forge proprietary relationships with the best suppliers, attract the best talent and get support from the government because of their position as lighthouse investors. Also, since most MNCs already have a presence in India to cater to the domestic market, they have a beachhead to work from. All in all, the benefits far outweigh everything else. MNCs can develop the ability to accelerate cost reduction, improve returns, improve competitiveness in Western markets and position themselves for leadership in Asian markets.

GOVERNMENT SHOULD PROMOTE CLUSTER CREATION AND REDUCE FEEDSTOCK IMPORT DUTIES

Clusters acquire greater significance in the specialty chemicals industry. In China, chemical parks such as those in Shanghai and Nanjing have attracted large investments from companies like BASF and DuPont. Besides the typical benefits of clustering, i.e., the sharing of common infrastructure, development of a talent pool and lowered inventory costs, specialty chemicals producers also benefit from increased access to a variety of feedstock that significantly reduces lead time in procurement and increases their ability to manufacture different types of specialty chemicals. The government can encourage cluster formation by providing SEZ-like benefits to existing clusters such as Vapi or Navi Mumbai, or by developing potential new clusters by developing world-class infrastructure, ensuring quick approvals and providing flexible labour laws.

Reducing import duties on feedstock should be another priority for the government. Feedstock availability is an important source of competitiveness for producers of fine and standard performance chemicals. While some feedstock (e.g., pigments) is widely available in India, some (e.g., phosphorus-based raw material) is in short supply. Most producers can overcome these shortages through imports, but in a few cases import barriers and high import duties combine (e.g., butadiene, monoethylene glycol) and producers have to face higher prices as a result of import parity pricing by suppliers.

Inadequate port infrastructure is a significant constraint as well. Long lead times to ship products caused by delays at ports accentuate the poor image of Indian suppliers as compared to Chinese suppliers who use their extensive river transport infrastructure along with developed port infrastructure to cut lead times. Furthermore, poor highway conditions in India increase transportation costs and the risk of product damage.

The common issues and potential resolution are discussed in detail in Chapter 6.

* * *

Offshore manufacturing and sourcing of specialty chemicals is poised to take off. With advantages comparable to if not greater than those of other LCCs, India has the potential to capture this opportunity. ■

6. Imperatives for the Government

India could emerge as a global powerhouse in manufacturing exports if the central and state governments act decisively to remove four barriers. The initiatives the government needs to take are: lowering indirect taxes and import duties to boost domestic demand; debottlenecking ports and accelerating power reforms; encouraging the creation of manufacturing clusters; and accelerating labour reforms and skill development. Although these issues have been well-debated, export success still hinges on how quickly and decisively the government can make the right policy changes.

The stakes are high. If the central and state governments can indeed undertake these reforms, India will become a manufacturing superpower and its share of manufacturing world trade will increase from the current 0.8 to 3.2 per cent by 2015. With US$300 billion of manufacturing exports by 2015, India will be able to create 11-12 million new manufacturing jobs through exports alone. Moreover, unlike the services sectors, the manufacturing revolution will create jobs for people transitioning out of agriculture as well.

The rest of this chapter describes what needs to be done. Much of it is based on a CII-McKinsey report *Learning from China to Unlock India's Manufacturing Potential*, which provides a detailed discussion of many of the topics covered here.

BOOST DOMESTIC DEMAND BY LOWERING INDIRECT TAXES AND IMPORT DUTIES

China's success in manufacturing is built on a strong domestic market, which is much larger than India's in several products. China's consumption of aluminium and steel, for instance, is more than five times India's (3.5 million tonnes of aluminium compared to India's 0.55 million tonnes and 141 million tonnes of steel compared to India's 28 million).

Enormous domestic demand helps Chinese players achieve low-cost positions in

scale-driven industries. It also helps attract foreign investments in local manufacturing capacities that are then further leveraged into becoming global sourcing hubs.

