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著者 Author(s)	Nakamura, Makiko / Ogawa, Keiichi
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Mobility of Skilled Labor in Transition Economies: The Perspectives from Brain-Drain, Brain-Waste, Brain-Circulation and Brain-Gain

NAKAMURO Makiko^{*}
OGAWA Keiichi^{**}

1. Introduction

The impact of labor migration in both sending and receiving countries has long been researched. Classic literature has come to a consensus on receiving countries having benefits; however, sending countries lose human capital, and thus have potential negative effects of the skilled emigration (e.g., Bhagwati and Hamada, 1974). In general, this phenomenon is called *brain-drain* and policy circles, such as the United Nations and the World Bank, have paid considerable attention to the development impact of this brain-drain phenomenon. Development communities are also concerned that highly educated emigrants cannot obtain qualified jobs in their destination countries and would make little use of their skills and knowledge, what is called *brain-waste*. However, recent research provides different perspectives from the brain-drain or brain-waste standpoint, and focuses more on the potential benefits of migrants' return to their countries of origin and remittances received from migrant family members abroad. These are called *brain-circulation* and *brain-gain*, respectively.

These four features of international labor mobility among highly educated professionals have a high level of regional variations. This research focuses on Europe and Central Asian countries. These countries have been in transition from centrally planned to market oriented economies after the collapse of the former Soviet Union in the 1990s, making significant changes in international labor mobility of highly educated workforce. However, so far, there is no study to provide a comprehensive survey of international labor migration in this region. Therefore, the objective of this paper is to

* Ph.D. Candidate, Columbia University.

** Professor, Graduate School of International Cooperation Studies, Kobe University.

review development impacts on international labor mobility with a special focus on brain-drain, brain-waste, brain-circulation, and brain-gain in transition economies within Europe and Central Asia.

2. Brain-Drain

Until recently, a great amount of literature on migration stresses the development impact of educated emigrants in the sending country, what is called “brain-drain.” In general, brain-drain is defined as the emigration of highly educated professionals, normally due to political and economic instabilities, and the subsequent loss of skills and knowledge faster than the replacement rates. It should be kept in our mind that, as a number of theoretical approaches summarized, the emigration of skilled labor has a positive impact on the global income, especially of receiving countries. It is generally agreed that international labor mobility of highly skilled and educated labor is supposed to be positive because it improves economic efficiency at the global labor markets.

However, brain-drain becomes more common amongst developing countries. The effect on sending countries of this phenomenon is rather negative. Generally speaking, highly skilled migration from developing countries flows toward the Western and Northern European countries, as well as toward Canada and the U.S. Adams (2003) developed migration statistics and concluded that migration in developing countries takes a large share of the highly educated population, as does international migration. Beinea, Docquier and Rapoport (2006) took over his work to extend migration statistics and found that annual emigration rates from the developing world amounts to 6 percent for highly educated professionals on average, compared to less than 1 percent for less educated ones.

This pattern is more significant in transition countries. The majority of these countries consisted of the former socialist or communist countries, and then rapidly moved on the path to democracy in the early 1990s due to the collapse of the former Soviet Union. Before the transition, migration was very tightly controlled to keep people in the countries; however, recently the countries deregulated their cross-boarder labor mobility. As a result, these countries have a large number of emigrants who seek better job opportunities in developed countries. In fact, this region accounts

for one-third of all developing country emigration, and emigrant stock within the region is 47.6 million amounting to almost 10 percent of the total population (World Bank, 2006). Several countries in the region, including Russia, Ukraine, and Kazakhstan, are the top sending and receiving countries of labor migrants worldwide (Walmsley, Ahmed, and Parsons, 2005)

Obviously, this labor mobility causes brain-drain in these transition countries; although there is large-scale emigration of highly educated workforce from these countries, there is little immigration of skilled workforce making its way back in. Basically, the highly educated workforce prefers working in a country where their rate of return to education would be highly rewarded in the labor market as a form of payment. In other words, the larger and more competitive the markets are, the greater the prospects for using knowledge and skills accumulated through education. In this regard, these countries have failed to attract highly educated professionals with such knowledge and skills because the labor market structure remains complex and entrenched with the previous system that is slow to recognize new economic environment. As a result, a lack of highly educated workforce may cause a constraint to productivity growth and contribute a high-level of unemployment rates throughout the region.

