HOW AND WHY IMMIGRANTS' EARNINGS DISTRIBUTIONS HAVE CHANGED RELATIVE TO NATIVES' EARNINGS IN CANADA: AN EMPIRICAL ANALYSIS

by

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An essay submitted to the Department of Economics

in partial fulfillment of the requirements for

the degree of Master of Arts

Queen's University

Kingston, Ontario, Canada

August 2008

Acknowledgements

Many sincere thanks to my patient, kind, knowledgeable, and helpful supervisor, Dr. Michael Abbott, who not only aided me with excellent suggestions, ideas, instruction, advice, revisions, and critique, but also with coding adjustments made to the data files. Thanks also to Dr. Casey Warman, whose literature suggestions and expertise in many topics surrounding immigration proved useful. I am also grateful to Mark Touw who offered helpful suggestions from his experience in dealing with similar regression analyses from his experience in urban planning. Lastly, I am indebted to family, friends, and colleagues for much support and encouragement throughout my time working on this paper.

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1. Introduction

Canada is a country of immigrants. Former and recent immigration make up the vast majority of Canada's population. So how are immigrants', particularly recent immigrants', earnings doing relative to Canadian-borns' earnings? What factors are important in explaining how immigrants to Canada have been doing over time? Questions such as "why do people move?" and "what happens when they do?" have driven an extensive examination into the economics of immigration, particularly over the past three decades. While many studies have sought to explain labour movements and the effect of immigration on host countries, the goal of this paper is to gain insight into how and why immigrants' earnings have – as this paper will show – gradually been losing ground relative to native-borns' earnings.

As mentioned above, Canada is largely made up of those descended from immigrants, while immigrants themselves make up about 18% of Canada's population.[1] To clarify the terms that will frequently be employed in this study: "immigrants" refers to those who were born in a foreign country and now reside permanently in Canada, while "natives" refers to all those born within Canada (and permanently residing in Canada, which is naturally a requirement for both natives and immigrants to be included in this study). Given that almost 20% of Canada's population are immigrants, this ranks Canada among world leaders in this category, with nearly 24% of Australia, 23% of Switzerland, 19% of New Zealand, 13% of Germany, 13% of the U.S., 12% of Sweden, 10% of France, 9% of the U.K., 8% of Norway, 2.5% of Italy and about 11% of the OECD's

[1] Percentage circa 2004: obtained from OECD FACTBOOK 2007: p. 252-253.

population consisting of immigrants.[2] Indeed, such a relatively high percentage of immigrants in Canada can only add weight and significance to the issue of how their labour-market performance compares to that of natives.

In order to address this issue, this paper purports to both illustrate the facts and explain the causes of increasing earnings inequality between immigrants and natives, employing data from the 1981, 1991, and 2001 Canadian censuses. The paper is structured as follows: past literature and findings will be reviewed in section 2, the empirical model will be specified in section 3, the data and empirical implementation will be described in section in 4, descriptive statistics will be highlighted in section 5, with section 6 presenting the results, and section 7 concluding the paper.

[2] Ibid.

2. Previous Literature

This paper seeks to offer insight into how immigrants' relative earnings have been doing over time, particularly within the overall Canadian earnings distribution. The fundamental foundation and instrumental impetus for this study is similar work done by George J. Borjas (particularly in his 1999 study), who has looked at how immigrants' earnings have changed over time within the aggregate United States earnings distribution. While Borjas has made a career out of studying many of the myriad issues surrounding the economics of immigration, this study seeks to apply some of the techniques he used in "The Economic Analysis of Immigration" (1999), including the regressions he used to adjust immigrants' earnings to ascertain adjusted earnings distributions in order to compare immigrants and natives with approximately the same observable characteristics such as age, experience, education, etc. While this technique is employed, other standard log-wage regression techniques and measures of inequality are also used. Indeed, Borjas (1999, p. 1722) warns that though "[i]t might be interesting to know that the wage of an immigrant high school worker dropout converges to that of a native high school dropout … [it is] more important to determine how the skills of the immigrant high school worker compare to those of the typical native worker". Thus, while it is no doubt informative to compare immigrants and natives with similar skills, this study will emphasize the importance of comparing immigrants and natives more generally.

As a literature or sub-field within the scope of economics as a discipline, the economics of immigration began in earnest with the ground-breaking study "The effect of Americanization on the earnings of foreign-born men" (1978) by Barry R. Chiswick. Many other important contributions have certainly been made by Borjas, (1985, 1994,

1999, 2003, 2005, among others), who has looked at rates of assimilation (or integration into the economy and society of the host country, measured largely by wage growth as a proxy), changes in immigrant cohort quality and earnings over time, the impact of immigration on the host economy, the labor-market impact of high skill immigrants, and sundry other issues involving the economics of immigration. Later papers by Chiswick (including 1986 and 2005), have delved into a number of issues, including analyzing changes in skills and other characteristics of incoming immigrant cohorts. Lalonde and Topel (1991) have also done influential work in the economics of immigration, including their paper "Labor market adjustments to increased immigration". However, their understanding of and approach toward immigrants' economic "assimilation" is incongruous to that of Borjas (this will be discussed later on in this paper).[3] Another important contribution was made by Baker and Benjamin (1994), who studied Canadian immigrants' earnings, with the results painting a far less positive picture than older studies such as Chiswick's (1978), which found that immigrant men earned as much as their native counterparts despite lower levels of education, leading to the conclusion that on-the-job training closed the education gap. Indeed, as will be pointed out below, both Chiswick's (1978) findings and conclusions have been found to no longer hold, with many subsequent studies having found that immigrants have been entering host country labour markets with lower earnings, which has resulted in lengthening the period required for immigrants to catch up to natives' earnings.

While studies by Friedberg (1995, 2000), have looked into the impact of immigration on host countries' labour markets and economies, she has also studied the

[3] Borjas and Lalonde and Topel have employed alternative definitions of the term "assimilation", which (consequently) resulted in different empirical understandings and results. This debate will be discussed in the next section of this paper.

large issue of immigrants' skills transferability, and why there is such a lack thereof. In fact, the issue of skills transferability still looms large, and much attention has been paid to it (including Schaafsma and Sweetman (2001), and DeVoretz in Djajic, (ed.) (2001) *International Migration: Trends, policies and economic impact*), resulting in various immigration policy changes, including changes to Canada's points system. Though immigrants do seem to be entering their host countries with relatively less transferable skills than in the past, when looking at their impact on host countries' economies and labour markets, the vast majority of studies conclude their impacts are either "negligible" (Lalonde and Topel, 1991), "small" (Borjas, on the U.S. case, 1999), "no[t] negative" (DeVoretz on the Canadian case, 2001), "not so bad" (Card, on the U.S. case, 2005), or "occupationally segmented" (Pedace, 2006).[4] While recent findings have indicated that there are somewhat bleak prospects for new immigrants in many countries, Card (2005) argues that strict earnings analyses may miss a key aspect of immigrants that is less bleak: the performance of their children. Card makes a valid assertion here, and points toward more longitudinal data becoming available for tracking both immigrants and their children. However, it can also be argued that immigrants' children's' prospects are endogenously determined, and while immigrants have been known to be driven and hard-working – qualities which they foster in their children – there can still be some

[4] Borjas (1999: 1708-9) simulated the impact on the U.S. labour market of a supply shock of immigrants increasing labour supply by 10% and found that "if capital is perfectly inelastic, all workers lose and capital gains substantially – the income of capitalists increases by between 2.4 and 11.8%. If capital is perfectly elastic, unskilled workers gain slightly (their earnings increase by less than 0.2%). Overall, the national income accruing to natives rises by 0.1 – 0.4% when capital is perfectly in elastic, and by 0.1 – 0.2% when capital is perfectly elastic . . . the simulation suggests that the overall impact of immigration on the US labor market is small". DeVoretz (2001) found that in general, immigration had no negative impacts on the Canadian labour market. Pedace's (2006) main results suggest that primary-sector native workers benefit the most from increased immigration, while native-born Hispanic-origin women working in the secondary sector suffer the most from downward wage pressures.

limitations, including the age of their children when they immigrated (if they were already born).[5]

Though more limited than studies focused on the United States, at least in number if not in scope, many other studies have been done on the economics of immigration internationally. Among these are studies such as Antecol et al (2006), which analyzed the differences in rates of immigrants' economic assimilation in Australia, Canada, and the United States using census data for the respective countries from the 1980s; their main finding was that total earnings assimilation was fastest in the United States, then Canada, and lastly Australia, which they argued was due to Australia's more generous unemployment insurance and relatively inflexible wages. Another international study has been done by Hammerstedt and Shukur (2006), who conducted a cohort analysis of immigrants' relative earnings in Sweden. They found both declining entry earnings and economic assimilation among non-European immigrants in recent cohorts (with most projected to not catch up with natives' earnings for more than 20 years) and cited more refugee migration, discrimination, and economic conditions as principle explanations of such declining rates of economic assimilation. Similar work has been done by Winkelmann and Winkelmann (1998), who studied immigrant earnings assimilation in New Zealand and found an initial earnings disadvantage of approximately 20 percent for all immigrants, with this disadvantage not disappearing until 20-30 years of residence. More mixed results have been found for other countries, with Schmidt's (1997) findings yielding little to no pattern for immigrants' earnings growth in Germany, and Hayfron

[5] Schaafsma and Sweetman (2001: 1095) found that "immigrants who arrive in their late teens . . . this age-at-immigration group appears to obtain less education than surrounding groups. It is plausible that entering a new society near this crucial transition induces those involved to obtain less schooling and that this has a life-long earnings impact".

(1998) and Longva and Raaum (2003) finding that immigrants' earnings assimilations vary by cohort in Norway, but that while non-OECD immigrants' earnings were considerably below natives' earnings, their rates of assimilation were much faster than the rates of non-OECD immigrants.

Canadian studies have also looked at various issues involved in the economics of immigration. As already mentioned, Baker and Benjamin (1994) looked at the "Performance of immigrants in the Canadian labor market", finding that the recent immigrants have not been performing as well as previous ones. Don DeVoretz in Djajic, (ed.) (2001) studied the "economic winners and losers" resulting from Canada's immigrant influx, finding that immigrants to Vancouver and Toronto are a boon to those cities' treasury transfers, while immigrants to Montreal impose a net drain on the public treasury. DeVoretz (2001) concluded that while Canada's immigration policy is well-run, with generally positive effects on the economy, because the "distributional economic effects are concentrated in cities or enclaves, antipathy towards immigrants is pronounced". In another Canadian study of the impact of where immigrants locate, Laryea (2002) found that immigrants living in small and medium sized CMAs (Census Metropolitan Areas: required to have an urban core of at least 100,000) enjoyed much higher rates of assimilation than their large CMA-dwelling counterparts.

While Canadian studies on the economics of immigration have covered a fairly wide scope of issues, the main papers have focused on the issue of immigrants' economic assimilation, or lack thereof (Baker and Benjamin, 1994; Bloom et al, 1995; Aydemir and Skuterud, 2005; Antecol et al, 2006). As noted above, there have been many other Canadian studies focusing on other issues, including location effects (Laryea, 2002;

Warman, 2007), the case of how self-employed immigrants have fared in the Canadian labour market (Frenette, 2004), and the importance of age-at-migration (Schaafsma and Sweetman, 2001). But very few studies have looked at the inequality of immigrants' earnings in Canada and how and why they have changed (Moore and Pacey, 2003).

Given that this paper deals with many issues surrounding earnings inequality, various measurement, regression, and descriptive techniques are borrowed from the earnings inequality literature. Peter Gottschalk, often in collaboration with Sheldon Danziger, has made important contributions to the wage/earnings and family income inequality literature, as well as other related aspects such as income growth and mobility (see Gottschalk, 1997; Gottschalk and Smeeding, 1997; Gottschalk and Danziger, 2005, for example). While the issue of mobility is not one this study explicitly deals with, given that cohort analyses are performed, the movement of immigrant workers into higher deciles in the native earnings distribution is (and will be subsequently) noted. Indeed, many studies looking at income inequality often also consider income and/or labour market mobility (Gottschalk, 1997; Jenkins and Kerm, 2006; Pedace, 2006), with some specifically focusing on earnings mobility and even comparing the differences in international earnings mobility across countries (Solon, 2002). In many ways, the earnings mobility literature complements that of the economics of immigration literature in that economic assimilation can be seen as analogous to earnings mobility. In other words, both measures analyze how (upwardly) mobile workers' earnings are over time. The issue of intergenerational mobility is somewhat different, though it should be noted that Canada has had a much greater degree of intergenerational mobility than in the

United States (Solon, 2002). A speculated reason for this is Canada's more progressive public policies (Solon, 2002: 65).

As for the issue of earnings inequality, there has been evidence for many years now that inequality in Canada (and even more so in the U.S.) has unambiguously increased (Moore and Pacey, 2003; Johnson and Kuhn, 2004; Heisz, 2007), and recent research suggests it has increased more than previously thought (Frenette, et al, 2007); and has worsened for immigrants (Statistics Canada, 2008). Such increasing earnings inequality has been repeatedly shown for the U.S. case (Butcher and Dinardo, 2002; Rodriguez et al, 2002; Gottschalk, 2005; Steelman and Weinberg, 2005; Jenkins and Kerm, 2006; Pedace, 2006).[6] Regarding the evidence on and speculation about what is driving such increased inequality, there has been much of both to sift through, though in terms of theory, there are essentially three schools of thought. The first is that increasing inequality has been due to skill-biased technical change; the second is that the rise of global trade has put downward wage pressure on especially the lower-earning workers; the third is that changing factor endowments, particularly in terms of greater supply of high versus low-skilled labour, has resulted in widening the wage gap.[7] In a survey of the earnings inequality literature, Steelman and Weinberg (2005) found that most economists are in consensus that skill-biased technical change appears to have had the largest impact on increasing earnings inequality. This certainly raises large policy concerns, as will the

[6] Steelman and Weinberg (2005) note that economists have not always agreed with each other about the degree and direction of earnings inequality, though the vast majority are now in agreement (and the data certainly seems clear) that inequality has increased over the past 30 years in the U.S., a trend that has also been seen in Canada.

[7] Baldwin and Cain (2000) analyze the ability of these three respective theoretical explanations for increased wage gaps for the U.S. case from 1979-1996, finding that none of these hypotheses can alone explain such increasing income equality observed in the U.S. Rather, they conclude that a combination of skill-biased technical change and an increased supply of highly educated labour relative to less-educated labour are the best at explaining the observed changes in the wage gap (along with other relevant economic relationships). For more on this topic, see Bound and Johnson (1992), and Bernard and Jensen (1997).

findings of this paper: with the evidence suggesting that less-skilled workers face large labour market challenges, investing more in skills-training certainly seems appropriate and desirable if Canada wants to attempt to assuage further inequality. Even with Canada's points system, immigrants to Canada have been met with many challenges, including lack of skill transferability. The results to be subsequently presented will hopefully illuminate the areas that have been contributing to the poorer labour market performance of recent immigrants, and thus highlight the resulting policy implications.

3. Empirical Models and Theoretical Framework

As previously noted the work of Chiswick (1978) precipitated both much work on the economic analysis of immigration and established an empirical framework on which most current studies on the topic are still based. As Borjas (1999) argues, most of the immigration literature focuses its research on analyzing differences in skill distributions between immigrants and natives. These studies have generally found the important (if somewhat expected) result that years since immigration is positively correlated to immigrants' earnings.[8] However, the interpretation of this correlation remains an issue of significant debate, with some seeing the correlation as a proxy for the assimilation or adaptation of immigrants into the host country's job market and society in general. Even amongst those using wage growth of immigrants relative to natives as a measure of assimilation, such as Borjas (1985, 1999, 2000, and 2003) and Lalonde and Topel (1991), there is disagreement on precisely how to measure such growth, and which factors to include.[9]

The model originally employed by Chiswick (1978) in his empirical analysis of immigrants' relative economic performance is:

[8] See Borjas (1999), 1718. This finding is supported by many U.S. studies, but also others done in Canada (Baker and Benjamin, 1994), Germany (Dustmann, 1993), and Australia (Beggs and Chapman, 1991).

[9] While not a major component of concern in this study, much work has been done on measuring immigrants' economic assimilation (which is, indeed, a topic in and of itself). However, the understanding of the meaning of the term "assimilation" has been interpreted very differently in various studies, owing mostly to historic differences between dictionary definitions of the term. The *Oxford English Dictionary* defines assimilation as the action of "making similar", while *Webster's Dictionary* defines it as the "social process of absorbing one cultural group into harmony with another". A definition of economic assimilation thus requires a base group to be defined to which immigrants are assimilating. While Borjas (1999, p. 1721) equates economic assimilation with the "rate of wage convergence between immigrants and natives in the host country", Lalonde and Topel (1991) equate assimilation with the economic value of years spent in the host country versus years spent in the source country; that is, their base group is the immigrants themselves.

$$\log w_l = X_l\beta_0 + \beta_1 I_l + \beta_2 ysm_l + \varepsilon_l, \quad (1)$$

where w_l is the earnings of individual l in the host country; X_l is a vector of socioeconomic characteristics including age, age squared, and education (approximated by highest level of education obtained); I_l is a dummy variable for person l which is set to one if the individual is foreign-born (and zero otherwise); ysm_l is the number of years the person has been in the host country (usually referred to as *years since migration – ysm* for short), which is set to zero if they are native-born. The detailed set of explanatory variables for individual l in year t for vector X is:

$$X_{lt} = [age_{lt}\ age^2_{lt}\ age^3_{lt} \times 10^{-4}\ dgree02_{lt}\ dgree03_{lt}\ dgree04_{lt}\ dgree05_{lt}\ dgree06_{lt}\ dgree07_{lt}\ dgree08_{lt}\ dgree09_{lt}\ dgree10_{lt}].$$

Because the vector X accounts for age, the β_2 coefficient thus measures the differential between the values the host labour market ascribes to time spent in the host versus source country.

Borjas (1999) notes that there are methodological difficulties that arise in identifying the cohort and aging effects; namely that studying such effects requires (available) longitudinal data to track such workers over time, or, as this study does (analogous to Borjas), the use of randomly drawn cross-sections that can track immigrant entry cohorts across census survey years. While longitudinal data is becoming more readily available, for the time period and purpose of this study, the techniques of Borjas (1999) are those followed here. Furthermore, this study employs census data from every 10 years, rather than 5, to help the study be more directly comparable to U.S. studies, which rely on the decennial U.S. census data.

Supposing a total of N available cross-section surveys, with cross-section t (t = 1,…,N) coming from year T_t, pooling the data obtained across the cross-sections for both immigrants and natives, we have the following regression model:

Immigrant equation:

$$\log w_{lt} = X_{lt}\varphi_{it} + \delta_i A_{lt} + \alpha y_{lt} + \beta C_{lt} + \sum \gamma_{it}\pi_{lt} + \varepsilon_{lt}, \quad (2)$$

Native equation:

$$\log w_{lt} = X_{lt}\varphi_{nt} + \delta_n A_{lt} + \sum \gamma_{nt}\pi_{lt} + \varepsilon_{lt}, \quad (3)$$

where w_{lt} provides the earnings of person l within the cross-section t; X denotes a vector of socioeconomic characteristics (including age, education, and region of residence); A measures the worker's current age at the time of the survey; C_{lt} denotes the calendar year of the immigrant's arrival in the host country; y_{lt} provides the number of years the immigrant has resided in the host country (often denoted *ysm* – years since migration), which is calculated by $y_{lt} = T_t - C_{lt}$; and π_{lt} is a dummy variable denoting whether person l was taken from the cross-section t.[10]

Given that the worker's age is a regressor, we thus have that the coefficient α accounts for the differential value between a year spent in the host versus source country, respectively. The identification problem (previously mentioned) emerges from the identity

[10] Borjas (1999) notes that a more general model "would account for non-linearities in age, years-since-migration, variation in the coefficient vector (φ, δ) over time, as well as differences in the coefficient α across immigrant cohorts", but claims that usually, these "generalizations do not effect the discussion of identification issues".

$$y_{lt} \equiv \sum \pi_t (T_t - C_{lt}). \qquad (4)$$

Equation (4) introduces this problem of perfect collinearity among the variables y_{lt}, C_{lt} and π_t in the immigrant earnings function. Because of this, key parameters of note (α, β, and the vector γ_i) are not identified. Some restriction must thus be imposed if these aging, cohort, and period effects are to be separated. Borjas (1985, 1999) suggests imposing the restriction that period effects be the same for natives and immigrants:

$$\gamma_{it} = \gamma_{nt}, \qquad \forall t. \qquad (5)$$

In other words, this restriction assumes aggregate economic trends affect native and immigrant earnings by the same amount (percentage-wise).[11]

Other problems with the generic model presented here have been posited by scholars such as Friedberg (1992), who has argued that the model in (2) and (3) ignores a crucial component of immigrant earnings: that of how old the immigrant is upon arrival to the host country. Indeed, Canadian scholars Joseph Schaafsma and Arthur Sweetman (2001) found that age at immigration is extremely important; they found that younger workers, between 21-30 years old, are much more able to integrate into Canada's economy and society, far outperforming older immigrants.[12] In response to this issue,

[11] Borjas (1999) posits that a "useful way of thinking about this restriction is that the period effects for immigrants are calculated from *outside* the immigrant wage determination system", further noting that the restriction is not as confining as it might seem, since it "does not define which native group experienced the same period effects as the immigrant population.

[12] Schaasfma and Sweetman (2001) argue that the strength of their findings merits altering Canada's current points system to put more emphasis on being in the age range 21-30, which they found to be much

Borjas (1999) points to U.S. data suggesting a strongly negative correlation between entry earnings and age-at-arrival; he notes that this identification problem not only remains when immigrants' entry earnings depends on their age-at-migration, but worsens. Consider, for example, this generalization of Eq. (2):

$$\log w_{lt} = X_{lt}\varphi_{it} + \delta_t A_{lt} + \alpha y_{lt} + \beta C_{lt} + \theta M_{lt} + \sum \gamma_{it}\pi_{lt} + \varepsilon_{lt}, \qquad (6)$$

where M_{lt} provides the age-at-migration of the immigrant. Like before, the parameter vector (α, β, γ_i) still cannot be identified given that the identity of Eq. (4) holds. Indeed, with the addition of the age-at-migration variable, another identity is introduced: $M_{lt} \equiv A_{lt} - y_{lt}$. With the perfect colinearity this identity introduces remaining even after imposing the first restriction above (that period effects are the same for natives and immigrants), another restriction is necessary. A possible restriction on the data can be made by assuming the coefficient of the age variable is identical for natives and immigrants. To estimate the system in (3) and (6) requires the restrictions that

$$\delta_i = \delta_n \text{ and } \quad \gamma_{it} = \gamma_{nt}, \qquad \forall_t. \qquad (8)$$

Assuming that the age coefficient is the same for both natives and immigrants is very restrictive, and as Borjas (1999) argues; "contradicts the notion of specific human capital". Given that age is associated with experience, assuming that immigrants' pre-

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more important than experience (which prior to their study had been given an increased percentage of the points), which they found to be difficult to transfer. Another of their findings was that immigrants in their late teens seem to struggle to adapt to a new country and culture, as evidenced by low rates of investment in education – far lower than natives of the same age.

migration "experience" has the same year-for-year value as in the host country goes against both theory and evidence (Friedberg, 2000; Hendricks, 2002; Jasso and Rosenzweig, 2002; Li, 2003; Vargas, 2005). However, some sort of restriction must be imposed on age-at-migration if it is to have an independent effect on earnings.[13]

A large amount of empirical evidence previously reported in literature summarizing the trends in immigrants' skills and earnings (Borjas, 1985, 1995, 1999; Chiswick, 1978; Lalonde and Topel, 1991) can be obtained through estimating the following regression model in each census cross-section:

$$\log w_{lt} = X_{lt}\beta_t + \delta_t I_{lt} + \varepsilon_{lt}, \qquad (9)$$

where w_{lt} is the earnings of individual l in the cross-section observed at time t (t = 1980, 1990, 2000); X is a vector of observed socioeconomic characteristics (including age, education, and region of residence); and I_{lt} is a dummy variable equal to one if individual l is an immigrant and zero otherwise. The coefficient δ_t provides the log earnings differential between immigrants and natives at time t. The results of this analysis, which uses two different specifications of the vector X (with the first including only an intercept, while the second includes a fourth-order polynomial in age, the worker's educational attainment, and region of residence)[14] are presented in Table 19.

[13] Borjas (1999: p. 1720-21) suggests that another approach to address this identification problem could be to "model the age-at-migration effect as a step function: persons who migrate as children face different opportunities in the host country than those who migrate as adults. This specification would break the perfect colinearity between age, age-at-migration, and years-since-migration. Overall, the lesson is clear: estimates of aging and cohort effects are conditional on the imposed restrictions. Different restrictions lead to different estimates of the underlying parameters of interest".

[14] The vector of educational attainment indicates the highest degree, diploma, or certificate obtained (see Appendix A.1.1 for details). The region of residence indicates which province or set of territories the worker resided in at the time of the census.

