Catalogue no. 89-657-X2018001
ISBN 978-0-660-28225-1

Ethnicity, Language and Immigration Thematic Series

Refugees and Canadian Post-Secondary Education: Characteristics and Economic Outcomes in Comparison

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Release date: November 14, 2018

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Abstract

This study draws on data from the Longitudinal Immigration Database to examine participation in Canadian post-secondary education (PSE) among adult immigrants in the 2002-2005 landing cohort, with an explicit focus on resettled refugees. The study describes the demographic characteristics of participants, the characteristics of participation, and the economic returns on investment in Canadian PSE. It also employs multivariate regression analysis to further examine the effects of participation in Canadian PSE on employment incidence and the income of those employed, while controlling for other factors associated with successful economic integration.

Acknowledgments

Special thanks to Scott McLeish, Tristan Cayn, and André Bernard for their support throughout the writing of this paper, as well as René Houle, Jean-Pierre Corbeil, Anne-Marie Rollin, Feng Hou and Marc Frenette for their constructive feedback on previous drafts.

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Refugees and Canadian Post-Secondary Education: Characteristics and Economic Outcomes in Comparison

by **Elena Prokopenko**

Introduction

UNHCR, the UN Refugee Agency, has reported a record number of people displaced globally every year since 2011, with over 60 million displaced persons reported in 2015 (UNHCR 2016). Canada, for its part has accepted roughly 115,000 resettled refugees between 2005 and 2014, who make up, on average, 4% of new permanent residents annually (IRCC 2015). In response to the current global situation, the government resettled a record 46,700 refugees in 2016 alone (UNHCR 2017). What factors are associated with their successful integration in Canada?

Refugees in Canada tend to fare worse in terms of economic integration, with lower incomes and employment rates than immigrants entering through other admission categories (Yu et al. 2009). Several studies have found that enrollment in post-migration schooling is associated with improved income and labour force participation among immigrants (Rollin 2011; Banerjee and Verma 2009; Bratsberg and Ragan 2002; Anisef et al. 2010). However, there has been little empirical analysis focusing on refugees' participation in Canadian post-secondary education (see Ferede 2010), and the economic returns on this investment specifically for refugees.

Refugees are different from other immigrants to Canada in that their immigration to Canada is not voluntary, their return to their home country is highly unlikely (Aydemir and Robinson 2006), and those admitted after 2002 are not selected based on an underlying assumption of an ability to integrate.[1] Moreover, their pre-arrival experiences are markedly different from those of other immigrants in ways that make their economic and social integration more difficult. For instance, they may have difficulty obtaining proof of academic qualifications from institutions in conflict zones, making access to Canadian post-secondary schooling more challenging. In light of these distinctions, the applicability of findings from studies of immigrants in general to the situation of refugees is questionable.

Currently published studies looking at the economic returns on investment in Canadian education do not capture the nuanced ways in which refugee experiences differ. For instance, some studies focus on only highly educated immigrants (Adamuti-Trache, Anisef and Sweet 2013; Girard 2010), or immigrants with some previous education (Rollin 2011), populations from which refugees are disproportionately excluded. Others include refugee status as an independent variable in a model that includes all categories of immigrants (e.g. Rollin 2011; Adamuti-Trache and Sweet 2010; Banerjee and Verma 2009), not allowing for potentially informative interactions between admission category and other covariates. Furthermore, studies do not disaggregate government assisted from privately sponsored refugees, although the two groups are distinct in their economic integration (e.g. IRCC 2011a).

Because participation in Canadian education can be a vehicle for both economic and social integration (Anisef et al. 2010), it merits more attention with respect to this population. Are the characteristics of refugees who pursue post-secondary education (PSE) in Canada similar to those of other immigrants? How is their participation different from that of other immigrants? How does employment income, and the probability of having employment income, vary in relation to PSE attendance for refugees? The answers to these questions can inform policy makers and guide settlement service providers in ways that support refugees' successful integration.

This study uses the Longitudinal Immigration Database (IMDB), an administrative dataset of immigrants to Canada linked to their tax returns, to study post-secondary schooling among government assisted and privately sponsored refugee adults arriving between 2002 and 2005. It proxies participation in PSE by using tuition and full-time and part-time education tax claims, building on the measure used by Rollin (2011) to study the impact of PSE participation on income growth in the first 8 years in Canada for immigrants in earlier cohorts. This paper first presents the characteristics of participants in PSE, the timing, duration, and type of participation

1. Immigrants to Canada can be divided into three broad classes – economic immigrants, who are assessed on a system that rewards characteristics and experience that would lead to economic integration in Canada; Family Class immigrants – spouses, children, parents and grandparents of Canadian and permanent resident sponsors who are financially responsible for the newcomers; and refugees, who are granted permanent residence solely based on a need for protection, as of the *2002 Immigrant and Refugee Protection Act*.

(full or part time), and finally the role of post-secondary training in the economic outcomes of resettled refugees, while controlling for individual characteristics. Findings are presented separately for men and women, and in comparison with Family Class immigrants and principal applicants (PA) in the Economic admission categories.

