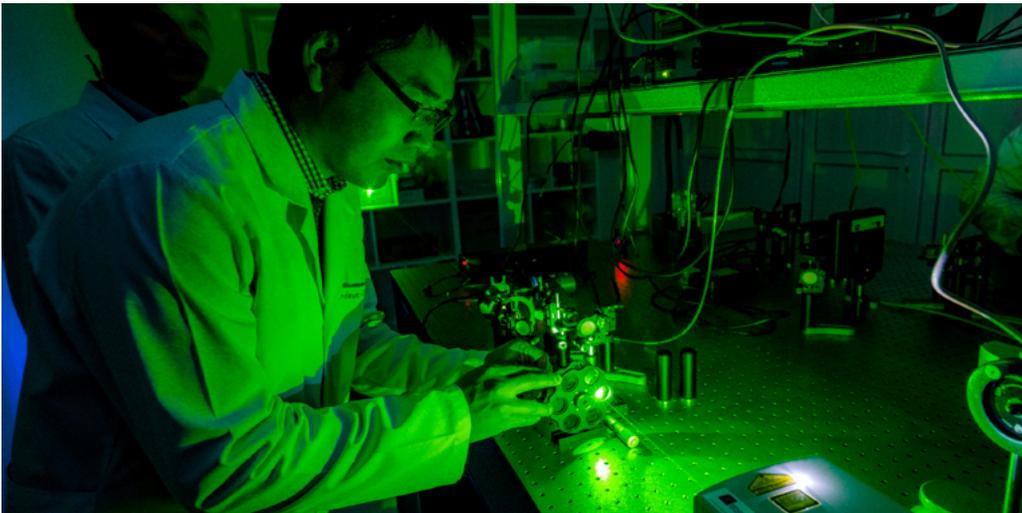


## SUMMARY

# Should You Be Worried about Brain Drain?



Brain circulation and linkages can enhance the social and economic development of developing countries, regardless of whether or not students decide to return home. Photo credit: ADB.

*Studies show that migrant high-skilled professionals can help increase trade, capital flows, and knowledge and technology transfers whether or not they return to their home countries.*

## Overview

The migration of highly educated or high-skilled professionals under the conventional human capital approach is considered a zero-sum game since host countries receive an inflow of human capital from home countries, enhancing the competitiveness of host countries (“brain gain”) at the home countries’ expense (“brain drain”).

However, an emerging approach indicates that brain drain in a global market economy actually creates an opportunity for brain circulation and brain linkage. First, the migration of high-skilled professionals from developing countries fosters opportunities to form transnational social capital that connects members of different countries and contributes to knowledge transfers from advanced countries (“knowledge remittances”). Second, it helps establish ties to the center of development and promotes integration into the global value chains with benefits such as increased trades, capital flows, and technology transfers. With such benefits, social and economic ties among high-skilled professionals can

create a win-win, positive-sum situation for both home and host countries.

This article was adapted from the working paper, *From Brain Drain to Brain Circulation and Linkage*, with permission from Stanford University's Walter H. Shorenstein Asia-Pacific Research Center. The study was supported by the Asian Development Bank's South Asia Human and Social Development Division.

## Brain Drain Fears

Over the last two decades, the development community has heightened its focus on higher education, recognizing that it can boost a country's capacity to participate in an increasingly knowledge-based global economy and accelerate economic growth. Official development assistance of the Organisation for Economic Co-operation and Development (OECD) countries toward higher education have more than doubled, from \$1.71 billion in 2002 to \$3.88 billion in 2016. The value addition to economies expected from higher education includes technology advances, research and development for innovation, enhanced entrepreneurship, job creation, and higher productivity, among others.

Experts and policymakers, however, are concerned that investing in higher education in less-developed countries may lead to a "brain drain," where highly-educated students and professionals leave their home countries and never return home. The 2016 Kauffman report on international science, technology, engineering, and math students in the US showed that among a random sample of 2,322 foreign doctoral students surveyed, 48% wished to stay in the US after graduation, while only 12% wanted to leave and 40% were undecided. Because students usually move from developing to developed countries to study, brain drain is more problematic for developing countries. Given accelerated talent flows around the world and the increasing integration of less-developed countries into global value chains, the negative impact of brain drain could be further amplified.

## Brain Circulation and Linkage

The migration of high-skilled professionals from developing countries may indeed create brain drain for the home countries. Yet, they can also significantly enhance the social and economic development of their home countries beyond monetary remittances, regardless of whether or not they return home, through "brain circulation" or "brain linkage."