While it has already been noted that caution must be taken into reading too much into comparing immigrants with similarly skilled, educated, and aged natives, analogous to Borjas (1999), it can be both interesting and elucidating to depict the development of immigrants' and natives' earnings distributions. These trends can be observed by using each Census PUMF as a cross-section to estimate the following regression within the sample native of workers:

$$\log w_{lt} = X_{lt}\beta_t + \varepsilon_{lt}. \tag{10}$$

Using the residuals from each regression to divide the native earnings distribution into deciles, v_{kt} provides the benchmark for the kth native earnings decile in each Census year t (with $v_{0t} = -\infty$, and $v_{10t} = +\infty$). By construction, each decile contains 10% of the native sample. As before, two different specifications of X are employed: the first involves only an intercept; the second involves zero-one dummy variables for age, educational attainment, and area of residence.

In order to determine how many immigrants are located in each of the native earnings distribution deciles, we can employ the estimated equations from (10) to predict the residuals for the immigrant sample in each census cross-section. Let $\tilde{v}_{lt}$ be the residual for immigrant l in year t and define

$$d_{kt} = \Pr[v_{k-1,t} < \tilde{v}_{lt} \leq v_{kt}]. \tag{11}$$

The statistic d_{kt} provides the percentage of the immigrant sample that lies within the kth decile of the native earnings distribution in year t.

Lastly, some standard log-earnings regressions (analogous to Vargas, 2005) are estimated using data from each census, respectively. The main one estimated here is essentially a variation of equation (1), with a dummy variable indicating marital status, *married*, added:

$$\log w_l = \beta_0 + \beta_1 X_l + \beta_2 ysm_l + \beta_3 ysm^2{}_l + \beta_4 married_l + \varepsilon_l, \qquad (12)$$

where w_l provides the earnings of person l in the full year prior to the census year; X denotes a vector of socioeconomic characteristics (including age, education, and place of birth)[15]; ysm_l provides the number of years an immigrant has resided in the host country (ysm_l = 0 for natives); $ysm^2{}_l$ is just the years-since-migration squared; and $married_l$ indicates marital status for individual l (=1 if married or common-law, = 0 otherwise).[16] The detailed set of explanatory variables for individual l in year t for vector X is:

$$X_{lt} = [\text{age age2 age3 } dgree02_{lt}\ dgree03_{lt}\ dgree04_{lt}\ dgree05_{lt}\ dgree06_{lt}\ dgree07_{lt}\ dgree08\ dgree09_{lt}\ dgree10_{lt}\ USA_{lt}\ UK_{lt}\ Other\ Europe_{lt}\ Asia_{lt}\ China_{lt}\ Africa_{lt}\ EasternAfrica_{lt}].$$

with the set of place of birth dummy variables (now only including Asia (for 1981 and 2001 samples); China, Hong Kong, and other East and South East Asia (for 1991 sample)) contained in the vector of socioeconomic characteristics X_{lt} with the base-group being all other immigrants' source countries.

[15] The vector X includes place-of-birth dummy variables: USA, UK, Other Europe, Asia (for 1981 and 1991 census data), China (for 1991 data), Africa (for 1981 and 1991 data), and Eastern Africa (for 2001 data).
[16] See Appendix A.1.1 for more on how *married* is defined.

4. Data and Empirical Implementation

The data sources for this study are Statistics Canada's Public Use Micro Data Files (PUMF) from the 1981, 1991, and 2001 Canadian Censuses. These PUMF files are made up of data obtained from the mandatory, long-form version of the census forms. For the purposes of this study, key data of interest include (at the time of the survey): earnings (from wages and salaries only), class of worker (i.e. part-time vs. full-time), immigrant status, years since migration, year of immigration, age at immigration, educational attainment (as measured by highest level of education), experience, age, gender, and area of residence (both by province/territory and city/rural area). The beauty of this census data is that it provides large amounts of reliable data that can be used to conduct detailed analyses, breaking the data down even by region of residence. The data also yields reliable cross-sections of the Canadian population over time, and can thus be used to calculate recent immigrants' labour market performances, as well as tracking immigrant cohorts' performances over time.

While PUMF files only contain pre-tax data, Moore and Pacey (2003: 35) have noted that the large size of the files "permits disaggregation by social characteristics and, more importantly, by metropolitan areas". In comparison, though the Survey of Household Spending (SHS) files contain after-tax incomes, their smaller size restricts their capabilities. Indeed, it is pre-tax income that this study is interested in, and the use of the large, pre-tax PUMF files has become common practice: Moore and Pacey (2003) used the PUMF files in their study on the determinants of inequality in Canada and they had previously (2001) found that although national-level analysis of the SHS affirms that

inequality is indeed lower using after-tax rather than pre-tax income, the trends in inequality are essentially identical.[17]

The individuals in this study's full sample include permanent resident men and women aged 25-64 (at the time of the census) who reported positive wage and salary earnings of greater than $1000 in the year previous to the census (real earnings in year 2000 Canadian dollars). This 'full sample' is very inclusive and is broad enough to obtain a large sample of more than 160,000 for the 1981 census, and over 300,000 individuals for both the 1991 and 2001 censuses, thereby bypassing the dilemmas of having to discard data due to more restrictive sample criteria (such as having to drop data from the Atlantic provinces and territories due to sample-size issues – examples of this include Laryea, 2002; Moore and Pacey, 2003). However, in order to also consider just those workers who work full-time, this study includes a 'limited sample', which contains only those who have worked 'full-year, full-time'; that is, they have worked more than 30 hours per week for over 48 weeks in the year prior to the census. These limited samples are still large: almost 100,000 individuals for the 1981 census, and about 200,000 for both the 1991 and 2001 censuses.

In terms of empirical implementation, 'earnings' are the real wages and salaries (excluding self-employed income) paid to the worker in the full year prior to the census year, where nominal wages and salaries are converted to real year 2000 Canadian dollars using Statistics Canada CANSIM Consumer Price Index (CPI) data.[18] For further

[17] Moore and Pacey (2001) further cite that "inferences regarding the structure of changes in inequality … will be relatively unaffected by using before-tax as opposed to after-tax income".

[18] The data comes from Statistics Canada (2007) CANSIM #737344 CPI, All Items, 2001 basket content. Given that wages and salaries are provided for the full year prior to the census year, the earnings data is thus for 1980, 1990, and 2000. Further, given that the base year is 2000, no adjustment was necessary for the earnings data from the 2001 census, with the 1980 earnings divided by 0.46167 and 1990 earnings divided by 0.82203, respectively, in order to have real earnings.

comparability and contrast, the real earnings from each census PUMF are disaggregated into 'limited' or 'full-year full-time' samples through creation of a dummy variable indicating that a worker was employed full-year full-time if they worked full-time for more than 48 weeks, or non-full-year full-time otherwise. It should be noted that a number of indicator variables were created for the 1981 PUMF in order to facilitate direct and reliable comparisons to the 1991 and 2001 PUMFs.[19] These indicator variables include: one for Atlantic Provinces and Territories, Canadian-born and foreign-born persons, non-missing values of year of immigration and immigrant age, values of years-since-migration, and entry cohort dummy variables for immigrants.

Other dummy variables created for the purposes of this study include: an immigrant status dummy for permanent resident immigrants[20]; a dummy for males and females; dummies for four age categories (age 25-34, 35-44, 45-54 and 55-64); five 'cohort' dummies for immigrants who arrived in Canada: before 1961; between 1961-70; 1971-80; 1981-90; and 1991-2001; a dummy for recent immigrants (who have immigrated within 10 years of the census); a marital status dummy; a census metropolitan area (CMA) dummy; specific CMA dummies; knowledge of official languages dummies; mother tongue dummies; and place of birth dummies. Lastly, in order to be properly incorporated into this study's log-earnings regressions, the PUMF's categorical variables for educational attainment and province of residence (at the time of the census) are represented by sets of zero-one dummy variables for each respective category.[21]

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[19] Many thanks to my supervisor, Dr. Michael Abbott, who graciously made initial augmentations to the 1981 PUMF file by creating these indicator variables.

[20] The original source coding has the immigrant indicator variable 'immpop' equal to 1 for permanent resident non-immigrants, 2 for permanent resident immigrants, and 3 for non-permanent resident immigrants (such as international students).

[21] See Appendix A.1.1 for all the specific variable names and definitions and Appendix A.3.1-3 for full-sample summary statistics for all the variables by census year.

5. Summary Statistics

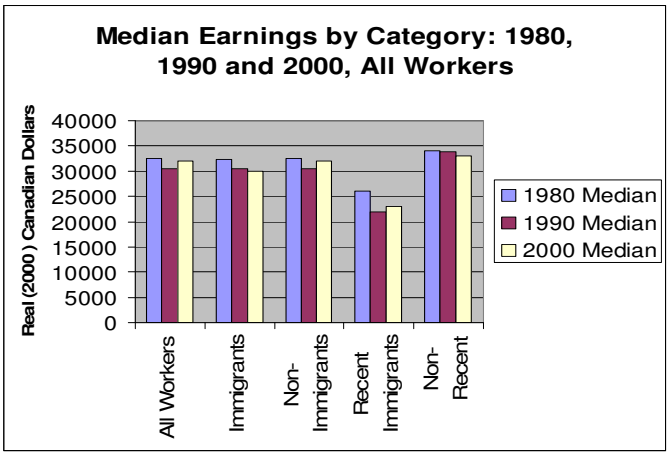
Table 1 summarizes the (in year 2000 Canadian dollars) median and mean real earnings in each of the years prior to the census years (1980, 1990, and 2000) for the major groups involved in this study: immigrants and non-immigrants, recent and non-recent immigrants, and all workers. Figure 1 displays these numbers graphically.

Table 1:
Mean and Median Earnings by Category: 1980, 1990, and 2000, All Workers[a]

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
All Workers	32491	30413	32000	34947	34392	36656
Immigrants	32317	30413	30000	35367	35039	35318
Non-Immigrants	32491	30413	32000	34828	34232	37012
Recent Immigrants	25993	21897	22902	30121	26087	27364
Non-Recent Immigrants	34007	33880	33100	37239	37729	38613

[a]Note that while some of the medians are approximately the same, this has been verified in the census data.

Figure 1



It becomes readily apparent that median immigrant earnings dropped over the three time periods, falling by 5.9% from 1980 to 1990, and a further 1.4% from 1990 to 2000, leaving median real immigrant earnings approximately 7.2% lower in 2000 than 1980. This compares to only a 1.5% drop in real non-immigrant median earnings from 1980 to 2000. Also, when comparing mean real earnings, immigrants' earnings stayed approximately the same over all three periods, while non-immigrants' earnings increased

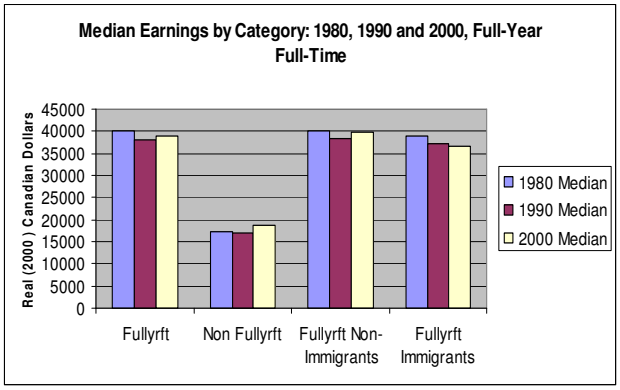
by 6.3%. Looking at the real earnings differences between recent and non-recent immigrants shows that while non-recent immigrants' median real earnings shrunk by 2.7% from 1980 to 2000, recent immigrants' median real earnings were 11.9% lower in 2000 than 1980. Thus, much of the drag on immigrants' real earnings is due to recent immigrants' lower earnings.[22]

Table 2 depicts real earnings for those in this study's limited, or full-year full-time earnings sample. There seems to have been little change in either median or mean real earnings for the sample in general, with a slight decrease in median and increase in mean real earnings.

Table 2:
Mean and Median Earnings by Category: 1980, 1990, and 2000, Full-Year Full-Time

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
Full-Year Full-Time	40034	37979	39000	43199	42288	43758
Non Full-Year Full-Time	17328	17031	18792	22754	21905	24346
FYFT Non-Immigrants	40130	38320	39832	43221	42169	44094
FYFT Immigrants	38989	37257	36700	43122	42772	42451

Figure 2



However, full-year full-time immigrants' mean real earnings actually decreased by 1.5% between 1980 and 2000. As well, full-year full-time immigrants' real median earnings decreased even further, dropping by 5.9% between 1980 and 2000.

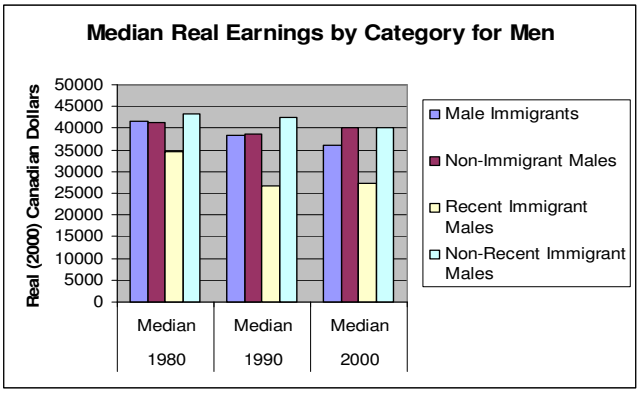
[22] This trend in worsening labour market performances of recent immigrant cohorts has been observed by various authors (Baker and Benjamin, 1994; Bloom et al, 1995; Aydemir and Skuterud, 2005; Antecol et al, 2006), though it will be interesting to see whether this trend will continue in the future.

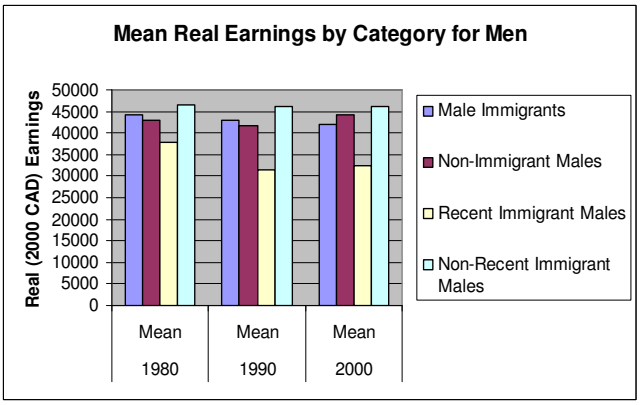
Another important partitioning of the data to consider is that of male/female earnings. While native (non-immigrant) males' median real earnings fell by 2.8% and their mean real earnings rose by 3.1% from 1980 to 2000, immigrant males' median real

Table 3: Mean and Median Earnings by Category: 1980, 1990, and 2000, All Males

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
Male Immigrants	41578	38406	36000	44299	42852	42024
Non-Immigrant Males	41155	38804	40000	42888	41710	44230
Recent Immigrant Males	34657	26763	27417	37784	31442	32308
Non-Recent Immigrant Males	43321	42578	40000	46504	46181	46067

Figure 3





earnings dropped 13.4% and their mean real earnings fell by 5.1% from 1980 to 2000 (with median real earnings decreasing 7.6% from 1980 to 1990, and a further 6.3% from 1990 to 2000). Breaking these male immigrant earnings down further, we note that recent immigrant males' median real earnings decreased a whopping 22.8% from 1980 to 1990

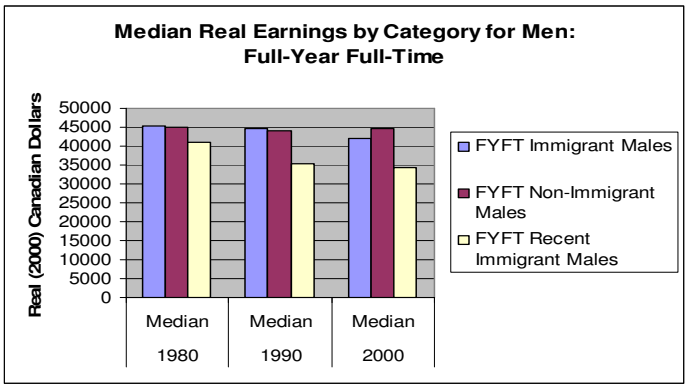
before rebounding slightly by 2.4% from 1990 to 2000, but still leaving recent immigrant males' median real earnings in 2000 20.9% lower than in 1980.

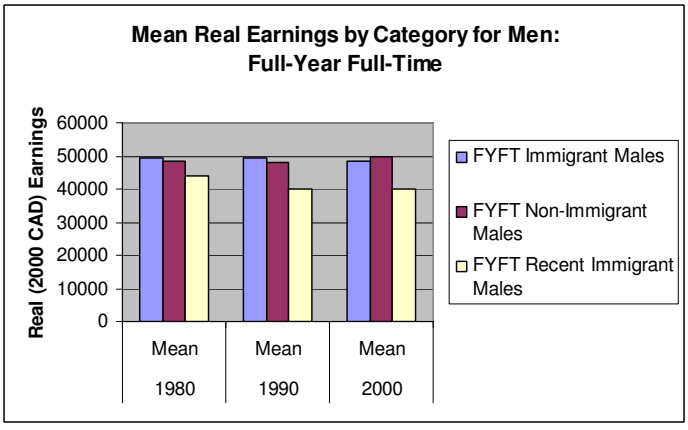
Table 4 looks at the extent of these somewhat startling drops in immigrant males' real earnings for those working full-year full-time. While non-immigrant males' median real earnings changed very little over the three periods, with their mean real earnings edging up slightly (3%) from 1980 to 2000, immigrant males' median real earnings dropped by 1.5% from 1980 to1990, and a further 6.3% between 1990 and 2000, totaling a 7.7% decrease from 1980 to 2000.

Table 4: Mean and Median Earnings by Category: 1980, 1990, and 2000, Males: Full-Year Full-Time

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
FYFT Immigrant Males	45487	44806	42000	49413	49290	48226
FYFT Non-Immigrant Males	44928	43898	44531	48367	48047	49840
FYFT Recent Immigrant Males	41155	35279	34324	44101	39834	39864

Figure 4





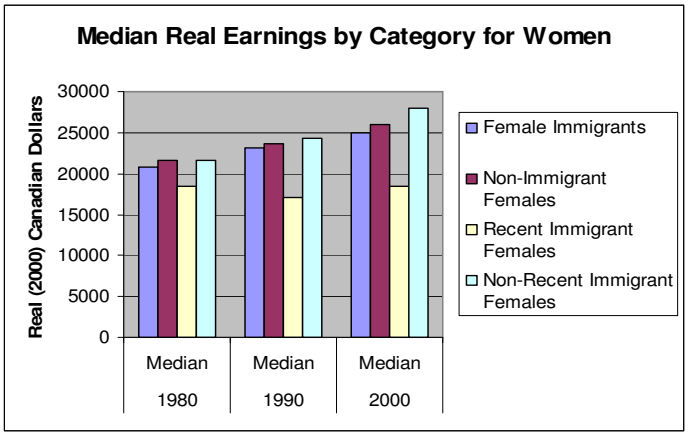
Immigrant males' mean real earnings also dropped by 2.4% from 1980 to 2000. Recent full-year full-time immigrant males' median real earnings clearly have a lot to do with the overall drop in immigrant males' earnings, with a drop of 14.3% seen from 1980 to 1990, and a further decrease of 2.7% from 1990 to 2000, totaling a 16.6% decrease from 1980 to 2000.

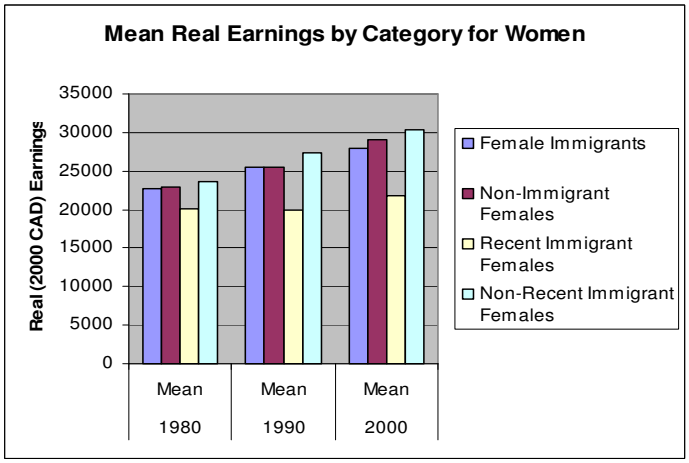
Table 5 shows the trends in females' real earnings, which clearly have been trending strongly upwards due largely to increases in female participation rates and working hours (Beaudry and Lemieux, 1999). Comparing female immigrants with their native counterparts shows that female immigrants' median real earnings increased 11.2% from 1980 to 1990 and 8.2% from 1990 to 2000, totaling an increase of 20.2% from 1980 to 2000, while female non-immigrants' median real earnings grew by 8.8% between 1980 and 1990 and by 10.3% from 1990 to 2000, totaling a very similar 20.0% increase from 1980 to 2000. This left the median real earnings for immigrant females only 4% ($1000 real 2000 Canadian dollars) lower than their native counterparts, while their mean real earnings were only 4.2% lower. It is interesting to note the difference between recent and non-recent immigrant women, however. Recent immigrant females' median real earnings

Table 5: Mean and Median Earnings by Category: 1980, 1990, and 2000, All Females

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
Female Immigrants	20794	23114	25000	22660	25545	27899
Non-Immigrant Females	21660	23571	26000	22978	25430	29061
Recent Immigrant Females	18411	17031	18454	20181	19891	21859
Non-Recent Immigrant Females	21660	24330	28000	23611	27304	30389

Figure 5





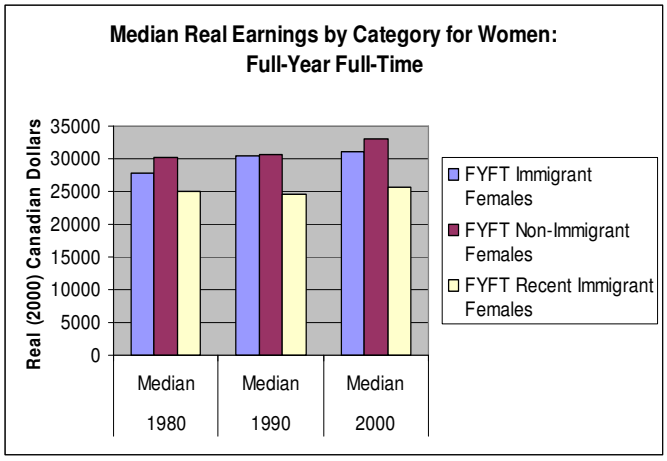
actually dropped by 7.5% from 1980 to 1990, but rebounded 8.3% from 1990 to 2000 for a total increase of only 0.2% from 1980 to 2000. This is while non-recent immigrant females saw increases in their median real earnings of 12.3% from 1980 to 1990 and 15.1% from 1990 to 2000, for a total increase of 29.3% from 1980 to 2000.

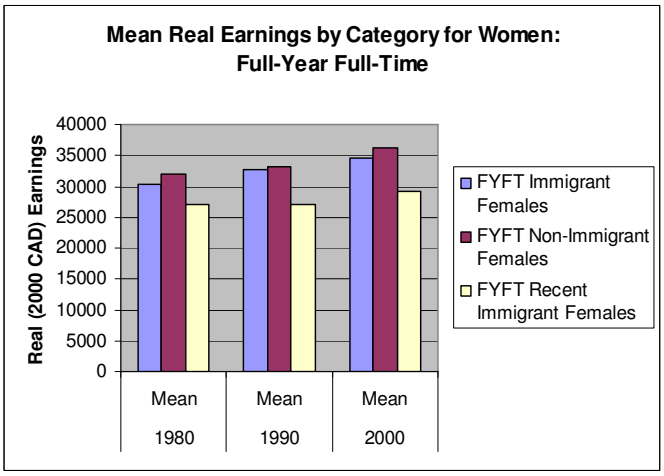
While we would expect the earnings increases to be smaller for those women working full-year full-time due to the previously mentioned strong effect of greater female participation rates and longer hours, Table 6 and Figure 6 point to this indeed being the case. Immigrant women working full-year full-time did see positive gains in

Table 6: Mean and Median Earnings by Category: 1980, 1990, and 2000, Females: Full-Year Full-Time

Real Earnings (2000 CAD)	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
FYFT Immigrant Females	27874	30394	31000	30296	32611	34624
FYFT Non-Immigrant Females	30241	30717	33000	32081	33242	36219
FYFT Recent Immigrant Females	25051	24603	25708	27154	26961	29286

Figure 6





their mean and median real earnings over the three census periods, with their median real earnings increasing by 9.0% from 1980 to 1990 and another 2.0% from 1990 to 2000, for an increase of 11.2% from 1980 to 2000. This is only a little more than half that of the 20.2% increase noted earlier for all immigrant females. Also, immigrant females working full-year full-time gained very little versus their native counterparts, both in terms of median and mean real income. However, the weakest growth in the full-year full-time

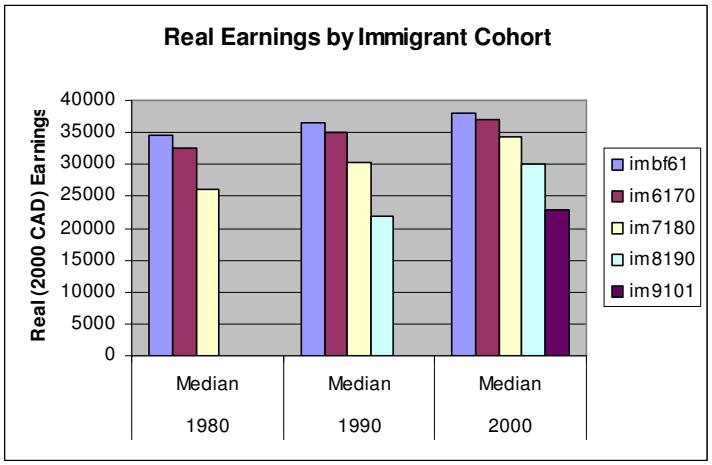
female sample was seen among recent FYFT female immigrants, whose median real earnings grew by only 2.6% from 1980 to 2000. This once again highlights how recent immigrants' real earnings have been becoming proportionally lower relative to all other workers: for recent full-year full-time female immigrants here, their median real earnings went from 17.2% below non-immigrant full-year full-time females in 1980 to 22.1% lower by 2000.