Data and Methodology

Data

The data used for this study come from the 2013 Longitudinal Immigration Database (IMDB) (Statistics Canada 2016). This dataset combines two administrative datasets to create a longitudinal database of all tax-filing immigrants and non-permanent residents in Canada. Immigration data comes from Immigration, Refugees and Citizenship Canada (IRCC), and contains demographic characteristics of all permanent and non-permanent residents who landed in Canada since 1980. It is linked to the T1 Family File (T1FF) from the Canada Revenue Agency (CRA), from 1982-2013, with a linkage rate of 87% (Statistics Canada 2016a). Only immigrants and non-permanent residents who are linked to at least one tax file are included in the database.

The immigration data includes characteristics known at landing, such as age, sex, marital status, admission category, country of birth, knowledge of official languages, and the highest education qualifications attained. Notably, knowledge of official languages and highest education qualifications attained are self-reported for refugees and Family Class immigrants, but must be supported with documentation for those entering as PA in the Economic Class. Tax data provides annual information about earned income, and tax credits claimed for the year – including claims for tuition, part-time or full-time education, and qualifying children.

Population

The population of interest for this study includes resettled refugees who landed between 2002 and 2005. Landing years 2002-2005 are combined to increase the sample size of refugees who received post-secondary training in this study. These years were selected because a significant shift in policy took effect in 2002; the implementation of the Immigrant and Refugee Protection Act (IRPA) placed greater emphasis on the need for protection and less on the ability to establish in Canada in the selection of refugees (IRCC 2011a). Because refugees arriving before 2002 would differ greatly in their potential for integration (the outcome of interest for this study), they are not comparable to those arriving from 2002 onward. The economic outcomes of this cohort are observed in the eighth year since landing, with a focus on the effect of participation in Canadian PSE in the first seven years in Canada.

The comparison groups are composed of immigrants arriving through the Family Class and as principal applicants in the Economic Class in the same years. Because resettled refugees are selected from abroad (IRCC 2011a), they can only be compared with other immigrants who were not in Canada before landing. Immigrants who were international students or foreign workers prior to admission tend to have better economic outcomes (Hou and Bonikowska 2015).

This combined landing cohort is coupled with T1FF tax data for the years 2002-2013. To include information about immigrants from each of the four landing years, only the first eight years since arrival are studied.

Only those arriving in the core working-age (25-54) are included in the study, to avoid conflation of economic outcomes of adult learners with those of immigrants entering school at the typical age of post-secondary school entry in Canada. The discontinuous educational pathways of adult learners are associated with lower wages earned after graduation (Akron and Duke 2004). A similar age restxriction is applied by Rollin (2011) who studied returns on investment in education for highly educated immigrants arriving at age 25-44.

Measures

Participation in post-secondary training: this measure is proxied by the presence of a tuition claim and a part-time or full-time education deduction in any of the first 8 tax returns since arrival (for years 0 – 7). According to the CRA (2015), a tuition claim for "a course qualifies if it was taken at the post-secondary level…or if it develops or improves skills in an occupation and the educational institution has been certified by Employment and Social Development Canada". The presence of a tuition claim alone has been used by Rollin (2011) to proxy participation in post-secondary education, and it is further refined in this study.

Because amounts claimed can include payments for accreditation exams,[2] it is possible that the individual claiming tuition did not participate in any training. Full-time and part-time education deductions "represent the calculated amount that a tax filer may claim for each whole or part month during the tax year in which they were enrolled" (Statistics Canada 2016). To refine the focus on specifically participation in training, only those who claimed a tuition amount as well as a part-time or full-time education deduction in a specific tax year are counted as participating in training for that tax year.

Employment income: The employment income variable on the T1FF includes wages and salaries, commissions from employment, training allowances, tips and gratuities and self-employment income (net income from business, profession, farming, fishing and commissions) (Statistics Canada 2016). It is adjusted for inflation to constant 2013 dollars, and logged when used as a dependent variable in Model 2.

Employment status: a binary measure to define a person's employment status was created based on the values of employment income in each tax year. To exclude short-term, low-wage employment that does not signal strong labour market attachment, a minimum threshold of $1,000 was imposed. This threshold mimics methodologies used in previous papers studying immigrant employment incidence using administrative data (e.g. Hou and Picot 2014; Ci, Hou and Morissette 2017). Thus, the measure is equal to 1 if the employment income in a given year is at least $1,000, and 0 otherwise.

Admission category: Government Assisted Refugees (GARs) are refugees that are initially screened and processed abroad by the UNHCR, and resettled in Canada. They receive government aid for their first year in Canada (IRCC 2011a). Privately Sponsored Refugees (PSRs) are also resettled refugees processed abroad by the UNHCR, however, as the name implies, they are sponsored by a group of volunteers who provide financial support during their first year in Canada.

Principal applicants in the Economic Class are selected based on their ability to make a contribution to the Canadian economy (IRCC 2016). They have the best labour market outcomes amongst immigrants (IRCC 2012). The Family Class aims to reunite Canadian citizens and permanent residents with sponsored relatives (IRCC 2011b).

