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OPERATIONS PRACTICE

Fulfilling the promise of India's manufacturing sector

India's product makers have a golden opportunity to join the global big leagues. They should seize it.

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India's manufacturers have a golden chance to emerge from the shadow of the country's services sector and seize more of the global market. McKinsey analysis finds that rising demand in India, together with the multinationals' desire to diversify their production to include low-cost plants in countries other than China, could together help India's manufacturing sector to grow sixfold by 2025, to \$1 trillion, while creating up to 90 million domestic jobs.

Capturing this opportunity will require India's manufacturers to improve their productivity dramatically—in some cases, by up to five times current levels.¹ The country's central and state governments can help by dismantling barriers in markets for land, labor, infrastructure, and some products (see sidebar, "Four imperatives for India's government"). But the lion's share of the improvement must come from India's manufacturers themselves.

Recognizing this, a few leading ones are upgrading their competitiveness by bolstering their operations to improve the productivity of labor and capital, while launching targeted programs to train the plant operators, managers, maintenance engineers, and other professionals the country needs to reach its manufacturing potential. A closer look at the experiences of these companies offers lessons for other Indian manufacturers and for global product makers considering opportunities in India.

Made in India?

India's manufacturers have long performed below their potential. Although the country's manufacturing exports are growing (particularly in skill-intensive sectors such as auto components, engineered goods, generic pharmaceuticals, and small cars) its manufacturing sector generates just 16 percent of India's GDP—much less than the 55 percent from services.² Moreover, a majority of India's largest manufacturers don't return their cost of capital (Exhibit 1), a factor that dampens investment in the sector and makes it less attractive than its counterparts in competing economies, such as China and Thailand. Indeed, China's manufacturers captured nearly 45 percent of the global growth in manufacturing exports from low-cost countries between 2001 and 2010, whereas India accounted for a paltry 5 percent.

Nonetheless, India's rapidly expanding economy, which has grown by 7 percent a year over the past decade, gives the country's manufacturers a huge opportunity to reverse the tide. History shows that as incomes rise, the demand for consumer goods skyrockets. And many of India's consumption sectors—including food and beverages, textiles and apparel,

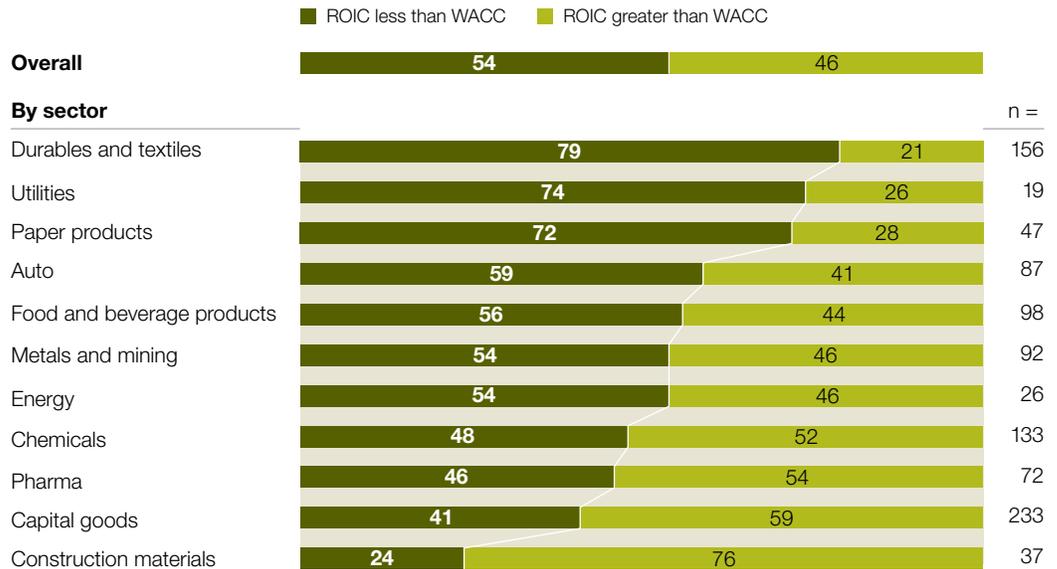
¹To improve total factor productivity three to five times, a manufacturer would have to improve its labor productivity by a factor of 2.0 to 3.0 and its capital productivity by a factor of 1.5 to 2.0.

²In fact, India exports goods worth 17 percent of GDP but also imports manufactured goods worth nearly 16 percent of GDP, so the net contribution of the manufacturing sector's exports to overall GDP is negligible. By contrast, China's manufacturing sector contributes 47 percent of China's GDP, and its contribution to net exports is large. Services account for 44 percent of China's GDP.