The underlying problems are not just human capital flights. Classic theoretical literature emphasized that developing countries have forgone revenue from taxes levied on emigrants residing in developed countries (Bhagwati and Hamada, 1982) In addition, more recent literature has argued that the training costs of highly educated professional mostly funded by government expenditures on education flowed outside the country (e.g., Stark and Levhari, 1998) If highly educated emigrants never return to the country of origin, in essence, labor-sending countries give publicly funded assistance to labor-receiving countries. This trend may escalate the economic disparity between the rich and the poor. From these points of view, international labor mobility encourages both human and monetary capital flights from a less developed country to a more developed one in the short-run.

According to migration statistics developed by Beine, Docquier and Rapoport (2006) Europe and Central Asia only have almost 8 to 10 percent of emigrants who completed tertiary education, which is relatively smaller than other countries, such as

Latin America and African countries (Figure 1) However, Docquier and Bhargava (2006) newly created the data on physicians ' emigration rates from 1991 to 2004 and found that transition economies within Europe and central Asia lose a greater number of physicians relative to other regions (Figure 2) indicating that the youngest and best medical professionals have been the most likely to leave their home countries in transition. This trend has been exaggerated over time and might have significantly diminished the quality of medical research that had flourished during the Cold War.

Emigration happens not only in medical research but also in other fields of research, including the natural sciences. According to UNESCO (2005), Russia has experienced a severer brain-drain. From 1990 through 2002, Russia lost 1,072,500 qualified scientists with higher university degrees due to emigration. On a ranking of countries by the proportion of those employed in academic fields, Russia currently ranks ninth in the world, although it had been top-notch before the Cold-War. Because many young highly educated have emigrated, the number of academics in their most productive years has decreased dramatically. The average age of professors or lecturers in Russian tertiary institutions is now approximately 60 years old, whereas it used to be just 40 to 45.

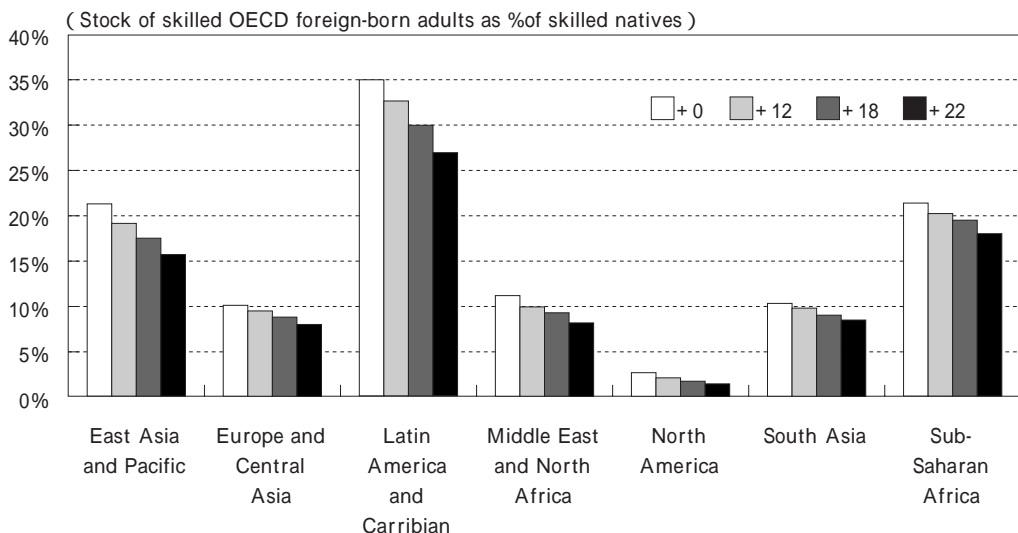


Figure 1: Brain-drain: the emigration of tertiary-educated population

Note: 12+, 18+, and 22+ represents stock of skilled OECD foreign-born adults arrived in the destination country after age 12, 18 and 22 as percent of skilled natives, respectively.

