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**The “Brain Gain” Hypothesis: Third-World Elites in
Industrialized Countries and Socioeconomic
Development in their Home Country**

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The “Brain Gain” Hypothesis. Third World Elites in Industrialized Countries and Socioeconomic Development in their Home Country

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Idea and goal

The basic idea of the “brain gain” hypothesis is, that intellectual and technical elites from the Third World who emigrated to an industrialized country represent a potential resource for the socioeconomic development of their home country. To date, development and migration theories state that the emigration of elites from developing countries has almost exclusively negative impacts on the Third World. This loss of important intellectual and technical resources is labeled with the catchword “brain drain”. By modernization theory as well as by dependence theory this “brain drain” is considered to be one of the most important causes of the under-development in the Third World. The “brain gain” hypothesis expands this perspective by predicting long-term positive effects in case of a return or network building processes of the emigrated Third World elites. In addition, the new hypothesis attempts to show *how* such a resource loss (“brain drain”) can be converted into a long-term resource profit (“brain gain”) for the developing country. Thus, “brain drain” is not seen as the (dead) end of a negative development that intensifies the economic and social crises of developing countries. Instead, it is considered a temporary stage

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within a long-term process with the possibility of a final resource profit for the developing country.

Theoretical assumptions

The “brain gain” hypothesis is based on two basic assumptions:

- Firstly: the Third World elites that emigrated to an industrialized country are able to play an important role in the development process of their home country through return migration and/or transnational networks (in the following shortly: remigration). This potential contribution of emigrated elites to the development process of their home country is (at least) relevant.
- Secondly: It is possible to give the emigrated elites of a developing country sufficient incentives to remigrate even if they have already been living abroad for a long time and have not yet built up any productive contact to their country of origin. Policy makers can intentionally initiate and amplify the positive development impulse of remigration mentioned in the first assumption.

Ad 1) The assumption that emigrated elites are able to play an important role in the development process of their home country is based on three arguments deduced from previous development and migration theory:

- Firstly: The argumentation of the “brain drain” research is based on the premise that the migration of the “brightest brains” of a developing country has negative impacts on its socioeconomic

development. This assumption is based on the findings of the “New Growth Theory” that states that the size and the quality of endogenous factors, e.g. the human capital stock, correlates positively with the degree of economic growth. If the human capital stock of a (developing) country decreases due to the emigration of elites, then the (weak) economic dynamics in this country decreases and results in a stagnation and/or a regress that in extreme cases can lead to the breakdown of entire sectors (which has been the case in some African countries).

The “brain gain” hypothesis reverses this conclusion and deduces, that through a remigration of elites the human capital stock increases and so does the potential growth of the developing country. The hypothesis, however, does not only assume, that the human capital stock is just increased by the exact amount of the initial loss (quantitative argument), but presumes an additional qualitative gain acquired through the experiences gathered by living in an industrialized country (qualitative argument). This assumption acknowledges that “brain drain” migration is always a migration of elites who increase their human capital through studying at universities and/or working in professional organizations, such as enterprises, hospitals or democratic administrations, and - in the case of the remigration - insert this increment to the development process of their country of origin (human capital argument).

- Secondly: Besides the human capital dimension the first basic assumption of the “brain gain” hypothesis contains also a financial capital dimension. It is not only assumed that the human capital is increased by the remigration of the elites, but also that financial capital transfers into the developing country are likely. This argument is based on findings of migration research, that well educated migrants are able to attain positions of high status in industrial societies which

enable them to accumulate capital. So far financial capital was mainly transferred through remittances from the migrants to their families and friends in the home country (IOM 1999). The “brain gain” hypothesis, however, extends this idea and assumes that this capital can also be transferred by investments in the Third World personally managed by the migrants (financial capital argument).

Synergy effects of transfers of financial and human capital are to be expected since the accumulation of financial capital in a foreign country presupposes a specific amount of human capital. It can be assumed that returned migrants will probably invest their capital with advanced economic know-how that they have gained in the industrialized country. Furthermore, it is conceivable, that capital can be invested more effectively by returned migrants than by domestic elites who were not able to increase their human (and financial) capital abroad (advantage over investing native elites). It is also possible that returned migrants are able to make better investments in their country of origin than foreigners with the same (or even higher) amount of human capital (and financial capital), due to the fact that the remigrated investors have a better knowledge of the developing country and, therefore, are able to estimate the risk of investments more accurately (advantage over investing foreigners).

- Thirdly: Besides the human and financial capital also a third form of capital, the so-called social capital, can be increased in the developing country through the remigration of elites. The social capital consists basically of important contacts to a developed country which would become accessible to the developing country with the help of remigrating elites. Remigrating entrepreneurs, for example, can provide access to the markets in industrialized countries, that are

important (if not even decisive) for economic success. Political elites (exile politicians) can mediate political contacts to the industrialized country. Scientists can build up co-operations with leading research centers in industrialized countries. All these contacts can be helpful, to open new investment channels for the developing country. In this case remigrating elites would function as “bridge-heads” between developed and developing world (social capital argument).

