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## **ABSTRACT**

### **High Skilled Immigration in the International Arena**

This conceptual paper, prepared for a United Nations Expert Group Meeting on Migration and Development, is concerned with the international mobility of high-skilled workers, previously referred to as the “brain drain”. After discussing the historical background of high-skilled international migration, the paper examines the reasons for the recent growth in demand for high-skilled workers in the technologically advanced nations. It then examines the impact of high-skilled migration on the level and distribution of income in the destinations. The causes and consequences of high-skilled emigration from the perspective of the origins or sending countries are examined. Educational finance and taxing policies that encourage emigration, emigrant remittances, and the “brain gain” from returning emigrants are discussed. Alternative public policies are considered.

JEL Classification: F22, J61, J31, O15

Keywords: immigration, high skilled workers, economic development

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## **“High Skilled Immigration in the International Arena”**

### **A. The Historical Background**

In the late nineteenth and early twentieth centuries international migration reached unprecedented levels (Chiswick and Hatton, 2003). During this period, often referred to as the Age of Mass Migration, millions of people left their home countries to cross the Atlantic, Pacific and Indian Oceans, and millions more moved within continents in search of better economic opportunities. These migrations were propelled by three phenomena. One was the decreased cost of transportation due to the development of steamships and railroads. A second was the expansion of demand for low-skilled labor on plantations and mines due to European colonization and of family farms on the frontier in North America and Australia. The third was the growth in the demand for low-skilled industrial workers in the industrializing centers, particularly in North America and Northwestern Europe. With the onset of World War I, the Great Depression, and then World War II international migration declined sharply. The decline that would have occurred in any case was reinforced by severe immigration restrictions in the major destinations.

In the second half of the 20<sup>th</sup> century there was at first a gradual and then a more intense resumption of international migration. This was propelled by further declines in the cost of information, communication and transportation, by the increased income in some sending regions that facilitated the financing of migration, but most importantly by the large disparities in wage opportunities between the destinations (primarily what are now referred to as the OECD countries) and the origins (primarily the less developed countries). Changes in immigration policy played a role in this period as well, as the primary destinations in North America, Europe and Australia relaxed their immigration policies to provide the labor that was in demand to fuel the post-war economic growth. (Of the OECD countries, only Japan maintained a “closed door” immigration policy.) The expanded opportunities for immigration came in various forms – primarily as permanent legal immigrant status in North America and Australia and primarily as “guest workers” or “temporary workers” in many Western European countries. Regardless of legal status, many “permanent immigrants” returned to their home countries, and many of the “temporary workers” stayed permanently.

A major theme that evolved in the immigration policies of the destination countries in the 1960’s to the 1980’s was family reunification. Whether the migrants were initially intended to be permanent or temporary, those who wished to stay could do so, and to bring their family members with them. At first these were welcomed on several grounds, including humanitarian concerns (uniting divided families) and to supply the labor force that was felt to be needed to offset the aging of the population due to very low fertility, a concern of particular interest in Western Europe.

## **B. The Demand for High Skilled Workers**

In the late 20<sup>th</sup> and early 21<sup>st</sup> centuries immigration policy responded once again to changes in economic and political circumstances. The Computer, Information or High-Technology Revolution, which began gradually in the early post-WWII period, accelerated in intensity and across the globe in the 1990's. In spite of the burst of the High Tech Stock Price Bubble, the Computer Revolution continues unabated in the early 21<sup>st</sup> century. Nor does it show any prospect of slowing down.

The Computer Revolution is one of three factors that have contributed to the increased relative demand for high-skilled workers in the OECD countries, that is, the widening of "skill-differentials" (i.e., the ratio of high-skilled to low-skilled wages). The other two are the globalization of the world economy and the large scale immigration of low-skilled workers, particularly from Latin America, Africa, and the Middle East, into the U.S. and Western Europe (Chiswick and Hatton 2003).

It appears that the Computer Revolution has not been "skill neutral," but rather has been "skill biased," that is, it has enhanced the productivity of high-skilled workers by more than it has enhanced the productivity of low-skilled workers. To provide some examples, computer engineers and programmers have been designing hardware and software that have displaced lower-skilled workers, whether through robots replacing assembly-line factory workers, electronic scanners replacing check-out clerks at retail establishments, or voicemail replacing answering service clerks.