Source: Docquier and Marfouk (2006)

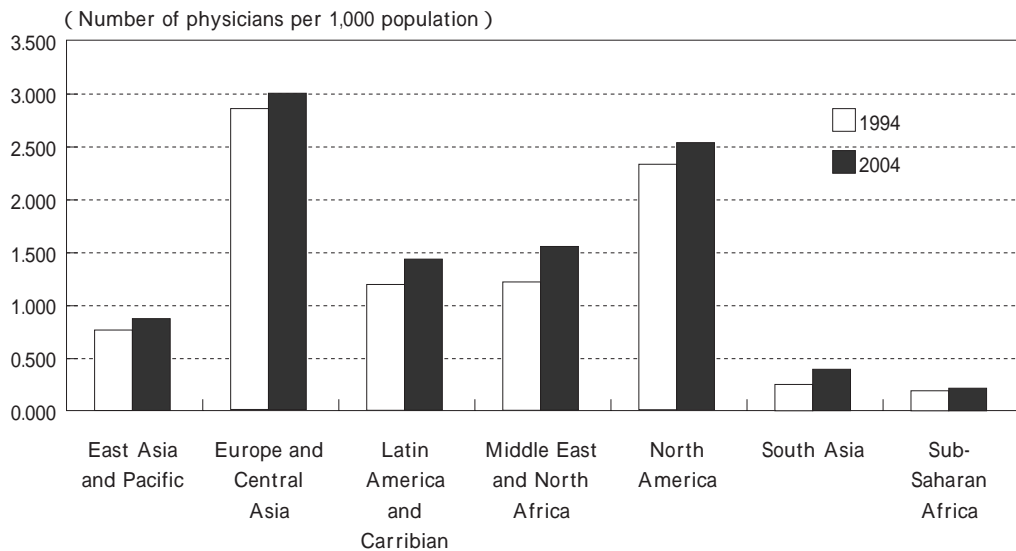


Figure 2: Brain-drain on medical professionals

Source: Beine, Docquier and Rapoport (2006)

Another striking example is Albania. According to the estimates of Tomiuc (2001) one-third of scientists have been currently seeking work outside the country and almost 40% of lecturers and researchers in the field of natural sciences had left this country during the 1990s. There are many examples of professional laborers in Italy, Greece, Canada and Germany, and it is estimated that only 5% of these will eventually return to Albania. Similarly, highly trained scientific specialists have been attracted to work abroad in Romania. According to Tascu, Noftsinger, Bowers (2002) 66 percent of students who acquired science university degrees in Romanian academic institutions are likely to emigrate. Furthermore, between 1990 and 1992 around 40,000 Bulgarian scientists emigrated to the U.K., Germany, France and Ireland with the intention of settling permanently (Straubhaar, 2000)

3. Brain-Waste

If a highly educated professional is able to obtain a qualified job at a destination country, she would find a place to fully demonstrate his or her knowledge. She then would obtain enough payments to match her skills and knowledge, even though she

would not be appropriately rewarded at the labor market in her home country. Such elimination of mismatches arising in the global labor market may introduce more competition, create new job opportunities, raise productivity, and improve economic efficiency in a long-run, as argued by Straubhaar and Wolburg (1999)

Unfortunately, brain-drain cannot eliminate global labor-mismatches between developed and developing countries. In fact, highly educated migrants frequently take jobs with low skill requirements and thus create “ brain waste, ” indicating that they make little use of this knowledge and skills in the destination countries.

Mattoo, Neagu, and Ozden (2005) estimated a multinomial logit-model to obtain the probabilities that an educated emigrant enters a skilled job in U.S. These probabilities vary across countries; for instance, a person from India has a highest probability of obtaining a skilled job in U.S. (69 percent) while a person from Albania has a lowest probability (14 percent) on average. Among the lowest possibilities are several transition countries. As compared with average probabilities in East Asian countries (46.9 percent), these transition countries have achieved much lower probabilities of obtaining a skilled job conditional on educational level (37.9 percent, see Figure 3)

They also estimated the probabilities that an educated emigrant with a science major becomes a scientist or a researcher because these human capitals are expected to be the driving force producing new technologies and innovations. They confirmed the same pattern with the previous result, but realized the regional variations across countries of origin are larger. A migrant with a degree in science-related fields from transition countries performs much worse relative to peers from other countries. In other words, emigrants who have identical educational backgrounds are perceived as belonging simultaneously to both unskilled and highly skilled groups, and therefore, any conclusions regarding brain waste will necessarily depend on the country of reference.