Exhibit 1

More than half of India's manufacturing companies do not return their cost of capital.

Relationship between return on invested capital (ROIC) and weighted average cost of capital (WACC) for top 1,000 manufacturing companies in India,¹ %



¹Based on India's 2006–10 median 5-year after-tax ROIC (excluding goodwill) and long-term WACC (estimated at ~12%).

and electrical equipment and machinery—have reached this inflection point. In fact, our research suggests that these sectors will grow from 12 to 20 percent annually over the next 15 years (Exhibit 2).

To be sure, global economic growth is poised to create opportunities for low-cost manufacturers everywhere: by 2015 the market for manufactured goods from low-cost countries will more than double, to nearly \$8 trillion a year. China will probably capture much of the growth. Still, we estimate that up to \$5 trillion a year will be up for grabs as global companies seek to diversify production and sources of supply beyond China, both to address rising factor costs there and to chase domestic demand in other countries.

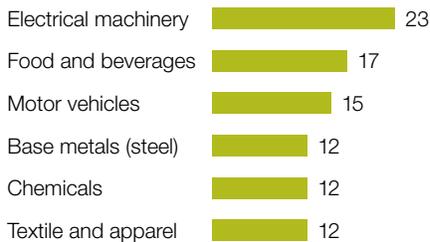
India has a massive workforce, an emerging supply base, and access to natural resources needed in production—notably, iron ore and aluminum for engineered goods, cotton for textiles, and coal for power generation. The country could become a viable manufacturing alternative to China in industries ranging from apparel to auto components and might even dominate some skill-intensive manufacturing sectors (Exhibit 3).

If India's manufacturing sector realized its full potential, it could generate 25 to 30 percent of GDP by 2025, thus propelling the country into the manufacturing big leagues, along

Exhibit 2

Many sectors in India will experience strong domestic market growth driven by increased consumption.

Compound annual growth rate of per capita consumption,¹ 2009–25, %



¹Based on consumption per 1,000 people; motor vehicles based on sales of vehicles per 1,000 people.

Source: Global Insights; McKinsey analysis

with China, Germany, Japan, and the United States. Along the way, we estimate that India could create 60 million to 90 million new manufacturing jobs and become an attractive investment destination for its own entrepreneurs and multinational companies.

India's product makers must embrace global best practices in operations—while tailoring them to India's unique environment—to improve the efficiency and effectiveness of the country's manufacturing investments dramatically. A look at how some Indian companies are making inroads in these areas suggests a path that others can follow.

Bolster operations

India's legacy of industrial protectionism has left many of the country's manufacturers uncompetitive. To seize the opportunities now available to them, they must dramatically increase the productivity of their labor and capital. The rewards could be significant: a McKinsey benchmarking study of 75 Indian manufacturers found that for an average company, the potential productivity improvements represented about seven percentage points in additional returns on sales.

[Improve labor productivity](#)

Indian manufacturers lag behind their global peers in production planning, supply chain management, quality, and maintenance—areas that contribute to their lower productivity (Exhibit 4). Consequently, workers in India's manufacturing sector are almost four and five times less productive, on average, than their counterparts in Thailand and China, respectively.

Exhibit 3

India could be competitive in a number of industries.**By 2025, India could ...****Sectors**

... establish leadership in these sectors and become one of the top 2 low-cost-country exporters.

- Aluminium
- Apparel
- Auto components
- Iron and steel

- Jewelry
- Leather
- Pharmaceuticals

- Power transmission and distribution equipment
- Specialty chemicals

... capture significant share in these sectors and become one of the top 3 to 5 low-cost-country exporters.

- Basic chemicals
- Commercial heating, ventilation, and air conditioning
- Computer hardware
- Consumer electronics
- Domestic appliances
- Engines and turbines

- Fabricated metal products
- Footwear
- Industrial- and medical-electronics equipment
- Machinery
- Miscellaneous electric equipment
- Motor vehicle assembly

- Other basic metals
- Paper and related products
- Petroleum and coal products
- Plastic products
- Storage media
- Telecom equipment
- Textiles

Nonetheless, some Indian companies are making strides. Tata Steel, for instance, improved its output per worker by a factor of eight between 1998 and 2011, largely by adapting its operational and management practices to India's unique conditions. The company dramatically improved the output of its blast furnaces, for example, by learning to adjust them continually to account for the large variations in the ash content of Indian coal from shipment to shipment. In this way, the steelmaker can burn coal with a high ash content more efficiently than would otherwise be possible.

