

INTERNATIONAL MIGRATION PAPERS

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**Skilled Labour Migration from
Developing Countries:
Annotated Bibliography**

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INTERNATIONAL MIGRATION PROGRAMME

INTERNATIONAL LABOUR OFFICE

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Foreword

This paper forms part of a series of studies conducted by the International Labour Office under the DFID-sponsored project on “*Skilled labour migration (the ‘brain drain’) from developing countries: Analysis of impact and policy issues.*”

International migration of skilled persons has assumed increased importance in recent years reflecting the impact of globalisation, revival of growth in the world economy and the explosive growth in the information and communications technology (ICT). A number of developed countries have liberalized their policies for the admission of highly skilled professionals.

The problem lies in that this demand is largely met by developing countries, triggering an exodus of their skilled personnel. While some amount of mobility is obviously necessary if developing countries are to integrate into the global economy, a large outflow of skilled persons poses the threat of a ‘brain drain’, which can adversely impact growth and development. The recent UK government (DFID) White Paper on International Development, “*Eliminating World Poverty: Making Globalisation Work for the Poor*” has rightly pointed out the need on the part of developed countries to be more sensitive to the impact on developing countries of the brain drain. It was in this context that the Department for International Development, United Kingdom, approached the ILO for carrying out research relevant to the above issues.

This bibliography, prepared by the USA lead researcher Professor Lindsay Lowell, covers literature on skilled migration, its impact and policy issues drawing upon a range of sources in both developed and developing countries. Apart from research publications, it has analysed news and media reports. The Canadian brain drain forms a separate section in view of available extensive research and commonalities with problems in other contexts.

ILO gratefully acknowledges the financial support of the Department for International Development, United Kingdom, for undertaking this research programme.

Mr. Piyasiri Wickramasekara, Senior Migration Specialist, International Migration Programme, acted as the ILO Project Coordinator and technically backstopped all the studies. ILO is most grateful to Professor B. Lindsay Lowell for his valuable contribution.

Geneva, July 2002

Manolo I. Abella
Chief
International Migration Programme

Economic Analyses and Policy Implications

Adams, Walter (Ed.). 1968. *The Brain Drain*. New York, Macmillan Company.

The book, based on papers presented at a 1967 conference in Switzerland, is among the earliest published collection of articles by scholars discussing theoretical issues and political concerns about the brain drain phenomenon with respect to developing country concerns. The editor notes (in an interesting portent of 1990s “globalization” discussions) that “today as never before there is a ‘common market’ for brainpower which transcends national boundaries” and discusses various ways or models of explaining human capital flow and their implications for policy makers. Adams notes a few factors that tend to encourage attraction of a developed country and away from a developing country such as: salary differentials; professional opportunity; lack of receptivity to change in home country; relevance of foreign training; lack of realistic manpower policies; technology gap; political balkanization; discrimination on non-economic grounds; and monopolistic restrictions in advanced countries. The book introduces the problem and reviews it from historical, analytical and international perspectives. Various authors discuss different analytical frameworks for interpreting brain drain such as the internationalist or nationalist model as well as the national importance of human capital and push-pull approaches. Others discuss the role of study abroad in emigration and case studies including France, Greece, the European Common Market, Africa, and India as well as the Underdeveloped Countries from a “less alarmist view.” The book explores an “agenda for action” to reverse factors that tend to encourage attraction to another country.

Beine, Michel, Frederic Docquier, and Hillel Rapoport. 1999. “*Brain Drain and Economic Growth: Theory and Evidence*,” *Seminaire organize par l’Axe Ethique et developpement durable du Centre d’Economic et d’Ethique pour l’Environnement et le Develooppement, CADRE, University of Lillie 2, France.*

Develops and economic model that determines that at some point where emigration (of skilled workers) possibilities lie in an intermediate range, it induces an incentive to pursue education in the source country. A “beneficial brain drain” (BBD) occurs when an economy is open to (uncertain) emigrations of skilled persons. Uses cross-sectional data to test the theory and finds some support (poorly documented empirical analysis), emigration positively affects human capital formation. In turn, human capital formation positively affects GNP growth, as does remittances.

Carrington, William J. and Enrica Detragiache. 1998. “*How Big is the Brain Drain?*” *International Monetary Fund Working Paper, WP/98/102, 25 pages.*

This is a key paper that develops one of the only sets of indicators of the extent of the brain drain. It uses US Census information on years of education to partition out the educational profile of developing-country migrants found in OECD countries; educated populations in source countries are derived from a companion paper by Barro and Lee. Emigration rates for 61 developing countries are applied to get the number of emigrants in 3 educational categories. There is a substantial range in estimates, with notable “brain drain” from the Caribbean, Central America, and some African and Asian countries.

Chami, Ralph and Jeffrey H. Fisher. 2000. “Do Bequests Increase Labor Market Risk?” International Monetary Fund working paper.

Private income transfers (remittances) to family members have typically been viewed as insuring the source country household against risk. However, in an equilibrium market one would expect aggregate transfers to affect the distribution of wages. As a result, remittances increase the volatility of wages (and “exceed the socially optimum level of transfers”).

Chau, Nancy H. and Oded Stark. 1998. “Human capital formation, asymmetric information, and the dynamics of international migration.” Department of Economics Working Paper Series, No. 95, 34 pp. Chinese University of Hong Kong, Department of Economics: Hong Kong, China.

"We consider the case in which the opening up of an economy to migration results in departure of skilled workers. We point out that while the possibility of migration changes the set of employment opportunities, it also affects the structure of incentives: higher returns to skills in the foreign country influence decisions about skill acquisition at home. We combine the changing opportunities--changing incentive structure idea with an assumption concerning the information environment: employers in the foreign country are neither perfectly informed nor equally informed over time about the skill levels of individual migrant workers as employers' experience of employing migrant workers accumulates."

Lien, Da-Hsiang Donald. 1987. “Economic Analysis of Brain Drain.” *Journal of Development Economics*, 25: 33-43.

Develops an economic model of the choice to emigrate and to return. Assumes that quality of university should signal employers about the quality of workers. But source country employers do not know how to evaluate the quality of their nation's émigrés. Therefore, returnees may be paid less than their full value; high quality émigrés face the steepest wage penalties and are least likely to return (creating high quality brain drain).

Mountford, Andrew. 1997. “Can a Brain Drain be Good for Growth in the Source Economy?” *Journal of Development Economics*, 53: 287-303.

Develops an economic model of the effects of emigration on productivity, even when average productivity is a function of past levels of human capital. Shows that at some level of skilled emigration the share of skilled remaining in the source country increases, as do the incentives to pursue education in the source country and, therefore, overall source country growth can actually be stimulated. Suggests that governments can set an optimal level of emigration (and that “temporary” emigration may also increase source country average productivity).

Glaser, William with G. Christopher Habers. 1978. *The Brain Drain Emigration and Return*. Oxford, Pergamon Press.

This monograph contains a good bibliography of early literature and is one of the earliest multinational and comparative studies of the brain drain phenomenon, conducted through the United Nations Institute for Training and Research (UNITAR). It was a response to debates and resolutions in the United Nations culminating in 1967 and focused on the

problem of poorer countries' losses when skilled professionals flowed from developing to developed countries and/or emigrating after study abroad. It examined motives, reasons or conditions by which they have returned or might do so. The report resulted from 13 surveys of 500 to 1,600 foreign students in 3 developed countries (Canada, U.S. and France) and 100 to 400 returnees in 8 developing countries (Argentina, Brazil, Columbia, Ghana, Greece, India, Korea and Sri Lanka). It indicated a broad range of push-pull factors and motives for returnees going home noting percentages of those remaining abroad vary by country and professional field. Commitment to the home country and family was among the strongest pull factors. Push factors were better incomes, research opportunities and facilities, and more opportunities to the skills productively than were available at home. The study offered recommendations, which in addition to encouraging better working conditions, pay and morale at home, also discussed non-monetary incentives such as appeals to leadership and patriotism for stimulating more returnees. It also suggested that more cooperative research among governments was needed to address the issue.

Hague, Nadeem U. and Se-Jik Kim. 1995. "Human Capital Flight: Impact of Migration on Income and Growth." Staff Papers of the International Monetary Fund, 42(3): 577-607.

Contrasts neoclassical approach with new endogenous growth approach that assumes increasing or constant returns to scale which result from human capital accumulation. Develops an endogenous growth model that demonstrates that human capital flight or brain drain can lead to a reduction of source country growth and offset convergence with receiving country growth. In an open economy the educated are more likely to emigrate; therefore, policy should focus education on primary and secondary education. Also, finds that remittances do offset the brain drain and they have a negative result for source country growth. Education policy is seen as an important response.

Johnson, Harry G. 1967. "Some Economic Aspects of the Brain Drain." *Pakistan Development Review*, 7(autumn): 379-411.

A neoclassical economic analysis assumes that each individual obtains and consumes their marginal product. Emigration of the highly skilled is in response to economic incentives at destination (experience an increase in wages) and it increases world income, without reducing the welfare of those left behind.

Mahroum, Sami. "Europe and the Challenge of the Brain Drain." Institute for Prospective Technological Studies, Sevilla, Spain.

The UK and Ireland rank highest in the number of emigrants they send abroad. The UK also led in the number of professional emigrating to the United States. In Science and Engineering, over half of the European students in the United States end up remaining there, greater stay rates than Koreans or Japanese students. "In the context of European emigration, "excellence" and "chain-effects" are central to the issue. The quality of recruits from Europe might have a chain-effect on employers' ability to attract more high-quality staff." "The fact that significant numbers of top European scientists are abroad could pose a serious challenge for Europe in certain emerging sectors such as biosciences."

Salt, John. *Current trends in international migration in Europe*. Pub. Order No. CDMG (97) 28. Nov 1997. 100 pp. Council of Europe: Strasbourg, France.

"This report seeks to present a balanced review of the current international migration across Europe as a whole.... It begins with a discussion of the demographic importance of migration as an agent of national population change. It then reviews the latest trends in Western Europe, as prelude to an extended discussion of the main patterns and trends in international migration in Eastern Europe and the former Soviet Union. There follows a discussion of the main policy developments across Europe as a whole. Finally, some issues for the future are raised."

Stark, Oded; Helmenstein, Christian; Prskawetz, Alexia. "A brain gain with a brain drain". *Economics Letters*, No. 55, 1997. 227-34 pp. Amsterdam, Netherlands.

"We study human capital depletion and formation in an economy open to out-migration, as opposed to an economy which is closed. Under the assumption of asymmetric information, the enlarged opportunities and the associated different structure of incentives can give rise to a brain gain in conjunction with a brain drain. Migration by high-skill members of its workforce notwithstanding, the home country can end up with a higher average level of human capital per worker."

Straubhaar, Thomas and Martin Wolburg. 1998. "*Brain Drain and Brain Gain in Europe: An Evaluation of East-European Migration to Germany*." CIIP and Institute for Global Conflict and Cooperation.

Data from the Eurostat Labor Force Survey indicate that a fairly high share of the outflow during 1992-1994 to Germany, the main destination country, was indeed fairly skilled. The greatest number of highly qualified left Yugoslavia, albeit the percent of skilled immigrants to Germany out of the total flow of refugees from this country was not as great as that from elsewhere. Hungary, Bulgaria, and Poland show the highest ratio of skilled workers. Of course, this is net inflow, adjusting the percent of skilled workers for cross-national populations drops this somewhat. But it still remains the case that Eastern immigrants in Germany tend to be highly skilled and if Yugoslavia is removed from the calculations, these immigrants are more skilled on average than is the German labor force. An endogenous growth model finds that the loss of human capital adversely affects GNP growth in Eastern European source countries, and that migrant remittances do not offset the amount of that loss.

Trefler, Daniel. 1997. "Immigrants and natives in general equilibrium trade models." *NBER Working Paper*, No. 6209, 35, [3] pp. National Bureau of Economic Research [NBER]: Cambridge, Massachusetts.

"This paper makes three observations about international trade and immigration. (i) Borjas has argued that immigration may yield a net social benefit even though it hurts those less-skilled workers who directly compete with immigrants.... (ii) Following Wood and Feenstra-Hanson, I argue that within an industry those goods produced abroad use more unskilled labor than those goods produced in the United States.... After transparently incorporating this into a new factor content study I find that changes in U.S. trade patterns almost certainly battered wages of those at the very bottom of the skill ladder. (iii) Despite globalization pressures, I find little evidence of earnings convergence

for a sample of 75 countries over the 1963-92 period. This holds true even after controlling for education, capital, and workers' industry of affiliation." Correspondence: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Author's E-mail: trefler@chass.utoronto.ca. Location: Princeton University Library (PF).

Wong, Kar Yiu and Chong Kee Yip. 1999. "Education, Growth, and Brain Drain." *Journal of Economic Dynamics and Control*, 23 (5-6: 699-726).

Develops an endogenous growth model of development with a two-sector overlapping-generation. Brain drain reduces the economic growth rate and hurts stayers through static accumulation. If human capital accumulation rates are already low, brain drain reduces the discounted lifetime income/utility of stayers. Simply put, brain drain reduces the wages of the unskilled, as well as GNP growth, although it increases the wages of high skilled stayers. Government expenditures on education can offset these effects. In particular, it is recommended that increasing the ratio of source country educators to students will lead to an increase in skilled wages, a reduction in unskilled wages, while reaching a balanced growth path (in "1 period").

Policy Implications

Bhagwati, Jagdish N. and Martin Partington (ed.). 1976. *Taxing the Brain Drain*. Amsterdam: North-Holland.

Propose a tax to deal with externalities created by transfers of human capital abroad. The tax would be levied on only high-skilled migrants and collected for a period of years (say 10). Estimated, for 1972, that US\$750 million in revenues could be raised and made available to the United Nations. These recommendations arose out of a conference in Bellagio in 1975 and received serious attention by academics.

Brown, Mercy. n.d. "Using the Intellectual Diaspora to Reverse the Brain Drain: Some Useful Examples." University of Cape Town, South Africa.

This paper focuses on expatriate networks / diaspora organizations; identifies the creation of 41 such organizations since 1990. Most are internet based and service Masters and Doctoral level workers. They tend to be run by expatriates who draw on various institutional supports while remaining independent. There are 5 types of networks identified and their primary effect is to intensify the exchange of information. Argues that the diaspora option is superior to counteractive or return strategies (see Meyer et al. 1997).

Haque, Nadeem Ul and Jahangir Aziz. 1999. "The Quality of Governance: 'Second-generation' Civil Service Reform in Africa." *Journal of African Economies*, 8(AERC Supplement): 65-106.

