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India, the world's R&D hot spot

Kunal Kumar Kundu

Kiran Shaw Mazumdar is the new poster girl of the Indian economy. The recent initial public offering (IPO) of Biocon, her biotechnology company, has made Kiran the richest woman in India and symbolizes the arrival of research and development (R&D) as the new star of the Indian economy.

As of now, 100 Fortune 500 companies - including Delphi, Eli Lilly, General Electric, Hewlett Packard, DaimlerChrysler and others - have put up R&D facilities in India over the past five years. GE's John F Welch Technology Center in Bangalore is the company's largest such facility outside the United States. With an investment of US\$60 million, it employs 1,600 researchers and plans to raise the number of staff to 2,400. GE Plastics has a 300-member research team in India. GE Motors India has developed an almost noiseless motor for GE's most sophisticated washing machines and is the soul sourcing point of millions of motors every year. The DaimlerChrysler Research Center in Bangalore is engaged in fundamental and applied research in avionics, simulation and software development.

The best-known Indian R&D companies are in pharmaceuticals - Ranbaxy, Dr Reddy's Labs and Sun Pharma, among others. Biotechnology is heating up, with Biocon and Shanta Biotech leading the way. Reliance Life Sciences is recognized by the US National Institutes of Health for stem-cell research. Quality, credibility, reliability and a very reasonable cost structure are what has helped India emerge as the information-technology outsourcing destination of the world, and it is now emerging as the pharma R&D hub to beat all.

India currently is giving Europe tough competition as a growing pharma R&D hub. The latest Ernst and Young study has identified India as an emerging hub for collaborative and outsourced R&D in drug development, biotechnology and chemicals. The report follows a European Commission communication that called for increased cooperation between the European Union and India in various fields, including biotechnology. "The EU is the world's second-largest center of biotechnology research activity after the USA. Indian biotechnology has been advancing rapidly in the past few years. Its next challenge is to successfully integrate the Indian biotechnology industry into the global biotechnology innovation system," noted the EC report.

Indian pharma companies are going for alternative business models to draw on competition and opportunity. They have shifted from business-driven research to research-driven business. So much so, in fact, that Indian pharma companies topped drug filings with the US Food AND Drug Administration (FDA) in 2003, having filed a total of 126 Drug Master Files, accounting for 20% of all drugs coming into the US market, higher than Spain, Italy, Israel and China. Of the 108 abbreviated new drug applications pending approval from the FDA in February, as many as 52 were patent challenges, and nearly half of these were for first-to-file (180 day market exclusivity) applications.

India's biotech sector itself is expected to generate \$5 billion in revenues and create over a million jobs in the next five years, according to Ernst & Young's 2004 "Progressions" report. As the companies' focus on accelerating productivity, collaboration is the way forward for several US and European companies faced with a resource crunch. With its abundant high quality/low cost technical manpower, India is emerging as a partner of choice.

The emergence of Indian pharma giants, taking an active place in global R&D fields, has also helped.

Indian companies have developed manufacturing processes for eight of the world's top 10 blockbuster drugs.

Branded drug	Innovator	2002 sales (\$billions)	Indian challenger/s
Lipitor	Pfizer	8.0	Ranbaxy
Zocor	Merck	5.6	Ranbaxy, Biocon
Prilosec/Losec	AstraZeneca	4.6	Dr Reddy's, Cipla
Procrit/Eporex	Johnson & Johnson	4.3	None
Norvasc	Pfizer	3.8	Dr Reddy's, Matrix
Zyprexa	Eli Lilly	3.7	Dr Reddy's
Prevacid	Takeda	3.2	None
Paxil/Seroxat	GlaxoSmithKline	3.1	Dr Reddy's, Bunyan
Celebrex	Merck	3.0	Cipla
Zoloft	Pfizer	2.7	Dr Reddy's, Cipla

Source: Chemical & Engineering News

A number of strategic overseas acquisitions took place in 2003 - Ranbaxy's acquisition of RPG Aventis' French business; Wockhardt's acquisition of CP Pharmaceuticals in the UK; and Zydus Cadila's acquisition of Alparma in France - all of which have catapulted these Indian companies into the global league. There was a lot of inbound investment as well. Multinationals like Roche, Bayer, Aventis and Chiron have made India their regional hub for advanced pharmaceutical ingredients and bulk supplies. Clinical research outsourcing is seeing fast growth too. Pfizer doubled its R&D spending in India to around \$13 million. Others such as Novartis, Astra Zeneca, Eli Lilly and GlaxoSmithKline have also committed to making India a global hub for their clinical research activities.

Less high-profile but more significant may be the mushrooming of new companies to do contract R&D for global ones. Divi's Labs, Vimta Labs and Matrix Labs are some new stars in this firmament. R&D is no longer confined to the government or big companies. It is sprouting everywhere. For example, patent applications in India have shot up from 4,000 in 1995 to almost 15,000 last year. Business Today estimates that Indian filings for US patents rose to 1,700 in 2003, up from 183 in 1997. The auto industry is another beehive of innovation. Multinational car companies originally came to India for the potentially huge domestic market. To cut costs, they had to use local components, which initially were of low quality. But soon the interaction between component manufacturers and multinationals led not just to quality improvement but innovations that nobody had dreamed of earlier. Today, Indian auto component companies are conducting computer-aided design and computer-aided manufacturing, constantly coming up with new designs that reduce costs and increase efficiency. This design savvy has made India a global player, exporting more than \$1 billion worth of components last year. And car exports have shot up to more than 100,000 in 2003-04.