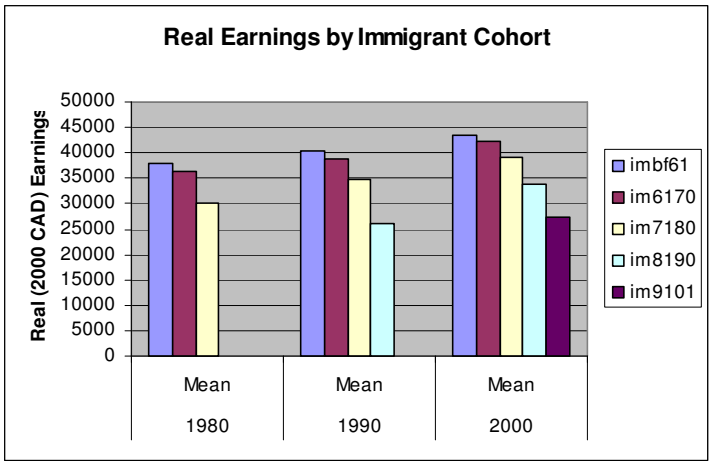
Table 7 and Figure 7 show how immigrant entry cohorts' earnings have evolved over the census periods. While it does seem evident that later immigrant cohorts' earnings 'catch up' or 'assimilate' to earnings of previous cohorts, it is also apparent that later cohorts have been starting with an initially larger earnings disadvantage.

Table 7: Mean and Median Earnings by Cohort of Arrival at Time of: 1980, 1990, and 2000 Censuses, All Immigrants

Real Earnings (2000 CAD) of All Immigrants, Males and Females, 1980-2000	1980 Median	1990 Median	2000 Median	1980 Mean	1990 Mean	2000 Mean
Immigrated before 1961	34657	36495	38000	37771	40368	43451
Immigrated between 1961-1970	32491	35066	37000	36390	38690	42130
Immigrated between 1971-1980	25993	30412	34328	30121	34799	39121
Immigrated between 1981-1990		21897	30000		26063	33780
Immigrated between 1991-2001			22902			27364

Figure 7





Indeed, when compared to the previously noted median real earnings for all workers for each respective year (see Table 1, line 1), the immigrant cohort that arrived from 1971-1980 had median real earnings 20.0% less than that of all workers in 1980, the immigrant cohort that arrived from 1981-1990 had median real earnings 28.0% less than that of all workers in 1990, and the immigrant cohort that arrived from 1991-2000 had median real earnings 28.4% less than all workers in 2000. The real earnings disadvantages were similar for mean real earnings; 13.8%, 24.2% and 25.3% less for the recent cohorts in 1980, 1990 and 2000, respectively. The positive news seems to be the rate of immigrant cohorts' earnings assimilation, which has helped to counterbalance the increasing initial earnings disadvantages recent cohorts have increasingly faced. For the immigrant cohort arriving from 1961-1970, their median real earnings increased by 7.9% from 1980 to 1990, and a further 5.5% from 1990 to 2000, for a total increase of 13.9% from 1980 to 2000. Meanwhile, the immigrant cohort arriving from 1971-1980 saw their median real earnings increase by 17.0% from 1980 to 1990, and a further 12.9% from 1990 to 2000, for a total increase of 32.1% from 1980 to 2000. As for the immigrant cohort arriving from 1981-1990, they saw their median real earnings jump by a whopping 37% from 1990 to 2000. So at least on the surface, it does appear that the rates of

Table 8

Distribution of Foreign-Born by Place of Birth and Period of Immigration (%), 2001

Country of Birth	< 1961	1961-70	1971-80	1981-90	1991-2001	Total by Country
Europe/U.S.	**92%**	**73%**	**41%**	**29%**	**23%**	**44%**
U.K.	24%	23%	14%	6%	3%	11%
U.S.	3%	7%	6%	3%	2%	5%
Germany	13%	4%	1%	1%	1%	3%
Italy	19%	14%	3%	1%	0%	5%
Netherlands	11%	2%	1%	1%	0%	2%
Former USSR	1%	0%	1%	1%	3%	1%
Other Europe	20%	23%	15%	16%	14%	16%
Asia	**2%**	**10%**	**30%**	**40%**	**50%**	**32%**
China	2%	2%	3%	5%	11%	6%
India	0%	3%	7%	7%	10%	7%
Other South Asia	0%	1%	2%	3%	7%	3%
Other E. and S.E. Asia	0%	1%	4%	5%	5%	4%
Hong Kong	0%	2%	5%	6%	6%	4%
Philippines	0%	1%	5%	6%	9%	6%
Vietnam	0%	0%	4%	7%	2%	6%
Americas*	**2%**	**9%**	**17%**	**17%**	**11%**	**13%**
Africa	**1%**	**3%**	**6%**	**6%**	**8%**	**6%**
Middle East	**1%**	**2%**	**3%**	**6%**	**6%**	**4%**
Oceania	**0%**	**1%**	**1%**	**1%**	**1%**	**1%**
Total by year Of arrival	8.9%	15.3%	24.0%	22.6%	29.3%	100.0%

Source: Author's calculation using the 2001 Statistics Canada Census PUMF.
Table is for immigrants aged 25-64 at the time of the 2001 Census who had positive earnings of at least $1000 and were not self-employed in 2000. Numbers may not sum due to rounding.
*Excludes the United States

assimilation have been increasing, and thus partly counter-balancing the decrease in cohorts' initial earnings disadvantages.

Lastly, Tables 8 and 9 show some of the changes that have been occurring in the composition of immigrants to Canada. As can be seen in Table 8, the source countries of immigrants have been radically changing, with immigrants from Europe and the U.S. making up 92% of those (in this study's full sample) who immigrated before 1961, but only 23% of immigrants in the full sample between 1991-2001. This decline in European immigrants has been countered with immigrants from virtually all other areas of the

Table 9

Immigrants' Years of Schooling by Decade of Arrival in Percentage, 2001

Decades	Years of Schooling 0-4	5-8	9-11	12-13	14-17	18+	Total by Decade
Before 1961	1%	8%	15%	31%	32%	13%	8.9%
1961-1970	2%	8%	11%	29%	35%	16%	15.3%
1971-1980	2%	5%	10%	27%	39%	17%	24.0%
1981-1990	3%	4%	10%	27%	38%	18%	22.6%
1991-2001	2%	3%	9%	23%	41%	22%	29.2%
Total by years of education	2%	6%	11%	27%	37%	17%	100.0%

Source: Author's calculation using the 2001 Statistics Canada Census PUMF.

world, though particularly from Asian countries, which were the source of just over 50% of immigrants in the full immigrant sample in 2001 for those who arrived between 1991-2001. While the source country of immigrants to Canada has changed, there has not been much change in level of education as measured by years of schooling. Table 9 shows that of those immigrants in the full sample, 21% of those arriving between 1961 and 1970 had 0 to 11 years of schooling and 80% had more than 11 years of schooling. For those arriving between 1991 and 2001, this changed to 14% and 86% with 0 to 11 and more than 11 years of schooling, respectively. This contrasts the educational attainment as measured by years of schooling by decade for immigrants arriving in the U.S., which saw 16% of its immigrants arriving between 1960 to 1969 have 11 or less years of schooling increase to 30% of those arriving between 1990 to 1999 (Vargas, 2005: 601, Table 8). These changes to the ethnic and educational make-up of Canada's immigrants will be analyzed in the next section, where the importance of these dynamics and that of earnings inequality and differences within the earnings distributions will be discussed in more depth.

6. Results

The main findings to be outlined below are that immigrants to Canada have been doing progressively worse in terms of their labour-market outcomes compared to natives. This is shown through a variety of methods: immigrants – particularly recent immigrants – have consistently fallen into lower deciles of the native earnings distribution; recent immigrant cohorts have been starting with larger earnings disadvantages than previous cohorts; and recent immigrants from Africa and Asia, who together made up approximately 58% of all immigrants to Canada between 1991-2001, have been performing much worse than previous immigrants from those source regions. Such decreasing labour market performance has occurred *despite* recent cohorts of immigrants being better educated than previous ones (as just noted on the previous page). While Canada's population overall has become more educated, Canada's immigrants' education levels alone cannot seem to account for such lower labour market performance, especially compared to the U.S. case, where recent immigrants have become increasingly less educated.[23] The results of this study will now be discussed in more detail, with other factors contributing to the worsening labour market performance of immigrants to Canada both presented and discussed.

The top panel of Table 10 presents the percentage distribution of the immigrant sample across deciles of the Canadian native earnings distribution, while the bottom panel does the same thing, but for recently arrived immigrants (where the calculation in equation (11) uses only the sample of immigrants who have been in Canada less than 10 years). As seen below, and analogous to the results of Borjas (1999), a substantial change

[23] Vargas, 2005: 601, Table 8.

Table 10
Immigrant placement in the Canadian native real earnings distribution, by decile[a], all native workers

Decile of native earnings distribution	Unadjusted distribution 1980	1990	2000	Adjusted Distribution 1980	1990	2000
All Immigrants						
1	8.6	9.6	11.3	9.2	10.8	13.5
2	9.9	10.0	11.2	10.5	11.2	12.8
3	13.3	10.8	11.0	12.6	12.3	12.6
4	8.5	10.9	10.0	12.2	11.9	11.9
5	12.1	10.0	11.3	11.2	11.0	10.2
6	8.0	11.6	9.3	10.6	9.9	9.0
7	10.3	8.0	8.5	9.4	9.3	8.0
8	8.8	9.0	8.9	8.7	8.2	7.6
9	10.0	9.6	8.6	8.4	7.9	7.3
10	10.5	11.2	9.6	7.2	7.6	7.1
Newly arrived Immigrants						
1	11.5	16.1	17.4	12.0	17.5	21.1
2	12.1	14.7	15.5	13.6	16.3	17.9
3	17.5	15.0	14.1	16.5	16.5	15.7
4	9.6	13.3	11.7	13.7	13.6	12.3
5	12.6	9.9	10.8	11.4	10.1	8.8
6	7.6	10.0	8.0	8.8	7.7	7.0
7	8.5	5.3	6.2	7.4	6.1	5.4
8	7.0	5.4	5.9	6.0	4.5	4.9
9	7.2	5.0	5.1	5.9	4.1	3.9
10	6.3	5.0	5.2	4.6	3.6	3.0

[a]Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). These regressions are calculated from the samples of both men and women aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), and were not self-employed in the year prior to the census; see Tables B.1.1, B.1.4 and B.1.7 in Appendix B. Sum of percentages of immigrants placed in the Canadian native earnings distribution may not add to 100 due to rounding.

in the relative earnings distribution of immigrants occurred during the 1980 to 2000 time period. In 1980, 18.5% of all immigrants and 23.6% of recent immigrants fell in the bottom two deciles of the unadjusted native earnings distribution. By 2000, 22.5% of all immigrants and 32.9% of recent immigrants fell in the two lowest deciles. Framed differently, the decreasing average relative earnings of successive immigrant cohorts can be seen as due to the increasing probability that recent immigrants fall into the bottom of

Table 11
Immigrant placement in the Canadian native male real earnings distribution, by decile[a], male workers

Decile of native male earnings distribution	Unadjusted distribution 1980	1990	2000	Adjusted Distribution 1980	1990	2000
Male Immigrants						
1	8.3	10.5	12.6	9.4	10.8	13.4
2	10.0	9.9	11.1	10.7	11.3	12.9
3	10.1	10.6	10.7	12.9	12.3	12.8
4	10.4	9.4	10.5	12.6	12.1	11.7
5	10.9	9.8	9.1	11.4	10.9	10.3
6	9.9	9.2	10.3	10.0	10.0	8.8
7	8.9	9.5	8.6	9.5	8.9	8.0
8	10.9	9.4	7.9	8.7	8.3	7.5
9	9.8	9.9	9.1	8.0	7.7	7.3
10	10.8	11.8	10.1	6.8	7.5	7.2
Newly arrived Male Immigrants						
1	13.5	20.1	19.8	12.1	17.1	20.7
2	14.5	17.4	16.1	13.3	16.4	17.9
3	12.8	15.3	14.0	16.3	16.2	15.6
4	11.6	9.9	11.8	14.9	13.3	11.9
5	10.3	8.9	8.7	11.2	10.0	9.1
6	8.2	6.6	8.1	8.7	8.1	6.9
7	7.5	6.1	5.9	7.1	5.8	5.4
8	8.3	5.4	5.2	6.2	4.9	5.0
9	6.6	4.9	5.3	5.9	4.4	4.1
10	6.6	5.2	5.0	4.3	3.8	3.4

[a]Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). These regressions are calculated from the samples of native men aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), and were not self-employed in the year prior to the census; see Tables B.1.2, B.1.5 and B.1.8 in Appendix B. Sum of percentages of male immigrants placed in the Canadian native earnings distribution may not add to 100 due to rounding.

the native earnings distribution.

Table 11 shows male immigrants' placement in the native male earnings distribution. As in the case for all immigrants' placement in the Canadian native real earnings distribution, male immigrants have become more likely to have their earnings fall within the lowest deciles of the native earnings distribution. This has been particularly evident for recent male immigrants, with 28% of all recent immigrant males

Table 12
Immigrant placement in the Canadian native female real earnings distribution, by decile[a], female workers

Decile of native female earnings distribution	Unadjusted distribution 1980	1990	2000	Adjusted Distribution 1980	1990	2000
Female Immigrants						
1	11.0	9.3	10.8	9.0	10.8	13.7
2	9.8	9.8	11.9	10.3	10.9	12.8
3	9.9	12.4	8.9	11.8	11.7	12.5
4	9.6	8.5	11.3	11.5	11.4	11.6
5	9.4	10.7	9.8	10.7	10.6	9.9
6	9.7	10.2	10.8	10.3	9.9	9.0
7	9.8	10.3	9.1	9.7	9.1	8.0
8	10.7	9.7	9.5	9.5	9.0	7.8
9	10.1	8.9	8.6	9.2	8.5	7.5
10	9.9	10.1	9.2	8.0	8.2	7.2
Newly arrived Female Immigrants						
1	10.1	13.9	16.5	12.2	18.1	21.7
2	9.9	13.6	16.3	13.7	16.4	18.1
3	10.7	16.4	11.6	15.7	16.3	15.4
4	13.3	10.2	13.4	13.9	13.2	12.1
5	14.7	11.2	10.4	10.6	10.3	8.6
6	11.2	10.0	8.9	9.5	8.0	6.9
7	9.6	8.6	6.8	7.2	5.8	5.6
8	9.0	6.9	6.2	6.7	4.7	4.8
9	6.1	4.8	4.9	5.9	4.0	3.9
10	5.3	4.4	4.8	4.6	3.2	2.8

[a]Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). These regressions are calculated from the samples of native women aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), and were not self-employed in the year prior to the census; see Tables B.1.3, B.1.6 and B.1.9 in Appendix B. Sum of percentages of immigrants placed in the Canadian native female earnings distribution may not add to 100 due to rounding.

placing in the bottom two deciles of the unadjusted male earnings distribution in 1980 growing to about 37% in both 1990 and 2000. After adjusting for such observable characteristics as age, education, and region of residence, immigrant males almost invariably placed lower than they did in the unadjusted distribution. Table 12 shows a similar story for female immigrants, who broadly followed the same trends as their male counterparts, placing consistently lower in the native female earnings distribution (with

20.8% of all and 20% of recent immigrant females falling in the bottom two deciles of the unadjusted female earnings distribution in 1980 growing to about 22.7% and 32.8% in 2000).

In comparison with Borjas' (1999) results, the placement of Canadian immigrants and newly arrived immigrants within both the unadjusted and adjusted native earnings distributions is much 'flatter', or equal. This may reflect both the higher inequality and lower mobility in earnings witnessed amongst the U.S. workforce (Gottschalk, 1997; Solon, 2002). For example, while Borjas (1999: 1726, Table 3) calculated that in 1990, 32.9% and 28.5% of all immigrant males fell in the bottom two deciles of the unadjusted and adjusted native male earnings deciles, respectively, the similar calculations presented here (for 1990) are 20.4% and 22.1%, respectively. Comparing the placements of all immigrants and newly arrived immigrants within the unadjusted versus adjusted native earnings distributions, both types of immigrants have generally fared worse when compared to similarly aged and educated natives. The speculated reasons[24] for this include: lack of skill transferability, language barriers, and other hindrances, which will be subsequently analyzed.

Modifying Borjas' adjusted earnings distribution technique to also adjust for workers of full-year full-time status yields the results shown in Table 13. The main results of this alternate adjustment are that more immigrants and recent immigrants' earnings are in the bottom three deciles of the native earnings distribution. This means that compared to similarly skilled full-year full-time native workers, full-year full-time immigrants' earnings were more skewed to the left of the earnings distribution than all

[24] See studies by Schaafsma and Sweetman (2001), DeVoretz in Djajic, (ed.) (2001), Friedberg (2000), Aydemir and Skuterud (2005), Statistics Canada (2008).

Table 13
Immigrant placement in the Canadian native FYFT earnings distribution, by decile[a], all full-year full-time workers

Decile of native FYFT earnings distribution	Unadjusted distribution			Alternate Adjusted Distribution		
	1980	1990	2000	1980	1990	2000
All Immigrants						
1	11.5	12.0	12.0	13.9	13.1	16.5
2	11.6	10.7	11.7	12.8	13.6	14.2
3	9.6	9.3	10.3	11.1	11.7	12.0
4	9.8	10.7	10.7	10.2	10.4	10.2
5	9.1	8.6	9.5	9.4	9.3	8.9
6	9.1	8.9	9.0	9.0	9.2	8.4
7	9.6	9.6	9.2	8.7	8.3	7.7
8	9.1	8.9	9.7	8.6	8.3	7.5
9	9.7	9.6	7.7	8.2	7.9	7.4
10	10.9	11.7	10.3	8.1	8.2	7.2
Newly arrived Immigrants						
1	11.5	20.2	18.1	20.5	22.1	25.6
2	12.1	16.6	16.7	17.0	19.1	19.1
3	17.5	12.3	12.4	12.9	14.6	12.8
4	9.6	11.1	11.2	10.1	10.4	9.9
5	12.6	8.4	8.9	8.7	8.3	7.9
6	7.6	6.9	7.3	7.0	7.0	6.6
7	8.5	7.2	7.5	6.9	5.2	5.5
8	7.0	5.8	7.0	6.4	5.0	4.7
9	7.2	5.6	5.1	5.6	4.3	4.5
10	6.3	5.9	5.8	5.0	4.0	3.4

[a] Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). These regressions are calculated from the samples of both women and men aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), who were not self-employed in the year prior to the census, and who were full-year full-time workers in each census reference year. See Tables B.2.1, B.2.4 and B.2.7 in Appendix B.

immigrants were in the general native earnings distribution. Much of this is likely due to the pronounced (negative) effect on earnings for those recently immigrated vs. those immigrants who have been in the Canadian labour market longer.

Tables 14 and 15 present male and female immigrants' placement in the native male and female earnings distributions, respectively. Note that while more immigrant women and men placed at the bottom of their respective alternative adjusted native earnings distributions than in the adjusted native earnings distribution, the placement of

Table 14

Immigrant placement in the Canadian native male FYFT earnings distribution, by decile[a], male full-year full-time workers

Decile of native male FYFT earnings distribution	Unadjusted distribution			Alternate Adjusted Distribution		
	1980	1990	2000	1980	1990	2000
Male Immigrants						
1	11.9	11.2	13.1	13.9	13.3	16.3
2	10.5	10.2	11.3	13.1	13.7	14.2
3	8.2	10.0	9.8	11.2	11.5	12.0
4	9.5	9.3	9.9	10.2	10.7	10.2
5	8.9	8.8	9.4	9.4	9.5	8.8
6	10.8	9.6	10.5	8.7	8.7	8.4
7	8.7	8.8	7.0	8.8	8.3	7.7
8	9.5	9.7	8.7	8.6	8.4	7.6
9	10.9	10.5	9.9	8.0	7.8	7.4
10	11.1	11.9	10.4	8.1	8.2	7.3
Newly arrived Male Immigrants						
1	18.2	21.4	19.8	20.0	21.2	25.0
2	14.1	16.8	16.5	17.0	19.0	18.8
3	9.4	12.3	12.0	12.5	14.1	12.8
4	9.9	9.4	10.9	10.4	10.5	9.9
5	8.1	8.0	8.3	9.0	8.0	7.8
6	9.8	7.3	8.7	6.8	7.2	6.5
7	7.6	6.4	5.4	6.6	5.5	5.9
8	8.1	6.3	6.2	6.9	5.5	4.9
9	7.9	6.1	6.3	5.7	4.6	4.8
10	6.8	6.0	5.9	5.1	4.4	3.6

[a] Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). The regressions are calculated from the sample of men aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), who were not self-employed in the year prior to the census, and who were full-year full-time workers in each census reference year. See Tables B.2.2, B.2.5 and B.2.8 in Appendix B.

immigrant women in the top two deciles of the alternative adjusted native distribution dropped from 17.2% of all and 10.3% of recent female immigrants in 1980 to only 14.8% of all and 7.4% of recent female immigrants in 2000. More female immigrants (especially recent immigrants) also placed in bottom of the alternative adjusted native female earnings distribution, with 25.3% of all and 38.6% of recent female immigrants placing in the bottom two deciles in 1980 increasing to 30.9% and 45.6% (respectively) in 2000.

Table 15

Immigrant placement in the Canadian native female FYFT earnings distribution, by decile[a], female full-year full-time workers

Decile of native female FYFT earnings distribution	Unadjusted distribution			Alternate Adjusted Distribution		
	1980	1990	2000	1980	1990	2000
Female Immigrants						
1	11.6	11.6	12.1	13.3	13.1	16.7
2	12.5	10.2	11.1	12.0	13.0	14.2
3	12.5	13.1	12.0	11.0	11.3	11.7
4	9.7	7.8	8.5	9.5	9.9	9.9
5	10.0	10.8	9.9	9.6	9.7	8.8
6	11.3	9.3	10.8	8.8	8.8	8.6
7	8.3	10.5	9.6	9.4	8.6	7.9
8	7.2	7.7	9.7	9.2	8.6	7.6
9	8.6	8.8	7.1	8.7	8.3	7.6
10	8.3	10.1	9.2	8.5	8.7	7.2
Newly arrived Female Immigrants						
1	15.5	18.2	18.2	21.3	23.0	26.4
2	16.7	15.3	15.8	17.3	19.8	19.2
3	14.6	16.2	15.2	12.2	14.0	12.9
4	9.9	9.3	8.8	9.7	10.7	9.6
5	9.2	10.6	9.0	8.9	8.2	7.4
6	10.3	7.9	9.2	7.5	6.2	6.7
7	7.2	7.8	6.8	7.0	5.5	5.6
8	5.5	4.7	7.2	5.9	5.0	4.8
9	5.7	5.2	4.4	5.5	3.9	4.2
10	5.4	4.7	5.4	4.8	3.7	3.2

[a] Notes: The adjusted distributions are obtained from log-earnings regressions including a fourth-order polynomial in age, a vector of dummy variables indicating educational attainment, and a vector of dummy variables for region of residence in Canada (both by province, and by CMA). The regressions are calculated from the sample of women aged 25-64 who earned at least $1000 (real (2000) Canadian dollars), who were not self-employed the year prior to the census, and were full-year full-time workers in each census reference year. See Tables B.2.3, B.2.6 and B.2.9 in Appendix B.

As seen in Table 14, the trends have been broadly similar for male immigrants, who have also seen their real earnings place lower in the native male earnings deciles.