As already mentioned, one can assume that these forms of capital cumulate in remigrating elites. A high amount of social capital is probably combined with a high amount of human and financial capital, either in one person or through networks.

Ad 2) The emigrated elites can be attracted by their developing home country and incorporated in the development process. This assumption seems to be the most serious objection to the “brain gain” hypothesis. Following the “brain drain” theory (which has authoritatively influenced the migration and development research so far) it is theoretically and empirically improbable that emigrated elites will return from a developed country, especially if they have achieved a standard of living abroad that is (far) beyond the usual standard of living in their home country. Thus, the migration of elites has been seen as an irreversible loss for the developing country.

The “brain gain” hypothesis does not support this conclusion, instead it supports the contrary assumption: it is theoretically conceivable and in reality possible for developing countries, to attract their elites from abroad and to incorporate them in the development process (even if they are well integrated in the industrialized country). This assumption is based on models (also used by the “brain drain” research) which state that the differences in the standards of living in deve-

oping and industrialized countries result in strong pull- and push-factors for talented and educated people, to leave the poor country and start a new life in a rich country.

In “brain drain” research the emigration of the Third World elites is explained with an overweight of incentives for a life in an industrialized country and/or negative conditions in the developing country. The “brain gain” hypothesis states that these circumstances are reversible. A return of emigrated elites and/or the building of transnational networks is likely if the pro-arguments for a return into the home country and/or the counter-arguments for a stay in the industrialized country predominate and the migrant therefore benefits from remigration. The importance of “pioneer migrants”, networks and chain reactions (chain migrations) for the initiation and maintenance of migration processes which has been observed by the “brain drain” research (Portes 1976) are equally valid in the reverse sense of the “brain gain” hypothesis. Once remigration has started and networks have been established, further remigrations are likely to follow.

Following the “brain gain” hypothesis emigrated elites are (1) a valuable resource for the development of their home countries and can be (2) intentionally opened up. In the following it will be shown that there is empirical evidence that the theoretically developed considerations of a “brain gain” can become reality.

Empirical evidence: The example of the technology development in India

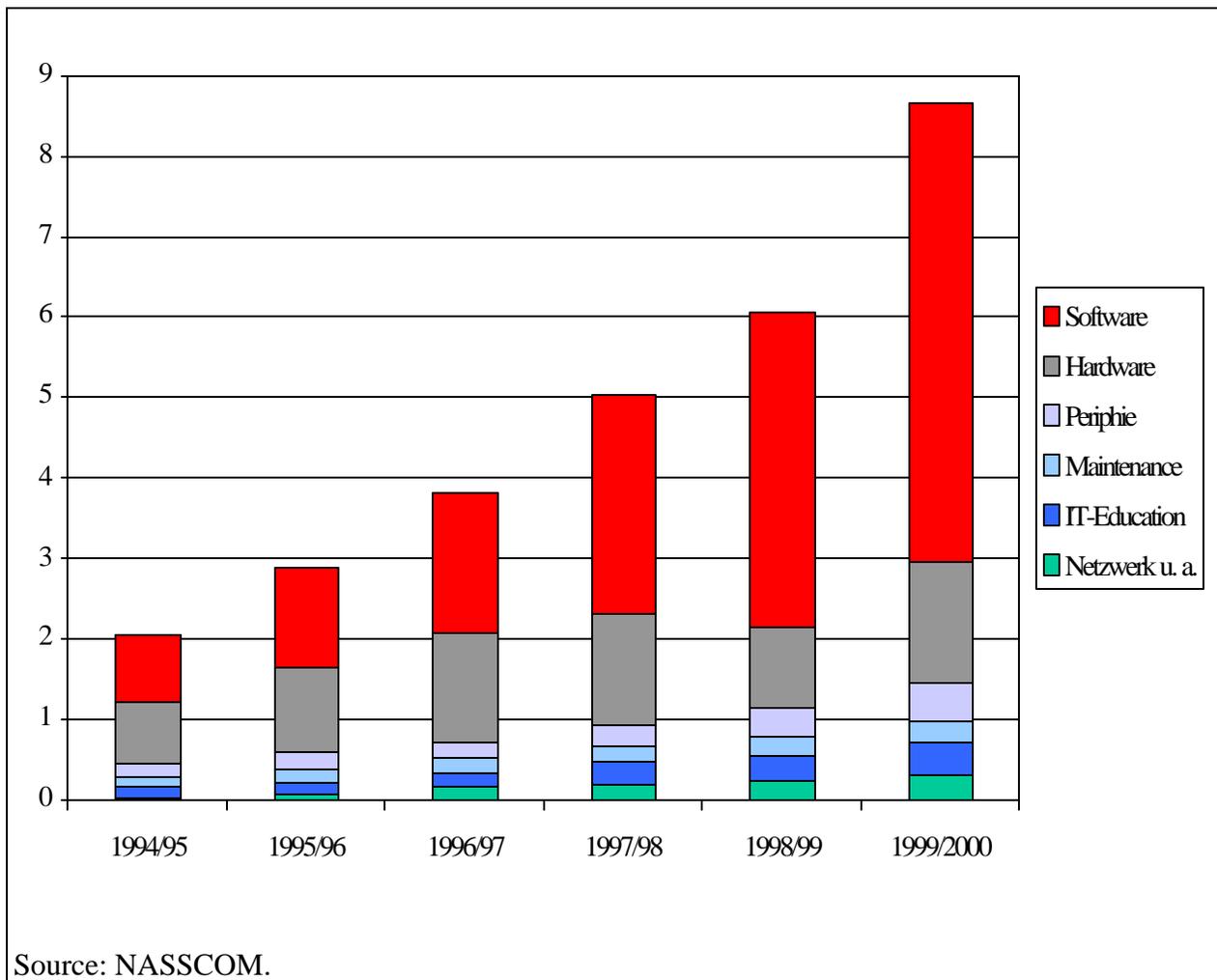
An example that shows how Third World elites (former “brain drain” emigrants) can make important contributions to the development of their home country, is India. Since the beginning of the 1990s a new positive development can be observed in the field of the Indian information technology (IT), which gives India (which is still among the 50 poorest countries of the world),² new hope in its fight against poverty and under-development. Although it is still a developing country and worldwide one of the biggest recipients of international development aid, India is one of the most attractive and dynamic development centers of technology products in the world. There is hope that India (after it missed the industrial revolution at the beginning of the 20th century) will become one of the leading nations in the new technology revolution and will benefit from its achievements (Lakshminarayan 1992). The country aims to become one of the worldwide tallest manufacturers and exporters of technology products and a “new global IT super power” of the 21st century. The chances to reach this goal are realistic in the eyes of leading development aid institutions as the Worldbank (Worldbank 1994). India is expected to play a leading role in the new world economy of the information age, which could open a door for the country to overcome poverty and underdevelopment (UNDP 2001a).

