Which immigration selection factors best predict the earnings of economic principal applicants?

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Introduction

This report provides updated empirical analysis for the design of the criteria for selecting economic immigrants in Canada. A key goal of Canada's selection of economic immigrants is to seek individuals with human capital characteristics that would "maximize the long-term potential of economic immigrants in an increasingly complex labour market and knowledge-based economy" (CIC 2010: 21). In support of this goal, this project examines how well various selection criteria, independently of each other and in combination, predict post-landing earnings among economic principal applicants. This information is relevant to the development of point levels for various factors in a selection system.

This report is a follow-up to an earlier report by Bonikowska, Hou and Picot (2015). Findings of the earlier report served as the technical guide for the development of the current Comprehensive Ranking System (CRS) used for selecting economic immigrants under the Express Entry immigration system. The former study was based on the earnings experiences of immigrants who landed between 1997 and 1999 and between 2002 and 2004.

Since the early 2000s, many new selection requirements have been implemented and the characteristics of admitted economic immigrants have changed considerably. The Provincial Nominee Program (PNP) continued to grow, and out-numbered the Federal Skilled Worker Program (FSWP) in admitting economic immigrants. Immigrants who came through the PNP tended to have higher employment rates and earnings in the initial years after landing than FSWP immigrants mostly because the former included a higher share of individuals with pre-landing Canadian work experience (Hou, Crossman and Picot 2020b). In 2008 the Canadian Experience Class (CEC) was introduced, which facilitates international students with Canadian work experience or temporary foreign workers to transition to permanent residence under certain circumstances. The creation of this immigration class is based on the idea that those who have already been in Canada prior to immigration may have an easier time transferring their pre-immigration human capital to the Canadian labour market, leading to stronger labour market outcomes. The expansion of the PNP and the introduction of the CEC are associated with a large increase in the share of economic immigrants who had pre-landing Canadian experience (Hou, Crossman and Picot 2020a)[1]. Furthermore, between 2008 and 2014, a series of Ministerial Instructions were implemented with the objective of improving the responsiveness of economic immigration programs to perceived occupational demand and to restricting the numbers of applications. Starting in 2010, FSW and CEC principal applicants became subject to mandatory language testing. Regulatory changes to the FSWP also came into effect in mid-2013 to strengthen language and educational credential requirements for economic immigrants, which included new minimum language requirements and mandatory educational credential assessments of foreign educational credentials. These changes would likely improve the match between labour market demand and skills of immigrants, and thereby enhance the quality of language and education metrics and thus their roles in predicting post-immigration earnings.

Relative to the period (1998-2010) covered in the previous study by Bonikowska, Hou and Picot (2015), the period in the current study displayed stronger economic conditions. While the national unemployment rate ranged from 7.2% to 8.3% in eight out of 13 years in the 1998-2010

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[1] Among economic immigrants aged 18 or older at landing, the share with pre-landing Canadian earnings increased from 8% in 2000 landing cohort to 46% in the 2018 landing cohort.

period, it ranged from 6.0% to 7.0% in seven out of 12 years in the 2006-2017 period. More favourable economic conditions tend to improve immigrants' labour market outcomes.

Significant policy developments and improved macroeconomic conditions raise the question of whether empirical results based on earlier cohorts of immigrants are still fully relevant. To ensure the effectiveness of the CRS in selecting economic immigrants, it is important to update the empirical evidence using more recent data, to re-evaluate the role of selection factors and to identify any emerging important factors in predicting post-immigration earnings. To this end, this project examines principal applicants who landed between 2005 and 2015, and their earnings over the period 2006 to 2017.

Similar to the study by Bonikowska, Hou and Picot (2015), this study considers only factors that could potentially be used in immigrant selection, such as those used in the Express Entry application management system. These variables are education, language, age, years of pre-landing Canadian work experience, years of pre-landing Canadian study experience, whether the applicant has a spouse, and various spousal characteristics, and are all measured at the time of landing. Some selection factors in the current Comprehensive Ranking System, such as arranged employment and siblings living in Canada, are not available for the arrival cohorts studied in this report.[2] They could be examined in a future study of immigrants selected through the Express Entry system since 2015. A new factor — pre-landing Canadian earnings, which shows a strong effect on immigrants' post-landing earnings in recent studies (Hou, Crossman and Picot 2020a) — is also examined in this study.

In addition to the predictive power of such variables, attention is also paid to the marginal effects of the selection factors on post-landing earnings. For example, what is the difference in earnings between a bachelor's degree and a secondary school certificate? The predictive power of a variable and its marginal effect are two different questions. One concerns the relative importance of each predictor among all selected factors. The other concerns the differences in earnings across various levels within a factor.

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[2] For the cohorts examined in this study, the information concerning the presence of siblings living in Canada was not included in the selection system; whether or not applicants had arranged employment was included in the selection grid for the Federal Skilled Worker Program, but the information is not available in the IMDB for these cohorts.

Data

The study uses Statistics Canada's Longitudinal Immigration Database (IMDB). This data set is constructed by linking administrative files on immigrant admissions and non-permanent resident permits with tax files. The data include immigrants who were admitted to Canada since 1952 and non-permanent residents issued permits since 1980, and who have filed at least one tax return since 1982. Of the immigrants who landed from 2000 to 2017 and were in their prime working age (25 to 54) at landing, up to 94% were linked to at least one tax record (Statistics Canada 2019).

The population used in this analysis consists of immigrants who were principal applicants in four programs in the Economic Class: Federal Skilled Worker program, Provincial Nominee Program, Canadian Experience Class, and Federal Skilled Trades Program. Only principal applicants are evaluated against the selection criteria in the points system for the selection of economic immigrants. The analysis is restricted to immigrants aged 20 to 54 in the year of landing, and with positive earnings in the year of interest. Economic immigrants (principal applicants) entering through the Quebec selection system are excluded because of the uniqueness of that system.[3]

This study focuses on immigrants in three landing cohorts based on how many years they have been observed in the IMDB: 2005–2007, 2008–2011, and 2012–2015 (see Appendix table 5 for sample size and characteristics of each cohort). While all three landing cohorts are used to assess the effect of human capital variables on earnings in the short-term (first two years after immigration), the first two cohorts are used to assess the effects in the medium-term (5 to 6 years after immigration), and only the first cohort is used to assess the effects in the long-term (10 to 11 years after immigration). Regression analysis includes only immigrants with at least $500 (in 2017 constant dollars) earnings in the years of interest.

Variables

Annual earnings (includes wages and salaries, commissions from employment, and self-employment income) during the first two full years in Canada after landing were used to represent short-term outcomes, earnings 5 to 6 years after landing for medium-term outcomes, and earnings 10 to 11 years after landing for long-term outcomes.

There are some restrictions on the explanatory variables used in the models. To render the analysis relevant to selection policy, it is important to include only those variables that are available at the time of immigration (landing), that could potentially be included in immigrant selection, and for which historical data are available. For example, although source country has been found to have a large effect on immigrant earnings, source country is not part of the points system used for selecting economic immigrants as its use could be discriminatory. Hence, source country is excluded from the list of explanatory variables. Its inclusion in the regression model

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3 Quebec Skilled Workers Program evaluates immigrants along similar dimensions as the Federal Skilled Workers Program, but with a different scoring system and puts relatively more weight on French language proficiency, Quebec connection, and the characteristics of the spouse and accompanying children.

could alter the effects of other variables, such as knowledge of official languages (which is correlated with source country), when predicting earnings.[4]

Furthermore, the contributions of the variables could only be evaluated using historical data. Hence, the explanatory variables are also restricted to those available in the best existing data source for this purpose, the IMDB. With these constraints, the explanatory variables, all of which are treated as discrete and measured at landing, comprise of age at landing[5] (7 levels), educational attainment (9 levels), language characteristics (6 levels), years of Canadian work experience prior to landing (6 levels), years of study in Canada prior to landing (7 levels), having a spouse at landing, spouse's educational attainment (9 levels), spouse's years of Canadian work experience prior to landing (6 levels), and spouse's years of study in Canada prior to landing (7 levels). Appendix table 5 shows how these variables were specified. In the additional analysis, the level of pre-landing Canadian earnings (5 levels) is also included.

Four variables require some explanation. The language variable is constructed by combining information on the mother tongue and on the official language spoken. This approach takes full advantage of available variables in the IMDB. In the current Express Entry CRS, however, language ability for many immigrants is determined by a language test, a superior approach to the measures used in this study. Language scores from a test may be a better predictor of earnings than the variable employed here. Hence, the predictive power of the language variable may be underestimated in this work.

Regarding years of Canadian work experience, many immigrants worked in Canada on temporary visas before becoming permanent residents, and, thus, acquired Canadian work experience before landing. The Canadian work experience variable was derived from the number of years that an individual had positive earnings in Canada before acquiring permanent residency.

Similarly, some immigrants studied in Canada on study permits before becoming permanent residents. The years of Canadian study experience variable was derived from the number of years that an individual held study permits.[6]

The level of pre-landing earnings was used to capture the quality or skill level of Canadian work experience, in complement to years of Canadian work experience which is primarily a quantity measure. It was based on an individual's maximum annual earnings in the 10 years before acquiring permanent residency.[7] It was coded in five levels against national median employment

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[4] For instance, if a variable representing 14 broad source regions was added to the full model for short-term earnings of the 2010–2015 cohort in Appendix table 5, the model R-squared would increase from 0.149 to 0.166, and the coefficient for "other mother tongue, speaking English" (vs. English mother tongue) would change from 0.340 (or 29% lower earnings) to -0.098 (9% lower earnings). In other words, the inclusion of source region in the model would capture a large part of the effect associated with language and thus reduce the explanatory power of the language variable.

[5] In a regression model that controls for the level of education and years of Canadian work experience and Canadian study experience prior to landing, age at landing primarily captures the effect of years of foreign experience. Age at landing may overestimate years of foreign experience if an individual did not work in all years after schooling, it may underestimate years of work experience if individuals worked while studying.

[6] This is a proxy measure because it is possible that some study permit holders did not actually enroll with a Canadian educational institution at least in part of the period while they held the permit. This variable is derived from the temporary residents file.

[7] For instance, if a temporary foreign worker had earnings in five years in Canada before becoming landed immigrants, the highest annual earnings among the five years were used to represent pre-landing Canadian earnings. Maximum annual earnings are adjusted to 2017 constant dollars.

earnings[8] (measured in the year prior to landing) among all workers aged 20 to 64 years and with positive earnings:

- no pre-landing Canadian earnings;
- >0 and <= half of national median earnings;
- >half of national median and <= national median earnings;
- >national median earnings and <= 2*national median earnings; and
- > 2*national median earnings.

The number of categories used for each of the discrete variables, such as educational attainment, can influence the contribution of the variable to the R-squared of a regression model, given the chosen methodology described below. Typically, the more detailed a variable (e.g., the finer the education-level groupings), the greater the variation in earnings accounted for by that variable. For each discrete variable, this study employed the maximum number of categories available in the source data, unless such level of detail was not supported by sufficient sample size.

Methods

Various regression analyses are employed to determine which variables best "predict" the earnings of economic principal applicants. Regression models are constructed separately for initial earnings, medium-term earnings, and long-term earnings as described above. For all regression models, the outcome variable is the log of annual earnings. Two separate sets of regression models are run: the first set of models includes all the explanatory variables discussed above except for the level of pre-landing earnings. The second set of regression models adds the level of pre-landing earnings to the first set.

The analysis focuses on the extent to which an explanatory variable "accounts for" the variation in the earnings of principal applicants. Variables that account for a large share of the variation in earnings of immigrants are more important when attempting to predict an immigrants' earnings; while those that account for little of the earnings variation, less so. The most commonly used approach to assessing which explanatory variables best predict the dependent variable is the contribution of each explanatory variable to the overall R-squared—the "goodness of fit" statistic—in a regression equation (Nathans et al, 2012).[9] The R-squared statistic measures the share of the overall variation in the dependent variable (earnings) accounted for by the explanatory variables.[10]

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[8] The national median earnings are derived from the Longitudinal Administrative Databank for each tax year among workers aged 20 to 64 and with positive earnings. For example, the national median earnings (in 2017 constant dollars) was $37,100 in 2000 and $41,600 in 2017.

[9] The R-squared varies between 0 and 1. A low R-squared implies that knowledge of the independent variables will only account for a small proportion of the variation in the earnings of immigrants. A high R-squared implies that if the values of the independent (explanatory) variables are known, a regression model can fairly accurately estimate the value of the dependent variable (here earnings). An independent variable that contributes the most to the model R-squared is deemed to be most "important" in predicting immigrant earnings.

[10] Strictly speaking, the results on the importance of each explanatory variable based on its contribution to the model R–squared should not be inferred beyond the study sample. For example, if the 2008–2011 cohort of immigrants is used to estimate the model and the contribution of each explanatory variable to the R-squared, the results will definitely be applicable to that cohort. However, for a later cohort (say the 2012–2015), the relationship between the explanatory and outcome variables may have changed due to changes in economic conditions, changes in supply or demand for particular types of immigrants, or for other reasons. Hence, the R-squared cannot precisely determine the ability of the regression model to "predict" future values of the dependent variable, and the importance of each explanatory variable. However, the relative importance of the explanatory variables such as education, age, language, and work experience to "predict" earnings does not change significantly over short periods of time. Hence, the relative predictive power of the variables estimated by this study are useful in informing the point values in the future points system.

The analysis starts with the unique contribution of each variable to the overall R-squared value. The unique contribution of a specific factor to the R-squared is determined by first running the full model, and then dropping the variable of interest from the regression. The reduction in the R-squared is regarded as the explanatory or unique contribution of the variable of interest in explaining the variance of immigrant earnings (i.e., the R-squared).[11] One can think about this exercise as measuring the predictive power of adding (or dropping) each variable conditional on the other variables being present. In terms of developing a points system, this approach reflects a variable's unique contribution to a points system which includes all the other explanatory variables. Because only the explanatory or unique contribution of each variable is being captured, the contribution of all variables does not add up to the total R-squared value for the regression.

In addition to a factor's unique contribution, the factor can overlap with other factors in predicting the variance of the outcome variable. Put differently, a particular set of factors can operate in combination in predicting the outcome variable because they share variance with the outcome variable. Such "overlapping" effect is referred to as the common contribution of a set of factors.[12] The common contribution is determined with an approach that partitions the model R-squared into that unique to each explanatory variable and that associated with each possible combination of explanatory variables (the common variance). This "commonality analysis" (Nathans et al. 2012; Rowell 1996; Amado 1999) produces values of the unique and common contributions that sum to the total R-squared. The analysis of the common contribution of factors in this study focuses on the four explanatory variables that are seen to be the most significant predictors (i.e. have the highest unique contributions to the model R-squared), and the combinations of these variables likely contribute the most to the R-squared (i.e. the variables most likely to be correlated).[13]

Assessing the causal effect of a particular variable, say education, on immigrant earnings is not the primary objective of this analysis. The interest here is to get the best possible "fit" to the data using the variables available, which increases the model's predictive ability. In essence, the analysis is attempting to develop a prediction model using the variables that contribute most to the "goodness of fit". It is not problematic here if some of the variables are proxies for other unmeasured variables, as long as this proxy value remains more or less constant through time. For example, pre-landing Canadian work experience may be in part a proxy for other unmeasured variables, such as an understanding of the Canadian labour market, the availability of networks, and other unobserved variables. These proxy relationships could be the underlying reasons for the contribution of "Canadian experience" to the goodness of fit. That is acceptable since the inclusion of pre-landing Canadian work experience would capture the effects of those unmeasured factors in predicting immigrant earnings. Similarly, a variable like pre-landing Canadian earnings may be, in part, capturing unobserved and unmeasured ability and personal

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[11] Explanatory variables are often correlated, and there may be shared variance between the variables. For example, language skill (in English or French) and education may be correlated. When language is dropped, the R-squared is reduced by the amount of the explanatory effect of language on earnings. However, to the extent that language and education have overlapping effects, some of the "language effect" may still be reflected in the education variable.

[12] In the example above, language skills and education each had a unique contribution to the overall regression R-squared. But there may also be a contribution to the R–squared because they operate in combination with each other. If the common contribution of these factors to the overall R–squared is large relative to their respective unique contributions, these factors should be jointly targeted to better predict immigrant earnings. The common contribution of two factors could be negative, indicating the presence of suppressor effects (Nathans et al. 2012).

[13] As the number of explanatory variables increases, the number of possible combinations of these variables (in the common component) becomes large quite quickly. This makes both the analysis and its interpretation more difficult.

attributes such as interpersonal relationships, the quality of education, motivation, etc., above and beyond observed human capital factors such as education, language, and work experience.

To determine whether the relative importance of the variables may vary with time spent in Canada, the outcome variable is altered from earnings during the first two full years in Canada after landing, to earnings after 5 and 6 years, and finally earnings after 10 and 11 years following landing. The contribution of each variable to the R-squared in each of these three models is used to assess how that variable's relative importance changes with the increased length of residence in Canada.

