

CHAPTER 1

BRAIN DRAIN, BRAIN GAIN, AND BRAIN CIRCULATION IN A HALF-GLOBALIZED WORLD

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At the end of the Second World War, as we entered the second half of the 20th century, the United States of America had become the most powerful country in the world, controlling about 50 percent of world economic activities. In addition to its wealth, the United States was the symbol of “democracy” and advocate of “liberty,” “equality,” and “justice.” The United States was such a beautiful and perfect place that it was perceived by many people all around the world as a “dream land” or even as a “heaven on earth.” On the other hand, in many war-torn countries in Asia, people were not only suffering from extreme poverty, miserable living conditions, and a low level of science and technology, but were also oppressed by repressive regimes. This drastic difference was the setting in which so-called “high-skill migration” started to take place.

There is a high correlation between education and legal migration. In the year 2000, for example, a person with a college or graduate school education was six times more likely to migrate legally than one with less than a high school education. Around 37 percent of the legal immigrant stock in OECD countries, more than 20 million people all told, fell into the high-skill category.

In 1962, I joined many young elite students in leaving my home country and becoming a graduate student in the United States. With a letter of admission to the graduate school, another letter offering a teaching

assistantship, and carrying a small suitcase, I arrived at the University of California, Berkeley. The airfare took most of my parents' life savings.

My excitement at that time was beyond description. In the "land of opportunity," where people are the masters of the land, nothing seemed to be impossible. I arrived at a time when the free speech movement had just turned into an anti-war movement. The student movement at that time sent a tidal wave across the world. For several decades starting from the mid-1950s, the State of California was developing very rapidly, and was interested in attracting high-skill migrants. Higher education was essentially free at that time, in order to attract excellent out-of-state students to enter universities and eventually to become citizens of California.

With the arrival of a large number of foreign students, especially from India, Iran, Taiwan, Korea, the Philippines, and Japan, the student body became diversified. Hardworking foreign students, most of whom eventually became first-generation immigrants, made important contributions to the development of the society as a whole. Later, many of them became very successful, becoming movers and shakers in academic institutions and industry. In fact, foreign born and foreign educated workers in US science and engineering fields make disproportionately large and valuable contributions to knowledge. For example, they are over-represented, relative to their share of the science and technology work force, among authors of the most cited scientific papers and inventors of highly cited patents.

The consequence of this massive "brain gain" for the United States was of course a serious "brain drain" from other countries, especially developing ones. I remember about 20 years ago, when there was a serious accident in Taiwan involving the explosion of an electric transformer, engineers were blamed for their incompetence. However, it was pointed out immediately that more than 90 percent of the graduates of science and engineering departments of the National Taiwan University had left the country after receiving their PhDs and were residing in the United States. The consequences of the departure of a large number of competent scientists, engineers, and medical doctors could be vividly seen in every sector of the society. However, it seemed almost impossible to stop the "brain drain" at that time. For rural areas in Taiwan, the exodus was not exclusively to the United States. As the economy gradually picked up in Taiwan, centered on the capital Taipei, the city also became a destination for the "brain drain,"

thus creating a great disparity within the island. However, this domestic “brain drain” did have a spillover effect in a relatively short time, especially as the infrastructure for communication and transportation developed, and the impact turned out to be less negative than the “brain drain” to foreign countries.

Starting from the early 1980s, light industries largely depending on manual labor became successful in Taiwan, especially those geared toward the export market, such as bicycles, textiles, Christmas tree lights, canned mushrooms, and plastic goods. Further, as the government in Taiwan started to enjoy a budget surplus and determined to invest in science and technology and upgrade industries, the need for high-skill workers increased. More and more Taiwanese expatriates decided to return home to start new careers and fulfill their dreams in their homeland. Many of them were already quite experienced and had acquired special skills and the spirit of entrepreneurship. With the help of forward looking government policies, a good labor market, and the relatively low cost of manufacturing, they were quite convinced that they would be able to compete with the rest of the world. Indeed, without those well-educated and experienced returnee scientists and engineers, numbering in their thousands and working in various associated fields in microelectronics, the high-tech industries, especially in the areas of personal computers, communications, and display equipment, would not have taken off.

Toward the end of the 1980s, in spite of the fact that those who left the country still significantly outnumbered those who came home, the return of a large number of “better developed brains” partially compensated for the ill effects of the “brain drain” of the past. At the beginning of the 1990s, there were about 800 very well educated PhD holders returning home annually, twice as many as those PhD holders who were educated in Taiwan. The change from the “brain drain” to a partial “brain return,” which we might call “brain circulation,” was a blessing to Taiwan. In fact, both the countries sending and receiving the so-called “high-skill migration” can share the benefits directly, even if the “brain circulation” only amounts to a small fraction of the “brain drain,” as long as the returning brains are more skilled and experienced than the departing ones.

In the late 1990s, I was invited to attend the “Knowledge Wave Conference” in New Zealand organized by the Prime Minister, Helen Clark.