The motor of the upswing in the Indian technology sector is the software sector. The total revenues of this sector were 5.7 billion US\$ in 1999/2000. This represents 65% of the total revenues of the IT Sector in India. In the last fifteen years about 400.000 new work places were build in this field alone. It is estimated, that by 2008 an additional two million work places will have been built up. The Indian software sector might then count a total turnover of 87 billion US\$ and would then represent more than 7.5% of the entire Indian gross domestic product. Foreign investments (which are needed in India urgently) are expected to increase by the year 2008 on a

² Measured by the Human Development Index (HDI) of the United Nations (cf. UNDP 2001 b).

level of four to five billion US\$ in the software sector alone. This would exceed the amount of the foreign investments of 1998 in the entire Indian economy (NASSCOM 2001). The booming software sector has already led to positive spill over effects in other fields, and the new technology standard in India is used for the modernization of the economy and administration.

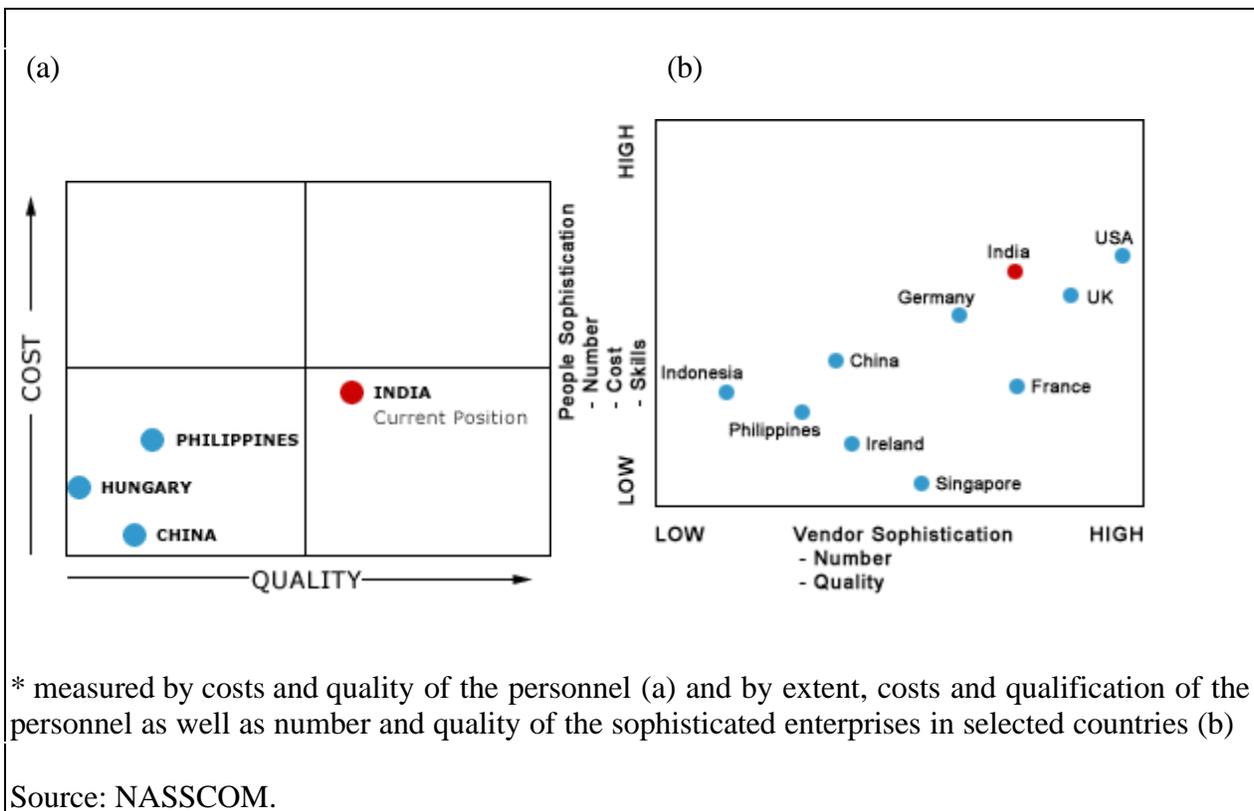
Figure 1: Sales Trend of the Indian IT-Sector 1994-2000 (in Billion US\$)



