

## Brain Gain Hypothesis: Indian IT-Entrepreneurs

By Uwe Hunger

For decades, migration research has concentrated on the negative impact the immigration of skilled elites has on the countries of origin. The brain drain long experienced by many developing countries has been seen by many migration and development theories as a final outcome of migration. Yet, recent developments have suggested that a return migration of previously “lost” elites from developing countries – the quasi-reversal of brain drain – is possible. Empirical research has shown evidence to suggest a positive relationship between economic development and the return migration of Third World elites (brain gain), including the establishment of social networks through migrant diasporas (Brown 2000). There have been several studies and reports (UNDP 2001a) on highly skilled migrants, mainly scientists, from developing countries and their links to their home country (Gaillard / Gaillard 1997; Johnson/ Regets 1998; Meyer 2001), that indicate the positive effects or benefits of brain gain. A prominent example is India, which has been one of the biggest recipients of international development aid and has been regarded as a country suffering the most from brain drain. Today this country is beginning to profit from the re-migration of its experts previously “lost” to the USA.

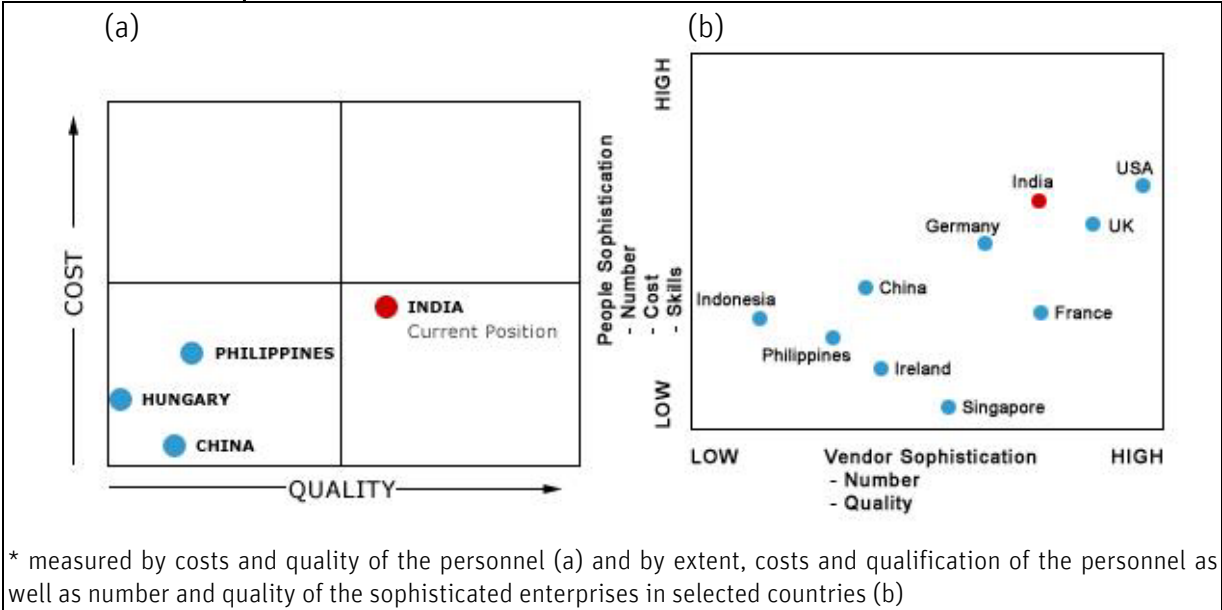
### **Economic and political reasons for the success of the Indian IT industry**

India is a prime example of how Third World elites (former brain drain emigrants) may contribute to the development of their home country. Since the beginning of the 1990s, a promising development has been observed within the field of information technology (IT) in India, which is still among the 50 poorest countries of the world – measured by the Human Development Index (HDI) of the United Nations (cf. UNDP 2001 b). Although it is still a developing country, India now appears to be one of the most attractive and dynamic centers for technology development worldwide. The Indian government hopes that the country will become one of the leading nations in information technology (Lakshminarayan 1992). Their aim is to become one of the world’s largest manufacturers and exporters of technology products, a “global IT super power” of the 21st century. Leading development aid institutions (e.g. World Bank 1994) estimate that India’s chances in reaching this goal are high. The role of information technology in India is seen as an opportunity for the country to overcome poverty and underdevelopment (UNDP 2001a).