Other independent measures include demographic characteristics that have been found to affect participation in education or the returns on investment in education by previous studies. Gender plays a decisive role in both the likelihood to participate in post-migration education (Anisef et al. 2009; Hum and Simpson 2003), and the returns on this investment once it is made (Rollin 2011). In general, immigrant women are also less likely to be employed, and have lower earnings, relative to immigrant men (Hudon 2015), consistent with the gender wage-gap observed in Canadian society at large (Drolet 2011). Gender roles within families also shape engagement with paid work, with research showing that marital status and the presence of dependent children differentially impact the employment rate of men and women (Moyser 2017). Women are also more likely to work part-time to fulfill caregiving duties (Moyser 2017), affecting their total annual employment income. For these reasons, models are run separately for men and women.

Age is included as a covariate, since older immigrants are less likely to participate in Canadian education (Banerjee and Verma 2009; Hashmi Khan 1997), and have lower earnings than those arriving at younger ages (Schaafsma and Sweetman 2001). The region of the country of origin[3] is included in the models to account for barriers to

2. Fees paid to "an educational institution, professional association, provincial ministry or other similar institution, to take an occupation, trade or professional examination to obtain a professional status…to be licensed or certified as a tradesperson, or to allow you to practice the profession or trade in Canada" can be claimed (CRA 2016).
3. Based on the UN M.49 standard for area codes, see http://unstats.un.org/unsd/methods/m49/m49.htm

employment resulting from discrimination (Oreopoulos 2009), source-country differences in women's labour force participation (Frank and Hou 2015), and lower wages of visible minorities (e.g. Hudon 2016). Knowledge of official languages is expected to positively correlate with economic outcomes (Adamuti-Trache and Sweet 2010; Banerjee and Verma 2009). Those arriving with pre-migration education credentials are more likely to invest in education after arrival (Hashmi Khan 1997), likely as a strategy to overcome the discounting of foreign credentials in Canada (Aydemir and Skuterud 2005; Banerjee and Verma 2009).

Methods

The methods of analysis for this study are both descriptive and will use more advanced statistical techniques. First, we compare the characteristics of refugees who participate in post-secondary education to those of non-refugee participants. We also present a descriptive analysis of the timing and quality of participation in post-secondary education of resettled refugee streams in relation to other immigrant categories.

Next, we assess the economic impact of participation in Canadian post-secondary training participation, first descriptively and then statistically. We analyze charts showing the employment rate and employment income of individuals with and without training within each admission class in terms of differences in absolute values and magnitudes of over-time change. We run two regression models to assess the two measures of economic integration. Having participated in training by year 7 is the independent variable of focus in a multivariate regression analysis which also includes other characteristics associated with employment outcomes, as described above. The first model is a logistic regression with a binary outcome;[4] the second model is an ordinary least squares regression where the dependent variable is the natural log of employment income of employed individuals in year 8. These models are run separately for each admission category and gender. The results of these regressions are presented as predicted probabilities of employment (Model 1), and as adjusted mean employment incomes (Model 2).

4. Where 1=employed in the eighth year since landing.

Results

Overview of the Study Population

Table 1 illustrates the characteristics of the cohort under analysis. The majority of the sample is composed of Economic Class PA, while resettled refugees, especially PSRs, are present in the smallest numbers. Nearly three in four Economic Class PA are men, while the majority of Family Class immigrants are women. Among refugees, men and women are present in nearly equal proportions. Family Class immigrants tend to be younger, while PSRs are more likely than immigrants in the other categories to be single at the time of landing. GARs are the most likely to report children on their first tax file.

Refugees are less likely than other categories to know an official language, with GARs reporting the lowest proportion of official-language knowledge. They are more likely to have a secondary school diploma or less as the highest educational qualification at landing, especially compared to the PA in the Economic Class. Economic PA participate in post-secondary training in Canada at the highest rate (42%) while immigrants in the other categories participate at similar rates between 19% and 21%.

Refugees are more likely to come from Africa, the Middle East and Central Asia, and less likely to come from other parts of Asia, Europe and the United States. Refugee characteristics are cohort-specific, with the composition depending largely on the current humanitarian crises. Refugees from Afghanistan, Colombia, Ethiopia, Sudan, Iraq, and Iran account for roughly 65% of the 2002-2005 refugee cohort.

Table 1
Characteristics of taxfiler immigrants landed in 2002 to 2005, aged 25 to 54 at landing, by selected admission categories

	Family class	Economic class principal applicants	Government-assisted refugees	Privately sponsored refugees
			percentage	
Sex				
Men	36	74	50	51
Women	64	26	50	49
Age at landing				
25-34	65	49	50	55
35-44	18	40	36	29
45-54	18	11	15	15
Marital status at landing				
Single	7	28	21	36
Married or common-law	91	70	70	58
Widowed, divorced, separated	3	3	9	6
Presence of children[1]				
Without children	37	33	31	41
With children	63	67	69	59
Either official language spoken at landing				
Yes	55	77	31	36
No	45	23	69	64
World area of last permanent residence				
South, Central America and the Caribbean	10	6	21	6
Europe and North America	12	19	4	4
Africa	8	9	33	45
Middle East and Central Asia	4	9	8	15
East, South, Southeast Asia and Oceania	66	57	33	30
Highest education qualification at landing				
Secondary or less	46	4	68	72
Non-university certification	21	15	15	18
University certification	34	81	17	10
Participation in postsecondary training in Canada[2]				
Yes	21	42	19	20
			number	
Total	**72,275**	**135,815**	**10,080**	**4,835**