Table 16 displays the real values (in constant 2000 dollars) of the earnings deciles of the aggregate non-immigrant and immigrant earnings distributions for the years 1980, 1990 and 2000. Thus, Table 16 shows how the aggregate immigrant earnings distribution changed relative to the aggregate non-immigrant earnings distribution across the three census years. Looking at both the actual (real) earnings decile dollar amounts and the

ratio of immigrant earnings deciles to non-immigrant earnings deciles on the fourth column of Table 16, it is readily observed that immigrants' earnings' lost ground relative to non-immigrants' earnings over the three census years.

Tables 17 and 18 do the same thing for the non-immigrant and immigrant earnings distributions of males and females, respectively. Note in Table 17 that the male immigrant earnings distribution has not changed much relative to the non-immigrant earnings distribution in the top earnings deciles, but has fallen quite significantly (relative to the non-immigrant earnings deciles) in the bottom earnings deciles. For example, while the ratio of immigrant male earnings for decile 3 to non-immigrant earnings for decile 3 was 1.06 in 1980, by 1990 the ratio had fallen to 0.98, and by 2000, the ratio had fallen even further to 0.89. As seen in Table 17, such a declining ratio has been even more pronounced when comparing the bottom two deciles of the male immigrant earnings distribution with those of the male non-immigrant earnings distribution.

As Table 18 shows, similar changes have occurred in the female immigrant earnings distribution when compared to the female non-immigrant earnings distribution, particularly at the lowest four deciles. However, as evidenced by decile 6 (where the ratio between the female immigrant earnings decile 6 and non-immigrant earnings decile 6 grew from 0.92 in 1980 to 0.96 in 1990 to 1.00 in 2000), less of a relative decrease has been observed in the middle deciles of the female immigrant earnings distribution compared to the female non-immigrant earnings distribution than in the analogous case for the male earnings distributions. The results displayed in Tables 17 and 18 point toward rather stark differences between female and male immigrant's earnings inequality, with male immigrants increasingly earning relatively less than their native counterparts.

Table 16
Deciles of Non-Immigrant and Immigrant Real Earnings Distributions for years 1980, 1990, and 2000, All workers

Year/Decile	Non-Immigrant Real Earnings Deciles	Immigrant Real Earnings Deciles	Ratio of Immigrant Deciles to Non-Immigrant Deciles
1980 – decile 1	7144	8664	1.21
1990 – decile 1	7433	7907	1.06
2000 – decile 1	8900	7767	0.87
1980 – decile 2	14123	15212	1.08
1990 – decile 2	14062	14598	1.04
2000 – decile 2	15059	14002	0.93
1980 – decile 3	21643	21661	1.00
1990 – decile 3	20147	19775	0.98
2000 – decile 3	21554	20000	0.93
1980 – decile 4	26452	25993	0.98
1990 – decile 4	25547	25157	0.98
2000 – decile 4	27288	25000	0.92
1980 – decile 5	32491	32318	0.99
1990 – decile 5	30413	30412	1.00
2000 – decile 5	32000	30000	0.94
1980 – decile 6	38164	37826	0.99
1990 – decile 6	36495	36495	1.00
2000 – decile 6	38300	35231	0.92
1980 – decile 7	43321	43321	1.00
1990 – decile 7	42577	42578	1.00
2000 – decile 7	45000	42000	0.93
1980 – decile 8	51413	51985	1.01
1990 – decile 8	49877	51093	1.02
2000 – decile 8	53708	51000	0.95
1980 – decile 9	62815	64765	1.03
1990 – decile 9	61191	64475	1.05
2000 – decile 9	67389	67000	0.99

Note: all earnings deciles from decile 1 to decile 9 are expressed in constant 2000 dollars.

Table 17
Deciles of Non-Immigrant and Immigrant Real Earnings Distributions for years 1980, 1990, and 2000, Male Workers

Year/Decile	Male Non-Immigrant Real Earnings Deciles	Male Immigrant Real Earnings Deciles	Ratio of Male Immigrant Deciles to Male Non-Immigrant Deciles
1980 – decile 1	13874	16842	1.21
1990 – decile 1	12165	12141	1.00
2000 – decile 1	12000	10000	0.83
1980 – decile 2	23827	25993	1.09
1990 – decile 2	21056	20681	0.98
2000 – decile 2	21000	18119	0.86
1980 – decile 3	30325	32185	1.06
1990 – decile 3	27979	27466	0.98
2000 – decile 3	28000	25000	0.89
1980 – decile 4	36173	36823	1.02
1990 – decile 4	34062	33454	0.98
2000 – decile 4	34000	30000	0.88
1980 – decile 5	41155	41578	1.01
1990 – decile 5	38804	38320	0.99
2000 – decile 5	40000	36000	0.90
1980 – decile 6	45487	45899	1.01
1990 – decile 6	43795	44689	1.02
2000 – decile 6	45000	42000	0.93
1980 – decile 7	51439	51985	1.01
1990 – decile 7	49877	51093	1.02
2000 – decile 7	52000	50000	0.96
1980 – decile 8	58410	59566	1.02
1990 – decile 8	58392	60825	1.04
2000 – decile 8	61000	60000	0.98
1980 – decile 9	69314	71480	1.03
1990 – decile 9	70557	73445	1.04
2000 – decile 9	77000	77780	1.01

Note: all earnings deciles from decile 1 to decile 9 are expressed in constant 2000 dollars.

Table 18
Deciles of Non-Immigrant and Immigrant Real Earnings Distributions for years 1980, 1990, and 2000, Female workers

Year/Decile	Female Non-Immigrant Real Earnings Deciles	Female Immigrant Real Earnings Deciles	Ratio of Female Immigrant Deciles to Female Non-Immigrant Deciles
1980 – decile 1	4312	4982	1.16
1990 – decile 1	5474	6083	1.11
2000 – decile 1	6692	6000	0.90
1980 – decile 2	8084	9663	1.20
1990 – decile 2	9732	10377	1.07
2000 – decile 2	12000	11100	0.93
1980 – decile 3	12289	12996	1.06
1990 – decile 3	14455	14598	1.01
2000 – decile 3	16720	15660	0.94
1980 – decile 4	16895	17328	1.03
1990 – decile 4	18316	18309	1.00
2000 – decile 4	21179	20000	0.94
1980 – decile 5	21661	20794	0.96
1990 – decile 5	23571	23114	0.98
2000 – decile 5	26000	25000	0.96
1980 – decile 6	25884	23931	0.92
1990 – decile 6	27954	26763	0.96
2000 – decile 6	30069	30000	1.00
1980 – decile 7	29693	28159	0.95
1990 – decile 7	32137	31629	0.98
2000 – decile 7	36000	34500	0.96
1980 – decile 8	34749	32491	0.94
1990 – decile 8	37736	36607	0.97
2000 – decile 8	43000	40000	0.93
1980 – decile 9	43321	42238	0.98
1990 – decile 9	48199	48538	1.01
2000 – decile 9	55000	52000	0.95

Note: all earnings deciles from decile 1 to decile 9 are expressed in constant 2000 dollars.

The first row of Table 19 depicts the trend in the relative earnings of immigrants to Canada. The unadjusted earnings differential between immigrants and natives changed significantly from 1980 to 2000: immigrants earned about 4.9% less than natives in 1980, but earned about 18% less than natives in 2000. The second row in Table 19 depicts the trend in the relative earnings of recent immigrants (these immigrants have been in Canada less than 10 years as of the census date). While recent immigrants earned about 22.2% less than natives in 1980, the recent immigrant cohort earned about 46.9% less than natives in 2000. A large fraction of the decline in the relative earnings of all and recent immigrants can be explained by changes in observable socioeconomic characteristics, but in contrast to the U.S. case, where declines in educational attainment among successive immigrant cohorts were significant, shifts in language ability and source country are the most significant in explaining the declining earnings of Canada's immigrant cohorts.[25]

Interpreting these trends, as indicated earlier, requires that restrictions be imposed on the period effects. If shifts in aggregate economic conditions did not affect the relative earnings of immigrants (as implied by equation 5), then the cohort effects in Table 19 indicate that the relative skills of successive immigrant cohorts significantly declined.[26]

[25] For the U.S. case, Borjas (1995) found that about half of the decline in immigrants' relative wage can be explained by changes in observable socioeconomic characteristics, especially educational attainment. For the Canadian case, Aydemir and Skuterud (2005) found that shifts in language ability and place of birth accounted for about one third of the observed earnings deterioration of immigrants' entry earnings. The importance of changes in language ability and country of origin are also shown here: see Tables 13 and 15, and additional regressions in Appendix B.2.1.

[26] Implicitly linking skills with earnings presupposes that data are interpreted in light of a human capital model of earnings determination.

Table 19
Relative mean earnings of immigrants in Canada, 1980-2000[a]

Group	Unadjusted relative earnings 1980	1990	2000	Adjusted relative earnings 1980	1990	2000
All immigrants	-0.049***	-0.098***	-0.180***	-0.030***	-0.075***	0.025***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.011)
Newly arrived	-0.222***	-0.393***	-0.469***	-0.167***	-0.294***	-0.504***
Immigrants	(0.009)	(0.007)	(0.007)	(0.008)	(0.007)	(0.012)
Prior to 1961 arrivals						
15-24 in 1981	-	0.028***	-	-	0.030***	
		(0.044)			(0.040)	
25-34 in 1981	0.070***	0.091***	-	0.038***	0.061***	-
	(0.016)	(0.013)		(0.015)	(0.012)	
35-44 in 1981	0.015	0.060***	-	0.019	0.053***	-
	(0.015)	(0.012)		(0.013)	(0.011)	
45-54 in 1981	0.065***	0.133***	-	0.060***	0.110***	-
	(0.012)	(0.012)		(0.011)	(0.011)	
1961-1970 arrivals						
15-24 in 1981	-	0.050**	0.082***	-	0.027**	0.064
		(0.014)	(0.016)		(0.012)	(0.015)
25-34 in 1981	-0.006	0.053***	0.034**	0.011	0.050***	0.037
	(0.016)	(0.013)	(0.014)	(0.014)	(0.011)	(0.013)
35-44 in 1981	-0.016	0.018***	0.093***	-0.004	0.029***	0.065***
	(0.012)	(0.010)	(0.015)	(0.011)	(0.009)	(0.014)
45-54 in 1981	-0.055***	0.060***	-	-0.022	0.025***	-
	(0.017)	(0.016)		(0.016)	(0.015)	
1971-1980 arrivals						
15-24 in 1981	-	-0.031***	0.011	-	-0.029***	-0.002
		(0.012)	(0.013)		(0.011)	(0.012)
25-34 in 1981	-0.190***	-0.059***	-0.033***	-0.131***	-0.052***	-0.040***
	(0.012)	(0.009)	(0.010)	(0.011)	(0.008)	(0.010)
35-44 in 1981	-0.203***	-0.092***	-0.041	-0.156***	-0.083***	0.004
	(0.016)	(0.012)	(0.017)	(0.015)	(0.011)	(0.016)
45-54 in 1981	-0.325***	-0.124***	-	-0.267***	-0.142***	-
	(0.029)	(0.023)		(0.025)	(0.021)	
1981-1990 arrivals						
15-24 in 1991	-	-	-0.047***	-	-	-0.039***
			(0.014)			(0.012)
25-34 in 1991	-	-0.345***	-0.143***	-	-0.244***	-0.133***
		(0.011	(0.010)		(0.009)	(0.010)
35-44 in 1991	-	-0.408***	-0.208***	-	-0.314***	-0.183***
		(0.013)	(0.013)		(0.011)	(0.012)
45-54 in 1991	-	-0.486***	-0.187***	-	-0.363***	-0.219***
		(0.023)	(0.027)		(0.020)	(0.026)

a Notes: Robust standard errors are in parentheses. Each cohort's age categories include those in the specific group according to their age as of the respective census - the first and last cohorts are only for the 1981 and 2001 censuses. The adjusted relative earnings are obtained from a regression including a fourth-order polynomial in age, a vector of dummy variables indicating region of residence, and a vector of dummy variables indicating the worker's educational attainment. The statistics are calculated in the sample of those aged 25-64 who earned at least $1000 (real $2000) and were not self-employed in the year prior to the census. *Significant at 10% significance level. **Significant at a 5% significance level. ***Significant at a 1% significance level.

This interpretation thus employs a difference-in-differences estimator to determine the trend in the relative skills of immigrants.[27]

The remaining rows of Table 19 describe how the relative mean earnings of a particular immigrant cohort develop over time. These numbers are obtained by estimating the regression model in equation (9) on a pooled sample which includes both natives and immigrants in a particular age group, with the immigrants having arrived at a particular time. For example, the ninth row of Table 19 reports the results from regressions that include natives aged 35-44 as of the time of the 1981 census and immigrants who were also aged 35-44 as of the 1981 census who arrived between 1961 and 1970. This sample is subsequently "tracked" across censuses (i.e. aged 45-54 as of the 1991 census; aged 55-64 as of the 2001 census). The earnings of these immigrants soon caught up with and overtook their native counterparts; an initial earnings disadvantage of about 1.6% in 1980 became an earnings advantage of 1.8% by 1990 and 9.3% by 2000. However, post-1970 immigrant cohorts have entered the Canadian workforce with much larger earnings disadvantages. Given this, more recent immigrant cohorts have still enjoyed quite a high rate of relative earnings growth. For example, those who immigrated from 1971-80 and were aged 35-44 at the time of the 1981 census went from a relative earnings disadvantage of 20.3% in 1980 to a disadvantage of only 4.1% by 2000. These findings show that while immigrants to Canada have been starting with generally lower relative

[27] Borjas (1999) points out that the U.S. wage structure underwent significant change in the 1980s, with a large decline in the relative wage of lower-skilled workers. He argues that because of this, the assumption that the period effects for immigrants and natives are the same is likely invalid. However, Borjas (1995) also has found evidence suggesting that changes to the U.S. wage structure were not large enough to account for the cohort effects he presents in his (1999) Table 2. The Canadian wage structure has gone through changes analogous to the U.S. case: Aydemir and Skuterud (2005) note that while entry earnings for native men and women have significantly declined in the past four decades, they "do not find any clear evidence that immigrants' earnings are more sensitive to entry macro conditions" (663).

earnings over successive immigrant cohorts, in contrast to the U.S. case (Borjas, 1999), they have continued to enjoy relatively rapid rates of earnings assimilation.

Table 20 shows how within-group inequality has changed among all workers, natives (or non-immigrants) and immigrants. These statistics, along with those of recent and non-recent, full and non-full-year-full-time workers, are depicted in Figure 8. Inequality among immigrant workers has risen relatively more than inequality among native workers in virtually all categories. While immigrant inequality as measured by the 90/10 earnings decile ratio was 7.48 in 1980, compared to 8.79 for non-immigrants, by 2000, the same ratio rose 15.3% to 8.63 for immigrants, but dropped 13.9% to 7.57 for non-immigrants. Using the 90/50 decile ratio, both immigrants' and non-immigrants'

Table 20: Within-Group Earnings Inequality: All workers

Within Group Inequality, All Workers

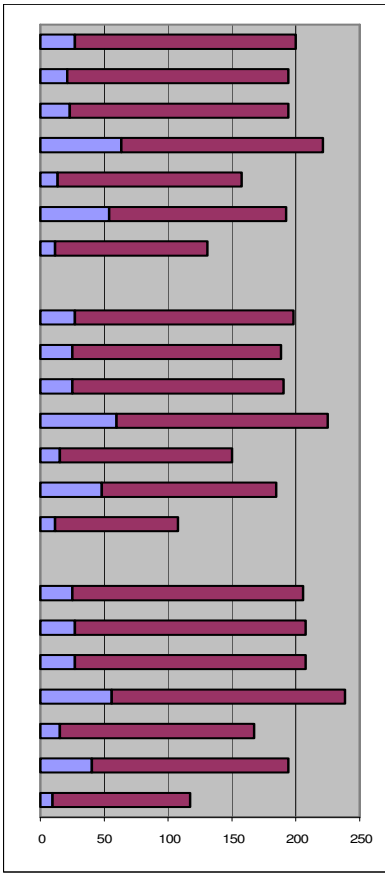
	P90/P10	P90/P50	P50/P10	P80/P20	P80/P50	P50/P20	P60/P40
1980							
All Workers	8.34	1.93	4.31	3.53	1.59	2.22	1.44
Non-Immigrants	8.79	1.93	4.55	3.64	1.58	2.30	1.44
Immigrants	7.48	2.00	3.73	3.42	1.61	2.12	1.46
1990							
All Workers	8.23	2.04	4.03	3.51	1.64	2.14	1.43
Non-Immigrants	8.23	2.01	4.09	3.55	1.64	2.16	1.43
Immigrants	8.17	2.12	3.85	3.50	1.68	2.08	1.45
2000							
All Workers	7.91	2.10	3.76	3.53	1.66	2.13	1.41
Non-Immigrants	7.57	2.11	3.60	3.57	1.68	2.12	1.40
Immigrants	8.63	2.23	3.86	3.64	1.70	2.14	1.41

Notes:
Source: Author's calculation using the 1981, 1991, and 2001 Statistics Canada Census PUMFs.

inequality increased from 1980 to 2000, however, immigrants' inequality again increased at a faster pace, 11.5%, than non-immigrants', 9.3%. As this study's results have repeatedly shown (and as Figure 8 illustrates), recent immigrants have been faring relatively worse over successive cohorts both in terms of their relative earnings and increased inequality.

Figure 8: Real ($2000) Income Distribution Comparison
(numbers given are percent of Canadians' median earnings according to the respective censuses)

	Low[a] Earnings Decile (P10/P50)	Length[b] of dark bars represents the gap between high and low earnings workers	High[c] Earnings Decile (P90/P50)	Ratio of high to low Earnings (Decile Ratio)
1980	%		%	
Immigrants	27		199	7.37
Non-Immigrants	22		193	8.77
All Workers	23		193	8.39
Non-Recent Fullyrft Immigrants	64		221	3.45
Non-Recent Non-Fullyrft Imm.	14		158	11.29
Recent Fullyrft Immigrants	53		192	3.62
Recent Non-Fullyrft Immigrants	11		131	11.91
1990				
Immigrants	26		199	7.65
Non-Immigrants	24		188	7.83
All Workers	25		191	7.64
Non-Recent Fullyrft Immigrants	60		225	3.75
Non-Recent Non-Fullyrft Imm.	16		150	9.37
Recent Fullyrft Immigrants	47		184	3.91
Recent Non-Fullyrft Immigrants	11		109	9.91
2000				
Immigrants	24		206	8.58
Non-Immigrants	28		207	7.39
All Workers	27		207	7.67
Non-Recent Fullyrft Immigrants	55		238	4.33
Non-Recent Non-Fullyrft Imm.	16		167	10.44
Recent Fullyrft Immigrants	41		194	4.73
Recent Non-Fullyrft Immigrants	10		117	11.70
Average[d]	30		184	6.13



Source: Author's calculation using the 1981, 1999, and 2001 Statistics Canada Census PUMFs.
aRelative earnings (as a percentage of the aggregate national median earnings) for individuals who are lower than 90 percent of those within the particular category and higher than 10 percent (for each particular census year).
bThe length of the dark bars represents the gap between the 90th and 10th percentiles, that is, the gap represents the 90th/50th percentile value minus the 10th/50th. The light and dark bars add to make the value for the 90th percentile (as a percentage of national median earnings).
cRelative earnings for individuals who are higher than 90 percent of those within the particular category and lower than 10 percent (for each particular census year).
dSimple average (of percentage of aggregate national median earnings for 10/50 and 90/50 decile ratios).

Table 21: Within-Group Earnings Inequality: Males

Within Group Inequality, Males	P90/P10	P90/P50	P50/P10	P80/P20	P80/P50	P50/P20	P60/P40
1980							
All Workers	4.78	1.70	2.80	2.40	1.42	1.69	1.25
Non-Immigrants	5.00	1.68	2.97	2.45	1.42	1.73	1.26
Immigrants	4.24	1.72	2.47	2.29	1.43	1.60	1.25
1990							
All Workers	5.90	1.85	3.18	2.80	1.51	1.85	1.29
Non-Immigrants	5.80	1.82	3.19	2.77	1.50	1.84	1.29
Immigrants	6.07	1.92	3.16	2.94	1.58	1.86	1.34
2000							
All Workers	6.42	1.98	3.25	3.03	1.56	1.95	1.36
Non-Immigrants	6.42	1.93	3.33	2.90	1.53	1.90	1.32
Immigrants	7.78	2.16	3.60	3.31	1.67	1.99	1.40

Notes:
Source: Author's calculation using the 1981, 1991, and 2001 Statistics Canada Census PUMFs.

Table 22: Within-Group Earnings Inequality: Females

Within Group Inequality, Females	P90/P10	P90/P50	P50/P10	P80/P20	P80/P50	P50/P20	P60/P40
1980							
All Workers	10.00	2.01	4.98	4.03	1.61	2.51	1.49
Non-Immigrants	10.05	2.00	5.02	4.30	1.60	2.68	1.53
Immigrants	8.48	2.03	4.17	3.36	1.56	2.15	1.38
1990							
All Workers	8.66	2.06	4.20	3.88	1.61	2.41	1.51
Non-Immigrants	8.80	2.04	4.31	3.88	1.60	2.42	1.53
Immigrants	8.00	2.11	3.80	3.54	1.59	2.22	1.46
2000							
All Workers	8.40	2.10	4.00	3.54	1.64	2.16	1.43
Non-Immigrants	8.22	2.12	3.89	3.58	1.65	2.17	1.42
Immigrants	8.81	2.12	4.17	3.60	1.60	2.25	1.50

Notes:
Source: Author's calculation using the 1981, 1991, and 2001 Statistics Canada Census PUMFs.

Tables 21 and 22 show how within-group inequality has changed among male and female workers, respectively, for the same categories of workers as in Table 20. Inequality among immigrant workers has risen relatively more than inequality among native workers in virtually all categories. While it should be noted that female workers' median and mean earnings have consistently been significantly lower than male workers' earnings (no matter the category), it is readily apparent from Tables 21 and 22 that female

within-group inequality is significantly higher than male within-group inequality, and indeed higher for all categories of workers. Another key observation is that although inequality between male workers of all types did not reach the same levels of inequality as that within female workers, inequality within males increased markedly over the three censuses. Indeed, as seen in Table 21, while the P90/P10 earnings ratio for non-immigrant males rose 16.0% from 1980-1990 and a further 10.7% from 1990-2000 for a total increase of 28.4% from 1980-2000, the percentage changes were much higher for immigrant males, with their P90/P10 earnings ratio growing by 43.2% from 1980-1990 and a further 28.2% from 1990-2000 for a total of 83.5% between 1980-2000. Compared to non-immigrant female workers, whose P90/P10 ratio actually fell by 18.2% from 1980-2000, and immigrant female workers, whose P90/P10 ratio grew by only 3.9% from 1980-2000, this is indeed a stark result.

7. Conclusions

This paper has sought to offer insight into how immigrants' relative earnings have been doing over time, particularly within the overall Canadian earnings distribution. The main results are: immigrants, especially recent immigrants, have been earning relatively less than their native counter-parts; earnings inequality among immigrants has worsened much more than among natives; recent immigrant cohorts have been earning both relatively and absolutely (in real terms) less than previous cohorts upon entry; and as a result, immigrants have been placing lower and lower in the native earnings distribution. Indeed, this paper finds all of these trends to also apply to the male-only and female-only real earnings distributions, with both having very similar results. The explanatory findings of this paper, with the detailed results largely contained in the appendix, are: in contrast to the U.S. case, the declining relative earnings of immigrants are not backed up by any evidence of declining education among immigrants; lower returns to foreign labour-market skills and experience are significant in explaining such lower relative earnings; and shifts to non-traditional source countries and the resulting language barriers inherent in such changes are also significant explanations of recent immigrants' struggles to adapt to the Canadian labour market.

These difficulties in adjusting to the Canadian labour market have become consistently more challenging for successive immigrant cohorts. This is evidenced by this study's results: recent immigrants' relative earnings tumbled from an initial earnings disadvantage of 4.9% in 1980 to 9.8% in 1990 and to an 18.0% disadvantage by 2000. As noted in section 2 (p. 11), recent data indicates that this trend has continued, with recent immigrants' relative earnings disadvantages becoming even more pronounced. These

findings are in line with those of the U.S. case, which Borjas (1999) has shown to have also experienced significant drops in the relative earnings of its recent immigrants over consecutive cohorts. However, unlike the U.S. case, this study highlights the fact that immigrants to Canada have not become less educated over time compared to previous immigrants, but rather, have actually become more educated. This, along with Canada's points system and progressive public policies, has been speculated to be a reason for Canada's continued high level of earnings mobility (Solon, 2002). Indeed, while Canada's immigrants have seen their initial relative earnings fall over time, this study has found their earnings catch-up, or 'economic assimilation', to still be quite strong, as evidenced by the strong relative earnings gains experienced by immigrant cohorts noted in Table 19.