They also tried to explain these regional variations by using cross-countries data. Their result implies that a highly educated emigrant from a country where English is a first language and governmental expenditure on tertiary education is high relative to peer countries is more likely to obtain a skilled job at a destination country. In most of transition countries, the native languages are Russian, Greek, and Turkish. In addition

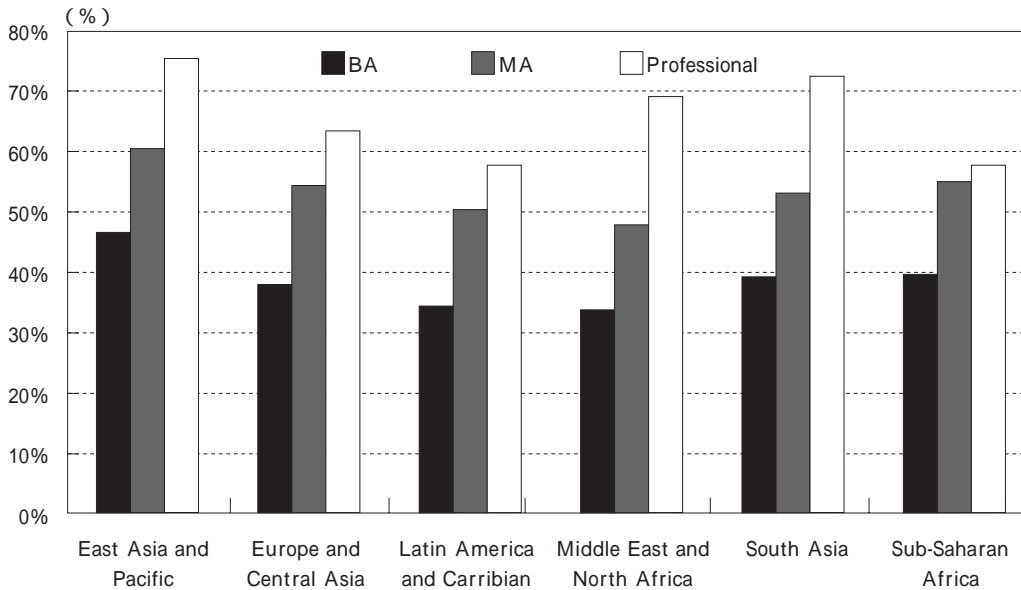


Figure 3: Probability of obtaining a skilled job conditional on educational level

Source: Mattoo, Neagu, and Özden (2005)

to that, these countries have seen a decline in government spending on tertiary education for past decades, while government spending on education has increased in other regions as shown in Figure 4. Mansoor and Quillin (2006) also showed the result of the surveys in Tajikistan and Kyrgyz Republic and clearly demonstrated that highly skilled emigrants from those countries frequently worked in sectors requiring low qualifications, including agriculture, transportation, and construction.

Therefore, migrant workers from transition countries will be disadvantaged to obtain qualified jobs due to language traditions and infrastructure limitations in their countries of origin. More specifically, Hansen (2006) revealed that highly educated migrants particularly from the former Yugoslavia, countries of the Former Soviet Union are affected by brain-waste.