While there is a consensus that the Computer Revolution is still in its infancy and that up to this point it is skill biased, it is less clear whether this is a permanent or temporary phenomenon. The skill bias will be a permanent phenomenon if it proves to be inherent in the new technology. The skill bias will be a temporary phenomenon if it arises solely because more highly educated workers have greater "allocative efficiency," that is, they tend to be the first to adopt and to most efficiently employ new technologies (Schultz, 1975). The superior decision making skills of more educated workers puts them at an advantage when it comes to adopting and utilizing new technologies, both in the past and in the present. If, in fact, the Computer Revolution is inherently skill biased, the increased skill differentials observed in the OECD countries over the past two to three decades will persist and might even continue to increase, whereas if the increased skill differentials are due to differential allocative efficiency the skill differentials can be expected to decline as the technology spreads in the population (Chiswick, 1979, Greenwood 1997, Greenwood, et al., 1997).

The globalization of the world economy has been facilitated by the decreased cost of information, communication and transportation. This has been intensified in part by the effects of the Computer Revolution lowering information and communication costs, and hence the cost of services, by "containerization" lowering the cost of transporting goods, and by reductions in tariff and non-tariff barriers to trade (including the emergence of free trade zones and monetary unions).

Another essential element has been the economic development of many previously less developed countries. As a result, many goods previously produced primarily by lower-skilled factory workers in the OECD countries are now produced in less developed countries. The globalization of the world economy has altered the international specialization in production. This has increased the demand for high-skilled workers in the advanced economies, but decreased the demand in those economies for lower-skilled workers whose “jobs have been shipped overseas.”

Finally, the immigration policies of some of the advanced economies have exacerbated the increase in skill differentials by fostering the migration of low-skilled workers. “Family reunification” policies bring family members of earlier immigrants and guest workers to the destination and they tend to be lower skilled. Policies to counteract the aging of the population have also tended to focus on attracting lower skilled workers, particularly for low-skilled service jobs, including the care of children and the aged.

In response to these developments, immigration policies in the advanced economies have shown a recent tendency to shift toward a focus on attracting high-skilled workers. This is seen in the United States in the Immigration Act of 1990 that reduced the previous emphasis on family migration and increased the role for high-skilled workers as permanent or temporary (H-B visas) visa recipients. It is seen in Canada and Australia in their skill-based points system for issuing many of their immigrant visas. It is also seen in Europe, and even Japan, with a shift in the emphasis in temporary visas from the low-skilled to the high-skilled workers.

### **C. The Consequences of High-Skilled Immigration**

It is easy to understand the attractiveness of high-skilled immigrants to the highly developed economies. We can think of the economy as consisting of three factors of production, high-skilled workers, low-skilled workers and physical capital (Chiswick, 1982). At the margin these factors can be substituted one for another – one can substitute some of one factor for another. For example, in retail establishments low-skilled workers can be replaced by electronic scanners (high-skilled workers and capital).

In a fundamental sense, these three factors of production are also complements in production. More of any one factor of production increases the productivity of the other two factors. For example, more high-skilled professionals increase the productivity (and hence the demand) for the lower-skilled workers who assist them in the production process, as well as increasing the productivity of capital. Thus, while the immigration of high-skilled workers tends to lower the marginal product, and hence wages, of high-skilled native-born workers, it also raises the productivity of low-skilled workers and capital.

Raising the wages of low-skilled workers has the effect of reducing income inequality and poverty (which in most economies is considered desirable) and reducing the extent of government income transfers from the taxpayers to the recipient of welfare and unemployment compensation benefits. The reduced tax burden by itself would have beneficial effects on the economy.

The increased return to capital as a result of high-skilled immigration tends in the long run to attract more capital to the economy. This may arise from encouraging domestic savings, discouraging natives from investing their capital elsewhere, and encouraging foreigners to invest in the domestic economy. This increased capital stock has a long-run feedback effect on the productivity, and hence earnings, of both the low-skilled and high-skilled workers in the destination economy.