In the literature this success is basically explained by (the combination of) two determinants (Heeks 1996; Bajpai/ Shastri 1998). On the one hand an economic determinant is supposed: a competitive advantage of the Indian IT economy resulting from the combination of low labor

costs (which are approximately a quarter of the US-level) and a high qualification level of the employees (which almost corresponds to that of the USA). Figure 2 illustrates this competitive advantage on the one hand (a) with regard to the cost/high-quality composition of the Indian IT Sector in comparison to other low wage countries (Philippines, Hungary and China) and on the other hand (b) in comparison to other (high developed) countries with regard to the extent, costs and qualification of the software personnel and the number and quality of the sophisticated enterprises in those countries. In this comparison India is already positioned more favorably than leading industrialized countries, as for example Germany.

Figure 2: International Competitive Position of the Indian Software Sector 2001*



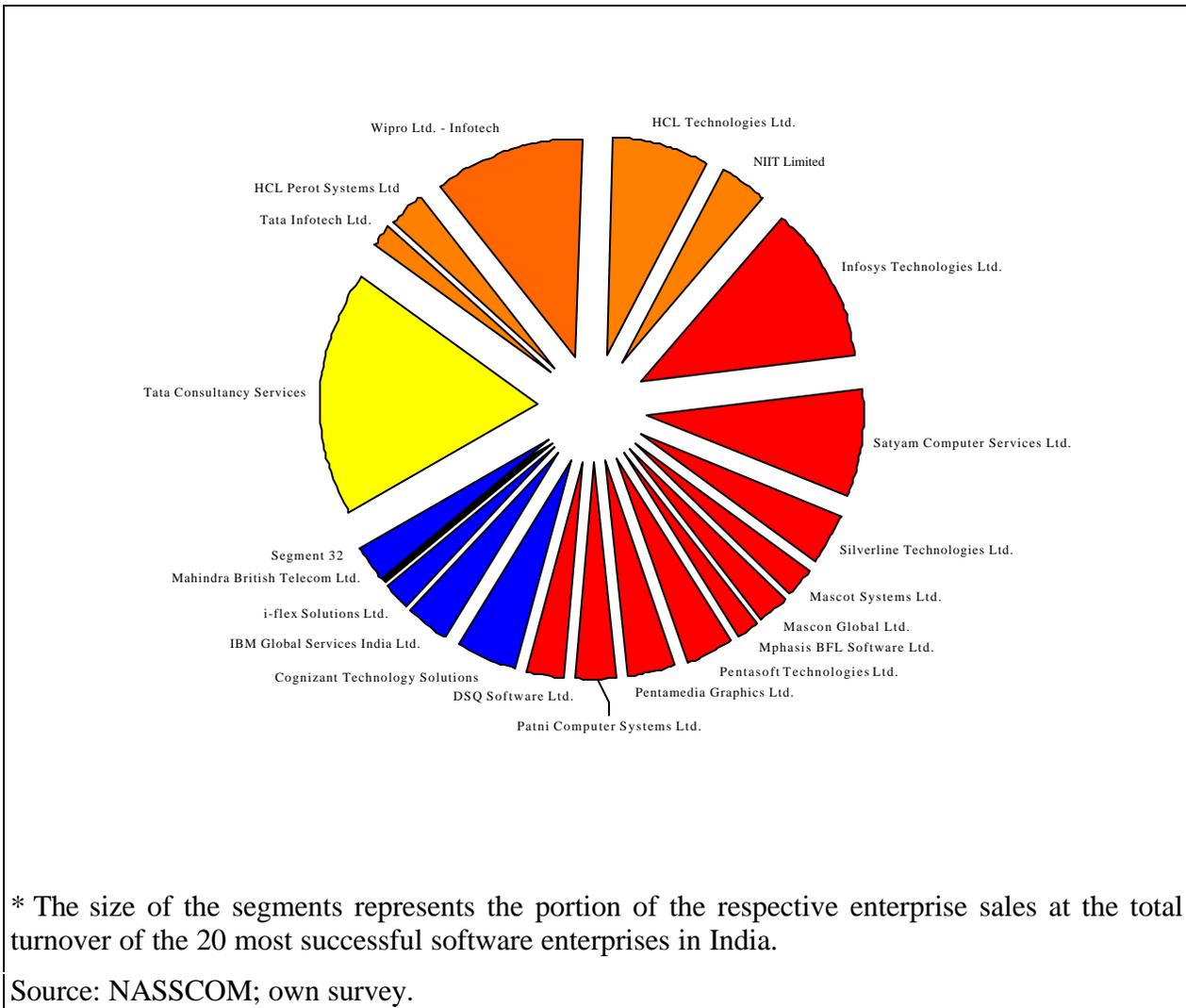
As a second determinant of the economic boom in India the role of policy programs is emphasized (political determinant). Two steps are regarded as essential: Firstly the nomination and political support of the IT sector as one of five key sectors of the Indian national economy since the mid 1980s; and secondly the change of the general Indian economic policy from the so-called self-reliance strategy to an open market economy at the beginning of the 1990s (Wagner 1997). This strategy change and specific support policy led to considerable liberalization, tax and import liberation for the software economy as well as extensive investments into infrastructures, particularly the technical infrastructure and the education system of the country. Due to these policies India's high technology parks are of highest international technical standard, and its English-speaking science and technical personnel is the second-largest besides the USA. Most scientific studies conclude, that the Indian software boom can be explained by the combination of economic and political determinants.

