Immigrant Employment and Earnings Growth in Canada and the U.S.: Evidence from Longitudinal data

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Abstract

Canada and the United States are two of the largest immigrant destinations in the world. For decades, the two countries have received large inflows of immigrants from many common sending nations while pursuing markedly different policies regarding the admission and integration of immigrants. The two North American neighbors also have structural and institutional differences in their labor markets and welfare systems. Previous research suggests that such differences have resulted in different levels of immigrant selection with respect to observed and unobserved skills. Yet, little is known about relative economic welfare of immigrants in these two countries, and no research has examined this question using longitudinal data that take into account the differential selection of immigrants. This paper uses nationally representative longitudinal data to study the employment and earning growth of immigrants from the same sending countries at the two destinations. The use of longitudinal data enables us to control for some of the selection upon entry and selective return migration.

Introduction

Over the past two decades, the populations of immigrants in Canada and the United States have more than doubled. While researchers have studied the economic assimilation of immigrants within each country, there is relatively little comparative research and none investigating the labor market experience in the post-1990 period. The existing comparative research of immigrant economic assimilation is based on cross-sectional data, which, as previous studies document, yield biased trajectories of employment and earnings on account of selection in immigration as well as return migration.[1] These biases are likely to compound in comparative research if, as documented in a number of recent studies, relative selection differs across the two destinations (Bonikowska et al. 2011, Kaushal and Lu 2013).

We study the employment and earnings trajectories of immigrants to the U.S. and Canada, within a comparative framework, using longitudinal data that cover the most recent period of immigration. The post-1990 immigration is important not just for the sheer size but also for the changing composition (characteristics) on account of significant changes in immigration policies of the two North American neighbors. Since the mid-1990s, Canada modified its point system to attach greater emphasis on the educational attainment and English/French proficiency of immigrants, and less significance to prevailing economic conditions and occupational demand (Beach, Green, and Worswick, 2006). Further, the past policy of linking immigration levels to the economy's absorptive capacity over the business cycle has been relinquished in favor of higher immigration irrespective of prevailing economic conditions.

Starting in 1990, the U.S. doubled the annual quota of employment based permanent immigration, and created as well as expanded several categories of visas for short term

[1] See: Duleep and Dowhan (2002), Hu (2000), Lubotsky (2007), Kaushal (2011)

temporary migration for employment or higher education. Consequently, in recent years, the inflow of foreign-born persons via non-immigrant visas has exceeded the inflow via immigration channels (USDHS, 2012).[2] Many short term residents subsequently adjust their status to permanent residents and further influence long term immigration via family reunification. Thus, in recent years, a growing proportion of foreign-born individuals who have obtained permanent residency in the U.S. have been temporary migrants already in the country (USDHS, 2012).

Partly on account of these changes in immigration and temporary migration policies, since 1990, selection patterns of immigrants to Canada and the U.S. have changed significantly. Kaushal and Lu (2013) document a relatively positive selection of immigrants to Canada (compared to the US) in terms of educational attainment and host country language proficiency, the two attributes that have gained greater significance in the Canadian points system. In the meantime, immigrants to Canada have experienced a relatively negative selection in terms initial earnings after arrival, an attribute that captures unobserved skills of immigrants but cannot be measured at entry and remains outside the domain of the points system. Bonikowska et al. (2011) find a growing wage disadvantage between university-educated recent immigrants and natives in Canada, but no specific trend for the two groups in the U.S.[3]

Given these differential selection patterns, an important issue with considerable policy implications is: How have immigrants to Canada and the U.S. performed over time? Do they exhibit different patterns of economic assimilation after adjusting for characteristics at arrival? Do these patterns differ by immigrants' region of origin? These questions have important

[2] Since 1990, every year close to 400,000 new immigrants are undocumented, overstaying their visa limits or entering without legal documentation, most often crossing the southern border.