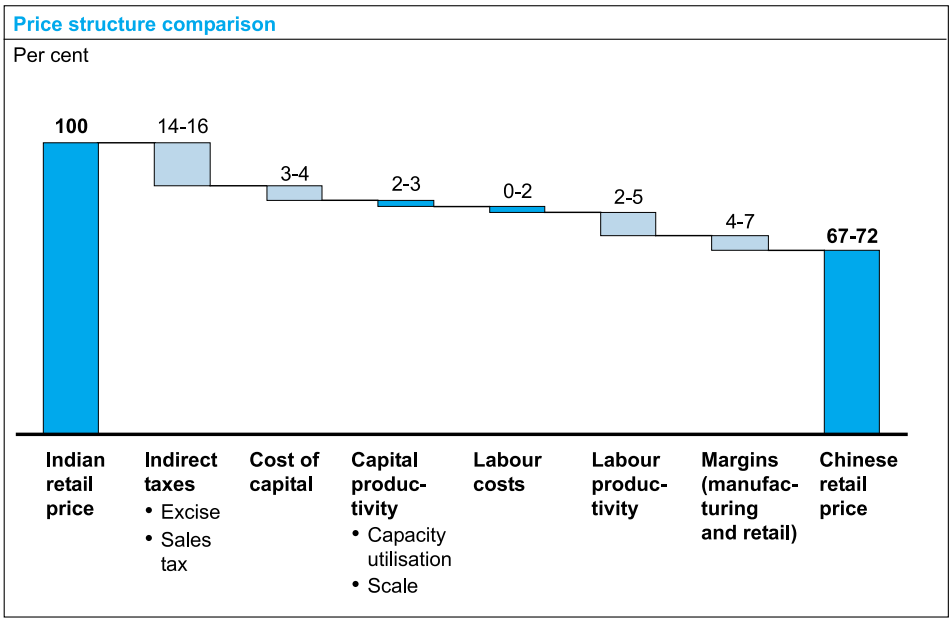
China's large domestic markets can be attributed to not only higher GDP, but also to lower prices, which, in turn, are made possible by lower indirect taxes and import duties. Lower indirect taxes in China account for almost half the total difference in Chinese and Indian prices (Exhibit 6.1). China has a flat 17 per cent VAT – about 15 per cent of retail price – while India's indirect taxes range from 25-30 per cent of the retail price for most manufactured products. Similarly, import duties on several key raw materials such as plastic and aluminium are much higher in India than in China, making inputs more expensive since most players resort to import parity pricing. The barrier to domestic demand can be gauged from the fact that a 30 per cent reduction in prices in India can double volumes in consumer durables.

India, moreover, has multiple taxes such as state tax, octroi, turnover tax and entry tax. These, along with state-level discretionary sales tax holidays, prevent easy inter-state movement of goods and encourage manufacturers to fragment capacity. To illustrate, a leading Korean television manufacturer produces approximately 2.3 million television sets in 20 locations in India whereas in China it produces 4 million sets in a single plant. The negative impact on productivity due to additional overheads, management complexity and extra capital investment is significant.

To stimulate domestic demand, the government urgently needs to simplify and reduce indirect taxes and reduce import duties to 10 per cent, in line with Asian benchmarks.

Simplify and reduce indirect taxes

Exhibit 6.1
INDIRECT TAXES ACCOUNT FOR NEARLY 50% OF THE DIFFERENCE IN RETAIL PRICES BETWEEN INDIA AND CHINA



Source: CII-McKinsey Report: *Learning from China to Unlock India's Manufacturing Potential*

Prior to 1994, the average taxes on manufactured goods in China amounted to 32 per cent of ex-showroom prices and myriad taxes existed. In 1994, the Chinese government simplified indirect taxes, reducing them in one stroke to 17 per cent VAT on all manufactured products in all provinces. Tax-sharing between the centre and provinces was simplified and fixed on a 75:25 basis. Almost no one is granted VAT exemptions, ensuring that companies do not set up multiple sub-scale facilities.

The proposed VAT for India is a step in the right direction but some serious flaws do exist and must be corrected.

- VAT credit is not available where the input has been sourced from another state, since in the current regime the originating state retains the central sales tax paid on the sale. This could encourage the setting up of multiple sub-scale facilities in different states and also lead to an increase in the overall taxation level.
- The taxation levels suggested in the current VAT regime are still quite high and many states have not extended VAT to replace local taxes such as octroi and entry taxes.

The government should:

- Replace all indirect taxes on goods such as excise, state and central sales tax, octroi and entry tax with a single nationwide VAT. It must also reduce total taxes on manufactured goods from 25-30 per cent of the retail price to 15 per cent of the retail price (as in China). Contrary to the widely-held belief that a reduction in tax rates and duties reduces government collections, analysis suggests that the combined impact of increased domestic demand and better compliance will substantially help the government make up for revenue losses (Exhibit 6.2).
- Discontinue the granting of discretionary tax holidays by the government. Recent work by the McKinsey Global Institute suggests that, in most cases, the central and state governments are giving away substantial sums of money in investments that would have been made anyway. In the automotive sector, a survey of foreign manufacturers with plants in India reveals that financial incentives were the least important factor in their decision to invest in India.
- Hasten the implementation of (refined) VAT by implementing a clear compensation plan for the states.