This study also assesses the extent to which particular interaction terms might affect the predictive power of the regressions. For example, education may have much higher predictive power if it is interacted with French or English language ability. That is, education may have little predictive power (low R-squared) if immigrants have poor English or French language skills, but much higher predictive power if their language skills are strong. Poor language skills may prevent immigrants from economically benefitting from their higher education. If education is "interacted" with language skills in the regression equation, such effects can be captured. There may be important interaction effects between other variables as well. The importance of interaction effects is assessed by any increase in the regression R-squared when specific interaction terms are added.

Changes over the study period in the characteristics of economic principal applicants

The characteristics of the principal applicants included in this study changed somewhat between the 2005–2007 cohort and the 2012–2015 cohort. They became much younger, as the proportion under age 35 increased from 45% to 62% between the two cohorts (Appendix table 5). While remaining very highly educated, the educational level did decline somewhat. Eighty percent of the principal applicants in the 2005–2007 cohort held a university degree compared to 70% for the 2012-2015 cohort. Ability in the official languages improved, as the proportion speaking English or with an English mother tongue increased from 80% to 93% (principal applicants in Québec are excluded from the study). The proportion with Canadian work experience prior to landing increased significantly, from 24% in the earlier cohort to 62% in the 2012-2015 cohort. Similarly, the proportion with some Canadian education prior to landing rose from 13% to 27%. Finally, the proportion with a spouse declined somewhat from 68% to 53%, and the characteristics of the spouses changed in a manner similar to those of the principal applicants.

Which variables best predict earnings?

Predicting short-run earnings

To determine the best predictors of earnings in the short term – during the first two years following landing – ordinary least squares (OLS) regression analysis is used. The outcome variable is the log of annual earnings during the first two full years in Canada, and all the explanatory variables described in the methods section are included except for pre-landing Canadian earnings. The sample consists of economic immigrant principal applicants who were aged 20 to 54 years at landing and had at least $500 employment earnings in at least one of the first two years in Canada.[14] Regressions were run for three separate cohorts: the 2005–2007, 2008–2011, and 2012–2015 cohorts.

The objective here is to find out the extent to which a variable contributes to the "goodness of fit" as measured by an R-squared. Depending on the cohort, the R-squared for the short term earnings regression models (earnings during the first two full years after landing) varies between 14.9% (i.e., 0.149) and 17.3% (Table 1).[15] Clearly, much of the variation (between 83% and 85%) in individual entry earnings among principal applicants remains unexplained by the variables included in the models. Other unknown factors, likely many of them unobserved and difficult to measure, or factors that cannot be included in the selection criteria, account for the remainder of the variation.[16]

Pre-landing Canadian work experience was the most important predictor of earnings in the short term. When it was dropped from the regression equation, the R-squared value decreased by between 5.3 and 8.4 percentage points, depending on the cohort. Language was the other variable that had a substantial, but much lower, effect on the predictive power of the model. When it was dropped from the regression, the R-squared declined by between 0.9 and 1.5 percentage points. The unique R-squared associated with "Canadian study experience" ranged from 0.009 to 0.023 in predicting short-term earnings. There are some issues in using this variable to predict earnings, however. Appendix A provides a more detailed explanation. In short, the results for the "prior Canadian study" variable do not constitute suitable information on which to base point values in a selection system. The contribution of other variables was minimal.

As noted in the methods section, some of the explanatory variables may enhance each other's effect beyond the unique contribution of each variable to the R-squared that is noted above. Some variables will make a contribution to the R-squared through shared variance with another variable, or what is referred to in this approach as "common components" (Nathan, Oswald, and Nimon 2012; Rowell 1996). Among the examined common components, only the language–

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[14] Each of the first two years is a separate observation. Any year for which earnings were below $500 is dropped from the sample.

[15] These values of R-squared are in keeping with those obtained in some other studies. For example, in the report by Bonikowska, Hou and Picot (2015), the R-squared values in a similar model for short-term earnings of principal applicants was 0.096 for the 1997-1999 cohort and 0.136 for the 2002–2004 cohort. In studies on earnings of immigrants in general and with additional explanatory variables (e.g. source country, province of residence, and economic condition at landing), the R-squared value typically ranged from 0.10 to 0.20 (e.g., Aydemir and Skuterud 2005, Fortin, Lemieux, Torres 2016). The R-squared value can go up to 0.68 when establishment (unit of production for which the business maintains accounting records) fixed effects are controlled for, that is, sorting into different establishments is a key predictor of earnings (Aydemir and Skuterud 2005).

[16] Variables such as ability, motivation, skills and interpersonal relationships. Other variables that could perhaps be measured but for which data are not available may also play a role, such as the location/institution of study, the field of study, the occupation, the degree of success in the occupation, and so on.

work experience component makes a significant contribution to the R-squared (bottom of Table 1). This component contributed between 0.8% and 1.1% to the model R-squared, depending on the cohort. None of the other combinations have a substantial common contribution to the model predicting short-term earnings. Hence, of the variables available (and excluding the pre-landing Canadian education experience variable), language and pre-landing Canadian work experience are the two most important predictors of earnings in the short term, at least for the cohorts studied. The spousal variables have little effect on the predictive power of the short-term earnings regression model.

Table 1: **The relative importance of predictors of earnings for principal applicants in the economic class by years since landing and landing cohort**

| | 2012-2015 cohort | 2008-2011 cohort | | 2005-2007 cohort | | |
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	10 to 11 years
R-Squared of the full model	0.149	0.173	0.097	0.166	0.103	0.092
Unique contribution to the R-squared						
Age	0.001	0.002	0.007	0.003	0.010	0.020
Education	0.005	0.006	0.007	0.003	0.004	0.006
Language	0.010	0.009	0.009	0.015	0.009	0.006
Canadian work experience	0.075	0.084	0.032	0.053	0.026	0.018
Canadian study experience	0.009	0.023	0.005	0.020	0.004	0.002
Spouse	0.006	0.005	0.006	0.005	0.007	0.007
Spouse's education	0.002	0.001	0.001	0.001	0.002	0.001
Spouse's language	0.002	0.002	0.001	0.002	0.001	0.002
Spouse Canadian work experience	0.000	0.001	0.001	0.000	0.000	0.000
Spouse Canadian study experience	0.001	0.001	0.001	0.001	0.001	0.001
Contribution of selected common components to the R-squared						
Age, education	0.000	0.000	0.000	0.000	-0.001	-0.001
Age, language	0.000	0.000	-0.001	-0.001	-0.001	-0.001
Age, Canadian work experience	0.001	0.001	0.001	0.000	0.000	0.000
Education, Language	0.001	0.000	0.000	0.000	0.000	0.000
Education, Canadian work experience	-0.001	0.002	-0.003	0.004	0.002	0.001
Language, Canadian work experience	0.010	0.008	0.004	0.011	0.006	0.004

Note: The variables listed on the left-hand side of the table were measured at landing.
Source: Statistics Canada, Longitudinal Immigration Database.

Predicting medium-term earnings

An identical regression model has been run to determine the predictive power of the explanatory variables on earnings in the medium-term – after 5 to 6 years in Canada. The analysis is conducted for the 2005–2007, and 2008–2011 landing cohorts of principal applicants and with positive earnings in either years 5 or 6 after landing. The overall R-squared falls from around 16% in the short-term model to around 10% (9.7% and 10.3%) in the medium-term model (Table 1), indicating that the explanatory variables are better at predicting entry earnings than medium-term earnings. That is likely because, as immigrants acquire experience in Canada, a convergence in the values of these variables for entering immigrants occurs. For example if there is a large divergence in language ability at landing, which would affect earnings, this divergence would be reduced over time. After a few years, many immigrants who had poor official language skills would have improved them, the language ability gap among immigrants would have been reduced, and so the predictive power of language at landing would be reduced.

Of the variables included in the model for medium-term earnings, again pre-landing Canadian work experience was the best predictor of earnings. When this variable was dropped from the regression, the R-squared fell by between 2.6 and 3.2 percentage points depending on the cohort (Table 1). Language at landing, and age at landing also contributed to the R-squared, which fell by around one percentage point when each of these variables was dropped from the regression (Table 1). Having a spouse had a small effect on the predictive power of the model, as the R-squared fell by around 0.7 percentage points when this variable was dropped. Otherwise, as was the case with the short-term model, spousal characteristics had little effect on the model's predictive power. Similarly, the contribution of the explanatory variables through shared variance or common components contributed little to the predictive power of the model (bottom of Table 1). None of the common components contributed more than 0.6 percentage points to the R-squared. Pre-landing Canadian work experience, along with age at landing and language at landing contributed the most to the predictive power of the model.

Predicting long-term earnings

The cohort of principal applicants who landed between 2005 and 2007 is used to study earnings after 10 to 11 years in Canada – defined here as the long-term. The regressions are identical to those used in the short and medium-term results, and are displayed in Table 1.

The overall R-squared in the long-term model was 9.2% (Table 1). That is, after 10 to 11 years in Canada, the variables used in the model accounted for 9.2% of the variation in earnings among principal applicants. The variables included in the model do a poorer job predicting earnings in the longer term than in the short term. The share of variation in earnings accounted for by the variables, while low in all years, declines with years spent in Canada. Among the variables included in the regression model, age at landing and pre-landing Canadian work experience were the best predictors of long-run earnings. When age at landing was dropped from the regression, the R-squared fell by 2.0 percentage points. Age at landing is a better predictor of long-run than of short-run earnings. Pre-landing Canadian work experience contributed 1.8 percentage points to the R-squared. The predictive power of pre-landing Canadian work experience, while still substantial in the long-run, was weaker than in the short run. Education at landing, language at landing, and whether one had a spouse all contributed small amounts – around 0.6 percentage points each – to the R-squared. None of the selected common components in Table 1 contributed substantially to the R-squared value, suggesting that none of the main explanatory variables had a substantial effect on the R-squared by operating in combination with other variables.

Interaction Effects

In addition to variables such as education, language, and work experience alone affecting earnings, interaction effects may also matter. That is, the effect of these variables may differ depending on the value that other variables take. Such effects are referred to as interaction effects.[17] For example if there is an interaction between education and pre-landing Canadian work experience, then the effect of education on earnings differs depending on whether an individual has pre-landing Canadian work experience or not.

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[17] Having variables that interact with one another is different than having variables that have shared variation that results in the "common components" described earlier. A variable interacts with another if its effect on the dependent variable (in this case earnings) changes, depending on the value of the second variable with which it is interacting.

To determine if there are important interaction effects, interaction terms between the key explanatory variables are added to the models outlined in the earlier sections. These interaction terms are added one at a time, and dropped from the regression when a different interaction term is added.[18] In this way one can measure the effect of the addition of the interaction term on the R-squared value. The effect is simply the difference in the R-squared value between the regression with the interaction term in the regression and without it. The results are shown in Table 2. Among the interaction effects examined, those between pre-landing Canadian work experience and age at landing, and between pre-landing Canadian work experience and the level of education increased the R-squared by between 0.4 and 0.9 percentage points. These interaction effects had some effect on the predictive power of the models in both the short-term and medium-term, with little effect in the long-term, while the effects of other interaction terms were minimal.

Table 2:   The relative importance of interaction between factors in explaining earnings of principal applicants in the economic class by years since landing and landing cohort

	2012-2015 cohort	2008-2011 cohort		2005-2007 cohort		
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	10 to 11 years
R-Squared of the full model	0.149	0.173	0.097	0.166	0.103	0.092
Increase in R-squared when interaction is added						
Age + education	0.002	0.001	0.002	0.001	0.002	0.002
Age + language	0.003	0.002	0.002	0.001	0.001	0.001
Age + Canadian work experience	0.007	0.006	0.004	0.004	0.003	0.001
Age + Canadian study experience	0.001	0.001	0.001	0.001	0.000	0.001
Education + language	0.001	0.003	0.002	0.003	0.002	0.001
Education + Canadian work experience	0.009	0.007	0.006	0.005	0.005	0.004
Education + Canadian study experience	0.003	0.002	0.001	0.003	0.001	0.001
Language + Canadian work experience	0.001	0.001	0.001	0.001	0.001	0.001
Language + Canadian study experience	0.001	0.000	0.001	0.001	0.001	0.001
Canadian work experience × Canadian study experience	0.003	0.003	0.001	0.004	0.001	0.001

Source: Statistics Canada, Longitudinal Immigration Database.

A comparison with the results of an earlier study

Bonikowska, Hou and Picot (2016) conducted a very similar study that assessed which variables best predicted the earnings outcomes of principal applicants who landed in 1997–1999 and 2002–2004. The methodology and variables included were virtually identical in the earlier and current studies. Many of the conclusions were similar, but a few differences do stand out. The R-squared values were higher for the later cohorts used in this study (2005–2007, 2008–2011, and 2012–2014) than for the two cohorts of the earlier study. This was true for the short, medium and longer run results. For example, the R-squared values for the short-term prediction models were 9.6% and 13.6% for the earlier cohorts, and increased to between 14.9% and 17.3% for the later cohorts. In other words, the ability to predict the earnings of the principal applicants improved as one moves from the 1997–1999 cohort to 2012–2015 cohort.

This improvement was likely related to the increased predictive power of the "Canadian pre-landing work experience" variable. This variable was a much stronger predictor of earnings outcomes for the later than for the earlier cohorts. It was the strongest predictor, among those

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18 Due to their large number, the regression coefficients are not shown here but are available on request.

examined, in the short, medium and longer-term for the later cohorts. This was not the case for the earlier cohorts. Education was not as strong a predictor variable for the later cohorts as it was in the earlier cohorts. In all cohorts, the predictive power of education increased as one moved from the short-term to longer-term. However, while education was one of the major predictor variables in the long run for the earlier cohorts, this was not the case for the later cohorts. Nevertheless, the marginal effect of education on earnings remained substantial. Those with a bachelor's degree earned from 12% to 23% more than comparable principal applicants with only a high school education, although this "university wage premium" was smaller than that observed in the earlier cohorts. Finally, the variable "with a spouse at admission" did provide some predictive power in this study, although less than that of many of the other variables. This variable was not included in the earlier study. Spousal characteristics themselves (e.g. education age, etc.) provided little predictive power in both studies.

To summarize, in the short run, language and Canadian work experience were the strongest predictor variables for all five cohorts examined by the two studies, but Canadian work experience was much stronger as a predictor variable in the later cohorts examined by this study. In the medium-term, language and Canadian work experience were the best predictor variables in all five cohorts, along with age. Educational attainment was also one of the better predictor variables in the earlier cohorts, but not in the later cohorts. Finally, in the longer term Canadian work experience and age were the best predictors in the later cohorts, while education and age were the best predictor variables in the earlier cohorts. Education had been replaced by work experience as one of the best predictor variables in the longer run.

The marginal effects of the explanatory variables

The previous section examined the extent to which the explanatory variables can predict earnings after landing, the outcome variable. However, most economic analyses do not focus on this issue, but rather concentrate on the relationship between the explanatory variable and the outcome variable (in this case earnings), which is determined by the value of the coefficients on the explanatory variables (i.e., marginal effects). In the analysis for this report, these relationships should be considered correlational rather than causal.[19]

The marginal effects on short-run earnings

The regression coefficients are shown in Table 3 and the results are consistent with earlier work. Principal applicants who were older at landing, particularly those over age 45, earned less during the first two years than younger immigrants, adjusting for differences in other background characteristics. Among the latest cohort (2012–2015) those aged 45 to 49 years at landing earned about 6% less than those aged 25 to 29 years. The differences among age groups were greater in earlier cohorts (Table 3).

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[19] For example, there may be a positive correlation between the spouses' education and the principal applicants' earnings, but it may not be that the spouses' education increases the principal applicants' earnings; other factors correlated with spouses' education may be the cause of the increase in earnings of the principal applicants. There are also issues related to omitted-variables bias. For example, source region is not included in this analysis since it is not used as a selection variable, but the coefficients on the language variable may be reflecting to some extent the effect of source region, resulting in a bias in the language coefficients from a causal perspective. As noted in the Methods section, these issues are not a major concern for the purposes of this paper.