[3] Researchers attribute the decline in entry earnings of successive immigrant cohorts in Canada to compositional shifts in language ability and region of birth, deterioration in returns to foreign labor market experience, and non-random sorting of immigrants across establishments in Canada's major cities and geographic regions (Aydemir and Skuterud 2005,2008; Green and Worswick 2009).

implications for future immigration in both countries and can provide lessons to guide immigration policy. To answer these questions, in this paper, we study the years-since-immigration trajectories of employment, hours worked, and real wage of immigrants in Canada and the U.S., applying person fixed effects models that allow us to control for time-invariant individual characteristics including unobserved entry-level attributes of immigrants..

Previous research

Research on the labor market assimilation of immigrants has evolved from earlier studies based on a single cross-section of data to studies of repeated cross-sections of censuses, and in more recent years, to studies using longitudinal data.[4] In both Canada and the U.S., these studies document that immigrants suffer from an initial earning disadvantage but tend to close this gap over time. Estimates of earnings growth, however, differ substantially between cross-sectional and longitudinal studies with the former generating substantially higher estimates than the latter (Borjas 1989; Duleep and Dowhan 2002; Hu 2000; Lubotsky 2007; Kaushal 2011).

There is limited but growing comparative research on immigrant labor market outcomes. Kogan (1996), van Tubergen and Kalmijn (2005) and van Tubergen (2006) compare self-employment status and destination language proficiency of immigrants across Europe. Foner (2005) compares West Indian immigrants in New York and London. Model, Fisher, and Sliberman (1999) study employment, occupational status and earnings of Caribbean-born immigrants at four destinations: US, UK, Canada, and France. The data they apply, however, do not provide information on education and years-since-immigration, making it difficult to draw

[4] See Chiswick (1978) and Borjas (1985, 1994) for cross-sectional research on US immigrants, and see Baker and Benjamin (1994), Bloom et al. (1995), Frenette and Morissette (2005), Warman (2007), Warman and Worswick, 2004 for comparable research on Canadian immigrants. For longitudinal studies of immigrant earnings assimilation, see Borjas (1989), Duleep and Dowhan (2002), Hall and Farkas (2008), Hu (2000), Lubotsky (2007), and Kaushal (2011) for the US and Banerjee (2009), Beenstock (2006), Li (2003) for Canada.

inferences about the relative economic assimilation of Caribbean immigrants at these destinations.

There is only one published paper of our knowledge that has studied the relative labor market assimilation of immigrants in Canada and the U.S. Using census data, Antecol, Kuhn, and Trejo (2006) studied employment and earnings assimilation of immigrants in Australia, Canada and the U.S. during the 1980s. They find that earnings assimilation is higher in the U.S. than in Canada or Australia, and while immigrants in Australia experience the highest levels of employment assimilation, immigrants in the US have higher levels of employment growth than immigrants in Canada. These findings hold in additional analysis conducted separately for immigrants from Europe and Asia that leads the authors to rule out the possibility that their results were due to a larger share of Latin American immigrants in the U.S. From the assimilation patterns across these three major immigrant destinations, the authors conclude that host-country labor market institutions (such as high levels of unemployment insurance and unionization in Australia and Canada compared to the U.S.) affect immigrant assimilation.

Anteol et al. (2006) is based on the 1980 and 1990 cross-sectional data, and arguably, their findings would be affected by selective immigration and return migration. In a study of immigrant earnings growth in the U.S., Lubotsky (2007) compared cross-sectional and longitudinal studies in the U.S. and found that estimates of earnings assimilation (growth in the earnings of immigrants relative to the US-born) from longitudinal data were about half as large as estimates from repeated cross-sectional data. Comparative studies using cross-sectional data would yield biased results if immigration and return migration are selective and the selection pattern is different for immigrants in Canada and the US. A comparative study with longitudinal data can address selective immigration by controlling for time-invariant factors such as entry

level characteristics. Estimates based on longitudinal data are also likely to be affected by return migration and sample attrition. However, unlike cross-sectional analyses, longitudinal studies provide unbiased estimates of earnings growth for the immigrant population that is observed throughout the period of study (i.e. in all waves of the longitudinal data). To some extent, longitudinal data also support sensitivity analyses for evaluating the presence of selective attrition.

