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Ethnic Enclaves and Immigrant Earnings Growth

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Ethnic Enclaves and Immigrant Earnings Growth*

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Abstract:

The impact of living in an ethnic enclave on earnings growth of immigrants in Canada is examined using the 1981–2001 Censuses. Consistent with U.S. findings, enclaves are found to have a negative impact on the earnings growth of male immigrants. A negative impact is also found for female immigrants. Living in an enclave was found to be particularly harmful for individuals immigrating as adults, especially for females, but did not affect immigrants who arrived at a young age. Enclaves had a more negative impact on high-skilled male immigrants, especially if they had received the bulk of their education outside of Canada. Enclaves also hindered language skills. JEL Classification: J15, J31

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1. Introduction

Immigrants are an important part of Canadian society. Aside from comprising an increasing proportion of the population, immigrants make up an increasing proportion of the labour market.[1] With the growing significance of immigrants for the overall health of the Canadian economy, the labour market outcomes of immigrants is an important issue. This paper examines the impact of ethnic concentration on the earnings growth of immigrants.

Although immigrants have become a more significant part of the Canadian labour force, their labour market performance has deteriorated in recent decades for both males and females. The deterioration in the labour market outcomes of recent immigrant cohorts to Canada is well documented. Studies by Baker and Benjamin (1994) and Bloom, Grenier and Gunderson (1995) both found that more recent male immigrant cohorts have not assimilated as well as previous cohorts.[2] [3] Bloom, Grenier and Gunderson (1995) also discovered similar findings for female immigrants who have had lower entry earnings for successive cohorts and have had a smaller rate of earnings assimilation (also see Beach and Worswick (1993)).

While most research has detected a poorer economic performance of recent immigrant cohorts, the reason for this decline has not been fully explained. Potential explanations could include: a change in the visa class composition of immigrants,[4] a change in composition of sending countries from western European to Asian and African countries (De Silva, 1997a), discrimination (Pendakur and Pendakur, 1998, 2002a; and Hum and Simpson, 1999), macro

[1] Statistics Canada (2003).
[2] However, Grant (1999) finds an improvement in the earnings assimilation for male immigrants during the 1980s. Warman and Worswick (2004) and Aydemir and Skuterud (2005) found that the late 1990s cohort had slightly higher entry earnings than the early 1990s cohort.
[3] In the United States, Borjas (1995) found that the entry wage of the 1970 and 1980 cohorts were lower than that of earlier cohorts and that a wage disadvantage between the recent cohorts and the native population would always exist. Also see Duleep and Regets (1997).
[4] Green (1999) notes that there has been a change in the composition of the classes admitted into Canada, with the proportion coming from the independent class dropping from 70 percent in 1973 to 20 percent in 1992. However, De Silva (1997b) finds that the earnings of the different classes converge over time.

conditions (McDonald and Worswick, 1997, 1998),[5] a change in the human capital of immigrants (Coulson and Devoretz, 1993) and a fall in returns to foreign work experience (Schaafsma and Sweetman, 2001; Green and Worswick, 2004; Aydemir and Skuterud, 2005).

Another potential explanation is the effect of residential patterns on immigrants' outcomes. Immigrants have not settled randomly across the country. They tend to settle in the large Canadian urban centres, and different groups are inclined to settle more densely in different urban centres. In addition, these immigrant groups tend to cluster in enclaves within these urban centres. If clustering inhibits the acquisition of skills necessary for labour market success, the tendency for immigrants to cluster may help to explain why recent cohorts have fared poorly.

In 1967, with changes to Canadian immigration policy, a point and class system was introduced and consequently immigration was no longer determined by country of birth.[6] With this change in immigration policy, there was a drastic shift in the country of origin of immigrants. Prior to this shift in policy, immigrants from countries that were seen as being similar to Canada were given preferential treatment. Other countries were viewed as "having values that were too far removed from Canadian values to enable them to adapt to Canadian society" (Weinfeld and Wilkinson, 1999). In the past, when sending countries were ethnically and culturally similar to Canada, concentration of ethnic groups may not have affected the degree of interaction between immigrants and the general Canadian population. They would be less likely to form enclaves and if they did so, these enclaves would not likely be as harmful. As the composition of the sending countries has changed, and the language and culture of the new cohorts has become remarkably different from previous cohorts, enclaves may isolate immigrants from the general Canadian labour market. Consequently, enclaves may hinder the transmission of human capital from

[5] McDonald and Worswick (1997) find that differences in unemployment probabilities of immigrants are affected by macro conditions, but over time, these rates come to resemble the rates experienced by non-immigrant men. McDonald and Worswick (1998) found that macro conditions affect the rate of earnings assimilation.

[6] For a thorough examination of the history of Canadian immigration policy see Green and Green (1995, 1999 and 2004).

Canadian-born individuals to immigrants, affecting the acquisition of the types of skills necessary for success of immigrants in the Canadian labour market.

It is also possible that ethnic communities may have a positive impact on immigrants' earnings. With the reduction of cultural and linguistic trauma as well as the presence of job opportunities, an ethnic community may provide a newly arrived immigrant with a better environment to obtain initial success in his/her new country. An immigrant residing outside his/her enclave may experience increased difficulties during the initial adjustment period due to the inadequate knowledge of the local job market, knowledge that may be provided within an ethnic community.