However, in addition to these two factors a third social (migration-bound) determinant can be found. On a closer look at the Indian software sector it can be seen, that the key positions of this line are to a large portion filled by Non-Resident Indians who left the country and emigrated (mainly to the USA) in the 1960s, 1970s and 1980s (former "brain drain" Indians). Many of these elites returned to their home country at the beginning of the 1990s after the introduction of the economic liberalization policy. Based on the arisen economic competitive advantage in India these elites have helped to build up the Indian software sector. 10 of the 20 most successful software enterprises in India (which represent more than 40% of the total turnover of the line) were set up by former Non-Resident Indians returning from the USA and/or are managed by them (red segments). Four additional enterprises (Mahindra-British Telecom, IBM, i-flex, Cognizant Tech-

nology Solutions) are joint ventures between Indian and foreign companies. All of them have former Non-Resident Indians in their top management (red-blue segments). The remaining six companies are old-established Indian companies (Tata, Wipro and HCL respectively their sister companies) which diversified in IT. Five of these six companies have also Non-Resident Indians in their top management (red-yellow segment). This means that 19 of the 20 top Software Companies in India were set up and/or have Non-Resident Indians in their top management today. In total it can be assumed, that at (at least) 28% of all Indian enterprises of the entire software sector were founded by Non-Resident Indians and/or are managed by them.³

Figure 3: Portion of Enterprises set up and/or managed by (former) Non-Resident Indians (red segments) of the twenty leading software enterprises in India 2000*

³ Based on a random sample of n=88 enterprises of a population of N=896 software enterprises in India that are members in the central employer association NASSCOM and represent 96% of the total turnover of the sector. The range of the 95%-confidence interval is in each case ± 10 of the determined value in the random sample.