Each year that the labor force is educated raises GNP by 1.2 percent. Economic development is mostly affected by secondary education and more, not primary education. Argues that already low public sector education has dropped in Africa over the past three decades, due to compressed government wages and human capital flight. Much of this is

the result of “1st generation” public sector reform. There are now 100,000 expatriates from abroad in Africa who are distort local wages, e.g., technical assistant programs are not the long-term answer; rather, government education and increases in public sector wages are needed to stem the brain drain.

Haque, Nadeem Ul and M. Ali Kahn. 1997. “*Institutional Development: Skill Transference Through a Reversal of ‘Human Capital Flight’ or Technical Assistance.*” Working Paper of the International Monetary Fund, July.

Develops an economic model to determine whether policies of return are more effective than technical assistance from abroad. The answer depends partly on the balance of “urban” versus “rural” growth, but generally “expatriate consultant advice” is a poorer response than policies of repatriation. Highly paid expatriate workers in source countries distort the wage structure and create incentives for emigration of local skilled workers. Paying locals/returnees a higher wage scale increases source country growth.

Meyer, et al. 1997. “Turning Brain Gain into Brain Gain: The Colombian Experience of the Diaspora Option.” *Science, Technology, and Society*, 2(2).

Develops a typology of responses to a brain drain. (1) *Counteractive* approaches include restrictive policies, incentive policies, and compensatory policies. (2) *Return Option* approaches were first implemented in the 1970s, but only countries such as India, South Korea, Hong Kong, and Taiwan have effectively implemented return strategies.

Teferra, Damtew. 2000. “*Revisiting the Brain Mobility Doctrine in the Information Ages.*” Center for International Higher Education, Boston College.

People move because they desire to exploit their best opportunities. Argues that substantial research shows that immigrant scholars contribute to their source countries through “brain circulation,” e.g., as visiting scholars, and through virtual networks (Thailand’s “Reverse Brain Drain Project” is successful in this latter regard).

Skilled Migration Processes and Policies

Behr, Peter. “Finding Links That Click Between Area Universities, Tech Firms.” *Washington Post*, D1 & D7, 26 February.

Heads of Johns Hopkins University, George Mason University and the University of Maryland are joining to build relations between their most advanced scientific research and teaching programs and major technology companies in the DC metropolitan region.

Bouvier, Leon F., and John L. Martin. 1995. *Foreign-Born Scientists, Engineers and Mathematicians in the United States.* Washington, D.C.: Center for Immigration Studies.

Presents statistics from the 1990 Census on immigrants in these high occupational categories. Argues that immigrants are over represented.

Bouvier, Leon F., and David Simcox. 1994. *Foreign Born Professionals in the United States*. Washington, D.C.: Center for Immigration Studies.

Presents statistics from the 1990 Census on immigrants in these high occupational categories. Argues that immigrants are over represented and have an dampening effect on the increased attraction and retention of domestic minority workers.

Bratsberg, Bernt. "The Incidence of Non-Return Among Foreign Students in the United States." *Economics of Education Review* 26 January 1995.

This article presents a comprehensive conceptual and empirical analysis of non-return among foreign students in the United States. Non-return rates are constructed for 69 source countries using administrative microdata from the U.S. Immigration and Naturalization Service (various years). The conceptual analysis extends the Roy-model formulation of Borjas (1987: 1992) to the return decision of the foreign student. The empirical analysis finds that the variation in non-return rates across source countries is explained by difference in economic and political conditions in the source countries. The article also reports indirect evidence of skill sorting among foreign students who stay in the United States.

Chen, Chao C. "Research on Mentioning Asian Scientists and Engineers." Faculty of Management, Department of Organizational Management, Rutgers University, 1996.

Invitation to industrial R&D organizations to participate in a research project by the Rutgers Faculty of Management studying successful cross-cultural mentioning relationships between Asian (e.g., Chinese, Korean, and Indian) and non-Asian scientists, engineers, and managers in U.S. R&D organizations.

Cobb-Clark, Deborah A. and Marie D Connolly. "The Worldwide Market for Skilled Immigrants: Can Australia Compete?" *International Migration Review* 31, no. 4 1997).

This paper highlights the importance of the factors, which determine the characteristics of the pool of potential skilled migrants from which Australian policymakers choose. It attempts to determine how the size of the pool of potential migrants is influenced by factors such as the relative economic conditions and U.S. and Canadian immigration policies.

DiTomaso, Nancy, et al. *An Examination of Bias in Performance of Scientists and Engineers*. Rutgers University, 1996.

A summary of findings with tables of performance ratings.

Espenshade, Thomas J., and German Rodriguez. "Completing the Ph.D.: Comparative Performances of U.S. and Foreign Students." *Social Science Quarterly* 78, no. 2 (2 June 1997): 593-605.

This article examines the comparative success of U.S. and foreign students in completing the Ph.D. at a select set of eleven institutions of higher education in the United States.

Farris, George F., Nancy DiTomaso, and Rene Cordero. “Over the Hill and Losing It? The Senior Scientist and Engineer.” Graduate School of Management, Technology Management Research Center, Rutgers University, 1995.

Summary of a cross-sectional study where 3163 non-supervisory scientists and engineers from 24 companies are examined in the relationship between age and innovation. Previous studies have found that performance peaks early in a scientific or technical career and then drops off until retirement. Sometimes a second peak in performance occurs during late career. This study asked three questions about older scientists and engineers: 1) How are they doing?; 2) What are they really like; 3) When do they do best? Note: such aging arguments are sometimes presented as a key reason for US employers to preferentially hire young, foreign workers.

Friedman, Judith J., and Nancy DiTomaso. “What Managers Need to Know About Changes in the U.S. Labor Force.” Department of Organization Management, Rutgers University, 28 February 1996.

Despite the recent attention to labor force diversity, there are widespread misunderstandings about current labor force trends. These misunderstandings can have detrimental effects on manager's business strategies and personnel policies. This paper describes recent trends in U.S. labor force composition and we describe likely future changes. We organize the discussion around nine widespread myths. Myths 1 to 2 deal with the extent to which the U.S. labor force and the U.S. population are becoming more diverse. Next, we turn to a set of myths (3 to 6) about one source of labor force diversity, immigration. Myths 7 to 9 then connect the economic situation of African Americans with immigration and with diversity efforts. Finally, we note the *real* coming shortage: jobs.

Gurcak, Jessica, and Thomas J. Espenshade. *Immigration of Scientists and Engineers to the United States: Issues and Evidence*. Office of Population Research, Princeton University, 1996.

Both the immigration of science and engineering personnel and the graduate education of foreign students have been subject to criticism in recent years. This paper outlines the major research into the impact of these populations to date. Foreign Ph.D. candidates make up a large percentage of graduate school enrolment in most science fields, especially engineering, but steer clear of other fields such as life sciences. While they have not been found to take places from equally qualified native students, they may have an easier time financially and also ease the need for recruitment of historically under represented populations. More than half of those earning U.S. doctorates remain in the U.S. In general, foreign-born scientists and engineers have higher levels of education than native-born scientists, and while on the average they have higher earnings, this may not be the case after controlling for education and other variables. Additionally, some have speculated that certain foreign-born groups are employed at low wages in violation of current immigration law. Evidence is mixed on whether over time, foreign-born scientists and engineers narrow the earnings gap found in their initial employment, or whether this merely reflects cohort earning trends. Immigrant scientists and engineers are substantially more likely to be involved in research and development and less likely to work in management than their native-born counterparts. They also show higher rates

of innovation. While little evidence exists on the subject, it is possible that immigration of foreign-born scientists and engineers into an area increases native migration out of the area.

Institute for Economic Development. “Workshop on Migration of Scientists and Engineers to the U.S.”

Presented at the Workshop on Migration of Scientists and Engineers to the U.S. Boston, MA, 21 May, 1997. Panels: I) Foreign Science and Engineering Students at U.S. Universities; II) Migration to the U.S. of Foreign-Trained Scientists and Engineers; III) U.S. Labor Market Experiences of U.S. and Foreign Scientists and Engineers; IV) Innovation and Productivity in US Industry: The Role of Foreign Scientists and Engineers.

Kanjanapan, Wilawan. “The Immigration of Asian Professionals to the United States: 1988-1990.” *International Migration Review* Vol. xxix, no. No. 1: 7-32.

This article examines the recent flows of Asian professionals to the United States based on the Immigration and Naturalization Service data for the fiscal years 1988-1990. Three specific dimensions of the Asian migration stream were investigated, namely, size, composition and mode of entry. The results show that Asians emerge as a dominant group in the immigration of all professionals. An examination of mode of entry indicates an existing demand for foreign professionals of certain occupational backgrounds in the U.S. labor market. Engineers and computer scientists represent this pattern as reflected by a heavy usage of the occupational preferences to enter the host country. Adjustment of status from temporary visas appears to be a common strategy. By contrast, health professionals were more likely to be admitted through kinship ties and the majority are new arrivals. The argument that the outflow of the highly trained Asians is simply a matter of migration and education is not fully supported by the data.

MacPhee, Craig R., and M.K. Hassan. “Some Economic Determinants of Third World Professional Immigration to the United States: 1972-87.” *World Development* 18, no. 8 (August 1990): 1111-18.

We estimate reduced from equations for immigration to the United States by engineers, natural and social scientists, and physicians from 18 Third World countries. Explanatory variables include income, real GDP growth, graduation in the United States, and study in each country of origin. Additional explanatory variables are foreign student enrolment in the United States, for implementation of restrictions on permanent visas in 1972-73. Results generally conform to expectation, but differ across occupations and with model specification. Most income statistics are unexpected, however, and the strong correlation of US income with graduation in the United States suggests that there is a simultaneity problem in models, which include income. Because immigration appears to respond to labor shortages in the United States and surpluses in countries of origin, our results suggest that US immigration quotas have not prevented Third World professionals from responding to economic incentives.

Massy, William F., and Charles A. Goldman. *The Production and Utilization of Science and Engineering Doctorates in the United States*. Stanford University, 1995.

This report describes a simulation of the supply and demand for science and engineering doctorates, time to the doctorate, departmental choice behavior, and related matters. The modeling was motivated by a desire to determine whether there is a credible case for long-term structural underemployment of people with doctoral degrees (as well as by the need for basic research into the modeling of high education). We conclude that there is indeed such a case. In fact, according to our results, about 22 percent of the new doctorates could fail to find suitable employment when the supply-demand system achieves steady state based on the conditions prevailing in the early 1990s.

North, David S. *The U.S. Pays: A Study of the Funding of Foreign-Born Ph.D. Candidates in Science and Engineering*. Arlington, Va, 1998.

Given both the dialogue about the increasing role that foreign-born graduate students are playing in science and engineering, and the statements by the Institute of International Education that foreign-born students provide several billions of dollars on the plus side of the nation's balance-of-payments ledgers, the purpose of this study was to secure first-hand information on the extent to which funds were used to support the education of Ph.D. students in science and engineering.

Regets, Mark. "Book Review: Soothing the Establishment: The Impact of Foreign Born Scientists and Engineers on America." *International Migration Review* 30, no. 4 (Sunday, December 1, 1996).

This is a book review. The book examines the role of foreign-born scientists and engineers in the U.S. both as student and workers.

Regets, Mark C. "Immigrants Are 23 Percent of U.S. Residents With S&E Doctorates." *Data Brief of the National Science Foundation* 1995, no. 15 (November 14, 1995).

Immigrants with science and engineering doctorates are more likely to be engaged in research and development than are native-born U.S. citizens with doctorates.

Russell, Sharon Stanton. "International Migration: Global Trends and National Responses." *Fletcher Forum of World Affairs* 20 (Summer/Fall 1996: 1-13).

Discusses the increasing prominence of immigration issues in "high politics" and the global migrations trends, including various control methods applied by individual nations and collective extra-national organizations such as the EU.

Salt, John. "Migration Processes Among the Highly Skilled in Europe." *International Migration Review* 26, no. 2 (Summer 1992): 484-505.

This article seeks to show that the migration process of highly skilled workers in contemporary Europe is part of the structuring of European business. It focuses on the employer's perspective and role in articulating movement, using data from various official sources as well as survey evidence from the United Kingdom. It suggests that the increasing importance of this form of mobility is related to the process of

internationalization by large employers and that the particular form of movement is dependent on the evolution of corporate business structures.

Smith, Steven A. *Assessing the Impact of Race and Nativity on the Careers of Scientists and Engineers: An Analysis of Selection and Attainment Processes in the Scientific Labor Market.* Rutgers University, 1997.

This study examined the impact of race and nativity on the careers of scientists and engineers employed in the U.S. using the 1993 National Survey of College Graduates provided by the National Science Foundation. Both factors were found to have significant effects on: (1) the likelihood of having a science or engineering degree versus a degree in a non-scientific field; (2) the likelihood of being employed versus being unemployed or not in the labor force; (3) the likelihood of scientists and engineers being employed in a science or engineering occupation versus being employed in a non-related field. Race and nativity were found to have less impact in the occupational and earnings attainment process, although the interactions between race and nativity were found to be significant in the earnings process.

Vasegh-Daneshvary, Nasser, Alan M. Schlottmann, and Henry W. Herzog Jr. "Immigration of Engineers, Scientists, and Physicians and the U.S. High Technology Renaissance." *Social Science Quarterly* Vol. 68, no. 2 (June 1987): 311-25.

This study investigates immigration of the high technology and medical work force to the United States with particular emphasis on the period 1967-78. The results suggest that public policy in the United States toward immigration from developing nations significantly affects such behavior, in both a general sense and for specific occupations (particularly physicians and surgeons).

Waldinger, Roger, Bozorgmehr, Nelson Lim, and Lucila Finkel. *In Search of the Glass Ceiling: The Career Trajectories of Immigrant and Native-Born Engineers.* Department of Sociology and Lewis Center for Regional Policy Studies, UCLA, 1995.

This report analyses the results from a telephone survey of 423 M.S. graduates of the UCLA engineering school, of whom 196 were native-born whites, and 227 were foreign-born persons from Asia. The survey was designed to examine native/immigrant differences at various points in the career and also over the course of the career, with an emphasis on the transition from college to graduate school, from school to the first full-time job, and from the first job to the last job.

Policy Issues and Skilled Migration

Akbar, Sajjad, and Don J. Devoretz. "Canada's Demand for Third World Highly Trained Immigrants: 1976-86." *World Development* 21, no. 1 (January 1993): 177-87.

Immigration to Canada, after a major policy change in 1978 which favored the family reunification class, has been dominated by Third World immigrants. These immigrants continue to be a significant source of highly trained individuals for Canada. Using an

excess demand model to estimate the determinants of demand, this paper finds that the supply of domestic graduates, occupational income and the previous periods immigration level are major variables that influence Canada's demand for skilled immigrants. Thus, it is argued that the movement in these variables primarily guides Canadian immigration policy toward skilled immigrants.