The software industry is the motor driving the upswing in the Indian technology sector. In the fiscal year 1999/2000, total revenues within this industry were 5.7 billion US Dollar. In the

past fifteen years the software industry has accounted for 400,000 new jobs. By 2008, it is estimated that additional two million jobs will have been created within this sector and this would then represent more than 7.5 per cent of the entire Indian GDP. Foreign investments (which are urgently needed in India) in the software sector alone are expected to increase by the year 2008 up to five billion US Dollar. This amount alone would exceed the total amount of foreign investments in the entire Indian economy in 1998 (NASSCOM 2001). Information technology is also being used to modernize the economy and administrative capacities of the government.

**International Competitive Position of the Indian Software Sector 2001\***



The figure illustrates the competitive advantage: India appears to be in a more favourable position than other leading industrialized countries such as Germany. Only in the USA the premises are better than in India (Source: NASSCOM).

Previous literature has attributed the success of information technology in India to two factors (Heeks 1996, Bajpai and Shastri 1998). The first factor is economic, and it has to do with the competitive advantage of low labour costs (approximately a quarter of the US level) and the high level of qualification of employees (which nearly corresponds to that of the US). Policy changes regarding the liberalization of the Indian market constitute the second, political factor. The shift from a self-reliance strategy to an open market economy at the beginning of the 1990s (Wagner 1997) and the prioritization of information technology as a key Indian industry, have lead to an increase in the flexibility of the software industry. This has in turn meant that India’s centres of technology are of the highest international technical standard and the number of scientific and technical specialists is second only to the US.

**Indian brains and capital are returning from the USA**

In addition to these two factors, a third factor connected to social migration may be responsible for the success of information technology in India. A large portion of top level management positions in the Indian software sector are filled by Indians who left the country and immigrated mainly to the USA in the 1960s, 1970s and 1980s (former brain drain Indians). At the beginning of the 1990s, after the introduction of the Indian economic liberalization policy, many of these elites built up networks or enterprises in India either by re-migrating to their

home country or – when staying in the US – through branches of their US-companies. In 2000, ten out of the 20 most successful software enterprises in India (representing more than 40 per cent of the total revenues within the industry) were set up and/or are managed by former Non-Resident Indians returning from the USA. Four additional enterprises (Mahindra-British Telecom, IBM, i-flex, Cognizant Technology Solutions) are joint ventures between Indian and foreign companies. All of them have former Non-Resident Indians in their top management. The remaining six companies are old-established Indian companies (Tata, Wipro, HCL, and their respective sister companies) and have diversified into IT. Five of these six companies also have Non-Resident Indians in their top management. Today, 19 of the 20 top software companies in India have Non-Resident Indians in top level management positions, and an explorative internet survey shows that half of all Indian enterprises within the entire software industry were founded and/or managed by them.

Furthermore, Non-Resident Indians returning from the USA founded various organizations contributing considerably to the upswing of the Indian software sector, such as the “National Association of Software and Service Companies” (NASSCOM). This central organization representing 96 per cent of all software enterprises has played a key role within the economic revitalization of India (Heeks 1996). Since the beginning of the software boom it functions as the central employer organization of the sector and – as a lobby organization – successfully influences the political initiatives. A second influential organization is “The Indus Entrepreneur” (TIE), which was established in Silicon Valley, California, at the beginning of the 1990s. The organization tries to help young Indian entrepreneurs to establish new enterprises and to attract venture capital.

The fact that the upswing of the Indian software industry is considerably linked to export opportunities in the USA, is further evidence stressing the importance of Non-Resident Indians in the USA. In the year 2000, 70 per cent of the total revenues of the Indian software economy were due to export revenues. 62 per cent of these export revenues came from North America. It can be hypothesized, that a majority of the export deals are based on marketing contacts made by Indians in the USA, who were able to convince US-customers of the quality and profitability of Indian software products. Today more than half of all Indian software enterprises (57 per cent) have subsidiaries in the USA (front office) that market Indian products in the US which are carried out in the development centers back home in India (back office).