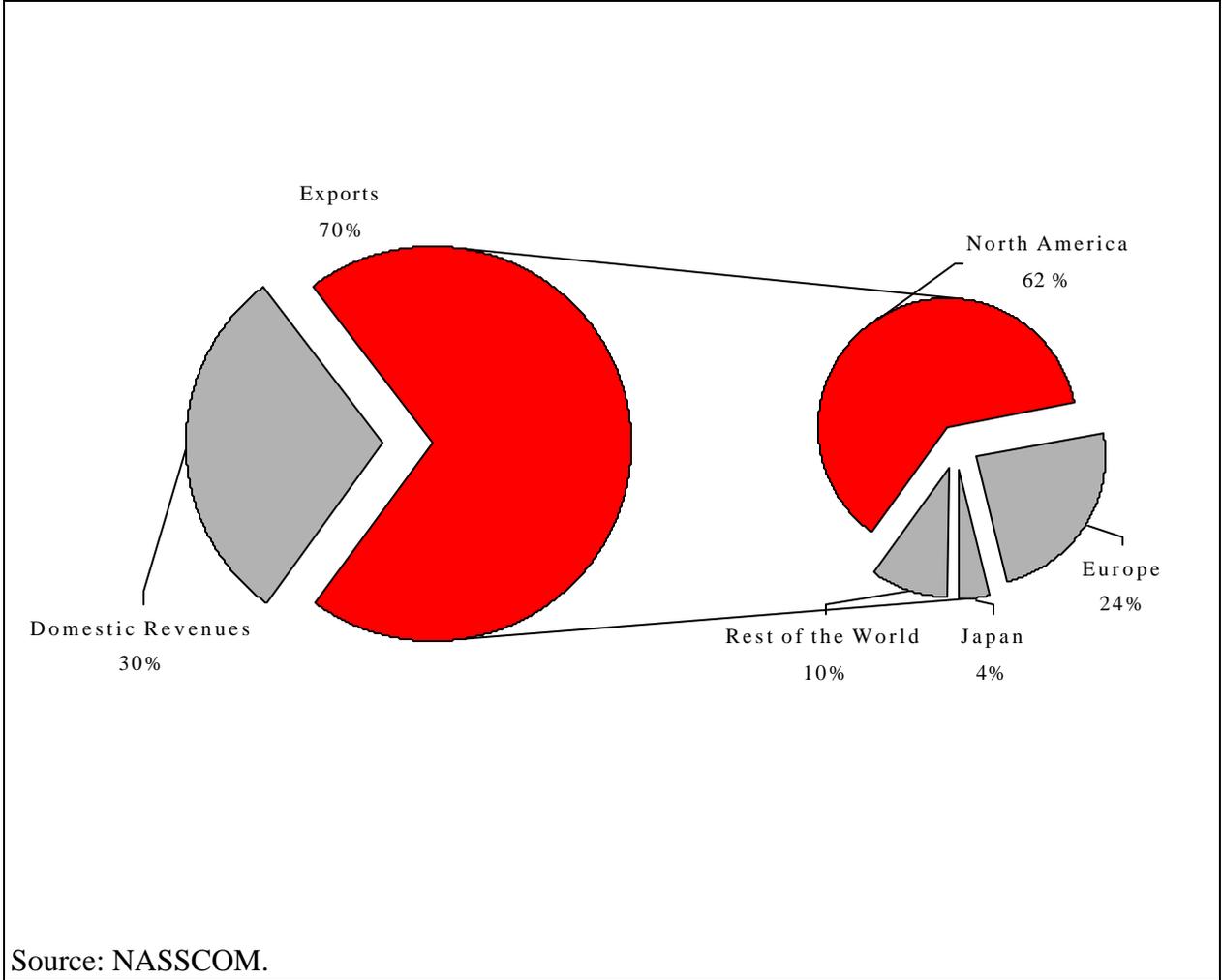
In addition also the central sector-organizations, which contributed to the upswing of the Indian software sector considerably, were founded by Non-Resident Indians from the USA. The most important organization, the “National Association of Software and Service Companies” (NASSCOM), was set up by Non-Resident Indians in the 1990s and today a former emigrant still belongs to its executive directors. This central organization - enterprises represented by them cover 96% of the total turnover of the Indian software economy - is ascribed a key function within India’s success process (Heeks 1996). Since the beginning of the software boom it functions as the central employer organization of the sector and as lobby organization influences the political

initiatives successfully. A second important organization is “The Indus Entrepreneur” (TIE), which was set up in silicon valley at the beginning of the 1990s by Indian software entrepreneurs in the USA. The organization tries to help young Indian entrepreneurs to establish new enterprises and to attract venture capital. In 1998 the TIE extended its activities to India where it also contributes to the financing of the central IT training centers (Chakravarty 2001). Besides these major organizations there are also minor private initiatives of Indians in the USA, who try to help India (for example by financing literacy programs in rural India).

The importance of the Non-Resident Indians in the USA for the development success in India can additionally be deduced from the fact that the upswing of the Indian software industry is considerably determined by the export opportunities in the USA. In the year 2000 70% of the total revenues of the Indian software economy were due to export revenues. 62% of these export revenues came from North America. It can be presumed, that a majority of the export deals is based on marketing contact by Indians in the USA, who were able to convince customers of the quality and profitability of Indian software products. Thus, today (at least) more than half of the Indian software enterprises (56%) have subsidiaries in the USA that land the necessary contracts (front office) that are carried out in the development centers in India (back office).⁴

Figure 4: Portion of the Export of the Total Revenues of the Indian Software Economy and Export Areas 2000

⁴ Based on the results of the random sample described in the preceding footnote.



All in all these data give rise to the assumption, that the described success of the Indian software industry wouldn't have been that big without the existence of an Indian software Diaspora in the USA and their contribution to the development process in India. This corresponds to the main statement of the "brain gain" hypothesis.