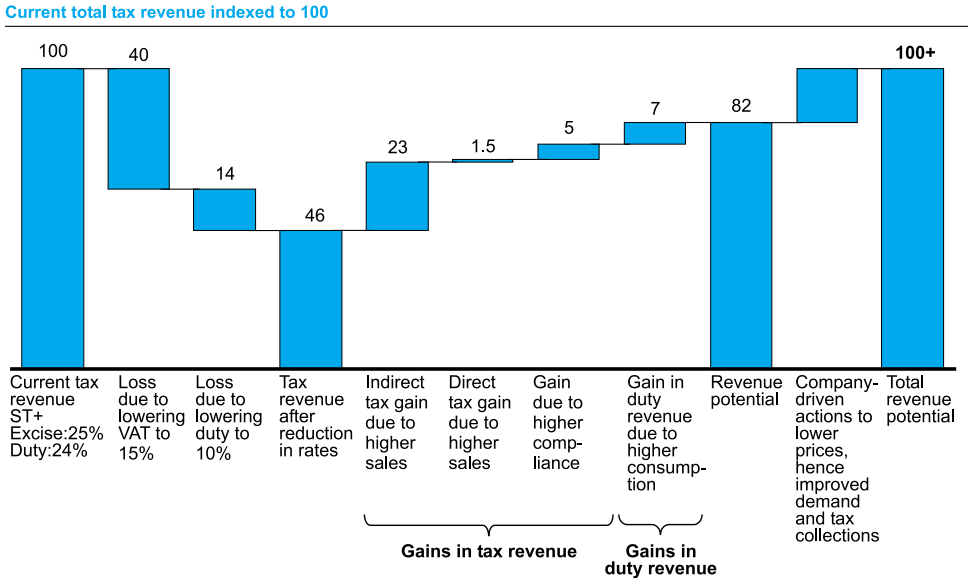
Reduce import duties to a single rate of 10 per cent by 2007

Not only are import duties high in India, they also display the peculiar phenomenon of an 'inverted' structure with import duties on raw materials higher than import duties on finished products. The central government should continue to reduce import duties to a single rate of 10 per cent over the next two or three years. This will give domestic manufacturers time to restructure and become competitive while still offering a base level of protection.

DE-BOTTLENECK PORTS AND ACCELERATE POWER REFORMS

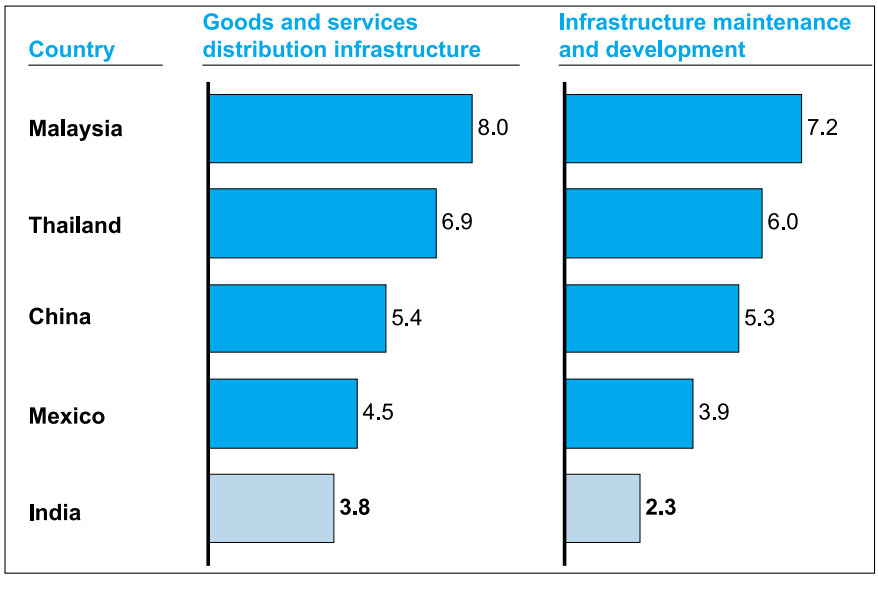
India's infrastructure remains poor, particularly when compared to that of other LCCs (Exhibit 6.3). To increase manufacturing competitiveness, both in the domestic and export sectors, port infrastructure must be improved and access to low-cost, uninterrupted power must be ensured.

Exhibit 6.2
INCREASED DEMAND AND COMPLIANCE COULD MAKE UP FOR REVENUES LOST DUE TO REDUCTION IN TAX RATES



Source: CMIE; McKinsey analysis

Exhibit 6.3
INDIAN INFRASTRUCTURE RANKS POORLY COMPARED TO OTHER LCCs
Survey scores: 10 = favourable for business; 1 = unfavourable for business



Source: World Competitiveness Yearbook, 2003

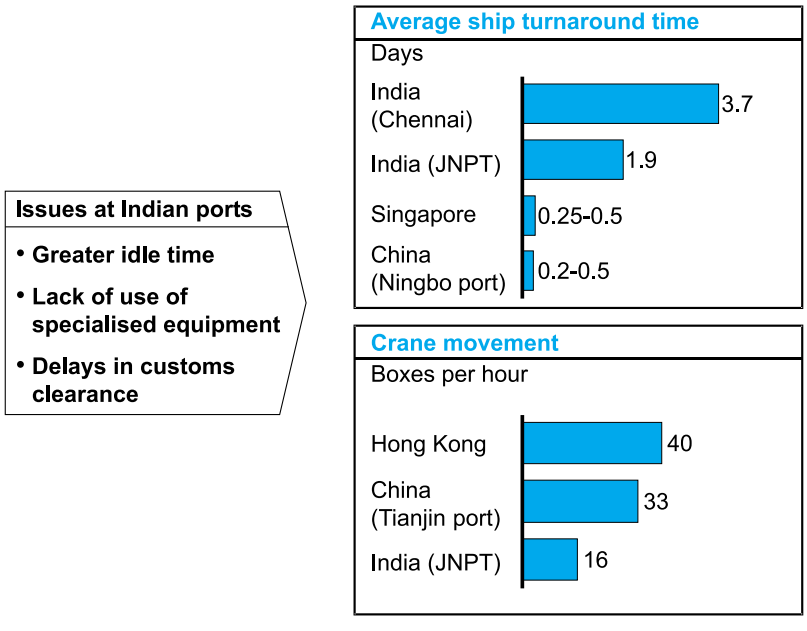
Port capacity, productivity and connectivity should be enhanced

India's success in software and IT-enabled services was driven by reforms in the telecom sector, which had in turn increased the availability of bandwidth while reducing telecom costs. Success in manufacturing exports requires a similar breakthrough in infrastructure.

