**INTERNATIONAL MIGRATION OF HIGHLY SKILLED WORKERS:
METHODOLOGICAL AND PUBLIC POLICY ISSUES**

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Many European countries, Australia, Canada, the United States, Japan and South Korea, have been actively promoting or at least seriously considering an increase in foreign labor flows, whether to meet the demands of their economies, offset a negative labor market impact of an aging population, stimulate R&D or promote entrepreneurship and expansion of foreign markets. In the last decade or so, there was a proliferation of new schemes and policy measures directed to recruit and ease the entry of skilled immigrants on both a temporary and/or permanent basis (Mclaughlan and Salt 2002). Some well-known examples are an H1-B visa program in the United States, a 'Green Card' scheme for Information Technology (IT) workers in Germany, a point system for permanent independent immigration in Australia and Canada, introduction of the Highly Skilled Migrant Programme in the United Kingdom (based on a point system) and a fast-track work authorization in Ireland. Countries like India, China, Taiwan, Ireland, Germany, and Sweden among others adopt policies to stimulate return migration of their emigrants by creating business and investment opportunities, giving an option of dual citizenship, and providing tax incentives (Mclaughlan and Salt 2002; OECD 2002; O'Neil 2003). But who are those highly skilled workers whose skills and qualifications are in such a great demand in the US, Canada, Australia, and EU countries?

In this paper we address two issues. First, we will discuss problems with definition and empirical identification of skilled workforce by examining different ways used in international research literature and immigration policies to operationalize 'highly skilled.' And second, by employing the U.S. Census 2000 data, we will describe the skilled immigrant labor force in terms of their demographic and socio-economic characteristics. We will use native-born professionals as a comparison group to demonstrate nativity differences in human capital characteristics, geographical and occupational distribution as well as labor market outcomes such as earnings and labor force participation. In conclusion, we address implications of international migration of the highly skilled for education, science, and labor policies.

[Here I am including just the first of our sections, which will be expanded further and tied with the remaining portion of the paper. Jeanne B.]

Defining Highly Skilled

Although the phrase "the best and the brightest" in relation to highly skilled immigrants became a mantra in public and policy discourses in recent years, a review of the U.S. and international academic and policy literature indicates that there is no consistent definition or measurement of highly skilled. The reasons for this gap in literature largely fall into two groups: data-related and conceptual.

Data issues

Questions about the definition, size, and impacts of skilled and professional migration have been unanswered partly due to the absence of appropriate data. The most readily available data sources are population censuses and labor force surveys (e.g. Current Population Survey in the United States). Although these sources have large sample sizes and are conducted using standard international classification, they are cross-sectional and even when survey years are pulled together they offer a snapshot of social and economic experiences of different cohorts of people rather than presenting a dynamic picture (for the review of cross-sectional data see Lowell, 2004). In addition, they often lack crucial information about immigrants such as their legal statuses, degree of return migration, place where immigrants obtained their education to name a few (Jasso et al. 2000; Rumbaut 2004). These are important considerations from the policy point of view. For instance, one of the hotly debated issues in the United States concerns the economic success of family- vs. employment-based immigrants. Borjas (1990, 1991) argues that the Immigration Act of 1965 with its greater emphasis on family reunification rather than on employment-based immigration resulted in a high inflow of low-skilled and poorly educated migrants. Consequently, it undermined the international competitiveness of the United States and imposed higher costs on the welfare system. He along with some politicians suggests a change in immigration policy to increase the number of people of 'higher immigrant quality.' However, a number of studies question the assumption that professional immigrants are drastically different and superior to their family-based counterparts in terms of their economic adaptation and impacts (Lowell 1996; Sorensen et al. 1992). To the contrary, they indicate that overtime the two groups of immigrants converge towards similar levels of social and economic incorporation. Obviously, these two streams of research make policy suggestions that are virtually the polar opposite of each other. The difficulty with such assessments lies in lack of <u>longitudinal</u> (national and cross-national) data that would incorporate admission statuses and economic and social characteristics and outcomes.

There have been done a number of special surveys undertaken in some OECD countries with a focus on skilled workers but such efforts are not harmonized across countries or done over time (OECD 2002). Since highly skilled workers are a crucial component of today's economy and skill-based migration becomes more prominent in the global migration, there is a definite need for better national and international coordination of data collection and analysis.

Conceptual issues

Another set of problems in studying skilled workforce and skilled migration has methodological and conceptual roots. Recognition of qualifications of skilled workers across varies countries, which makes comparative research using international migration statistics difficult. Different policy and philosophical approaches on managing migration make it unclear "who" the highly skilled are in various contexts. (Mclaughlan and Salt 2002; OECD 2002; Solimano and Pollack 2004). Moreover, definitions vary overtime reflecting the changes in economic and labor market structures of national and global economies. The term 'skilled workers,' which is used often interchangeably with 'professional' and 'highly skilled' workers does not have the same meaning in different contexts. For instance, Penn (XXX) in his theoretical analysis of skilled workers in

contemporary Britain and America, refers to labor aristocracy as skilled workers as a way to differentiate them from manual working class.