Government officials in New Zealand were quite envious of the success of high-tech industries in Taiwan. Knowing that a large number of scientists and engineers returning from the United States had played a crucial role, they asked me who in Taiwan in the 1960s had the wisdom and vision to send most of our brilliant university graduates to pursue graduate studies in the United States. I told them that it was the miserable living conditions, the repressive regime, martial law, and the low academic level rather than the vision of government officials which caused the exodus of talented young people. However, the government in Taiwan did play a role in creating the environment to entice a “brain return.” Of course, they were very surprised. New Zealand, a beautiful country with excellent living conditions, did not suffer sufficiently from the “brain drain” to build up an expatriate talent pool in the United States to be able to tap. In order for the developing countries to derive the benefit from the “brain circulation” involving countries with advanced science and technology, it is essential to encourage a large number of talented young students to study abroad. Perhaps it is worth pointing out that 25 years ago I dreamt of helping Taiwan establish some world-class research and academic institutions, such that students could pursue their advanced degrees in Taiwan at the highest level. Working with many accomplished scholars, the dream was realized to a great extent. At the present time, Taiwan has become a democratic society, and the economy as well as academic institutions have vastly improved. With excellent job opportunities available, there is not as much incentive for young people to go abroad. Although we do not have to worry about “brain drain” as much at present, we are also losing the opportunity to derive the benefit from “brain circulation,” since the talent pool in the United States is diminishing quickly. For a small place like Taiwan, this turn of events is certainly not what I expected.

It seems to be apparent that the game of “brain gain” and “brain drain” can be played more effectively between a developing country and a developed one. However, during the last few decades, several developed countries have tried to imitate the United States and benefit from high-skill migration by offering attractive conditions, but without resounding success. Aside from Australia and Canada, most of the densely populated developed countries lack the necessary magic to accept foreigners with open arms, making them believe that “all men are created equal” and providing them

with the opportunity to become permanent residents or citizens in a relatively short time.

For developing countries, it is not a good idea to build a barrier to stop the “brain drain” or seek compensation from recipient countries for their loss of talent. Instead, what they need to do is to change the situation from a “brain drain” into a “brain circulation.” Many newly industrialized countries or regions in Asia have been able to do this successfully. One of the conditions necessary to promote an effective “brain circulation” is to provide good education such that university graduates will be admitted to excellent graduate schools in the advanced countries, and for the home government to have a good policy to attract them back again later. It is of utmost importance for the returning talents to be convinced that they can still compete effectively with the rest of the world after coming back to their homeland. Patriotism alone will not be enough to attract talented people back home.

As we examine the development of human society at the beginning of the 21st century, we discover that two important changes, which will have very significant consequences for the future of mankind, are taking place. Unfortunately, we have not paid enough attention to them, and they might cause great difficulties for human society in the not-too-distant future. Firstly, the Earth, which used to appear “infinite” to human beings, has become “finite.” As the population on Earth has increased to six billion and human activities have intensified during the last century, we have moved into an entirely different situation in which harmonious relations between the biosphere and human beings have been broken. Yet we are still following the trajectories for the development of human society in the past, when the Earth was practically “infinite,” and we are thus heading in the wrong direction altogether.

Secondly, the globalization process is not yet complete. Some economic activities are globalizing and crossing national boundaries, yet competition based on the nation state is as strong as ever. In the half-globalized world, it is not surprising that we will have to tackle such problems as the widening gap between the rich and the poor, both within and between countries. These problems, as well as those created by high-skill migration, could easily be avoided if the entire world were to be completely globalized, or if the entire world were to become one community.

In spite of the fact that globalization of the world economy is driving us toward a borderless society, the differences between peoples in various regions will not vanish overnight. The establishment of a new, common global culture, together with more effective ways of communicating among all peoples, will certainly take time. Differences of cultural heritage, language, and religion that make this world so rich and colorful will not, and should not, be made to disappear. As the world shrinks in relative terms, and contact between its peoples becomes more frequent, whether or not differences in civilization are likely to cause an inevitable clash, as suggested by the well-known scholar, Samuel Huntington (1996), would seem to be entirely dependent on how well people learn to communicate and to understand, appreciate, and respect cultural heritage. To become good citizens of the global village, we need to learn quickly — and also to teach our young people — to take a global view of different peoples. In this respect, the promotion of extensive “brain circulation” would certainly be the best first step.

If we examine the influence of the United States on the developing countries in the Asia-Pacific region, perhaps one could argue that the most important factor is higher education, especially when expatriates of various countries return home to assume important positions and exert their influence. Unfortunately, most of the universities are more interested in raising funds from their successful alumni and recruiting the best possible students than in helping developing countries to move forward. But the world’s most distinguished universities should aim for global influence through the creation of new forms of social thought, the accumulation of new scientific knowledge, and the development of new technologies for mankind, and also by helping developing countries to establish a healthy mechanism for “brain circulation.”

In 1994, after spending 32 years in the United States, I returned to Taiwan, thus becoming a part of the “brain circulation.” My return to Taiwan did encourage some “big brains,” for example, members of the United States National Academy of Sciences and professors holding chairs at first rate universities, to join the trend. The mutual gains derived from sending “young brains” to places where knowledge creation is most efficient and providing the best environment for them to develop will be both richer and fairer than those arising from a competition over talent, as long as sufficient numbers

of “big brains” return. Working together, we can make the most of the many opportunities presented in the nascent century of human capital.

This is the first time in human history that all human beings on Earth have been faced with learning to work together and live together as one family in a global village — in other words, to establish “one community for the entire world.” The time has come for finally realizing that the planet Earth on which we live is only finite in space, capacity, and natural resources and that, in a sense, we have “over developed” in an unsustainable way. This is a necessary awakening — vital for the survival and sustainable development of mankind. I believe that if we make the correct choice at this crossroads, then the 21st century is likely to be seen as the great turning point, or great transition — the beginning of a new era in the history of mankind.

Reference

Huntington, Samuel (1996). *The Clash of Civilizations and the Remaking of World Order*. New York: Simon & Schuster.