The immigration of high-skilled workers has an additional beneficial effect. High-skilled workers are the driving force for innovation and invention (improvements in technology), that is, the efficiency with which resources are utilized and the speed of the dissemination of technological advances. In technical terms, they help push outward the economy's "production possibility frontier".

It might be argued that this feature of high-skilled immigration is less relevant in an era of nearly instantaneous communication and transmission of information. While there is much truth to this, two additional considerations are warranted (Gerschenkron 1962, Chapter 1). One is the "first mover advantage". The location where new technological developments take place has a competitive advantage, even for technological advances that are not tied to location specific natural resources. In an increasingly "foot loose" world economy it may not matter where technological advances take place, but once they take place "first mover advantage" and "path dependency" give that location an edge (David 1985).

Moreover, technological advances are implemented within an economic context. Thus, there tend to be country-specific elements in part reflecting wage differentials and relative scarcities of factors of production that help shape the development and implementation of the new technology. This, too, gives an advantage to the economy in which the inventions and innovations take place.

Thus, high-skilled immigration has both short-run and long-run advantages for the developed economies.

The immigration of low-skilled workers, on the other hand, tends to lower the wages of all low-skilled workers and thereby widen income inequality, increase poverty and increase the burden on the income transfer system. It is sometimes argued that low-skilled immigrants are needed "to do jobs that native workers will not do". This fallacy is based on the assumption that economies and production/consumption possibilities cannot or will not adjust to changes in relative prices. Substitution possibilities exist in production – mechanical harvesters have replaced hand labor for many crops, including picking many fruits and vegetables. Substitution possibilities exist in consumption – more efficient and computer-based automobiles have reduced the demand for low-skilled auto mechanics, while consumer durables in the home have reduced the demand for servants. Substitution possibilities exist in the labor market – low-skilled workers whose jobs have disappeared can be shifted to do the low-skilled jobs that are still in demand.

The argument is often made that the OECD countries, especially those with very low fertility and hence an aging population, need immigrant labor to provide the taxes to ensure the



viability of their pension and old-age assistance programs. This argument has lost its force in recent years with the realization that rather than solving the tax-transfer dilemma, low-skilled immigrants actually add to it. Especially if account is taken of the cost of educating the children of low-skilled immigrant workers (and they tend to have higher fertility rates than the native born in the OECD countries), together with child allowances, medical benefits, welfare programs and unemployment benefit programs, low-skilled workers tend to draw more benefits than they pay in taxes.

Thus, there appears to be a realization in most of the OECD countries that their economies are enhanced far more by high-skilled immigration than by low-skilled immigration. Their immigration policies are increasingly recognizing this situation. This does not mean that low-skilled immigration will disappear. Humanitarian concerns regarding family reunification, refugees and asylees will continue to influence immigration policy, and many entering under these programs will be lower-skilled workers. Other international and domestic political pressures may induce some developed economies to maintain programs that attract low-skilled immigrants. Vested interest groups (such as employers in certain industries) will argue for the migration of low-skilled permanent or “temporary” labor to “save” their industries. Finally, immigration laws, as in the case with other laws, cannot be perfectly enforced. As a result there will be people who enter the destination in violation of the country’s laws or who violate a condition of a legal entry (time limit on the visa, work prohibited, etc.).

#### **D. The Perspective from the Countries of Origin**

There are two primary sources for high-skilled immigrants into developed countries (Chiswick and Hatton, 2003). One is other developed economies. The rate of mobility across the developed countries of high skilled migrants can be expected to increase. Multilateral and bilateral agreements regarding the free movement of labor among developed economies have become more commonplace, as in the European Union and between Australia and New Zealand. The globalization of the economy and multinational corporations means that national borders are less relevant for the movement of not only goods and capital, but also people – with this movement being most cost effective for high-skilled workers. Finally, an important barrier to mobility, linguistic differences, is diminishing among high-skilled workers. In much of the world, English has become the lingua franca of science, technology and business, as well as the internet, and proficiency in English is increasingly among the skills of professionals and managers.

