

# From Brain Drain to Mutual Gain: Sharing the Benefits of High-Skill Migration

*A global economy built on policies that foster mutual gain would be both richer and fairer than one premised on a war for talent.*

**T**he news on high-skill migration (HSM) is good and getting better. More highly skilled people are moving across borders for education and work than ever before. Judging by figures on graduate-school applications from abroad that were released in March 2006 by the Council of Graduate Schools, the United States is recovering from its overreaction in the wake of the September 11, 2001, terrorist attacks and reestablishing its position as the most desirable destination for the world's talented and restless. HSM benefits the migrants themselves, the knowledge-producing community, and the global economy as a whole. Managed wisely, HSM might also benefit many of the countries in the developing world that traditionally have been thought to be hurt by it.

Although the aggregate benefits of HSM outweigh the aggregate costs, these benefits and costs are unevenly distributed. Indeed, at the national level, HSM has typically been seen as a zero-sum game, a brain drain that makes the rich

richer and the poor poorer. Attachment to the brain drain metaphor these days, however, obscures as much as it illuminates. New research suggests that knowledge acquired abroad by talented migrants and the benefits that derive from that knowledge are returning home more often than in the past, even when the "brains" themselves do not. What's more, under some conditions, the prospect of migration may enhance, rather than reduce, human capital formation within source countries.

Before consigning the brain drain to the dustbin of history, though, a heaping helping of caution is in order. The incipient shift toward mutual gain is limited in scope and may prove fragile. Small developing countries remain vulnerable to human capital flight. Larger ones confront constraints on their capacity to absorb and use new ideas effectively. Migrants from all source countries face the prospect of a potent backlash within the receiving countries, animated by anti-immigrant sentiment and concern about the offshoring of jobs.

Policymakers around the world should seize emerging opportunities to expand the mutual gains that might be made through HSM. To do so, they will need to change the way they think about the issue and let go of the zero-sum metaphors of “brain drain” and “war for talent.” Having done so, they will be better prepared to take creative steps toward achieving two objectives: strengthening the capacity of source countries, especially small ones, to absorb knowledge and extract benefits from it, and nurturing knowledge spillovers from receiving countries to source countries.

### **The rising tide of HSM**

The first rule of migration studies is to visualize large error bars around virtually every statement one reads. Data are spotty at best, limiting researchers’ confidence in comparisons over long periods of time, across many countries, and among ill-defined subpopulations such as the highly skilled. Researchers sponsored by the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), and World Bank, among others, have only just begun to sort out and systematize information that has been collected by diverse national border control and census agencies.

The data, such as they are, suggest that there is a rising tide of HSM. IMF and World Bank studies consistently find a high correlation between education and legal migration. In 2000, for instance, a person with a college or graduate-school education was six times more likely to migrate legally than was one with less than a high-school education. 37% of the legal immigrant stock in OECD countries, more than 20 million people all told, fell into the high-skill category, compared with 33% a decade earlier. Another 600,000 or so highly skilled people work outside of their native land on temporary visas at any given moment. And some 1.6 million men and women are studying abroad at the undergraduate or graduate-school levels, a number that has approximately doubled during the past 20 years.

Many of these highly skilled migrants hail from developing countries and reside in rich ones. About 70% of the

foreign-born in the U.S. science and engineering workforce whose place of birth was identified by the National Science Foundation, for instance, are natives of non-OECD countries. In addition, the vast majority of expatriate workers on temporary visas come to the OECD from developing countries. Some 700,000 of OECD foreign students, about half of the total, are citizens of developing countries as well. Migration specialists B. Lindsay Lowell, Allan Findlay, and Emma Stewart conclude that “nearly one in ten tertiary educated adults born in the developing world resided in North America, Australia, or Western Europe in 2001.”

Unless the receiving countries erect barriers for political reasons, the tide is not likely to ebb any time soon. The population-age profile of most of the developing world is still a pyramid, whereas that of the OECD (and of China, thanks to the one-child policy put in place nearly 30 years ago) resembles an apartment building. Differences in salaries and opportunities between source and receiving countries remain large, and awareness of these differences is becoming more widespread thanks to the penetration of information technology into even the most backward villages.