1. Defined as the presence of one or more children aged 18 and younger, as identified by the T1 Family File (T1FF) processing on the tax file.
2. Participation in any postsecondary training is defined as claiming tuition credits, and full-time or part-time education deductions on the T1 tax return in any of the first 7 years since landing.
Notes: Population includes only those filing taxes in the the seventh and eighth years since landing.
Percentages may not add up to 100 due to rounding.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

Table 2 outlines the proportion of immigrants participating in post-secondary training at any point in the first 7 years after arrival, within admission categories and other individual characteristics. In most cases, trends in PSE participation by individual characteristics are similar between admission categories, and align with findings from previous studies. Younger immigrants are more likely to participate in post-secondary training, as are unmarried immigrants, and higher education at landing is correlated with greater participation in post-migration training in every admission category. Immigrants from Africa participate in post-secondary training at the highest rate in all immigrant classes except Economic, where principal applicants from South, Central America and the Caribbean have a higher participation rate.

Comparing trends between admission categories, refugee women are less likely to participate in training, while women in other immigration categories have higher participation rates than men. Refugees and Family Class immigrants who speak an official language at landing are at least twice as likely to participate in post-migration training, whereas among Economic Class PA, there is no difference in participation by language ability.

Table 2
Participation rate of immigrants aged 25 to 54 at arrival in postsecondary training[1], by individual characteristics and selected admission categories, 2002 to 2005 landing years

	Family class	Economic class principal applicants	Government-assisted refugees	Privately sponsored refugees
			percentage	
Sex				
Men	18	39	22	21
Women	23	51	17	18
Age at landing				
25-34	27	49	24	26
35-44	18	39	17	15
45-54	4	24	9	7
Marital status at landing				
Single	28	51	25	27
Married or common-law	21	39	18	16
Widowed, divorced, separated	11	46	13	16
Presence of children[2]				
Without children	15	41	18	21
With children	24	43	20	19
Either official language spoken at landing				
Yes	29	42	30	34
No	11	42	15	12
World area of last permanent residence				
South, Central America and the Caribbean	22	55	25	25
Europe and North America	27	41	14	18
Africa	35	50	28	29
Middle East and Central Asia	17	32	13	13
East, South, Southeast Asia and Oceania	19	41	10	9
Highest education qualification at landing				
Secondary or less	8	15	14	15
Non-university certification	27	35	30	31
University certification	35	45	32	33
			number	
Total	**15,265**	**57,260**	**1,950**	**960**

1. Participation in any post-secondary training is defined as claiming tuition credits, and full-time or part-time education deductions on the T1 tax return in any of the first 7 years since landing.
2. Defined as the presence of one or more children aged 18 and younger, as identified by the T1 Family File (T1FF) processing on the tax file.
Notes: Population includes only those filing taxes in the the seventh and eighth years since landing.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

What are the characteristics and timing of the post-secondary education completed in Canada for the different categories? Table 3 presents the characteristics of the education deductions claimed by immigrants in this cohort. Refugees are more likely to be taking part in full-time training only, and less likely to be studying only part-time; PSRs are the most likely group to engage in both full and part-time training. Refugees also tend to begin their studies after more years in Canada, with only 19% of GARs and 28% of PSRs participating before the second year in Canada, compared to 36% and 43% for Family and Economic Class PA respectively. The number of years in which refugees participate in post-secondary education is similar for Family Class immigrants and refugees, while PA in the Economic Class tend to have more years of PSE participation.

Table 3
Characteristics of postsecondary training received by immigrants in first 8 years since landing, by selected admission category, 2002 to 2005 landing cohort

	Family class	Economic class principal applicants	Government-assisted refugees	Privately sponsored refugees
			percentage	
Type of training received				
Full-time Training Only	37	32	51	48
Part-time Training Only	30	32	11	16
Full-time and Part-time Training	34	36	38	36
Years since landing at first year of postsecondary education participation				
0-1	36	43	19	28
2-3	33	34	40	35
4-5	19	15	24	22
6-7	12	8	16	15
Number of years enrolled in postsecondary education[1]				
1	38	32	37	45
2	26	25	26	22
3	15	17	14	11
4	9	11	10	8
5 or more	12	15	13	14
			number	
Average number of years enrolled	2.4	2.6	2.5	2.4
Total	**15,260**	**57,260**	**1,955**	**960**