Data and Measures

We use the Canadian Survey of Labour and Income Dynamics (SLID) Panels 2-5 for 1996 to 2008 and the US Survey of Income and Program Participation (SIPP) Panels in 1996, 2001 and 2004, covering roughly the same period. Both datasets are nationally representative and longitudinal. Their sampling framework is somewhat different. Each SLID panel spans six years, with respondents completing annual interviews. A new panel is introduced every three years such that at any point in time SLID contains two panels. SIPP panels, on the other hand, last 3 to 4 years (36 to 48 months).[5] Respondents are interviewed every four months about their employment and earnings data of previous four months. To improve comparability of these two datasets, we conduct analysis by restricting the Canadian samples to the first four years of each panel and all outcomes are measured annually.[6]

The samples are restricted to individuals aged 25 to 59 years in the first year of the survey who arrived in the host country at age of 16 or above.[7] Individuals currently enrolled in school are excluded from the analysis.[8] We also exclude a small proportion of American

[5] The 1996 and 2004 Panels span 48 months and the 2001 is 36 months.
[6] We also conducted analysis keeping all six years of data for SLID and the results were not different.
[7] The assimilation experience of immigrants who arrive at a young age may differ from the assimilation experience of immigrants who arrive at older ages. To avoid differences in age at arrival to affect the outcome of our analysis, we restrict the sample to immigrants who entered host country after age 16. We also conducted all analysis including those who at age 16 or before and the results were similar to those reported.
[8] The SLID and the SIPP exclude individuals who are institutionalized or living in military barracks.

immigrants in Canada and Canadian immigrants in the US. While these are important demographic groups, they are not the focus of our study.

We study four outcomes: employment, annual hours worked, hourly wage, and annual earnings last year. Because labor market experience differs by gender, all analysis is done separately for men and women. In both datasets, employment is defined as equal to 1 if a respondent reported non-zero working hours in the past year, otherwise 0. The second outcome, annual total hours worked, is constructed using the total hours of usually scheduled work from all jobs available in SLID. In SIPP, we multiply the usual hours worked in a week and weeks worked in that month. Hours worked in each month are summed to obtain annual hours worked.[9] Observations with more than 4,000 annual hours worked are considered as outliers and hence excluded from the analyses. SLID provides data on annual earnings. For SIPP, we construct the annual total earnings variable by summing the monthly earnings in each year.[10] Observations with annual non-positive (negative or zero) earnings are excluded from the analysis.

In SLID, hourly wage is derived by dividing total annual earnings by the total usual hours worked in all jobs. In SIPP, for wage earners, we use the monthly hourly wage from a particular job and compute the annual average; for others (salary earners or workers who are both wage and salary earners), we calculate the annual average hourly wage using monthly earnings, usual hours worked in a week, and actual weeks worked in that month. When an individual has two hourly paid jobs, we calculated the average hourly wages weighted by hours worked in each job. We exclude observations with hourly wage valued more than 250 or less than 1 dollar. Wage and annual earnings data are expressed in January 1996 currency using Consumer Price Index for each country.

[9] We replace non response months with average monthly hours worked in that year.
[10] We replace non response months with average monthly earnings in that year.

Both SLID and SIPP have data on immigrant's period of arrival, which are used to construct variables on years since immigration. This variable is grouped into four categories: 0-5 years; 6-10 years; 11-20 and >20 years. Both data also provide information on immigrant's country/region of origin. We categorize respondents into four categories: Africa and the Middle East, Asia, Latin America, and Europe, Australia and New Zealand. Both datasets provide detailed data on the educational attainment of respondents. Using these data we recode educational attainment into four categories: less than high school, high school degree, some college or associate degree, and bachelor degree or above. Other demographics included in the regression analyses are: age categories (25-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-64), marital status at the end of each year, whether the respondent has a child, and state/province of residence.