Brain circulation refers to a situation where people return to their home country after being educated abroad and contribute to the development with educational and work experience obtained abroad. They can facilitate brain power both geographically and intellectually. Brain linkage takes shape when some choose to remain in the host country after education but engage with their home countries through business visits or short-term stays, fostering interactions between home and host countries.

To understand the importance of brain circulation and brain linkage for development, the authors emphasize the value of higher education beyond its human capital. A conventional view on talent flows has been to consider labor primarily as human capital or the totality of education, skills, and experience

embodied in individuals. The new model extends labor as social capital or the productivity capacity embodied in the ties and networks linking organizations and individuals. The authors maintain that social capital provides less tangible but equally important benefits, such as enhanced trust and cooperation, information sharing, and improved access to market information and innovations in development. In a global market economy, transnational social capital, or ties spanning geographic and cultural distance, is particularly valuable.

## Case Studies

The main implication from the paper is that less-developed countries should not hold back their people from studying or working overseas, because this will only isolate them from the global economy. What is important is to find ways of converting possible brain drain into brain circulation and linkage, as these will connect them to the center of development and integrate them into the global value chains. Case studies from several countries, including India, the Republic of Korea, the People's Republic of China, and Taipei, China illustrate how these countries were able to convert brain drain into brain circulation and linkage.

### India

India has experienced a brain drain over the last several decades, as the number of students studying overseas, especially in the US, has grown significantly. In 2015–2016, India was the second largest provider of international students to the US, after the People's Republic of China. More than one million India-born professionals were working in the US, mostly in information technology, management, business, and finance. As of the late 1990s, Indians made up 28% of Silicon Valley's software and engineering talent and were founders of iconic firms such as Sun Microsystems, Cirrus Logic, and Hotmail.

When the Indian economy started growing, government initiatives such as the establishment of the Software and Technology Parks of India (e.g., in Bangalore) and waves of liberalization policies helped promote brain circulation. Many studies have documented the significant role of Indian returnees in building the information technology (IT) industry that took off since the 1990s. [1] Many from the US returned to India to start IT research and development laboratories, to supervise US investments and outsourcing contracts, and to train and manage Indian professionals to the US efficiency and standards. Many US-educated Indian engineers with companies in Silicon Valley even moved part of their operations to Bangalore or started software services firms in Bangalore.

India's large, highly-skilled diaspora also played an active role in setting up formal networks that promoted brain linkages, such as the The Indus Entrepreneur (TiE). TiE—originally intended as a Silicon Valley organization to facilitate mentoring of promising, young, expatriate IT professionals—developed into a worldwide network of Indian professionals that yielded substantial influence. A 2001 survey of 2,273 Indian immigrant professionals in Silicon Valley showed that 80% of the respondents exchanged information on American jobs or business opportunities with people in India, 67% served as an advisor or helped to arrange business contracts, and 18% invested their own money in start-ups or venture funds in India.

## People's Republic of China

Since China's "open door" policy began after 1978, overseas education expanded rapidly during the 1980s, which included thousands of students going to the US annually. However, less than 10% of students returned home during the early years. Among PhD graduates in science and engineering in 1995, 88% of those from the People's Republic of China remained in the US for employment. When the ICT industry was established and demand for new services and business was created, many Chinese who were educated and working abroad began returning during the 1990s. By 2007, the overall rate of return had increased to 30% and accelerated as China's economy offered more and better opportunities for emigrants with overseas experience. While the government primarily targeted brain circulation in its early policies, lack of state resources for incentivizing permanent return led the government to offer temporary return options for its diaspora, encouraging Chinese abroad to return only for short periods of time but still contribute while living abroad. Through such short-term stays or frequent visits, China-born engineers in Silicon Valley were actively connecting with China, accelerating industrial upgrading.

As China underwent rapid economic growth, the government invested in a changing combination of both permanent and temporary programs. For example, a survey on high-tech firms in Beijing's Zhongguancun Science Park showed that returnee entrepreneurs create a significant spillover effect that promotes innovation in other local high-tech firms. Another study showed that returnees in high-tech zones, compared to people in the zones who had not been overseas, were more likely to import technology and capital, and use that technology to target the domestic market.