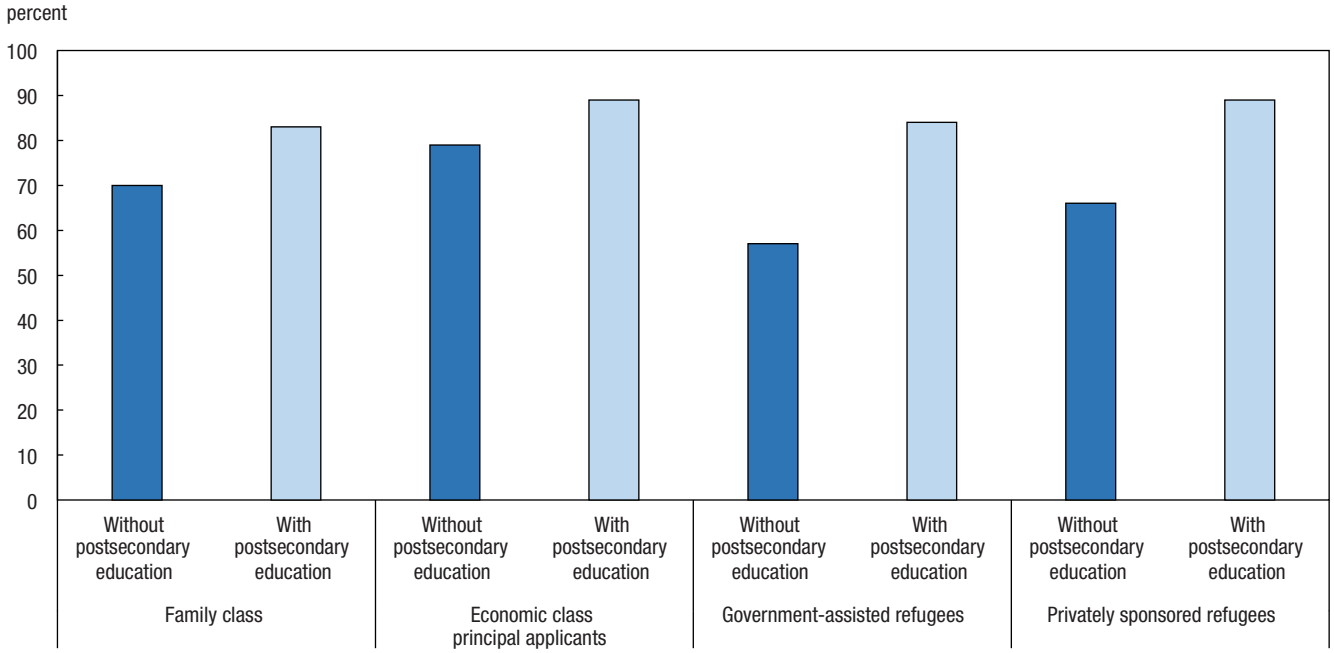
1. Based on the number of years enrolled at any point during the year, not necessarily for the duration of the year.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

Economic Outcomes of Participation in Post-Secondary Training

In what ways does participation in Canadian post-secondary education affect economic integration of immigrants? The following charts present immigrants' economic outcomes eight years since landing, by admission category and previous PSE participation.[5]

Chart 1 presents the proportion of immigrant taxfilers in the seventh year who are employed in year eight, defined as reporting employment earnings greater than $1,000 in constant 2013 dollars, by admission category and participation in PSE in the first seven years in Canada. Eight years after landing, those with at least one year of Canadian PSE participation reported higher employment incidence within every admission category. Refugees with training were just over 30% (GARs) and 25% (PSRs) more likely to be reporting employment income than their counterparts without. Among Economic PA and Family Class immigrants, the difference was less than 16%. Notably, while GARs without training had the lowest employment incidence among immigrants in this study (57%), those with post-secondary training were employed in higher proportion than immigrants without training in all other admission categories. As well, PSRs with Canadian training reported employment income in equal proportion to Economic Class PA (89%).

Chart 1
Proportion with employment income eight years after landing, by admission category and participation in postsecondary education