Research Strategy

Our objective is to compare the trajectories of the labor market outcomes of immigrants (relative to natives) at the two destinations using longitudinal data. We begin with a simple model as described in equation (1) estimated on a sample of nonelderly adults, aged 25 to 59 in the first wave of each panel, separately for each country:

$$(1)\quad \begin{aligned} &Y_{ij} = XB + \alpha_0 * IMM_i + \alpha_1 * T_j + \alpha_2 * IMM_i * T_j + \upsilon_i + \varepsilon_{ij} \\ &\upsilon_i \sim N(0,\sigma^2); \varepsilon_{ij} \sim N(0,\eta^2) \end{aligned}$$

where Y_{ij} is one of the four labor market outcomes of individual i in year t (whether employed, annual hours worked, hourly wage, and annual earnings). The vector X denotes individual characteristics, namely age (a set of dummy variables of 5-year age groups), educational attainment (less than high school, high school degree, some college or associate degree, and bachelor degree or above), whether currently married, whether has children, an indicator for the

survey panel, and state/province of residence. The variable IMM is equal to 1 if the respondent is foreign-born, otherwise 0. T_i is a trend variable denoting the number of years since the first interview and goes from 1 to 4. The coefficients of interest are: α_0 that estimates the difference in the labor market outcome (e.g. hourly wage) of immigrants and natives at the at the base of the survey; α_1 that estimates the average annual growth in the labor market outcome for the native born persons and $\alpha_1 + \alpha_2$ estimates the wage growth for the immigrants; α_2 is the coefficient of economic assimilation capturing the difference in annual growth of the outcome between immigrants and natives. Analyses are done separately for men and women because the labor market determinants differ by gender.

To estimate if immigrant economic assimilation differs by their length of residence in the host country, equation (1) is estimated by replacing the variable IMM with four dummy variables indicating the following years since immigration categories: 0-5 years; 6-10 years; 11-20 and >20 years.[11] As in the earlier analysis, native-born population are the comparison category. In these regressions we also control for period of arrival (four variables indicating whether arrived before 1970, arrived during 1970-1979, arrived during 1980-1989, and 1990 or later). Further, to estimate if assimilation differs by immigrants' region of origin, the variable IMM is replaced by four dummy variables indicating the region of origin of the immigrants (Asia, Europe, Africa and the Middle East and Latin America and the Caribbean). Equation (1) is estimated using a random intercept model to adjust for heterogeneity within individuals in any specific year.

Next, we estimate equation (1) with the inclusion of individual fixed effects. The inclusion of person fixed effects is important because unmeasured, person-specific factors may be correlated with immigrant selection, length in the host country, and earnings. For example, if

[11] We do not include linear year since immigration variables because some panels in the two datasets provide only aggregated information.

our analysis shows different levels of selection for US and Canadian immigrants (relative to the native population) over time, simply comparing the earnings growth (or other labor market outcomes) of immigrants' at the two destinations may lead to biased results because it will confound differences in earnings with differences in immigrants' characteristics at arrival.

It is likely that immigrants who are less successful in the host economy may return to their countries of birth. If so, the association between time in the host country and earnings would be positive, all else equal, in an analysis using cross-sectional data, even if earnings did not increase over time. In our comparative analysis such bias may also occur if selectivity in return migration differs for migrants in Canada and the US. This approach yields estimates that describe how the earnings of immigrants change with time in the host country for the sample of immigrants who are present throughout the distribution of years since immigration.

