



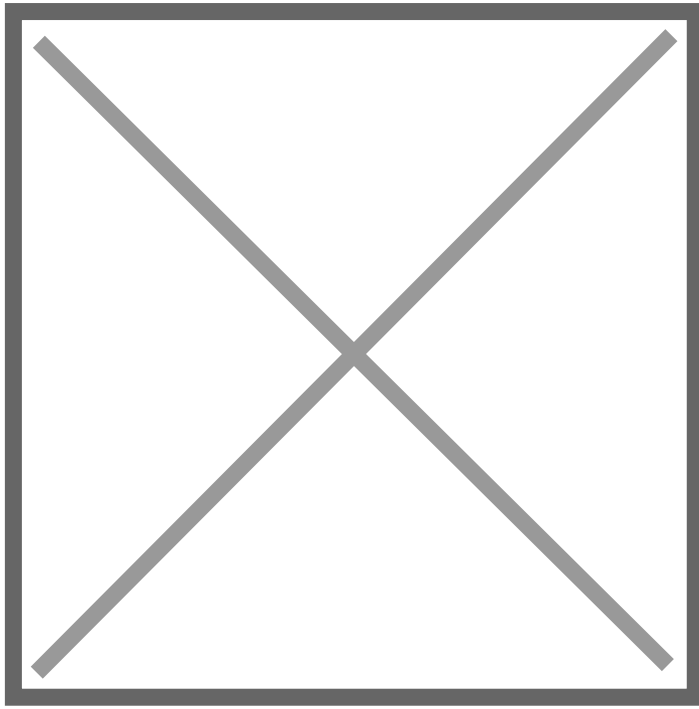
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Technoglobalism: The Indian Opportunity & Challenge

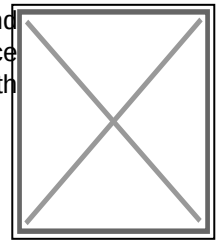
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Technoglobalism: The Indian Opportunity & Challenge

The term "Techno-globalism" means a strong interaction between the internationalisation of technology and the globalisation of the economy. Technoglobalism has created a widening of cross-border interdependence between individual technology based firms as well as economic sectors. Techno-globalism provides both challenges and opportunities for India.

In recent years, multi-sourcing of innovations has gained enormous prominence. There is an increasing pressure on shortening international market penetration times for new products, on shortening R&D times and on decreasing the market life times for new products. Innovations are beginning to have multiple geographical and organisational sources of technology with increasingly differentiated and innovation specific patterns of diffusion. R&D in high-technology industries such as biotechnology, microelectronics, pharmaceuticals, information technology and new materials has become highly science based. The costs of doing R&D are also increasing phenomenally. The high technology goods have doubled their share of world merchandise in the last 20 years while at the same time dropping the share of primary products by half. More than half of the GDP in major OECD countries is attributed to the production and distribution of knowledge.



There has been a progressive weakening of the strategic position of corporate central laboratories within large firms. The firms around the world are becoming very selective with internal developments focused on critical products and processes. They complement their internal efforts with external technology acquisition on a global basis.

Global networks

Creation of seamless laboratories around the world is also being helped by the evolution of global information networks. Indeed, these networks are allowing the real-time management and operation of laboratories in any part of the world. Thus, companies are gaining a competitive advantage by using the global knowledge resource and working with a global time clock. The trend is also being fuelled by the shortage of R&D personnel in some emerging high technology areas in industrialized countries. The companies have to bridge that demand-supply gap in skills by external outsourcing. Obtaining access to high-quality scientists, engineers and designers is on the top of the agenda of many major companies now.

The demographic shift in the western world means that a country like India with its relatively favourable demographic profile with a large proportion of working and talented young people can become a global innovation hub, from which not only outsourcing of innovation will be done, but in which R&D based innovation centers will be set up by the western companies. Indian advantage will not just be cost but cost-cum-competence, considering the huge talent pool. A German software company set up in Bangalore recently showed that the ideas generated per employee were on the average three and a half

times higher in their outfits elsewhere in the world!

