2.7 Transnational Business and Technological Adjustment: An Indian Case Study

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The pace of technology change is rapidly increasing in the developed economies, bringing with it particular pressure on business to innovate and successfully manage shortening life-spans of products and processes. Information about technology change is, furthermore, rapidly communicated world-wide. This puts into stark relief the relative achievements and failures of different communities and political philosophies, and highlights the dichotomy between the progress of the developed and un(der)developed nations.

The flow of technology and evolution of transnational businesses in developed countries and newly industrialised countries such as South Korea, Mexico and Brazil is well documented. Developments in India and China, where a high degree of self-reliance, slow growth and modest international trade has avoided hyper-inflation and hyper-indebtedness but rendered their economic infrastructures relatively obsolete and fragile, have remained something of an enigma. This paper records the experience of one transnational corporation in India, with particular reference to a classic example of technological adjustment requiring the establishment of a local R&D centre.

The Indian Scene

Industrial development in India since 1947 is marked by distinct and well-defined phases. Up to around 1960, India concentrated on building an industrial infrastructure virtually from scratch. Since the private sector was insignificant at that time, much of this development was undertaken in the public sector. While such a strategy allowed this basic infrastructure to be developed with the limited resources available, persisting with it has turned out to be self-defeating and has led to widespread obsolescence and inefficiency. The Indian private sector has subsequently grown moderately well, mainly in an environment of shortages and absence of competition. The flow of advanced technology and foreign investment has been exceedingly modest, although this had started to change very slowly in the 1980s, particularly in the electronics industries.

During the 1960s, India's major achievement was an impressive increase in agricultural output and productivity. The use of new crop varieties and new transplanting techniques by a tradition-bound farming community are examples of significant technology adjustment. Economic growth has picked up significantly in the 1980s, despite these structural obstacles. India's high propensity rapidly and successfully to absorb transnational technology has been demonstrated in a fairly wide range of enterprises, such as long-range weather forecasting and rural telecommunications.

The success of technology adjustment and adaptation in India is critically influenced by the priorities , abilities and outlook of the local population. Fortunately, the basic education system in India has remained strong and continued to meet the rising demand for engineers and scientists. The use of English has also given ready access to the West. The one area of unmitigated failure has been India's inability to slow down significantly the population growth rate, which now threatens the achievements of the past forty years.

Although many foreign companies which were in India before 1947 have continued to grow and generally prosper, investment by new transnational corporations has been negligible. With the possible exception of the Bhopal disaster, India's competence in managing highly complex and advanced technologies is high. Complex technologies have also been brought to India and made more efficient and environment-friendly by Indian technologists. In contrast, poor management in large public sector units has led to obsolescence in heavy industries and the infrastructure.

It is therefore a great pity that India, despite many advantages, is being gradually left behind as significantly more resources and technologies flow into nearby countries such as Thailand, Indonesia and Malaysia. India's growth has been hampered more by her failure to recognise and take advantage of geo-economic realities and her own inherent strength, than by technology adjustment failure. Nevertheless, realities of economics and market forces are likely to force pragmatic changes even in India, sooner rather than later.

The Unilever Experience

The Unilever subsidiary Hindustan Lever (HL) is acknowledged as one of the oldest, largest and most successful transnational corporations in India. Unilever's pioneering of successful industrial R&D in India has been crucial to this success. Since the establishment of Unilever's R&D centre in India in 1958 was not part of a global strategy per se, it is worth recalling the circumstances which led to its establishment.

In the early 1950s, the consumer goods business of HL was flourishing. It manufactured and distributed well-known household products in both rural and urban markets. However, some of the key raw materials such as palm oil, tallow and certain speciality chemicals and perfumes had to be imported, as were indeed many requirements of different Indian industries during that period. Principally due to a significant fall in India's international trade, the country faced a serious shortage of foreign exchange in the 1950s. Consequently, imports were either drastically reduced or stopped altogether, threatening the future of HL and other import-dependent industries.

HL's strategic analysis of how to deal with this situation led, firstly, to the introduction of petrochemical-based detergents, which had started growing rapidly in the West after World War II, to the Indian market in the late 1950s. In retrospect this may appear obvious. However, the raw materials, chemistry and technology for manufacturing detergents are entirely different from traditional soap-making. Furthermore, the Indian housewife had, through generations, become used to washing clothes with tablets of soap under running water or in village streams. Washing with the new detergent powder needed changes to this traditional daily habit. The success of detergents around the world is, of course, now a matter of history but its origins in a new market such as India provide a fascinating illustration of adjustments of both technologies and products.