Capacity at India's ports is saturated. While declared container capacity is currently 40 million tonnes, utilisation is 43 million tonnes (23 million for exports and 20 million for imports). As India's exports increase, lack of capacity will increasingly become a bottleneck. Required container capacity for exports alone could amount to 120-150 million tonnes by 2015 if the aspiration is achieved. Clearly, the announced capacity addition for the tenth five-year plan (additional 20-25 million tonnes by 2008) will be insufficient to meet requirements. The problem is further exacerbated by the low productivity of Indian ports because of the lack of specialised equipment and delayed customs clearance, among other things (Exhibit 6.4).

Finally, while the Golden Quadrilateral (GQ) and the East-West and North-South Corridor projects launched by the National Highways Authority of India (NHAI) are a step in the right direction, port connectivity to manufacturing clusters and the

Exhibit 6.4
INDIAN PORTS ARE NOT AS PRODUCTIVE AS THEIR GLOBAL COUNTERPARTS



Source: Indian Ports Association; Drewry Shipping Consultants; literature search

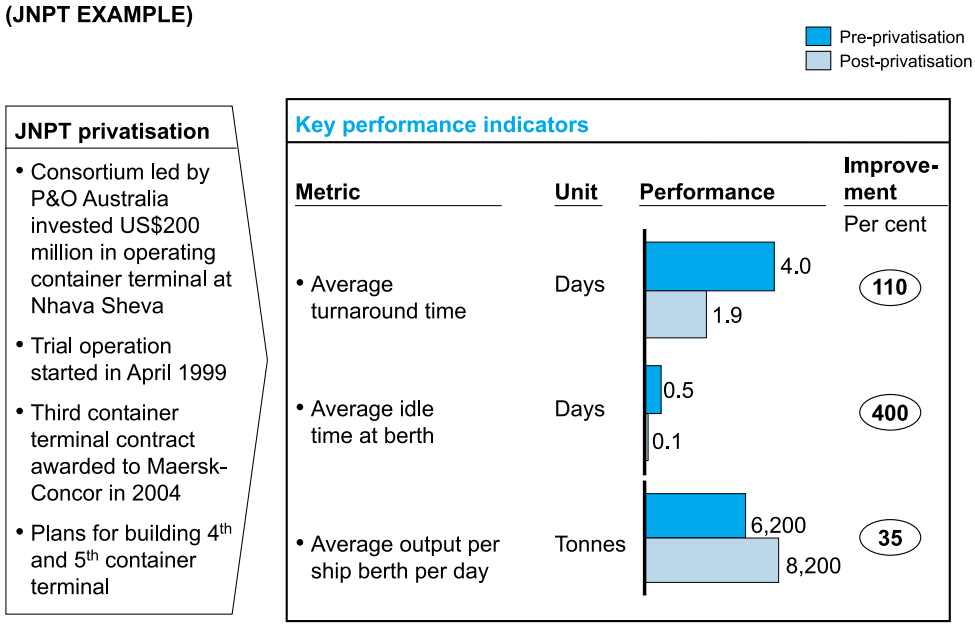
GQ remains an unresolved issue.

The government should:

- **Invest in additional capacities (over and above currently planned expansions):** This is required because of the high level of uncertainty and associated risks that usually prevail in the initial years of large infrastructure projects, making private investment difficult.

- **Continue with planned privatisation of operations, particularly since existing privatisation has demonstrated clear benefits in improved productivity:** For example, the privatisation of the Nhava Sheva container terminal of the Jawaharlal Nehru Port Trust (JNPT) improved the port's

Exhibit 6.5
PORT PRIVATISATION HAS LED TO A CLEAR IMPROVEMENT IN PRODUCTIVITY (JNPT EXAMPLE)



Source: Ministry of Shipping; Indian Ports Association; McKinsey analysis

overall performance by reducing average turnaround time by 110 per cent and average idle time at berth by 400 per cent (Exhibit 6.5).

- **Further reduce customs clearance times:** This can be done by simplifying the number of procedures, increasing the number of self-certification procedures and automating processes. The objective should be to bring down customs clearance time to one or two days (as in China) from the current levels of one or two weeks.
- **Undertake a series of targeted road development projects:** These will ensure easy access from the clusters to the GQ, corridors and national highways.