Table 3: **Part 1. Coefficients from ordinary least squares regression models predicting earnings of principal applicants in the economic class, by years since landing and landing cohort**

	2012-2015	2008-2011		2005-2007		
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	10 to 11 years
Intercept	10.404 ***	10.444 **	10.830 ***	10.527 ***	10.836 ***	11.025 ***
Age (reference: 25 to 29)						
20 to 24	-0.029 **	-0.005 *	0.000	0.043 *	-0.079 ***	0.002
30 to 34	0.007	0.007 **	0.026 ***	-0.048 ***	-0.058 ***	-0.051 ***
35 to 39	0.033 ***	0.009 **	0.011	-0.076 ***	-0.114 ***	-0.143 ***
40 to 44	0.005	-0.030 **	-0.077 ***	-0.133 ***	-0.210 ***	-0.267 ***
45 to 49	-0.059 ***	-0.109 **	-0.181 ***	-0.195 ***	-0.314 ***	-0.432 ***
50 to 54	-0.031 **	-0.161 *	-0.316 ***	-0.241 ***	-0.423 ***	-0.580 ***
Education (reference: bachelor's degree, >=15 years of schooling)						
Secondary or Less	-0.121 ***	-0.214 **	-0.235 ***	-0.111 ***	-0.150 ***	-0.206 ***
Trade Certificate	-0.065 ***	-0.044 **	-0.135 ***	0.064 ***	-0.061 ***	-0.181 ***
Non-University Certificate or Diploma	-0.183 ***	-0.189 **	-0.212 ***	-0.063 ***	-0.116 ***	-0.136 ***
Some University – No Degree	-0.159 ***	-0.187 *	-0.184 ***	-0.138 ***	-0.154 ***	-0.131 ***
Bachelor's degree, <=14 years of schooling	-0.102 ***	-0.059 **	-0.062 ***	0.031 **	0.002	-0.027 *
Master's degree, <=16 years of schooling	0.006	-0.119 *	-0.099 ***	-0.159 ***	-0.140 ***	-0.146 ***
Master's degree, >=17 years of schooling	0.020 ***	-0.108 **	-0.013 *	-0.064 ***	-0.006	0.018 *
Doctorate	0.116 ***	0.052 *	0.053 ***	0.114 ***	0.181 ***	0.180 ***
Language (reference: English mother tongue)						
Not speaking English or French	-0.474 ***	-0.557 *	-0.553 ***	-0.707 ***	-0.544 ***	-0.424 ***
Other mother tongue, bilingual	-0.334 ***	-0.364 *	-0.355 ***	-0.349 ***	-0.284 ***	-0.256 ***
Other mother tongue, French	-0.552 ***	-0.557 *	-0.522 ***	-0.660 ***	-0.559 ***	-0.400 ***
Other mother tongue, English	-0.340 ***	-0.317 **	-0.318 ***	-0.337 ***	-0.315 ***	-0.281 ***
Mother tongue French	-0.219 ***	-0.295 *	-0.267 ***	-0.178 ***	-0.167 ***	-0.241 ***
Years of Canadian work experience (reference: no)						
1	0.609 ***	0.671 **	0.420 ***	0.666 ***	0.464 ***	0.361 ***
2	0.671 ***	0.740 **	0.439 ***	0.798 ***	0.552 ***	0.461 ***
3	0.711 ***	0.791 **	0.475 ***	0.856 ***	0.620 ***	0.525 ***
4	0.740 ***	0.888 **	0.527 ***	0.922 ***	0.663 ***	0.590 ***
>=5	0.799 ***	1.063 *	0.629 ***	1.073 ***	0.721 ***	0.584 ***
Years of Canadian study experience (reference: no)						
More than 0 to less than 1	-0.210 ***	-0.283 *	-0.173 ***	-0.145 ***	-0.155 ***	-0.159 ***
1 to less than 2	-0.183 ***	-0.188 *	-0.119 ***	-0.099 ***	-0.053 *	0.015
2 to less than 3	-0.194 ***	-0.278 *	-0.188 ***	-0.357 ***	-0.166 ***	-0.111 ***
3 to less than 4	-0.287 ***	-0.591 *	-0.276 ***	-0.600 ***	-0.271 ***	-0.207 ***
4 to less than 5	-0.351 ***	-0.645 *	-0.248 ***	-0.752 ***	-0.301 ***	-0.192 ***
5 or more	-0.370 ***	-0.671 *	-0.330 ***	-0.748 ***	-0.379 ***	-0.253 ***

* Significantly different from reference category (p<0.05)
** Significantly different from reference category (p<0.01)
*** Significantly different from reference category (p<0.001)
Note: Independent variables in this table are measured at landing.
Source: Statistics Canada, Longitudinal Immigration Database.

Table 3: **Part 2. Coefficients from ordinary least squares regression models predicting earnings of principal applicants in the economic class, by years since landing and landing cohort**

| | 2012-2015 | 2008-2011 | | 2005-2007 | | |
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	10 to 11 years
With a spouse at admission	0.345 ***	0.253 *	0.279 ***	0.279 ***	0.305 ***	0.306 ***
Spouse education (reference: bachelor's degree, >=15 years of schooling)						
Secondary or Less	-0.093 ***	-0.067 **	-0.083 ***	-0.091 ***	-0.119 ***	-0.105 ***
Formal Trade Certificate or Apprenticeship	-0.147 ***	0.006 *	-0.018	-0.038 *	-0.070 ***	-0.079 ***
Non-University Certificate or Diploma	-0.107 ***	-0.072 **	-0.065 ***	-0.083 ***	-0.089 ***	-0.071 ***
Some University – No Degree	-0.074 ***	-0.034 *	-0.040 *	-0.086 ***	-0.065 ***	-0.029
Bachelor's degree, <=14 years of schooling	-0.028 **	0.059 **	0.031 **	0.030 *	0.018	-0.006
Master's degree, <=16 years of schooling	-0.093 ***	-0.158 *	-0.116 ***	-0.133 ***	-0.131 ***	-0.070 ***
Master's degree, >=17 years of schooling	0.048 ***	0.035 **	0.041 ***	0.022 *	0.021 *	0.016
Doctorate	-0.059 **	-0.039 *	-0.055 **	-0.059 *	-0.092 ***	-0.050
Spouse language (reference: English mother tongue)						
Not speaking English or French	-0.314 ***	-0.240 *	-0.229 ***	-0.271 ***	-0.208 ***	-0.217 ***
Other mother tongue, bilingual	-0.160 ***	-0.141 *	-0.152 ***	-0.101 ***	-0.067 **	-0.028
Other mother tongue, French	-0.217 ***	-0.399 *	-0.351 ***	-0.351 ***	-0.226 ***	-0.244 ***
Other mother tongue, English	-0.252 ***	-0.207 *	-0.182 ***	-0.177 ***	-0.137 ***	-0.147 ***
Mother tongue French	-0.069 *	-0.046 *	-0.014	-0.026	0.092	0.150 *
Spouse Canadian work experience (reference: no)						
1	0.080 ***	0.121 *	0.135 ***	0.029	0.012	0.021
2	0.050 ***	0.106 *	0.117 ***	0.066 **	0.058 **	0.123 ***
3	-0.002	0.015 *	0.020	0.072 **	0.106 ***	0.029
4	-0.035 *	0.023 *	0.014	0.119 **	0.013	0.049
>=5	-0.100 ***	0.000 *	-0.020	0.100 *	-0.020	-0.027
Spouse Canadian study experience (reference: no)						
More than 0 to less than 1	-0.026	-0.005 *	-0.052	-0.020	-0.007	-0.131 *
1 to less than 2	-0.096 ***	-0.106 *	-0.075 *	-0.130 ***	-0.043	-0.012
2 to less than 3	-0.102 ***	-0.201 *	-0.106 ***	-0.365 ***	-0.214 ***	-0.204 ***
3 to less than 4	-0.217 ***	-0.288 *	-0.199 ***	-0.319 ***	-0.169 ***	-0.184 ***
4 to less than 5	-0.192 ***	-0.276 *	-0.239 ***	-0.350 ***	-0.215 ***	-0.248 ***
5 or more	-0.164 ***	-0.252 *	-0.314 ***	-0.345 ***	-0.334 ***	-0.337 ***
sample size	288,264	220,185	227,168	144,920	145,981	114,262
Model R -square	0.149	0.173	0.097	0.166	0.103	0.092

* Significantly different from reference category (p<0.05)
** Significantly different from reference category (p<0.01)
*** Significantly different from reference category (p<0.001)
Note: Independent variables in this table are measured at landing.
Source: Statistics Canada, Longitudinal Immigration Database.

Educational attainment was positively correlated with entry earnings, but not as strongly as one might expect. Bachelor's degree holders (>=15 years of schooling) earned 12%-24% (or 0.111 to 0.214 log points) more than individuals with secondary education or less in the short-term, depending on the cohort. Compared with immigrants with a bachelor's degree, those with education below a bachelor's degree all showed lower entry earnings for all three landing cohorts. As will be seen, the effects of the educational attainment were stronger in the medium and long-term. These results are consistent with earlier research, which found that the earnings advantage that highly educated entering immigrants traditionally held over the less educated immigrants during the first few years in Canada was much reduced or disappeared among

cohorts entering after 2000. Earlier research also showed that since earnings increase much faster among the more highly educated new immigrants than others, the earnings advantage of the highly educated increases with years spent in Canada (Picot, Hou and Qiu 2016).

The correlation between language background and earnings was quite strong. For example, in the 2012–2015 cohort, principal applicants who spoke neither English nor French at landing earned 0.474 log points (38%) less than those with English as their mother tongue, after adjusting for other background variables.[20] The applicants who have a mother tongue other than English or French, but who spoke English or French at landing---the large majority of applicants---earned significantly less than those with English as a mother tongue, but more than those who spoke neither English nor French. The negative effect of having a mother tongue other than one of Canada's official languages decreased in the longer term, but not substantially.

The number of years of pre-landing Canadian work experience (i.e., the number of years with positive earnings prior to landing) made an important difference in earnings. Again for the 2012–2015 cohort, even one year of experience resulted in a 0.609 log points (84%) increase in earnings relative to those with no pre-landing Canadian work experience. This increased to 0.799 log points (122%) for those with five or more years of pre-landing Canadian work experience. It seems that having some pre-landing Canadian work experience (as compared to no such experience) is important for post-landing increases in earnings, but the number of years of such experience does not matter as much; the gain associated with having more years of such experience is relatively small.

The coefficients of "With a spouse at admission" in Table 3 refers to the differences in log earnings between a PA without a spouse at the time of admission and a PA with a spouse who held a bachelor's degree, had English as the mother tongue, had no Canadian work experience, and no Canadian study experience (i.e. the reference groups of the spousal characteristics variables in the model). Having such a spouse was positively correlated with earnings. Principal applicants with such a spouse tended to earn between 0.253 and 0.345 log points (or 29% and 41%) more than those without a spouse, controlling for other variables. The effect of having a spouse at the time of admission is conditioned on the spouse's characteristics. For instance, in the first two years after landing, PAs with a spouse who did not speak English or French, had a secondary or lower education, and had no Canadian work and study experience, would have earnings 5% to 8% lower than those of PAs without a spouse, depending on the landing cohort. The marginal effects (coefficients) associated with spouses' background variables tended to be similar to, but generally weaker, than the marginal effects described above for the principal applicants.[21]

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[20] This result may in part be reflecting the effect of source country, not language, on earnings. That is because source country is excluded from this regression, and language background and source country are highly correlated.

[21] In situations where the spouse had less than a bachelor's degree, for the latest cohort the principal applicant tended to earn perhaps 7% to 15% less than in situations where the spouse had a bachelor's degree. In situations where the spouse spoke neither English nor French, the earnings of the principal applicants tended to be 0.314 log points lower than if the spouses mother tongue was English or French. The spouses' years of Canadian work experience prior to landing was somewhat positively correlated with the principal applicants' entry earnings.

The marginal effects on medium-term earnings

Overall, the marginal effects of the explanatory variables on medium-term earnings were very similar to those observed in the short-term earnings model. There were a few differences, however. The negative correlation between age at landing and earnings was stronger. For example, principal applicants aged 50 to 54 earned between 0.316 and 0.423 log points (i.e., 27% and 35%) less than those aged 25 to 29 (Table 3). The education effect was also stronger. Individuals with secondary school or less earned between 0.150 and 0.235 log points (14% and 21%) less than those with a bachelor's degree. The association between language at landing and earnings was very similar to that observed in the short-run model. The correlation between years of pre-landing Canadian work experience and earnings was weaker than that observed in the short-run model, but remained quite strong. For example individuals with one year of pre-landing Canadian work experience earned between 0.420 and 0.464 log points (52% and 59%) more than those with no work experience. This difference was over 0.600 log points in the short-term earnings model. The positive effect of having a spouse (who had a bachelor's degree, English mother tongue, no Canadian work experience, and no Canadian study experience) on earnings changed little with years in Canada. As with the short-term model, the associations between spousal characteristics and medium-term earnings were similar to those observed for the principal applicants themselves, but generally weaker. There was little change between short-term and medium-term models regarding these variables.

The marginal effects on long-term earnings

The negative association between age at landing and earnings strengthens further in the long term model. For example, among the 2005–2007 cohort, those landing between the ages of 50 to 54 earned 0.241 log points (22%) less than those entering between ages 25 and 29 in the short run, 0.423 log points (35%) less in the medium term and 0.580 log points (44%) less in the long run (Appendix table 5). Overall, landing at age 45-49 or older was associated with an earnings disadvantage for all three landing cohorts and for short-term, medium-term or long-term earnings; the effect was stronger with time spent in Canada.

The positive effect of education on earnings tends to increase somewhat with years spent in Canada. The earnings advantage of bachelor's degree holders over those with secondary school or less increases from 0.111 log points (12%) in the short-term model to 0.206 log points (23%) in the long-term model. The positive effect of language at landing on earnings decreases with years spent in Canada. This is not surprising, as new principal applicants with poor official language skills would improve their skills. As a result, the effect of language at landing on earnings would weaken over time. For example, based on the 2005–2007 cohort results, in the short-run, individuals not speaking English or French at landing earned 0.707 log points (51%) less than those with English as their mother tongue. In the medium-term this declined to 0.544 log points (42%) and in the long run to 0.424 log points (35%).

The positive effect of years of Canadian work experience prior to landing on earnings weakened as immigrants spent more time in Canada. For example, in the short-term, those with one year of Canadian work experience earned 0.666 log points (95%) more than those with no prior to landing work experience. This declined to 0.464 log points (59%) in the medium-term, and to 0.361 log points (43%) in the long term. This result is also not surprising, as the immigrants with no pre-landing Canadian work experience would acquire Canadian experience with time spent in Canada, reducing the gap in factors rewarded in the Canadian labour market that existed between

them and those who had some experience prior to landing. This in turn would reduce the earnings gap between the two groups. The positive effect of having a spouse changed little with time spent in Canada. Similarly, the correlation between spousal characteristics and the earnings of principal applicants changed little over time.

To summarize, as the years in Canada increased for principal applicants, the negative effect of age at landing on earnings strengthened, as did the positive effect of educational attainment on earnings. The positive effect of language on earnings weakened, as did the positive effect of years of pre-landing Canadian work experience on earnings. The positive effect of having a spouse, and the correlation between spousal characteristics and the earnings of principal applicants changed little with years spent in Canada.

How does Canadian work experience moderate the effect of education and age on earnings?

The interaction between variables discussed earlier suggests that the effect of one variable may be conditioned on the value of another variable. To better assess the key interaction effects, separate regressions were run for two groups: those with some pre-landing Canadian work experience and those without. The coefficients of these models are presented in Appendix table 6. The focus in this section is on the results in the short-term and medium-term for the 2008–2011 cohort to reduce repetition in the discussion as the results were similar in the other cohorts. The general pattern also applies to long-term earnings for the 2005–2007 cohort.

The R-squared is much larger for individuals with pre-landing Canadian work experience (at 16.4% for the short-term and 10.1% in the medium-term) than for those without (at 3.8% and 4.5% respectively). Thus, the predictive power of the main explanatory variables is relatively weak for those principal applicants who do not have pre-landing Canadian work experience. Over 95% of the variation in earnings outcomes is left unexplained after accounting for differences in age, education, language, and so on. The predictive power of the same variables is much stronger among principal applicants with pre-landing Canadian work experience.

The effects of age and education at landing on earnings depend on whether the principal applicant had pre-landing Canadian work experience or not. As noted earlier, principal applicants who were older at landing tended to have lower earnings in both the short- and medium-term than younger (at landing) principal applicants. This result holds for those without pre-landing Canadian work experience, but for those with pre-landing Canadian work experience, there is no such negative effect, and older (at landing) principal applicants tend to earn more than younger ones, particularly in the short-run. That is, employers appear to be recognizing pre-landing Canadian work experience as beneficial, as is generally observed in Canadian labour market. In general, older workers with more work experience earn more than younger workers. In that sense, principal applicants with pre-landing Canadian work experience more closely resemble Canadian-born workers than those without.[22]

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[22] For example, for the 2008–2011 landing cohort, in the short run principal applicants aged 50 to 54 years without Canadian work experience earned 0.322 log points (28%) less than those aged 25 to 29. Among those with Canadian work experience, they earned 0.185 (20%) more. In the medium term, there was no difference in earnings between younger and older workers with pre-landing work experience, but among those without such experience, those aged 50 to 54 at landing earned 0.430 (35%) less than those aged 25 to 29 years.

The results for the effect of educational attainment are similar. Principal applicants with pre-landing Canadian work experience received a significant earnings premium for higher levels of education, as one would expect in a normal labour market. However, those without pre-landing Canadian work experience received a much smaller education premium. For example, in the medium-term, among principal applicants without pre-landing Canadian work experience, those with a bachelor's degree earned 0.097 log points (10%) more than those with secondary school or less. But for principal applicants with pre-landing Canadian work experience, this earnings premium was 0.383 log points (47%). Once again, principal applicants landing with previous Canadian work experience more closely resembled Canadian-born workers regarding the recognition of their higher education as demonstrated by the earnings premium.

How does official language proficiency moderate the effect of education and age on earnings?

The effect of educational attainment and age at landing (a proxy for work experience prior to landing) on earnings depends on the official language proficiency of principal applicants, in a similar way to that noted above regarding pre-landing Canadian work experience. To examine this effect, separate regressions were run for three language groups: those with an English or French mother tongue (likely the highest proficiency in official language), those with another mother tongue (other than English or French) but who speak English or French, and those who do not speak English or French at landing (Appendix table 7).[23] As above, the discussion here focuses on the results for the 2008–2011 cohort of economic principal applicants. The results are similar for other cohorts.