The most obvious starting place is to define highly skilled either by level of education (Borjas 2003) or occupation (Bouvier and Simcox 1994; Cornelius, Thomas J. Espenshade and Salehyan 2001). Some observers favor one definition over the other and which definition is applied often depends on what one is trying to accomplish and what data are available for the analysis. The most fundamental definition of highly skilled tends to be restricted to persons with a "tertiary" education, typically meaning adult ages persons who have completed a formal two-year college degree or more[1]. Of course, this is also the most readily available international statistic and so, by default, the most widely studied measure of high skilled mobility. When possible it is preferable to have additional information about initial (baccalaureate) degree holding and graduate or professional degrees. In fact, the National Science Foundation of the United States, which has some of the most complete international data on the stock of scientists and engineers, tends to focus on data for doctoral degree holders. The potential problem with this definition has to do with the fact that some immigrants could have completed a college education abroad but because of non-transferability of their credentials or some other reasons work in less skilled occupations. A so-called 'brain waste' occurs when the skills of immigrants are mismatched, with the result that "a doctor drives a taxi instead of practicing medicine" (Migration News). Again, data about the place where a person received his/her education as well as major field of study would have been an important piece of information for the analysis of labor market incorporation of immigrants.[2]

Other students of international mobility of professionals rely on occupational characteristics. For example, Liu (Liu 1992) used Professional, Technical, and Kindred (PTK) Immigrants data from the INS public-use tapes and included health professionals (physicians, other health diagnosing occupations, registered nurses, other health treaters, and health technicians) and high-tech personnel (math, computer, and natural scientists, engineers, and other technicians). However, using only occupation does not guarantee that one will actually capture all people with college education. For example, Bouvier and Martin (1994) found that 31 percent of native-born engineers and 38.7 percent of mathematicians and computer scientists did not have a college degree in 1990, the corresponding numbers for foreign-born engineers and computer scientists are 14.5 and 23 percent.

One example to streamline the definition of highly skilled workers across various national contexts is the Canberra Manuel definition of Human Resources in Science and Technology (HRST). This measure, collaboratively constructed by the OECD and European Commission/Eurostat, is based on two dimensions: qualification (tertiary level

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[1] For the purposes of capturing completed education adult usually means ages 25 and older. Naturally, this is young if graduate degree holders are of interest. However, statistics are sometimes only available for persons ages 15 and older.

[2] For example, the analysis of correspondence of educational training and employment patterns of foreign engineers in Canada conducted by Boyd using 1996 Canadian Census data shows that recently arriving immigrants with engineering training experience a strong mismatch between their education and occupational and earning opportunities (Boyd, Monica. 2000. "Match or Mismatch? The Labor Market Performances of Foreign-Born Engineers." *Population Research & Policy Review*)

or better education) and occupation (training/employment in a science and technology occupations) (Auriol and Sexton 2002; OECD 1995).[3] According to the manual, HRST are individuals who satisfy *one or other* of the two requirements:

> 1. successfully completed education at the third level in an Science & Technology (S&T) field of study;
> 2. not formally qualified as above, but [currently] employed in a S&T occupation where the above qualifications are normally required.

Although one of the most detailed definitional guidelines for comparative international statistics, the Canberra Manual definition has its limitations. If relevance to policy is important, one needs to emphasize that governments typically define "highly" skilled immigrants, not in terms of either or, but in terms of both education and occupation (Mclaughlan and Salt 2002). For example, the United States' well-known specialty worker H-1B visa program is based on a list of occupations and a minimum degree requirement of a baccalaureate (Lowell 2001).[4] In fact, the definition of highly skilled requires an educational component and a threshold defining minimum competence in a knowledge society. Occupation is important not only because by its nature it "excludes" workers with little education, but also because it targets skills that are desired. The S&T occupations in the Canberra definitions can be seen as uniquely embodying technical skills that are crucial for R&D and the engineering of knowledge economies.

In addition, restricting the meaning of highly skilled to S&T occupations makes the Canberra Manual too narrow as it disregards other highly skilled categories that are in high demand such as businessmen, managers, teachers, and healthcare providers. Of course, one can go beyond narrowly defined immigration policy interests and add writers and artists to a list "creative class" workers (Florida and Tinagli 2004). The current discussion of how alternative definitions tap into different dimensions of highly skilled work raises an interesting point about what is important in today's knowledge-based society – education, skills, or creativity?

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[3] The S&T definition can be as narrow (including only natural sciences) or broad (engineering and technology, natural and social sciences as well as medical sciences and humanities) as the interested users need it.

[4] There are educational exemptions in the H-1B visa as in the case of models of whom rather few are actually admitted as H-1Bs. Other U.S. visas like the O are reserved for individuals who have established themselves as recognized artists and performers.