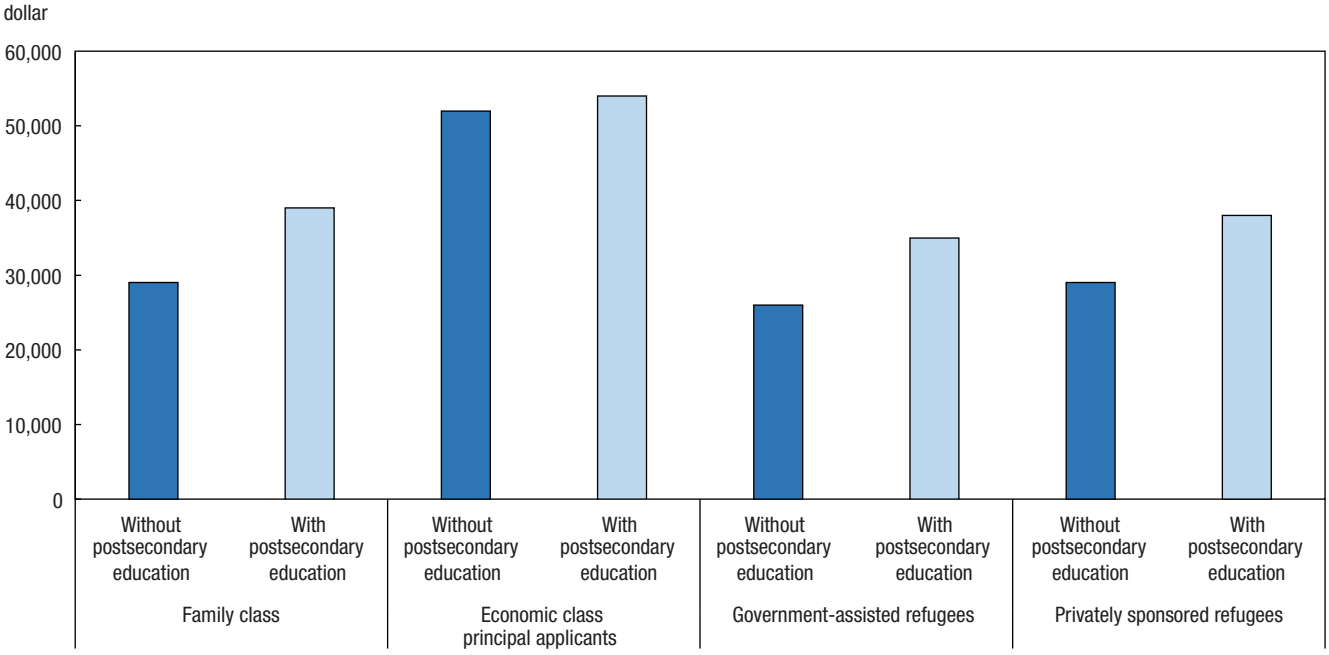


Note: Employment defined as reporting employment income of at least $1,000 (in constant 2013 dollars).
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

5. Individuals participating in PSE in year 8 were excluded, as their participation in PSE may interfere with the ability to work.

Chart 2 illustrates the eighth year earnings of the employed individuals presented in Chart 1, by admission category and participation in PSE. Participation in Canadian PSE is associated with higher employment earnings for all admission categories. As expected, Economic Class PA have the highest average earnings, whether or not they have participated in Canadian training. However, the difference in average earnings of those with and without training is the smallest for Economic PA, at $2,000. This likely reflects the fact that, unlike other immigrants in this study, Economic Class PA were selected for their ability to integrate into the Canadian labour market, and may have been able to find gainful employment even without Canadian PSE. By contrast, the average eighth year earnings of refugees are $9,000 higher among those with Canadian PSE experience, while Family Class immigrants exhibit a $10,000 difference between those with and without training.

Chart 2
Mean employment income eight years after landing, by admission category and participation in postsecondary education



Note: Mean of those employed, defined as those reporting employment income of at least $1,000 eight years since landing.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

While these descriptive statistics show that those with post-secondary training are more likely to report employment and have higher average incomes, is this really the result of training, or positive selection? Are individuals who partake in post-migration PSE already more likely to succeed economically? The following regressions control for observed individual characteristics known to be associated with better economic integration of immigrants.

Results of Multivariate Analyses

Table 4 presents the predicted probabilities of employment in the eighth year since landing, with models run separately within each admission category by gender. After controlling for other characteristics associated with economic benefits, participation in Canadian post-secondary education in the first seven years in Canada is associated with a significantly higher probability of employment in year eight for immigrants in all admission categories in this study. The difference in the predicted probability of employment between those with and without Canadian training is greater for women than men within each admission category, although, men, both with training and without, are still more likely to be employed.

Controlling for other factors, participation in post-secondary training is associated with the highest percent increase in the predicted probability of employment amongst GAR women (76%), Family Class women (30%) and PSR women (26%). Women who are Economic PA exhibit a smaller increase in employment incidence (16%) associated with participation in Canadian PSE. Among men, GARs and PSRs show a 12% and 14% increase in employment incidence associated with Canadian PSE participation, while male Economic Class PA with Canadian PSE have a 10% advantage in the probability of employment in year eight. The smallest difference in employment incidence between those with and without training is seen amongst Family Class men, for whom participation in training is associated with only a 2% increase in the predicted probability of employment.

Those with children, especially women, are less likely to be employed within every admission category save Family Class men. Knowledge of official language does not significantly affect the probability of employment for refugee men, while for all other groups knowing an official language at arrival is positively associated with employment. Amongst refugees, education qualifications at landing are significantly associated with a higher probability of employment only for GAR women. Principal applicants in the Economic Class benefit from both non-university and university credentials acquired before landing, while Family Class men actually have a slightly, but significantly, lower probability of employment in year 8 if they have a university degree compared to a secondary school diploma or less at arrival. Interestingly, GARs from Africa have significantly higher likelihood of employment than men from Europe and North America, while the opposite is true among Economic Class PA and Family Class immigrants.

Table 4
Predicted probability of employment in eighth year since landing, immigrants landed in 2002 to 2005 at age 25 to 54

	Privately sponsored refugees		Government-assisted refugees		Economic class principal applicants		Family class	
	Men	Women	Men	Women	Men	Women	Men	Women
	percentage							
Age at landing								
25-34 (ref.)	90	68	81	57	88	83	91	68
35-44	84***	60**	73***	50***	85***	83	88***	69**
45-54	69***	33***	56***	31***	77***	74***	80***	51***
Presence of children 7 years since landing								
No (ref.)	88	70	77	58	86	86	89	76
Yes	85*	52***	74*	47***	85***	80***	89	58***
Marital status at landing								
Single (ref.)	86	58	78	53	87	83	88	69
Married	86	61	74*	52	85***	82*	89	65***
Divorced, widowed, separated	84	49*	70	44**	84**	79**	89	67
Knowledge of official language at landing								
No (ref)	86	56	75	49	82	78	88	63
Yes	87	67***	75	55**	86***	83***	90***	66***
World area of last permanent residence								
South, Central America and the Caribbean	86	78	81**	67***	90	86	90*	70
Europe and North America (ref.)	88	72	69	50	90	86	88	70
Africa	92	72	82***	59*	82***	80***	86	58***
Middle East and Central Asia	79*	52**	58*	32***	81***	80***	79***	42***
East, South, Southeast Asia and Oceania	73**	43***	67	37**	85***	80***	90**	66***
Highest education qualification at landing								
Secondary or less (ref.)	86	58	74	49	82	77	89	65
Non-university certification	87	61	76	53	86***	80*	90	66
University degree	88	65	77	55*	85***	83***	88**	65
Participation in Canadian postsecondary education by year 7								
No	84	57	73	45	82	76	89	61
Yes	94***	72***	83***	79***	90***	88***	91***	79***
	number							
Total	**2,340**	**2,260**	**4,680**	**4,860**	**94,145**	**31,565**	**25,080**	**44,080**