Adler, Brian and Beth Jarrett. "Capital V. Labor: Who Wins and Who Loses Under the 1990 Immigration Act?" *U. Miami Inter-American Law Review* 23, no. 1992 (Spring-Summer, 1992): 789-822.

This paper argues that the Immigration Act of 1990 fosters the free movement of capital across national boundaries without doing the same for labor and has the effect of increasing capital's ability to have an exploitative relationship with laborers from both the United States and developing countries. It demonstrates the way in which IA90 increases the restrictions on labor mobility, while NAFTA increased capital mobility, thereby exacerbating the disparity in empowerment between capital and labor. Section four in particular examines the employment based via provision of IA90 with regards to skilled and unskilled workers.

Agarwal, Vinod B., and Winkler Donald R. "Migration of Professional Manpower to the United States." *Southern Economic Journal* 1984, no. 50 (1984): 814-30.

The present study investigates both total and indirect professional immigration and focuses special attention on the constraints to professional immigration and adjustments of status imposed by immigration policies.

"American Free Trade Agreement and the Lessons of the European Community." *Georgetown Immigration Law Journal* 7, no. 323: 323-65.

This Note will first analyze labor migration within the European Community paradigm. It will focus upon the Community structure and the importance of the EC as the guardian of social and fiscal policy concerning labor migration and rights. This structure will then be compared to the proposed NAFTA regime. In paralleling these two systems, it become evident that NAFTA must enforce labor rights in order to protect labor forces and ease labor migration within its constituent Party States. However, rather than obligate immediate policy harmonization within the NAFTA regime, as found in the EC, this advocates the creation of an enforcement mechanism for current existing labor programs and policies. The final section of this Note will review a variety of dispute resolution and enforcement mechanisms that could be implemented in conjunction with NAFTA, ranging from national consultation and arbitral body (similar to those pro Chapters Nineteen and Twenty of NAFTA), to more innovative institutions, including the ombudsman system. This discussion will ponder upon the problems of labor in North America and conclude that, in the short-term, a judicial system similar to that of the Inter-American Court of Human Rights is best suited to rectifying the agreement's negative social effects upon the Party State's labor forces.

Cassise, Christopher J. "The European Union v. The United States Under NAFTA: A Comparative Analysis of the Free Movement of Persons Within the Regions." *Syracuse Law Review* 46 (1996): 1343-78.

The author argues that NAFTA has essentially not changed anything with regard to U.S. immigration policy. He believes this to have been the intent of the parties to the treaty. Thus, the U.S. laws are very much the same as they were before the treaty. Moreover, the status of immigration policy does not seem to be on a path toward freer movement.

Chang, Howard F. "Liberalized Migration as Free Trade: Economic Welfare and the Optimal Immigration Policy." *University of Pennsylvania Law Review* 145 (May, 1997): 1147-244. Argues that the application of trade principles to immigration law suggests that specific liberalizing reforms, which are likely to increase the levels of employment based and family based immigration by eliminating certain immigration barriers, would raise national economic welfare as well as global economic welfare. He concludes that under any reasonable measure of social welfare, optimal policies would entail higher levels of employment based immigration than we currently allow.

Freeman, Gary P. "Modes of Immigration Politics in Liberal Democratic States." *International Migration Review* 29, no. 4 (Friday, December 22, 1995).

The author argues that there are important characteristics of immigration politics common to all liberal democracies, and that these are largely expansionist and inclusive. Also includes an historical analysis of democratic immigration policies among several nations.

Iribarren, Patricia M. "Canada's New Immigration Policy: Family Reunification Versus Skilled Workers." *Georgetown Immigration Law Journal* 9 (Winter, 1995): 227-31.

Canada's new immigration policy reduces quotas and makes a fundamental shift toward preferring highly skilled workers to family class immigrants. The changes stem from the governments desire to respond to public opinion and to boost the flagging economy. Argues that nations should be sensitive to the views of immigrants regarding family visas. If immigrants believe that they or their family members are not welcome, then countries such as Canada may find it difficult to attract the types of highly skilled immigrants they seek.

Keely, Charles B. *Nonimmigrant Visa Policy of the United States*. Georgetown University, 1996.

The objectives of this analysis are: (1) to provide perspectives about the history, interconnections, and implications of current Nonimmigrant visa policy, (2) followed by criteria for developing Nonimmigrant visa policy for contemporary realities, and (3) an outline of a nonimmigrant policy.

Lobo, Arun Peter and Joseph J. Salvo. 2000. "Changing U.S. Immigration Law and the Occupational Selectivity of Asian Immigrants." New York City Department of City Planning.

Shifts away from and then toward employment-based admission categories drove the skilled composition of Asian immigrants over the past 30 years. U.S. policy on employment-based immigration has a direct, positive effect on immigrants' skill levels.

Developed Countries: News Reports

England/British Isles

Arthur, Charles. 2000. "Up to 50 Selected Academics will have salaries boosted by £100,000 by grants from the DTI and Wolfson Foundation: £4m fund will try to halt UK brain drain." Millennium Debate website, <http://www.millennium-debate.org/ind27jul3.htm>.

Sir Bob May, the government's chief scientific advisor said "this is an attempt to be more competitive and recruit the David Beckhams of science." Some funds will be spent on research assistants and travel opportunities.

Behan, Rosemary, "Big Salaries Prompt New Brain Drain to East Bloc," *The Daily Telegraph*, August 3, 1998; p. 5

Brain drain from Britain to former Communist countries of middle management. Antal International (specialist in recruiting executives in central and eastern Europe) conducted study looking at salaries and benefits paid to junior, middle management and senior staff in information technology, accounting banking, human resources and sales and marketing over past five years. Interest rate rises in Britain had combined with superior salary packages offered in eastern European countries to encourage skilled workers to leave. Average salary of finance manager in Russia is nearly £100,000, including benefits. Increased demand because greater stability and expanding businesses of the former Communist countries. Also states that some are leaving because of the opportunity to be innovative and really create a new business system in certain countries and industries because there is so little infrastructure there are many improvements to make and greater ability to succeed.

Milton, Catherine, "Juggling Careers in the Job Circus—Why Skilled 'Knowledge' Workers are Best Placed to Succeed in the 1990s." *Financial Times*, November 13, 1992; *Management*, p. 8

Article focuses on trends and predictions of those trends of job types needed in the UK. Need to have more than one career and commit to training. Believes highly skilled workers will do well in the coming years and Institute of Careers Guidance and the Create Employment Consultancy predicts, "About 1.9 million new jobs will be created in value-added service occupations, at a time when 1.2 million blue-collar jobs will go." Jobs created in four industries: hotel and catering (240,000), business services (400,000), health education and other services (670,000 +) and other services (650,000). Job decline in primary industries and utilities (agriculture, oil and gas) and manufacturing. Broad industry growth in technicians, multi-skilled craftworkers, secretarial (part-time), junior clericals (part-time) and health and welfare professionals.

Quinn, Sue, “UK Crisis May Lead to Great Aussie Brain Drain.” *ABIX: Australasian Business Intelligence*, September 17, 2000; p. 30

Britain relaxing immigration laws to attract skilled workers. There is a concern that this will lead to loss of young Australians. Home Office Minister Barbara Roche is expected to provide a pilot scheme in the next few weeks.

“Brain Drain to East Europe.” *Financial Times* (London); July 21, 1998; *National News*, p. 10

Britain facing brain drain because of salary packages that exceed those of similar positions in the UK. Quotes five-year study by Antal International that found salaries increasing by 10% each year for young professional expatriates.

Smithers, Rebecca and Chris McGeal. 2001. “Raid on South African Teachers.” *The Guardian*, February 16.

South Africa’s education minister accused Britain of “raiding” his country with mass recruitment drives by London schools in South Africa. “A government-to-government consultation would have ensured that the best interests of both countries could be discussed and an arrangement worked out in which both countries could benefit,” he said.

Europe

Graham, Robert, “World News-Europe: France Worried Over “Brain Drain” as Number of Jobs Grows.” *Financial Times* (London), June 16, 2000; *World News-Europe*, p. 8

Concern that there is a skill shortage and a growing brain drain that will affect the economy adversely because there is an increase in the number of jobs being created in both the private and semi-public sector—1.1% increase in the first quarter of the year (439,000 jobs being created each year). Problem because of unemployment—at the end of the year, predicting 9% and in June 1997, the unemployment rate was 12.5%, with shortages being reported mostly in the IT sector and with skilled workers. Concern that more students are studying and remaining in the US and UK. Recommendations of the senate report on the brain drain are to change the wealth tax and reduce restrictive stock options laws.

Islam, Shada, “e-Europe Seeks out Skilled Workers.” *Business Times* (Singapore), March 24, 2000; *World News*, p. 21

European Union special summit discussed plans for an “e-Europe.” European Commission President Romano Prodi stated that Europe needed to attract more skilled people. There is a concern about catching up to US internet economy and preventing brain drain of skilled IT specialists to US. “Mr. Prodi’s call for Europe’s traditionally immigrant-wary governments to start looking for foreign skills follows persistent complaints by top companies that they cannot fill vacancies in hi-tech jobs.” The article specifically discusses changes in perception of immigrants and encourages European governments to consider foreign specialists an asset to the companies and the countries. “Earlier this month, Germany announced plans to grant up to 30,000 special work visas to foreign IT specialists, ending years of running a restrictive immigration policy.”

Torney, Kathryn, “More Funding Plea to End “Brain Drain.” *Belfast Telegraph*, June 12, 2000

Northern Ireland concerned that there is not enough funding for research and development in the universities. Concern that lack of competitiveness for students in Northern Ireland will affect the economy as there will be few, to train and educate the workforce. Concern that there is little return of those who have gone abroad to study.

“German Business Steps Up Drive for E.U.’s Central Europe Expansion.” *Deutsche Presse-Agentur*, February 15, 2001; *Financial Pages*

Germany business groups are lobbying the E.U. for an increase in member states to include Central European states like Poland and the Czech Republic. “While Germany had focused on fighting unemployment, it also needed to address the considerable shortages for skilled workers that had emerged in the workforce.” Concern that Germany will be flooded with workers from Central Europe who are highly skilled, but low paid.

“New Moves to End Brain Drain.” *Belfast Telegraph*, December 17, 1999.

Northern Ireland encouraging highly skilled expatriates to return and join a software boom. Ministers of Enterprise Trade and Development, Sir Reg Empey and Sean Farren began a recruitment drive aimed at people returning for Christmas. Interested in building software industry and need skilled workers to expand the industry.

“EU’s Needs Immigration to Fill 1.7 Million Skill Shortage.” *AFX European Focus*, February 7, 2001; *Economic News*, *Company News*, *Govt*

European Commission President Romano Prodi says, at a news conference, the EU needs 1.7 million immigrants to fill a skilled labor shortage. He would like to create a system analogous to the US green card to fill the shortage with “qualified immigration.” Wants to create a system that will not only benefit EU countries, but will also allow the immigrants to return to their own country with business and skills that benefit the home country.

“Connected: Europe Attempts to Plug the Brain Drain.” *The Daily Telegraph* (London); October 7, 1999, p. 7

Discusses brain drain from EU to US and a specially commissioned study to determine what draws hi-tech workers to Silicon Valley and what they can do to get them back. Yves Jean Conte, former French trade commission, led the study and reported that EU should not be fighting this brain drain trend to the US because it is a brain circulation. He explained, “...many of the Europeans who strike it rich in America retain links with their home countries and eventually set up highly successful subsidiaries there. This indirect growth dwarfs whatever might have been achieved had the boffins and entrepreneurs stayed at home.” Factors that contribute to the brain drain: ability to risk-take in the US because of the culture and the lack of red tape to doing business.

Australia

McIntosh, Trudi, “Council Moves to Head Off Expanding IT&T Brain Drain.” *ABIX: Australasian Business Intelligence*, November 24, 1998; p. 16

Skilled labor force crisis occurring because there are insufficient numbers of IT graduates and skilled workers are being recruited by foreign companies.

McKenna, Michael, “Firms Told Higher Pay Will Stop Brain Drain.” *ABIX: Australasian Business Intelligence*, October 27, 1999; p. 2

“Australian Employment Minister Tony Abbot urged industry to pay Australia’s skilled workers more to stop the ‘brain drain.’” The article cites employers struggling to fill vacancies while other companies are planning to increase their staff. Industries facing the greatest shortage are: IT, telecommunications, services, tourism, finance and electrical.

Odgers, Rosemary, “Migrants to Plug Brain Drain.” *ABIX: Australasian Business Intelligence*, December 11, 2000; p. 2

Discusses plans to prevent brain drain through reduced restrictions on immigration laws while also encouraging Australians to remain in the country. Policy for migration in 2001 will include tax breaks, increase in research and the commercialization of innovative business ideas and technology in Australia.

“Getting the Right People.” *ABIX: Australasian Business Intelligence*, December 12, 2000; p. 14

Australian government is now willing to relax its immigration policy to allow entry of highly-skilled immigrants. “Australian Prime Minister, John Howard, announced on 10 December 2000 that immigration restrictions could be eased to reverse the country’s ‘brain drain.’” Highly skilled workers are becoming increasingly mobile. The United States was quick to see the trend and long ago eased its immigration restrictions accordingly.” Author also advocates easing immigration restrictions in general to benefit the aging population.

New Zealand

Cheng, Chua Huck, “NZ Reeling from Brain Drain.” *The Straits Times* (Singapore), November 23, 1999; Commentary Analysis, p. 44

Article examines theories of how to stem the brain drain as well as the types of groups that are leaving by age, education and occupation. Two things that have been purported to be a means of stemming brain drain are: (a) More money for research in tertiary education and (b) loan repayment relief from “part interest write-offs.” Students have been protesting increasing tuition fees for courses in medicine and dentistry as well as science and arts. Scholarship money has become scarce and loans are the current method of financing education, which leaves students with a burden for repayment. As an election issue, each party is promising changes in educational financing with living allowances, funds for the universities. “This has shaped up as a major issue of the campaign. Many young graduates are heading overseas because jobs at home are scarce or they pay poorly compared with Britain or Australia.” “PhD holders in science are reportedly making unimaginable amounts teaching English in Japan.” “Many graduates are leaving to make better money for faster settlement of loans—or to avoid paying back altogether.”

In 1999 New Zealand suffered a net migration loss of between 11,370 to 68,000. Of those, 2,114 were life science and health professionals; 1,085 were engineers, mathematicians and trained in physical sciences and 2,763 were corporate managers. A study of the age groups of those leaving found that 50% were 20 to 29 and the 30 to 39 group was the next largest. Families were also a significant in the group leaving. Those leaving mainly went to Australia 47% (32,000) and Asia received 9 % (6,223) but Britain received 17,000 and 4,000 went to North America. Article speculates that beyond the better salaries as a “push” factor is the fact that New Zealand is not an intellectual society and those scholars and researchers who are leaving are going to universities and research centers. Concern that projections that professionals who left as part of the “brain drain” and were expected to return are not going to return to the country—no brain circulation.