### **India as an example**

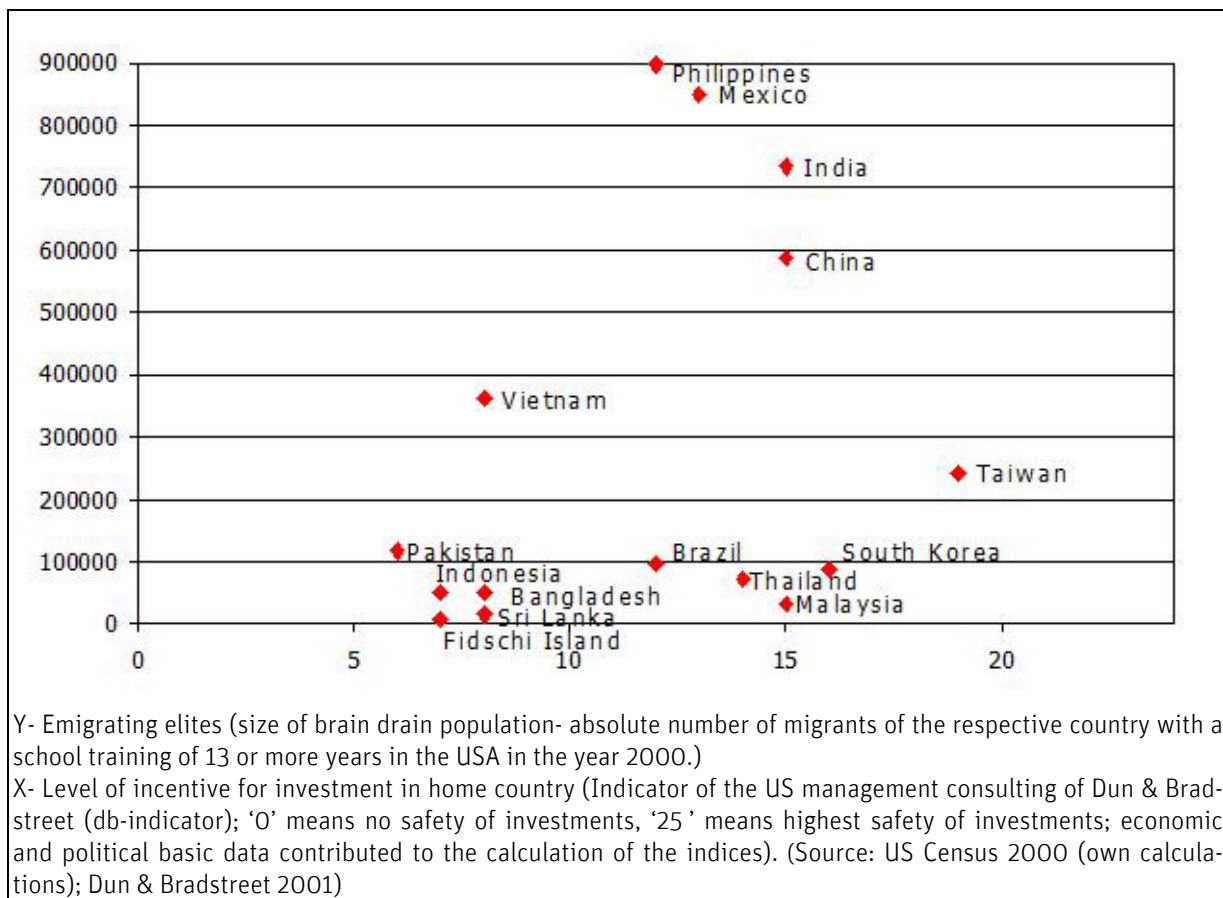
In the past few years a remarkable economic upswing has taken place in the IT-sector providing new jobs in India with potential positive spill-over effects for its overall economy. This development coincides with the return of elites who had previously migrated to the US. The data show a causal relationship between the return migration of elites and the success of the Indian software industry. Therefore, operating on the assumption that brain gain has positive effects on the economy of developing countries, it seems to be promising to investigate how it might be initiated and supported. Hypothetically there are several ways in which emigrating Third World elites may contribute to economic development in their home country. In the case of India, IT-experts who emigrated to the US have successfully been able to transfer their expertise in establishing and managing IT-enterprises in India. In emigrating to developed countries, highly skilled individuals have been able to increase and enrich their knowledge while studying at various institutions of higher learning and/or working in various professional organizations such as corporate, hospital, and government administrations. Thus, the possibility

that the human capital is reacquired is essential to any discourse concerning the positive effects of brain gain.