The company has also made significant organizational changes to support the new ways of working. To make employees more accountable, for example, Tata Steel reduced the number of managerial layers to 5, from 13. It also began investing heavily in building analytical and interpersonal skills among frontline managers and staff to ensure access to scarce competencies. Today, the company's Shavak Nanavati Technical Institute trains more than 2,000 employees a year in both "hard" skills as well as "soft" ones, such as conflict resolution. Together, these moves strengthened the company's focus on continuous improvement—Tata Steel won the coveted Deming Prize in 2008 for advances in process excellence and quality improvements—and helped it become one of the world's lowest-cost steel producers.

Improve capital productivity

India's manufacturers must also improve the productivity of their capital,³ in some cases by 50 percent or more. While such improvements are challenging, they are possible if

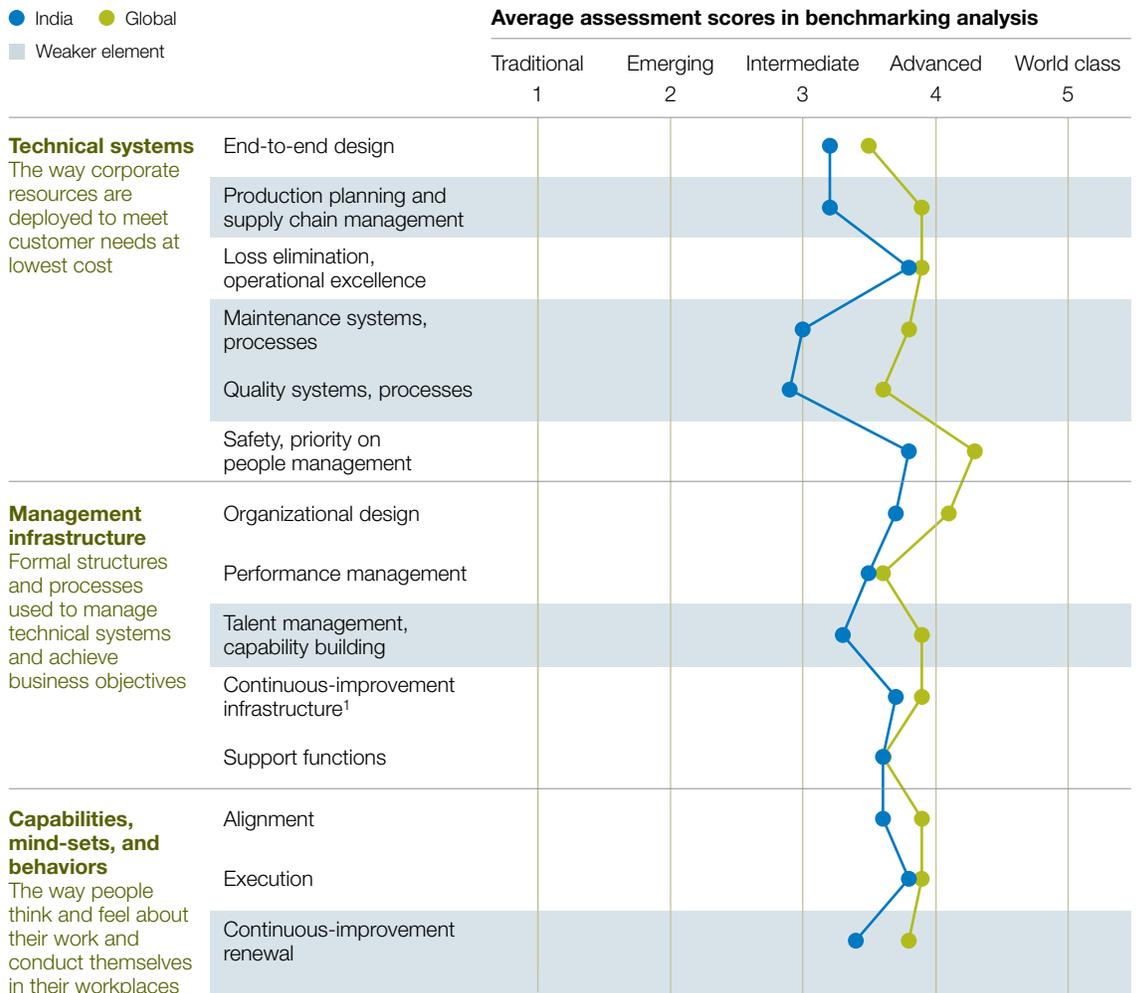
³In this article, we define capital productivity as operating profit divided by total assets.

companies set bold targets and adopt an “owner–entrepreneur” mind-set when tackling large capital projects or making other big investments.