Love, Phil, “Brain Drain More Like a Steady Leak.” *The Evening Post* (Wellington), September 12, 2000; Business, p. 11

New Zealand has been losing brains to Australia for nine years says economist Peter Conway of the Council of Trade Unions. Conway’s research has shown that the New Zealanders leaving last year included 698 doctors, 447 engineers, 953 scientists—all of whom were educated by taxes paid by New Zealanders. Also believes the loans for tertiary education is a push factor for graduates to go overseas. In the year ending July 2000, statistics of departures are: 36,874 to Australia; 15,379 to Britain; 6,873 to China; 4,288 to North America; 1,980 to Japan.

Van den Bergh, Roeland, “Job Boot on Other Foot.” *The Dominion* (Wellington), February 7, 2001; Business, p. 29

Skilled workers are using their status to choose their employers carefully. Discussing idea that employees do not only leave for money, or even mainly for money, and that people are leaving because they want to have a better fit in a company with better management and leadership. Discusses brain drain of New Zealanders to the US and Britain as well as an increase in workers from South Africa, Ireland and Britain who are looking for more responsibility and greater access to top management and mentoring.

“Balancing the Cost of the Brain Drain.” *The Evening Post* (Wellington), January 16, 2001; Features, Editorial, p. 4

Article delves into the theory of brain drain of teachers and other skill groups by denouncing that it is a growing problem and is rather a trend for New Zealand citizens to travel widely and for the government and companies to make use of immigrants. Article also argues that there is a large return of New Zealanders who will affect the skills shortage favorably.

“Brain Drain Growing, says Hasler.” *The Evening Post* (Wellington), December 22, 2000; News, National, p. 2

National Immigration Spokeswoman Marie Hasler says migration statistics indicate the brain drain is increasing. The number of skilled professionals leaving permanently in November 2000 as compared with November 1999 increased by 6.1%, while the number of arrivals was 4.8% less within the same time period. Immigration Minister Lianne Dalziel blames this change in trend to the student loan debt that has been accumulating.

“Fears of “Brain Drain” Unfounded: Survey.” *Waikato Times* (Hamilton), February 2, 2001, News, National, p. 14

Describes employment market for New Zealand graduates as stable. States that number of university graduates who have reported their employment destination to be overseas increased by 6.1% in 1999 according to the University Graduates Destinations report. Article suggests that this change is not a dramatic increase and approximately 6.7% of those graduates who reported foreign destinations were already overseas at the time of the survey.

“Why Won’t They Come Home?” *The Dominion* (Wellington), September 13, 2000, Features, Editorial, p. 12

Author believes that though Deputy Prime Minister Jim Anderton hopes to encourage New Zealanders living overseas to return, he believes the government will not produce results. States that as of June 2000, 71,000 people left for overseas resulting in a net migration loss of 9,760 with the health, construction, forestry and dairy industries faring the worst as they need skilled workers. City council of Wellington is setting up an economic development package to prevent people from leaving. Author denounces policies of current government that seem to be causing brain drain, increase in the top tax rate, nationalization of workplace accident insurance (which means that New Zealanders are unable to look for the best deal), Employment Relations Act which makes the labor market favor unions and burdens businesses and a code in draft that makes good-faith bargaining even more difficult.

Canada

Batcho, Stefanie, “Canada Hopes to Further Boost Immigrant Numbers in Coming Years” *Agence France Presse*, February 9, 2001; Financial

Discusses Canadian immigration strategies to increase skilled workers. The Citizenship and Immigration Minister Elinor Caplan has specific targets it intends to reach with respect to numbers of immigrants and refugees arriving in Canada. Article states that Canadian government is focusing on China, India, Pakistan, Philippines and South Korea as not only the countries where they receive most of their immigrants, but also the countries of skilled workers they want to have. Minister Caplan, “A successful immigration program like ours is not just about numbers on a page, but rather about hardworking people and their families who come here from the world over to help build our economy, our society and our culture.” Plans to increase the number of immigrants accepted by 4.4% in 2002 than 2001. Skilled workers accounted for more than half the immigrants arriving in Canada.

Crane, David, “Canadians Taxed By Lack of Opportunity.” *The Toronto Star*, October 21, 1998

Lack of opportunity and not taxes are the main reasons people are leaving Canada for the United States. “When, for example, we read that top medical researchers are leaving a Toronto hospital for the United States, Canadian income tax rates aren’t mentioned. What the researchers do mention, as do many university researchers who leave, is that the Americans are willing to invest much more in research and development. Likewise,

young Canadian graduates in computer science, business, law, accounting and other fields may feel that the United States offers more exciting opportunities. After all, the United States has a much more innovative culture than Canada.

Dunne, Nancy, “Brain Drain Cost Calculated.” *Financial Times* (London), April 27, 1999; US and Canada, p. 6

Cost to Canada of immigration of highly skilled workers to U.S. is C\$ 6.6 Billion between 1982 and 1996, including the cost of post-secondary education (C\$ 3.7 Billion). Increase from 0.7 per 10,000 Canadians leave for the U.S. in 1989 to 1.7 in 1996. Article does focus on the fact that this is a reduced number from past levels of immigration in the 1950s and 1960s.

Durkan, Sean (Ottawa Bureau), “Brain Drain A Myth: Report.” *The Toronto Sun*, July 14, 1999; News, p. 1

Canadian Association of University Teachers protest the idea that the brain drain is being caused by taxes and wants the government to focus on post-secondary education and research as they believe the lack of opportunity for this is the true cause of the brain drain. Article states on the idea that the theory of a brain drain due to high taxes is being promulgated by the rich. Article focuses on how to spend money on education and research to help build the Canadian population of educated. Canadian Association of University Teachers believe no brain drain and only a few are leaving for the U.S.

Martin, Susan Taylor, “Canada Brain Drain.” *St. Petersburg Times*, September 5, 1999; National, p. 1A

Human interest story that discusses the reasons why a young couple has decided to move from Toronto to St. Petersburg, Florida. States that the most prevalent reasons people are leaving Canada are, taxes, higher cost of living, ability to make more money so that both parents don't have to work, family currently living in Florida and little discretionary income to use. In 1986, Conference Board of Canada found 3% of country's natural scientists emigrated to U.S., by 1996 11% emigrated. Between 1986 and 1996 engineers emigrating tripled and the number of doctors emigrating increased by 5 times. For every American moving to Canada, six Canadians are moving to the U.S. The issue of taxes—quotes a study that states taxes are the reason Canada ranks near the bottom of 47 developed countries in its ability to retain well-educated people. Quotes from people about why they are leaving:

“For young people starting out, it's a bad place to be”, Tony says. “You can find a job for \$30,000, \$35,000, but the housing is what will kill you.” Tony has since taken a job with IBM, where he is making enough that he and Suzanne were able to buy a home with a pool near her parents. They estimate that their disposable income is as much as 25% higher than it would be in Canada—enough that Suzanne won't have to work until their sons, 4 and 2, are in school.

Andrew Strong, 37-year old builder in Ontario, “The government just killed it”, he says. “Impact fees were up to \$15,000, a lot compared to about \$4,800 down here. It was almost impossible to be a builder unless you're a big corporation with deep pockets.”

Strong is building a subdivision tailored to the elderly, “It took two years to get approval, but it would have taken four years in Canada. There are so many fingers in the pot, so many departments. I couldn’t do this magnitude of business up there.”

Nankivell, Neville, “How to Beat the Skills Crunch.” *National Post*, February 14, 2001; *Financial Post*: Editorial, p. C15

Discusses affect of shortage of skilled workers on economic growth of country. Decries use of preferential taxes as solution and encourages a more general approach that does not focus on information technology and communication industries/sectors. Wants the government to realize there are shortages in general skilled fields, construction, engineering, food services, heavy equipment operators and truck transportation that he believes are affecting many businesses. Suggestions for responses that don’t just focus on a few industries:

- Require universities to be more sensitive to changes in industries and use co-op work programs to meet private sector demand.
- Change to broad-based personal income tax and reduce marginal rates on high income workers.
- Use incentives to stop brain drain by creating focusing on financial support for post-graduate education, higher salaries for top researchers, increased funding for research, grants to business and R&D tax incentives to keep scientists and high-tech experts.
- Create system where students studying on immigrant visas can stay as permanent residents with fewer restrictions for spouses.
- Regulated recognition of educational achievements in provinces that allow professionals to move easily within Canada, knowing their qualifications will be recognized.

Nankivell, Neville, “Brain Drain Reason Enough to Cut Taxes: Problem Has Reached ‘Crisis Proportions’.” *The Financial Post*, June 11, 1998; News, Section 1, p. 21, *Nation’s Business*

Discussing brain drain concern of business groups. “Tom d’Aquino, president of the Business Council on National Issues, says the problem has reached ‘near crisis’ proportions. While the numbers may seem small relative to our total population, ‘the people we are loosing are the ones we need most.’” Lobbying for change in taxes: “Our top marginal personal tax rates hover around 50% and more (federal and provincial combined) and kick in at about \$60,000 to \$70,000”. The top U.S. rates are only 40% and take effect at above US\$220,000.

Statistics quoted: “About 28,000 skilled Canadian professionals left in 1996 to work in the U.S. under NAFTA permits, according to Reform party background paper. This was three times the 1991 level. A total of 47,000 Canadians went to the U.S. in 1996 as temporary workers, compared with 25,000 in 1991”.

CP, “Shortage Cause of Brain Drain.” *The Toronto Star*, January 14, 1998; *Business*, p. C11

Study from Berkeley, California at a conference for industry, education and government leaders says U.S. will need 324,000 skilled workers to fill high-tech jobs and focuses on need for computer programmers, analysts and engineers. Estimates of vacancies in similar industries in Canada are 20,000 to 30,000.

CP, “Good Jobs are Going Begging,” *The Toronto Sun*, September 6, 1999; News, p. 3

Hi-tech industry shortage of skilled workers at 20,000. Demand increasing over supply in industries from computer specialists in manufacturing to workers who know how to operate sophisticated mining equipment. “Students are saying a part of it is: ‘I’m being recruited by American companies that take an interest in my career and I don’t see the same interest level by Canadian companies.’”

Charles Sirois, “We Need Knowledge Workers: Charles Sirois Excerpt from a Speech.” *National Post*, February 23, 1999; *Financial Post*: Comment, p. C7

Article focuses on concern for lack of graduates in the fields that need them the most. Statistics: In a study of 52 Quebec information technology companies, these companies created 1,816 university-level IT jobs in 1998, but only 1,150 bachelors of science in IT, computer engineering and electrical engineering were available in the job market—40% shortfall. 175 Canadian technology companies planned to hire 10,000 people in 1998 and the country’s computer science and electrical engineering programs combined only produced 5,000 undergraduates. Author suggests Canadian companies and the government be more vigilant about retaining graduates at all levels before the graduate by keeping in mind that U.S. companies will recruit in every field. Author suggests education system should not reject possible graduates because their grades are just shy of being accepted, though they could possibly be well-trained.

United States

“Wyoming’s Foot on the Gas.” 2001. *The Economist*, February 17, p. 38.

Albany county, home of the University of Wyoming, lost 5.6% of its population during the 1990s, as did other university towns. The loss of talent affects the ability of these states to get ahead. Wyoming’s teachers rank 42nd nationally in earnings.

Van Slambrouck, Paul, “Give Me Your Huddled Masses...Er, Geniuses.” *Christian Science Monitor*, August 27, 1999; USA, p. 3

Focuses on H1-B visas. Congress increased the number of H1-B visas to 115,000. “The old notion that immigrants create a ‘brain drain’ on their host countries is increasingly outmoded in the technology sector, says Ms. Saxenian, UC Berkeley Professor. High-tech workers move back and forth between their native and adopted countries. ‘The brain drain may be giving way to an accelerating process of e-brain circulation.’” Two key causes for immigration in high-tech: education is at a premium and results in recruitment from abroad and barriers to starting a high-tech business are lower than in older industries so immigrants are creating their own. Says H1-B visas are not a zero sum game because it will create jobs and hiring immigrants is easier and cheaper than retraining American

workers. US educational system is not turning out enough skilled engineers and scientists.

Weber, Jonathan, “Special Edition: World on the Move; The Impact of Technology; Around the World and Back at the Speed of Light; New Communications Links are Bending Boundaries and Creating Opportunities in Remote Locations. There are Major Implications for Jobs and Labor Migration.” *Los Angeles Times*, October 1, 1991; *World Report*, p. 6 column 1

Focuses on ability of American firms to use overseas labor markets by using communication links to enhance U.S.-based operations. “Now that offices halfway around the globe from one another can communicate as if they were on the same street, the international distribution of labor may be fundamentally altered. Yet it’s not at all clear exactly what kind of long-term impact new technologies will have on job creation and labor migration.” “On the one hand, new communications links appear to be creating new opportunities for both skilled and semi-skilled ‘information workers’ in countries such as Ireland, India and Philippines. As multinational corporations move an ever-increasing variety of operations offshore, some potential émigrés in those countries may now be able to find work at home.” Multi-national firms are broadening the types of functions they are willing to move to developing countries, they are not simply sources of raw materials and cheap labor.

Discusses ways private firms (i.e. Hewlett-Packard) are training workers in countries so that those workers can be called upon when there are difficult projects without having to export labor. Countries like Taiwan and Singapore have succeeded in developing dynamic, high-tech industries of their own and are attempting to lure skilled expatriates back home. But, there is the concern that relaxed U.S. immigration laws will make it easier for skilled expatriates to remain in the U.S. Also concern for lower-skill information industry jobs that are being moved to the Caribbean, Ireland, the Philippines and the American Mid-West because these jobs don’t benefit the economy of those countries since they can be moved. Private companies in US have been trying to establish better communications systems in countries like India as well as in Africa and South America. Article mostly focuses on the way the “global economy” and internationalization is affecting developing countries because the US has increased its interest in using the labor, both skilled and semi-skilled of those countries.