In addition to brain gain, the remigration of elites is also likely to coincide with an increase in capital revenue flows into the developing country. In the case of India, for example, emigrant elites have also established enterprises in the US, and then expanded their economic activities to include India. Financial capital transfers of this kind might be more important to the development of India than the usual remittances from migrants to their families and friends in the home country. Based upon the assumption of brain gain it is likely that financial capital is invested more effectively by the (re)migrated highly-skilled elites than by domestic elites whose human capital has not been increased abroad. Thus, (re)migrated Third World elites might even have advantages over other foreign investors, considering that the former have an insider's knowledge of investment risks within the developing country. There is also the potential for increased social capital. This refers to the availability of profitable contacts and the affiliation to important networks in a developed country. Thus, (re)emigrating entrepreneurs may provide access to the markets in industrialized countries which are important for economic revitalization. In this case (re)migrating elites would function as "bridge-heads" between developed and developing world opening new investment channels for the developing country.

Whether the potential brain gain is able to offset all the negative effects of brain drain remains questionable as is the case in India: a country which still suffers from an estimated loss of 2 billion US Dollars per year due to the effects of brain drain (UNDP 2001a). Nevertheless, the example of India shows that the existence of brain drain is (at least) mitigated by the remigration of, and/or establishment of networks by, Indian elites. It is conceivable that other developing countries, suffering from brain drain, might look to India to see how they can also benefit from brain circulation and the positive effects of brain gain. Potential obstacles to brain gain are the possible lack of incentives for return migration. Many emigrated elites are not interested in returning to their home, especially if they have achieved a standard of living abroad that is (far) beyond the usual standard of living in their home country.

## “Brain Drain”-Populations and Safety of Investments



The figure illustrates the problem faced by many 'brain drain countries': high levels of elite emigration, combined with low incentives for return.

On the other hand, countries such as Taiwan have high levels of safety concerning investments, which has meant that return migration for the purpose of investing in the home country is particularly attractive for Taiwanese migrants. In this way, the boom in the Taiwanese technology sector in the 1990s was heavily influenced by Non-Resident Taiwanese returning from the USA (Chang 1992; Lin 1998). Other comparable examples are China (Saxenian 2001), and South Korea (Bang-Soon 1992). On the other end of the scale are found countries such as Mexico and the Philippines, which particularly suffer from the effects of brain drain, yet have few incentives to gain significant return migration. To counter this, it would be necessary to increase the safety of investments (politically and economically speaking), a step which the Mexican government has started working towards (Ellingwood 2001).

The example of India demonstrates that the positive effects of brain gain can be supported – at least to a certain extent – by government policies. The Indian government has not only invested a great amount of money in education, but has also been able to encourage lost elites to invest in the economy through reforms which have liberalized the economy. Future research should focus on investigating the effects of “brain gain” and how governments, suffering from brain drain, might initiate and accelerate this process.

## Literature / Links

Aneesh, A. (2001): Rethinking Migration: On-Line Labor Flows from India to the United States. In: W.A. Cornelius, T.J. Espenshade, I. Salehyan (Ed.): The International Migration of the Highly Skilled. Demand, Supply, and Development Consequences in Sending and Receiving Countries. San Diego, CCIS Anthologies 1, pp. 351-372.

Asha, [www.ashanet.org](http://www.ashanet.org).

Bajpai, N./ Shastri, V. (1998): Software Industry in India: A Case Study. In: Development Discussion Paper No. 667, Harvard Institute for International Development.

Bang-Soon, Y. (1992): Reverse Brain Drain in South Korea. In: Studies in Comparative International Development, pp. 4-26.

Bhagwati, N. (1983): International Migration of the Highly Skilled: Economics, Ethics and Taxes. In: R.C. Feenstra (Ed.), J. Bhagwati: International Factor Mobility (Essays in Economic Theory, Vol. 2), Cambridge, Mass./London, pp. 57-70.

Bhagwati, Jagdish N. (Ed.) (1976): The Brain drain and taxation: theory and empirical analysis. Amsterdam, New York.

Brown, M. (2000): Using intellectual diaspora to reverse the brain drain: some useful examples. In: ECA/IDRC/IOM (United Nations Economic Commission for Africa, International Development Research Centre, International Organization for Migration) (Ed.): Brain Drain and Capacity Building in Africa, pp. 90-106.