In conclusion, the relative earnings distribution of immigrants underwent a significant change over the 1980-2000 period. Comparing how immigrants' earnings were placed in the native earnings distribution (which has 10% of natives in each decile, by construction) in 1980 versus 2000, 4% more immigrants and 9.3% more recent immigrants placed in the bottom two deciles in 2000 than in 1980. Put differently, immigrants became increasingly more likely to fall into the bottom of the native earnings distribution. A large amount of this observed decline in immigrants' relative earnings can be explained by the traditional socioeconomic characteristics, but in contrast to the U.S. case, declines in educational attainment have not been seen among consecutive immigrant cohorts; shifts in region of origin and language ability have been far more important in explaining such earnings deteriorations. If vicissitudes in aggregate economic circumstances had no affect on immigrants' relative earnings, then such

declining cohort effects observed in Table 19 indicate immigrants' relative skills have declined over successive cohorts. While some of this decline is picked up through region-specific effects involving language and other capabilities, the literature has no full and clear explanation of the cause of this declining trend in immigrant earnings. What is clear is that immigrants coming to Canada are arriving primarily from non-European, non-English or French-speaking countries, and this appears to have shifted the earnings distribution of Canadian immigrants leftward relative to the earnings distribution of Canadian natives. However, immigrants arriving in Canada have been generally well-educated, and have enjoyed strong rates of earnings assimilation. Canada is, and will continue to be, a country of immigrants. Helping those immigrating to Canada adjust and learn to integrate into Canada's labour market economy must be a policy priority, as is seeing the benefits of immigrating at an early working age. The unclear elements of precisely why immigrants continue to face even further relative earnings disadvantages than in the past will be topics for further investigation.

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Appendix A.1:

A.1.1 Names and Definitions of All Variables

Real ($2000) wages and salary earnings by individual:

realwages	Represents the wages and salary earnings (variable 'wages' in the PUMFs) adjusted to year 2000 Canadian dollars: i.e. 'wages'/0.46167 for the 1981 census data and 'wagesp'/0.82203 for the 1991 census data (no adjustment needed for the 2001 census data). This adjustment follows from CANSIM #V737344: CPI, All Items, 2001 basket content (year 2000 is then taken to be the base year, rather than 1992). Those values of 'realwages' that are missing (= .) and less than $1000 are dropped.

Natural logarithm of real ($2000) wages and salary earnings by individual:

lne	Represents the natural logarithm of 'realwages'.

Recent immigrant status indicator variable:

recentim	= 1 if the individual has immigrated within 10 years at the time of the respective census; = 0 otherwise.

Full-year full-time indicator variable:

fullyrft	= 1 if the individual has worked at least 49 weeks in the year prior to the time of the census, and has worked mainly full-time in those weeks (defined as over 30 hours per week); = 0 otherwise.

Age variable:

age	= the individual's age as of the time of the census. Only those with age >=25 & age <=64 are kept.

Age category indicator variable:

agecat4	= 1 if the individual's age is from 25 to 34; = 0 otherwise
agecat5	= 1 if the individual's age is from 35 to 44; = 0 otherwise
agecat6	= 1 if the individual's age is from 45 to 54; = 0 otherwise
agecat7	= 1 if the individual's age is from 55 to 64; = 0 otherwise (Base group = agecat7)

Immigrant Status indicator variable:

im1	= 1 if the individual is a permanent resident immigrant; 0 otherwise

Immigrated by decade (or cohort) indicator variables:

imbf61	= 1 if the individual immigrated before 1961; 0 otherwise
im6170	= 1 if the individual immigrated from 1961-70; 0 otherwise
im7180	= 1 if the individual immigrated from 1971-80; 0 otherwise
im8190	= 1 if the individual immigrated from 1991-01; 0 otherwise (the coding
im9101	for this variable includes those who immigrated up to the time of the date of the 2001 census (Base group = im9101)

Years-since-migration variable:

ysm	= the number of years since migrating to Canada from their source country as measured at the time of the census

Weeks worked variable:

wkswk	= the weeks worked by an individual in the year prior to the date of the census. The 'work' excludes maintenance around the home, housework, and volunteer work, while it includes weeks of paid vacation, paid absence for training, and sick leave with pay. For its 'fullyrft', or limited sample, this study uses wkswk >= 49 & wkswk <= 52 because of strong evidence that many full-year workers (against instructions) excluded their weeks of paid vacation or sick leave.

Male indicator variable:

male	= 1 if the individual is male; 0 otherwise (both this indicator variable and the below 'female' indicator variable were made from the categorical variable 'sex', with sex = 2 for males and = 1 for females)

Female indicator variable:

female	= 1 if the individual is female; 0 otherwise

Highest obtained degree, certificate, or diploma indicator variables:

degree01	= 1 if individual has obtained no certificate or diploma; = 0 otherwise
degree02	= 1 if individual has obtained high school graduate certificate; = 0 otherwise
degree03	= 1 if individual has obtained trades certificate or diploma; = 0 otherwise
degree04	= 1 if individual has obtained college certificate or diploma; = 0 otherwise
degree05	= 1 if individual has obtained university certificate or diploma below bachelor's level; = 0 otherwise

degree06	= 1 if individual has obtained university degree at bachelor's level; 0 otherwise
degree07	= 1 if individual has obtained university degree with university certificate above bachelor's level; = 0 otherwise
degree08	= 1 if individual has obtained a medical degree; = 0 otherwise
degree09	= 1 if individual has obtained a master's degree; = 0 otherwise
degree10	= 1 if individual has obtained an earned doctorate degree; = 0 otherwise

Marital status indicator variable:

married	= 1 if individual is married (or common-law) as of time of census; = 0 otherwise. Note that this variable was created out of 'marst' = 2 for the 1981 census, which included those in a common-law partnership under the classification = 2, or 'now married', and 'marsthp' = 2 for the 1991 and 2001 censuses, which retained the historical (h) definition for persons (p), while creating a new variable classification for those legally (l) married: 'marstlp')

Province or territory of residence as of time of census indicator variables:

nfld	= 1 if residing in Newfoundland as of census date; = 0 otherwise
ns	= 1 if residing in Nova Scotia as of census date; = 0 otherwise
nb	= 1 if residing in New Brunswick as of census date; = 0 otherwise
pei	= 1 if residing in Prince Edward Island as of census date (note that PEI was lumped in with the territories in the 1981 census, but was treated separately for the 1991 and 2001 censuses); 0 otherwise
que	= 1 if residing in Quebec as of census date; = 0 otherwise
ont	= 1 if residing in Ontario as of census date; = 0 otherwise
man	= 1 if residing in Manitoba as of census date; = 0 otherwise
sask	= 1 if residing in Saskatchewan as of census date; = 0 otherwise
alb	= 1 if residing in Alberta as of census date; = 0 otherwise
bc	= 1 if residing in British Columbia as of census date; = 0 otherwise
terri	= 1 if residing in the territories (what is now Nunavut, North West Territories, and the Yukon) as of census date (includes PEI for the 1981 census); = 0 otherwise Note: these indicator variables were derived from the categorical variable 'provp' in the 1991 and 2001 censuses and 'prov' for the 1981 census.

Census Metropolitan Area (CMA) indicator variable:

cma1	= 1 if the individual resided within a cma as of the date of the census; = 0 otherwise Note: this and the non-cma variable were derived from 'cmap' in the 1991 and 2001 censuses and 'cma' in the 1980 census, for which

	dwelling in a CMA = 1, and = 0 otherwise)

Non-Census Metropolitan Area (CMA) indicator variable:

cma0	= 1 if the individual did not reside within a cma as of the date of the census; = 0 otherwise

Specific CMA indicator variables:

halifax	= 1 if the individual resided within the Halifax CMA as of the date of the census; = 0 otherwise
quebec	= 1 if the individual resided within the Quebec CMA as of the date of the census; = 0 otherwise
montreal	= 1 if the individual resided within the Montreal CMA as of the date of the census; = 0 otherwise
ottawahull	= 1 if the individual resided within the Ottawa-Hull CMA as of the date of the census; = 0 otherwise
toronto	= 1 if the individual resided within the Toronto CMA as of the date of the census; = 0 otherwise
hamilton	= 1 if the individual resided within the Hamilton CMA as of the date of the census; = 0 otherwise
stcathniag	= 1 if the individual resided within the St. Catharines-Niagara CMA as of the date of the census; = 0 otherwise
kitchener	= 1 if the individual resided within the Kitchener CMA as of the date of the census; = 0 otherwise
london	= 1 if the individual resided within the London CMA as of the date of the census; = 0 otherwise
winnipeg	= 1 if the individual resided within the Winnipeg CMA as of the date of the census; = 0 otherwise
calgary	= 1 if the individual resided within the Calgary CMA as of the date of the census; = 0 otherwise
edmonton	= 1 if the individual resided within the Edmonton CMA as of the date of the census; = 0 otherwise
vancouver	= 1 if the individual resided within the Vancouver CMA as of the date of the census; = 0 otherwise Note: only these 13 CMAs which were included in the 1980 list of CMAs were included in this study, however, more CMAs were added in the 1991 and 2001 censuses (Sherbrooke, Trois-Riviere, Oshawa, Windsor, Sudbury, Thunder Bay, Regina, Saskatoon, and Victoria were added for the 1991 census and kept, with no new addition, for the 2001 census), which boosted the amount of residents residing in CMAs, not just because of increasing urbanization, but because of additional cities reaching CMA size (a metropolitan area with an urban core of at least 100,000 residents)

Place of birth indicator variables:

	Note: these indicator variables were derived from 'pob' (place of birth) in the 1981 census, and 'pobp' and 'pobpa' (a for augmented) in the 1991 and 2001 censuses. The 'pobpa' includes more specific countries that the person was born in, rather than more general areas that 'pobp' encapsulates.
usa	= 1 if an individual is born in the United States of America; = 0 otherwise
uk	= 1 if an individual is born in the United Kingdom; = 0 otherwise
germany	= 1 if an individual is born in Germany; = 0 otherwise
italy	= 1 if an individual is born in Italy; = 0 otherwise
neth	= 1 if an individual is born in the Netherlands; = 0 otherwise
poland	= 1 if an individual is born in Poland; = 0 otherwise
portugal	= 1 if an individual is born in Portugal; = 0 otherwise
china	= 1 if an individual is born in China; = 0 otherwise
india	= 1 if an individual is born in India; = 0 otherwise
hongkong	= 1 if an individual is born in Hong Kong; = 0 otherwise
philippines	= 1 if an individual is born in the Philippines; = 0 otherwise
vietnam	= 1 if an individual is born in the United Kingdom; = 0 otherwise
formerussr	= 1 if an individual is born in the former U.S.S.R (this variable includes only the parts of former U.S.S.R. that are now included in Europe: Estonia; Latvia; Lithuania; Belarus; Republic of Moldova; Russian Federation; Ukraine); = 0 otherwise
formeryugo	= 1 if an individual is born in the former Yugoslavia (in the 2001 census, this variable includes: Bosnia and Herzegovina; Croatia; Macedonia; Slovenia; Yugoslavia); = 0 otherwise
othereuro	= 1 if an individual is born in: Austria; Belgium; France; Liechtenstein; Luxembourg; Monaco; Netherlands (for 1991 census); Switzerland; Bulgaria; Czechoslovakia; Hungary; Romania; Republic of Ireland (Eire); Denmark; Finland; Iceland; Norway; Sweden; Albania; Andorra; Cyprus; Gibraltar; Greece; Malta; San Marino; Spain; Vatican City State; Yugoslavia; (for the 2001 census, erstwhile Czechoslovakia is listed as Czech Republic and Slovakia, and France is not listed as part of 'other Europe' but defined separately); = 0 otherwise (Note: includes 'western asia' as well as middle east nations. Also, this category is separate only in the 1991 and 2001 censuses)
middleeast	= 1 if an individual is born in: Afghanistan; Turkey; Bahrain; Iran; Iraq; Israel; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; Syria; United Arab Republic; Republic of Yemen; (the 2001 census also includes: Armenia, Azerbaijan; Georgia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan; Palestine/West Bank/Gaza Strip); = 0 otherwise (this is not an individual category for the 1991 census)
asian	= 1 if an individual is born in an Asian country (this variable is not

	defined in the 1991 census, though both the 1981 and 2001 censuses do report this variable); = 0 otherwise
othersouthasia	= 1 if an individual is born in: Bangladesh; Bhutan; Republic of Maldives; Nepal; Pakistan; Sri Lanka (in the 1991 census, India is included); = 0 otherwise
othereastandseasia	= 1 if an individual is born in: (for 1991 census:) Japan; North Korea; South Korea; Macao; Mongolia; Taiwan; Brunei; Union of Myanmar (listed as "Cambodia" in 2001 census); Indonesia; Kampuchea; Laos; Malaysia; Singapore; Thailand; = 0 otherwise
africa	= 1 if an individual is born in any African country for the 1981 and 1991 census; = 0 otherwise
easternafrica	= 1 if an individual is born in: Burundi; Comoros; Djibouti; Eritrea; Ethiopia; Kenya; Madagascar; Malawi; Mauritius; Mayotte; Mozambique; Reunion; Rwanda; Seychelles; Somalia; Unite Republic of Tanzania; Uganda; Zambia; Zimbabwe (this variable is only defined for the 2001 census); = 0 otherwise
otherafrica	= 1 if an individual is born in: Algeria; Egypt; Libya; Morocco; Sudan; Tunisia; Western Sahara; Botswana; Lesotho; Namibia; Republic of South Africa; Swaziland; Angola; Benin; Burkina Faso; Cameroon; Cape Verde; Central African Republic; Chad; Republic of the Congo; Cote d'Ivoire; Equatorial Guinea; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia; Mali; Mauritania; Niger; Nigeria; Sao Tome and Principe; Saint Helena; Senegal; Sierra Leone; Togo; The Democratic Republic of Congo; = 0 otherwise
southandcamerica-carrib	= 1 if an individual is born in: (for the 1991 census) Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama; Anguilla; Antigua (or, 'Antigua and Barbuda' in 2001 census); Aruba; Bahamas; Barbados; Bermuda; Cayman Islands; Cuba; Dominica; Dominican Republic; Grenada; Guadeloupe; Haiti; Jamaica; Martinique; Montserrat; Netherlands Antilles; Puerto Rica; St. Christopher and Nevis (or, 'St. Kitts and Nevis' in 2001 census); St. Lucia; St. Vincent and the Grenadines; Trinidad and Tobago; Turks and Caicos Islands; Virgin Islands (British); Virgin Islands (USA); Argentina; Bolivia; Brazil; Chile; Columbia; Ecuador; Falkland Islands; French Guiana; Guyana; Paraguay; Peru; Suriname; Uruguay; Venezuela; = 0 otherwise
oceania	= 1 if an individual is born in: American Samoa; Australia; Cook Islands; Fiji; French Polynesia; Guam; Kiribati; Marshall Islands; Federated States of Micronesia; Nauru; New Caledonia; New Zealand; Palau; Papua New Guinea; Pitcairn; Samoa; Solomon Islands; Tonga; Tuvalu; Vanuatu; Wallis and Futuna; = 0 otherwise (this variable is listed only for the 2001 census)
othercou	= 1 if an individual is born in a country and/or region not = 1 if an individual is born in other countries and regions not elsewhere identified; = 0 otherwise

Knowledge of official languages indicator variables:

	Note: these indicator variables were derived from 'oln' (which stands for knowledge of official languages) in the 1981 census and 'olnp' in the 1991 and 2001 censuses.
englishonly	= 1 for individuals who know only English; 0 otherwise
frenchonly	= 1 for individuals who know only French; 0 otherwise
bothengfre	= 1 for individuals who know both English and French; 0 otherwise

Mother tongue indicator variables:

	Note: these indicator variables were derived from 'mtn' (which stands for mother tongue) in the 1981 census and 'mtnp' in the 1991 and 2001 censuses.
english	= 1 for individuals whose mother tongue is English; 0 otherwise
french	= 1 for individuals whose mother tongue is French; 0 otherwise
german	= 1 for individuals whose mother tongue is German; 0 otherwise
italian	= 1 for individuals whose mother tongue is Italian; 0 otherwise
chinese	= 1 for individuals whose mother tongue is Chinese; 0 otherwise
othertongue	= 1 for individuals whose mother tongue is other than: English, French, German, Aboriginal languages, Netherlandic languages, Italian, Spanish, Portuguese, Polish, Ukrainian, Greek, Chinese, Austro-Asiatic languages, Arabic, Punjabi, and other Indo-Iran; = 0 otherwise

Appendix A.2

TABLE A.2.1 Category means for men and women, immigrants and native-born, 1981 data

	Men		Women	
	Immigrants	Native-born	Immigrants	Native-born
Log Annual Earnings ($2000)	10.5129	10.4650	9.7499	9.7220
Entry cohort				
Immigrated before 1961	0.4713	-	0.4265	-
1961-1970	0.2759	-	0.2962	-
1971-1980	0.2528	-	0.2773	-
Years Since Migration (YSM)	19.5024	-	18.5591	-
Degree 1	0.3609	0.4089	0.4246	0.3763
Degree 2	0.1147	0.1743	0.1778	0.2265
Degree 3	0.2109	0.1731	0.1061	0.0929
Degree 4	0.1138	0.0913	0.1411	0.1605
Degree 5	0.0261	0.0176	0.0286	0.0365
Degree 6	0.0897	0.0860	0.0766	0.0764
Degree 7	0.0175	0.0152	0.0152	0.0150
Degree 8	0.0067	0.0041	0.0034	0.0016
Degree 9	0.0402	0.0240	0.0222	0.0131
Degree 10	0.0195	0.0055	0.0043	0.0012
Married	0.8426	0.8008	0.7764	0.7199
Newfoundland	0.0034	0.0253	0.0014	0.0208
Nova Scotia	0.0092	0.0399	0.0090	0.0369
New Brunswick	0.0050	0.0316	0.0044	0.0292
Montreal	0.1262	0.1214	0.1157	0.1254
Quebec	0.1425	0.2955	0.1280	0.2741
Toronto	0.3125	0.0882	0.3446	0.1078
Ontario	0.5418	0.3214	0.5630	0.3409
Manitoba	0.0309	0.0400	0.0374	0.0430
Saskatchewan	0.0125	0.0356	0.0132	0.0397
Vancouver	0.0977	0.0461	0.0994	0.0532
British Columbia	0.1589	0.1077	0.1536	0.1109
Rural (not in a CMA)	0.2413	0.5317	0.2174	0.4881
Mother Tongue				
English	0.3772	0.6405	0.4279	0.6607
French	0.0374	0.3147	0.0342	0.2911
Italian	0.1286	0.0027	0.1052	0.0030
Chinese	0.0457	0.0006	0.0537	0.0007
Other	0.0135	0.0146	0.0125	0.0165
Place of birth				
U.S.A.	0.0537	-	0.0599	-
United Kingdom	0.2077	-	0.2285	-
Germany	0.0575	-	0.0583	-
Italy	0.1328	-	0.1074	-
Poland	0.0333	-	0.0314	-
Portugal	0.0394	-	0.0357	-
Other Europe	0.0364	-	0.0292	-
Former U.S.S.R.	0.0248	-	0.0207	-
Asia	0.1351	-	0.1465	-
Africa	0.0291	-	0.0297	-
S. and C. America and Caribbean	0.0678	-	0.0952	-

TABLE A.2.2 Category means for men and women, immigrants and native-born, 1991 data

	Men		Women	
	Immigrants	Native-born	Immigrants	Native-born
Log Annual Earnings ($2000)	10.4163	10.4091	9.8626	9.8502
Entry cohort				
Immigrated before 1961	0.2398	-	0.2040	-
1961-1970	0.2573	-	0.2620	-
1971-1980	0.2775	-	0.2970	-
1981-1990	0.2250	-	0.2368	-
Years Since Migration (YSM)	20.6556	-	19.8059	-
Degree 1	0.2790	0.2996	0.2928	0.2481
Degree 2	0.1689	0.2140	0.2330	0.2706
Degree 3	0.1844	0.1829	0.0949	0.0992
Degree 4	0.1255	0.1254	0.1673	0.1966
Degree 5	0.0259	0.0178	0.0354	0.0331
Degree 6	0.1158	0.1043	0.1129	0.1090
Degree 7	0.0221	0.0163	0.0217	0.0188
Degree 8	0.0069	0.0039	0.0031	0.0020
Degree 9	0.0514	0.0301	0.0351	0.0209
Degree 10	0.0199	0.0057	0.0038	0.0017
Married	0.8189	0.7593	0.7635	0.7288
Newfoundland	0.0025	0.0243	0.0017	0.0223
Prince Edward Island	0.0009	0.0050	0.0007	0.0056
Nova Scotia	0.0088	0.0372	0.0082	0.0355
New Brunswick	0.0054	0.0307	0.0048	0.0286
Montreal	0.1125	0.1170	0.1041	0.1220
Quebec	0.1284	0.2812	0.1146	0.2737
Toronto	0.3583	0.1026	0.3862	0.1117
Ontario	0.5625	0.3347	0.5807	0.3452
Manitoba	0.0298	0.0389	0.0295	0.0403
Saskatchewan	0.0095	0.0342	0.0091	0.0375
Vancouver	0.1078	0.0504	0.1129	0.0521
British Columbia	0.1591	0.1129	0.1608	0.1107
Rural (not in a CMA)	0.1490	0.4361	0.1362	0.4101
Mother Tongue				
English	0.3298	0.6462	0.3784	0.6509
French	0.0319	0.3000	0.0278	0.2939
Italian	0.0964	0.0082	0.0750	0.0086
Chinese	0.0845	0.0024	0.0926	0.0023
Other	0.1366	0.0087	0.1448	0.0106
Place of birth				
U.S.A.	0.0444	-	0.0596	-
United Kingdom	0.1607	-	0.1723	-
Germany	0.0452	-	0.0434	-
Italy	0.0992	-	0.0766	-
Poland	0.0306	-	0.0324	-
Portugal	0.0446	-	0.0377	-
Other Europe	0.1713	-	0.1425	-
Former U.S.S.R.	0.0096	-	0.0141	-
China	0.0327	-	0.0316	-
Hong Kong	0.0321	-	0.0386	-
Philippines	0.0249	-	0.0459	-
Vietnam	0.0254	-	0.0235	-

Africa	0.0448	-	0.0381	-
S. and C. America and Caribbean	0.0990	-	0.1244	-

TABLE A.2.3 Category means for men and women, immigrants and native-born, 2001 data

	Men		Women	
	Immigrants	Native-born	Immigrants	Native-born
Log Annual Earnings ($2000)	10.356	10.4436	9.9375	9.9917
Entry cohort				
Immigrated before 1961	0.0932	-	0.0844	-
1961-1970	0.1557	-	0.1496	-
1971-1980	0.2362	-	0.2435	-
1981-1990	0.2210	-	0.2306	-
1991-2000	0.2939	-	0.2919	-
Years Since Migration (YSM)	20.6091	-	20.4109	-
Degree 1	0.2031	0.2229	0.1957	0.1653
Degree 2	0.1763	0.2202	0.2067	0.2419
Degree 3	0.1388	0.1801	0.0867	0.0976
Degree 4	0.1460	0.1664	0.2014	0.2453
Degree 5	0.0365	0.0208	0.0475	0.0334
Degree 6	0.1656	0.1258	0.1671	0.1519
Degree 7	0.0271	0.0168	0.0268	0.0254
Degree 8	0.0083	0.0050	0.0067	0.0034
Degree 9	0.0716	0.0353	0.0533	0.0321
Degree 10	0.0266	0.0066	0.0080	0.0036
Married	0.7945	0.7243	0.7331	0.7066
Newfoundland	0.0016	0.0201	0.0013	0.0196
Prince Edward Island	0.0005	0.0055	0.0005	0.0059
Nova Scotia	0.0068	0.0351	0.0071	0.0351
New Brunswick	0.0037	0.0302	0.0042	0.0288
Montreal	0.1105	0.1151	0.0985	0.1205
Quebec	0.1244	0.2707	0.1106	0.2650
Toronto	0.3939	0.1010	0.4052	0.1070
Ontario	0.5680	0.3343	0.5718	0.3425
Manitoba	0.0250	0.0387	0.0250	0.0394
Saskatchewan	0.0076	0.0330	0.0083	0.0354
Vancouver	0.1285	0.0519	0.1351	0.0528
British Columbia	0.1703	0.1172	0.1801	0.1168
Rural (not in a CMA)	0.1141	0.4236	0.1134	0.4073
Mother Tongue				
English	0.2806	0.6619	0.3155	0.6627
French	0.0320	0.2854	0.0282	0.2816
English and French	0.0011	0.0032	0.0008	0.0035
Italian	0.0514	0.0101	0.0396	0.0110
Chinese	0.1191	0.0022	0.1283	0.0025
Other	0.1934	0.0098	0.2078	0.0119
Place of birth				
U.S.A.	0.0332	-	0.0477	-
United Kingdom	0.1121	-	0.1110	-
Germany	0.0271	-	0.0272	-
Other Europe	0.2402	-	0.2178	-

Former U.S.S.R.	0.0143	-	0.0141	-
Asia	0.3703	-	0.3677	-
Eastern Africa	0.0236	-	0.0225	-
Other Africa	0.0369	-	0.0291	-
S. and C. America and Caribbean	0.1161	-	0.1409	-