The earnings advantage of having a higher education is much greater among principal applicants with strong language skills at landing than among those with weaker skills. This may not be too surprising, since stronger language skills would likely facilitate the economic benefit of higher education. In the short run, entering principal applicants with an English or French mother tongue received a 0.251 log points (29%) earnings premium for having a bachelor's degree, when compared with those with secondary school or less. Among their counterparts who did not speak either official language at landing, there was no earnings advantage at all for having a bachelor's degree. The short run earnings advantage of having a bachelor's degree as compared with those with secondary school or less was between 0.117 and 0.219 log points (11%–20%) among principal applicants with a mother tongue other than English or French who spoke English or French at landing. These differences changed somewhat in the medium-term, as immigrants who entered with no official language skills acquired some official language ability but a gap remained. In the medium-term, the bachelor's degree earnings premium (compared to those with secondary school or less) was 0.197 log points (22%) among individuals whose mother tongue is English or French and 0.250 log points (28%) among those with another mother tongue (other than English or French) who speak English or French, but only 0.119 (13%) for those who landed with no ability to speak English or French. The interaction effect of education

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[23] Among the 2012–2015 arrival cohort of economic PAs in our study sample, 4% did not speak English or French at landing, 83% had a mother tongue other than English or French but spoke English or French, and 13% had an English or French mother tongue. The corresponding percentages are 7%, 80% and 13% for the 2008–2011 cohort; and 12%, 75% and 13% for the 2005–2007 cohort.

and language may also be in part related to the effect of country of education[24] or source country which were not controlled for in the analysis[25].

Language ability also affected the association between age at landing (a proxy for work experience prior to landing) and earnings, particularly in the medium-term. Among individuals with an English or French mother tongue, workers aged 45 to 49 years at landing earned 0.061 log points (6%) more than those entering at age 25 to 29. But among individuals who did not speak English or French at landing, 5 to 6 years after landing 45 to 49-year-olds earned 0.418 log points (34%) less than their 25 to 29-year-old counterparts, after adjusting for other background differences. Once again, employers appear to treat the work experience of individuals with an English or French mother tongue more like they would treat a Canadian-born worker (Warman 2010). Those who do not speak English or French at landing do not receive any remuneration for work experience prior to landing. This may be related in part to country of origin, which is not controlled for (see footnote 9). Interestingly, the returns to Canadian work experience prior to landing are similar for both those with an English or French mother tongue and those who did not speak either language at landing. Both groups received a significant wage premium for pre-landing Canadian experience (roughly 0.420 log points or 52%) for one year of experience compared to those with none (Appendix table 7).

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[24] The IMDB has the information on country of birth of immigrants, but does not have the information to identify country of highest education.

[25] Immigrants with an English or French mother tongue are more likely to come from and have been educated in a Western country than those who did not speak English or French at landing. Country of education in particular is correlated with post-landing earnings. Country of origin and/or country of education were not controlled for in the regression. Hence, the language variable may be in part picking up effects associated with these factors.

Earlier research has shown that pre-landing earnings in Canada are highly correlated with post-landing earnings, both in the short and long run. Principal applicants with high levels of pre-landing Canadian earnings entering during the late 2010s earned twice as much in the short-run as compared to immigrants without pre-landing Canadian earnings, after adjusting for background characteristics like education and age. This earnings advantage persisted, but decreased in magnitude in the long-run. In contrast, there was little difference in earnings between principal applicants with low pre-landing Canadian earnings and those who had no pre-landing Canadian earnings (Hou, Crossman and Picot 2020).

As noted earlier, the primary goal of this analysis is to determine which variables best predict post-landing earnings. If the objective was to determine what "causes" various levels of post landing earnings, including pre-landing earnings in the regression would not be reasonable. High pre-landing earnings clearly do not "cause" high post-landing earnings. However if the objective is prediction not causal explanation, pre-landing earnings are a good predictor of post-landing earnings, and hence pre-landing earnings can be a valuable variable in this research. Earnings prior to landing likely capture a number of important unobserved characteristics, usually human capital related, that affect post-landing earnings. The results show that pre-landing earnings are by far the best predictor of post-landing earnings among all variables included in the analysis.

First, the R-squared increases significantly in all the models when pre-landing earnings is added (Table 4). The R-squared value for the short-run models ranges between 21.0% and 25.7%, depending on the cohort. This is an increase from between 14.9% and 17.3% in the models without pre-landing earnings (Table 1). Thus, the share of the variation in principal applicants' short-run earnings accounted for by the models increases from around 16% to around 23%. As before, the models do less well in predicting medium- and long-term than short-term earnings, but there is still a significant improvement.[26]

The unique contribution of pre-landing earnings to the R-squared of the short-run model was quite high at 10.7 percentage points (for the 2012–2015 cohort). This is much higher than the unique contribution observed by any other variable in earlier models, demonstrating the much stronger predictive power of this variable. This unique contribution was somewhat lower among earlier cohorts (Table 4), possibly because this variable has become more important in recent cohorts due to the increase in the share of entering immigrants who had high pre-landing earnings. The contribution of pre-landing earnings to the R-squared diminished in predicting longer-term earnings. Among the 2005–2007 cohort, for example, its contribution fell from 4.4 percentage points in the short-term model, to 2.5 percentage points in the medium-term model, and further to 1.6 percentage points in the long-term model. With pre-landing earnings in the model, the unique predictive power of the other variables falls to almost zero (Table 3). From a forecasting perspective, pre-landing earnings serves as a proxy for the other variables such as education, work experience, language and age, absorbing much of their predictive capability.

The only "common component" of any importance in this model was the component combining the years of pre-landing work experience with pre-landing Canadian earnings. This component added between 5.2 and 8.2 percentage points to the R-squared in the short-term model, 2.4 to 3.0

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[26] The R-squared for the medium term model increases from around 10% to around 13%, and for the long term model from 9% to 11%.

percentage points in the medium-term model and 1.7 percentage point in the long-run model. Again, the most important contribution of this component was the more reliable prediction of short-run earnings. All other selected common components were close to zero.[27]

Table 4: **The relative importance of predictors of earnings for principal applicants in the economic class by years since landing and landing cohort, with pre-landing Canadian earnings as a predicator**

| | 2012-2015 cohort | 2008-2011 cohort | | 2005-2007 cohort | | |
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	10 to 11 years
R-Squared of the full model	0.257	0.252	0.143	0.210	0.127	0.108
Unique contribution to the R-squared						
Age	0.001	0.003	0.009	0.004	0.011	0.022
Education	0.001	0.002	0.003	0.002	0.002	0.004
Language	0.002	0.004	0.006	0.012	0.007	0.004
Canadian work experience	0.001	0.002	0.001	0.001	0.001	0.000
Canadian study experience	0.001	0.002	0.000	0.001	0.001	0.001
Spouse	0.003	0.003	0.004	0.004	0.006	0.006
Spouse's education	0.001	0.001	0.001	0.001	0.002	0.001
Spouse's language	0.001	0.001	0.001	0.002	0.001	0.001
Spouse Canadian work experience	0.000	0.000	0.000	0.000	0.000	0.000
Spouse Canadian study experience	0.000	0.000	0.000	0.000	0.000	0.000
Pre-landing earnings in Canada	0.107	0.079	0.047	0.044	0.025	0.016
Contribution of selected common components to the R-squared						
Age, education	0.000	0.000	0.000	0.000	0.000	-0.001
Age, language	0.000	0.000	0.000	0.000	-0.001	-0.001
Age, Canadian work experience	0.000	0.000	0.000	0.000	0.000	0.000
Education, Language	0.000	0.000	0.000	0.000	0.000	0.000
Education, Canadian work experience	0.000	0.000	0.000	0.000	0.000	0.000
Language, Canadian work experience	0.000	0.000	0.000	0.000	0.000	0.000
Age, pre-landing earnings in Canada	-0.001	-0.001	-0.002	-0.001	-0.002	-0.001
Education, pre-landing earnings in Canada	0.004	0.003	0.003	0.001	0.001	0.002
language, pre-landing earnings in Canada	0.007	0.004	0.003	0.003	0.002	0.002
Year of work experience, pre-landing earnings in Canada	0.074	0.082	0.030	0.052	0.024	0.017

Note: The variables listed on the left-hand side of the table were measured at landing.
Source: Statistics Canada, Longitudinal Immigration Database.

Not surprisingly the association between pre-landing Canadian earnings and post-landing earnings is quite strong relative to all other variables (Appendix table 8). For example, for the 2012–2015 cohort, entering principal applicants with more than twice the national median annual earnings prior to landing earned 1.493 log points (or 3.4 times) more than their comparable counterparts with no pre-landing earnings. It is important to note that this is after accounting for any differences in the other explanatory variables such as education, language, age, years of Canadian work experience, and so on. There was no earnings advantage (compared to those with no pre-landing earnings) for those with less than half the national median Canadian earnings prior to entry. Those with between 1.0 and 2.0 times the national median prior to entry had a 0.805 log points (124%) earnings premium over those with no pre-landing earnings. This

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[27] Note the sum of the unique contributions and the selected common components do not equal to the total model R-squared. For instance, in the model for the 2012–2015 cohort in the 1 to 2 years, the sum of the unique contributions and the selected common components is 0.205, about 0.052 smaller than the total R-squared. That is because there are numerous other common components involving all the possible combinations of two variables, three variables, up to 10 variables. The R-square contribution associated with each of these common components is small, but together they contribute 0.052 to the total model R-squared.

earnings premium declined somewhat, but not a lot, when moving from short- to medium- to long-term earnings outcomes.[28] Thus, even after controlling for observable background characteristics, individuals with moderate to high pre-landing Canadian earnings experienced a significant earnings premium over those with no such pre-landing earnings in both the short- and long-term.

Furthermore, the association between almost all other principal applicant characteristics and earnings was much weaker when pre-landing Canadian earnings was added to the model (Appendix table 8). The one exception was age at entry, which changed little. In particular, years of Canadian work experience became virtually statistically insignificant. This phenomenon was observed for short run, medium run and long run earnings. This of course should not be interpreted in any causal manner. Rather, not surprisingly pre-landing Canadian earnings are correlated with all of these variables, and hence when added to the model, captures much of the variance that previously was ascribed to education, language, and so on.

How do pre-landing Canadian earnings moderate the effect of age and education on earnings?

It was observed earlier that the effect of education and age (a proxy for work experience prior to landing) on earnings was substantially different for those with and without pre-landing Canadian work experience. This suggests that principal applicants with pre-landing Canadian experience had outcomes closer to those expected for Canadian workers in a normal labour market. The same may be true for individuals with and without pre-landing Canadian earnings, or with low versus high pre-landing earnings.

To examine this question, regression models are run separately for principal applicants without, with low (<= national median earnings) and high (>national median earnings) pre-landing Canadian earnings (Appendix table 9). The discussion here focuses on the 2008–2011 cohort and short-run and medium-run earnings. Among principal applicants with no pre-landing Canadian earnings, immigrants who were older at entry had substantially lower earnings than those entering in their youth, both in the short run and medium run, and even in the long-term.[29] Among those with high pre-landing Canadian earnings, older workers at entry earned more than younger arrivals.[30] They seem to have received remuneration for pre-landing work experience, as one would expect, at least in the short-run. That may not have been true in the medium-term, since age at landing had little effect on medium-term earnings.

The effect of education on earnings also differed significantly between those with and without pre-landing Canadian earnings. Among the group with no such earnings, there was little difference in both short-run and medium-term earnings between those with secondary school or less and a bachelor's degree (Appendix table 9). But among principal applicants with high pre-landing Canadian earnings, there was a significant earnings premium for having a bachelor's

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[28] For example among the 2005–2007 cohort, 10 to 11 years after landing, principal applicants with more than twice the national median earnings prior to landing earned 1.019 log points (177%) more than those without pre-landing earnings. This earnings advantage for other groups was 0.180 log points (20%) for those with between 0.5 and 1.0 national median earnings, and 0.360 log points (43%) for those with 1.0 to 2.0 national median earnings prior to landing.

[29] Those entering at age 50 to 54 earned 0.323 log points less in the short run than those entering at age 25 to 29. The difference was even greater in the medium term and the long run (Appendix table 5).

[30] Those entering at age 50 to 54 earned 0.251 log points more than those entering at age 25 to 29 in the short run. There was little difference in medium-term earnings across the age distribution.

degree. They earned roughly 0.450 log points (57%) more than those with secondary school or less in both the short-run and medium-term.

An important finding from the analysis by level of pre-landing Canadian earnings is that returns to human capital (particularly age at landing and education) were broadly similar for principal applicants without pre-landing Canadian earnings and those with low pre-landing earnings. In other words, immigrants with a low level of pre-landing Canadian earnings face similar difficulties as immigrants without pre-landing Canadian work experience in transferring their human capital into the labour market. This finding applies to all three cohorts of principal applicants in this study.

Conclusion

This paper asks which of the common immigration selection factors best predict earnings of economic principal applicants. The predictive power of the variables is assessed for short-run earnings (1 to 2 years after landing), medium-term earnings (5 to 6 years after landing) and long-run earnings (10 to 11 years). The variables include those available to be utilized in an economic immigrant selection system.[31] In addition to assessing the predictive power of such variables, some discussion of the marginal effects of these variables on earnings is included. These are two different questions and utilize different statistical measures to answer.

The predictive power of selection factors is indicated by the proportion of the variance in post-immigration earnings that these factors can account for, which is measured by the R-squared value of a regression model predicting post-immigration earnings.[32] Together, the immigration selection factors considered in this report account for roughly 15% of the variation in the short-run earnings of principal applicants. The remaining 85% is due to unobserved factors.[33] The predictive power of these factors is at its best in the short run. Their ability to predict earnings declines with years in Canada, falling to around 10% in the medium term, and 9% in the long run. The ability of these factors to account for the variation in earnings among principal applicants is much weaker for those who had no pre-landing Canadian work experience (accounting for around 4% of the short-term earnings variation) compared to those who had pre-landing Canadian work experience (about 16%).

Of the variables included, pre-landing Canadian work experience makes the largest unique contribution to the prediction of post-landing earnings, particularly in the short run, but also in the medium and long run. Language at landing is another key predictor of short-run earnings. Pre-landing Canadian work experience, language at landing, and age at landing are the best predictors of medium-run earnings. Age at landing and pre-landing Canadian work experience are the best predictors of long-run earnings. Younger age at landing, often used as a proxy for fewer years of foreign work experience when education and Canadian work experience are taken into account, is a better predictor in the long run than in the short run.

The lower predictive power of the selection factors in the long run is likely due in part to the fact that as immigrants acquire experience in Canada, a convergence in the values of these factors occurs. For example, after a few years, many immigrants who had poor official language skills would have improved them, the language ability gap among immigrants would have been reduced, and so the predictive power of language at landing would be reduced.

The interaction of one variable with another could affect earnings outcomes. Interaction refers to the situation when the effect of one factor is conditioned on the level of another factors. For

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[31] They include age, education, and language, all at landing, pre-landing Canadian work experience, pre-landing Canadian education experience, whether the applicant has a spouse, and background characteristics of the spouse. Pre-landing Canadian earnings is also used in one set of models.

[32] The total R-square value of regression models consists of the unique contribution associated with each selection factor, and the shared contribution associated with the combination of factors. In the current study, the shared contributions are generally very small.

[33] The selection variables such as education, age, language, etc., do improve the ability to predict the earnings outcome of a potential immigrant. However, there are many factors not included in the selection system that have a strong impact on outcomes. These could include potentially measurable variables such as field of study, location/institution of study, and occupation in the home country, and other largely unmeasurable variables such as motivation, interpersonal relations, networks, past labour market success and so on. Previous Canadian work experience, and the temporary foreign worker's success with such experience as measured by earnings, can serve as a proxy for some of the unknown factors. It should be recalled, however, that factors such as education, age, and language skills do have a significant effect on earnings, as noted earlier.

example, individuals with poor language abilities could be less able to achieve the earnings premium associated with education. In the current CRS, transferability factors are designed to reflect interaction effects.[34] The analysis indicates that the effect of interaction terms examined by the models on the predictive power of the models was generally small. Only two interactions had some small effects: the educational level at landing with Canadian work experience, and age at landing with Canadian work experience.

In general, the spousal variables had little effect on the predictive power of the models focusing on earnings of economic principal applicants.

When pre-landing Canadian earnings was added to the model with the variables mentioned above, the predictive power of the models improved considerably. With this addition, the share of the variation in short-term earnings accounted for by the model increased from 15% to 26%. Pre-landing Canadian earnings was by far the single most effective variable in predicting post-landing earnings. The unique contribution of other variables to the predictive power fell to almost zero when pre-landing Canadian earnings was added. Like many other variables (except age at landing), its predictive ability declined with years in Canada, but remained strong.