The winds of technoglobalism are bringing in a silent revolution in India. It is rapidly becoming a global R&D hub. More than 100 companies around the world have set up their R&D centers in India just during the last five years. The biggest would be the R&D center of General Electric (GE) at Bangalore. Its current size of 1600 employees will increase to around 2400 employees, making it the second largest R&D centre of GE in the world.

What are the real and unique opportunities that India offers for becoming a true global R&D platform? The cost of doing R&D is fraction of that in the developed world. Last year, the entire spend of India's R&D was \$5 billion, less than the R&D budget of one company like Pfizer alone! A dollar in India delivers so much more than anywhere else in the world. There is a world-class technical manpower. India has over 250 universities, 1500 R&D units, several IITs and engineering colleges. It has the world's largest chains of publicly funded R&D institutions. This is an extraordinary rich resource, which was underutilized even within the Indian space of R&D opportunity. India's emergence as a global R&D hub has a social, economic, political and strategic significance.

But in what way will this help India? Can we not argue that the real benefit of all this will be to the foreign firms and not to the Indian firms? In other words, the migration of talent that was across the national borders will be now within India itself. Is it good or bad for India?

What would be the impact of this on "brain drain"? One school of thought is that there will be gradual reversal of brain drain. A normal Indian scientist would love to stay in India, provided he is given a challenging job here. He would love to have his children grow up here in India. All this would become possible for him as India becomes a great R&D web, with world's best companies doing their most challenging R&D here in India, whether it is Intel designing its latest chip or GE designing its latest aero engine!

As India become a global R&D web the demand on science will increase enormously. This will lead to the demand on the creation of new human capital, both in numbers as well as quality. Production of 5000 PhDs annually is too small a number for India, which is one sixth of humanity! This number had not grown, since there was no demand on science in Indian industry with some notable exceptions. This number can be raised to 25,000 PhDs or even higher. This will augur well for India.

Another implication is that there will be enhanced competition among institutions and firms to seek the best brains to work for them. This will automatically mean that the institutions will really have to create an intellectually stimulating, rewarding and hassle free environment to keep these researchers with them. Competition will draw the best from everyone and will benefit everyone.

The Indian industry itself will benefit in the long run. The researchers who will work in these non-Indian innovation enterprises will acquire insights and skills, which would be impossible to acquire otherwise. All such Indians reside abroad today. No more so. In the coming years, they will prefer to reside and work in India. There will be enormous benefits that the Indian industry can reap out of this supply of superior R&D leadership

The shift to India as an R&D destination will take place in several other areas. Take drugs and pharmaceuticals. The concern after the countries become TRIPS compliant in terms of accepting product patents after 1.1.2005 is that of access to cheap and affordable drugs. The R&D infrastructure in India provides a low cost option just as the large patient pool, trained doctors, good clinical diagnosis capacity and genetic diversity of the Indian people provide opportunities for clinical research. The increased emphasis on diseases for the poor coupled with the setting up of global health funds implies that there is a scope that India can become a destination of "global knowledge for global good through global funding". This offers opportunities for India pharma to create both "financial capital" as well as "social capital".

Another implication is linked to India's positioning in the comity of nations. Imagine in 15 to 20 years time, around 25-35 percent of the new knowledge that will determine critically the industrial competitiveness of major firms around the world being produced in India. Take this fact along with the crucial dependence of the big economies on this new knowledge. It is obvious that India's interest in international fora cannot simply be ignored by these large economies, as all this critical knowledge capital will find its abode in the human capital that will reside in the innovation centres located in India.

The impact of technoglobalism in India so far indicates that access to highly talented human capital is going to be the most important factor. The challenge is how to continue to tap the incredible dynamism of global R&D so that Indian institutions and companies can assume the leadership in creating high-wage jobs and building new industries. This will require a sustained commitment to investment in science and technology, to strengthen research infrastructure, development of capabilities and means to rapidly integrate new knowledge and technologies into products and gain access to growing global sources of innovation, development of technology centers and government incentives and protection, in particular protection of

intellectual property extended to science-based high technology inventions. Government will have to play an increasing role to influence the turn of events, both positively and proactively.

Goldman Sachs predictions show that by 2050 India will be the third largest economy after China and the US. By 2050, India has the potential to occupy the first position amongst the knowledge producing centers in the world.