TABLE A.3.1 Summary Statistics, 1981 Census PUMF Full-Sample

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
lne	162335	10.1717	0.8809	6.9085	12.2858
fullyrft	162335	0.5964	0.4906	0	1
recentim	162335	0.0582	0.2341	0	1
realwages	162335	34947.24	23893.54	1000.715	216604.9
age	162335	40.0109	10.8904	25	64
agecat4	162335	0.3946	0.4888	0	1
agecat5	162335	0.2649	0.4413	0	1
agecat6	162335	0.2064	0.4047	0	1
agecat7	162335	0.1340	0.3407	0	1
imbf61	162335	0.1002	0.3003	0	1
im6170	162335	0.0629	0.2428	0	1
im7180	162335	0.0582	0.2341	0	1
wkswk	162335	44.4100	12.6283	1	52
male	162335	0.5934	0.4912	0	1
female	162335	0.4066	0.4912	0	1
ysm	162335	4.2313	9.4660	0	50.5
dgree01	162335	0.3938	0.4886	0	1
dgree02	162335	0.1833	0.3869	0	1
dgree03	162335	0.1466	0.3537	0	1
dgree04	162335	0.1206	0.3256	0	1
dgree05	162335	0.0257	0.1581	0	1
dgree06	162335	0.0826	0.2753	0	1
dgree07	162335	0.0155	0.1234	0	1
dgree08	162335	0.0036	0.0599	0	1
dgree09	162335	0.0225	0.1483	0	1
dgree10	162335	0.0058	0.0761	0	1
married	162335	0.7785	0.4152	0	1
nfld	162335	0.0189	0.1360	0	1
ns	162335	0.0321	0.1764	0	1
nb	162335	0.0249	0.1559	0	1
que	162335	0.2536	0.4351	0	1
ont	162335	0.3783	0.4850	0	1
man	162335	0.0395	0.1948	0	1
sask	162335	0.0318	0.1756	0	1
alb	162335	0.0942	0.2921	0	1
bc	162335	0.1195	0.3244	0	1
terri	162335	0.0072	0.0845	0	1
cma1	162335	0.5485	0.4976	0	1
cma0	162335	0.4515	0.4976	0	1
halifax	162335	0.0125	0.1113	0	1
quebec	162335	0.0245	0.1545	0	1
montreal	162335	0.1228	0.3282	0	1
ottawahull	162335	0.0332	0.1792	0	1
toronto	162335	0.1470	0.3541	0	1
hamilton	162335	0.0243	0.1540	0	1
stcathniag	162335	0.0125	0.1112	0	1
kitchener	162335	0.0131	0.1138	0	1

london	162335	0.0130	0.1133	0	1
winnipeg	162335	0.0260	0.1593	0	1
calgary	162335	0.0291	0.1680	0	1
edmonton	162335	0.0305	0.1721	0	1
vancouver	162335	0.0599	0.2373	0	1
usa	162335	0.0128	0.1125	0	1
uk	162335	0.0482	0.2142	0	1
germany	162335	0.0128	0.1125	0	1
italy	162335	0.0271	0.1625	0	1
poland	162335	0.0072	0.0845	0	1
portugal	162335	0.0084	0.0912	0	1
othereuro	162335	0.0074	0.0858	0	1
formerussr	162335	0.0051	0.0714	0	1
asian	162335	0.0310	0.1734	0	1
africa	162335	0.0065	0.0805	0	1
southandcamericacarrib	162335	0.0176	0.1314	0	1
othercou	162335	0.0025	0.0497	0	1
englishonly	162335	0.6721	0.4694	0	1
frenchonly	162335	0.1211	0.3263	0	1
bothengfre	162335	0.1982	0.3987	0	1
english	162335	0.5932	0.4912	0	1
french	162335	0.2456	0.4304	0	1
german	162335	0.0263	0.1601	0	1
italian	162335	0.0285	0.1665	0	1
chinese	162335	0.0113	0.1059	0	1
othertongue	162335	0.0149	0.1211	0	1

TABLE A.3.2 Summary Statistics, 1991 Census PUMF Full-Sample

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
lne	317953	10.1551	0.8659	6.9101	12.4021
fullyrft	317953	0.6126	0.4872	0	1
recentim	317953	0.0456	0.2086	0	1
realwages	317953	34378.92	24505.62	1002.396	243300.1
age	317953	39.9431	10.1363	25	64
agecat4	317953	0.3603	0.4801	0	1
agecat5	317953	0.3233	0.4677	0	1
agecat6	317953	0.2070	0.4051	0	1
agecat7	317953	0.1095	0.3122	0	1
imbf61	317953	0.0442	0.2055	0	1
im6170	317953	0.0513	0.2206	0	1
im7180	317953	0.0567	0.2310	0	1
im8190	317953	0.0455	0.2084	0	1
wkswk	317953	44.6928	12.5091	1	52
male	317953	0.5422	0.4982	0	1
female	317953	0.4578	0.4982	0	1
ysm	317953	4.0067	9.5844	0	55
dgree01	317953	0.2778	0.4479	0	1
dgree02	317953	0.2317	0.4219	0	1
dgree03	317953	0.1444	0.3515	0	1
dgree04	317953	0.1554	0.3622	0	1
dgree05	317953	0.0259	0.1588	0	1
dgree06	317953	0.1080	0.3104	0	1
dgree07	317953	0.0183	0.1342	0	1
dgree08	317953	0.0034	0.0585	0	1
dgree09	317953	0.0295	0.1691	0	1
dgree10	317953	0.0056	0.0745	0	1
married	317953	0.7549	0.4302	0	1
nfld	317953	0.0192	0.1373	0	1
pei	317953	0.0044	0.0662	0	1
ns	317953	0.0309	0.1731	0	1
nb	317953	0.0249	0.1557	0	1
que	317953	0.2470	0.4313	0	1
ont	317953	0.3852	0.4866	0	1
man	317953	0.0376	0.1901	0	1
sask	317953	0.0305	0.1720	0	1
alb	317953	0.0958	0.2943	0	1
bc	317953	0.1214	0.3265	0	1
terri	317953	0.0032	0.0562	0	1
cma1	317953	0.6314	0.4824	0	1
cma0	317953	0.3686	0.4824	0	1
halifax	317953	0.0127	0.1120	0	1
quebec	317953	0.0248	0.1555	0	1
montreal	317953	0.1172	0.3216	0	1
ottawahull	317953	0.0377	0.1905	0	1
toronto	317953	0.1590	0.3657	0	1
hamilton	317953	0.0231	0.1502	0	1

stcathniag	317953	0.0130	0.1135	0	1
kitchener	317953	0.0138	0.1168	0	1
london	317953	0.0146	0.1198	0	1
winnipeg	317953	0.0247	0.1554	0	1
calgary	317953	0.0313	0.1740	0	1
edmonton	317953	0.0330	0.1787	0	1
vancouver	317953	0.0628	0.2426	0	1
usa	317953	0.0113	0.1058	0	1
uk	317953	0.0338	0.1807	0	1
germany	317953	0.0092	0.0956	0	1
italy	317953	0.0179	0.1324	0	1
poland	317953	0.0063	0.0793	0	1
portugal	317953	0.0083	0.0909	0	1
othereuro	317953	0.0032	0.1764	0	1
formerussr	317953	0.0020	0.0443	0	1
middleeast	317953	0.0053	0.0727	0	1
china	317953	0.0068	0.0821	0	1
hongkong	317953	0.0071	0.0840	0	1
Philippines	317953	0.0078	0.0880	0	1
vietnam	317953	0.0050	0.0704	0	1
othereastandseasia	317953	0.0061	0.0777	0	1
africa	317953	0.0089	0.0940	0	1
southandcamericacarrib	317953	0.0235	0.1514	0	1
othercou	317953	0.0020	0.0451	0	1
englishonly	317953	0.6770	0.4676	0	1
frenchonly	317953	0.1215	0.3267	0	1
bothengfre	317953	0.1941	0.3955	0	1
neitherengfre	317953	0.0074	0.0855	0	1
english	317953	0.5897	0.4919	0	1
french	317953	0.2444	0.4297	0	1
german	317953	0.0185	0.1349	0	1
italian	317953	0.0238	0.1526	0	1
chinese	317953	0.0193	0.1376	0	1
othertongue	317953	0.0354	0.1849	0	1

TABLE A.3.3 Summary Statistics, 2001 Census PUMF Full-Sample

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
lne	316672	10.2136	0.8676	6.9087	12.2061
fullyrft	316672	0.6341	0.4817	0	1
recentim	316672	0.0616	0.2404	0	1
realwages	316672	36655.51	26953.91	1001	200000
age	316672	41.7857	9.8599	25	64
agecat4	316672	0.2683	0.4431	0	1
agecat5	316672	0.3354	0.4721	0	1
agecat6	316672	0.2788	0.4484	0	1
agecat7	316672	0.1174	0.3219	0	1
imbf61	316672	0.0187	0.1355	0	1
im6170	316672	0.0321	0.1764	0	1
im7180	316672	0.0504	0.2187	0	1
im8190	316672	0.0474	0.2125	0	1
im9101	316672	0.0616	0.2404	0	1
wkswk	316672	45.9092	11.3529	1	52
male	316672	0.5244	0.4994	0	1
female	316672	0.4756	0.4994	0	1
ysm	316672	4.3134	10.3205	0	60
dgree01	316672	0.1964	0.3973	0	1
dgree02	316672	0.2222	0.4157	0	1
dgree03	316672	0.1352	0.3420	0	1
dgree04	316672	0.1973	0.3979	0	1
dgree05	316672	0.0299	0.1704	0	1
dgree06	316672	0.1441	0.3512	0	1
dgree07	316672	0.0222	0.1473	0	1
dgree08	316672	0.0050	0.0703	0	1
dgree09	316672	0.0399	0.1957	0	1
dgree10	316672	0.0078	0.0881	0	1
married	316672	0.7263	0.4459	0	1
nfld	316672	0.0160	0.1255	0	1
pei	316672	0.0046	0.0676	0	1
ns	316672	0.0291	0.1683	0	1
nb	316672	0.0242	0.1536	0	1
que	316672	0.2364	0.4249	0	1
ont	316672	0.3869	0.4870	0	1
man	316672	0.0361	0.1865	0	1
sask	316672	0.0287	0.1668	0	1
alb	316672	0.1055	0.3072	0	1
bc	316672	0.1292	0.3354	0	1
terri	316672	0.0033	0.0571	0	1
cma1	316672	0.6477	0.4777	0	1
cma0	316672	0.3523	0.4777	0	1
halifax	316672	0.0129	0.1129	0	1
quebec	316672	0.0238	0.1525	0	1
montreal	316672	0.1150	0.3190	0	1
ottawahull	316672	0.0385	0.1924	0	1
toronto	316672	0.1659	0.3720	0	1

hamilton	316672	0.0222	0.1473	0	1
stcathniag	316672	0.0122	0.1099	0	1
kitchener	316672	0.0148	0.1209	0	1
london	316672	0.0144	0.1190	0	1
winnipeg	316672	0.0241	0.1533	0	1
calgary	316672	0.0370	0.1888	0	1
edmonton	316672	0.0340	0.1814	0	1
vancouver	316672	0.0690	0.2534	0	1
usa	316672	0.0096	0.0975	0	1
uk	316672	0.0241	0.1534	0	1
germany	316672	0.0062	0.0786	0	1
italy	316672	0.0102	0.1003	0	1
netherlands	316672	0.0037	0.0609	0	1
poland	316672	0.0063	0.0794	0	1
portugal	316672	0.0069	0.0829	0	1
france	316672	0.0033	0.0576	0	1
greece	316672	0.0026	0.0508	0	1
othereuro	316672	0.0112	0.1055	0	1
formerussr	316672	0.0031	0.0557	0	1
formeryugo	316672	0.0052	0.0719	0	1
asia	316672	0.0795	0.2705	0	1
middleeast	316672	0.0089	0.0939	0	1
india	316672	0.0141	0.1178	0	1
othersouthasia	316672	0.0071	0.0839	0	1
china	316672	0.0116	0.1070	0	1
hongkong	316672	0.0094	0.0967	0	1
Philippines	316672	0.0124	0.1107	0	1
vietnam	316672	0.0070	0.0834	0	1
othereastandseasia	316672	0.0085	0.0921	0	1
easterafrica	316672	0.0050	0.0705	0	1
otherafrica	316672	0.0074	0.0857	0	1
southandcamericacarrib	316672	0.0277	0.1643	0	1
othercou	316672	0.0000	0.0047	0	1
englishonly	316672	0.6815	0.4659	0	1
frenchonly	316672	0.1079	0.3102	0	1
bothengfre	316672	0.2041	0.4030	0	1
neitherengfre	316672	0.0064	0.0795	0	1
english	316672	0.5855	0.4926	0	1
french	316672	0.2303	0.4210	0	1
german	316672	0.0119	0.1084	0	1
italian	316672	0.0179	0.1327	0	1
chinese	316672	0.0278	0.1645	0	1
othertongue	316672	0.0507	0.2193	0	1

Appendix B

Table B.1.1. Regression output, (Borjas-style) adjusted distribution, 1981 census data, all native workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 126397
F(22,126374)	= 488.72
Prob > F	= 0.0000
R-squared	= 0.0739
Root MSE	= .85623

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.3584588	.0651357	5.50	0.000	.2307939	.4861237
age2	-.0109186	.0023778	-4.59	0.000	-.0155791	-.0062581
age3	.1532962	.0374932	4.09	0.000	.0798101	.2267822
age4	-.0083477	.0021586	-3.87	0.000	-.0125784	-.0041169
dgree02	.2060556	.0069465	29.66	0.000	.1924406	.2196706
dgree03	.3356622	.0072291	46.43	0.000	.3214934	.3498311
dgree04	.2582907	.0082675	31.24	0.000	.2420865	.2744949
dgree05	.3406039	.0160434	21.23	0.000	.3091591	.3720487
dgree06	.585055	.0091475	63.96	0.000	.5671261	.602984
dgree07	.6768372	.0182192	37.15	0.000	.6411278	.7125465
dgree08	.8701699	.0489703	17.77	0.000	.7741889	.966151
dgree09	.7499429	.0167361	44.81	0.000	.7171404	.7827454
dgree10	.9731147	.0306479	31.75	0.000	.9130454	1.033184
nfld	-.2540206	.0167685	-15.15	0.000	-.2868866	-.2211545
ns	-.1883057	.0130597	-14.42	0.000	-.2139025	-.1627089
nb	-.2141721	.014475	-14.80	0.000	-.2425429	-.1858014
que	-.0152836	.0060027	-2.55	0.011	-.0270488	-.0035185
man	-.1251645	.0130014	-9.63	0.000	-.150647	-.0996819
sask	-.141318	.0143651	-9.84	0.000	-.1694733	-.1131627
alb	.0599761	.0091292	6.57	0.000	.042083	.0778692
bc	.0650575	.0086782	7.50	0.000	.0480483	.0820666
terri	-.2140237	.0269962	-7.93	0.000	-.2669359	-.1611115
_cons	5.522213	.6493818	8.50	0.000	4.249436	6.79499

Table B.1.2. Regression output, (Borjas-style) adjusted distribution, 1981 census data, native male workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & sex==2, r;

Linear regression

Number of obs	= 75227
F(22, 75204)	= 446.91
Prob > F	= 0.0000
R-squared	= 0.1176
Root MSE	= .68744

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.5134331	.0705407	7.28	0.000	.3751737	.6516925
age2	-.0151797	.0025704	-5.91	0.000	-.0202177	-.0101417
age3	.2069648	.0405057	5.11	0.000	.1275738	.2863558
age4	-.011086	.002333	-4.75	0.000	-.0156586	-.0065133
dgree02	.2675046	.0071717	37.30	0.000	.2534481	.281561
dgree03	.2212062	.0071164	31.08	0.000	.2072582	.2351543
dgree04	.3409018	.0088187	38.66	0.000	.3236172	.3581863
dgree05	.4084134	.0173564	23.53	0.000	.3743948	.4424319
dgree06	.4626293	.0097781	47.31	0.000	.4434642	.4817944
dgree07	.5741623	.0192585	29.81	0.000	.5364157	.6119088
dgree08	.6380815	.0552667	11.55	0.000	.529759	.7464041
dgree09	.5425991	.0178515	30.40	0.000	.5076103	.577588
dgree10	.6942432	.0296005	23.45	0.000	.6362263	.7522601
nfld	-.3232404	.0183715	-17.59	0.000	-.3592485	-.2872322
ns	-.2309748	.0136147	-16.97	0.000	-.2576595	-.2042901
nb	-.2260376	.0149709	-15.10	0.000	-.2553806	-.1966947
que	-.0948443	.0061866	-15.33	0.000	-.1069701	-.0827186
man	-.1181894	.014042	-8.42	0.000	-.1457118	-.0906671
sask	-.1124458	.015976	-7.04	0.000	-.1437586	-.0811329
alb	.0768896	.0095354	8.06	0.000	.0582004	.0955789
bc	.0860514	.0088359	9.74	0.000	.0687331	.1033696
terri	-.265098	.0319876	-8.29	0.000	-.3277936	-.2024025
_cons	3.801773	.7055197	5.39	0.000	2.418958	5.184588

Table B.1.3. Regression output, (Borjas-style) adjusted distribution, 1981 census data, native female workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & sex==1, r;

Linear regression

Number of obs	= 51170
F(22, 51147)	= 196.61
Prob > F	= 0.0000
R-squared	= 0.0788
Root MSE	= .87955

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.107267	.1054239	-1.02	0.309	-.3138989	.0993648
age2	.0039467	.0038595	1.02	0.307	-.0036179	.0115113
age3	-.0575469	.06102	-0.94	0.346	-.1771467	.0620529
age4	.0029123	.0035222	0.83	0.408	-.0039913	.0098159
dgree02	.2715695	.0106379	25.53	0.000	.2507191	.2924198
dgree03	.2659748	.014314	18.58	0.000	.2379192	.2940304
dgree04	.4094918	.0119491	34.27	0.000	.3860714	.4329123
dgree05	.5721511	.0223659	25.58	0.000	.5283138	.6159884
dgree06	.7386249	.0159886	46.20	0.000	.707287	.7699628
dgree07	.8362508	.0314168	26.62	0.000	.7746735	.897828
dgree08	1.056195	.0950256	11.11	0.000	.8699443	1.242446
dgree09	.9061521	.0349432	25.93	0.000	.8376632	.9746411
dgree10	1.038763	.1168706	8.89	0.000	.8096951	1.26783
nfld	-.2352601	.0278656	-8.44	0.000	-.2898769	-.1806433
ns	-.1707801	.0215867	-7.91	0.000	-.2130903	-.1284698
nb	-.2568336	.0233009	-11.02	0.000	-.3025036	-.2111635
que	.030796	.009876	3.12	0.002	.0114389	.0501531
man	-.1221482	.0198756	-6.15	0.000	-.1611046	-.0831918
sask	-.141898	.0217705	-6.52	0.000	-.1845685	-.0992275
alb	.0232694	.0144219	1.61	0.107	-.0049978	.0515365
bc	.0266594	.0138207	1.93	0.054	-.0004293	.0537481
terri	-.1307152	.0403313	-3.24	0.001	-.2097651	-.0516654
_cons	10.41768	1.047899	9.94	0.000	8.363782	12.47157

Table B.1.4. Regression output, (Borjas-style) adjusted distribution, 1991 census data, all native workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 255110
F(23,255086)	= 1150.24
Prob > F	= 0.0000
R-squared	= 0.0934
Root MSE	= .824

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.4015261	.0474835	8.46	0.000	.3084598	.4945924
age2	-.0122488	.0017382	-7.05	0.000	-.0156556	-.008842
age3	.1755593	.0275428	6.37	0.000	.1215761	.2295425
age4	-.0099093	.0015961	-6.21	0.000	-.0130376	-.0067811
dgree02	.1769758	.004763	37.16	0.000	.1676404	.1863111
dgree03	.3218576	.0053009	60.72	0.000	.3114679	.3322473
dgree04	.3060204	.0052523	58.26	0.000	.295726	.3163147
dgree05	.3853472	.0106963	36.03	0.000	.3643827	.4063118
dgree06	.5781125	.0059326	97.45	0.000	.5664848	.5897402
dgree07	.6410736	.0122053	52.52	0.000	.6171515	.6649957
dgree08	.93305	.0341634	27.31	0.000	.8660906	1.000009
dgree09	.7262264	.0105521	68.82	0.000	.7055445	.7469083
dgree10	.8589735	.0250783	34.25	0.000	.8098207	.9081264
nfld	-.4238119	.0119154	-35.57	0.000	-.4471658	-.4004581
pei	-.3853045	.0218005	-17.67	0.000	-.4280328	-.3425762
ns	-.2494386	.0092029	-27.10	0.000	-.2674761	-.2314012
nb	-.3002356	.0101007	-29.72	0.000	-.3200327	-.2804384
que	-.1329868	.0040447	-32.88	0.000	-.1409143	-.1250593
man	-.1814478	.0088439	-20.52	0.000	-.1987816	-.1641139
sask	-.2820434	.0097089	-29.05	0.000	-.3010725	-.2630143
alb	-.0850736	.0061015	-13.94	0.000	-.0970323	-.0731149
bc	-.0909963	.0058769	-15.48	0.000	-.1025148	-.0794777
terri	-.0580744	.0319797	-1.82	0.069	-.1207538	.0046051
_cons	4.943079	.4733898	10.44	0.000	4.015248	5.870911

Table B.1.5. Regression output, (Borjas-style) adjusted distribution, 1991 census data, native male workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & male==1, r;

Linear regression

Number of obs	= 137935
F(22,137912)	= 881.31
Prob > F	= 0.0000
R-squared	= 0.1273
Root MSE	= .72223

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.7205195	.0581878	12.38	0.000	.6064725	.8345664
age2	-.0230258	.0021226	-10.85	0.000	-.027186	-.0188656
age3	.3387894	.033538	10.10	0.000	.2730556	.4045233
age4	-.0192001	.0019391	-9.90	0.000	-.0230006	-.0153996
dgree02	.2368506	.0056813	41.69	0.000	.2257153	.2479858
dgree03	.2577653	.0057983	44.46	0.000	.2464007	.2691299
dgree04	.3589554	.0065173	55.08	0.000	.3461816	.3717291
dgree05	.4060956	.015397	26.37	0.000	.3759178	.4362734
dgree06	.5137175	.0071785	71.56	0.000	.4996477	.5277872
dgree07	.554921	.015348	36.16	0.000	.5248393	.5850028
dgree08	.7535493	.0417427	18.05	0.000	.6717345	.8353641
dgree09	.5878556	.0122626	47.94	0.000	.5638212	.61189
dgree10	.6496714	.0260183	24.97	0.000	.5986759	.7006668
nfld	-.4159716	.0143841	-28.92	0.000	-.4441641	-.387779
ns	-.2257601	.0107048	-21.09	0.000	-.2467414	-.2047789
nb	-.2712822	.0115003	-23.59	0.000	-.2938226	-.2487418
que	-.1551998	.0047851	-32.43	0.000	-.1645785	-.1458211
man	-.1806892	.0107897	-16.75	0.000	-.2018368	-.1595416
sask	-.2558089	.0124199	-20.60	0.000	-.2801517	-.2314662
alb	-.059486	.0072877	-8.16	0.000	-.0737698	-.0452022
bc	-.0610956	.0069494	-8.79	0.000	-.0747162	-.0474749
terri	-.1286263	.0416583	-3.09	0.002	-.2102757	-.0469769
_cons	1.646829	.5825843	2.83	0.005	.5049749	2.788683

Table B.1.6. Regression output, (Borjas-style) adjusted distribution, 1991 census data, native female workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & female==1, r;

Linear regression

Number of obs	= 117175
F(22,117152)	= 605.82
Prob > F	= 0.0000
R-squared	= 0.1042
Root MSE	= .82408

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.0926919	.0703276	-1.32	0.188	-.2305328	.0451491
age2	.0047758	.0025801	1.85	0.064	-.0002812	.0098328
age3	-.082736	.0409772	-2.02	0.043	-.1630507	-.0024214
age4	.0045623	.0023803	1.92	0.055	-.0001031	.0092276
dgree02	.2481678	.0069274	35.82	0.000	.2345902	.2617455
dgree03	.2417819	.0092429	26.16	0.000	.223666	.2598978
dgree04	.43522	.0074173	58.68	0.000	.4206822	.4497578
dgree05	.5818015	.0137189	42.41	0.000	.5549126	.6086904
dgree06	.7140211	.0089849	79.47	0.000	.6964109	.7316313
dgree07	.8180307	.0179912	45.47	0.000	.7827682	.8532931
dgree08	1.064911	.0570865	18.65	0.000	.9530227	1.1768
dgree09	.8666761	.0180927	47.90	0.000	.8312148	.9021375
dgree10	.9501703	.0636538	14.93	0.000	.8254099	1.074931
nfld	-.4232561	.0175734	-24.09	0.000	-.4576997	-.3888126
ns	-.2692922	.0137224	-19.62	0.000	-.2961878	-.2423965
nb	-.348911	.0151954	-22.96	0.000	-.3786938	-.3191282
que	-.1089354	.0059829	-18.21	0.000	-.1206617	-.097209
man	-.1560272	.0128771	-12.12	0.000	-.1812661	-.1307883
sask	-.2622528	.0134956	-19.43	0.000	-.288704	-.2358016
alb	-.1002974	.00896	-11.19	0.000	-.117859	-.0827359
bc	-.1264321	.0086689	-14.58	0.000	-.143423	-.1094412
terri	.0413298	.0468476	0.88	0.378	-.0504907	.1331504
_cons	9.908209	.6995754	14.16	0.000	8.537053	11.27937