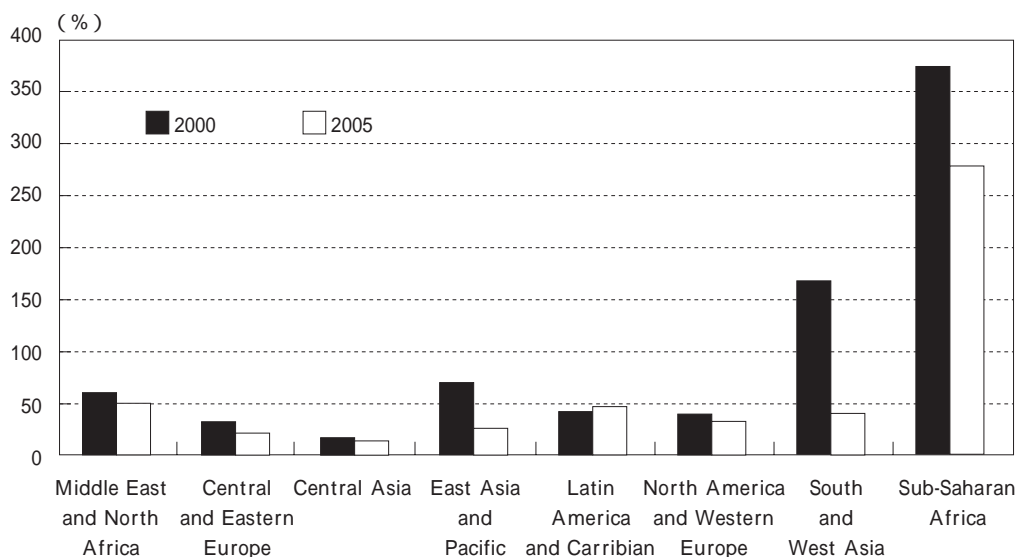


Figure 4: Public expenditure per pupil in tertiary education as a % of GDP per capita

Source: UIS education data, UNESCO Institute for Statistics

4. Brain-Circulation

Many recent studies pointed out that a salary increase was the reason that best explained their decisions to migrate (Koszalka and Sobieszczanski, 2003). In other words, the more significant wage differentials between home and destination countries, the more likely to continue emigration would be. On the other hands, it is well-known that migrants from East Asian countries are more likely to return to their home countries than ones from transition countries. Government officials in low-income countries have been trying to make highly educated emigrants return to home countries eventually.

On this point, an influential literature was released by Rosenzweig (2006). His claim was that the migrant's decision to return to the home country depends on "skill prices," which is the labor market rewards to skills. He estimated skill prices across countries by using information on the wages of workers with the same skills across all countries of the world. Two immigration surveys that he used provide the home-country earnings for a sample of new U.S. legal immigrants admitted to legal permanent residence.

Table 1: Proportion of return migrants having completed higher education

Country	Female	Male
Bosnia and Herzegovina	11.0	9.5
Bulgaria	31.5	25.0
Georgia	52.7	37.7
Kyrgyz Republic	30.3	20.0
Romania	11.5	12.8
Tajikistan	28.8	17.2

Source: Mansoor and Quillin (2006)

Rosenzweig called return migrants “brain-circulation,” indicating emigrants have completed higher education and would return to the countries of origin at some point in their entire life. There is very little research conducted on brain-circulation in transition countries; however, Mansoor and Quillin (2006) estimated the proportion of return migrants having completed a bachelor or master’s degree (Table 1). According to these estimates, former Soviet Union countries and Bulgaria were also characterized by high levels of return migrants with higher degrees, while Bosnia and Herzegovina and Romania were not. Perhaps cross-country differences could have been partially explained by the respective education systems and tertiary education enrollment, but we still need further investigation.

Their estimates also reveal that the female return migrants were more frequently highly qualified than males. Such a result could have been partially explained by the fact that work opportunities abroad were probably less numerous for lower-qualified women. It is also possible that emigration strategies differed according to the education levels of the partners: in a couple with a woman whose qualifications are higher than the man, the gain resulting from female emigration would tend to be higher than from male emigration.

5. Brain-Gain

In addition to brain-circulation as the potential benefit of emigration arising from return migrants, brain-gain has also become an important aspect to be examined in recent literature. This is referred to as the potentially positive impact of skilled

emigration on the development of those left behind in the source countries. The brain-gain mechanism relies on an increase in migrant remittances received at the source country from highly skilled emigrants, which can partially or wholly compensate for any losses from emigration. This has become more relevant as remittances have grown in recent decades.

According to the Balance of Payment Statistics (BOP) released by the International Monetary Fund (IMF) in 2007, officially recorded remittances worldwide totaled over US\$336.9 billion, which has increased almost three times larger than much as ten years ago (US\$119.5 billion in 1997). Furthermore, remittances have an important characteristic. They are less volatile than other types of private capital flows, including foreign direct investments. Rather, remittances are often counter-cyclical and tend to increase in times of hardship in the recipient country. One concrete example to illustrate this is the Asian currency crisis in 1997: private capital flows toward developing countries have been shrinking during 1997-2001; however, remittances toward these countries have increased constantly since then.