State-level power reform should be facilitated through a rationalised regulatory framework

The Central Electricity Act 2003 is a step towards improving power supply, and should allow Indian companies access to low-cost uninterrupted power. It permits delicensing of generation, allows open access in transmission and focuses on phasing out cross-subsidies.

Much, however, still remains to be done, especially at the state level. The following actions are recommended:

- State regulatory authorities should clearly define the rules and access charges

for third-party supply of industrial power. A time-bound, clear definition of contractual obligations of generating companies for open access and provision of a fair access charge should be introduced. In addition, the regulatory authority should clarify rules for third-party supply.

- There must be a continued push towards privatising distribution to improve revenue and operational efficiencies.

ENCOURAGE THE DEVELOPMENT OF MANUFACTURING CLUSTERS

Clusters in the form of SEZs marked by special economic systems and policies are a key feature of China's success in manufacturing. Starting out with four SEZs in 1978, China now has over 500 economic development zones. These SEZs receive over 75 per cent of FDI and drive over 50 per cent of China's exports. All SEZs have world-class infrastructure. For example, the Shenzhen SEZ has multi-lane highways within the zone that connect it to major cities in China. Shenzhen also has eight port areas. Even the smaller economic zones have world-class infrastructure, both within and outside. In addition, units based in an SEZ in China are allowed to sell their output in the domestic market on payment of local tax (VAT) as well as duties on imported raw material. For Indian SEZs, a great deal needs to be done before they can be called world class.

The following changes are suggested:

- **Increase access to the DTA:** In contrast to China, units based in Indian SEZs are allowed access to the DTA only on payment of prevailing high import duties on finished goods. This deters several investors from putting up plants in SEZs since access to the domestic market provides the scale to make manufacturing operations competitive. The government should permit sales to the DTA by paying duties on imported inputs, local taxes on domestic inputs and domestic taxes on domestic sales. This will provide a level playing field to units inside and outside SEZs, similar to the Chinese dual-book system.
- **Allow use of contract labour:** To give companies the flexibility they need to manage their operations, labour laws should be amended to allow the unconditional use of contract labour in SEZs. Contract labour is a well-established international practice.
- **Simplify administrative and customs procedures:** This can be done through increased levels of self-certification, simplification and automation of procedures and empowerment of the Development Commissioner. Further, practices such as setting up a 'golden card' system of checks, with privileged clearance for units with an unblemished track record, should also be explored.
- **Extend SEZ-like benefits to existing manufacturing clusters:** Many clusters have already emerged in India. Examples include Tirupur, Ludhiana, Bangalore, Chennai and Gurgaon for apparel; Delhi, Pune, Bangalore and Chennai for auto components; and Vapi-Valsad for specialty chemicals. The

aspiration should be to raise these clusters to world-class standards by providing them with SEZ-like benefits. These would include world-class infrastructure such as the ability to buy power directly from a generator; multi-lane road connectivity to the Golden Quadrilateral and nearest ports; simplified administrative procedures and flexibility in contract labour laws, at least for all new investments.

ACCELERATE LABOUR REFORMS AND TECHNICAL SKILL DEVELOPMENT

Constraints on the rationalisation of labour inhibit economic growth and job creation, especially in labour-intensive manufacturing. Discussions with Indian apparel manufacturers, for example, suggest that many of them are afraid of setting up large-scale factories that employ 40,000 people as in China, because of the lack of flexibility in India's labour laws. In addition, even if the labour laws are reformed, estimates suggest that India will fall short of technically-trained manpower since ITIs currently meet no more than 50 per cent of the industry's requirement for technically qualified people.

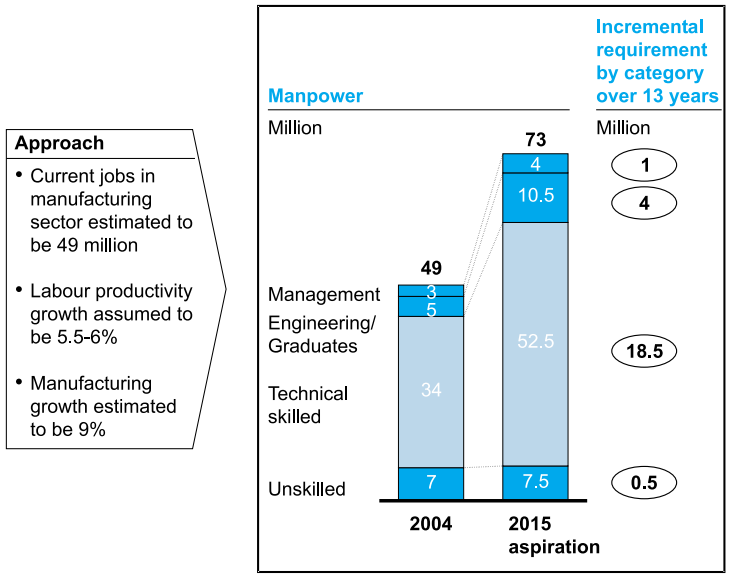
To remove these impediments to competitiveness, the government should simplify labour laws and reform the vocational training system.