For example, a global mining and metals company that was setting up aluminum smelter operations in India set a capital cost target 50 percent lower than the industry’s global average. The company then empowered its project teams to reach the goal—for example, by giving them greater freedom to make decisions about capital specifications and

Exhibit 4

Indian manufacturers lag behind their global peers in key operational areas.



¹For example, problem-solving methodology, tracking tools.

Source: McKinsey’s benchmarking studies in 75 Indian and 30 global companies; McKinsey analysis

which low-cost equipment suppliers to use. (A technical and commercial audit team of senior managers ensured that the new approach didn't compromise the quality of capital equipment or backfire in the form of graft.)

Moreover, the company did not give the contract out on an EPC⁴ basis. Instead, it brought together a mix of Chinese and European companies to finalize the design and to supply the equipment needed, and the integration and commissioning work was done in-house, thus saving much of the margin that would otherwise have been given away. Together, these moves helped the company to launch its Indian smelter operations at a capital cost 50 percent below industry averages (and 20 percent less than other players in the same market spent).

Many Indian companies are also assessing the technical design of their capital equipment to make trade-offs between capital expenditures and life cycle expectations for reliability—essentially “Indianizing” the specifications. Tata Power, for example, has lowered its capital expenditures in a drive to identify relatively inexpensive designs and specifications for big projects. During the planning stages of a new 4,000-megawatt facility, for instance, the company brought together customers, suppliers, and Tata engineers to make a number of Indianized design decisions. These included using cheaper welded tubes instead of seamless ones in feedwater heaters and redesigning the layout of the turbine-generator building to make it more compact. Together, such trade-offs saved the company more than \$100 million in capital outlays while preserving the plant's core capabilities and meeting standards for safety and reliability.

Meanwhile, some Indian companies are working to raise the productivity of their *existing* assets—for example, by focusing on the reliability of equipment. In our experience, throughput improvements from 40 to 100 percent⁵ are possible when Indian companies apply traditional lean-management techniques to keep machines running longer and to reduce time wasted during retooling and production line changeovers. Tata Steel, for instance, focused on standardized tasks throughout its mills and trained workers to uncover the root causes of equipment problems. One of the company's melting shops we studied raised its production dramatically over two years by standardizing jobs and empowering its operations and maintenance employees to identify potential problems of key machines that had previously been prone to creating production bottlenecks.

⁴Engineer, procure, construct: a common contracting arrangement, under which the contractor is responsible for all aspects of engineering, procurement, and construction, including the management of subcontractors.

⁵In our assessment, the potential improvement ranges from 20 to 40 percent for continuous-process industries (such as steel), 30 to 60 percent for discrete manufacturing (automotive, mining), and 50 to 100 percent for batch-process-based industries (such as pharmaceuticals).

Four imperatives for India's government

India's central and state governments must eliminate four barriers that slow down the efforts of the country's manufacturers to improve their capital and labor productivity.

1. Product market and ownership barriers. More than half of India's employees in the organized sector (regulated by labor laws for hiring and firing) still work in government-owned institutions—for example, in the base-metals, petroleum, and power generation industries. Product market barriers and government ownership tend to lower productivity and distort markets significantly.

Yet receding levels of government ownership have dramatically improved the productivity of labor and capital in other parts of the economy. India's automotive sector, for example, was among the first to be liberalized, in the early 1990s, and the entry of multinational and domestic players sparked a competitive transformation. Subsequently, between 1995 and 2005 the automotive sector's GDP per manufacturing employee grew by a factor of 15. Today, India produces nearly three million small cars a year, of which about one-quarter are exported. To be sure, India's government might well deem some sectors (aerospace and defense, for example) as strategic and limit the extent of foreign participation. Yet for a majority of sectors, greater private and multinational participation in India can help unlock productivity structurally.

2. Land market barriers. Distortions in the land market (including high stamp duties and cumbersome regulations) are a huge barrier to productivity improvements in India. In the steel industry alone, we estimate that more than \$60 billion of committed capital currently awaits environmental or land clearances. Much of this planned investment has already been delayed by three to five years.

Challenges to aggregating land in India also make it tough for suppliers and manufacturers to raise their overall productivity by locating facilities closely together and thus reaping network effects enabled by streamlined supply chains, the sharing of infrastructure, and mutual learning opportunities.