The other source of high-skilled immigration to the developed economies is the less developed countries. In the post WWII period this migration was referred to as the “brain drain” (Adams 1968). It was so labeled because the source countries provided the training, often at the tertiary level, for high ability individuals who subsequently left the country and, it was presumed, they would not return. The loss of this high level human capital was viewed as a subsidy by the developing world to the advanced economies and the loss of this technology, innovation and entrepreneurial talent retarded economy development, both directly and indirectly through discouraging investment of physical capital in the local economy.

The “brain drain” has actually been encouraged by the educational policies of many of the countries of origin. Tertiary education was highly subsidized by governments providing it without charge to the students. This increased the number of students seeking tertiary education and, in particular, reduced the more favorable selectivity in the demand for higher education when the students pay for their schooling. The resulting expansion of the tertiary education system produced more graduates than the economy could absorb or resulted in a lower quality of higher education if the governmental resources for the expanded system were not forthcoming. Both developments would encourage the best and the brightest to go abroad after graduation from the local university or technical institute to seek their opportunities elsewhere in further schooling and in the labor market.

These tendencies were exacerbated by the tax system. The “free” tertiary education was often financed by higher direct and indirect taxes on the incomes of the graduates who remained. This, too, encouraged emigration as there was no prospect of the government recouping the cost of the education from those who emigrated. There is no realistic prospect that the destination countries would levy a fee on emigrants from developing countries and remit this to the origin. Moreover, autocratic policies and unfree markets reduced opportunities at home for high-skilled workers, encouraging their emigration.

For many in the developing countries who could benefit substantially from tertiary education limited family resources and weak capital markets would make it very difficult if not impossible to finance their schooling. One alternative financing arrangement would be for the government to provide loans inversely related to family wealth to students who meet the academic standards. These loans would require repayment in proportion to the subsequent earnings of the individual – hence those who go abroad and have high earnings would be expected to make larger loan repayments. As these loan agreements are legal contracts, law courts in the destination could be used to enforce repayment. Moreover, loan repayments on schedule could be made a provision for the validity of country of origin passports, their renewal and, for those who adopt foreign nationalities, a condition for re-entry visas.

As it turns out, however, the “brain drain” is not a total loss for the developing countries. Emigrants often provide substantial financial flows to the origin (emigrant remittances) to support relatives who remain, and to buy property. The latter is usually a new or upgraded house, farmland or a business in the home country. There is also the phenomenon of the “brain gain”, that is, the return to the origin of emigrants who have acquired additional human capital abroad either in overseas educational institutions or through on-the-job training. Incentive schemes to encourage the return of high-skilled emigrants can be developed to minimize the human capital loss. Moreover, emigrants can serve as an entrepreneurial bridge between the developing and developed economies. This can increase trade, including both exports and imports, and facilitate the investment of foreign capital.

Thus, there is much that the developing countries can do to minimize the loss and maximize the benefits to their economic development from high-skilled emigration. The reform of the financing mechanisms for higher education by adopting appropriate school fees (tuition charges) and loan schemes can raise the quality of both the schools and the students, and reduce the incentives for emigration. Moreover, incentives can be provided to encourage high-skilled

emigrants to return. Policies to seek to legally bar the emigration of high-skilled workers would, however, be counterproductive. In addition to being politically unacceptable in the modern world, it would be impossible to enforce without political repression. Moreover, it would be technologically and economically counterproductive as the movement of people is an integral part of modern economic development.

## **E. Conclusions**

The world economy has been transformed in recent decades. While the age of free mobility of all grades of labor across national borders is not likely to return in the foreseeable future, we are entering a period in which there is an internationalized or global labor market for high-skilled workers. While this mobility will not be without regulation or restrictions, the permanent (long-term) and temporary (short-term) mobility of high-skilled workers will intensify across developed economies, between developed and less developed economies, and even across less developed economies.

This high-skill international migration appears to be a net benefit for the receiving economies. For the sending economies there is the concern regarding the loss of the best and the brightest in the labor force and of the origin's investment in their human capital.

There is no stopping or reversing the trend toward the internationalized labor market for high-skilled workers. Legal barriers to emigration will not work. Destination governments will not subsidize the origins for their losses. The countries of origin are, however, not without remedies. The adjustment of policies regarding the financing of tertiary education and regarding the repatriation of emigrants can turn what had been labeled a "brain drain" into a "brain and resource gain".

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