Simplify labour laws to provide greater flexibility

Even a communist country such as China provides more flexibility than India in its labour laws. After the labour law reforms of the mid-1980s, all new companies in China have the flexibility to retrench workers and to pay productivity-based wages. These policies began with all the units that were set up in SEZs and now cover all new investments in China. Together with labour reform, the Chinese government

Exhibit 6.6
INDIAN TECHNICAL INSTITUTES (ITIs) WILL BE ABLE TO MEET LESS THAN 50% OF INDIA'S TECHNICAL SKILL REQUIREMENT BY 2015

ESTIMATE



Source: McKinsey analysis

strengthened social security (e.g., it provides assistance of US$35 per unemployed person per month in Beijing and US$10 per month in the hinterland for up to three years after the loss of a job) and eased previously stringent restrictions on labour mobility (imposed through the residence permit system). These favourable labour conditions are one of the most important factors to have contributed to attracting FDI into the country. Foreign-invested enterprises, in turn, have infused best practices into Chinese manufacturing. Over time, these practices have percolated down to local companies as well and resulted in an overall growth in labour productivity.

It is suggested that the Indian government undertake the following labour reforms:

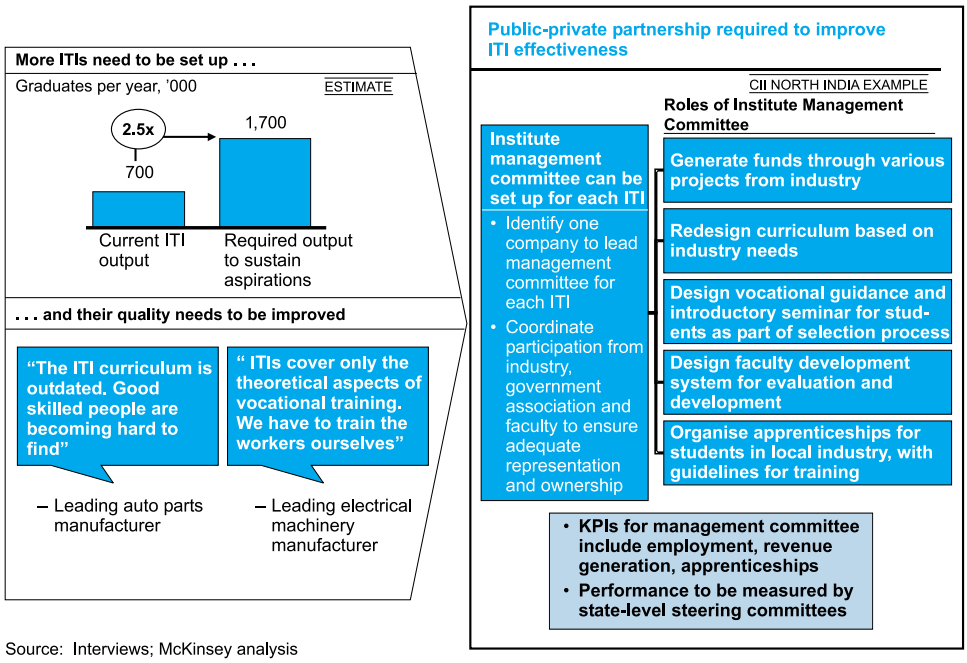
- **Amendments to the Contract Labour Act:** In India, contract labour cannot be used for core activities. Restrictions are also placed on its use for non-core activities such as a provision requiring that contract labourers be made permanent after 11 months of work. The government should allow the use of contract labour for all activities, and not just those of a temporary nature.
- **Flexibility in labour laws:** The government should repeal section 5B of the Industrial Disputes Act, which mandates that companies with more than 100 workers should obtain the state government's approval to rationalise their workforces.

The government can immediately begin by extending these laws for all new investments and new jobs that are created beyond a certain date, say, 1 July 2004.

Strengthen vocational training

If Indian manufacturing has to meet its aspirations, it will be required to produce 1.7 million technically skilled people every year (Exhibit 6.6). The ITIs today can

Exhibit 6.7
GOVERNMENT AND INDUSTRY ASSOCIATIONS NEED TO WORK TOGETHER TO IMPROVE ITIs



Source: Interviews; McKinsey analysis

train only 700,000 people a year. Moreover, the industry often has to put these ITI graduates through a training programme of a further 6-12 months. Thus, both the quality and the number of people being trained need to be improved. This should be done by revising the entire curriculum and inviting public and private participation in the functioning of the ITIs (Exhibit 6.7). In addition, the private sector should be given targeted incentives (e.g., through FSI increases, tax breaks) to enter the vocational training business.

* * *

Though many of these issues have been incessantly debated, the determination with which the government moves – and the pace at which it implements these reforms – will make or mar the future of manufacturing in India. ■

Appendix: Study Methodology

The purpose of this study was to assess the opportunity for export-led growth in India and develop a comprehensive set of recommendations for Indian companies, MNCs, the government and industry associations, in order to unlock India's manufacturing potential. Over the course of this study, more than 50 interviews with CEOs and senior managers of Indian companies, Indian industry associations, senior India-based managers in MNCs and sourcing executives in MNCs based in regional or global headquarters were conducted. The team also drew heavily on existing work in McKinsey's Indian offices (*Learning from China to Unlock India's Manufacturing Potential* and *India: The Growth Imperative*); in McKinsey's offices around the world; and multiple independent studies.