These demographic and economic trends have fueled an international competition to offer, as Devesh Kapur and John McHale put it in their recent book, better deals to highly skilled migrants. Australia and Canada, among others, have moved aggressively to compete with the United States for their services, and even Germany has shown signs of softening its traditional immigration phobia. Some important source countries, such as China and South Korea, have also been working hard to retain talented citizens and induce those who have already gone abroad to return home.

### **The conventional wisdom**

If the data on flows of people are spotty, the data on who gains and who loses from migration might be characterized as dotty: Analysts need to use both sophisticated theories and common sense to connect data points that, standing alone, provide a far from comprehensive picture. For the past few decades, these experts have largely agreed that

## **HSM POLICIES SHOULD AIM TO DISTRIBUTE FAIRLY THE BENEFITS OF EXPANDED MIGRATION, RATHER THAN SEEK TO LIMIT MIGRATION OR KNOWLEDGE FLOWS.**

benefits follow the highly skilled when they move from one country to another.

Simulations by L. Alan Winters, director of the World Bank's development research group, and his colleagues provide some sense of the scale of the aggregate benefits of migration. According to their model, if the labor force of the OECD countries were to be increased by 3% by temporary migration, world welfare would expand by \$150 billion, resulting in, they write, "greater gains than the removal of all restrictions on goods trade!" Not all of these gains come from cheaper haircuts and housecleaning; lifting immigration quotas only on skilled workers produces aggregate benefits of roughly \$45 billion in this model.

As Winters et al. are quick to emphasize, these estimates should not be taken literally. They are based on using existing human capital more effectively by matching it to complementary resources, such as other talented people, state-of-the-art equipment, and organizational wherewithal. They do not account for contributions made by migrants to the stock of knowledge, which continue to pay off over a long period of time.

Yet as Paula Stephan and Sharon Levin have shown, foreign-born and foreign-educated workers in U.S. science and engineering (S&E) fields make disproportionately large and valuable contributions to knowledge. For example, they are overrepresented (relative to their share of the S&E workforce) among authors of the most-cited scientific papers and inventors of highly cited patents. The aggregate benefits of freer flows of talented people may well be underestimated by conventional economic models.

Aggregate benefits, of course, often mask distributional costs, and that has long been accepted to be so in this case. In the Winters et al. model described above, for instance, the migrants themselves and the economies that receive them derive benefits, whereas those left behind in the source countries are made worse off. The losses total some \$21 billion in the full model and \$34 billion in the model that includes only HSM.

A lopsided distribution of gains and losses from migra-

tion remains plausible even when we account, as above, for the unique economic properties of knowledge. Most of the gains attributable to advances in knowledge are not captured by those who make them, but rather spill over to society more broadly. Such spillovers tend to be geographically localized, clustering near where the ideas were originally generated. Source countries thus lose more than the income that the migrants would have earned had they stayed home; they also lose the spillovers associated with the migrants' ideas. Even if those ideas would have been less valuable had their creators never left home, the source countries would have gotten a much larger share of that smaller pie.

These presumed losses constitute the drain in the brain drain. For the past 30 years or so, developing countries have sought unsuccessfully to be compensated for these losses out of the net contributions their natives have made to the well-being of their adopted countries. With a few exceptions, the receiving countries have accepted the premise that HSM constitutes a brain drain, even though they have made little more than token gestures toward compensating source countries. In the past few years, though, this premise has been subjected to more rigorous scrutiny than before.

### **Can drain lead to gain?**

Recent research has opened two lines of attack on the conventional wisdom about the distributional consequences of HSM. One claims that the prospect of migration induces greater investment in skills and education within the source countries. The other suggests that migration precipitates knowledge spillovers from the receiving countries to the source countries. Together, the two arguments suggest that HSM is not a brain drain but, paradoxically, may even lead to a net gain for source countries.