HL also decided, secondly, to explore the use of indigenous raw materials as import substitutes to avoid losing its large and pre-eminent natural soap business altogether. Indigenous edible oils were not available for soap-making because India had swung in a few years from being a net exporter of edible oil to being a net importer. Although Unilever had a number of R&D establishments in Europe, they were not equipped to explore raw materials indigenous to India and of urgent need to the Indian business. However, a high-quality research infrastructure and skills were available locally. Consequently, in 1958 Unilever established the HL R&D Centre, its first outside Europe, with an immediate brief to develop technologies to solve its import restriction crisis. This initiative turned out to be one of the most successful import substitution efforts of its time and permanently changed the technology culture and the climate of innovation and self-reliance in HL. It provides a classic example of development by a transnational corporation of a local strategy involving technological adjustment and an instructive contrast to the more direct technology transfer in the detergents case.

Technologies were developed for upgrading a wide range of non-conventional, inedible vegetable oils such as rice bran, linseed, castor, sal, karanja and kusum for use in the manufacture of toilet soap. By thus completely substituting the traditional oils (tallow and palm oil) which are imported, the country stands to save large sums of foreign exchange. In 1989 alone Hindustan Lever used 110,000 tonnes of unconventional oils in soap making, valued at over £15 million in foreign exchange.

Furthermore these developments have resulted in the generation of a large amount of indirect employment. It is estimated that, at current levels of usage of these oils, more than 150,000 additional jobs have been created in the collection of the seeds and the subsequent oil extraction. Just as importantly, these jobs have been created in the least developed parts of the country. A further technological adjustment, also dependent on import substitution, has made possible the production of structured soaps with a performance equivalent to conventional soaps at significantly lower levels of total fatty matter. It is estimated that about 350,000 tonnes of oils will be saved during the next five years, bringing a foreign exchange saving of over £60 million.

The cultural and technological issues involved were quite complex. Innovations involving basic science and technology were, at that time, primarily in the domain of Government and academic laboratories, and commercial exploitation of indigenous technology was virtually non-existent in Indian industry. Setting up an industrial R&D establishment, forging relationships with peer groups and networking with Government and academic laboratories in India and with Unilever laboratories in Europe was time-consuming and laborious. The process of innovation transfer from laboratory to pilot plant turned out to be a fairly complex process. Associated capital expenditure decisions were, by their very nature, high-risk propositions. Invariably the time estimated between discovery and exploitation was overshot. However, the eventual commercial rewards exceeded even the most optimistic forecasts.

Many of the innovations from HL's R&D Centre have subsequently found application in other Unilever companies and the laboratory itself has branched out into various other disciplines. Today, patents, publications and awards bear testimony both to the success of its scientists and to the powerful advantages of being part of Unilever's global R&D network. The research centre continues to attract some of the brightest Indian post-doctoral scientists from around the world. Many of the scientists, after a successful stint in the laboratory, have moved to other parts of the HL business in senior management positions and there is a continuous enriching exchange of scientists with other Unilever laboratories.

Concluding Remarks

The history of HL in India is but one example of the rewards that can flow from appropriate technology transfer or technology adjustment, even in an environment that is only moderately enabling. Given India's regulatory and structural obstacles, few investors other than transnational companies such as Unilever, with an existing large stake in India, had both the incentive and ability to profit from investment in the country after 1947. In contrast, developing nations such as Thailand, Malaysia and Indonesia have attracted large-scale foreign investment and the effects of the resultant technology transfer on their economies are obvious. The combination of free market forces and advanced communication technology will, in time, force the pace of political and economic change in India, China and elsewhere. In India's case the educational, R&D and language infrastructures are already in place to capitalise on the investment that would flow from a more favourable government approach to open-market practices.

The Author

Dr Ashok S Ganguly graduated as a chemist from Bombay University in India, followed by post-graduate studies at the University of Illinois in the USA. He joined Hindustan Lever (subsidiary of Unilever) in 1962, working as a research scientist before transferring to production management in 1971 and becoming Chairman in 1980. Since May 1990 he has been Director (Research and Engineering) on the Board of Unilever PLC in London. He has been involved in many professional and national organisations in India (including member of the Science Advisory Council to the Prime Minister and of the Governing Council of the Council of Scientific and Industrial Research, and President of the Bombay Chamber of Commerce and Industry 1984-5) and in 1987 received the Padma Bhushan (one of India's highest honours) for his contribution to public service.

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