The work was carried out in two phases: Phase 1 was an exercise conducted to define the vision and aspiration for Indian manufacturing. Phase 2 involved the deeper study of four representative sectors (apparel, auto components, electrical and electronic products and specialty chemicals) and synthesis to evolve imperatives for Indian companies, MNCs, the government and industry associations.

This appendix describes the methodology followed in each phase.

PHASE 1: DEFINING VISION AND ASPIRATION

The team began by defining the sectors to be included in manufacturing (Exhibit A.1) and the countries to be defined as LCCs for the purposes of all analyses (Exhibit A.2). The aspiration for India's exports was calculated on a bottom-up basis based on the share that India could aspire for in the projected offshoring to LCCs.

Projected offshoring to LCCs

This was estimated by evaluating current levels of offshoring in a segment of industries (described in Chapter 1) and projecting potential future levels based on

the leading sector in that cluster. Segments were identified based on two factors: benefits from offshoring (value added to sales ratio) and ability to offshore (current offshoring levels and future offshorability criteria). Sectors with higher benefits from offshoring and higher ability to offshore were likely to have the highest potential for future offshoring. The actual estimate of projected offshoring was based on the assumption that all sectors were likely to achieve offshoring levels similar to the leading sector in their cluster (e.g., all labour-intensive sectors would achieve offshoring levels similar to apparel).

Exhibit A1
MANUFACTURING* IS DIVIDED INTO 38 SUB-SECTORS

Sector	Product/Segments
• AC and refrigeration (commercial)	• Commercial heating, ventilation and AC equipment
• Aircraft and parts	• Aircraft bodies, space vehicles, aeroplane parts
• Aluminium	• Aluminium smelting and refining, aluminium products
• Apparel	• Knitted apparel, cut and sewn apparel, apparel accessories
• Auto components	• Chassis parts, engine and powertrain parts, body parts
• Building materials	• Cement, lime, gypsum, concrete
• Basic chemicals	• Organic and inorganic chemicals, petrochemicals
• Computer hardware and peripherals	• Computer hardware, peripherals like printers, scanners, hard disks
• Consumer electronics	• TV, audio equipment, DVD and VCD players, video cameras
• Domestic appliances	• Washing machines, microwave ovens, refrigerators, home AC, cooking range
• Electrical equipment manufacturing	• Batteries, switchgear, motors,transformers
• Power generation equipment	• Turbines, engines, generation sets, mechanical power distribution equipment
• Fabricated metal product manufacturing	• Forging and stamping, cutlery and handtool, boiler and tanks, hardware, springs and wire products, machine shops, coating, engraving and allied activities
• Fertilisers	• Fertilisers
• Footwear	• All footwear
• Glass and ceramics	• Glass and glass products, clay products and refractories
• Iron and steel products and foundries	• Iron and steel mills, rolling and drawing of steel, steel products, ferrous foundries
• Jewellery	• Articles of precious metals, silverware, polished diamonds

* Food manufacturing excluded
Source: US Bureau of Economic Analysis; US NAICS codes; McKinsey analysis

India's competitiveness

India's competitiveness and consequently its aspiration in terms of exporter rank among LCCs was determined by comparing it with four other LCCs – China, Mexico, Poland and Thailand – which were shortlisted on the basis of attractiveness for global sourcing, sustainability of the appeal and current level of offshoring. A three-part framework was used to do this. It covered factor-based advantages, structural factors and government policies as described in Chapter 1.

India's potential export aspiration

Finally, the two elements were combined to calculate India's potential export aspiration. For example, in a sector such as pharmaceuticals, if India was expected to be a top two player, its share of the projected offshoring in pharmaceuticals would be the average of the current share of the top two players. In select cases, the aspiration was further refined based on a deeper study of the four sectors and inputs from industry experts.

A DEEPER STUDY OF THE FOUR REPRESENTATIVE SECTORS

A deeper study of the four sectors was conducted in order to identify imperatives at