The induced investment argument assumes that potential migrants (or their parents) believe that good preparation at home will increase their chances of reaping the economic bonanza associated with going abroad. The vagaries of migration are such, however, that they are unable to make such investments in a fully informed and rational

manner. They act more like venture capitalists (or maybe even lottery participants) than like bond buyers (who receive a fixed return) when they acquire skills and education.

The combination of poor information and high aspiration, the argument continues, means that more people in the source countries will try to make themselves attractive candidates for migration than are actually able to migrate. Those who have made the investment but cannot leave need not write it off entirely. They can still put their hard-won knowledge to work in the domestic economy. This result is not the big payoff of migration, but it may still represent a positive return on an individual's educational investment. The domestic economy tallies these additional wages, but, more important, it benefits from the localized spillovers associated with the expansion in knowledge work as well.

The second challenge to the conventional wisdom uses the idea of knowledge spillovers differently. Improvements in information and communication technology, its advocates argue, allow people to capitalize on knowledge over much larger distances than ever before. Cheap transportation makes possible more frequent personal meetings and visits. Massive bandwidth and sophisticated software facilitate rich and extended electronically mediated interactions. In the not too distant future, virtual reality communication channels may even enable the long-distance transfer of tacit knowledge, such as cutting-edge scientific techniques, which currently requires direct contact. These technological opportunities are being realized by new kinds of scientific and business organizations. Global collaborative networks in both sectors help to create trust that lowers the risk and raises the reward of knowledge exchange.

The general expansion of the geographical scope of knowledge spillovers has specific consequences for the HSM debate. Highly skilled migrants are more likely to generate international knowledge spillovers than they used to be, brain drain skeptics argue, and the benefits of these spillovers are more likely to be captured in the source countries than elsewhere. Migrants are able to maintain strong relationships with the friends they left behind, and they are

better positioned to build new international linkages with colleagues in source countries than anywhere else. These bilateral networks, which may be scientific, financial, or commercial, tend to become self-reinforcing. Multinational firms that employ expatriates, for instance, are inclined to site operations in the source countries, which in turn, may strengthen the firms' connections to suppliers, academic institutions, and other potential recipients of knowledge spillovers there.

Neither of these arguments presumes that the brains that were "drained" ever return to the source countries for good. In fact, as long as the migrants are perceived to do sufficiently well after they leave (in the induced investment argument) and maintain sufficiently intensive knowledge-based relationships with their former compatriots (in the knowledge spillover argument), the source countries may even be better off if they never come back. The sustained incentives to invest in skills and education and the continuing flows of useful knowledge, in the view of the most enthusiastic adherents of these positions, more than compensate for the loss of the human capital of the departed.

### **Ambivalent evidence**

These challenges to the conventional wisdom that HSM must be a brain drain are logically coherent. They appeal to the instincts of the Western scientific and technical community, with its long tradition of internationalism and respect for individual choice, not to mention its wish to justify its existing practices. We should be wary, however, of leaping to the comforting conclusion that the transformation of drain into gain is inevitable and irreversible. Both the induced investment and the knowledge spillover arguments rest on assumptions that may not be accurate in all circumstances. Whether the push for the gain outweighs the pull of the drain, or vice versa, is ultimately an empirical matter.

It is surely the case that the prospect of emigration induces the desire for skills and education among some who might benefit by leaving, especially when the potential payoff is very large relative to opportunities at home. But this desire can-

## **WE NEED TO LET GO OF THE BRAIN DRAIN METAPHOR ONCE AND FOR ALL AND NOT LET A “WAR FOR TALENT” PUT DOWN ROOTS IN THE POLICYMAKING DISCUSSION.**

not always be acted on. Those with the desire may lack the means to invest in themselves or their children. Even if they can express a demand for knowledge, financially or politically, the domestic system of education and training may be too rigid to respond to it. In addition, those who are able to equip themselves for emigration may not do so in way that adds significantly to their contributions should they wind up staying home. The source country may not be able to use the skills and knowledge they obtain, and they may feel frustrated.