Because Canada has stronger safety nets and systems for integrating immigrants, selective return migration (return of immigrants who do less well in the labor market) may be less in Canada than in the US. The use of longitudinal data and person fixed effects will adjust for those unobserved and observed immigrant characteristics, e.g. characteristics at arrival that have a time invariant influence on earnings. We acknowledge that the longitudinal analysis is also affected by return migration (if people outmigrate between the waves). Because we will estimate the wage trajectories of individuals who are present in all waves of the surveys, our sample will be affected by return migration. However, our longitudinal analysis will not be affected by the mechanical changes in sample composition across years-since-immigration due to return migration that has afflicted most research based on cross-sectional data (Borjas 1994; Lubotsky 2007). To minimize selection bias, we compare the earnings trajectories of immigrants

after adjusting for a rich set of characteristics at arrival, including educational attainment, marital status, and the presence of children.

To test for the presence of selective return migration (selective attrition and the direction of selectivity) in the longitudinal data, we will compare the wages of immigrants who are in all waves of the longitudinal data with those of immigrants who are only in the first two waves. If those in all waves have higher wage or wage growth than those only in the first two waves, this would indicate that sample attrition is negatively selected (Kaushal 2011).

We will also estimate a series of models that sequentially adjust for occupational composition of immigrants and labor market conditions in the US and Canada, as a way of assessing the relative importance of these factors on immigrants' outcomes. Finally, we will conduct analysis with multiple cross-sections of census data (synthetic cohort analysis) and compare those findings with the longitudinal results. This final analysis will shed light on the selectivity of return migration.

Preliminary Results

Table 1 presents preliminary estimates based on equation (1) and Table 2 presents the results from corresponding models with person fixed effects. Both tables are from analyses based on men. Wage growth for the natives is positive in both countries, and is larger in Canada than in the U.S. The immigrant population suffer a wage disadvantage in the base year of the survey, and the immigrant-native wage gap is somewhat larger in the U.S. However, immigrant wage growth relative to the native population is higher in the U.S. than in Canada. Taking into account the lower wage growth in general in the US, the wage growth of immigrants at the two destinations is similar (1.5% in Canada vs. 1.4% in the US).

In both countries, wage disadvantage among foreign-born workers (compared to natives) is more among the recent arrivals. For immigrants who have lived in the US for more than 20 years, the wage gap is statistically insignificant; but immigrants who have lived in Canada for 20+ years, the wage disadvantage continues to be large. Wage assimilation (difference in wage growth between foreign-born and native workers) is higher among recent arrivals When we stratify immigrants by sending region, wage assimilation is positive only for Latin American immigrants in the US.

These results largely hold when we adjust for time-constant unobserved factors using person fixed effects in Table 2.

The next step of our analyses will examine potential explanations for the higher rate of growth for US immigrants.

Table 1. Log Hourly Wages of Immigrants and Natives, Men (Random Intercept Model)

	Canada			United States		
	1	2	3	1	2	3
Time						
Trend	0.015***	0.016***	0.016***	0.002*	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Nativity						
Foreign Born	-0.198***			-0.229***		
	(0.016)			(0.011)		
Foreign Born × Trend	0.001			0.012***		
	(0.005)			(0.003)		
Cohort						
Arrival 0-5 Years		-0.367***			-0.351***	
		(0.037)			(0.024)	
Arrival 6-10 Years		-0.368***			-0.230***	
		(0.038)			(0.025)	
Arrival 11-20 Years		-0.309***			-0.201***	
		(0.045)			(0.035)	
Arrival 20+ Years		-0.168**			-0.058	
		(0.074)			(0.061)	
0-5 Years Since Arrival × Time		0.019*			0.032***	
		(0.011)			(0.007)	
6-10 Years Since Arrival × Time		0.003			0.016**	
		(0.010)			(0.007)	
11-20 Years Since Arrival × Time		-0.000			0.000	
		(0.012)			(0.006)	
20+ Years Since Arrival × Time		-0.005			0.007	
		(0.008)			(0.009)	
Region						
Europe			-0.223***			-0.096***
			(0.033)			(0.029)
Latin America and Caribbean			-0.317***			-0.349***
			(0.051)			(0.018)
Africa and Middle East			-0.412***			-0.295***
			(0.051)			(0.040)
Asia			-0.417***			-0.212***
			(0.030)			(0.023)
Europe × Time			0.000			0.010