Regarding the marginal effects of the variables on earnings, the results were similar to those observed in an earlier study (Bonikowska et al. 2015). These marginal effects should be considered as correlational, not causal. Education at landing had a weak positive effect on short-term earnings, but a stronger positive effect on long-term earnings. That is because earnings increase faster with years in Canada for those highly educated than for less educated immigrants. Furthermore, education has a much larger positive effect on earnings for immigrants with strong language skills and pre-landing Canadian work experience.

Age at landing (often a proxy for foreign work experience) matters. Immigrants who are older at landing tend to earn less than those who are younger, but this negative effect is not observed among immigrants with pre-landing Canadian work experience. These entrants more closely resemble Canadian-born workers as they appear to receive remuneration for work experience.

Years of pre-landing Canadian work experience are strongly positively correlated with earnings after landing, but this correlation weakens with time spent in Canada. Language background at landing is strongly positively associated with earnings. Entering economic principal applicants who have a spouse with good official language ability and a university education tend to earn more than those who do not, after controlling for other factors. The spousal background variables such as education, language, and age at landing tend to have weaker effects on earnings of the principal applicant than what is observed for the principal applicants themselves. The low predictive power and small marginal effect of spousal background variables on principal applicants' earnings suggests that these variables contribute little to the prediction of the principal applicants' earnings. However, although not part of this study, there is another way to look at these results. It seems likely that while their effect on principal applicants' earnings may be weak, they are likely good predictors of the spouses' own earnings. Selecting spouses with

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[34] Empirical studies show that the transferability of foreign education and work experience of immigrants in the destination country tends to be higher among those with a good proficiency of the official language and destination-country work experience (Bonikowska, Hou and Picot 2015). In the CRS, transferability factors assign additional points to a post-secondary degree and foreign work experience if the applicant also has good official languages proficiency and Canadian work experience. https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/express-entry/eligibility/criteria-comprehensive-ranking-system/grid.html

higher points levels (and hence likely higher earnings) would increase family income, and hence the outcome of economic immigrants in general.

For reasons discussed in Appendix A, pre-landing Canadian study, while included in the analysis, does not provide results that are usable as background information for the selection system.

Finally, the level of pre-landing earnings was strongly positively correlated with post-landing earnings. Immigrants with low pre-landing earnings experienced little or no earnings advantage relative to those without pre-landing earnings, but the advantage was significant for those with higher pre-landing earnings. It is important to recall that this is after accounting for effect of background variables such as education, language, and age. Pre-landing earnings is strongly positively correlated with earnings within education, language, and age groups.

Pre-landing Canadian earnings as a factor in the immigrant selection system

As noted above, the pre-landing Canadian earnings variable is by far the best predictor of post-landing earnings among those variables included in the analysis. It is not surprising that pre-landing Canadian earnings are highly correlated with post-landing earnings – past outcomes are often the best predictors of future outcomes. In essence, pre-landing Canadian earnings capture a number of otherwise unobserved characteristics of potential applicants that are correlated with higher earnings. The effect of these characteristics are above and beyond those of education, language ability, and work experience that are controlled for in the analysis. Such unobserved characteristics likely include interpersonal relations, problem-solving ability, communication skills, language proficiency not measured by the self-reported language variables, the quality of education received, and so on. Pre-landing Canadian earnings likely reflect "realized market value" of immigrants' skills and qualifications (Hou and Picot 2016). While "years of pre-landing Canadian work experience" captures the **quantity** of pre-landing work experience, it does not capture the **quality** of work experience to the same extent as the level of pre-landing Canadian earnings.

Pre-landing Canadian earnings are the best predictor of immigrants' post-landing earnings, as the regression results show clearly, and including pre-landing Canadian earnings increases the models' predictive power considerably[35]. Since earnings outcomes are an important consideration for selecting economic principal applicants, including pre-landing Canadian earnings would improve immigrants' economic outcomes and the effectiveness of the selection system.

However, there are some reasons to be cautious when including this factor in the points system. Allocating a too large number of points to this factor could lead to temporary foreign workers becoming the primary source of economic immigration. This result could increasingly move the selection power away from the government into the hands of individual firms and employers. Employers hiring temporary foreign workers may prioritize short-term labour needs; their interest are not always in line with the government's longer-term objectives related to competitiveness and human capital development (Crossman, Hou and Picot, 2020). Caution would then be necessary when determining the number of points allocated to pre-landing earnings.

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[35] For example, the proportion of the variation in earnings among the principal applicants accounted for by selection variables (i.e., the R-squared) increases from between 15% to 17% without the variable, to 21% to 26% with the variable in the short term model. An improvement is also seen in the medium and longer term prediction models, although to a lesser extent. The R-squared increases from roughly 10% to 13% in the medium-term models and 9% to 11% in the longer term models.

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Appendix A: Interpreting the "Years of Canadian Study" effect

The regression results in Appendix table 5 indicate that the number of years of study in Canada prior to landing is negatively correlated with earnings, particularly in the initial years after landing. For example, in the 2012–2015 cohort, those with 2 to 3 years of Canadian study prior to landing earned 0.194 log points (18%) less than those with no Canadian study. This seems counterintuitive, although it is consistent with the findings of earlier research (Bonikowska, Hou and Piot 2015). There are a number of reasons for this result.

First, without controlling for any other selection factors, there is a positive correlation between Canadian study before landing and short-term earnings after landing. This association becomes negative after controlling for many other background characteristics, including educational attainment (e.g. holding a bachelor's degree), years of Canadian experience and official language. It is possible that with similar observable characteristics, former international students have lower unobserved abilities or motivations than other economic immigrants. In explaining a similar finding in the United States, Lowell and Avato (2014) suggest that those who first come to pursue US education are likely not as highly selected as economic immigrants who have to demonstrate their skills and job-ready abilities to be sought out abroad by US employers. An Australian study also finds that many former international students do not have advanced English ability and are in low-demand fields of study, and thus fare poorly in employment and earnings compared with other skilled immigrants (Hawthorne and To 2014).

Second, immigrants who studied in Canada before landing are more likely to engage in further studies after landing. In the study sample, 16.6% of immigrants who studied in Canada before landing were attending school while reporting employment earnings during the first full year after landing, compared with only 5.5% among immigrants who did not study in Canada before landing. As a result, those with prior Canadian study would be seen to be earning less than those without.

Third, the negative result for Canadian study regarding short-term earnings was evident primarily among principal applicants who had previous Canadian work experience. For those without such experience, prior Canadian study tended to have no significant effect on short-term earnings (Appendix table 6). Again, negative selection is a likely explanation. It is possible that temporary foreign workers who could find and held high-paying jobs before landing may not have the need to pursue Canadian education, and they maintained such advantage after immigration. In contrast, those who could not find high-paying jobs before landing may choose to pursue Canadian education as a way to improve their qualifications, and they may be more likely to continue schooling after landing and reduce working time.

Appendix B: Tables

Table 5:   Descriptive statistics of variables among principal applicants in the economic class who filed income tax in the first full year after landing

	Landing years		
	2012 to 2015	**2008 to 2011**	**2005 to 2007**
Age group at admission			
20 to 24	4.2%	2.8%	1.5%
25 to 29	29.1%	23.3%	16.9%
30 to 34	28.3%	24.9%	27.0%
35 to 39	18.4%	20.7%	23.2%
40 to 44	11.1%	15.0%	17.7%
45 to 49	6.2%	9.4%	10.3%
50 to 54	2.7%	4.0%	3.5%
Education at admission			
Secondary or Less	10.2%	9.3%	4.6%
Trade Certificate	6.4%	6.4%	4.1%
Non-University Certificate or Diploma	9.8%	12.5%	9.4%
Some University – No Degree	3.9%	1.1%	2.2%
Bachelor's degree, <=14 years of schooling	8.6%	7.6%	5.5%
Bachelor's degree, >=15 years of schooling	35.4%	36.6%	45.5%
Master's degree, <=16 years of schooling	2.3%	2.2%	3.3%
Master's degree, >=17 years of schooling	20.6%	20.3%	21.0%
Doctorate	2.9%	3.9%	4.5%
Language at admission			
Not speaking English or French	3.9%	7.0%	12.6%
Other mother tongue, bilingual	2.2%	4.2%	5.5%
Other mother tongue, French	0.1%	0.3%	0.4%
Other mother tongue, English	80.6%	75.1%	68.8%
Mother tongue French	1.2%	1.1%	0.8%
English mother tongue	12.0%	12.4%	11.8%
Years of Canadian work experience at admission			
1	4.1%	5.4%	4.1%
2	12.8%	12.5%	6.3%
3	16.5%	12.3%	5.8%
4	12.8%	6.8%	4.0%
>=5	16.1%	7.0%	3.8%
No Canadian work experience	37.6%	56.0%	76.0%
Years of Canadian study at admission			
More than 0 to less than 1	1.6%	0.6%	0.5%
1 to less than 2	6.2%	2.0%	1.2%
2 to less than 3	6.0%	2.3%	2.0%
3 to less than 4	3.4%	2.4%	2.3%
4 to less than 5	3.5%	3.3%	2.7%
5 or more	6.7%	7.3%	4.2%
No Canadian education experience	72.6%	82.1%	87.1%

Table 5 continued….

	Landing years		
	2012 to 2015	**2008 to 2011**	**2005 to 2007**
With a spouse at admission			
No	47.0%	38.2%	32.5%
Yes	53.0%	61.8%	67.5%
Spouse education at admission			
No spouse	47.0%	38.2%	32.5%
Secondary or Less	10.1%	13.4%	11.9%
Formal Trade Certificate or Apprenticeship	2.5%	3.1%	3.3%
Non-University Certificate or Diploma	5.0%	7.9%	8.8%
Some University – No Degree	2.4%	1.3%	3.7%
Bachelor's degree, <=14 years of schooling	4.8%	5.6%	5.3%
Bachelor's degree, >=15 years of schooling	17.9%	20.8%	24.3%
Master's degree, <=16 years of schooling	1.4%	1.5%	2.0%
Master's degree, >=17 years of schooling	8.3%	7.2%	7.1%
Doctorate	0.7%	1.0%	1.1%
Spouse language at admission			
No spouse	47.0%	38.2%	32.5%
Not speaking English or French	5.5%	8.9%	17.1%
Other mother tongue, bilingual	0.9%	1.7%	2.0%
Other mother tongue, French	0.1%	0.2%	0.4%
Other mother tongue, English	41.5%	44.1%	40.8%
Mother tongue French	0.3%	0.3%	0.3%
English mother tongue	4.7%	6.6%	6.9%
Spouse Canadian work experience at admission			
No spouse	47.0%	38.2%	32.5%
1	3.6%	3.5%	2.1%
2	3.6%	3.1%	2.0%
3	2.5%	1.8%	1.2%
4	1.5%	0.8%	0.5%
>=5	1.4%	0.7%	0.4%
No Canadian work experience	40.5%	51.9%	61.2%
Spouse Canadian education at admission			
No spouse	47.0%	38.2%	32.5%
More than 0 to less than 1	0.2%	0.2%	0.2%
1 to less than 2	0.7%	0.4%	0.4%
2 to less than 3	0.7%	0.5%	0.4%
3 to less than 4	0.4%	0.3%	0.4%
4 to less than 5	0.4%	0.3%	0.3%
5 or more	0.7%	0.8%	0.4%
No Canadian education	49.9%	59.3%	65.3%
Pre-landing Canadian earnings at admission			
No Canadian work experience	37.9%	56.4%	76.7%
> 0 and<= 50% national median earnings	4.8%	5.6%	5.8%
> 50% national median, <= national median	24.8%	13.7%	5.9%
>national median, <= 2*national median	22.2%	15.2%	5.7%
> 2*national median	10.3%	9.2%	6.0%
Sample size	142,822	108,143	71,379

Source: Statistics Canada, Longitudinal Immigration Database.

Table 6: Coefficients from ordinary least squares regression models predicting employment earnings of principal applicants in the economic class, by years since landing and presence of pre-landing Canadian work experience