The most thorough efforts to test the induced investment argument empirically suggest that large countries, especially those in which educational levels are very low, may benefit from HSM, whereas small countries are often big losers. Frederic Docquier and his colleagues, for instance, have calculated that China and India, among others, are net beneficiaries of HSM at its current level and would benefit even more if outflows were to rise. At the other extreme, Guyana, Haiti, and Jamaica, which have lost more than 80% of their college-educated population to migration, have, unsurprisingly, been made worse off as a result. Docquier and his coauthors conclude that although more of the 50 developing countries in their sample are “losers” than “winners,” the winners contain some 80% of the total population.

This conclusion must be treated as tentative, given the state of the data and the ongoing debate about the models, but it makes sense. Migration opportunities are not necessarily offered by receiving countries in proportion to the population of the sending countries. Citizens of the Dominican Republic, El Salvador, and Jamaica (with a combined population of less than 20 million) are more than 100 times more likely to be admitted as legal immigrants to the United States, for instance, than those of India and China (with a population of more than 2 billion). The induced investment argument suggests that there are so many people in large countries competing for so few migration slots that the “surplus” human capital generated by the competition is substantial. In addition, large countries probably have more diverse institutional structures in education and the economy than small ones. They are therefore better able to adapt

to changes in demand for training and to absorb the surplus. Looking at India, for instance, Simon Commander and his colleagues find “compelling evidence” of a supply-side response to the demand for information technology-related training, especially among private educational suppliers.

The counterclaims against the knowledge spillover argument resemble those offered to rebut the induced investment argument. The knowledge gained by highly skilled migrants may not always be valuable in the source countries. Even if it is potentially valuable, these countries may be unable to benefit from it because they lack “absorptive capacity,” a somewhat mysterious mix of capabilities, incentives, organizations, and institutions associated with knowledge-based growth. Migrants may also face obstacles to establishing productive scientific, commercial, and financial connections to their former homelands.

The evidence that there are some knowledge spillovers from receiving to source countries is incontrovertible. Annalee Saxenian, for instance, has shown that a healthy traffic in knowledge and information between Silicon Valley, California, and Bangalore, India, mediated by Indian expatriates, helps to account for the emergence of the high-technology cluster there. Similarly, in their exposition of “third generation globalization,” Leonard Lynn and Hal Salzman link the establishment by multinational corporations of engineering operations in developing countries to the presence of highly skilled migrants among the employees of these corporations.

One may reasonably doubt, however, whether case studies like these can be generalized. Researchers have been seeking to demonstrate the existence of receiving country–source country knowledge spillovers, and therefore they have selected cases that are expected to be positive examples of the phenomenon. Further case studies will undoubtedly shed more light, but we should not expect convincing quantitative evidence about the geographical scope and directionality of spillovers to appear any time soon. Knowledge spillovers, especially those that depend on tacit knowledge and thus are not codified in patent citations or other familiar indicators, are quite difficult to track and measure.

On balance, this body of work, preliminary as it is, suggests that HSM does not harm developing countries as dramatically or as systematically as most observers have assumed in the past. Claims for compensation by the largest developing countries, whose advocates have at times been the most vocal proponents of the brain drain view, warrant a skeptical response. On the other hand, even the brain gain optimists agree that there are good reasons to be concerned about massive human capital flight from certain small developing countries, where neither induced investment nor knowledge spillovers are likely to amount to much. The losses in these cases are often especially crippling in health care and education, undermining human as well as economic development.

### **The potential for a backlash**

The argument to this point, and in most of the literature, assumes that any shift from brain drain to mutual gain is a process endogenous to the nascent global knowledge economy, the aggregate result of myriad individual and organizational decisions. But these decisions are, of course, also embedded in a political and legal context. Given the current heated immigration debates and concerns about perceived loss of jobs to developing countries, we must also consider whether actions might be taken that could not only stop the trend toward mutual gain but even reverse it.