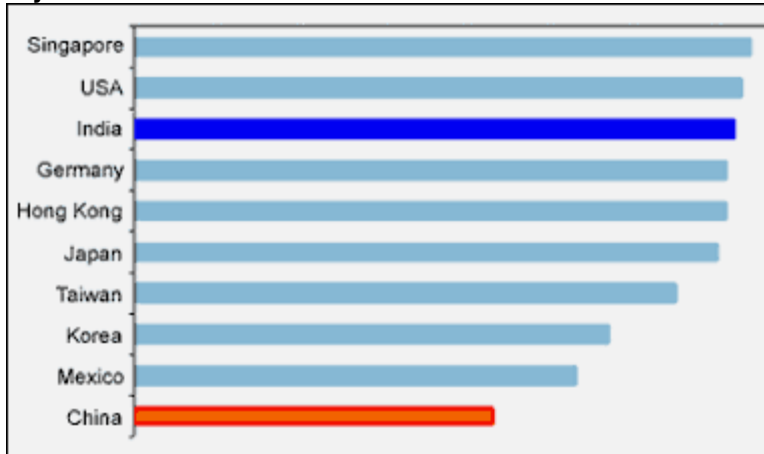
What makes India tick

India is ahead of China in terms of the proportion of its population that has attained tertiary education. According to the Institute for Management Development (IMD) World Competitiveness Year Book for 2001,

about 8% of the Indian population ranging from 25 to 34 years old had attained some tertiary education compared with 5% in China. Another edge for India is that a majority of the tertiary programs use English as the main medium of instruction. This is not the case in China. India also adds about 2.3 million bachelor degree graduates and about 300,000 engineers annually. In terms of the degree to which the university education system meets the competitive needs of the economy, IMD ranks India sixth among 30 nations, with a score of 6.2 out of 10 compared with a ranking of 25 for China, which received a score of 4.4.

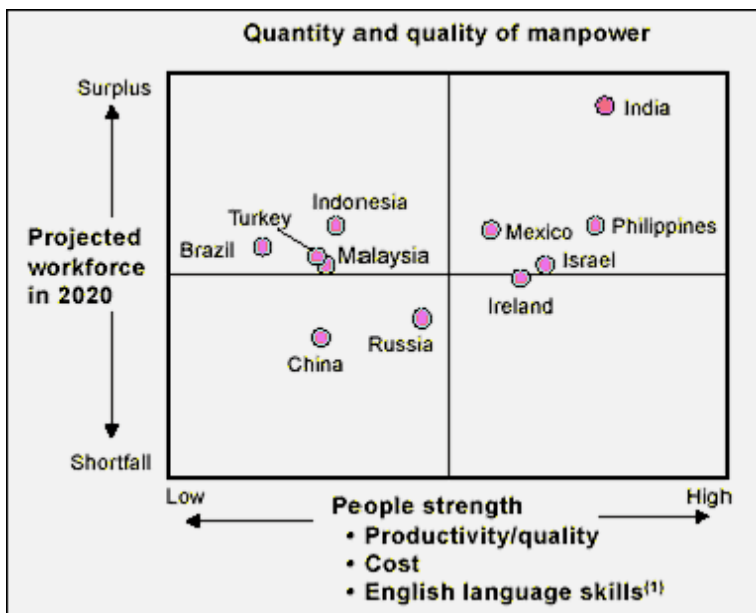
India also has a large pool of skilled labor, especially engineers, relative to its economy's needs. According to IMD, India ranks among the top three of 30 nations in terms of the availability of skilled labor. In fact, IMD ranks India No 1 in terms of the availability of qualified engineers, while China is in 29th place.

Availability of skilled labor



Source: IMD Competitiveness Yearbook, 2003

The following graph shows India's competitive advantage vis-a-vis other nations.



Note: Pakistan, Bangladesh and Vietnam have not been represented for lack of reliable data on productivity and cost of service employees.
 Source: **BCG**

In the bad old days of the license-permit raj (the system of allotting industrial and commercial permits to expand or initiate production ventures under government regulations), companies had no incentives to

conduct R&D. Getting foreign collaboration approval ensured monopoly profits for years. But the new competition brought in by economic liberalization in the 1990s made R&D an essential tool to competing and surviving. Other miracle Asian economies such as South Korea and Taiwan used labor-intensive manufacturing as their launching pad, taking advantage of their low wages. Later, they moved up the value chain. India missed the bus in terms of labor-intensive exports, but has now caught the jet plane of brain-power exports. This began in computer software. It then spread to design-intensive manufacturing. And it is now sparking an R&D revolution.

Kunal Kumar Kundu is a senior economist with a leading bilateral Chamber of Commerce in India. He has a masters in economics with specialization in econometrics from the University of Calcutta.