| | 2012–2015 cohort | | 2008–2011 cohort | | | | 2005-2007 cohort | | | | | |
| | 1 to 2 years | | 1 to 2 years | | 5 to 6 years | | 1 to 2 years | | 5 to 6 years | | 10 to 11 years | |
	Without Canadian work experience	With Canadian work experience	Without Canadian work experience	With Canadian work experience	Without Canadian work experience	With Canadian work experience	Without Canadian work experience	With Canadian work experience	Without Canadian work experience	With Canadian work experience	Without Canadian work experience	With Canadian work experience
Intercept	10.455 ***	11.077 ***	10.431 ***	11.245 ***	10.846 ***	11.288 ***	10.506 ***	11.408 ***	10.838 ***	11.394 ***	11.011 ***	11.522 ***
Age (reference: 25 to 29)												
20 to 24	-0.067 **	-0.006	-0.045 *	0.02	-0.133 ***	0.097 ***	-0.029	0.134 ***	-0.134 ***	0.03	-0.07	0.112 **
30 to 34	0.042 ***	-0.001	0.013	-0.029 ***	0.039 ***	-0.027 **	-0.061 ***	-0.047 ***	-0.069 ***	-0.064 ***	-0.047 ***	-0.087 ***
35 to 39	0.02 *	0.075 ***	-0.043 ***	0.086 ***	-0.008	0.033 **	-0.117 ***	0.056 **	-0.14 ***	-0.032	-0.145 ***	-0.142 ***
40 to 44	-0.072 ***	0.117 ***	-0.109 ***	0.135 ***	-0.125 ***	0.031 **	-0.184 ***	0.083 ***	-0.25 ***	-0.016	-0.28 ***	-0.168 ***
45 to 49	-0.203 ***	0.126 ***	-0.2 ***	0.098 ***	-0.248 ***	-0.009	-0.264 ***	0.123 ***	-0.37 ***	-0.02	-0.448 ***	-0.321 ***
50 to 54	-0.22 ***	0.172 ***	-0.322 ***	0.185 ***	-0.43 ***	-0.014	-0.348 ***	0.185 ***	-0.512 ***	0.029	-0.62 ***	-0.328 ***
Education (reference: bachelor's degree, >=15 years of schooling)												
Secondary or Less	0.047 *	-0.156 ***	-0.023	-0.409 ***	-0.097 ***	-0.383 ***	0.043 **	-0.523 ***	-0.035 *	-0.458 ***	-0.116 ***	-0.445 ***
Trade Certificate	0.089 ***	-0.134 ***	0.158 ***	-0.266 ***	-0.023	-0.261 ***	0.225 ***	-0.46 ***	0.049 **	-0.417 ***	-0.113 ***	-0.396 ***
Non-University Certificate or Diploma	-0.102 ***	-0.217 ***	-0.082 ***	-0.318 ***	-0.137 ***	-0.303 ***	0.025 *	-0.343 ***	-0.048 ***	-0.323 ***	-0.085 ***	-0.285 ***
Some University – No Degree	-0.087 ***	-0.162 ***	-0.112 ***	-0.346 ***	-0.165 ***	-0.231 ***	-0.112 ***	-0.304 ***	-0.129 ***	-0.384 ***	-0.122 ***	-0.251 ***
Bachelor's degree, <=14 years of schooling	0.027 *	-0.198 ***	-0.014	-0.19 ***	-0.031 **	-0.164 ***	0.059 ***	-0.172 ***	0.007	-0.064	-0.025	-0.098
Master's degree, <=16 years of schooling	-0.079 ***	0.162 ***	-0.126 ***	-0.036	-0.125 ***	0.019	-0.16 ***	-0.022	-0.154 ***	0.046	-0.159 ***	0.001
Master's degree, >=17 years of schooling	-0.084 ***	0.12 ***	-0.114 ***	-0.077 ***	-0.066 ***	0.129 ***	-0.04 ***	-0.137 ***	-0.029 ***	0.081 ***	-0.01	0.135 ***
Doctorate	-0.18 ***	0.254 ***	-0.13 ***	0.171 ***	-0.107 ***	0.228 ***	0.002	0.053 **	0.049 **	0.251 ***	0.048 *	0.288
Language (reference: English mother tongue)												
Not speaking English or French	-0.482 ***	-0.44 ***	-0.553 ***	-0.491 ***	-0.572 ***	-0.455 ***	-0.696 ***	-0.565 ***	-0.538 ***	-0.542 ***	-0.408 ***	-0.616 ***
Other mother tongue, bilingual	-0.379 ***	-0.271 ***	-0.362 ***	-0.296 ***	-0.365 ***	-0.289 ***	-0.323 ***	-0.341 ***	-0.277 ***	-0.25 ***	-0.221 ***	-0.316 ***
Other mother tongue, French	-0.573 ***	-0.411 ***	-0.587 ***	-0.331 ***	-0.574 ***	-0.201 *	-0.636 ***	-0.481 *	-0.559 ***	-0.287	-0.374 ***	-0.583
Other mother tongue, English	-0.28 ***	-0.362 ***	-0.255 ***	-0.333 ***	-0.293 ***	-0.308 ***	-0.309 ***	-0.303 ***	-0.293 ***	-0.299 ***	-0.257 ***	-0.286 ***
Mother tongue French	-0.317 ***	-0.226 ***	-0.25 ***	-0.297 ***	-0.21 ***	-0.295 ***	-0.098 *	-0.227 ***	-0.12 *	-0.222 ***	-0.197 ***	-0.319 ***
Years of Canadian study (reference: no)												
More than 0 to less than 1	0.105	-0.216 ***	-0.035	-0.354 ***	-0.104 *	-0.198 ***	0.16 **	-0.372 ***	-0.063	-0.193 ***	-0.058	-0.201 ***
1 to less than 2	0.079	-0.18 ***	0.124 **	-0.241 ***	0.044	-0.177 ***	0.111 *	-0.229 ***	0.104 *	-0.128 ***	0.046	-0.029
2 to less than 3	-0.05	-0.175 ***	0.073	-0.291 ***	-0.076	-0.221 ***	-0.09	-0.454 ***	-0.011	-0.218 ***	-0.043	-0.154 ***
3 to less than 4	-0.056	-0.243 ***	-0.146 *	-0.561 ***	-0.175 ***	-0.283 ***	-0.093	-0.671 ***	-0.102	-0.287 ***	-0.055	-0.235 ***
4 to less than 5	0.02	-0.302 ***	-0.24 ***	-0.578 ***	-0.142 *	-0.238 ***	-0.047	-0.79 ***	-0.013	-0.31 ***	-0.084	-0.2 ***
5 or more	-0.06	-0.303 ***	-0.226 ***	-0.54 ***	-0.03	-0.276 ***	-0.042	-0.727 ***	-0.113 *	-0.337 ***	-0.011	-0.24 ***
With a spouse	0.121 ***	0.47 ***	0.172 ***	0.337 ***	0.214 ***	0.338 ***	0.212 ***	0.378 ***	0.248 ***	0.395 ***	0.264 ***	0.41 ***
Spouse education (reference: bachelor's degree, >=15 years of schooling)												
Secondary or Less	-0.093 ***	-0.139 ***	-0.086 ***	-0.113 ***	-0.107 ***	-0.1 ***	-0.09 ***	-0.15 ***	-0.128 ***	-0.121 ***	-0.105 ***	-0.132 ***
Formal Trade Certificate or Apprenticeship	-0.158 ***	-0.181 ***	0.021	-0.075 ***	-0.003	-0.09 ***	-0.059 ***	-0.058	-0.082 ***	-0.1 *	-0.084 ***	-0.106 *
Non-University Certificate or Diploma	-0.122 ***	-0.101 ***	-0.088 ***	-0.066 ***	-0.063 ***	-0.08 ***	-0.083 ***	-0.116 ***	-0.079 ***	-0.162 ***	-0.067 ***	-0.105 ***
Some University – No Degree	-0.031	-0.137 ***	-0.018	-0.078 *	-0.046 *	-0.025	-0.071 ***	-0.117 *	-0.057 ***	-0.112 *	-0.016	-0.207 **
Bachelor's degree, <=14 years of schooling	0.016	-0.084 ***	0.088 ***	-0.02	0.039 ***	0.004	0.055 ***	-0.214 ***	0.03 *	-0.121 *	0.001	-0.088
Master's degree, <=16 years of schooling	-0.103 ***	0.029	-0.15 ***	-0.087 *	-0.11 ***	-0.057	-0.124 ***	-0.134 *	-0.121 ***	-0.144 *	-0.066 **	-0.014
Master's degree, >=17 years of schooling	0.024 *	0.078 ***	0.018	0.058 ***	0.032 ***	0.07 ***	0.008	0.017	0.004	0.056 *	0.009	0.024
Doctorate	-0.173 ***	0.057 *	-0.08 **	-0.023	-0.117 ***	0.064 *	-0.113 ***	-0.063	-0.124 ***	-0.089 *	-0.078 *	-0.062
Spouse language (reference: English mother tongue)												
Not speaking English or French	-0.139 ***	-0.385 ***	-0.165 ***	-0.266 ***	-0.158 ***	-0.258 ***	-0.183 ***	-0.497 ***	-0.14 ***	-0.429 ***	-0.173 ***	-0.425 ***
Other mother tongue, bilingual	-0.081 *	-0.052	-0.072 ***	-0.118 ***	-0.094 ***	-0.13 ***	-0.06 *	-0.085 ***	-0.015	-0.136 ***	-0.027	0.021
Other mother tongue, French	0.006	-0.257 **	-0.312 ***	-0.347 ***	-0.276 ***	-0.231 *	-0.308 ***	0.176	-0.166 ***	-0.149	-0.231 ***	-0.1
Other mother tongue, English	-0.127 ***	-0.262 ***	-0.163 ***	-0.186 ***	-0.13 ***	-0.189 ***	-0.106 ***	-0.25 ***	-0.079 ***	-0.219 ***	-0.11 ***	-0.207 ***
Mother tongue French	-0.055	0.053	-0.193 **	0.181 ***	-0.083	0.109	-0.231 ***	0.201 *	0.117	0.011	0.12	0.188
Spouse Canadian work experience (reference r												
1	0.076	-0.031 **	0.231 ***	-0.012	0.098	0.052 ***	-0.073	-0.076 ***	-0.132	-0.059 **	-0.078	-0.058 *
2	0.275 ***	-0.054 ***	0.12	-0.004	-0.028	0.044 **	0.181	-0.004	-0.118	0.013	0.209 *	0.055 *
3	0.136	-0.09 ***	0.009	-0.05 **	-0.09	-0.032	-0.019	0.037	0.045	0.064 *	-0.045	-0.014
4	0.165	-0.107 ***	0.16	0.022	0.218	-0.017	-0.21	0.132 ***	0.411	-0.011	0.832 *	0.014
>=5	-0.11	-0.143 ***	-0.411	0.064 *	-0.179	-0.004	0.231	0.145 ***	-0.17	-0.021	0.286	-0.058
Spouse Canadian education (reference: no)												
More than 0 to less than 1	0.067	-0.09 **	0.114	-0.139 **	0.093	-0.174 ***	-0.104	-0.002	-0.002	0.007	-0.225 *	-0.064
1 to less than 2	-0.07	-0.136 **	-0.133	-0.16 ***	-0.023	-0.121 ***	-0.063	-0.164 ***	-0.02	-0.067	0.03	-0.044
2 to less than 3	-0.122	-0.148 ***	-0.12	-0.272 ***	0.097	-0.17 ***	-0.229	-0.366 ***	-0.077	-0.232 ***	-0.328 *	-0.203 ***
3 to less than 4	0.016	-0.288 ***	0	-0.362 ***	-0.057	-0.246 ***	0.016	-0.359 ***	0.133	-0.209 ***	-0.05	-0.21 ***
4 to less than 5	-0.106	-0.242 ***	0.12	-0.359 ***	-0.173	-0.274 ***	-0.047	-0.353 ***	-0.028	-0.221 ***	-0.039	-0.272 ***
5 or more	-0.351 **	-0.204 ***	-0.01	-0.298 ***	-0.1	-0.322 ***	-0.481 **	-0.31 ***	-0.006	-0.313 ***	-0.264	-0.313 ***
Sample size	111,604	176,660	125,808	94,377	139,091	88,077	111,257	33,663	116,181	29,800	92,891	21,371
Model R-square	0.026	0.117	0.038	0.164	0.045	0.101	0.058	0.22	0.043	0.118	0.045	0.096

* significantly different from reference category (p<0.05)   ** significantly different from reference category (p<0.01)   *** significantly different from reference category (p<0.001)
Note: Independent variables in this table are measured at landing.   *Source: Statistics Canada, Longitudinal Immigration Database.*

Table 7: Coefficients from ordinary least squares regression models predicting employment earnings of principal applicants in the economic class, by years since landing and presence of pre-landing Canadian work experience

	2012–2015 cohort 1 to 2 years			2008–2011 cohort 1 to 2 years			2008–2011 cohort 5 to 6 years			2005-2007 cohort 1 to 2 years			2005-2007 cohort 5 to 6 years			2005-2007 cohort 10 to 11 years		
	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language	Mother tongue English/French	Other mother tongue, speak English/French	Other mother tongue, do not speak official language
Intercept	10.138 ***	10.082 ***	10.045 ***	10.214 ***	10.145 ***	9.886 ***	10.682 ***	10.52 ***	10.269 ***	10.375 ***	10.212 ***	9.738 ***	10.662 ***	10.546 ***	10.265 ***	10.869 ***	10.766 ***	10.589 ***
Age (reference: 25 to 29)																		
20 to 24	-0.094 ***	-0.025 **	0.007	-0.086 *	0.001	-0.075	-0.027	0.004	-0.022	-0.102	0.049 *	0.031	-0.034	-0.087 ***	-0.115	0.085	0.003	-0.123
30 to 34	0.071 ***	0.002	-0.057	0.08 ***	0.005	-0.056 *	0.074 ***	0.025 **	-0.036	0.05 *	-0.053 *	-0.08 **	0.05	-0.064 ***	-0.113 ***	0.001	-0.055 ***	-0.079 **
35 to 39	0.225 ***	0.015 *	-0.112 ***	0.169 ***	0.004	-0.154 ***	0.119 ***	0.012	-0.139 ***	0.11 ***	-0.083 ***	-0.151 ***	0.064 *	-0.118 ***	-0.233 ***	0.009	-0.143 ***	-0.262 ***
40 to 44	0.319 ***	-0.03 *	-0.194 ***	0.24 ***	-0.048 *	-0.246 ***	0.114 ***	-0.078 ***	-0.329 ***	0.1 ***	-0.15 ***	-0.204 ***	0.018	-0.217 ***	-0.352 ***	-0.079 *	-0.268 ***	-0.417 ***
45 to 49	0.336 ***	-0.109 ***	-0.342 ***	0.179 ***	-0.136 ***	-0.333 ***	0.061 **	-0.2 ***	-0.418 ***	0.039	-0.217 ***	-0.274 ***	-0.081 **	-0.317 ***	-0.514 ***	-0.263 ***	-0.421 ***	-0.639 ***
50 to 54	0.467 ***	-0.134 ***	-0.344 ***	0.133 ***	-0.209 ***	-0.354 ***	-0.135 ***	-0.337 ***	-0.469 ***	0.027	-0.299 ***	-0.257 ***	-0.142 ***	-0.46 ***	-0.543 ***	-0.378 ***	-0.589 ***	-0.8 ***
Education (reference: bachelor's degree, >=15 years of schooling)																		
Secondary or Less	-0.158 ***	-0.117 ***	-0.027	-0.251 ***	-0.219 ***	0.064 *	-0.197 ***	-0.25 ***	-0.119 ***	-0.144 ***	-0.163 ***	0.216 ***	-0.117 ***	-0.195 ***	-0.051	-0.176 ***	-0.239 ***	-0.164 ***
Trade Certificate	-0.099 ***	-0.06 *	-0.028	-0.153 ***	-0.058 *	0.215 ***	-0.183 ***	-0.157 ***	0.04	-0.133 ***	0.013	0.411 ***	-0.197 ***	-0.077 ***	0.143 ***	-0.19 ***	-0.199 ***	-0.11 **
Non-University Certificate or Diploma	-0.206 ***	-0.184 ***	-0.149 ***	-0.178 ***	-0.185 ***	-0.177 ***	-0.189 ***	-0.202 ***	-0.279 ***	-0.134 ***	-0.065 ***	0.016	-0.112 ***	-0.124 ***	-0.093 ***	-0.069 *	-0.146 ***	-0.158 ***
Some University – No Degree	-0.202 ***	-0.151 ***	-0.204 ***	-0.334 ***	-0.141 ***	-0.182 ***	-0.259 ***	-0.161 ***	-0.193 ***	-0.204 ***	-0.107 ***	-0.123 ***	-0.19 ***	-0.117 ***	-0.173 ***	-0.144 ***	-0.11 ***	-0.141 ***
Bachelor's degree, <=14 years of schooling	-0.191 ***	-0.097 ***	-0.043	-0.195 ***	-0.065 ***	0.296 ***	-0.165 ***	-0.065 ***	0.156 ***	-0.065	0.037 *	0.013	-0.09	0.002	0.024	-0.173 ***	-0.03 *	0.029
Master's degree, <=16 years of schooling	0.054	-0.001	-0.066	-0.009	-0.137 ***	-0.018	-0.04	-0.122 ***	0.127 *	0.013	-0.182 ***	-0.034	0.066	-0.168 ***	0.021	-0.056	-0.171 ***	0.039
Master's degree, >=17 years of schooling	0.062 **	0.01 *	-0.033	0.02	-0.13 ***	-0.056 *	0.008	-0.029 **	0.095 **	0.007	-0.085 ***	-0.003	0.066 *	-0.021 *	0.037	0.05	0.01	0.024
Doctorate	0.156 ***	0.096 ***	-0.143 **	0.144 ***	0.018	-0.027	0.199 ***	0.004	0.076	0.167 ***	0.084 ***	0.036	0.23 ***	0.16 ***	0.116 *	0.273 ***	0.156 ***	0.099
Years of Canadian work experience (reference: no)																		
1	0.807 ***	0.584 ***	0.541 ***	0.725 ***	0.666 ***	0.535 ***	0.426 ***	0.42 ***	0.414 ***	0.659 ***	0.67 ***	0.495 ***	0.442 ***	0.472 ***	0.354 ***	0.411 ***	0.344 ***	0.066
2	0.903 ***	0.636 ***	0.564 ***	0.859 ***	0.707 ***	0.705 ***	0.51 ***	0.417 ***	0.455 ***	0.867 ***	0.771 ***	0.472 ***	0.655 ***	0.513 ***	0.134	0.568 ***	0.416 ***	0.248 *
3	0.922 ***	0.676 ***	0.745 ***	0.944 ***	0.754 ***	0.649 ***	0.592 ***	0.443 ***	0.476 ***	1.008 ***	0.795 ***	0.769 ***	0.754 ***	0.566 ***	0.405 ***	0.666 ***	0.47 ***	0.298 *
4	0.926 ***	0.71 ***	0.753 ***	1.051 ***	0.845 ***	0.743 ***	0.616 ***	0.5 ***	0.473 ***	1.106 ***	0.855 ***	0.66 ***	0.856 ***	0.592 ***	0.255	0.747 ***	0.529 ***	-0.003
>=5	0.962 ***	0.777 ***	0.826 ***	1.199 ***	1.019 ***	0.853 ***	0.773 ***	0.582 ***	0.615 ***	1.235 ***	1.006 ***	0.862 ***	0.922 ***	0.643 ***	0.586 **	0.746 ***	0.527 ***	0.293
Year of Canadian study (reference: no)																		
More than 0 to less than 1	-0.172 ***	-0.213 ***	-0.064	-0.297 ***	-0.288 ***	0.085	-0.06	-0.196 ***	-0.064	-0.404 ***	-0.103 **	0.423	-0.344 ***	-0.102 *	-0.345	-0.29 **	-0.137 **	0.05
1 to less than 2	-0.293 ***	-0.166 ***	-0.086	-0.304 ***	-0.169 ***	0.063	-0.191 ***	-0.099 ***	-0.104	-0.335 ***	-0.062 *	0.058	-0.136	-0.023	-0.212	-0.227 ***	0.064 *	0.089
2 to less than 3	-0.359 ***	-0.167 ***	-0.248 ***	-0.381 ***	-0.254 ***	-0.157 *	-0.362 ***	-0.16 ***	-0.077	-0.516 ***	-0.322 ***	-0.281	-0.38 ***	-0.124 ***	-0.126	-0.48 ***	-0.048	-0.125
3 to less than 4	-0.382 ***	-0.268 ***	-0.156 *	-0.587 ***	-0.567 ***	-0.539 ***	-0.412 ***	-0.244 ***	-0.24 **	-0.755 ***	-0.567 ***	0.324	-0.455 ***	-0.231 ***	0.372 *	-0.324 ***	-0.172 ***	0.002
4 to less than 5	-0.367 ***	-0.32 ***	-0.426 ***	-0.628 ***	-0.618 ***	-0.651 ***	-0.391 ***	-0.21 ***	-0.23 **	-0.744 ***	-0.724 ***	-0.117	-0.536 ***	-0.253 ***	0.307	-0.574 ***	-0.138 ***	0.442
5 or more	-0.396 ***	-0.35 ***	-0.476 ***	-0.74 ***	-0.641 ***	-0.534 ***	-0.463 ***	-0.296 ***	-0.281 **	-0.877 ***	-0.71 ***	-0.109	-0.592 ***	-0.327 ***	-0.114	-0.382 ***	-0.213 ***	-0.128
With a spouse	0.316 ***	0.327 ***	0.354 ***	0.344 ***	0.311 ***	0.304	0.293 ***	0.35 ***	0.257	0.209 ***	0.457 ***	0.77	0.199 ***	0.39 ***	0.532	0.211 ***	0.399 ***	0.445
Spouse education (reference: bachelor's degree, >=15 years of schooling)																		
Secondary or Less	-0.179 ***	-0.085 ***	-0.012	-0.2 ***	-0.052 ***	-0.004	-0.133 ***	-0.07 ***	-0.078 *	-0.051	-0.109 ***	0.017	-0.014	-0.129 ***	-0.099 **	0.032	-0.114 ***	-0.129 ***
Formal Trade Certificate or Apprenticeship	-0.244 ***	-0.138 ***	-0.02	-0.223 ***	-0.033 *	0.174 ***	-0.173 ***	-0.043 **	0.098 *	-0.085 *	-0.096 ***	0.079 *	-0.081	-0.094 ***	-0.029	-0.057	-0.111 ***	0.01
Non-University Certificate or Diploma	-0.089 ***	-0.108 ***	-0.091 *	-0.077 **	-0.055 **	-0.116 ***	-0.063 ***	-0.048 ***	-0.11 **	0.031	-0.093 ***	-0.059 *	0.024	-0.101 ***	-0.081 *	0.016	-0.089 ***	-0.039
Some University – No Degree	-0.147 ***	-0.071 ***	0.069	-0.22 ***		-0.164 *	-0.078	0.031	-0.064	-0.153 *	-0.089 ***	-0.012	-0.087	-0.066 ***	-0.06 *	-0.065	-0.048 *	-0.007
Bachelor's degree, <=14 years of schooling	-0.188 ***	-0.021 *	0.119 **	-0.224 ***	0.069 *	0.129 *	-0.161 **	0.039 *	0.029	-0.347 ***	0.025	0.168 ***	-0.004	0.017	0.021	-0.155	-0.004	0.006
Master's degree, <=16 years of schooling	-0.186 **	-0.094 ***	0.074	-0.173 *	-0.158 ***	0.098	-0.211 *	-0.105 ***	-0.161	-0.053	-0.142 ***	-0.002	-0.107	-0.126 ***	-0.16	-0.31 *	-0.065 **	-0.017
Master's degree, >=17 years of schooling	0.044	0.051 ***	-0.059	0.036	0.045 **	-0.037	0.077 *	0.046 ***	-0.027	0.106 **	0.008	0.061	0.094 *	0.021	-0.045	0.043	0.012	0.022
Doctorate	0.018	-0.053 *	-0.13	0.041	-0.045	-0.207 *	0.122 *	-0.076 ***	-0.135	0.09	-0.101 ***	-0.033	0.19 **	-0.129 ***	-0.391 ***	0.151 *	-0.065 *	-0.343 **
Spouse language (reference: English mother tongue)																		
Not speaking English or French	-0.387 ***	-0.269 ***	-0.345 ***	-0.106	-0.314 ***	-0.24	-0.179	-0.319 ***	-0.094	-0.133	-0.464 ***	-0.706	-0.317 *	-0.334 ***	-0.298	0.108	-0.349 ***	-0.233
Other mother tongue, bilingual	-0.072	-0.141 ***	-0.263	-0.16 *	-0.233 ***	-0.204	-0.172 *	-0.244 ***	-0.27	-0.068	-0.281 ***	-0.495	-0.179	-0.138 **	-0.371	-0.013	-0.116 **	-0.136
Other mother tongue, French	-0.638 ***	-0.197 ***	-0.341	-0.983 ***	-0.561 ***	-0.27	-0.915 ***	-0.506 ***	-0.342	0.736 *	-0.649 ***	-0.747	0.117	-0.414 ***	-1.219	0.531	-0.391 ***	-0.028
Other mother tongue, English	-0.256 ***	-0.223 ***	-0.319 ***	-0.142 ***	-0.267 ***	-0.227	-0.149 ***	-0.251 ***	-0.108	-0.134 ***	-0.347 ***	-0.65	-0.088 *	-0.229 ***	-0.305	-0.06	-0.25 ***	-0.219
Mother tongue French	-0.255 ***	0.026		-0.368 ***	0.224 *	0.502	-0.298 ***	0.242 *	0.75	-0.216 ***	-0.05		-0.114 *	0.264 *		-0.054	0.073	
Spouse Canadian work experience (reference: no)																		
1	0.041	0.078 ***	0.005	-0.07 *	0.166 ***	0.139 **	0.011	0.162 ***	0.156 **	0.023	0.027	0.288 *	-0.04	0.03	0.248	-0.07	0.055	0.175
2	-0.008	0.05 ***	0.182 **	-0.051	0.127 ***	0.26 **	-0.026	0.147 ***	0.12 *	-0.061	0.115 ***	-0.462 *	-0.042	0.088 *	-0.161	0.002	0.177 ***	-0.569 **
3	-0.022	-0.002	-0.135	-0.069	0.009	0.102	-0.077 *	0.034	-0.026	-0.119 *	0.129 ***	-0.219	-0.051	0.152 ***	0.521	-0.133 *	0.088 *	-0.331
4	-0.085 *	-0.038 *	0.093	-0.138 **	0.052	-0.097	-0.071	0.031	-0.019	0.038	0.135 **		-0.028	0.024		0.012	0.07	
>=5	-0.177 ***	-0.098 ***	0.078	-0.212 ***	0.054	-0.135	-0.151 ***	0.016	-0.066	-0.218 **	0.225 ***		-0.299 ***	0.085		-0.441 ***	0.143 *	
Spouse Canadian education (reference: no)																		
More than 0 to less than 1	-0.172	-0.003	-0.411	0.222	-0.043	0.093	0.066	-0.082	0.06	-0.082	-0.024	-0.113	-0.199	-0.02	0.214	-0.199	-0.156 *	0.15
1 to less than 2	-0.131	-0.095 ***	-0.177	-0.291 **	-0.108 **	-0.049	-0.104	-0.096 **	0.015	-0.166	-0.133 **	0.095	-0.154	-0.022	-0.51	-0.143	0.002	-0.085
2 to less than 3	-0.352 ***	-0.088 **	-0.021	-0.184	-0.218 ***	-0.062	-0.131	-0.113 ***	-0.183	-0.171	-0.424 ***	0.424	-0.281 *	-0.212 ***	-0.551	-0.269	-0.221 ***	0.097
3 to less than 4	-0.143	-0.211 ***	-0.87 **	-0.376 ***	-0.303 ***	0.009	-0.357 **	-0.221 ***	0.327	-0.536 ***	-0.32 ***	-0.601	-0.454 *	-0.168 ***	0.426	-0.23	-0.216 ***	0.733
4 to less than 5	-0.348 ***	-0.171 ***	-0.395 *	-0.076	-0.327 ***	-0.137	-0.107	-0.282 ***	-0.078	-0.34 *	-0.373 ***	-1.344	-0.109	-0.256 ***	0.276	-0.445 **	-0.267 ***	0.674
5 or more	-0.31 ***	-0.162 ***	-0.208	-0.372 **	-0.277 ***	-0.238 *	-0.303 *	-0.352 ***	-0.25 *	-0.401 *	-0.38 ***	-0.495	-0.369 *	-0.353 ***	-0.689	-0.465 *	-0.356 ***	-0.853 *
Sample size	37,468	239,205	11,591	29,341	175,136	15,708	28,999	181,225	16,944	18,080	100,000	18,509	17,558	100,000	19,534	12,862	84,762	16,638
Model R-square	0.186	0.104	0.122	0.218	0.125	0.139	0.116	0.061	0.085	0.221	0.091	0.035	0.136	0.064	0.031	0.115	0.069	0.048