3. Labor barriers. Stringent labor laws make it difficult for Indian companies to restructure and thus to increase their productivity and expand output. Firing underperforming workers is difficult in India, and this ongoing problem translates into high levels of unproductive labor at many companies there. India's government should consider liberalizing its labor laws by encouraging reskilling programs that could help workers become more productive and prepare them for new jobs. Encouragingly, India's National Skill Development Corporation (NSDC) is experimenting with ways to use public-private partnerships to strengthen vocational training. Coupled with sensible labor laws, such moves could quickly begin to make a difference.

4. Infrastructure. Urgent attention is needed to create more railways, roads, ports, and power-generating capacity across India. Poor infrastructure saps industrial productivity and leaves the country at a huge disadvantage compared with others. Bad road conditions, for example, limit trucks carrying cargo in India to an average distance of only about 250–300 kilometers a day, compared with the developed world’s average of 500 kilometers. Similarly, turnaround times for ships loading and unloading in India’s ports can be up to four days, compared with only 10 to 12 hours in Hong Kong.

Recently, India’s Ministry of Commerce & Industries called for the development of National Investment and Manufacturing Zones (NIMZs).¹ The encouragement of such industrial

clusters is a positive development, since they are a proven way of catalyzing the efforts of the public and private sectors to address infrastructure challenges. In the Indian state of Jharkhand, for instance, a cluster in the city of Jamshedpur attracted dozens of industrial companies that teamed up to improve the local infrastructure. The benefits extend beyond better roads, power, and water supply: companies in Jamshedpur actively collaborate to improve workers’ skills and have even, in some cases, developed shared pools of workers. The learning benefits for companies are substantial, too, as industrial clusters help spark the kinds of supplier ecosystems that help innovation thrive.

¹ For more, see the government’s recently announced National Manufacturing Policy (NMP), available at www.india.gov.in.

Targeted skill development

India’s manufacturers could learn a lot from the IT sector’s experience in promoting the large-scale development of skills. India’s IT services and business-process-outsourcing sectors together hire nearly a million new recruits a year and bring them up to speed in just months. A key factor in this success was the early recognition among Indian IT companies, back in the 1990s, that the number of engineering graduates in computer sciences wouldn’t meet the needs of the country’s burgeoning IT sector. In response, Infosys, Wipro, and other companies began hiring graduates from all engineering disciplines and using in-house curricula and faculties to build skills among new hires. That approach ultimately led to the formation of a successful network of independent, privately owned computer-training institutes, such as Aptech and NIIT.

India’s manufacturers should follow a similar path by establishing in-house training centers to promote vital manufacturing roles, including those of fitters, machinists, maintenance engineers, and welders. Some Indian companies are already taking matters into their own hands. For example, to impart vocational skills, India’s largest automaker,

Maruti Suzuki, has adopted six technical institutes across the country, some in regions with little manufacturing presence. By using the company’s own managers as faculty for some classes, Maruti Suzuki inculcates trainees with a strong feel for its culture as well. The automaker is now expanding its training programs to include employees of key suppliers.

Although training programs make good business sense, they are also increasingly necessary to get local populations to accept the establishment of a manufacturing footprint in India. Tata Motors’ partnership with the Gujarat state government to improve the skills of local workers, for example, helped the company to ameliorate concerns about the displacement of residents by the construction of a Tata Nano car factory, while giving the company access to new workers. Today, nearly 1,000 people who live within a 10-kilometer radius of this Sanand factory make Nanos. Similarly, Tata Steel has agreed with the Orissa state government to train and improve the skills of workers living near a planned steel plant in Kalinganagar. The company has pledged to give local villagers jobs in the project’s execution and operations.

Frontline workers aren’t the only ones whose skills need upgrading; India’s manufacturers must also improve those of managers. Consider the experience of the cement maker Holcim, where executives set—and achieved—such goals as significantly improving the reliability and energy efficiency of the production process, as well as other important operating metrics at the company’s Indian subsidiaries.

At the heart of this initiative is an academy the company set up in its Indian plant to help future leaders bolster their skills through a “field and forum” approach that intersperses class work with hands-on fieldwork in the form of operational-improvement projects. Similarly, Holcim trains its managers to focus performance dialogues with frontline employees on the importance of identifying the root causes of problems and of finding potential solutions through cross-functional teams. The company uses operational “war rooms” in its Indian plants to serve as a clearinghouse for the best ideas and to uncover the best contributions. In parallel, Holcim created an ambitious leadership program to support the personal development of up-and-coming manufacturing leaders.



The combination of rocketing domestic demand and the multinationals’ desire to diversify their manufacturing footprint offers Indian product makers a once-in-a-generation opportunity to emerge from the shadow of the country’s services sector. By improving their productivity and bolstering operations, they could become an engine of economic prosperity for the whole country. ○