4. Conclusions

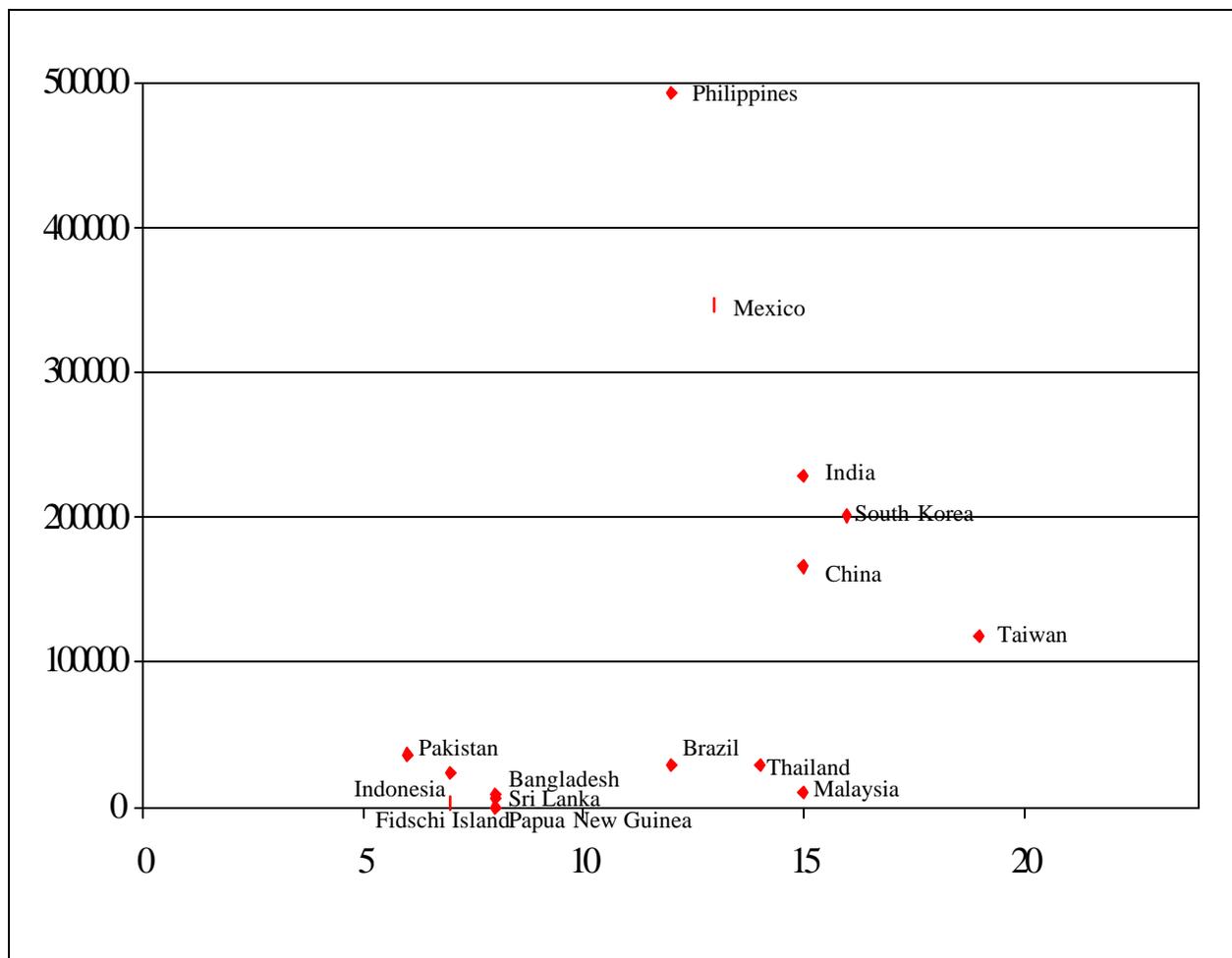
The idea of the “brain gain” hypothesis, that emigrated elites represent a resource for developing countries that can be used for the development process, seems rather obvious, but has hardly been followed. The data of the technology development in India indicate, however, that the idea of the “brain gain” do not have to remain theory, but can become reality. This gives rise to the assumption that other countries might also have a chance for a “brain gain”. Two basic social trends support this assumption: Firstly the trend towards transnationalization due to globalization which makes it possible to live in two countries simultaneously (Pries 1997; Faist 2000); and secondly the trend towards a “knowledge society”, in which the importance of human beings – who carry the knowledge - in the development process is increasing (OECD 2001).

Following the “brain gain” hypothesis, every “brain drain” is a potential “brain gain”. Thus, developing countries can - as India did - attempt to attract their emigrated elites in industrialized countries and persuade them to return home. However, the decisive question is *how* this can be realized in concreto. A first step would be to evaluate the potential (that is the extent and the quality) of the “brain drain” population of a developing country. How many elites do live abroad and in which fields are they (self) employed? After the evaluation of the (migrant) potential, it is as a second step necessary, to assess the potential of the developing country to motivate and induce its Diaspora to return home and/or to build up transnational networks. It is important to consider both the general political and economic structures in the developing country and the potentiality of the specific lines and sectors to attract the particular target group abroad.