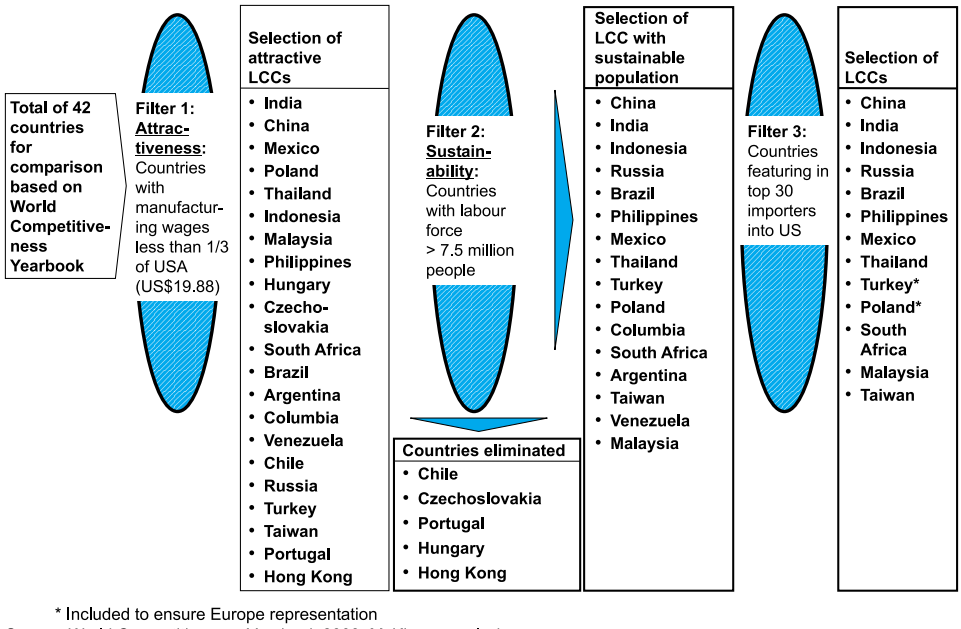
Exhibit A1
MANUFACTURING* IS DIVIDED INTO 38 SUB-SECTORS **Contd....**

Sector	Product/segments
• Leather	• Leather and hide tanning and finishing, allied products
• Machinery manufacturing	• Agricultural, industrial, commercial and service machinery, pumps and compressors, material handling equipment
• Miscellaneous electric equipment manufacturing	• Electrical lighting fixtures, household electrical equipment
• Motor vehicles assembly and body manufacturing	• Fully built-up cars including bodies, chassis and engines of vehicles, trucks, motorcycles, buses
• Industrial and medial electronic equipment	• Electronic surgical equipment, laboratory equipment, search and detection equipment, industrial automation systems
• Other basic metals and foundries	• Copper, lead, zinc, tin and other non-ferrous metals
• Paper and related products	• Pulp, paper and paperboard mills, converted paper products, printing and related support products
• Petroleum and coal products	• Products of petroleum refineries
• Pharmaceuticals	• Pharma and medicinal products
• Plastic products	• Packaging materials, pipes and fittings, foam products, bottles
• Power transmission equipment	• Power distribution transformers, motors
• Railway and ships	• Railroad coaches and engines, ship-building
• Rubber products	• Tyres, rubber hoses and belts
• Semiconductor and electronic components	• Integrated circuits, printed circuit boards, valves and components, memory chips
• Specialty chemicals	• Dyes and pigments, adhesives, printing inks, agrochemicals
• Storage media	• CDs, optical media
• Telecommunication equipment	• Telephone apparatus (switches, routers), TV transmission equipment (TV cameras), security systems
• Textiles	• Fibre and yarn mills, fabric mills, textile furnishing mills, other textile products
• Toys, sporting and athletic goods	• Toys, dolls, games, sporting equipment
• Wood products	• Sawmill and wood preservation, plywood, veneer

* Food manufacturing excluded
Source: US Bureau of Economic Analysis; US NAICS codes; McKinsey analysis

a micro-level of detail for Indian industry, MNCs, the government and industry associations. Four representative sectors were identified. They constituted approximately 25 per cent of the overall potential and were a representative mix of

Exhibit A2
13 LCCs WERE IDENTIFIED BASED ON A DETAILED STUDY OF WAGE RATES AND WORKFORCE SIZE



* Included to ensure Europe representation
Source: World Competitiveness Yearbook 2003; McKinsey analysis

skill-intensive (auto components and electrical and electronic products), labour-intensive (apparel) and process-intensive (specialty chemicals) sectors. They were also a mix of first-wave (apparel and electrical and electronic products) and second-wave offshoring (auto components and specialty chemicals) sectors.

To start with, a hypothesis was developed on the imperatives through multiple in-depth interviews with McKinsey experts worldwide and preliminary interviews with Indian players, MNCs (executives in India and sourcing executives abroad) and Indian industry associations in each sector. These hypotheses were refined through specific analyses based on secondary research (including the study of successful companies in India and other LCCs and construction of landed cost comparisons for illustrative products) and validated in further interviews.

This exercise focused on:

- Developing an understanding of global trends in offshoring and expected future offshoring.
- Identifying a potential segmentation that helped highlight the key success factors in each sector.
- Evaluating India's competitiveness in the key buying factors and using this to identify focus segments and refine the estimated aspiration for the sector.
- Developing potential business models and imperatives (including product selection) for Indian companies, MNCs, the government and industry associations.

SYNTHESIS

The findings in each sector were synthesised to arrive at the overall imperatives described in the report. The team validated, refined and syndicated these recommendations through multiple meetings with CII office bearers and CII council meetings (Western Regional Council Meeting, National Seminar on 'Globalisation Strategies for Indian Manufacturing' and Maharashtra State Council) and discussions with some earlier interviewees. ■

Made in India

The next big manufacturing export story

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