Chakravartty, P. (2001): The Emigration of Highly Skilled Indian Workers to the United States: Flexible Citizenship and India's Information Economy. In: W.A. Cornelius, T.J. Espenshade, I. Salehyan (Ed.), The International Migration of the Highly Skilled. Demand, Supply, and Development Consequences in Sending and Receiving Countries, San Diego, CCIS Anthologies 1, pp. 325-350.

Chang, S. (1992): Causes of Brain Drain and Solutions: The Taiwan Experience. In: Studies in Comparative International Development, No. 1, pp. 27-43.

Gaillard, Jaques / Gaillard, Anne Marie (1997): The International Mobility of Brains: Exodus or Circulation? In: Science, Technology and Society, 2(2), pp. 195-228.

Galeano, Eduardo / Belfrage, Cedric (1998): Open veins of Latin America. Five Centuries of Pillage of a Continent. New York: Monthly Review Press.

Heeks, R. (1996): India's Software Industry. State Policy, Liberalisation and Industrial Development. New Delhi.

Hillmann, F./Rudolph, H. (1996): Jenseits des brain drain. Zur Mobilität westlicher Fach- und Führungskräfte nach Polen. In: Discussion Paper FS I 96-103, Social Science Research Centre Berlin, Berlin.

IMF (1998): How Big is the Brain Drain. In: IMF Working Paper 98/102 (written by W.J. Carrington and E. Detragiache), Washington D.C.

Johnson, Jean M./Regets, Mark C. (1998): International Mobility of Scientists and Engineers to the United States – Brain Drain or Brain Circulation? In: National Science Foundation Issue Brief. NSF 98-113.

Kaiser, Martin/ Wagner, Norbert (1991): Entwicklungspolitik. Grundlagen, Probleme, Aufgaben. Bonn.

Ladame P. (1970): Contestée: La circulation des élites. In: International Migration Review, No. 1/2, pp. 39-49.

Lakshminarayan, N. (1992): Indian Software Production for the World Market. In: G. Cyranek/ S.C. Bhatnagar (Ed.), Technology Transfer for Development. The Prospects and Limits of Information Technology, Neu Delhi, pp. 118-128.

Ellingwood, Ken (2001): Mexican Emigrants Official Touts Plan to Head Off Exodus of Job-Seekers to U.S.. In: LA Times, August, 10, 2001, pp. B10.

Lin, Otto (1998): Science and Technology Policy and Its Influence on Economic Development in Taiwan. In: H.S. Rowen (Ed.): Behind East Asian Growth. The Political and Social Foundations of Prosperity, London.

Meyer, Jean-Baptiste (2001): Network Approach versus Brain Drain: Lessons from the Diaspora. In: International Migration Vol. 39 No. 5/2001 Special Issue International Migration of the Highly Skilled, pp. 91-110.

NASSCOM (2001): The IT Software and Services Industry in India. In: Strategic Review 2001. Neu Delhi, [www.nasscom.org](http://www.nasscom.org).

Rostow, Walt W. (1960): Stages of Economic Growth: a non-communist manifesto. Cambridge.

Saxenian, A (2001): Silicon Valley's New Immigrant Entrepreneurs. In: W.A. Cornelius, T.J. Espenshade, I. Salehyan (Ed.): The International Migration of the Highly Skilled. Demand, Supply, and Development Consequences in Sending and Receiving Countries. San Diego: CCIS Anthologies 1, pp. 197-234.

Senghass, Dieter (Ed.) (1974): Peripherer Kapitalismus. Analysen über Abhängigkeit und Unterentwicklung. Frankfurt a.M.

The Indus Entrepreneurs, [www.tie.org](http://www.tie.org).

UNDP (2001a): Human Development Report 2001, Making New Technologies Work for Human Development. New York, Oxford.

UNDP (2001b): Human Development Indicators. New York, Oxford.

Wagner, C. (1997): Politischer Wandel und wirtschaftliche Reformen in Indien, Rostocker Informationen zu Politik und Verwaltung 7. Rostock.

World Bank (1994): Exploiting Information Technology for Development, A Case Study of India. In: Discussion Paper N. 246 (written by N. Hanna), Washington D.C.

State: December 2009

The original version of this article was first published in the Journal of Comparative Policy Analysis, Vol. 6, No. 2, 99-109, August 2004. For the full version, please view [www.jcpa.ca](http://www.jcpa.ca).

The Online Handbook Demography of the Berlin-Institute is supported by

**Robert Bosch Stiftung**