The quality of immigrant source country educational outcomes: Do they matter in the receiving country? ☆

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HIGHLIGHTS

- Immigrant source country education quality affects receiving country return to education.
- Higher receiving country return to education associated with higher source country test scores.
- No effect for young immigrants educated in receiving country.
- Inclusion of source country GDP does not alter result.
- Quality matters both within and across education credential categories.

ARTICLE INFO

ABSTRACT

International test scores are used to proxy the quality of source country educational outcomes and explain differences in the rate of return to schooling among immigrants in Canada. The average quality of educational outcomes in an immigrant's source country and the rate of return to schooling in the host country labor market are found to have a strong and positive association. However, in contrast to those who completed their education pre-immigration, immigrants who arrived at a young age are not influenced by this educational quality measure. Also, the results are not much affected when the source country's GDP per capita and other nation-level characteristics are used as control variables. Together, these observations reinforce the argument that the quality of educational outcomes has explanatory power for labor market outcomes. The effects are strongest for males and for females without children.

1. Introduction

It is increasingly recognized that it is beneficial for economic analyses to differentiate between the quantity of education attained (e.g., years of school or highest degree) and the quality of educational achievement (e.g., test score derived measures of cognitive ability).[1] Understanding the relationships between immigrants' formal schooling and source country-level average cognitive skills, as proxied by an index derived from multiple sets of international standardized tests, on the one hand, and labor market outcomes in the receiving country on the other, is relevant to a variety of topics. One issue involves the labor market integration of immigrants in destination country labor markets (Borjas and Friedberg, 2009; Borjas, 1995; Aydemir and Skuterud, 2005; Dustmann et al., 2005; Ferrer and Riddell, 2008). Inasmuch as the quality, or relative quality, of pre-immigration educational outcomes varies across source countries this may affect the labor market integration of immigrants and have implications for receiving

[1] Although we view test scores as reflecting the quality of general cognitive educational outcomes, it is important to note that they derive from a variety of inputs including the formal education system, but also including, for example, family inputs, nutrition, and cultural norms affecting student learning effort. That is, there are many inputs to the education production function.

countries' immigrant selection and settlement policies. This is a long-standing issue; Chiswick (1978) observed a gap in rates of return to education and hypothesized that educational quality might be at issue. More recently Chiswick and Miller (2010) explore source country school quality using American data. Immigration points systems such as those in Canada and Australia, and those being considered in other countries including the US, assume (either implicitly or explicitly) that a year of education is of the same "quality" regardless of where it is obtained. However, in complementary work to that here, Ferrer et al. (2006) use individual-level test scores to explore immigrant labor market outcomes and find that these scores explain the entire immigrant-domestic born gap in the rate of return to education.

Second, research on endogenous growth by, for example, Hanushek and Kimko (2000), Barro (2001), Erosa et al. (2010), and Barro and Lee (2012) suggest that the quality of educational outcomes as proxied by, for example, national-level average test scores, has very substantial impacts on national productivity and economic growth in contrast to measures of educational attainment or inputs — see Hanushek and Woessmann (2008) for a review. In a sub-section of their work exploring causality, using US data Hanushek and Kimko undertake an exercise similar in some aspects to that conducted here and they have broadly similar findings. Manuelli and Seshadri (2010) suggest the quality of human capital varies systematically with the level of development and find that effective human capital per worker varies substantially across countries. In accounting for differences in output per worker across countries, Schoellman (2012) demonstrates that "education quality" is roughly as important as quantity. Hanushek and Woessmann (2012) further explore this association by tracking the cognitive skill distribution within countries and over time. This paper builds on Hanushek and Kimko's index of the quality of national-level educational outcomes. Since their index is found to have predictive power in a context other than that for which it was produced, this increases the credibility of the index and their approach.

A third related area of research focuses on the importance of educational outcomes, in contrast to school system resource inputs, for labor market productivity. One reading of the literature suggests that increased inputs are sometimes associated with improved labor market outcomes, especially when the initial level of inputs is low and/or the variation in inputs is large, but that in many situations the link between resource inputs and both cognitive outcomes (i.e., test scores) and labor market outcomes is tenuous (Hanushek, 1996; Betts, 1996). Card and Krueger (1992), and Heckman et al. (1996a, 1996b), use data from the US for the American born to look at the impact of educational inputs on labor market outcomes where identification comes from individuals who migrate across states. They find some evidence that inputs matter, but observe that the connection is weak. In a related vein, Bratsberg and Terrell (2002) find that source country educational inputs impact the return to education observed for immigrants to the US.