* significantly different from reference category (p<0.05)   ** significantly different from reference category (p<0.01)   *** significantly different from reference category (p<0.001)

Note: Independent variables in this table are measured at landing.   *Source: Statistics Canada, Longitudinal Immigration Database.*

Table 8: **Part 1: Coefficients from ordinary least squares regression models predicting earnings of principal applicants in the economic class, by years since landing and landing cohort, with pre-landing Canadian earnings as a predictor**

	2012-2015 cohort	2008-2011 cohort		2005-2007 cohort		10 to 11 years
	1 to 2 years	1 to 2 years	5 to 6 years	1 to 2 years	5 to 6 years	
Intercept	10.261 ***	10.321 ***	10.745 ***	10.425 ***	10.766 ***	10.969 ***
Age (reference: 25 to 29)						
20 to 24	-0.021 *	-0.009	0.001	0.044 *	-0.074 ***	0.004
30 to 34	-0.003	-0.011	0.009	-0.065 ***	-0.074 ***	-0.062 ***
35 to 39	-0.010	-0.044 ***	-0.029 ***	-0.107 ***	-0.138 ***	-0.161 ***
40 to 44	-0.064 ***	-0.085 ***	-0.119 ***	-0.166 ***	-0.236 ***	-0.287 ***
45 to 49	-0.135 ***	-0.168 ***	-0.226 ***	-0.232 ***	-0.341 ***	-0.453 ***
50 to 54	-0.135 ***	-0.234 ***	-0.370 ***	-0.284 ***	-0.456 ***	-0.606 ***
Education (reference: bachelor's degree, >=15 years of schooling)						
Secondary or Less	-0.040 ***	-0.079 ***	-0.136 ***	-0.001	-0.070 ***	-0.144 ***
Trade Certificate	-0.020 **	0.024 **	-0.088 ***	0.137 ***	-0.006	-0.137 ***
Non-University Certificate or Diploma	-0.109 ***	-0.123 ***	-0.165 ***	-0.034 ***	-0.096 ***	-0.120 ***
Some University – No Degree	-0.064 ***	-0.105 ***	-0.132 ***	-0.121 ***	-0.142 ***	-0.124 ***
Bachelor's degree, <=14 years of schooling	0.008	-0.016 *	-0.034 ***	0.036 **	0.005	-0.028 *
Master's degree, <=16 years of schooling	-0.007	-0.113 ***	-0.098 ***	-0.158 ***	-0.140 ***	-0.147 ***
Master's degree, >=17 years of schooling	0.009	-0.091 ***	-0.010	-0.048 ***	0.001	0.022 **
Doctorate	0.010	-0.039 ***	-0.015	0.023	0.109 ***	0.120 ***
Language (reference: English mother tongue)						
Not speaking English or French	-0.270 ***	-0.399 ***	-0.437 ***	-0.595 ***	-0.463 ***	-0.359 ***
Other mother tongue, bilingual	-0.169 ***	-0.219 ***	-0.248 ***	-0.234 ***	-0.202 ***	-0.192 ***
Other mother tongue, French	-0.363 ***	-0.423 ***	-0.422 ***	-0.546 ***	-0.478 ***	-0.332 ***
Other mother tongue, English	-0.138 ***	-0.168 ***	-0.208 ***	-0.218 ***	-0.228 ***	-0.212 ***
Mother tongue French	-0.100 ***	-0.164 ***	-0.164 ***	-0.094 **	-0.102 **	-0.185 ***
Years of Canadian work experience (reference: no)						
1	0.146 ***	0.180 ***	0.049	0.100 **	0.064	0.031
2	-0.052	-0.071 *	-0.139 ***	-0.108 ***	-0.089 *	-0.062
3	-0.048	-0.066 *	-0.133 ***	-0.116 ***	-0.076 *	-0.046
4	-0.039	-0.033	-0.124 ***	-0.114 **	-0.077 *	-0.014
>=5	-0.014	0.033	-0.096 **	-0.066	-0.085 *	-0.065
Years of Canadian study experience (refere						
More than 0 to less than 1	-0.046 ***	-0.142 ***	-0.072 **	0.039	-0.024	-0.047
1 to less than 2	-0.031 ***	0.016	0.028	0.160 ***	0.130 ***	0.166 ***
2 to less than 3	-0.045 ***	-0.007	0.003	0.083 ***	0.142 ***	0.135 ***
3 to less than 4	-0.098 ***	-0.190 ***	-0.005	-0.019	0.131 ***	0.113 ***
4 to less than 5	-0.130 ***	-0.185 ***	0.058 ***	-0.116 ***	0.150 ***	0.169 ***
5 or more	-0.149 ***	-0.211 ***	-0.020	-0.106 ***	0.075 ***	0.104 ***

Table 8: **Part 2: Coefficients from ordinary least squares regression models predicting earnings of principal applicants in the economic class, by years since landing and landing cohort, with pre-landing Canadian earnings as a predicator**

	2012-2015 cohort 1 to 2 years	2008-2011 cohort 1 to 2 years	2008-2011 cohort 5 to 6 years	2005-2007 cohort 1 to 2 years	2005-2007 cohort 5 to 6 years	2005-2007 cohort 10-11 years
With a spouse	0.223 ***	0.214 ***	0.256 ***	0.253 ***	0.292 ***	0.297 ***
Spouse education (reference: bachelor's degree, >=15 years of schooling)						
Secondary or Less	-0.062 ***	-0.052 ***	-0.074 ***	-0.083 ***	-0.116 ***	-0.100 ***
Formal Trade Certificate or Apprenticeship	-0.115 ***	0.033 **	0.002	-0.038 *	-0.072 ***	-0.080 ***
Non-University Certificate or Diploma	-0.081 ***	-0.062 ***	-0.057 ***	-0.075 ***	-0.083 ***	-0.067 ***
Some University – No Degree	-0.035 ***	-0.006	-0.022	-0.073 ***	-0.056 ***	-0.022
Bachelor's degree, <=14 years of schooling	0.029 ***	0.083 ***	0.047 ***	0.043 ***	0.026 *	0.001
Master's degree, <=16 years of schooling	-0.090 ***	-0.144 ***	-0.106 ***	-0.124 ***	-0.126 ***	-0.066 ***
Master's degree, >=17 years of schooling	0.029 ***	0.017 *	0.030 ***	0.013	0.013	0.012
Doctorate	-0.072 ***	-0.046 *	-0.059 **	-0.083 ***	-0.112 ***	-0.066 *
Spouse language (reference: English mother tongue)						
Not speaking English or French	-0.233 ***	-0.204 ***	-0.208 ***	-0.240 ***	-0.192 ***	-0.206 ***
Other mother tongue, bilingual	-0.119 ***	-0.127 ***	-0.144 ***	-0.095 ***	-0.069 **	-0.028
Other mother tongue, French	-0.146 **	-0.377 ***	-0.337 ***	-0.330 ***	-0.214 ***	-0.241 ***
Other mother tongue, English	-0.183 ***	-0.182 ***	-0.168 ***	-0.155 ***	-0.127 ***	-0.140 ***
Mother tongue French	-0.047	-0.097 *	-0.048	-0.081	0.065	0.129 *
Spouse Canadian work experience (reference: no)						
1	-0.003	-0.002	0.035 **	-0.050 **	-0.045 *	-0.026
2	-0.026 **	-0.024 *	0.002	-0.041 *	-0.028	0.047
3	-0.044 ***	-0.075 ***	-0.065 ***	-0.025	0.017	-0.049
4	-0.064 ***	-0.067 **	-0.062 *	0.022	-0.058	-0.018
>=5	-0.086 ***	-0.101 ***	-0.108 ***	0.020	-0.099 *	-0.099 *
Spouse Canadian study experience (reference: no)						
More than 0 to less than 1	-0.007	0.010	-0.046	-0.055	-0.032	-0.117
1 to less than 2	-0.042 *	-0.036	-0.035	-0.084 *	-0.009	0.028
2 to less than 3	-0.033	-0.043	0.000	-0.191 ***	-0.088 *	-0.103 *
3 to less than 4	-0.119 ***	-0.127 ***	-0.080 *	-0.146 ***	-0.039	-0.064
4 to less than 5	-0.045	-0.093 **	-0.098 **	-0.165 ***	-0.082	-0.137 **
5 or more	-0.085 ***	-0.105 ***	-0.193 ***	-0.214 ***	-0.221 ***	-0.239 ***
Pre-landing Canadian earnings (reference: l						
> 0 and<= 50% national median earnings	0.069 *	0.032	0.127 ***	0.082 *	0.110 **	0.121 **
> 50% national median, <= national median	0.313 ***	0.315 ***	0.195 ***	0.360 ***	0.207 ***	0.180 ***
>national median, <= 2*national median	0.805 ***	0.789 ***	0.533 ***	0.762 ***	0.479 ***	0.360 ***
> 2*national median	1.493 ***	1.572 ***	1.203 ***	1.631 ***	1.238 ***	1.019 ***
Sample size	288,264	220,185	200,000	144,920	100,000	114,262
Model R -square	0.257	0.252	0.143	0.210	0.127	0.108

* significantly different from reference category (p<0.05)   ** significantly different from reference category (p<0.01)   *** significantly different from reference category (p<0.001)

Note: Independent variables in this table are measured at landing.   *Source: Statistics Canada, Longitudinal Immigration Database.*

Table 9: Coefficients from ordinary least squares regression models predicting employment earnings of principal applicants in the economic class, by years since landing and level of pre-landing Canadian earnings