Developing Countries: News Reports

Eastern Europe

Finley, Bruce, “Daughter Flies Nest for U.S. Émigré’s Parents Battling Loneliness. “*The Denver Post*, March 24, 1997; A Section, p. A-06

Story describes reasons for leaving home country—in this case, Russia. Focuses on the lives of one daughter who lives in Colorado and her parents, how the family is dealing with such a separation and why they want their daughter to be where she is at this time. “Even during the Communist youth group meetings in Soviet times, Vika envisioned her

future in the United States. Last year, she heard about a job opportunity at Colorado College in Colorado Springs. The liberal arts college wanted a Russian trained to teach the Russian language who could run their Russian House, where U.S. students studying the language reside.” “In Colorado, Vika said she can’t concentrate sometimes because she worries about her parents. They talk on the telephone once a week for about 20 minutes. Communicating via computer doesn’t appeal to them.” “Rationally, Anna and Vladimir tell themselves, Vika’s departure makes sense. Vika is trained to teach Russian and needs a good job. Those are scarce in Russia.” Mother has lost her job and money is difficult for the family, they are considering moving to the United States to be near her even though they do not have jobs and do not speak the language.

Koesoebjono, Santo, “Massive Brain Drain is Looming.” *The Jakarta Post*; April 13, 2000;

Netherlands announcing intention to recruit specialized nurses from outside the European Union. Theory of what governments can do to ensure they do not lose human capital it has invested in:

- Special remuneration and privileges for certain expertise. Funding can be allocated from development aid funds to strengthen local human resources to keep skilled workers from leaving, includes an agreement between countries or with companies should a guarantee a return the workers or a rotation system.
- Workers and experts living abroad should also be given the opportunity to study and train to improve their competence and expertise.
- Certain categories of people should be required to guarantee their return through contract.
- If persons with contracts break those contracts, they must repay the cost of training and the extra salaries that are paid to hire replacements.
- Organizations should give a deposit for employees going abroad and government officials should provide permits to leave the country and pass legislation regulating labor migration.

“Recent United Nations study indicates the 15-member countries of the European Union will need some 40 million immigrants by the year 2025 to avoid the shrinking of their workforce.” “This high demand forces them to shop across borders. Developing countries, including Indonesia, are the right sources of qualified workers, ranging from specialists in science, technology and medicine to those in ‘caring’ professions such as nurses. The risk of massive outflow of expertise from developing countries is looming.” Argues against the unequal exchange between developing and developed countries because of loss of expertise. Feels such a continued situation will cause others within the country to lack motivation to specialize and create and hinder developing countries.

Rozen, Laura Kay, “For Bosnians, A Jobless Peace: Economy Struggles to Revive.” (Special to the *Christian Science Monitor*—Sarajevo), *Christian Science Monitor*, November 20, 1996; *Business & Money*, p. 9

Discusses plight of skilled workers in Bosnia who can’t get jobs in their profession and either leave or try to get jobs in other professions. “Edin Chulov speaks fluent English, designed a generator that brought electricity to a city, rebuilt his family home twice, and

demonstrates a work ethic that would make Microsoft's Bill Gates blush. But after he graduated from the University of Sarajevo with a degree in mechanical engineering this past spring, he couldn't find a job." "I wanted to stay in Bosnia, I had...fought during the war," Mr. Chulov says. "If I couldn't find a job, I knew I would have to leave." Bosnia faces massive unemployment—officially 70% of the workforce—even though the nation needs skills and manpower to rebuild. Working as a driver for the United Nations pays twice as much (\$600/month) as working as a doctor at Kosovo hospital (\$300/month). "I cannot further my professional skills here," says Jasmine Alibegovic, a doctor who now works as a translator for the BBC. "I would like to go to Slovenia."

Vishnevsky, Anatoly, Zhanna Zayonchkovskaya, "The Fourth Wave of Emigration." *Moscow News*, February 12, 1992; Politics, p. 7

Skilled workers are now emigrating for economic reasons, and the largest numbers are leaving the former USSR from the European part and the Asian part of Russia. Experts expect an exodus of between two-five million people in the next five years. Seventeen percent of the people in Moscow and St. Petersburg wanted to leave and work in the west according to a survey. In 1989, 70,000 researchers left. In 1990, 534 scholars and experts left to work abroad for a long period from the Institutes of the USSR Academy of Sciences. Believe that most people will be absorbed into Britain, France, Germany, North America, Australia and New Zealand. Authors believe exodus theories are exaggerated because the cost of traveling, getting visas and leaving is prohibitive and there is no social system in the countries to help immigrants adapt.

Asia

Boey, Stephen "Use Net Job Postings to Reverse Brain Drain." *Business Times (Malaysia)*, April 5, 2000; Nation, p. 2

Article discusses success and interest in using internet sites to inform expatriates about positions available in firms as a means of reversing brain drain. Discusses one particular website (JobsDB.com) in Malaysia that has plans to increase to many other countries if successful in returning expatriates to their countries through website.

Burns, Simon "Banking on Brains." *ABIX: Australasian Business Intelligence*, October 19, 2000; p. 57

Discusses brain drain mostly to US and reasons for leaving are venture capital, infrastructure in US and open immigration policy for skilled workers. Touches also on subject of inventions of Asians going overseas instead of remaining in Asia.

Caven, Bill "High-Flying Jobs in Hong Kong." *The Herald (Glasgow)*, October 18, 1994; p. 13

Hong Kong needs skilled manpower, i.e. 7,000 construction professionals over the next two years because of work on Hong Kong's airport. Demand for British professionals is increasing. Government report highlighted trends in employment and showed need for skilled workers in Hong Kong due to a shortage. Forecasting need for 1,210 architects and 4,390 engineers. Hong Kong has become attractive alternative for young British professionals.

Elliott, John “Singapore Takes Each-Way Bet on Hong Kong’s Future.” *Financial Times* (London), July 30, 1991; Section I, Overseas News, p. 4

Singapore hoping to have a hand in hand over of Hong Kong to China and wants to be alternative for investors who are uncertain about Hong Kong. Discusses major transfer by companies to Singapore from Hong Kong in regional and functional headquarters.

Giang, Tu “Brain Drain Hurts State, Rural Sectors.” *The Vietnam Investment Review—Emerging Markets Datafile*, January 22, 2001.

Discusses brain drain phenomena in terms of young educated graduates going to foreign-invested companies instead of provinces and state agencies. Basically concerned with educated youth not returning to small provinces and areas of their birth and how that will affect these areas because they are not able to pay such high salaries.

Hamid, Hamisah “Budget 2001 A Boon to Workers.” *Business Times* (Malaysia), November 2, 2000; Human Resource, p. 4

Author characterizes “Budget 2001” as a “knowledge-based budget with various incentives for the information communication technology (ICT) industry. Expecting budge to be a chart for the country’s globalization, liberalization and e-economy. Budget includes tax relief, incentives for further study and purchasing computers, loans for civil servants to buy houses, cars and computers. Budget also includes incentives to return expatriates such as tax exemptions and permanent resident status for spouses and children. Government incentives include: withdrawing money from the “Employees Provident Fund” to purchase computers for personal use, government employees applying for loans to purchase computers, computers given to employees as tax-exemptions for companies and contributions toward ICT projects receiving tax deductions. Government also hopes to cultivate reading among population.

Hamid, Hamisah “Arrest Digital Divide, Says Dons.” *Business Times* (Malaysia), November 23, 2000; Human Resource, p. 4

Discusses the connection between the brain drain and poverty as well as encouraging the government to focus on education. Professors Dr. Mohamad Alias, Dr. Ahmad Sobri Jaafar and senior lecturer Abdul Rahim Anuar from Universiti Utara Malaysia (UUM) stated in a working paper entitled “Managing the Supply of K-Workers: The Role of Higher Learning Institutions”, ““Even though we have overcome the problems of economic divide as indicated by the significant decline in poverty, a widening digital divide would translate into a widening disparity in regional income per capita.”” Want to allocate more money to language, math and science at the primary school level.

Professors encourage public and private sectors to address lack of highly skilled IT manpower. Concern for building this base of educated graduates from the institutions in the country by focusing education on IT. Between 1996 and 1998, demand for professional and technical manpower grew 4.8% per year and was mainly for engineers, consultants, architects and technicians. In 1998 only 7% of the total number of students enrolled in upper secondary and tertiary education went into the IT and multimedia fields.

Professors also encourage using private companies to place students in programs with them so students can gain knowledge while still in school and stimulate thinking and the educational experience.

Haron, Sharif, James Kandish “Ghani: No Reason for Singapore to Pinch Manpower from Johor.” *New Straits Times* (Malaysia), November 3, 1997; p. 1

Discussing specific problems of brain drain from Singapore to Malaysia.

Hong, Carolyn “Wooing Them Home.” *New Straits Times* (Malaysia) August 29, 2000; p. 1

Discusses incentive program from government to encourage expatriates to return and invest as stated by Deputy Prime Minister Datuk Seri Abdullah Ahmad Badawi. Using relaxed immigration policies to lure expatriates because want to focus on increasing and attract human resources.

Kadir, Kartini Abd “Perks Given to Check Brain Drain.” *Business Times* (Malaysia), July 19, 1996, p. 20

Discusses government concern for loosing educated graduates to private sector within the country because of its inability to pay the salaries offered by private firms. Government plans to introduce special incentive programs to doctors, engineers and architects as well as other professionals working in the public sector.

Kaur, Hardev “Toward a New, Knowledgeable, Competitive Malaysia.” *Business Times* (Malaysia), October 30, 2000; Trends notes, p. 6

Discusses Budget 2001. Finance Minister Tun Daim Zainuddin “spelled out incentives to ensure that the country is ready to face up to the new challenges and to remain on its growth and development trajectory.” This budget is also the first one for the “Eight Malaysia Plan” and offers “holistic approach—from funding and investment aspects to research, training and ownership of individual computers.” Budget 2001 policy objectives are to enhance, improve and uplift the country’s competitiveness and resilience internationally. Discusses incentives for expatriates and retaining Malaysians trained in the country.

Manecksha, Ferina, Ridzuan A. Ghani “Industry Optimistic of Budget Incentives (HL).” *New Straits Times—Computimes* (Malaysia), October 26, 2000; p. 1

Discusses Budget 2001 incentive—taxes for companies to encourage IT build-up and research and development to retain IT workers in the country and boost IT industry in the country.

McKenzie, Scott, Wanda Szeto “Exodus Set to Shift Up a Gear As 1997 Nears.” *South China Morning Post*, October 10, 1994, NSW, p. 1

Concern for a Hong Kong brain drain when the turnover to China occurs. Discusses increase in the number of visas being issued and where people intend to go.

Mustaffa, Nur Aida “More Knowledge Workers from Informatics.” *New Straits Times—Computimes* (Malaysia), November 22, 1999; IT in Education, p. 36

Informatics group of colleges expects to increase number of graduates to meet requirements of MSC. To this effect, the college uses partnerships with multinational firms.

Pham, Alex “Technology & Innovation: Head of the Class.” *The Boston Globe*, July 17, 2000; Business, C1

Focusing on one person and then expanding to a discussion in general of migration from Asia to US it discusses the “brain circulation” not the “brain drain” and discusses why it benefits Asian countries to have entrepreneurs leave the country to start businesses in the US and then return or pour money into the country to benefit others. Pretty good article for “human interest” with quotes about what Asians are doing in the US and why they are leaving their home countries and going to the US to start companies or why they are remaining in their countries and what they are doing to innovate industries there.

Porter, Barry “Economics Professor gives Singapore Something to Chew Over.” *South China Morning Post*, March 31, 2000; Business Post, Southeast Asia Briefing, p. 12

Discusses Singapore’s ability to attract foreign workers and investments as a function of their changing image as a country that is more liberal than it is currently viewed. Prime Minister Goh Chok Tong intends to change Singapore economics by making it a more enjoyable place to live to attract foreign talent and retain nationals to build “knowledge-based economy.” Discusses plans by Malaysia and Europe to attract and retain IT skilled professionals.

Sani, Rozana “New Study By Ministry to Stem IT Brain Drain.” *New Straits Times—Computimes* (Malaysia), May 15, 2000; p. 1

Focuses on government action and incentives to attract and retain IT skilled workers. “Science, Technology and Environment Ministry is planning a study to look at ways to attract Malaysian IT experts and professionals working overseas to return to the country, which will help reduce the effects of the “brain” exodus currently occurring in the local IT and multimedia industry.” Expects that the MSC (Multimedia Super Corridor) will be a good way to attract Malaysians from overseas while also focusing on monetary incentives. Benny Moe of JobsDB Malaysia believes there will be a need for 100,000 knowledge workers by 2005.

Wong, Douglas (Kuala Lumpur) “Mahathir Plans Brain Gain of 5,000 Skilled Workers a Year.” *The Straits Times* (Singapore), March 9, 2000; Malaysia, p. 30

“Prime Minister Datuk Seri Dr Mahathir Mohamad announced yesterday that Malaysia intended to attract 5,000 skilled foreign workers a year as part of a new ‘knowledge-economy master plan.’” Wants to increase foreign talent in any and all areas, but intends to decrease the number of unskilled foreign workers by 100,000 a year. Announced a freeze of hiring foreign workers in 138 categories of skilled and semi-skilled jobs. Plan to cover: massive investment in education; national media system and new rules of transparency for private and public sectors.

Yim, Sauw “Exodus Eases as Skilled Staff Opt to Remain in Their Posts.” *South China Morning Post*, August 26, 1998; *Business Post*, p. 2

Discusses government actions to help small and medium-sized business attract skilled workers and resolve their brain drain problem.

“ASEANWATCH: Bringing Us Home.” *Businessworld (Philippines)*, August 29, 2000

Discusses brain drain of Filipino IT workers to other countries that have been recruiting IT workers and have programs in place to train and develop their skills. Compares Philippines to other countries and the efforts of each in this area.

“Brain Drain No Longer a Problem for Asian Countries.” *Japan Economic Newswire*, October 22, 1999

Discusses Pacific Economic Cooperation Council meeting that denounces idea of brain drain for Asian countries and states that developed countries are suffering more from brain drain. Also discusses need for government to focus on people and not infrastructure to build electronic commerce.

“MSC Needs Skilled and Talented Workers in K-Economy.” *Malaysian Economic News*, October 24, 2000.

Discusses need for Malaysians abroad to return to use expertise learned in foreign multinational companies to develop MSC.

“Better Education, Higher Pay Sought for IT Professionals.” *Businessworld (Philippines)*, August 3, 2000

Philippine government using Investment Priorities Plan to attract foreign investors despite US, Germany and Australia’s efforts to recruit IT professionals. Plans to increase the number of IT professionals through Virtual Center for Technology Innovation in IT—project of Dept. of Science and Technology and the Information Technology Foundation of the Philippines.

“Asia Needs to Cooperate to Reverse IT Brain Drain.” *Xinhua General News Service*, January 14, 2001; *World News—Los Angeles*

Singapore’s Minister for Communication and Information Technology Yeo Cheow Tong encourages creation of regional IT environment to reverse brain drain. Wants to create an Asian IT belt to link Asian IT hubs and attract global companies while retaining Asia’s professionals. Brain drain affects economic growth in home country because of the shortage in expertise. Singapore Prime Minister Goh Chok tong also suggested Asian IT Belt at ASEAN (Association of Southeast Asian Nations) summit. ASEAN heads of state signed the e-ASEAN Framework Agreement, which is a plan to speed up economic integration through the internet.