Table B.1.7. Regression output, (Borjas-style) adjusted distribution, 2001 census data, all native workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 250089
F(23,250065)	= 1225.71
Prob > F	= 0.0000
R-squared	= 0.1018
Root MSE	= .81538

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.5461017	.0503677	10.84	0.000	.4473824	.644821
age2	-.0173101	.0018346	-9.44	0.000	-.0209058	-.0137145
age3	.2579109	.0289573	8.91	0.000	.2011553	.3146664
age4	-.0150723	.0016741	-9.00	0.000	-.0183536	-.0117911
dgree02	.1526848	.005211	29.30	0.000	.1424715	.1628981
dgree03	.263634	.0058126	45.36	0.000	.2522414	.2750266
dgree04	.2870734	.0053043	54.12	0.000	.2766773	.2974696
dgree05	.4003837	.0104691	38.24	0.000	.3798645	.4209028
dgree06	.5730915	.0059033	97.08	0.000	.5615213	.5846617
dgree07	.5978052	.0114972	52.00	0.000	.5752709	.6203394
dgree08	.8654379	.0306342	28.25	0.000	.8053958	.9254801
dgree09	.7028074	.0097408	72.15	0.000	.6837158	.7218991
dgree10	.8134816	.0220674	36.86	0.000	.7702301	.8567331
nfld	-.4214564	.0125254	-33.65	0.000	-.446006	-.3969069
pei	-.4269804	.0212489	-20.09	0.000	-.4686276	-.3853332
ns	-.3009868	.0092906	-32.40	0.000	-.3191961	-.2827775
nb	-.3131382	.009926	-31.55	0.000	-.3325929	-.2936835
que	-.1460659	.0040967	-35.65	0.000	-.1540953	-.1380366
man	-.1948364	.0087119	-22.36	0.000	-.2119115	-.1777614
sask	-.2515901	.0096599	-26.04	0.000	-.2705232	-.2326569
alb	-.0492388	.0059079	-8.33	0.000	-.0608182	-.0376594
bc	-.0750911	.0057229	-13.12	0.000	-.0863079	-.0638744
terri	-.05751	.0299743	-1.92	0.055	-.1162589	.0012389
_cons	3.354366	.5047899	6.65	0.000	2.364991	4.34374

Table B.1.8. Regression output, (Borjas-style) adjusted distribution, 2001 census data, native male workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0 & male==1, r;

Linear regression

Number of obs	= 131085
F(23,131061)	= 810.88
Prob > F	= 0.0000
R-squared	= 0.1291
Root MSE	= .75055

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.7152384	.0654639	10.93	0.000	.5869304	.8435465
age2	-.0225646	.0023815	-9.47	0.000	-.0272324	-.0178969
age3	.3308192	.0375613	8.81	0.000	.2571996	.4044387
age4	-.0188971	.0021705	-8.71	0.000	-.0231513	-.014643
dgree02	.1893949	.0064071	29.56	0.000	.1768372	.2019526
dgree03	.2299062	.0066412	34.62	0.000	.2168895	.242923
dgree04	.3369433	.006767	49.79	0.000	.3236801	.3502064
dgree05	.4005271	.0154121	25.99	0.000	.3703197	.4307346
dgree06	.5455634	.0076216	71.58	0.000	.5306252	.5605015
dgree07	.5500638	.0171068	32.15	0.000	.5165347	.5835928
dgree08	.7923495	.0394582	20.08	0.000	.7150121	.8696868
dgree09	.6123817	.012714	48.17	0.000	.5874625	.6373009
dgree10	.6852602	.0256733	26.69	0.000	.6349409	.7355794
nfld	-.4532263	.0164262	-27.59	0.000	-.4854213	-.4210313
pei	-.489799	.0287253	-17.05	0.000	-.5461	-.433498
ns	-.2989869	.0119286	-25.06	0.000	-.3223668	-.2756071
nb	-.3250731	.0126129	-25.77	0.000	-.3497942	-.300352
que	-.1757628	.0051849	-33.90	0.000	-.1859251	-.1656004
man	-.2224333	.0113666	-19.57	0.000	-.2447117	-.2001548
sask	-.2386897	.0129699	-18.40	0.000	-.2641105	-.2132688
alb	-.0025944	.0072997	-0.36	0.722	-.0169017	.0117129
bc	-.0870286	.0073249	-11.88	0.000	-.1013852	-.072672
terri	-.1341404	.040064	-3.35	0.001	-.2126651	-.0556156
_cons	1.558858	.6572837	2.37	0.018	.2705933	2.847122

Table B.1.9. Regression output, (Borjas-style) adjusted distribution, 2001 census data, native female workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0 & female==1, r;

Linear regression

Number of obs	= 119004
F(23,118980)	= 705.63
Prob > F	= 0.0000
R-squared	= 0.1205
Root MSE	= .80469

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.2924734	.0721795	4.05	0.000	.1510028	.4339441
age2	-.0091899	.002631	-3.49	0.000	-.0143466	-.0040331
age3	.144729	.0415625	3.48	0.000	.0632671	.2261909
age4	-.0092741	.0024051	-3.86	0.000	-.0139881	-.0045601
dgree02	.2266777	.007753	29.24	0.000	.211482	.2418735
dgree03	.1974698	.0097202	20.32	0.000	.1784184	.2165213
dgree04	.4154325	.0076907	54.02	0.000	.4003589	.430506
dgree05	.5773331	.01371	42.11	0.000	.5504617	.6042046
dgree06	.7227304	.0086235	83.81	0.000	.7058284	.7396324
dgree07	.7994314	.0150959	52.96	0.000	.7698438	.8290191
dgree08	.9375824	.0457833	20.48	0.000	.8478478	1.027317
dgree09	.8683616	.0143486	60.52	0.000	.8402386	.8964845
dgree10	.9399727	.0397472	23.65	0.000	.8620688	1.017877
nfld	-.3567394	.017699	-20.16	0.000	-.3914291	-.3220497
pei	-.3322432	.029526	-11.25	0.000	-.3901138	-.2743727
ns	-.2915211	.0131605	-22.15	0.000	-.3173154	-.2657268
nb	-.3036397	.0141774	-21.42	0.000	-.3314272	-.2758521
que	-.1173362	.0058902	-19.92	0.000	-.1288809	-.1057916
man	-.1499509	.0123494	-12.14	0.000	-.1741555	-.1257463
sask	-.2307223	.0131455	-17.55	0.000	-.2564873	-.2049573
alb	-.1022951	.0085	-12.03	0.000	-.118955	-.0856353
bc	-.0620682	.0082423	-7.53	0.000	-.078223	-.0459134
terri	.0567918	.0434671	1.31	0.191	-.028403	.1419866
_cons	5.911549	.7227738	8.18	0.000	4.494924	7.328174

Table B.2.1. Regression output, alternate adjusted distribution, 1981 census data, all native FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 75251
F(22, 75228)	= 481.54
Prob > F	= 0.0000
R-squared	= 0.1199
Root MSE	= .52733

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.3295924	.0529171	6.23	0.000	.2258751	.4333096
age2	-.0096684	.001936	-4.99	0.000	-.013463	-.0058738
age3	.1284385	.0306019	4.20	0.000	.068459	.188418
age4	-.0065743	.0017664	-3.72	0.000	-.0100365	-.0031122
dgree02	.150643	.0055988	26.91	0.000	.1396695	.1616166
dgree03	.1979229	.0060481	32.72	0.000	.1860687	.2097771
dgree04	.2296581	.0062742	36.60	0.000	.2173608	.2419555
dgree05	.3234068	.0108459	29.82	0.000	.3021489	.3446647
dgree06	.4728126	.0068546	68.98	0.000	.4593776	.4862476
dgree07	.507273	.014381	35.27	0.000	.4790863	.5354597
dgree08	.6063897	.0570263	10.63	0.000	.4946183	.7181611
dgree09	.5948583	.0129996	45.76	0.000	.5693791	.6203376
dgree10	.6874701	.0238872	28.78	0.000	.6406512	.734289
nfld	-.112801	.0143423	-7.86	0.000	-.1409118	-.0846902
ns	-.1443799	.0101467	-14.23	0.000	-.1642673	-.1244925
nb	-.1230432	.0117901	-10.44	0.000	-.1461517	-.0999347
que	-.0170418	.0046584	-3.66	0.000	-.0261724	-.0079113
man	-.0886343	.0108196	-8.19	0.000	-.1098405	-.067428
sask	-.0814294	.0125636	-6.48	0.000	-.106054	-.0568047
alb	.0687643	.0077913	8.83	0.000	.0534934	.0840352
bc	.1012987	.0067603	14.98	0.000	.0880486	.1145488
terri	-.0851112	.0220072	-3.87	0.000	-.1282453	-.0419771
_cons	6.200385	.5266939	11.77	0.000	5.168067	7.232702

Table B.2.2. Regression output, alternate adjusted distribution, 1981 census data, native male FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & sex==2, r;

Linear regression

Number of obs	= 51471
F(22, 51448)	= 319.23
Prob > F	= 0.0000
R-squared	= 0.1251
Root MSE	= .4987

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.1164063	.0615642	1.89	0.059	-.0042602	.2370728
age2	-.0019278	.0022443	-0.86	0.390	-.0063266	.0024711
age3	.0101318	.0353705	0.29	0.775	-.0591947	.0794584
age4	-.0001012	.0020367	-0.05	0.960	-.0040933	.0038908
dgree02	.1852924	.0063519	29.17	0.000	.1728427	.1977421
dgree03	.1467761	.0064456	22.77	0.000	.1341427	.1594095
dgree04	.2482169	.007367	33.69	0.000	.2337776	.2626562
dgree05	.3191542	.0145839	21.88	0.000	.2905696	.3477388
dgree06	.4092531	.0081353	50.31	0.000	.3933077	.4251984
dgree07	.4453986	.0177689	25.07	0.000	.4105715	.4802257
dgree08	.5029115	.06511	7.72	0.000	.3752952	.6305277
dgree09	.4920303	.0150684	32.65	0.000	.462496	.5215647
dgree10	.569369	.0252151	22.58	0.000	.5199472	.6187908
nfld	-.1207409	.0165378	-7.30	0.000	-.1531551	-.0883268
ns	-.1584929	.0116741	-13.58	0.000	-.1813743	-.1356115
nb	-.1250707	.0131507	-9.51	0.000	-.1508461	-.0992952
que	-.0465272	.0052533	-8.86	0.000	-.0568237	-.0362306
man	-.1039473	.0127623	-8.14	0.000	-.1289614	-.0789331
sask	-.104518	.0153358	-6.82	0.000	-.1345763	-.0744597
alb	.0750567	.0090009	8.34	0.000	.057415	.0926985
bc	.0968038	.007665	12.63	0.000	.0817803	.1118273
terri	-.0989524	.0261329	-3.79	0.000	-.1501731	-.0477316
_cons	8.422371	.6152859	13.69	0.000	7.216404	9.628338

Table B.2.3. Regression output, alternate adjusted distribution, 1981 census data, native female FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & sex==1, r;

Linear regression

Number of obs	= 23780
F(22, 23757)	= 263.37
Prob > F	= 0.0000
R-squared	= 0.1782
Root MSE	= .47319

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.4232498	.0845561	5.01	0.000	.2575144	.5889852
age2	-.01401	.0031073	-4.51	0.000	-.0201004	-.0079196
age3	.2035536	.0493254	4.13	0.000	.1068727	.3002344
age4	-.0109594	.0028592	-3.83	0.000	-.0165637	-.0053552
dgree02	.1873589	.00872	21.49	0.000	.1702671	.2044507
dgree03	.1728988	.0121128	14.27	0.000	.149157	.1966406
dgree04	.3345389	.0095613	34.99	0.000	.3157982	.3532797
dgree05	.5106377	.0146955	34.75	0.000	.4818337	.5394417
dgree06	.6151298	.0110005	55.92	0.000	.5935682	.6366915
dgree07	.6677285	.0223316	29.90	0.000	.6239572	.7114999
dgree08	.7467836	.1058674	7.05	0.000	.5392768	.9542904
dgree09	.7819597	.022883	34.17	0.000	.7371075	.8268119
dgree10	.7936238	.0632512	12.55	0.000	.6696474	.9176002
nfld	-.1211655	.02195	-5.52	0.000	-.164189	-.0781421
ns	-.1253099	.0158822	-7.89	0.000	-.15644	-.0941799
nb	-.1618267	.0186948	-8.66	0.000	-.1984698	-.1251836
que	.0117729	.0076436	1.54	0.124	-.0032091	.026755
man	-.0813645	.0164695	-4.94	0.000	-.1136457	-.0490833
sask	-.0395065	.0189984	-2.08	0.038	-.0767445	-.0022685
alb	.0389087	.0122479	3.18	0.001	.014902	.0629154
bc	.0905109	.0107129	8.45	0.000	.0695129	.111509
terri	-.0376538	.0338082	-1.11	0.265	-.1039201	.0286124
_cons	5.339848	.8377603	6.37	0.000	3.697784	6.981911

Table B.2.4. Regression output, alternate adjusted distribution, 1991 census data, all native FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 156292
F(22,156269)	= 1084.13
Prob > F	= 0.0000
R-squared	= 0.1293
Root MSE	= .57478

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.4532031	.0443341	10.22	0.000	.3663091	.5400971
age2	-.0141653	.0016307	-8.69	0.000	-.0173614	-.0109691
age3	.2014268	.0259805	7.75	0.000	.1505056	.252348
age4	-.0109379	.0015145	-7.22	0.000	-.0139063	-.0079696
dgree02	.1465866	.0044833	32.70	0.000	.1377994	.1553738
dgree03	.2289013	.0050358	45.46	0.000	.2190314	.2387713
dgree04	.2643393	.0047795	55.31	0.000	.2549716	.273707
dgree05	.3472096	.0092579	37.50	0.000	.3290643	.3653549
dgree06	.5196424	.0051394	101.11	0.000	.5095693	.5297154
dgree07	.5644208	.0098824	57.11	0.000	.5450515	.5837901
dgree08	.7240279	.037997	19.05	0.000	.6495547	.7985012
dgree09	.6548941	.0086683	75.55	0.000	.6379045	.6718837
dgree10	.7334632	.0195206	37.57	0.000	.6952034	.7717231
nfld	-.1341623	.0108157	-12.40	0.000	-.1553609	-.1129638
ns	-.166809	.0079043	-21.10	0.000	-.1823012	-.1513168
nb	-.1753497	.0093632	-18.73	0.000	-.1937013	-.156998
que	-.1117612	.0035382	-31.59	0.000	-.1186959	-.1048264
man	-.1368365	.0077735	-17.60	0.000	-.1520723	-.1216007
sask	-.2384975	.0097365	-24.50	0.000	-.2575808	-.2194142
alb	-.0544379	.0055993	-9.72	0.000	-.0654125	-.0434633
bc	-.0188352	.0052548	-3.58	0.000	-.0291345	-.0085359
terri	.1422337	.0272686	5.22	0.000	.0887879	.1956795
_cons	4.845394	.4402414	11.01	0.000	3.98253	5.708258

Table B.2.5. Regression output, alternate adjusted distribution, 1991 census data, native male FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & male==1, r;

Linear regression

Number of obs	= 94231
F(22, 94208)	= 631.59
Prob > F	= 0.0000
R-squared	= 0.1347
Root MSE	= .5487

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.4142078	.0556434	7.44	0.000	.3051474	.5232683
age2	-.0127218	.0020389	-6.24	0.000	-.016718	-.0087256
age3	.1822722	.0323787	5.63	0.000	.1188104	.245734
age4	-.0101745	.0018823	-5.41	0.000	-.0138639	-.0064851
dgree02	.1666008	.0054365	30.64	0.000	.1559452	.1772563
dgree03	.1831139	.0056191	32.59	0.000	.1721005	.1941272
dgree04	.279597	.0059387	47.08	0.000	.2679571	.2912368
dgree05	.3304456	.0135521	24.38	0.000	.3038836	.3570076
dgree06	.452633	.0064172	70.53	0.000	.4400553	.4652107
dgree07	.4770454	.0136101	35.05	0.000	.4503699	.503721
dgree08	.5782941	.0455343	12.70	0.000	.4890474	.6675408
dgree09	.5413702	.0105134	51.49	0.000	.5207642	.5619763
dgree10	.5856092	.021633	27.07	0.000	.5432088	.6280095
nfld	-.1140314	.0129563	-8.80	0.000	-.1394255	-.0886372
ns	-.1466601	.0089975	-16.30	0.000	-.1642951	-.1290251
nb	-.1561164	.0108615	-14.37	0.000	-.1774049	-.134828
que	-.1166722	.0043729	-26.68	0.000	-.1252429	-.1081014
man	-.1400122	.0097361	-14.38	0.000	-.1590949	-.1209295
sask	-.2178135	.0122512	-17.78	0.000	-.2418257	-.1938014
alb	-.040556	.0069059	-5.87	0.000	-.0540914	-.0270206
bc	-.0066916	.0063542	-1.05	0.292	-.0191458	.0057626
terri	.1160638	.0326698	3.55	0.000	.0520313	.1800963
_cons	5.296354	.555034	9.54	0.000	4.208494	6.384215

Table B.2.6. Regression output, alternate adjusted distribution, 1991 census data, native female FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld ns nb que man sask alb bc terri if im1==0 & female==1, r;

Linear regression

Number of obs	= 62061
F(22, 62038)	= 620.89
Prob > F	= 0.0000
R-squared	= 0.1728
Root MSE	= .53568

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.2153907	.0652564	3.30	0.001	.0874879	.3432934
age2	-.0058112	.0024064	-2.41	0.016	-.0105278	-.0010945
age3	.0700353	.0384318	1.82	0.068	-.0052911	.1453617
age4	-.0032707	.0022455	-1.46	0.145	-.0076718	.0011305
dgree02	.2061355	.0067323	30.62	0.000	.1929403	.2193308
dgree03	.1768085	.0089927	19.66	0.000	.1591827	.1944343
dgree04	.3546736	.0070339	50.42	0.000	.3408872	.36846
dgree05	.5042108	.0119203	42.30	0.000	.480847	.5275747
dgree06	.6477549	.0077579	83.50	0.000	.6325494	.6629605
dgree07	.7332579	.0134713	54.43	0.000	.7068543	.7596616
dgree08	.9229522	.062742	14.71	0.000	.7999777	1.045927
dgree09	.8149005	.0142627	57.14	0.000	.7869456	.8428553
dgree10	.8948496	.0415869	21.52	0.000	.8133392	.9763599
nfld	-.1531156	.015668	-9.77	0.000	-.1838249	-.1224063
ns	-.2000142	.0125357	-15.96	0.000	-.2245842	-.1754442
nb	-.2248323	.0145093	-15.50	0.000	-.2532705	-.196394
que	-.1093066	.0051936	-21.05	0.000	-.119486	-.0991273
man	-.1283055	.0113233	-11.33	0.000	-.1504992	-.1061119
sask	-.252092	.0142245	-17.72	0.000	-.279972	-.2242121
alb	-.0777448	.0083581	-9.30	0.000	-.0941266	-.061363
bc	-.0517305	.0079405	-6.51	0.000	-.0672939	-.036167
terri	.179893	.0443255	4.06	0.000	.0930148	.2667711
_cons	7.156979	.6460725	11.08	0.000	5.890676	8.423283

Table B.2.7. Regression output, alternate adjusted distribution, 2001 census data, all native FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0, r;

Linear regression

Number of obs	= 159708
F(23,159684)	= 1101.76
Prob > F	= 0.0000
R-squared	= 0.1354
Root MSE	= .59943

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.3709523	.0484401	7.66	0.000	.2760108	.4658939
age2	-.010953	.0017723	-6.18	0.000	-.0144267	-.0074794
age3	.1509822	.0281208	5.37	0.000	.095866	.2060984
age4	-.0081814	.0016354	-5.00	0.000	-.0113866	-.0049761
dgree02	.1233132	.0050438	24.45	0.000	.1134274	.133199
dgree03	.2072298	.0056309	36.80	0.000	.1961932	.2182663
dgree04	.2532302	.0050345	50.30	0.000	.2433626	.2630977
dgree05	.3564966	.0096597	36.91	0.000	.3375638	.3754293
dgree06	.5305249	.0054369	97.58	0.000	.5198687	.5411811
dgree07	.561002	.0097851	57.33	0.000	.5418233	.5801806
dgree08	.7567373	.0322686	23.45	0.000	.6934915	.8199831
dgree09	.6676724	.0085365	78.21	0.000	.6509411	.6844037
dgree10	.7084263	.0193268	36.66	0.000	.6705461	.7463064
nfld	-.258398	.0123931	-20.85	0.000	-.2826882	-.2341078
pei	-.3329888	.0220197	-15.12	0.000	-.3761469	-.2898307
ns	-.2343173	.008642	-27.11	0.000	-.2512554	-.2173792
nb	-.2488384	.0094671	-26.28	0.000	-.2673937	-.230283
que	-.1473908	.0037215	-39.61	0.000	-.1546848	-.1400969
man	-.1813608	.0079078	-22.93	0.000	-.19686	-.1658616
sask	-.2333994	.0094916	-24.59	0.000	-.2520027	-.2147961
alb	-.0454285	.005551	-8.18	0.000	-.0563084	-.0345486
bc	-.0156321	.0051889	-3.01	0.003	-.0258024	-.0054619
terri	.0580008	.0271496	2.14	0.033	.0047882	.1112134
_cons	5.526639	.4837115	11.43	0.000	4.578575	6.474703

Table B.2.8. Regression output, alternate adjusted distribution, 2001 census data, native male FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0 & male==1, r;

Linear regression

Number of obs	= 92334
F(23, 92310)	= 630.05
Prob > F	= 0.0000
R-squared	= 0.1395
Root MSE	= .59084

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.3778698	.0631788	5.98	0.000	.25404	.5016997
age2	-.0111638	.0023071	-4.84	0.000	-.0156856	-.0066419
age3	.1557169	.0365451	4.26	0.000	.0840889	.227345
age4	-.0086108	.0021219	-4.06	0.000	-.0127698	-.0044518
dgree02	.1318422	.0062433	21.12	0.000	.1196053	.144079
dgree03	.1788398	.0064846	27.58	0.000	.1661301	.1915495
dgree04	.2822838	.0063697	44.32	0.000	.2697993	.2947684
dgree05	.3484429	.0143532	24.28	0.000	.3203108	.3765751
dgree06	.5064544	.0070807	71.53	0.000	.4925764	.5203325
dgree07	.5349838	.0148994	35.91	0.000	.5057812	.5641864
dgree08	.6981426	.0421634	16.56	0.000	.6155028	.7807824
dgree09	.5995809	.0114242	52.48	0.000	.5771895	.6219722
dgree10	.6239448	.0229651	27.17	0.000	.5789335	.6689561
nfld	-.2404696	.0168906	-14.24	0.000	-.2735751	-.2073642
pei	-.3668424	.0296228	-12.38	0.000	-.4249029	-.308782
ns	-.2194612	.0110014	-19.95	0.000	-.2410239	-.1978985
nb	-.2350076	.0121844	-19.29	0.000	-.258889	-.2111263
que	-.1536344	.0048161	-31.90	0.000	-.1630739	-.1441949
man	-.1962985	.0104292	-18.82	0.000	-.2167396	-.1758574
sask	-.2293224	.0129537	-17.70	0.000	-.2547115	-.2039332
alb	-.015764	.0070446	-2.24	0.025	-.0295714	-.0019565
bc	-.0240183	.0066693	-3.60	0.000	-.0370901	-.0109465
terri	.0244415	.0357145	0.68	0.494	-.0455587	.0944416
_cons	5.53737	.6324365	8.76	0.000	4.297801	6.776939

Table B.2.9. Regression output, alternate adjusted distribution, 2001 census data, native female FYFT workers

regress lne age age2 age3 age4 dgree02 dgree03 dgree04 dgree05 dgree06 dgree07 dgree08 dgree09 dgree10 nfld pei ns nb que man sask alb bc terri if im1==0 & female==1, r;