	2012–2015 cohort 1 to 2 years			2008–2011 cohort 1 to 2 years			5 to 6 years			2005-2007 cohort 1 to 2 years			5 to 6 years			10 to 11 years		
	no earnings	low earnings	high earnings	no earnings	low earnings	high earnings	no earnings	low earnings	high earnings	no earnings	low earnings	high earnings	no earnings	low earnings	high earnings	no earnings	low earnings	high earnings
Intercept	10.452 ***	10.56 ***	11.219 ***	10.433 ***	10.732 ***	11.405 ***	10.845 ***	10.765 ***	11.477 ***	10.503 ***	10.812 ***	11.489 ***	10.833 ***	10.833 ***	11.426 ***	11.008 ***	11.018 ***	11.625 ***
Age (reference: 25 to 29)																		
20 to 24	-0.068 **	0.024 *	-0.044 **	-0.045 *	-0.005	0.033	-0.128 ***	0.097 ***	0.096 ***	-0.019	0.12 ***	0.034	-0.121 ***	0.017	0.036	-0.048	0.109 **	0.092
30 to 34	0.044 ***	-0.02 **	0.006	0.013	-0.046 ***	0.017	0.04 ***	-0.04 **	-0.015	-0.057 ***	-0.088 ***	0.045 *	-0.068 ***	-0.148 ***	0.073 ***	-0.046 ***	-0.125 ***	-0.045
35 to 39	0.022 *	0	0.074 ***	-0.043 ***	-0.087 ***	0.129 ***	-0.009	-0.098 ***	0.059 ***	-0.115 ***	-0.101 ***	0.172 ***	-0.141 ***	-0.182 ***	0.121 ***	-0.145 ***	-0.271 ***	-0.057
40 to 44	-0.072 ***	-0.048 ***	0.123 ***	-0.11 ***	-0.1 ***	0.184 ***	-0.126 ***	-0.177 ***	0.08 ***	-0.182 ***	-0.274 ***	0.237 ***	-0.25 ***	-0.346 ***	0.171 ***	-0.281 ***	-0.361 ***	-0.09 *
45 to 49	-0.201 ***	-0.126 ***	0.155 ***	-0.2 ***	-0.246 ***	0.187 ***	-0.249 ***	-0.238 ***	0.043 *	-0.262 ***	-0.277 ***	0.264 ***	-0.369 ***	-0.419 ***	0.186 ***	-0.449 ***	-0.52 ***	-0.234 ***
50 to 54	-0.219 ***	-0.201 ***	0.216 ***	-0.323 ***	-0.263 ***	0.251 ***	-0.431 ***	-0.4 ***	0.047 *	-0.345 ***	-0.403 ***	0.344 ***	-0.511 ***	-0.515 ***	0.234 ***	-0.621 ***	-0.781 ***	-0.216 ***
Education (reference: bachelor's degree, >=15 years of schooling)																		
Secondary or Less	0.046 ***	0.003	-0.19 ***	-0.027 *	-0.107 ***	-0.443 ***	-0.098 ***	-0.122 ***	-0.454 ***	0.042 **	-0.087 *	-0.527 ***	-0.035 *	-0.085 *	-0.5 ***	-0.117 ***	-0.199 ***	-0.443 ***
Trade Certificate	0.088 ***	0.002	-0.171 ***	0.156 ***	-0.023	-0.302 ***	-0.024	-0.058 **	-0.331 ***	0.224 ***	-0.092 *	-0.477 ***	0.049 *	-0.184 ***	-0.407 ***	-0.113 ***	-0.195 ***	-0.406 ***
Non-University Certificate or Diploma	-0.103 ***	-0.101 ***	-0.18 ***	-0.084 ***	-0.165 ***	-0.287 ***	-0.139 ***	-0.189 ***	-0.29 ***	0.023 *	-0.254 ***	-0.329 ***	-0.05 *	-0.31 ***	-0.255 ***	-0.088 ***	-0.293 ***	-0.193 ***
Some University – No Degree	-0.089 ***	-0.025 *	-0.162 ***	-0.114 ***	-0.105 *	-0.247 ***	-0.168 ***	-0.041	-0.15 *	-0.111 ***	-0.286 ***	-0.25 ***	-0.127 ***	-0.446 ***	-0.303 ***	-0.124 ***	-0.18	-0.247 ***
Bachelor's degree, <=14 years of schooling	0.025 *	-0.005	-0.116 ***	-0.016	-0.044 *	-0.041 *	-0.032 **	-0.04 *	-0.08 **	0.058 ***	-0.147 *	-0.056	0.006	-0.049	0.025	-0.025	-0.095	-0.065
Master's degree, <=16 years of schooling	-0.079 ***	0.151 ***	0.137 ***	-0.13 ***	-0.15 *	0.035	-0.126 ***	-0.023	0.041	-0.16 ***	-0.15 *	0.093	-0.153 ***	-0.071	0.128 **	-0.159 ***	-0.083	0.062
Master's degree, >=17 years of schooling	-0.086 ***	0.03 ***	0.164 ***	-0.119 ***	-0.177 ***	0.127 ***	-0.067 ***	0.174 ***	0.127 ***	-0.041 *	-0.223 ***	0.066 *	-0.03 *	0.108 ***	0.099 ***	-0.01	0.138 ***	0.15 ***
Doctorate	-0.172 ***	0.108 ***	0.2 ***	-0.127 ***	0.074 *	0.098 **	-0.105 ***	0.188 ***	0.134 ***	0.005	0.002	-0.044 *	0.051 **	0.3 ***	0.114 ***	0.046 *	0.354 ***	0.197 ***
Language (reference: English mother tongue)																		
Not speaking English or French	-0.476 ***	-0.188 ***	-0.239 ***	-0.554 ***	-0.255 ***	-0.348 ***	-0.569 ***	-0.235 ***	-0.385 ***	-0.693 ***	-0.223 ***	-0.545 ***	-0.532 ***	-0.227 ***	-0.567 ***	-0.404 ***	-0.328 ***	-0.56 ***
Other mother tongue, bilingual	-0.37 ***	-0.131 ***	-0.146 ***	-0.364 ***	-0.152 ***	-0.128 ***	-0.364 ***	-0.127 ***	-0.183 ***	-0.323 ***	-0.205 ***	-0.181 ***	-0.271 ***	-0.135 ***	-0.131 ***	-0.216 ***	-0.198 ***	-0.24 ***
Other mother tongue, French	-0.57 ***	-0.052	-0.449 ***	-0.589 ***	0.004	-0.18	-0.565 ***	0.072	-0.14	-0.635 ***	-0.076	-1.342 *	-0.554 ***	0.13	-1.197	-0.369 ***	-0.067	-1.623 *
Other mother tongue, English	-0.276 ***	-0.131 ***	-0.217 ***	-0.254 ***	-0.171 ***	-0.204 ***	-0.291 ***	-0.155 ***	-0.209 ***	-0.307 ***	-0.163 ***	-0.197 ***	-0.286 ***	-0.172 ***	-0.227 ***	-0.252 ***	-0.153 ***	-0.238 ***
Mother tongue French	-0.313 ***	-0.067 *	-0.202 ***	-0.246 ***	-0.177 ***	-0.258 ***	-0.209 ***	-0.176 ***	-0.255 ***	-0.108 *	-0.201 **	-0.076	-0.142 **	-0.145	-0.097	-0.195 ***	-0.294 ***	-0.196 *
Years of Canadian work experience (reference: >=5)																		
1		0.024 *	0.089 ***		0.009	-0.048 **		0.093 ***	0.024		0.051	-0.087 ***		0.136 ***	-0.024		0.078 *	-0.064
2		-0.087 ***	0.011		-0.153 ***	-0.135 ***		-0.072 ***	-0.067 ***		-0.122 ***	-0.094 ***		-0.035	-0.031		-0.025	-0.055
3		-0.074 ***	0.024 ***		-0.132 ***	-0.11 ***		-0.036 *	-0.074 ***		-0.091 ***	-0.124 ***		-0.002	-0.041		-0.003	-0.037
4		-0.06 ***	0.018 *		-0.068 ***	-0.069 ***		-0.018	-0.06 ***		-0.075 ***	-0.056 *		-0.027	0.014		0.022	0.026
Years of Canadian study (reference: no)																		
More than 0 to less than 1	0.117	-0.036 *	-0.158 ***	-0.037	-0.208 ***	-0.299 ***	-0.104 *	-0.025	-0.192 ***	0.16 **	-0.11	-0.2 ***	-0.044	0.006	-0.077	-0.033	-0.097	-0.04
1 to less than 2	0.119 **	-0.047 *	-0.137 ***	0.172 ***	-0.055 *	-0.138 ***	0.094 **	-0.018	-0.112 ***	0.179 ***	0.087 *	-0.007	0.168 ***	0.156 ***	-0.036	0.132 **	0.257 ***	-0.031
2 to less than 3	0.03	-0.079 ***	-0.143 ***	0.096 **	-0.116 ***	-0.178 ***	-0.009	-0.038	-0.176 ***	-0.05	-0.006	-0.188 ***	0.04	0.152 ***	-0.07	0.024	0.156 ***	0.038
3 to less than 4	-0.052	-0.166 ***	-0.155 ***	-0.279 ***	-0.336 ***	-0.263 ***	-0.221 ***	-0.02	-0.235 ***	-0.088	-0.158 ***	-0.332 ***	-0.03	0.154 ***	-0.205 ***	-0.064	0.166 ***	-0.272 ***
4 to less than 5	-0.108	-0.256 ***	-0.123 ***	-0.289 ***	-0.33 ***	-0.296 ***	-0.14 *	0.03	-0.21 ***	-0.127 *	-0.277 ***	-0.311 ***	-0.037	0.13 ***	-0.132 *	-0.037	0.164 ***	-0.165 **
5 or more	-0.243 ***	-0.273 ***	-0.133 ***	-0.239 ***	-0.361 ***	-0.326 ***	-0.116 *	-0.064 ***	-0.21 ***	-0.103 *	-0.274 ***	-0.418 ***	-0.054	0.07 *	-0.189 ***	0.005	0.124 ***	-0.228 ***
With a spouse	0.122 ***	0.114 ***	0.409 ***	0.174 ***	0.142 ***	0.343 ***	0.217 ***	0.222 ***	0.307 ***	0.213 ***	0.206 ***	0.394 ***	0.253 ***	0.272 ***	0.359 ***	0.266 ***	0.469 ***	0.346 ***
Spouse education (reference: bachelor's degree, >=15 years of schooling)																		
Secondary or Less	-0.091 ***	-0.004	-0.143 ***	-0.085 ***	-0.032	-0.126 ***	-0.108 ***	-0.029	-0.109 ***	-0.092 ***	-0.029	-0.142 ***	-0.129 ***	-0.042	-0.098 *	-0.106 ***	-0.159 ***	-0.05
Formal Trade Certificate or Apprenticeship	-0.156 ***	-0.083 ***	-0.147 ***	0.019	0.041	-0.117 ***	-0.003	0.046	-0.147 ***	-0.06 *	-0.003	-0.041	-0.085 *	-0.061	-0.068	-0.085 *	-0.12	-0.092
Non-University Certificate or Diploma	-0.12 ***	0.006	-0.101 ***	-0.087 ***	-0.012	-0.073 ***	-0.063 ***	-0.078 **	-0.06 **	-0.083 ***	-0.05	-0.142 ***	-0.08 ***	-0.127 ***	-0.156 ***	-0.066 ***	-0.147 ***	-0.067
Some University – No Degree	-0.029	0.037	-0.158 ***	-0.02	0.021	-0.074 *	-0.048 *	0.083	-0.042	-0.072 *	0.063	-0.19 **	-0.056 *	-0.047	-0.126	-0.017	-0.163	-0.211 *
Bachelor's degree, <=14 years of schooling	0.018	0.125 ***	-0.12 ***	0.089 ***	0.129 ***	-0.084 *	0.039 *	0.179 ***	-0.087 *	0.053 **	0.128	-0.25 ***	0.029 *	0.044	-0.083	0.001	0.002	-0.033
Master's degree, <=16 years of schooling	-0.102 ***	0.017	-0.021	-0.145 ***	0.031	-0.167 ***	-0.111 ***	-0.133 *	0.016	-0.125 ***	-0.126	-0.095	-0.123 ***	-0.092	-0.147	-0.066 *	-0.097	0.03
Master's degree, >=17 years of schooling	0.026 *	0.075 ***	0.026 *	0.02	0.016	0.017	0.033 *	0.056 *	0.045 *	0.003	0.042	0.004	0.002	0.039	0.079 *	0.008	-0.005	0.074
Doctorate	-0.153 ***	0.141 **	-0.014	-0.067 *	-0.256 ***	0.018	-0.112 ***	-0.107	0.076 *	-0.112 ***	0.019	-0.054	-0.127 ***	-0.19 *	0	-0.079 *	-0.011	-0.017
Spouse language (reference: English mother tongue)																		
Not speaking English or French	-0.146 ***	-0.119 ***	-0.37 ***	-0.166 ***	-0.067	-0.242 ***	-0.16 ***	-0.159 ***	-0.224 ***	-0.185 ***	-0.244 ***	-0.476 ***	-0.145 ***	-0.215 ***	-0.426 ***	-0.176 ***	-0.315 ***	-0.458 ***
Other mother tongue, bilingual	-0.089 ***	0.021	0.025	-0.075 *	-0.058	-0.089 *	-0.097 *	-0.164 *	-0.072	-0.062 *	-0.17 *	-0.042	-0.021	-0.189 *	-0.108 *	-0.03	-0.078	0.042
Other mother tongue, French	-0.002	-0.044	-0.31 **	-0.314 **	-0.291	-0.324 *	-0.281 *	-0.21	-0.2	-0.308 *	0.213	0.01	-0.168 *	-0.595 ***	0.112	-0.237 *	-0.461 *	0.273
Other mother tongue, English	-0.132 ***	-0.058 *	-0.244 ***	-0.167 ***	-0.037	-0.181 ***	-0.133 ***	-0.068 *	-0.204 ***	-0.108 ***	-0.181 ***	-0.178 ***	-0.086 **	-0.114 *	-0.183 ***	-0.113 ***	-0.265 ***	-0.156 ***
Mother tongue French	-0.062	-0.15	0.149 **	-0.198 ***	0.043	0.209 **	-0.086	-0.204	0.238 ***	-0.222 ***	-0.315	0.147	0.142	-0.443 *	0.028	0.123	-0.665 ***	0.294 *
Spouse Canadian work experience (reference: no)																		
1	0.066 ***	-0.042 **	-0.034 *	0.213 ***	-0.061 **	-0.03 *	0.148 ***	0.05 *	0.008	-0.037	0.007	-0.099 ***	-0.156 **	0.016	-0.073 *	-0.05	0.002	-0.069
2	0.232 **	-0.106 ***	-0.048 *	0.157 *	-0.146 **	-0.005	-0.009	-0.049 *	0.037 *	0.15	0.024	-0.09 *	0.006	0.02	-0.054	0.288 **	0.072	-0.015
3	0.14	-0.1 ***	-0.088 ***	-0.027	-0.156 **	-0.09 *	-0.083	-0.102 ***	-0.053 **	-0.066	0.026	-0.052	0.05	0.128 **	-0.056	-0.053	0.106	-0.185 ***
4	-0.051	-0.156 ***	-0.103 ***	-0.129	-0.093 *	-0.122 ***	-0.039	-0.06	-0.095 **	0.013	0.063	-0.042	0.071	0.004	-0.136 **	0.344	-0.012	-0.092
>=5	-0.166	-0.154 ***	-0.152 ***	-0.376	-0.186 ***	-0.109 **	-0.255	-0.145 **	-0.101 **	0.25	0.189 *	-0.152 **	0.132	-0.06	-0.168 **	0.246	-0.121	-0.157 *
Spouse Canadian education (reference: no)																		
More than 0 to less than 1	0.064	-0.019	-0.045	0.101	-0.039	-0.033	0.078	-0.082	-0.155 *	-0.058	-0.074	-0.001	0.03	0.01	-0.037	-0.211 *	0.048	-0.206
1 to less than 2	-0.082	-0.057 *	-0.065 *	-0.134	-0.021	-0.161 **	0.003	-0.116 *	-0.08	-0.049	-0.117 *	-0.183 **	-0.036	-0.044	-0.047	0.051	-0.081	0
2 to less than 3	-0.105	-0.098 ***	-0.048	-0.112	-0.061	-0.156 ***	0.005	-0.115 **	-0.026	-0.289 ***	-0.25 ***	-0.125	-0.061	-0.217 ***	-0.036	-0.176	-0.175 **	-0.223 *
3 to less than 4	-0.065	-0.219 ***	-0.109 ***	-0.11	-0.205 ***	-0.159 ***	-0.16	-0.117 *	-0.158 ***	-0.184	-0.176 **	-0.264 ***	0.057	-0.134 *	-0.194 *	-0.041	-0.12	-0.338 ***
4 to less than 5	0.051	-0.068 *	-0.135 ***	0.094	-0.176 ***	-0.236 ***	-0.247 *	-0.185 ***	-0.157 ***	-0.218	-0.184 *	-0.298 ***	-0.184	-0.085	-0.268 **	-0.283 *	-0.156 *	-0.331 ***
5 or more	-0.319 ***	-0.071 *	-0.156 ***	-0.037	-0.101 *	-0.242 ***	-0.096	-0.259 ***	-0.189 ***	-0.347 ***	-0.311 ***	-0.321 ***	-0.143	-0.362 ***	-0.23	-0.423 ***	-0.05	-0.095
Sample size	112,339	84,125	91,800	126,742	41,320	52,123	140,087	39,093	47,988	112,214	16,406	16,300	100,000	14,392	14,460	93,607	10,258	10,397
Model R -square	0.026	0.031	0.107	0.039	0.064	0.147	0.045	0.041	0.108	0.057	0.061	0.159	0.043	0.061	0.111	0.045	0.088	0.086

* significantly different from reference category (p<0.05)   ** significantly different from reference category (p<0.01)   *** significantly different from reference category (p<0.001)
Note: Independent variables in this table are measured at landing.   *Source: Statistics Canada, Longitudinal Immigration Database.*