“Government Committed to Ensuring Success of the MSC.” *New Straits Times (Malaysia)*, February 13, 2001; *National*, p. 5

Government in Malaysia intent on improving IT industry through development of software applications, Deputy Prime Minister announcing launch of software program

called “Compass” to reach these goals. Government is introducing incentives to companies with MSC status to produce more software.

“Need For More Knowledge Workers.” *New Straits Times* (Malaysia), April 26, 1998; National, p. 5.

Discusses education courses that focus on IT “knowledge workers” and encouraging education in general through loans from the government.

“Shortage of engineers for Multimedia Super Corridor.” *The Straits Times* (Singapore), March 22, 2000; Malaysia, p. 48

Discusses shortage of engineers that will affect development of MSC as projected though higher education institutions are graduating thousands of engineers. They are discussing focusing on women engineers. International Trade and Industry Minister Datuk Seri Rafidah Aziz said Malaysia needed 30,461 workers and was short 2,303 because it only had 28,158 currently in MSC companies.

“Malaysia to Embark on “Brain Gain” of Skilled Foreign Workers.” *Deutsche Presse-Agentur*, March 8, 2000; International News

Prime Minister Mahathir Mohamad intends to phase out 100,000 unskilled low-knowledge foreign workers a year from a current 2 million currently in the country. Mahathir intends to introduce “Strategic Initiative One” a plan to develop knowledge-driven economy that competes successfully with other countries.

“Reversing the Brain Drain.” *New Straits Times* (Malaysia), September 7, 2000; Opinion, p. 12

Discusses need to retain skilled workers because Malaysians have been migrating to other countries steadily. Author wants to encourage a better work environment and increased opportunities as a means of retaining skilled workers. Encourages innovative culture that attracts young professionals such as the MSC. Best incentives are higher salaries and job satisfaction that recognizes worker’s abilities and performances.

India

Constable, Pamela (Washington Post Service). “India High-Tech Drain Shows Signs of Slowing.” *International Herald Tribune* (Neuilly-sur-Seine, France), September 15, 2000; News,

Begins with and discusses the main reasons people are leaving India for the US.

Namita Gupta won admission to Indian Institute of Technology at age 17 and spent five years studying. She has now been recruited from I2 Technologies, a Dallas company which is has been her dream. “I want to get a taste of freedom, and the idea of going to America is exciting, but the life I have here is safe, like a cocoon. My career is very important, but I don’t want to miss out on family life. A lot of people go to the US and never come back. I don’t want to be one of those.” Though article starts out with idea that many Indians are going to the US on temporary work visas, there is now a choice because India has a high-tech industry that is beginning to grow. States that many

Indians are returning while foreign companies are setting up investments and joint ventures in India because of new laws. “In the 1970s and 1980s there were more opportunities in the US, but that’s changed now,” says Lalit Malhotra, a professor of physics at the New Delhi campus of the Indian Institute of Technology. “There are a lot of multinationals here, and they pay very well. There was a time when the whole of a computer class would disappear from India after their studies. Now it is more like 50-50.”

India does still represent 45% of the H1-B visas issued by the US. “In 1993 84% of the new computer science graduates headed for jobs or advanced study in the US, now only 60% do so, according to India’s National Association of Software and Services Companies.”

Devi, Chandra. “Learning Fast From the Experts.” *New Straits Times—Computimes (Malaysia)*, May 8, 2000, IT in education, p. 30

Article discusses India’s prowess in IT both in corporations and “manpower.” States that India has 3 Million scientists and engineers ranking it 3rd to US and Russia in scientific and technical manpower. Software industry has grown 50 each year for the past 10 years. Touts India’s success to higher education by both private and government-run universities, while the large English-speaking population also makes it a place employers go to find workers. “Once considered a brain drain for India, skilled manpower is today the number one money earner in terms of foreign exchange.” Article discusses prospects for Malaysia’s project, the Multimedia Super Corridor (MSC). States MSC will have problems without the development of skilled IT professionals from the country and should focus on education in the country to produce the workers they require. Focuses on education as a means of bringing about success with the MSC and as a way for the government to ensure that Malaysians remain in the country upon graduation.

Dugger, Celia W. “Return Passage to India: Émigrés Pay Back.” *The New York Times*, February 29, 2000; Section A, p. 1, Column 2, Foreign Desk

Discusses theory of “brain trust” and “brain circulation.” Discusses investment interests from those graduates of India Technical Institutes who are being asked to contribute to higher education to prevent more graduates from leaving.

Ghosh, Nirmal. “New Delhi Reaps Benefits From IT Brain Drain.” (India Correspondent). *The Straits Times (Singapore)*, March 6, 2000; World, p. 6

Entrepreneurs giving back to Indian tertiary education institute, Indian Institute of Management among others, and discusses new investments in dot.coms in India. Though many top graduates of IIM are being recruited by US, British and multinational firms.

Harding, Luke. “The New Migration: India Starts to Count its Losses: Exodus: West Lures Doctors and IT Workers.” *The Guardian (London)*, October 31, 2000; Guardian Foreign Pages, p. 16

India suffering from loss of educated professionals where half of the foreign doctoral and post-doctoral students study in Europe and America and return within two years of completing their studies. Bob Bradnock of School of Oriental and African Studies in

London sees brain drain as ‘positive’ force because people develop skills abroad and there is a two-way flow. LM Singhvi, former Indian high commissioner in London believes that all countries suffer from the migration of skilled workers because there is a loss of skilled manpower that has been invested in by the country. Approximately 18 Million Indians live abroad in more than 100 countries.

“Nasscom Projects 370,000 IT Workforce Required in India by 2008.” *Asia Pulse*, February 9, 2001; *Nationwide Financial News*

Recommendation for the government is to set up IITs and IIITs in every state with an allocation of US\$ 3.24 Billion in a five year plan. According to a study by the National Association of Software and Services Companies (Nasscom) IT workforce requirement is expected to need 205,000 in 2002 and up to 370,000 by 2008.

“India Techs Long to Work in America.” (San Francisco Examiner) *Star Tribune* (Minneapolis, MN); August 14, 2000; *Business, Tech Work*, p. 9D

Discusses why people are leaving India—desire to support their families at home. “It’s very simple. They have an outstanding education system there. You’re able to get very, very highly qualified engineers and programmers,” said Vivek Ranadive, CEO of Tibco Software Inc.” There is also the belief that if talented Indians had remained in India, the situation in the country would be different. [Article doesn’t really elaborate on this concept.]

Africa

Chenault, Kathy. “Cuban Doctors Helping Fill Void Left by South African Emigrants.” *The Dallas Morning News*; December 16, 1998; *News*, p. 17A

Discusses the affect of the brain drain on poverty. “But four years after historic all-race elections inspired hopes for change, those aims are threatened by a brain drain of professionals and skilled workers flocking to foreign countries. The problem is felt most acutely in impoverished rural regions and townships. That is forcing officials to look for ways to meet the needs of neglected South Africans, such as the program putting Cuban doctors like Dr. Licea to work in rural clinics and hospitals.” 404 Cuban doctors are working in South Africa. Concern for corporate brain drain because foreign companies aren’t able to find enough staff. There are also teacher shortages and foreign recruiters are taking technicians and professionals. Mr. Mandela has shown concern that South Africans are emigrating now when they have an obligation to help create a system that is not unjust. The reasons why people leave are crime, higher pay and exposure to technology in richer countries. However, many leave because they want jobs, employment is a high factor because it is currently 33%. Article is an example of how brain drain is affecting the economy and concerns of poverty increasing and affecting the larger population.

Kobokoane, Thabo. “Educated Seeking to Leave SA, Poll Shows.” *Business Times* (South Africa); July 11, 1999; *News*, p. 3

Discusses survey of reasons people leave South Africa and the numbers of people leaving.

Mallet, Victor. “South Africa “brain drain” worse than feared.” *Financial Times (London)*; October 5, 1999; *World News*, p. 16

Discusses report of Cape Town-based Trade & Industry Monitor. Between 1989 and 1997, 233,609 South Africans have emigrated to the US, UK, Canada, Australia and New Zealand compared with the official figure of 82,811 reported by Statistics of South Africa, which is 75% of South African emigration. Author argues foreign investment is not attracted to South Africa because of a shortage of skilled professionals in engineering and medicine that is compounded by the difficulty of getting short-term work permits for skilled foreign workers that would be technical and managerial staff.

MacGregor, Karen. “Academic Repression: The Nigerian Brain Drain.” *The Guardian (London)*; July 12, 1993; *The Guardian Education Page*, p. E6

Discusses the reasons academics are leaving Nigeria—intellectuals are being persecuted and targeted because they are viewed as a threat to dictatorship governments. Colonial rule has caused an increase in foreign skilled workers for programs of the World Bank and the International Monetary Fund. Intellectuals are a focus for the dictatorships because intellectuals are able to focus on government weaknesses and are able to mobilize mass opposition.

Muchiri, Michael Kibaara. “The Brain Drain, Curse for the Third World.” *The Jakarta Post*, March 24, 2000

Discusses brain drain and problem for third world. United Nations Economic Commission for Africa (ECA) warned that the African continent had to act quickly to reverse the brain drain of 20,000 skilled professionals a year who emigrate to Europe or the US. Between 1985 and 1990 Africa lost 60,000 scientists, doctors and engineers. United Nations Development Program estimated that more than 21,000 Nigerian doctors emigrated and resettled in the US. Argues problems of brain drain and how developed nations are contributing to it by giving educational aid and then luring graduates with promises of better lives and large salaries. Discusses the affect of the brain drain on African poverty that can not be overcome because of problems with economies, wars and Aids. Advocates things that individuals can do to make the future of Africa better.

Stones, Lesley. “Black Skills Hold Key to Future, Says Survey—Brain Drain and Job-Hopping are Exacerbating Shortages.” *Business Day (South Africa)*; February 24, 2000; *Information Technology* p. 13

Discusses report of SA Information Technology Strategy project (Saitis). Advocates use of blacks to fill vacancies from brain drain of IT workers in industry. Concerns of public sector in attracting skilled IT workers when faced with higher salaries from private sector. Report concludes that there needs to be increased communication between government and IT industry as well as more private sector training and education training that includes IT literacy in primary schools and training programs in secondary schools.

Wocke, Alber and Saul Klein. “SA needs to attract, not deter, skilled foreign labor.” *Business Day (South Africa)*; October 18, 2000; *Opinions & Analysis* p. 14

Research study by Wits Business School declares Immigration Bill the Parliament is considering to be detrimental to SA’s “growth prospects.” The Bill proposes to tax skills

of foreigners, which will affect decisions of foreigners to go to South Africa. It also is a disincentive to hiring foreign labor because it requires employers to put money into a training fund. Human Sciences Research Council study on labor market skills found that employment of professionals will rise between 1998 and 2003 by 93,000 while there will be a decline of 71,000 for semi-skilled and unskilled labor. IMF study has concluded that highly educated South African migration exceeds 8%. International Labor Organization study concluded that shortage of skilled labor negatively affected economic growth and stunted development of labor-intensive sectors while reducing the ability of the labor market to adapt to globalization. Author wants to encourage small and medium-sized business by foreigners.

“South Africa; South Africa Faces Skilled Labor Shortages.” Panafican News Agency, *Africa News*; April 13, 2000; News, Documents & Commentary

Declares that skilled worker shortage will affect South Africa’s ability to fulfill economic growth targets over the next three to five years. Corporate Services report shows that the shortage of managerial and technical staff is between 350,000 and 500,000. Also states the “departure of skilled labor is at least three times higher than official statistics indicate.” Advocates incentive-based immigration policy to help the country’s economy.

“Africa-at-Large; Can Africa’s Brain Drain Be Stemmed? UN Economic Commission for Africa.” *Africa News*; February 17, 2000; News, Documents & Commentary

Discusses Regional Conference on Brain Drain and Capacity Building in Africa, which will occur February 22-24, 2000. The main objective is to “situate the issues pertaining to the causes, magnitude and implications of brain drain in the African region in the context of the current debate about capacity building in the continent.” It is being sponsored by the Economic Commission for Africa (ECA), International Organization for Migration (IOM) and the International Development Research Center (IDRC).

Specific objectives of the conference:

- Review approaches in capacity building and the extent to which they take into account human capital flight and the impact on future/existing capacity;
- Develop a comprehensive and integrated approach for effectively utilizing human resources in Africa;
- Recommend and disseminate to African policy-makers practical implementation modalities to stem or reverse brain drain and build capacity at national and regional levels; and
- Follow up and develop project activities geared to strengthening human resource capacity building and the return of qualified Africans to member states.

Conference hopes to explore the impact of the brain drain on different levels and sectors including the interrelationship of the government-education-industry in building capacity. Hope to decide how to stem brain drain so that investments are not being lost. UN Secretary General Kofi Annan stated, “‘scientific innovation is the driving force of growth and development.’ He added that if Africa is to take part in this progress, nothing

less than a transformation in priorities and policies is needed to develop Africa's scientific knowledge and expertise.

“S. Africa Keen on Indian Teachers and Russian Scientists.” *Agence France Presse*; February 12, 2001; International news

Essop Pahad, minister in the office of President Thabo Mbeki said, “South Africa would like to attract Indian teachers and Russian scientists to work in the country to make up for shortages of skilled labor.” This announcement follows declarations by the president to make immigration laws less restrictive. South Africa is suffering net loss of people with 8,402 emigrants and 3,669 immigrants in 1999. “South Africa, Academics, Business Suggest Ways to Begin Plugging the Brain Drain”.

***African News*, February 7, 2001; News, Documents & Commentary**

Discusses idea of brain drain as a “bandwagon effect” from Professor Don Ross of the University of Cape Town (UCT) school of economics. It is a “phenomenon initiated by a (small) group of skilled South Africans intent on emigrating. Once their emigration became noticeable, SA's skilled began to fear the consequences of the economy's rich core shrinking significantly.”

IMF estimates 8% of highly educated South Africans emigrate. Tomson Financial Bankwatch believes 16% of South Africans with tertiary education live overseas. More than 56% of professionals emigrated annually since 1994 than in 1989. One-third of enterprises report a significant loss of people since 1994 where as prior to that only 2% reported such a loss. South Africans are dissatisfied with cost of living, tax levels, safety and security and the standard of public and commercial services. Suggestion that the government can address this issue by increasing skilled immigrants to alleviate anxiety over brain drain. “Ravi Moodley, president of the SA Institute of Artisans says that immigration could plug certain specialist competency areas in which SA is deficient.”