## Republic of Korea

During the 1950s and 1960s, large numbers of highly-educated people left South Korea to pursue their studies abroad, with very few returning home. A weak industrial base, poor research and development infrastructure, and limited capacities of higher educational institutions offered neither employment opportunities nor incentives for return. Only since the 1970s when the South Korean economy began to take off with strong industry development strategies, the government was able to recruit back many ethnic Korean scientists living in industrial countries, especially in the US. Some 27,000 PhD holders returned to South Korea between 1982 and 2003. Among PhD graduates in science and engineering in the US in 1995, only 11% of those from South Korea remained in the US with the rest returning back home. Government-endowed, public-sector R&D institutions brought 1,002 scientists and engineers back home under their own sponsorship during the 1981-1986 period.

Following the 1997–1998 financial crisis, the South Korean government supplemented its brain

circulation strategies with brain linkage efforts, establishing worldwide business networks among the Korean diaspora to engage them in the country's development. The Overseas Korean Foundation was set up in 1997, followed by the Overseas Koreans Law in 1998 that entitled overseas Koreans to visa-free entry, longer stays, ability to buy and sell land and other properties, and to work in the country in high-skilled professional or managerial jobs. The government also eased restrictions for foreign direct investment by foreigners in general, and by overseas Koreans in particular.

## Taipei, China

Taipei, China suffered severe brain drain during its early development, especially in the sciences and engineering. During the 1970s and 1980s, an estimated 20% of its college students studied abroad and few returned home. In the late 1980s, many US-educated engineers began to return home through active government recruitment and opportunities created by the development of the semiconductor and electronics industries (e.g., the Hsinchu Science Industrial Park, the Industrial Technology Institute), resulting in a reverse brain drain. Returnees became important investors and entrepreneurs. In 2000, 113 of the industrial park's 289 companies were started by those who studied in the US. While brain circulation had been dominant, brain linkages became important to the engineers who were working in the US and Taipei, China, and regularly commuting across the Pacific. They had professional contacts and language skills to function well in both environments.

# Enabling Factors and Policies

In today's world of greater labor flows and mobility, developing countries have greater opportunities to connect themselves to the most economically advanced countries for the transfer of knowledge and experiences. Governments can design policies specifically aimed at attracting migrant high-skilled professionals for brain circulation or brain linkage. Permanent return policies prioritize brain circulation, while temporary return and diaspora engagement policies focus on enhancing brain linkages. The paper also identifies several social, economic, and institutional factors that are crucial for promoting brain circulation or brain linkage. These include:

## Economic opportunities and incentives

Opportunities and incentives are key to promoting brain circulation and brain linkage for those who upgraded their skills abroad.[2] Permanent return migration—brain circulation—is more likely in countries undergoing robust economic growth with an adequate scientific, technological, and business environment. It will work best especially when there is a strong demand for advances in science and technology, which can lead to developing career pathways and increased employment for returning professionals. For developing country contexts, short-term programs can also be an effective approach in motivating talented professionals to contribute to home countries, thereby supplementing brain circulation with brain linkage.

## Critical mass of human and social capital

Higher education institutions are crucial in building a critical mass of human and social capital, which are

necessary for brain circulation and brain linkages to catalyze economic growth. Governments such as South Korea, China, India, and Taipei, China have invested heavily in higher education and worked to establish economic clusters or “hot spots” of technological and educational institutions (advanced science and engineering colleges and research centers) that promoted professional growth.

## Good governance

Studies show strong correlation among good governance, entrepreneurship, and economic growth. Returnees and diaspora are more likely to invest in countries with low levels of corruption and ones where there are well-functioning public institutions.

## Policy Implications

Certainly, there is a risk of brain drain for developing countries when their talents go abroad. Yet, the paper shows that developing countries should not be afraid of losing their talent. Holding talent back from studying or working overseas may lead to the isolation of developing countries from the global economy. Less developed countries often lack not merely human capital, but also lack ties to the center of global economic activity. The key question for developing countries is how to convert a possible brain drain into brain circulation and brain linkage. This can be accomplished by creating permanent or temporary return programs, along with financial and other incentives, to make returning homeland attractive and worthwhile. Another option is through diaspora engagement policies, especially in a global context of increasing skills mobility.

The authors state that having a critical mass of educated professionals in the home country is crucial for facilitating brain circulation and linkage. Hence, it is important for developing countries to continue to invest in higher education to cultivate human and social capital for national development. Developing countries could benefit from crafting a program in the higher education sector or other sectors designed to maximize social capital formation, as well as human resource development. Such programs would include: monitoring of student, alumni, research, and professional networks; formation of home-host networks; and programmatic support for back-and-forth skilled labor movement.

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