* significantly different from reference category at p<0.05
** significantly different from reference category at p<0.01
*** significantly different from reference category at p<0.001
Note: Predicted probabilities based on holding all other variables at their mean.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

Table 5 presents the mean employment income of employed immigrant taxfilers at 8 years since landing, after adjusting for other characteristics in the model in a log-linear regression. These results corroborate findings from above analyses that participation in Canadian PSE is associated with economic benefits in year 8. This effect holds over and above the influence of other characteristics in the model for all groups, with the exception of PSR men.[6]

As with the incidence of employment, participation in post-secondary training is associated with a greater increase in average incomes among women than men in the same admission category, although Economic Class PA are an exception. The largest difference between those with and without PSE is in the adjusted mean incomes of GAR women ($7,557), PSR women ($6,701), and Family Class women ($6,659). Among men, the increase in mean income associated with post-secondary training is highest for Economic Class PA ($5,623), followed by GAR men ($4,843) and men in the Family Class ($4,304). While the average earnings of PSR men with training are higher than those without, they are not significantly different. This may be due to their small numbers in the sample.

The effects of other covariates are generally in line with what is expected from the literature. Interestingly, the presence of children in year 7 is associated with lower earnings for women in all categories, while it is associated with higher incomes for all except GAR men. Knowledge of official languages significantly improves average income of all groups except PSRs. While post-secondary education credentials at landing are associated with higher earnings in year 8 in all admission categories, this relationship is not significant for GAR men.

6. The term was significant once the threshold for employment was raised to $5,000.

Table 5
Adjusted mean employment income in eighth year since landing, immigrants landed in 2002 to 2005 at age 25 to 54 employed 8 years since landing

	Privately sponsored refugees		Government-assisted refugees		Economic class principal applicants		Family class	
	Men	Women	Men	Women	Men	Women	Men	Women
	dollars							
Age at landing								
25-34 (ref.)	35,000	24,000	29,000	20,000	56,000	43,000	39,000	24,000
35-44	33,420	27,453*	27,435	22,359**	46,276***	41,561**	35,710***	24,872*
45-54	31,830	22,286	24,052***	18,913	37,350***	32,851***	30,258***	17,391***
Presence of children 7 years since landing								
No (ref.)	34,000	27,000	29,000	25,000	48,000	44,000	31,000	23,000
Yes	36,468*	21,486***	26,769*	20,981***	53,076***	40,124***	34,709***	19,178***
Marital status at landing								
Single (ref.)	36,000	26,000	29,000	24,000	52,000	43,000	41,000	26,000
Married	32,445*	26,077	27,806	23,322	57,645***	44,473*	39,497	24,669**
Divorced, widowed, separated	36,145	29,851	24,230	23,702	50,154	43,230	43,380	24,001*
Knowledge of official language at landing								
No (ref.)	31,000	22,000	27,000	19,300	45,000	39,000	26,000	17,400
Yes	30,665	22,719	29,021*	22,954***	52,211***	44,014***	33,688***	21,340***
World area of last permanent residence								
South, Central America and the Caribbean	40,149**	20,929	30,621	21,531**	65,794***	50,478***	42,812***	30,058
Europe and North America (ref.)	28,000	25,000	30,000	29,000	55,000	43,000	53,000	30,000
Africa	36,445**	26,448	28,595	23,682	46,426***	37,102***	38,877***	23,924***
Middle East and Central Asia	28,495	19,451*	19,512***	18,997**	50,252***	43,018	36,696***	23,714***
East, South, Southeast Asia and Oceania	25,426	17,544**	22,662**	17,358***	48,536***	40,931**	38,749***	25,528***
Highest education qualification at landing								
Secondary or less (ref.)	32,000	23,000	27,000	20,000	35,000	30,000	28,000	16,900
Non-university certification	35,603*	26,119*	26,696	21,658	39,842***	32,485*	30,591***	18,184***
University degree	40,722***	28,147*	26,693	23,708**	48,421***	42,531***	35,711***	21,624***
Participation in Canadian postsecondary education by year 7								
No (ref.)	32,000	23,000	27,000	19,400	51,000	41,000	35,000	20,000
Yes	34,969	29,701***	31,843***	26,957***	56,623***	44,717***	39,304***	26,659***
	number							
Total	**1,910**	**1,300**	**3,650**	**2,560**	**84,505**	**28,590**	**22,805**	**29,835**

* significantly different from reference category at p<0.05
** significantly different from reference category at p<0.01
*** significantly different from reference category at p<0.001

Note: Reference values are observed mean employment incomes of immigrants who filed taxes 7 and 8 years since landing, had employment earnings of at least $1,000 in year 8 and were not claiming postsecondary education.
Adjusted incomes are based on ratios in reference to the observed mean, derived from exponentiated coefficients of a log-linear regression of income, controlling for all other characteristics in the model.
Constant 2013 dollars.
Source: Statistics Canada, Longitudinal Immigration Database (IMDB), 2013.