“Africa-at-Large; Can Africa's Brain Drain Be Stemmed?: UN Economic Commission for Africa.” *Africa News*; February 17, 2000; News, Documents & Commentary

Program to end brain drain used by 10 African governments has succeeded in returning and integrating 1,500 skilled Africans to fill positions in important sectors of the economy reported the IOM. Regular colloquiums organized by Southern African Regional Institute for Policy Studies (Sarips) and the Southern African Political and Economic Series (Sapes).

“How the South African Educated Trickle from the Country: Chairman Naidoo.” *Business Times (South Africa)*; August 1, 1999; News, p. 3

Discusses extensive study on brain drain by IMF researchers William Carrington (US Bureau of Labor Statistics economist) and Enrica Detragiache (Commodities and Special Issues Division of the IMF Research Dept. economist). OECD reported that education level differences of the population affect economy of a country and that raising educational opportunities should also raise income in the developing countries. Migration to the US accounted for 54.3% of the total migration from developing

countries. Largest migration to US from three countries—Ghana, 26%; South Africa, 8% + and Egypt, 2.5%.

Middle East

Abboud, Mounir, “Arab Professionals Find Better Life and Fortune in the West.” *Moneyclips*; April 24, 1994

Arab Labor Organization—Dr. Nabil Dajani: “A real problem faces us. If this drain continues, extremely grave consequences may result and we may end up going down the slopes of backwardness.” More than 470,000 Arab professionals moved to the West between 1985 and 1990. Professionals that are moving are doctors, engineers, bankers, pharmacists, teachers and scientists as well as skilled laborers. In 1985, there were 40,000 Arab migrants, in 1989, 91,000 migrants and in 1991, 129,000 migrants. Egypt, Lebanon and Iraq are the biggest losers—250,000 people left Lebanon since 1985. “Dr. Samir Makdisi an economics expert at the Lebanese University in Beirut said many scientists had left because of economic and social instability resulting from the political situation in the Arab region.”

Migration from densely populated countries: Egypt, Yemen, Tunisia and Morocco. Also migration from Sudan and Syria. “Dr. Elias Zein (author of book about Arab brain drain) believes brain drain may be halted, or at least slowed down, if the gap between Arab and foreign experts working together in the Arab world was bridged.”

Al-Sereihi, Saeed “Arab Brain Drain Big Loss to State Exchequer.” *Middle East Newsfile*; May 9, 1999

Drain on resources of country and believes is result of economic factors and lack of professional satisfaction. Minister of Higher Education, Dr. Khalid Bin Muhammad Al-Anqari, spoke on the causes of Arab brain drain:

- Academic, low spending on scientific research and few connections between researchers and other organizations.
- Economic, low living standards.
- Professional, no link between higher education and the labor market.

Dr. Al-Anqari gives some vague answers about how to change the brain drain by attracting people back and what to do to improve lives of professionals.

Canadian Brain Drain

Note: Selected references from the project on “Renewal and Retention: Attracting and Keeping Faculty and Senior Administrators at British Columbian Universities,” The Laurier Institution, <http://www.laurierinst.com>. Literature generally reviewed or available.

Amey, M.J. 1994. "Faculty Recruitment, Promotion, and Tenure." in Burton R. Clark and Guy R. Neave, Eds., *The Encyclopedia of Higher Education*, Volume 1, Oxford, Pergamon Press, pp. 1623-1634.

This article reviews the principal themes in the Higher Education research literature on faculty recruitment, promotion, and tenure. It notes one of the most difficult challenges for academic institutions is recruiting and retaining quality faculty and suggests it is important to examine the relevancy and operationalization of various values, policies and practices such as tenure and how these are affected by academic labor market changes. The article notes research indicating that recruitment of one career faculty member in the U.S. represents a potential investment of over a million dollars and an important issue due to concerns about effects of a shrinking faculty market and rising costs for recruitment and retention. Research indicates various changes in hiring practices since the 1970s and that universities might better re-evaluate their approaches more systematically exploring candidates' issues, historical practices, reward systems, tenure decisions, alternatives to tenure, retirements, part-time as well as women or minority faculty, and other factors. It suggests "adequately confronting the future will require rethinking assumptions and values of the past, particularly as they are ascribed to the concept of tenure." It argues that as the academic labor market changes "so must institutional policies."

Grubel, H.G. 1994. "Brain Drain, Economics of." in Torsten Husen and T. Neville Postlethwaite, Eds. *The International Encyclopedia of Education*, Second Edition, Volume 1, Oxford, Elsevier Science Ltd., pp. 554-561.

This article draws from the principal themes in the economics of brain drain and international migration literature. Remarks partly build on research done for the author's 1977 monograph, *The Brain Drain: Determinants, Measurement and Welfare Effects*. The article reviews the historical and conceptual background to the issue. It also discusses: motives for highly skilled worker migration and the kinds of survey or economic studies used to measure these; the magnitude of brain drain flows; problems with certain types of data such as U.S. Immigration Statistics; and welfare effects as well as short-term and long-term output effects or "costs" associated with this brain migration phenomenon. Concerning those "welfare effects" the article reviews the United Nations debate over the loss of human capital from developing countries by brain drain; the varying effects of the phenomenon on educational finance; its role in taxation and services; as well as personal and qualitative benefits arising from mobility. It concludes with policy recommendations noting that given such public concern and political rhetoric there have been few solid policy proposals to reduce it or deal with its consequences. The article notes existing recommendations fall into three categories: reducing incentives without interfering with flow; making immigration policies of countries that gain less discriminatory in favor of highly skilled people and making it more difficult for students or temporary visitors to obtain permanent residency; and redressing inequities alleged to arise from the debt on educational outlay owed to the losing countries as well as tax surcharges on immigrants remitted to source countries.

Moore, K.M. 1994. "Faculty Rewards and Incentives." in Burton R. Clark and Guy R. Neave, Eds., *The Encyclopedia of Higher Education*, Volume 1, Oxford, Pergamon Press, pp. 1641-1648.

This article reviews the principal themes in the Higher Education research literature on faculty rewards and incentives. It notes that scholars over time have developed a complex reward and incentive system and although they historically have not pursued material rewards as much as in other fields, more now expect rewards for exemplary work, longevity of service, and for other activities. The article touches on the nature, complexity and diversity of reward and incentive systems; differing perspectives and interests in these from individual faculty or organizational perspectives; distinctive types of rewards and incentives such as merit pay, titles, improved working conditions, punishments and disincentives; allocations; and experimental systems. The article notes that a key factor in encouraging and sustaining faculty while rewarding them for accomplishments is recognizing the essential autonomy of faculty members as academic professionals. It suggests that although inadequate compensation is often an important reason for mobility many of the most important incentives are internal ones. It also suggests institutions must pay more attention to what motivates faculty and that this will be even more important in coming years given the projected growth of the higher education sector in many countries and the faculty turnover in others.

Pedersen, Paul B. 1990. "Social and Psychological Factors of Brain Drain and Reentry Among International Students: A survey of the Topic." *McGill Journal of Education*, Vol. 25, No. 2 (Spring), pp. 229-243.

This paper reviews the principal arguments and data regarding motives for international students, mainly from developing countries, returning to home. It also examines results of a study conducted jointly by the United States National Science Foundation and the National Science Council in Taiwan, R.O.C. as a case study. The paper suggests the data raise three questions: Is there a brain drain? Why do students return home? What problems do graduates encounter upon their return? The paper explores the implications arising from these questions. Whether there is a brain drain or not depends on how graduates are counted as a statistic in their time away after graduation. The article suggests most researchers agree that 90 percent of graduates eventually return home from study in Canada or the U.S. but that this differs in science and engineering. Some researchers suggest that international students remaining in the U.S. play an essential role in educating the next generation. The article also reviews reasons for returning home building on earlier research which identified thirteen key factors including: home country attitudes toward nationals; government and international sponsorships; self-sponsorship; availability of and announcements of appropriate employment; ambiguity of immigration laws; inadequate statistics and data on non-returnees; lower classes and minorities who are more likely to remain (in the U.S.); and brain drain severely hampering development efforts in developing countries an issue supported by some studies and rejected by others. This article reviews conclusions from Glaser's UNITAR study (cited below), which noted income was not always the strongest determinant for returnees as well as other non-economic influences. The paper also discusses re-entry problems and support mechanisms to assist returnees and encourage them to readapt and stay. The article concludes that many recommendations made by Glaser and other studies (although now

dated as is this article) are still relevant now. The author recommends a “brain plan” to put the real or presumed danger of brain drain into perspective and address problems of re-entry and adaptation for returnees.

Schuster, J. 1994. “Academic Labor Markets.” in Burton R. Clark and Guy R. Neave, Eds., *The Encyclopedia of Higher Education*, Volume 1, Oxford, Pergamon Press, pp. 1537-1547.

This article reviews the principal themes in the Higher Education research literature on the academic labor market discussing conceptual issues and describing factors that impinge on that market. It attempts a broad overview, but confines itself mainly to full-time teachers-scholars and restricts the purview principally to the U.S. labor market. The article notes that the ability of colleges and universities to meet their core societal responsibilities “depends fundamentally on their ability to attract and retain persons who possess the requisite competencies and commitment.” The faculty it says is the very core of the academy and the labor market determines who faculty will be. The article notes that making sense of the academic labor market is replete with challenges sometimes described as being characterized by “economically irrational behavior” and situated amidst a complex of several overlapping sub markets. The article reviews some historical background; methodological perspectives and units of analysis including the understanding of national data and trends; understanding supply and demand forces and dimensions; compensation issues; competition among professions; the international dimension including student flows and immigration; women and minority concerns; and outlooks or projections. To conclude, it also notes the role of federal policy as a “potentially potent weapon for stimulating supply and, less directly demand.” In terms of consequences, it suggests that the demand for faculty will exceed the supply of well-qualified faculty across most fields by around 1997. The most likely scenario for the academic labor market it predicts “will feature intense competitiveness to recruit and retain good faculty members” entailing substantial pressures on costs for institutions. The article raises concerns about a costly sellers market in the midst of pressures to economize. Empirical Analyses, Studies and Survey Reports (Canada, U.S. and International).

Bastarache, Lise. 1999. “*Interprovincial mobility of highly skilled workers.*” Current Analysis (October) a special report of the Royal Bank of Canada, Economics Department.

This study assesses to what extent some provinces are “attracting a disproportionate share of highly skilled/highly educated workers compared to other provinces” examining flows of university graduates and “knowledge workers.” It uses data from the 1996 Federal Census and examines results from the 1991-1996 period. It notes that only B.C. managed to attract more university graduates (gaining 8%) than it lost to other provinces. B.C. also led the country with a 6% net gain with Newfoundland the highest outflow of -8%. It suggests Alberta and Ontario will be the most competitive migrant recipients in future due to the most competitive personal tax environments in Canada. It argues that funding of post-secondary education, or lack of funding does not significantly contribute to inter-provincial mobility of university graduates.

DeVoretz, D. J. 1999. "The Brain Drain is Real and It Costs Us." *Policy Options*, (September), pp. 17-24. Also posted at www.irpp.org

This paper builds on the author's C.D. Howe Commentary (cited next) arguing that a net transfer of highly skilled Canadians to the U.S. in the 1990s is not in doubt. That transfer, it says, is largely one-way constituting a substantial subsidy from the Canadian taxpayer to the world's richest country and to Bill Gates in particular, with the Canada-U.S. Free Trade agreement, NAFTA and their mobility provisions, as well as changes in U.S. immigration policy accentuating the trend. The paper suggests evidence is mounting that Canadians who move to the U.S. outperform similarly trained U.S. born workers, and although they may move under temporary work visas under NAFTA, they no longer have to wait to enter the U.S. before applying for permanent residence. Instead they can queue while there. The paper suggests that motivations to move and remedial measures needed to repatriate may vary by occupation. It argues that a simple head count comparing inflows to Canada from other countries may lead to skepticism about the brain drain, but that this net result is deceiving. Instead one cannot ignore costs of upgrading the productivity of new immigrants, underlying economic forces initiating Canadians' move to the U.S., and ethical problems concerning Canada using "peasant-taxpayers" in poorer developing countries to make up for its own brain drain losses. The paper argues Canada must "implement policies to retain Canadians and entice émigrés to return.

DeVoretz, D. J. and Samuel A Laryea. 1998. "*Canadian Human Capital Transfers: The United States and Beyond.*" C.D. Howe Institute Commentary (October), Toronto, C.D. Howe Institute.

This study argues that a brain drain of talented Canadians to the U.S. is "both real and costly" suggesting that causes are not well understood but complex. Generally it suggests "push" factors such as Canadian graduates unable to find suitable work at home and "pull" factors mainly higher after-tax earnings. The study claims that in the 1990s structural changes in Canada-US economic relations have resulted in a net outflow of mainly highly trained managers and professionals to the U.S. Transfers partly reflect greater ease due to the North American Free Trade Agreement leading to more temporary workers but have also increased permanent emigration. This means a net loss of \$6.7 billion to Canadian society from 1982-1996 due to taxpayer subsidies for higher education and training costs. If replacement costs measured through the human capital of new immigrants were not factored in losses would have been \$11.8 billion Substantial numbers continue to graduate in certain occupations such as nursing at great cost to the public purse, only to move the U.S. In some fields where Canada has been trying to attract personnel such as engineers or scientists, for example, Canadian educated graduates to the U.S. represents 14.5 percent in annual flow. The study raises significant educational policy questions.

Frank, Jeff and Eric Belair 1999. "*South of the Border—Graduates from the Class of 95 Who Moved to the United States: An Analysis of Results from the Survey of 1995 Graduates Who Moved to the United States.*" Hull/ Ottawa, Human Resources Development Canada/Minister of Public Works and Government Services Canada, also posted at www.hrhc-drhc.gc.ca/arb

This report analyses results of a survey of post-secondary graduates from the class of 1995 that were living in United States in 1997. The survey was conducted in 1999. The sample size and principal methodology consisted of 531 interviews from the 4600 graduates who had moved. The results indicated that over one-third were in the health occupations (36%) with one-quarter (26%) in applied sciences and engineering. The report argued that those who had moved tended to be high-quality graduates in key fields and demonstrated that Master's and PhD graduates were over-represented in the outflow to the U.S. Some 12% of PhD graduates and 3% of Master's moved compared to 2% of bachelor's and college graduates. Interviews suggested that 57% relocated for work-related reasons, 23% for education and 17% for relationships. Work reasons meant mainly greater availability of jobs in particular or general fields as well as higher pay indicated in 40% of responses, but few graduates explicitly mentioned lower taxes.

