

Brain Gain

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Brain gain refers to the hypothesis that the emigration of advanced students and highly-skilled workers may produce domestic incentives for investment in education and skills that are so powerful that they more than offset the human capital losses incurred as a direct result of the departures. This hypothesis poses a challenge to the more widely held view that such emigration results in a net loss of human capital or brain drain.

A brain gain may be realized only if several conditions are met. First, many emigrants must receive substantially higher returns on their education and skills than they would have had they stayed home. Second, these gains must be perceived by individuals in the sending countries who have the potential to acquire more education and skills, thereby inducing a demand for them. Third, domestic institutions must be able to respond effectively to this demand. Fourth, some of those who have been induced to add to their human capital stock by the prospect of emigration must be unable to emigrate. Finally, this group must be able to put their newly gained education and skills to good use at home.

The first condition is likely to be met quite often. Large international differences in compensation are a driving factor in many migration decisions. Although not all emigrants are able to put their education and skills to work in the receiving countries, many do. A quarter of all college-educated workers in science and engineering occupations in the United States in 2003, for instance, were born outside the country.

When emigrants experience employment success, reports are likely to filter back to interested communities in the sending countries, fulfilling the second condition. (Indeed, if these reports are exaggerated, so much the better for the brain gain hypothesis.) Electronic mail and the World Wide Web have expanded and accelerated the communication channels for such information. A case in point is the close association in the late 1990s and early 2000s between salaries in the U.S. information technology industry and foreign student enrollments at the graduate level in related fields.

The third condition may be the most difficult to fulfill. Effective institutions for education and training tend to be rigid. They require highly-skilled teachers who may be difficult to recruit and retain. They may need substantial capital inputs for facilities and equipment. They may be burdened by red tape and political demands. Even when it is possible to expand such institutions, their quality may decline so significantly that their net contributions to human capital formation are far less than hoped for. New higher education franchises in India, for example, are a far cry from the Indian Institutes of Technology that have shaped expectations among foreign employers.

If the educational bottleneck is surmounted by a large number of prospective emigrants, it does seem probable that a substantial fraction of them will be frustrated in their attempt to secure a better return on their investment in themselves by seeking skilled work abroad. This condition, the fourth for realizing a brain gain, is enacted through immigration quotas, labor market regulations, and other forms of protection for skilled workers in the receiving countries. Applicants for an employment-based “green card” for permanent residence in the United States, for instance, must typically wait several years for a decision.

The final question is whether these would-be emigrants can put their hard-won knowledge to effective use in the domestic economy. This condition, like the third one, is not necessarily easily met. The profile of the demand for skills, especially highly-specialized skills, may be different at home than abroad. Nurses and doctors whose training prepared them to treat middle-class patients in comfortable surroundings provide an illustration; they may choose not to practice their professions, rather than serve poor villages where the medical needs are greatest.

The data available for assessing the brain gain hypothesis, although they are improving, are still too poor to allow for anything other than tentative conclusions. The firmest of these conclusions is that a brain gain is more likely in countries with large populations than small ones. Beine *et al.* (2003), for example, find that China and India benefit from current levels of emigration of college-educated individuals 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 to emigration, have been made worse off. While more of the fifty developing countries in Beine *et al.*'s sample are “losers” than “winners,” the winners contain some 80% of the total population.

These tentative findings are intuitively appealing, given the conditions required to realize a brain gain. Large countries seem likely to more easily achieve the economies of scale required to support expansion of and new entry into higher education. They may also benefit more from competition among provinces and localities to provide public education and among private educational institutions as well. National quotas in receiving countries amount to a smaller fraction of the populations of large sending countries than small ones. (Citizens of Jamaica, for instance, are more than a hundred times more likely to be admitted as legal immigrants to the U.S. than those of India.) Finally, the more diversified economies of large countries may provide more opportunities for “surplus” human capital to be used productively.

Although the conditions for a brain gain may be more likely to be fulfilled in large countries, there are many policies that sending countries of all sizes might undertake to raise the odds of such an outcome. Chief among these are educational policies that provide general skills and economic policies that foster investment and entrepreneurship. Receiving countries, too, have a potential role to play, for instance, by linking their immigration policies to labor market conditions at home and abroad. Neither brain gain nor brain drain is, in the final analysis, an outcome of immutable laws of economics, but rather a construction of policy decision-making within institutional constraints.

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