Although the immigration debate in the United States and Western Europe is focused primarily on unskilled labor and illegal immigrants, the issue transcends mere economic calculation, igniting passions associated with national identity. Stoked by political opportunists, xenophobia could lead to restrictions across all categories of migrants, even those considered to be desirable in calmer days. After the 2001 terrorist attacks, for instance, the United States reflexively cracked down on foreign students and visiting scholars, particularly those from developing countries. International applications to U.S. graduate schools dropped 28% in 2003–2004 and another 5% in 2004–2005. Only in 2005–2006, some five years after the attacks (and well after most observers recognized that the country was shooting itself in the foot) has this decline begun to be reversed.

There are also plausible scenarios that would produce a backlash targeted specifically at HSM within the receiving countries in the near future. We know that such migration produces distributional costs within as well as across countries. Some native-born citizens who might have received educational and employment opportunities in the migrants' fields are displaced to less remunerative fields, while the earning power of those who remain in the migrants' fields may be

diminished. The political objections of those who perceive themselves to be bearing these costs contribute to the setting of quotas and other limits on HSM, as in the case of H1-B visas in the United States.

Such objections would surely be amplified and gain political potency if HSM came to be associated in the receiving countries with job transfers to countries with lower labor costs, or offshoring. The more the geographical scope of knowledge spillovers expands, the more sensible this association becomes. At the extreme, the gains from migration might be captured entirely by the migrants themselves and their business partners in the source countries. Ron Hira supplies evidence that U.S. temporary visas (L-1 and H1-B) can operate in this fashion. Some service-sector professionals who receive them acquire tacit knowledge about business practices and relationships with future clients. This allows them, when they return home, to displace U.S. competitors.

If the domestic knowledge spillovers of HSM that accrue to the native-born are perceived to dwindle, the receiving countries could respond in several ways. One would simply be to reduce HSM. This approach sacrifices any aggregate benefits that derive from HSM. Another would be to try to restore the old brain drain status quo by limiting the international flow of spillovers. Since 9/11, for example, the United States has sought to limit the access of some foreign students and visitors to scientific knowledge thought to be of potential use to terrorists. This approach is difficult to make work; to the extent that it does, it could set off a dangerous chain reaction of intellectual protectionism.

A third and better approach under these circumstances would be for the receiving countries to compete more aggressively to capture a fair share of the spillovers. Such competition might even help to accelerate the realization of the mutual gain ideal for HSM, in which it is neither a drain on the source countries nor (in the immortal words of Ross Perot) a "giant sucking sound" in the receiving countries.

### **An agenda for action**

My conclusion begins with a reminder of the first rule of migration studies: Visualize large error bars. When it comes to HSM, the data are poor and the scale and distribution of costs and benefits are disputed. International organizations that are working to reduce the uncertainties, including the World Bank, IMF, and OECD, deserve support in doing so.

These error bars and the dynamic nature of migration itself and the knowledge spillovers associated with it militate against making major and irreversible policy commitments in this field. For example, an "exit tax" to compensate source countries, an old idea that has found renewed

support recently, would probably be very hard to change once imposed, even if future data suggest that such compensation is superfluous. Similarly, the proposed World Migration Organization, envisioned by its advocates to operate in parallel with the World Trade Organization, seems likely to be prone to rigidity if it were to seek to govern HSM on a global basis.

Accepting that the error bars are large, however, should not paralyze policymakers. The ongoing debate about drain and gain reveals important areas of consensus that ought to form the basis for action. It also points toward innovation in policy implementation, engaging new and flexible formations of governmental agencies and nongovernmental entities.

One point of consensus should be to abandon zero-sum terminology for conceptualizing HSM. It's time to stop using the phrase "brain drain" as a synonym for HSM. The emerging concept for a global "war for talent" is even worse. The creation and exchange of knowledge are the greatest positive-sum game that humanity has invented. HSM is a vital part of that game, a joint venture from which both source and receiving countries have the potential to gain. HSM policies should aim to distribute fairly the benefits of expanded migration, rather than seek to limit migration or knowledge flows.