Helliwell, John F. 1999. "Checking the Brain Drain: Evidence and Implications." *Policy Options*, (September), pp. 6-17. Also posted at www.irpp.org

This paper attempts to quantify recent migratory flows of those with higher education from Canada to the U.S. comparing these with historical data including migration from other countries to the U.S. and migration to Canada from other countries. Canada to U.S. flows are estimated from the U.S. Census and Population Survey. The paper challenges recent methodology, calculations and conclusions of the 1988 DeVoretz and Laryea study. It also points to problems with using FTA/NAFTA data in particular for measuring emigration numbers. Helliwell claims there is not a current brain drain comparing 1960s data with 1990s figures. He suggests the 1957-61 brain drain was more than 3 times as large as estimates for the 1990s. The paper also notes that in simple numbers, while accounting for the value of new immigrants, Canada is experiencing a "brain gain" not a drain while introducing data from a separate study (cited next) of UBC alumni. The paper notes that Canadians are generally a more mobile people than Americans, are more familiar with job opportunities there, and more likely to possess skills in demand accounting for some outflow. However, it suggests internal migration is more likely than international migration for Canadians. The paper's main conclusion is that the 1990s movement of educated Canadians to the U.S. is surprisingly small compared to historical data and there is no evidence of a current crisis or cause for alarm.

Helliwell, John F. Helliwell and David F. Helliwell. In Press 2000. "Tracking UBC Graduates: Trends and Explanations." in Isuma: *The Canadian Journal of Policy Research*, (January), Vol 1 No 1.

This paper argues that evidence from aggregate data show a decline in numbers of Canadians moving to the U.S. relative to past movements beginning in 1920. It corroborates this by analyzing current addresses of recent UBC graduates who are more likely to be living elsewhere in Canada but especially still in British Columbia than the U.S. It shows that the proportion of UBC graduates living in the U.S. has continued to fall during the 1990s for all large bachelors programs and that this evidence is consistent with the 1995 Statistics Canada survey of 1995 graduates. The paper also documents bachelor of nursing graduates as U.S. residents dropping from 9 percent for 1960s graduates to less than 2 percent for 1990s graduates. MDs also show drop from 12 percent in the 1950s to 3 percent for 1990s graduates. PhDs holders from UBC in the

1990s have a larger (15 percent) of U.S. residences than other groups slightly more than the national average. Yet PhD holders from UBC represent fewer than 50 percent Canadian citizens so actual numbers may be deceiving. Overall more UBC graduates still reside in B.C., then the rest of Canada with a small proportion in the U.S. and rest of the world. The paper offers explanations for these numbers including a “gravity model” to explain geographic distribution suggesting that distance is a factor in numbers with some variations. However PhDs were more likely to move further away due to their specialization and where their research interests take them so the effects of distance on migration drops with higher levels. This study matched data from the U.S. Bureau of the Census with UBC data and conceded that it will take the year 2000 U.S. Census to assess whether there has been a resurgence of Canadian university graduates to the U.S.

Iqbal, Mahmood. 1999. “Are We Losing Our Minds?” *Policy Options*, (September), pp. 34-38. Also posted at www.irpp.org

This paper, reiterates much of what the author argued in the Conference Board of Canada study (cited next), restates his case and rebuts his critics. The paper argues that the brain drain is growing in key professions saying that it was no more than 3 percent in the 1980s and is now as high as 11 percent. The author says that data on temporary moves does not contain multiple entries per migrant and there is no measurement error. He also claims that simple economic work indicates a direct relationship between higher tax rates in Canada especially after 1990, differences in professional incomes, and the gap in the unemployment rate between Canada and the U.S., which has also widened after 1990. The author presents data suggesting not much growth in permanent emigrants to the U.S. in various skilled labor categories. However he says in 1997 non-permanent emigrants accounted for 94 percent of outflow compared to 77 percent in 1986. He argues that economic variables usually thought to influence migration have changed and demonstrates these have increased in the 1990s. The author concedes, however, that his econometric results can only be suggestive but not definitive and his interpretation marked with caution due to data limitations and other explanatory variables not accounted for.

Iqbal, Mahmood. 1999. “Are We Losing Our Minds? Trends, Determinants and the Role of Taxation in Brain Drain to the United States”. (July). Ottawa, Conference Board of Canada.

This study argues that a Canadian brain drain to the U.S. is real and rising at an increasing rate. It shows that since the Free Trade Agreement (FTA) came into effect in 1989 and the North American Free Trade Agreement (NAFTA) of 1994 structural changes in Canada-US economic relations have resulted in a six-fold increase net in non-permanent work visas for Canadians from 17,000 to 98,000 per year. The FTA meant more movement of physicians and nurses and NAFTA a sharp increase in all categories. It suggests the drain is evident in key professions such as 2.7 percent of natural scientists migrating in 1986 with 10.6 per cent in 1996. The study reports surveys indicating higher salary paid in U.S. dollars, more growth opportunities, exposure to leading edge technology, lower taxes, better management and even warmer climate are all reasons for emigration to the U.S., but that such surveys have limitations. The study presents quantitative national data on economic factors that suggests causes for a brain

drain including: a difference in earnings showing Canada has lagged in earnings growth with a widened gap since 1990; a difference in unemployment rate also after 1990; and the “tax wedge,” or difference in the level of tax burden, higher in Canada in the last 30 years with a gap widened over time. The study stresses lower taxes “especially” have a significant impact on the emigration of highly skilled Canadians. It suggests that emigrating Canadians might also “owe” something to the society they are leaving.

Johnson, Jean M. 1998. “Statistical Profiles of Foreign Doctoral Recipients in Science and Engineering: Plans to Stay in the United States.” An SRS Special Report from Division of Science Resources Studies, Directorate for Social, Behavioral and Economic Sciences (November). Arlington, National Science Foundation. The Report is also posted at www.nsf.gov/sbe/srs/stats/htm

This report prepared for the U.S. National Science Foundation (NSF) is a compilation of detailed statistic data providing a basis for a NSF “Issue Brief”. The report provides detailed statistical profiles of students from several major countries (Canada among them) who were doctoral recipients in science and engineering at U.S. universities. It also provides survey information describing their initial intent in locating to the United States after graduation. The report suggests that the “number of foreign doctoral recipients with firm plans to stay in the United States is a good indicator of those who actually stay.” The notion of a “firm plan” means that a student has “accepted a definite offer of a post-doctoral appointment or employment.” The study argues that in the last decade, the number of students from Europe, Asia and North American earning Science and Engineering (S&E) doctoral degrees in the U.S. has been increasing faster than the overall S&E doctoral degrees awarded by U.S. institutions. In real numbers earned degrees increased from 2,400 in 1985 to over 8,000 in 1996 indicating an average annual growth rate of 11.6 percent. In terms of regional breakdowns the study notes that, within North America, Canada has sent far more S&E doctoral students than Mexico, is higher than Europe, but smaller than for Asia. Some 1993 (43 %) of 4156 Canadian doctoral recipients (2,387 of these were S&E graduates) reported firm offers for further U.S. work or study. Specific numbers were differentiated among various professions.

Johnson, Jean M. and Mark C. Rogers. 1998. “International Mobility of Scientists and Engineers to the United States – Brain Drain or Brain Circulation?” Division of Science Resources Studies Issue Brief (Revised November 10th), Arlington, National Science Foundation. This summary is posted at www.nsf.gov/sbe/srs/issuebrf/sib98316.htm

This “Issue Brief” by the U.S. National Science Foundation questions whether the mobility of foreign scientists and engineers to the United States constitutes a one-way “brain drain” depriving origin countries of their “best and brightest.” Or “brain circulation” when many of those scientists actually return to their home countries better for the experience, some taking advantage of higher level opportunities at home as a result. The study suggests that a large foreign component of U.S. human intellectual capital is linked to American higher education institutions’ ability to attract, support and retain foreign S&E graduate students. Financially supported activities, particularly research assistantships, appear to be a major factor attracting foreign students and these have grown in S&E departments as the number of students has. Subsequently about 22

percent of foreign S&E doctoral recipients stay in the U.S. for postdoctoral work and 17 percent accept permanent employment with differential returns depending on countries. The study reports on a statistical data collected by the National Science Foundation concluding that for some countries (like China and India) the net effect is brain drain to the U.S. but for others (Taiwan and South Korea) “brain circulation” is a more appropriate descriptor. The study suggests, however, that more research is needed on the activities of foreign doctoral recipients who have returned to their home countries. It also suggests examining patterns of circulation, lengths of stay that are beneficial to the U.S. or origin countries as well as world diffusion of S&E knowledge.

O’Neill, Tim. 1999. “Trends in Canada-US Migration: Where’s The Flood?” Economic Analysis (March 24th) a special report of the Bank of Montreal, Economics Department.

This paper challenges recent studies that have suggested Canada is suffering from a brain drain. It argues that the inflow of international immigrants destined to Canada’s labor force “overwhelms the outflow of Canadian emigrants to the U.S. labor force by a wide margin.” It examines the issue in a post World War II context focusing on both non-economic and economic explanatory factors. The paper also criticizes some researchers use of data on Canadian temporary workers suggesting border data gathered by the U.S. Immigration and Naturalization Service (INS) does not control for multiple crossings. The paper’s key findings indicate that: net emigration from Canada to the U.S. has displayed a modest upward trend since the early 1980s but are 1/3 of numbers recorded in the 1950s and early 1960s; non-economic factors such as the Viet Nam war and U.S. immigration ceilings from Western Hemisphere countries meant a sharp decline after 1965; FTA/NAFTA labor mobility provisions after 1988 meant a sharp increase in working visas for Canadians partly due to greater income and employment opportunities in the U.S.; increased Canadian movement to the U.S. suggests that Canada is becoming less economically attractive but that the outflow falls well short of historical levels and does not warrant hysteria generated in some quarters.

Ryten, Evan, Dianne Thurber, and Lynda Buske. 1998. “The Class of 1989 and Physician Supply in Canada.” *Canadian Medical Association Journal*, Vol. 158, No. 6 (March 24th), pp. 723-728.

This paper reports the findings of a 7 year longitudinal study of 1722 people awarded a Canadian MD degree in 1989 examining their migration and specialty choices after graduation to assess their contribution to the physician work force of Canada. It traces the current location, post MD training history and professional activity of the graduates using data from several medical professional and education associations in Canada and the U.S. Findings indicate that 67.5 percent of graduates residing in Canada when entering medical school still resided in the same province but inter-provincial migration was a factor. Except for Ontario, British Columbia and the Territories all other provinces experienced a net loss. Overall results indicated that the 1989 cohort diminished by 16 percent mainly due to loss through migration to other countries with 193 (11.2 percent) outside Canada in 1995-1996. The paper argues that this “yield” from the 1989 cohort does not meet demand created by Canadian population growth or retiring and emigrating physicians. It also suggests as outputs from Canadian medical schools drop further a gap

between requirements and supply will drop further. The study highlights inter-provincial mobility and emigration as the most intractable of problems for the future physician workforce as well as underproduction of specialists compared to general practitioners.

Statistics Canada. 1998. “Brain Drain or Brain Gain? What do the Data Say?” Copy of a PowerPoint presentation. Ottawa, Statistics Canada. (October 1st).

This presentation suggests there is little statistical evidence supporting large scale exodus of knowledge workers from Canada to the United States but acknowledges that available data are several years old and problems might not have been detected. The presentation argues that Canada does lose a small number of skilled workers in key occupations, mainly the health sector, to the United States, but the numbers involved are small in a historical sense. For the 1990-1996 period annual outflow of Canadian university graduates to the U.S. was 8512, whereas 4 times as many (32,829) university graduates came from other countries indicating a positive balance (24,317) in favor of Canada. The presentation argues Canada that more immigrant university degree holders imply our net gain “in this brain trade.” Moreover the presentation notes that the percentage of immigrants with higher degrees is greater than that of the Canadian population. PhD or Masters holding immigrants are 8.0 percent compared to 2.6 percent of Canadians, 9.2 percent had Masters, medical or doctoral degrees compared to 3.1 percent of Canadians and 29.9 held bachelors or higher compared to 17.0 percent for Canadians. The presentation suggests that despite recent increases in outflow of Canadians to the U.S. there has been a significant decline in absolute numbers in the post war period. Canada does experience a net population loss to the U.S., but it is overwhelmed by immigration into Canada from the rest of the world.

Stewart-Patterson, David. J. 1999. “The Drain Will Be a Torrent if we don’t Staunch it Now.” *Policy Options*, (September), pp. 30-33. Also posted at www.irpp.org

This paper acknowledges that immigration and census data may not show a big brain drain – “yet.” But that substantial numbers of Canadian CEOs say it has already affected the way they do business and many worry the problem will increase in the coming decade. The paper reports on one consulting company describing a global “war for talent” with the battle over quality rather than quantity. The brain drain, the paper notes is too passive a word for the phenomenon with the higher income and lower tax paying U.S. acting like a high power vacuum cleaner sucking in the talent that is fuelling its growth. The paper reports on a recent survey of 150 Canadian member CEOs of the Business Council on National Issues (BCNI) confirming concerns. The survey reported that 94 percent of companies lost some employees due to offers from abroad with 15 percent occurring frequently or constantly, and that the brain drain is inhibiting their ability to maintain and expand critical operations in Canada. In response to such concerns BCNI launched “Canada Global Leadership Initiative” in April 1999 to make Canada the best country in the world to live, work, invest and grow. The author argues that even Statistics Canada tax data show that the people in the top income brackets are more likely to move to the U.S. than people in lower tax brackets suggesting policy makers must address the issue and soon.

UBC Alumni Association. “*Brain Drain Questionnaire and Responses.*” posted at UBC alumni web site: www.alumni.ubc.ca

This is not a methodologically controlled survey with statistically significant data leading to a formal study or report sufficiently interpreting the findings. Rather it speaks for itself in the form of raw and non-statistically gathered data listing quotes/responses from UBC alumni responding to questions posted on the UBC alumni web site. The questionnaire begins by asking “are you part of the brain drain” and “have you left Canada for work elsewhere” and why? It asks about present occupation, reasons for leaving Canada, qualities about the new location liked best and least, what is missed about Canada, what would entice a move back and how the brain drain issue should be best addressed. The feedback or posted comments are anecdotally rich, many emotionally charged and suggestive of a brain drain reality exemplified by individual cases. This is understandable since the data are skewed recording responses from only those people who have moved from Canada. To date (12/7/99) the survey has posted 233 responses from 178 alumni who say they first sought work in Canada. Among those 139 moved due to no job opportunities in Canada, 58 people mentioned low pay as a reason, while 48 mentioned high taxes as a factor. Responses about what would entice them back were 99 saying jobs with better pay and security, 56 noting lower taxes and 55 saying more job opportunities among other factors. The UBC Alumni Association posted the questionnaire on their Web Site in April 1998, continues to collect responses and update its Web comment postings periodically.

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