Linear regression

Number of obs	= 67374
F(23, 67350)	= 671.65
Prob > F	= 0.0000
R-squared	= 0.1788
Root MSE	= .55616

lne	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.2199398	.0698896	3.15	0.002	.0829563	.3569233
age2	-.0060404	.002562	-2.36	0.018	-.0110619	-.0010189
age3	.0811344	.0407309	1.99	0.046	.001302	.1609669
age4	-.0045278	.002374	-1.91	0.056	-.0091808	.0001251
dgree02	.1896559	.0077327	24.53	0.000	.1744998	.2048121
dgree03	.1597682	.0097086	16.46	0.000	.1407392	.1787971
dgree04	.3403458	.007576	44.92	0.000	.3254969	.3551947
dgree05	.4942485	.0126918	38.94	0.000	.4693726	.5191244
dgree06	.647564	.0080467	80.48	0.000	.6317923	.6633356
dgree07	.711663	.0125416	56.74	0.000	.6870814	.7362446
dgree08	.8331503	.0446687	18.65	0.000	.7455997	.9207009
dgree09	.809388	.0120356	67.25	0.000	.7857982	.8329778
dgree10	.8273356	.0340579	24.29	0.000	.7605821	.8940891
nfld	-.221977	.0165452	-13.42	0.000	-.2544056	-.1895483
pei	-.2647782	.0313491	-8.45	0.000	-.3262225	-.203334
ns	-.2417726	.0125298	-19.30	0.000	-.2663309	-.2172143
nb	-.2557199	.0134598	-19.00	0.000	-.282101	-.2293387
que	-.1346244	.0053258	-25.28	0.000	-.145063	-.1241859
man	-.1508846	.0112013	-13.47	0.000	-.172839	-.1289301
sask	-.2147402	.0128135	-16.76	0.000	-.2398547	-.1896258
alb	-.0885188	.0080448	-11.00	0.000	-.1042867	-.0727509
bc	-.0033069	.007601	-0.44	0.664	-.0182049	.0115911
terri	.1462395	.0405878	3.60	0.000	.0666874	.2257916
_cons	6.981135	.6963024	10.03	0.000	5.616382	8.345887

Table B3.1 – Log Earnings Regression (now with age added) Output for Equation (12)

Variable	Coefficient (with unadjusted earnings) 1980	1990	2000
Constant	8.269	8.051***	8.146***
	(0.136)	(0.101)	(0.105)
Age at Time of Survey	0.081***	0.082***	0.067***
	(0.010)	(0.007)	(0.007)
Age Squared	-0.001***	-0.001	-0.000*
	(0.000)	(0.000)	(0.000)
Age Cubed x 10^{-4}	0.004***	0.001	-0.005***
	(0.002)	(0.001)	(0.001)
High School Graduate Certificate	0.210***	0.177***	0.152***
	(0.006)	(0.004)	(0.005)
Trades Certificate or Diploma	0.337***	0.309***	0.247***
	(0.006)	(0.005)	(0.005)
College Certificate or Diploma	0.282***	0.316***	0.288***
	(0.007)	(0.005)	(0.005)
University Certificate or Diploma Below Bachelor's Level	0.372***	0.359***	0.348***
	(0.014)	(0.09)	(0.009)
University Degree: Bachelor's Level	0.598***	0.575***	0.553***
	(0.008)	(0.005)	(0.005)
University Degree: University Certificate above Bachelor's Level	0.675***	0.641***	0.575***
	(0.017)	(0.011)	(0.010)
Medical Degree	0.894***	0.891***	0.794***
	(0.035)	(0.025)	(0.021)
Master's Degree	0.768***	0.723***	0.668***
	(0.014)	(0.009)	(0.008)
Earned Doctorate Degree	1.045***	0.978***	0.829***
	(0.026)	(0.020)	(0.017)
YSM	0.001*	-0.003***	0.003***
	(0.001)	(0.001)	(0.000)
YSM Squared	0.000**	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Married	0.134***	0.113***	0.121**
	(0.005)	(0.003)	(0.003)
USA	-0.193***	-0.158***	-0.133***
	(0.019)	(0.014)	(0.016)
UK	0.004	0.051***	0.014
	(0.011)	(0.009)	(0.016)
Other Europe	0.037	-0.037***	-0.133***
	(0.025)	(0.009)	(0.014)
Asia	-0.195***	-	-0.322***
	(0.013)		(0.007)
China	-	-0.295***	-
		(0.018)	
Africa	-0.085***	-0.157***	-
	(0.026)	(0.016)	
Eastern Africa	-	-	-0.204***
			(0.021)

Notes: Robust standard errors are in parentheses. The statistics are calculated in the sample of those aged 25-64 who earned at least $1000 (real $2000) and were not self-employed in the year prior to the census. *Significant at 10% significance level. **Significant at a 5% significance level. ***Significant at a 1% significance level.

Table B3.2
Log Earnings regressions estimating aging and cohort effects in Canada (2001 data)

Variable	Model (1)		(2)	
	Native	Immigrant	Native	Immigrant
Intercept	7.702***	7.928***	7.567***	7.815***
	(0.122)	(0.255)	(0.121)	(0.255)
Age at Time of Survey	0.097***	0.064***	0.098***	0.064***
	(0.009)	(0.018)	(0.009)	(0.018)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Age Cubed x 10^{-4}	-0.002***	0.001***	-0.003***	0.001***
	(0.002)	(0.003)	(0.002)	(0.003)
High School Graduate Certificate	0.169***	0.086***	0.148***	0.085***
	(0.005)	(0.010)	(0.005)	(0.010)
Trades Certificate or Diploma	0.262***	0.228***	0.259***	0.232***
	(0.006)	(0.012)	(0.006)	(0.012)
College Certificate or Diploma	0.305***	0.230***	0.279***	0.232***
	(0.005)	(0.010)	(0.005)	(0.010)
University Certificate or Diploma Below Bachelor's Level	0.395***	0.254***	0.361***	0.253***
	(0.010)	(0.017)	(0.010)	(0.017)
University Degree: Bachelor's Level	0.591***	0.436***	0.543***	0.434***
	(0.006)	(0.011)	(0.006)	(0.011)
University Degree: University Certificate Above Bachelor's Level	0.633***	0.481***	0.584***	0.480***
	(0.011)	(0.023)	(0.011)	(0.023)
Medical Degree	0.874***	0.685***	0.834***	0.690***
	(0.030)	(0.046)	(0.031)	(0.046)
Master's Degree	0.727***	0.612***	0.671***	0.609***
	(0.010)	(0.016)	(0.010)	(0.016)
Earned Doctorate Degree	0.841***	0.901***	0.773***	0.902***
	(0.022)	(0.026)	(0.022)	(0.026)
Census Metropolitan Area Dummy	-	-	0.195***	0.117***
			(0.003)	(0.011)
Years since migration at time of survey	-	0.085***	-	0.085***
		(0.004)		(0.004)
Years since migration squared	-	-0.002***	-	-0.002***
		(0.000)		(0.000)
Years since migration cubed x 10-4	-	0.018***	-	0.019***
		(0.002)		(0.002)
Cohort effects:				
Arrived in 1961-1970	-	-0.097***	-	-0.096***
		(0.026)		(0.026)
Arrived in 1971-1980	-	-0.165***	-	-0.163***
		(0.036)		(0.036)
Arrived in 1981-1990	-	-0.138***	-	-0.136***
		(0.047)		(0.047)

Notes: Robust standard errors are in parentheses. The regressions are estimated in the sample of workers aged 25-64, who earned at least $1000 the year prior to the census, and were not self-employed. Model (2) includes a dummy variable indicating if the worker lives in a census metropolitan area (CMA).
*Significant at 10% significance level.
**Significant at a 5% significance level.
***Significant at a 1% significance level

Appendix C

Table C.1.1: Trends in Immigrant Females' Earnings Inequality

1980	p90/p10	p90/p50	p50/p10	p80/p20	p80/p50	p50/p20	p60/p40
non-immigrant females	10.05	2.00	5.02	4.30	1.60	2.68	1.53
imbf61 female non-fullyrft	10.00	2.33	4.29	4.37	1.83	2.38	1.46
imbf61 female fullyrft	3.02	1.72	1.76	1.98	1.44	1.37	1.23
1990							
non-immigrant females	8.80	2.04	4.31	3.88	1.60	2.42	1.53
imbf61 female non-fullyrft	10.27	2.57	4.00	4.19	1.94	2.16	1.53
imbf61 female fullyrft	4.12	1.92	2.15	2.35	1.53	1.53	1.25
2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
imbf61 female non-fullyrft	11.50	2.67	4.31	4.62	1.86	2.48	1.56
imbf61 female fullyrft	3.90	1.80	2.17	2.44	1.53	1.60	1.29
1980							
non-immigrant females	10.05	2.00	5.02	4.30	1.60	2.68	1.53
im6170 female non-fullyrft	9.81	2.49	3.94	4.08	1.90	2.14	1.56
im6170 female fullyrft	3.09	1.78	1.73	2.09	1.48	1.42	1.20
1990							
non-immigrant females	8.80	2.04	4.31	3.88	1.60	2.42	1.53
im6170 female non-fullyrft	9.14	2.46	3.71	4.00	1.85	2.17	1.52
im6170 female fullyrft	3.55	1.76	2.02	2.11	1.45	1.46	1.25
2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
im6170 female non-fullyrft	10.98	2.55	4.30	4.58	1.89	2.42	1.55
im6170 female fullyrft	4.15	1.84	2.25	2.33	1.52	1.54	1.29
1980							
non-immigrant females	10.05	2.00	5.02	4.30	1.60	2.68	1.53
im7180 female non-fullyrft	9.39	2.26	4.15	4.21	1.74	2.42	1.56
im7180 female fullyrft	3.01	1.73	1.74	2.00	1.38	1.45	1.23
1990							
non-immigrant females	8.80	2.04	4.31	3.88	1.60	2.42	1.53
im7180 female non-fullyrft	10.00	2.41	4.16	4.18	1.84	2.27	1.50
im7180 female fullyrft	3.58	1.74	2.06	2.21	1.43	1.55	1.23
2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
im7180 female non-fullyrft	9.00	2.50	3.60	4.28	1.90	2.25	1.62
im7180 female fullyrft	3.82	1.83	2.09	2.31	1.50	1.54	1.23
1990							
non-immigrant females	8.80	2.04	4.31	3.88	1.60	2.42	1.53
im8190 female non-fullyrft	9.80	2.53	3.88	4.50	1.89	2.38	1.55
im8190 female fullyrft	3.68	1.82	2.02	2.35	1.49	1.58	1.28

2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
im8190 female non-fullyrft	10.00	2.38	4.20	4.29	1.79	2.40	1.54
im8190 female fullyrft	3.73	1.84	2.03	2.29	1.47	1.56	1.31
2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
im9101 female non-fullyrft	10.33	2.58	4.00	4.75	1.98	2.40	1.50
im9101 female fullyrft	4.17	1.94	2.14	2.50	1.56	1.61	1.33

Table C.1.2: Trends in Immigrant Males' Earnings Inequality

1980	p90/p10	p90/p50	p50/p10	p80/p20	p80/p50	p50/p20	p60/p40
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
imbf61 male non-fullyrft	6.33	1.78	3.56	2.92	1.50	1.95	1.29
imbf61 male fullyrft	2.88	1.66	1.74	1.92	1.38	1.39	1.20
1990							
non-immigrant males	5.80	1.82	3.19	2.77	1.50	1.84	1.29
imbf61 male non-fullyrft	8.12	2.04	3.98	3.49	1.61	2.17	1.49
imbf61 male fullyrft	3.40	1.71	1.99	2.09	1.43	1.46	1.26
2000							
non-immigrant males	6.42	1.93	3.33	2.90	1.53	1.90	1.32
imbf61 male non-fullyrft	13.00	2.60	5.00	5.14	1.93	2.66	1.58
imbf61 male fullyrft	4.42	1.90	2.32	2.41	1.47	1.64	1.32
1980							
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
im6170 male non-fullyrft	6.63	1.92	3.45	3.26	1.59	2.06	1.42
im6170 male fullyrft	3.00	1.66	1.81	2.00	1.38	1.45	1.20
1990							
non-immigrant males	5.80	1.82	3.19	2.77	1.50	1.84	1.29
im6170 male non-fullyrft	7.58	2.00	3.79	3.46	1.60	2.16	1.45
im6170 male fullyrft	3.50	1.75	2.00	2.09	1.41	1.48	1.26
2000							
non-immigrant males	6.42	1.93	3.33	2.90	1.53	1.90	1.32
im6170 male non-fullyrft	10.38	2.12	4.89	4.04	1.69	2.39	1.54
im6170 male fullyrft	4.16	1.86	2.24	2.42	1.50	1.61	1.29
1980							
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
im7180 male non-fullyrft	10.11	2.16	4.68	4.16	1.70	2.44	1.49
im7180 male fullyrft	3.10	1.63	1.90	2.00	1.37	1.46	1.25
1990							
non-immigrant males	5.80	1.82	3.19	2.77	1.50	1.84	1.29
im7180 male non-fullyrft	9.00	2.05	4.40	3.74	1.64	2.29	1.44
im7180 male fullyrft	3.60	1.82	1.98	2.21	1.49	1.49	1.29
2000							
non-immigrant males	6.42	1.93	3.33	2.90	1.53	1.90	1.32
im7180 male non-fullyrft	9.26	2.28	4.07	4.17	1.76	2.37	1.55

im7180 male fullyrft	4.13	1.92	2.15	2.38	1.56	1.53	1.26
1990							
non-immigrant males	5.80	1.82	3.19	2.77	1.50	1.84	1.29
im8190 male non-fullyrft	10.97	2.53	4.34	4.37	1.86	2.35	1.53
im8190 male fullyrft	4.00	1.90	2.11	2.47	1.53	1.61	1.29
2000							
non-immigrant males	6.42	1.93	3.33	2.90	1.53	1.90	1.32
im8190 male non-fullyrft	9.17	2.31	3.97	4.08	1.71	2.38	1.50
im8190 male fullyrft	4.31	1.97	2.18	2.50	1.54	1.63	1.29
2000							
non-immigrant males	6.42	1.93	3.33	2.90	1.53	1.90	1.32
im9101 male non-fullyrft	11.25	2.54	4.43	4.71	1.86	2.53	1.59
im9101 male fullyrft	4.67	2.04	2.29	2.72	1.60	1.70	1.33

Table C.1.3: Immigrant Females' Earnings Inequality

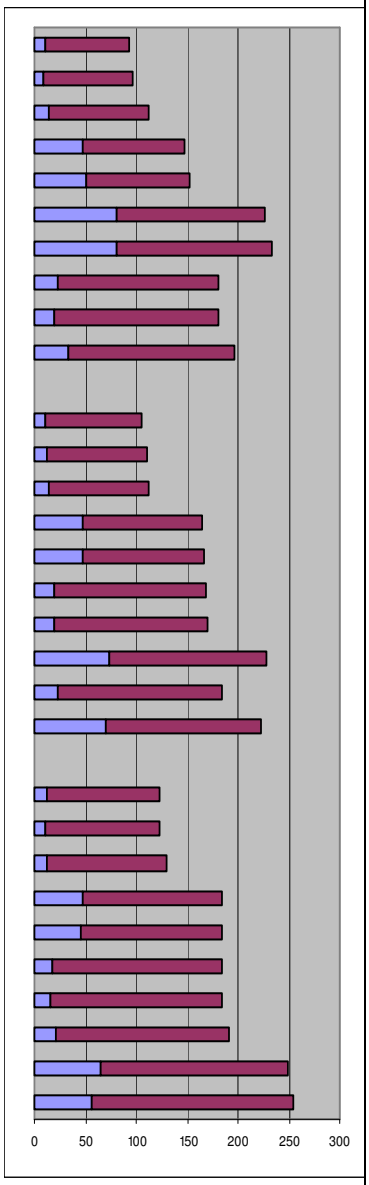
1980	p90/p10	p90/p50	p50/p10	p80/p20	p80/p50	p50/p20	p60/p40
non-immigrant females	10.05	2.00	5.02	4.30	1.60	2.68	1.53
non-immigrant females, non-fullyrft	12.08	2.68	4.50	5.16	2.01	2.57	1.63
non-immigrant females, fullyrft	2.99	1.65	1.81	1.98	1.42	1.40	1.21
immigrant females, non-fullyrft	9.63	2.34	4.11	4.32	1.82	2.37	1.44
immigrant females, fullyrft	3.06	1.71	1.79	2.02	1.41	1.43	1.19
recent female immigrants	8.50	2.00	4.25	3.42	1.60	2.14	1.43
1990							
non-immigrant females	8.80	2.04	4.31	3.88	1.60	2.42	1.53
non-immigrant females, non-fullyrft	10.32	2.59	3.98	4.40	1.94	2.27	1.56
non-immigrant females, fullyrft	3.67	1.74	2.10	2.20	1.47	1.50	1.24
immigrant females, non-fullyrft	9.82	2.53	3.88	4.40	1.89	2.33	1.52
immigrant females, fullyrft	3.73	1.79	2.08	2.25	1.44	1.56	1.25
recent female immigrants	8.74	2.14	4.08	4.17	1.79	2.33	1.50
2000							
non-immigrant females	8.22	2.12	3.89	3.58	1.65	2.17	1.42
non-immigrant females, non-fullyrft	10.29	2.67	3.86	4.50	2.00	2.25	1.65
non-immigrant females, fullyrft	4.00	1.82	2.20	2.39	1.52	1.58	1.25
immigrant females, non-fullyrft	11.33	2.67	4.25	4.69	2.00	2.34	1.64
immigrant females, fullyrft	4.14	1.94	2.14	2.39	1.54	1.55	1.25
recent female immigrants	10.50	2.28	4.61	4.15	1.76	2.37	1.47

Table C.1.4: Immigrant Males' Earnings Inequality

1980	p90/p10	p90/p50	p50/p10	p80/p20	p80/p50	p50/p20	p60/p40
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
non-immigrant males, non-fullyrft	9.00	2.25	4.00	4.11	1.78	2.31	1.50
non-immigrant males, fullyrft	2.83	1.64	1.73	1.89	1.36	1.38	1.21
immigrant males, non-fullyrft	7.68	1.93	3.98	3.38	1.57	2.15	1.37
immigrant males, fullyrft	2.92	1.67	1.75	1.97	1.41	1.40	1.22
recent male immigrants	5.91	1.85	3.20	2.67	1.50	1.78	1.32
1990							
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
non-immigrant males, non-fullyrft	9.00	2.27	3.97	4.16	1.76	2.36	1.56
non-immigrant males, fullyrft	3.29	1.69	1.94	2.04	1.41	1.45	1.24
immigrant males, non-fullyrft	9.41	2.28	4.12	4.43	1.79	2.48	1.56
immigrant males, fullyrft	3.67	1.76	2.08	2.25	1.47	1.53	1.28
recent male immigrants	8.68	2.23	3.90	3.80	1.73	2.20	1.45
2000							
non-immigrant males	5.00	1.68	2.97	2.45	1.42	1.73	1.26
non-immigrant males, non-fullyrft	10.20	2.40	4.25	4.65	1.86	2.50	1.51
non-immigrant males, fullyrft	3.86	1.82	2.12	2.24	1.46	1.54	1.25
immigrant males, non-fullyrft	12.00	2.61	4.60	4.87	1.91	2.55	1.60
immigrant males, fullyrft	4.59	1.97	2.33	2.64	1.57	1.68	1.34
recent male immigrants	9.30	2.26	4.11	3.85	1.74	2.21	1.39

Figure C.2.1 Real ($2000) Income Distribution Comparison
(numbers given are percent of Canadians' median earnings according to the respective censuses)

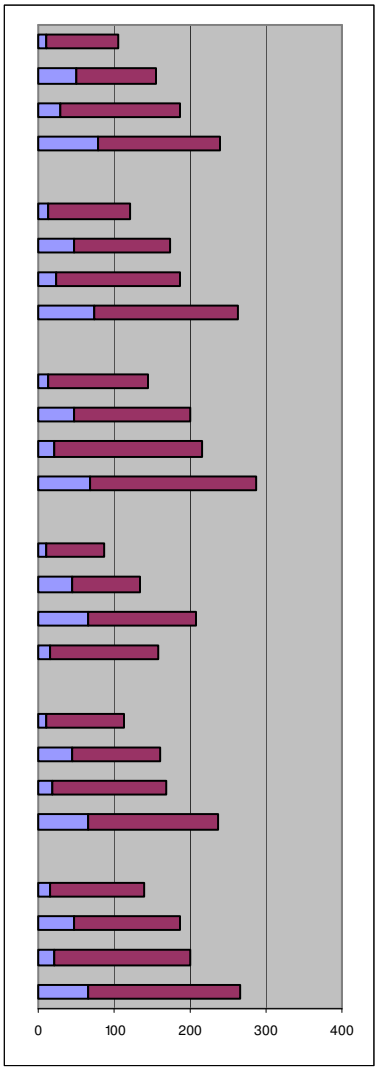
	Low[a] Earnings Decile (P10/P50)	Length[b] of dark bars represents the gap between high and low earnings workers	High[c] Earnings Decile (P90/P50)	Ratio of high to low Earnings (Decile Ratio)
1980				
Female Non-Fullyrft Immigrants	10		94	9.40
Female Non-Fullyrft Non-Imm.	8		97	12.12
Female Fullyrft Immigrants	13		147	11.31
Female Recent Immigrants	48		113	2.35
Female Fullyrft Non-Imm.	51		153	3.00
Male Fullyrft Non-Imm.	80		227	2.84
Male Fullyrft Immigrants	80		233	2.91
Male Non-Fullyrft Immigrants	23		180	7.83
Male Non-Fullyrft Non-Imm	20		180	9.00
Male Recent Immigrants	33		197	5.97
1990				
Female Non-Fullyrft Non-Imm	11		105	9.54
Female Non-Fullyrft Immigrants	12		110	9.17
Female Recent Immigrants	14		112	8.00
Female Fullyrft Non-Imm.	48		165	3.44
Female Fullyrft Immigrants	48		167	3.48
Male Non-Fullyrft Non-Imm.	20		168	8.40
Male Non-Fullyrft Immigrants	19		171	9.00
Male Fullyrft Non-Imm	74		228	3.08
Male Recent Immigrants	23		183	7.96
Male Fullyrft Immigrants	71		223	3.14
2000				
Female Non-Fullyrft Non-Imm	12		123	10.25
Female Non-Fullyrft Immigrants	11		123	11.18
Female Recent Immigrants	13		129	9.92
Female Fullyrft Non-Imm.	47		185	3.94
Female Fullyrft Immigrants	45		185	4.11
Male Non-Fullyrft Non-Imm.	18		185	10.28
Male Non-Fullyrft Immigrants	16		185	11.56
Male Fullyrft Non-Imm	21		191	9.09
Male Recent Immigrants	66		249	3.77
Male Fullyrft Immigrants	56		254	4.54
Average	34		169	4.97



aRelative earnings (as a percentage of the aggregate national median earnings) for individuals who are lower than 90 percent of those within the particular category and higher than 10 percent (for each particular census year).
bThe length of the dark bars represents the gap between the 90th and 10th percentiles, that is, the gap represents the 90th/50th percentile value minus the 10th/50th. The light and dark bars add to make the value for the 90th percentile (as a percentage of national median earnings).
cRelative earnings for individuals who are higher than 90 percent of those within the particular category and lower than 10 percent (for each particular census year).
dSimple average.

Figure C.2.2 Real ($2000) Income Distribution Comparison, by Immigrant Cohort
(numbers given are percent of Canadians' median earnings according to the respective censuses)

	Low[a] Earnings Decile (P10/P50)	Length[b] of dark bars represents the gap between high and low earnings workers	High[c] Earnings Decile (P90/P50)	Ratio of high to low Earnings (Decile Ratio)
1980				
im6170 female non-fullyft	11		105	9.54
im6170 female fullyft	50		155	3.10
im6170 male non-fullyrft	28		186	6.64
im6170 male fullyrft	80		240	3.00
1990				
im6170 female non-fullyft	13		120	9.23
im6170 female fullyft	49		173	3.53
im6170 male non-fullyrft	25		187	7.48
im6170 male fullyrft	75		262	3.49
2000				
im6170 female non-fullyft	13		145	11.15
im6170 female fullyft	48		200	4.17
im6170 male non-fullyrft	21		215	10.24
im6170 male fullyrft	69		286	4.14
1980				
im7180 female non-fullyft	9		87	9.67
im7180 female fullyft	44		133	3.02
im7180 male non-fullyrft	67		207	3.08
im7180 male fullyrft	16		158	9.87
1990				
im7180 female non-fullyft	11		112	10.18
im7180 female fullyft	45		161	3.58
im7180 male non-fullyrft	19		168	8.84
im7180 male fullyrft	66		238	3.61
2000				
im7180 female non-fullyft	15		139	9.27
im7180 female fullyft	49		186	3.80
im7180 male non-fullyrft	22		199	9.04
im7180 male fullyrft	64		266	4.16
Average	38		180	4.74



aRelative earnings (as a percentage of the aggregate national median earnings) for individuals who are lower than 90 percent of those within the particular category and higher than 10 percent (for each particular census year).
bThe length of the dark bars represents the gap between the 90th and 10th percentiles, that is, the gap represents the 90th/50th percentile value minus the 10th/50th. The light and dark bars add to make the value for the 90th percentile (as a percentage of national median earnings).
cRelative earnings for individuals who are higher than 90 percent of those within the particular category and lower than 10 percent (for each particular census year).
dSimple average.