			(0.007)			(0.008)
Latin America and Caribbean × Time			0.002			0.019***
			(0.013)			(0.004)
Africa and Middle East × Time			-0.011			0.009
			(0.014)			(0.013)
Asia × Time			0.004			0.002
			(0.007)			(0.006)
Constant	2.340***	2.341***	2.337***	1.750***	1.753***	1.764***
	(0.016)	(0.016)	(0.016)	(0.021)	(0.021)	(0.021)
Age, Education, Marital Status, and # of children controls	o	o	o	o	o	o
N	79585	79585	79565	152136	152136	152136
Foreign Born				17133	17133	17133

Note: *** for p<.01, ** for p<.05, and * for p<.1. The outcome is logged annual average hourly wage, and outliers (<$1 &>$250) are set to missing. Sample includes individuals aged 25-59 in first wave of the panel, not enrolling in school in anytime of the reference year, and responded to two or more years in the Survey of Labour and Income Dynamics for Canada, and the Survey of Income and Program Participation in the United States. Immigrants arriving before the age of 17 and immigrants from the US to Canada and from Canada to the US are excluded from the sample. All models include controls for age, highest level of schooling, marital status, and presence of children in the household.

Table 2. Log Hourly Wages of Immigrants and Natives, Men (Fixed Effects Model)

	Canada					United States				
	1	2	3	4	5	1	2	3	4	5
Time										
Trend	0.022***	0.022***	0.023***	0.023***	0.023***	0.007***	0.007***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Nativity										
Foreign Born × Trend	-0.002		-0.001			0.015***		0.014***		
	(0.005)		(0.005)			(0.003)		(0.003)		
Cohort										
0-5 Years Since Arrival × Time		0.022**		0.021*			0.042***		0.038***	
		(0.011)		(0.011)			(0.008)		(0.008)	
6-10 Years Since Arrival × Time		0.006		0.005			0.022***		0.018**	
		(0.010)		(0.010)			(0.007)		(0.007)	
11-20 Years Since Arrival × Time		-0.010		-0.008			-0.000		-0.000	
		(0.012)		(0.012)			(0.006)		(0.006)	
20+ Years Since Arrival × Time		-0.015**		-0.012			-0.001		0.006	
		(0.008)		(0.008)			(0.009)		(0.009)	
Region of Origin										
Europe × Time					-0.006					0.010
					(0.007)					(0.009)
Latin America and Caribbean × Time					-0.003					0.021***
					(0.014)					(0.004)
Africa and Middle East × Time					-0.009					0.010
					(0.014)					(0.013)
Asia × Time					0.007					0.003
					(0.007)					(0.006)
Constant	2.768***	2.768***	2.729***	2.732***	2.729***	2.545***	2.545***	2.433***	2.434***	2.434***
	(0.002)	(0.002)	(0.044)	(0.044)	(0.044)	(0.002)	(0.002)	(0.025)	(0.025)	(0.025)
Age, Education, Marital Status, and # of children controls	x	x	o	o	o	x	x	o	o	o
N	79585	79585	79585	79585	79565	152136	152136	152136	152136	152136
Foreign Born						17133	17133	17133	17133	17133

Note: *** for p<.01, ** for p<.05, and * for p<.1. The outcome is logged annual average hourly wage, and outliers (<$1 &>$250) are set to missing. Sample includes individuals aged 25-59 in first wave of the panel, not enrolling in school in anytime of the reference year, and responded to two or more years in the Survey of Labour and Income Dynamics for Canada, and the Survey of Income and Program Participation in the United States. Immigrants arriving before the age of 17 and immigrants from the US to Canada and from Canada to the US are excluded from the sample. Models 3-4 include controls for age, highest level of schooling, marital status, and presence of

children in the household.