Discussion and conclusions

This study draws on data from the IMDB to examine Government Assisted Refugees' (GARs) and Privately Sponsored Refugees' (PSRs) participation in Canadian post-secondary education and their returns on investment in comparison with other immigrant taxfilers arriving as adults in the 2002-2005 cohort. This study proxies participation in post-secondary education (PSE) using multiple administrative tax variables, and finds that PSE participation in the first seven years since landing is associated with higher likelihood of employment in year 8 for men and women in all admission categories studied, and higher earnings of those employed for all groups save PSR men.

Refugees participate in post-secondary training at a lower rate than Economic Class principal applicants (PA), but at a comparable rate to immigrants in the Family Class. The characteristics of PSE participants are similar between admission categories, but the properties of participation differ for refugees. Both groups of refugees who participate in Canadian PSE are more likely than non-refugees to engage in full-time, and less likely to engage in part-time, studies. They are also less likely to initiate studies within their first year in Canada. This may be because a higher proportion of refugees arrive in Canada without the necessary pre-requisites to enter school at the post-secondary level, as more than two thirds have at most a secondary diploma at the time of landing. They may also delay their entrance into post-secondary schooling while they engage in language training, since a higher proportion report not being able to communicate in an official language at the time of landing.

Looking at the descriptive results of economic returns on investment in Canadian post-secondary education, immigrants in all admission categories who have received Canadian PSE by year eight are more likely to be employed in the eighth year since landing, and those who are employed are more likely to have higher earnings if they have participated in Canadian PSE. Among participants, the economic outcomes of PSRs are higher than those of GARs eight years since landing. This finding may signal the persistence of PSRs' economic advantage stemming from access to Canadian social networks facilitated by their sponsors (Lamba and Krahn 2003).

Controlling for other characteristics associated with economic integration, the positive effect of participation in Canadian PSE on the probability of being employed 8 years since landing is significant for all immigrants in the study. The employment incidence of those with PSE experience were greater than 10% higher than of those without, with the exception of men in the Family Class and Economic Class PA.

Women in each admission category exhibit a larger increase in the incidence of employment associated with PSE participation than men, in line with findings from Rollin (2011): GAR women who received PSE in the first 7 years since landing were 75% more likely to be employed in year 8 than those who did not, while PSR women were 26% more likely. This compares with a 14% and 12% increase in probability of employment for GAR and PSR men, respectively. This gender difference may reflect the influence of unmeasured personal characteristics in the model. For instance, it may be that women who did not enroll in PSE also did not intend to enter the labour force in the first place, while among men, traditional gender roles exert a stronger pressure to work for pay.

Interestingly, human capital assets at landing are less important in predicting the economic outcomes of refugees, especially refugee men, compared to other immigrants. Knowledge of an official language at landing is not associated with higher employment rates in year 8 for refugee men, while it is for refugee women and other immigrants in this study. As well, previous education credentials do not significantly impact employment incidence of refugees, with the exception of GAR women with university degrees, while it is associated with improved outcomes of Economic Class PA.

The positive effect of participation on income amongst those employed is also significant for all groups save PSR men, for whom the effect is positive but not significant.[7] Women again see greater increases in average incomes associated with PSE participation than men. The average incomes of PSE participants were between $3,000 and $6,000 higher for men, and $4,000 to $8,000 higher for women, compared to those who did not have PSE experience after 7 years in Canada. Refugee women saw larger income gains than women in other admission categories, but men who were Economic Class PA showed the highest increase in mean incomes associated with

7. The effect becomes significant when those with annual earnings between $1,000-$4,000 are excluded, suggesting that for PSR men, the relationship between Canadian PSE and earnings is weaker amongst low earners.

participation, controlling for other factors in the model. Notably, since the income measure is derived from tax files, it cannot be known whether the increase in annual earnings represents an increase in wages or an increase in the hours worked.

The limitations of this study lie with the assumptions inherent in using deterministically linked administrative data - the linkage may include false links between immigrants and tax files, or miss true matches that were not identified. Another limitation is the inability to control for unobserved individual characteristics such as motivation, health status, or abilities that can impact both PSE attendance and labour market outcomes. Measurement error is also inherent in the indirect measure of participation in Canadian PSE. For example, it is possible that some individuals who had eligible education deductions did not claim them on taxes. This measure also does not, and arguably cannot, capture whether or not the immigrant completed their studies. A linkage between the IMDB and the Postsecondary Student Information System (PSIS) could be used to validate the use of education credits as a proxy for post-secondary education, and provide additional details about immigrants' received credentials.

Future research could take advantage of the longitudinal nature of this data to better analyze the effect of time on the returns to investment in Canadian education. How does the fact that refugees typically begin Canadian PSE later than non-refugees affect their economic integration? The current study is also not sensitive to the timing of returns on investment – how soon does participation "pay off" for refugees as opposed to other immigrants?

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