Figure 5 gives an example how the potential of a developing country for the realization of a “brain gain” could be assessed. In this graph the number of elites emigrated from a developing

country into the industrialized country (USA) (Size of the “brain drain” population; y-axis) is related to an index for the safety of investments in the respective developing country (as an indicator for the incentive to remigrate and to transfer capital; x-axis) to illustrate a rough estimate of “brain gain” potentials of various countries.

Figure 5: “Brain Drain”-Populations* (y-axis) and Safety of Investments (x-axis) of Selected Developing Countries**



*Absolute number of migrants of the respective country with a school training of 13 or more years in the USA 1990

** Indicator of the US management consulting of Dun & Bradstreet (db-indicator); ,0' means no safety of investments, ,25' means highest safety of investments; economic and political basic data contributed to the calculation of the indices.

Source: IMF 1998; Dun & Bradstreet 2001.

Although this is a very simple illustration it nevertheless shows, that besides India other developing countries also have a chance to realize a “brain gain” in the future. Within the graph, Taiwan attracts attention, because it shows the highest safety of investments within the considered countries and had about 100.000 high educated people in the USA in 1990. Interestingly enough,

studies have shown, that the Taiwanese boom in its technology sector in the 1990s was influenced by Non-Resident Taiwanese returning from the USA (Chang 1992; Lin 1998). Similarly, the positive economical development in China has been related to the remigration of emigrated Chinese (the so-called Overseas Chinese) in the USA (Saxenian 2001). For South Korea the same relationship was supposed (Bang-Soon 1992). Like India the South-Korean state government has lately installed a government office, which is supposed to motivate emigrated elites to return to their home country.

According to the “brain gain” hypothesis, Mexico and the Philippines, which are both strongly affected by “brain drain”, also seem to have a chance for a future “brain gain”. The reason that there has not been a “brain gain” so far, might be, that the attractiveness of these countries, i.e. its level of the safety of investments, is too low (as indicated in figure 5). In this case it would be necessary to increase the safety of investment (in political and economic respect) in these countries first, and then – in a second step – develop policies that motivate the elites to return home. Mexico, which has not been considered as a classical “brain drain”-country, is of special interest, because its new President Vicente Fox announced a policy, that aims to motivate Mexican emigrants in the USA to contribute to the development process of their home country (LA Times 2001).

For Brazil, Thailand and Malaysia the problem seems to be, that they do not have a lot of emigrated elites (at least in the USA) which reduces their chances for a “brain gain” - even if the level of the safety of investments in these countries is comparable to the level in India. Bangladesh, Papua New Guinea, Sri Lanka, the Fiji Islands, Indonesia and Pakistan do neither have

emigrated elites (in the USA) nor do they offer a high level of safety of investments. For these countries it would be necessary to evaluate whether they produce a sufficient number of elites in their country. To formulate a general (policy-)model on the basis of the “brain gain” hypothesis, it would be, first of all, necessary to invest into the education system of these countries to build up a bigger elite population (1st stage) even if a majority of these elites would migrate into industrialized countries - due to a lack of opportunities in the developing country - (“brain drain”, 2nd stage). After the elites have accumulated (human, financial and social) capital in the industrialized country (3rd stage) the attraction policies for the emigrated elites can be started (4th stage), so that finally (5th stage) the network formation and remigration of the emigrated elites (“brain gain”) can occur.

The Indian “brain gain” reflects this scheme. First of all, immediately after the independence of 1947 the Indian government increased the investments to the education system (1st stage) as part of its self-reliance-strategy. Elites left the country already in the 1960s due to its lack of opportunities. India was then regarded as the country which suffered most from “brain drain” (2nd stage). The emigration was particularly headed to the USA where most Indians were able to establish themselves very well due to their good education. Today Indians are regarded as one of the minorities which integrated into the US-American society best. Especially in the software sector this setup was extremely successful (3rd stage). In the 1980s India introduced its IT-policy which attracted the emigrated elites in the USA (4th stage). It took further five to ten years until finally it resulted in return migration and the described network processes (5th stage). This process gives in particular hope to those countries that suffer strongly from “brain drain” like India

did in the past. Future research should focus on the question how a “brain gain” could be quickly realized for these countries.⁵

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⁵ Interestingly enough the current temporary government in Afghanistan - the developing country that is currently in the focal point of the world public - consists of former “brain drain” elites, that want to support the reconstruction process of their home country with their know-how gained in industrialized countries. Currently the department for higher education and the departments for budgets as well as for culture and information are headed by former expatriate Afghans (cf. San Diego Union Tribune 2001). Besides these top politicians there are reports that Afghan entrepreneurs in the USA have already returned or are going to return to Afghanistan in order to assist in the development process of the (nearly) completely destroyed country (cf. USA Today 2001). This is in accordance to the idea of the “brain gain” hypothesis.

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