Although remittances have increased in all regions, an increase in remittances of Europe and Central Asia is particularly significant (Figure 5). According to data, in 2007, remittances received by the region amounted to over US\$50.4 billion, which is almost 15 percent of the world total and five times larger than 10 years ago (US\$9.5 billion in 1997). On top of that, remittances received within these transition countries exceed the volume of official development assistance (ODA) and foreign aid (US\$5.8 billion in 2007, see Figure 5) while ODA and financial aids remain almost the same amount as much as 10 years ago (US\$6.7 billion in 1997). Unlike the ODA, remittances are a part of private inflows at market terms and are thus expected to achieve more efficient resource allocations at receiving countries than ODA.

Remittances as a portion of gross domestic product (GDP) in many countries within this region are large by world standards. For instance, surprisingly, migrants' funds represent over 40 percent of GDP in Tajikistan and over 30 percent in Moldova, over 10 percent in Kyrgyz Republic, Bosnia and Herzegovina, and Serbia, while the world average is only 0.7 percent (Figure 6). This indicates that remittances from migrant workers abroad make up an important part of household incomes at origin. More than that, according to the survey conducted by Mansoor and Quillin (2006),

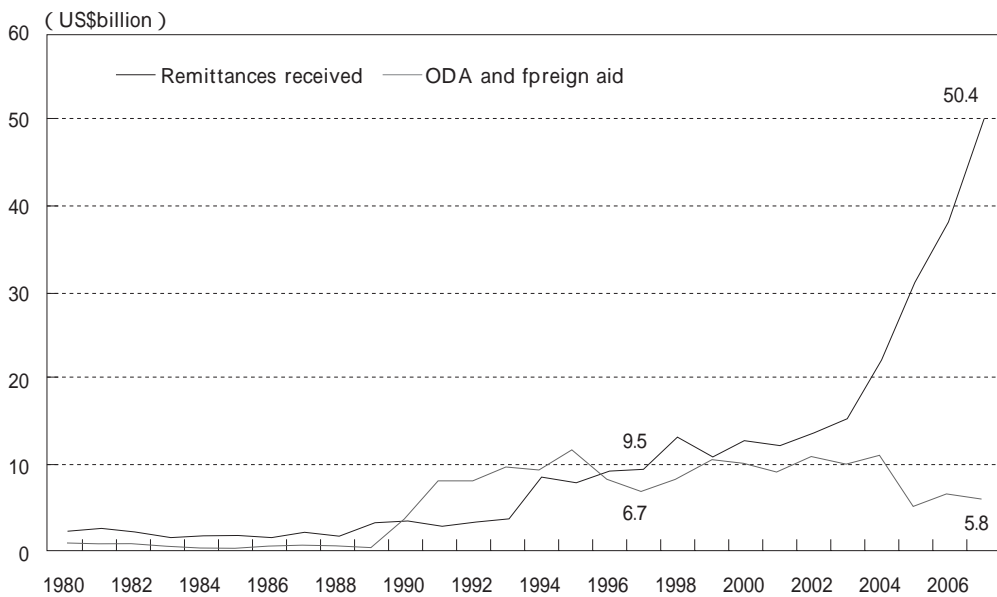


Figure 5: Remittances versus ODA in transition countries

Note: Remittances are defined as the sum of workers' remittances and compensation of employee in Balance of Payment Statistics.

Source: World Development Indicators, World Bank

highly educated people send more money than those with lower qualifications in Eastern Europe and Russia. According to this report, approximately 20% of remittances in this region corresponded to an investment in material capital and 14% to investment in human capital.

Of course, the expansionary effect of remittances on development will be greater when they are spent on human capital investments, if we subscribe to an endogenous growth theory. Rapoport and Docquier (2005) presented the simple model where remittances encourage investments in human capital and may therefore modify the long-run steady-state of the source economy, but there are a few studies investigating the relationship between remittances and human capital accumulation through the formal schooling in transition countries. Nakamuro (forthcoming) and Ogawa and Nakamuro (forthcoming) find that in Albania, a child from the average household who receives remittances from a migrant family member abroad is approximately 4% to 27% more likely to attend school than children from a household that does not receive remittances, after controlling for other variables. Similarly, in Tajikistan, a

child residing in a household that receives remittance transfers from abroad is 2% to 16% more likely to attend school than his or her counterpart. Consequently, remittances become significant, leading to accumulate the human capital ensuring economic development in these countries in transition.