It is clear that individual-level measures of educational achievement (i.e., test scores) have very substantial (conditional) correlations with labor market success. For example, Green and Riddell (2003) study individual-level IALS scores in relation to earnings and find a sizeable effect with these simple test scores accounting for a substantial fraction of the return to education. However, the origin of the correlation is less than clear. Plausibly, individual unobserved ability contaminates both measures' relationship with labor market success. In this paper, by using immigrants' source country average levels of educational outcomes we avoid individual-level cognitive ability capturing the effects of unobserved individual-specific variables with which they may be correlated. This is also closer to the policy question that may be posed by a government considering investing in improved educational quality. That is, is there a relationship between the nations' average level of test scores (i.e., cognitive skills), and labor market outcomes?

Exploring differences in the return to education of immigrants to Canada as a function of the average quality of educational outcomes in each immigrant's source country is the objective of the present study.

Overall, we find that differences in the source country average quality of pre-immigration educational outcomes have substantial impacts on the Canadian labor market earnings of immigrants. The observed impact flows through the return to education, with those from source countries with higher test scores having much higher returns to education, so that the gap widens as years of schooling increases. Adding country-level controls, especially source country GDP per capita, does not appreciably alter the relationship so it is not a wealthy-country effect. Further, the return to education observed for those immigrants who arrive before age 10 is not a function of their source country quality of educational outcome. This reinforces the idea that it is the quality of educational outcomes, and not source country effects per se, that is correlated with the return to education. Notably, the findings for the sample of all women differs somewhat from that for men, especially conditional on source country characteristics. However, in line with the literature on immigrant gender roles, when the sample is restricted to women who are unmarried or without children living in the household, the results are quite similar to those for men.

The remainder of this paper is structured as follows. Section 2 discusses the data and provides an initial descriptive analysis. Section 3 presents a random coefficient approach, including a test for the form of heteroscedasticity in the second stage and a feasible Generalized Least Squares strategy. Estimates from the core regression analysis are discussed in Section 4, as are those from sub-group analysis that helps in confirming and describing the phenomenon under study. Section 5 discusses the findings, draws conclusions and suggests options for future work.

2. Data and descriptive statistics

To undertake this analysis Canadian census data are combined with an index of the quality of source country educational outcomes derived from country-level scores from international standardized tests and related information. Hanushek and Kimko (2000) derived the index to allow international comparisons of economic growth. Their measure of the quality of educational outcomes is for 87 countries, but there are only sufficient numbers of immigrants in the Canadian census data to look at 81 of these for males, and 79 for females, with further reductions in some analyses using subsets of the sample. Further, since GDP per capita is not available for three of the countries the number in the regression analysis is reduced to 78 for males and 76 for females.

A merged sample of immigrants from the 1986, 1991, 1996 and 2001 Canadian census 20% files is employed. Combining the four increases the sample size sufficiently to allow more countries to be included in the analysis than would otherwise be possible. (A sensitivity test is conducted to see how robust the results are to the aggregation.) Census 2006 is excluded because the questions pertaining to education changed so substantially that the measurement of schooling is not comparable to that in previous censuses. The selection rules employed for the sample for analysis are that the immigrants must have been born since 1945, be at least 25 years old, and not currently attending school. Those living in the Territories are omitted, as are those with missing relevant variables. Further, immigrants from source countries with fewer than 60 observations are excluded, as are the domestic born. However, in the subgroup analysis we retain all countries with more than 10 observations, which balance several criteria including the desire to retain as large a set of countries as possible. The sample, however, contains the broadest possible set of people in the labor market; thus anyone with positive weeks of work and earnings in the year is included.[2]

Table 1, for males, and Table 2, for females, present descriptive statistics by source country. *Years of school* is measured as the sum of years

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[2] The findings appear to be quite robust across alternative approaches to selecting the sample for analysis. Limited experiments suggest that changing or removing the "born in since 1945" restriction makes little difference. Also, sensitivity tests limiting the sample to those with strong labor force attachment produced remarkably similar results.