A second point of consensus is that small developing countries are the most likely to suffer net costs from HSM. The great powers may not agree about who wins and who loses when Indian or Chinese or Russian computer programmers come to the United States or Europe, but they should accept that there is a problem when the health care and educational systems of Africa and the Caribbean are hollowed out. Focusing on the cases that are clearly problematic sidesteps the slow and ultimately futile process of devising a one-size-fits-all solution. In addition, an approach that targets small countries reduces the threat of backlash in the receiving countries. Any offshoring that might be caused indirectly by HSM-related policy oriented to these countries would be on a modest scale.

Third, we should not assume that we live in the best of all possible worlds. Brain drain might spontaneously turn into mutual gain, even for smaller developing countries, as new technologies and organizational systems diffuse; but then again, it might not. Conscious collective action, involving all of the affected parties, may help bring to fruition opportunities for migrants to build partnerships back to their native lands. To be sure, policies related to HSM cannot overcome civil conflict, dictatorship, or deeply embedded corruption. Migrants from nations suffering from profound

maladies like these may well choose not to look back, much less go back, until stability and respect for human rights are established where they came from.

For the countries that offer a good prospect for the strengthening of mutual gain, two policy objectives stand out, one corresponding to each of the challenges to the conventional brain drain wisdom laid out above. The first objective is to strengthen the capacity of source countries to absorb knowledge and extract benefits from it. Stronger educational systems that are more responsive to the global knowledge economy, perhaps through the introduction of private competition at the secondary and tertiary levels, are one key element of absorptive capacity. Another element is entrepreneurship that allows developing-country economies to capitalize on supply-chain relationships and foreign direct investment, rather than merely supply unskilled labor that cuts costs for their international customers.

A second objective is to deliberately nurture knowledge spillovers from receiving countries to this group of source countries, strengthening what Lynn and Salzman refer to as collaborative advantage. Governments can remove barriers that inhibit communication and travel for expatriates. They might also subsidize the organizational infrastructure of highly skilled diasporas and provide incentives for them to create educational, scientific, and commercial relationships with partners in the source countries. Experimentation with information and communication technology in areas such as distance learning and health care promises to allow expatriate teachers, doctors, and other highly skilled professionals to become able to share more easily what they have learned with the citizens of their home countries.

Many of these steps can be taken by receiving and source countries acting on their own, but they might be enhanced by being embedded in a framework of international cooperation. Bilateral cooperation may be the most promising general approach, because for many source countries, a single receiving country dominates the emigration pattern, because of factors such as proximity and shared language. Great Britain, for instance, has sought (with limited success) to slow the flow of nurses from Africa, where they are badly needed to deal with the HIV/AIDS pandemic and other public health threats. In other cases, ad hoc efforts involving a few countries would be appropriate; this approach would also permit the smaller receiving countries to play an active role.

The variable geometry of national governments' participation in such efforts may ultimately be less important than which agencies and organizations within and outside these governments take the most active roles. They should

not be dominated by ministries that are primarily responsible for border control; scientific, educational, and commerce-oriented agencies should take the leading roles. Equally important is that governments concentrate on facilitating and enabling private, academic, and nongovernmental networks that have the potential to become self-sustaining. The U.S. National Institutes of Health, for instance, has established a program that assists developing-country researchers who have trained in the United States to set up projects in their home countries, with the expectation that they will become independent members of such networks.

A global knowledge economy built on policies that foster mutual gain would be both richer and fairer than one premised on a war for talent. The more that imaginative people from different places are able to share and build on one another's ideas, the more knowledge will be discovered and the more diverse uses for it will be invented. A world in which countries seek to hoard talent and ideas, and "raid" their "enemies" to acquire more, would breed resentment far more bitter than that of the brain drain era. Working together, we can make the most of the many opportunities presented by the nascent century of human capital.

### **Recommended reading**

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Robert E. B. Lucas, "International Migration to the High Income Countries: Some Consequences for Economic Development in the Sending Countries," paper presented at the World Bank Conference on Development, April 2004.

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