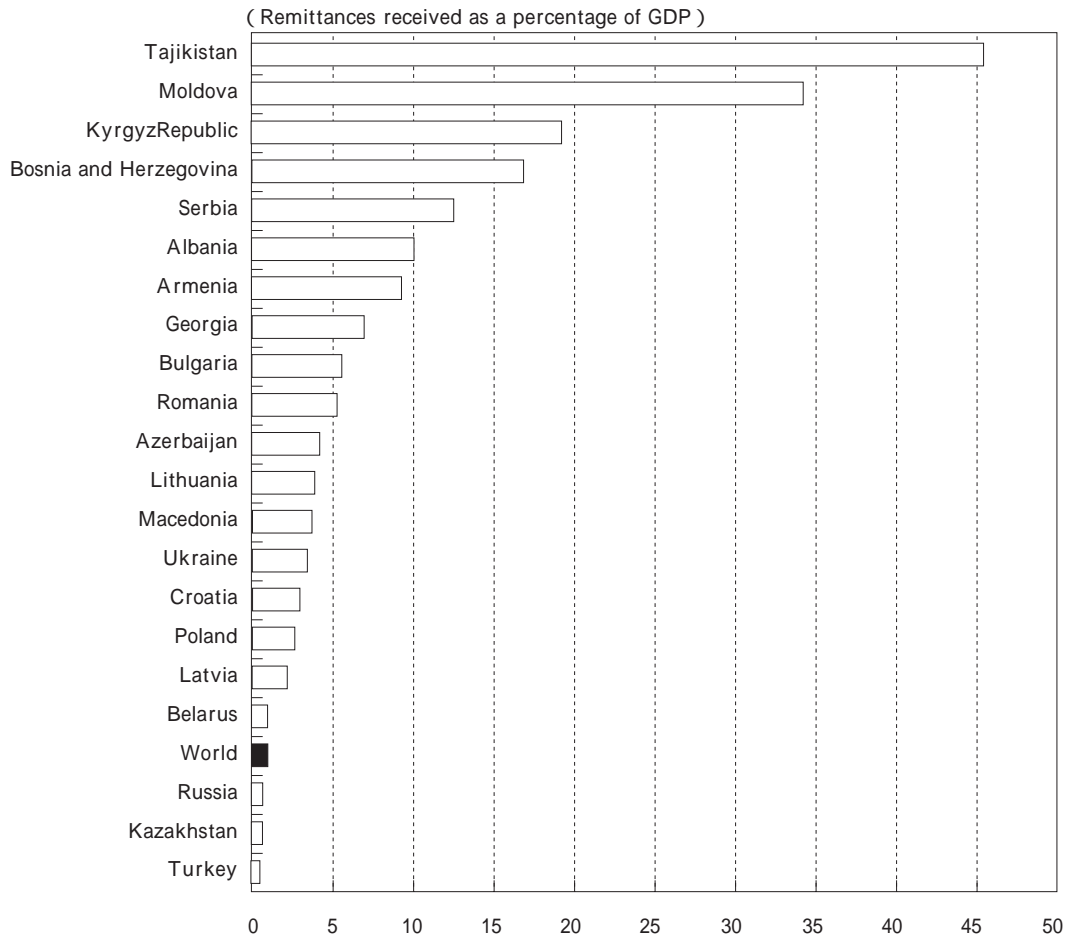


Figure 6: Remittances as a portion of GDP in transition countries

Source: Mansoor and Quillin (2006)

6. Conclusion

This paper reviews the development impact of international labor mobility, especially of highly educated migrants, among transition countries within Europe and Central Asia. The paper first introduces the concepts of brain-drain and brain-waste, indicating that highly educated workers from developing countries were unable to find jobs when they emigrated to developed countries where there was significant skilled labor. Some countries are successful in making migrants return to their countries of origin. As a result, potential benefits were gained through the returnees' full use of networking skills and experiences that they acquired in high-income countries. This phenomenon is favorable for the country of origin as brain-circulation. Furthermore, remittances from a highly educated labor force who emigrated - what is called brain-gain - have a positive impact on development through accumulation of human capital in transition economies.

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