However, the level of success of an immigrant choosing to reside in an enclave may be confined to the level of opportunities present in the community. Although it may be easier for an immigrant to adapt to the common language and culture present in their ethnic community, adaptation to the ethnic community may not encourage the accumulation of the skills required for success in the labour market. While it is not being argued that ethnic communities will have a lower level of human capital, rather it is suggested that the skills present within the enclaves will be less transferable to the Canadian labour market. With a relatively lower portion of human capital in an ethnic community transferable to the Canadian labour market, immigrants that locate inside their ethnic community may experience lower income growth than those immigrants who reside outside their ethnic community. Furthermore, living in their ethnic community, immigrants do not have as great an incentive or need to learn the dominant language. Residing outside his/her enclave, an immigrant can no longer communicate in his/her native language and therefore, must acquire a stronger understanding of the dominant language.

Evidence from the United States indicates that segregation has a negative impact on the earnings assimilation of male immigrants. Using the 1980 and 1990 American Censuses, Borjas (2000a) found that residing in an ethnic community had a statistically significant negative effect on the wage growth of male immigrants. Currently there are no studies that examine the impact

of enclaves on earnings assimilation of immigrants in Canada. This paper uses the Canadian Census to examine the effect of ethnic enclaves on the earnings growth. As well, there are no studies on the impacts of ethnic enclaves on the earnings growth of female immigrants. This paper addresses this issue by giving equal focus to both males and females. From the results obtained from this paper, it is hoped to give evidence to whether enclaves act as a refuge where immigrants can prosper in their new country, or whether ethnic enclaves impede immigrants' progress confining them to the economic opportunities present within the enclave.

2. Enclave and Neighbourhood Literature

With the increasing ethnic and cultural diversity in large Canadian and American cities, residential patterns have become an area of interest in determining the outcomes of immigrants and ethnic groups. Using the 1990 U.S. Census and employing home language as a proxy for social networks, Bertrand, Luttmer and Mullainathan (2000) uncovered evidence that these social networks influenced welfare participation. Also using the 1990 U.S. Census, Chiswick and Miller (2002a, 2002b) examined the effect of linguistic concentration on earnings. Their results indicate that concentration of the home language has a negative impact on earnings. Further, Chiswick and Miller (2002b) found that concentration of minority languages resulted in a lower proficiency in English. Lazear (1999), using the 1900 and 1990 U.S. Censuses discovered a negative relationship between the proportion of the local population that speaks the same minority language and the probability that English is learnt. Using the 1991 Canadian Census, Chiswick and Miller (2001) also detected a negative effect of concentration of people of the same mother tongue on language proficiency in Canada.

The effect of enclaves is not confined to outcomes of immigrants. In addition to finding that segregation had a negative impact on employment and earnings of black Americans, Cutler and Glaeser (1997) found that enclaves lowered high-school graduation rates and increased the incidence of single motherhood for this group. Conversely, they found that segregation had a

small positive effect on the outcomes of white Americans. Clark and Drinkwater (2002) examined immigrant and native-born ethnic minorities in England and Wales and found that living in enclaves has a negative impact on labour market outcomes. They also found that the ethnic entrepreneurship opportunities that are often linked with enclaves do not exist in England and Wales with ethnic concentration actually having a negative impact on the incidence of self-employment. In the United States (see Borjas, 1986) and in Australia (see Le, 2000), a positive impact of enclaves was found on the incidence of self-employment of immigrants, while in Canada (see Razin and Langlois, 1996) no impact was found.

Not all studies found neighbourhood effects on the labour market outcomes of its inhabitants. Oreopoulos (2003) found that after controlling for socioeconomic characteristics, neighbourhoods had an insignificant effect on earnings, years of welfare participation, income and educational attainment of children from Toronto's subsidized housing area.

3. Specification of Enclaves

The immigrant ethnic enclaves are classified in terms of country of birth. A standard approach of using the concentration of an ethnic group to measure residential segregation is employed. The *exposure index* gives the fraction of the population between the ages of 18 and 64 in each Census Metropolitan Area (CMA) by country of birth.[7] [8] Both males and females in this age group, regardless of labour market status, were included in the calculation of the indices due to the human capital externalities they potentially provide.

[7] Census Metropolitan Areas refer to cities in Canada with populations of at least 100,000 in the urban core. For the remainder of the paper, Census Metropolitan Areas will be referred to as CMAs.

[8] Several papers have used exposure to measure enclaves. Borjas (2000a) used exposure to one's own group in metropolitan areas as the measure of segregation while Lazear (1999) looked at exposure at the county level and Chiswick and Miller (2002a, 2002b) used exposure at the state level. Examining linguistic enclaves in Canada, for individuals living in CMAs, Chiswick and Miller (2001) used exposure to the group residing in the CMA. For those not living in a CMA, exposure to the group residing in the balance of the province was used. Enclaves have also been measured using threshold levels of ethnic concentration. For example, Hou and Picot (2003) define enclaves as Census Tracts with at least 30 percent of the population from a single visible minority group.

This paper will measure ethnic concentration at the CMA level. While a CMA may be viewed as too large an area to be considered a neighbourhood, smaller geographical units may cause more severe problems. A smaller geographical specification, such as a Census Tract, may give a more accurate portrayal of a neighbourhood, however, controlling for the interaction between a given group across two neighbourhoods would be difficult. With the low cost of transportation available within CMAs, it is difficult to infer that people from the same ethnic group living in neighbourhoods close by are more likely to interact than if they resided in neighbourhoods that are a further distance apart (up to a certain distance). This problem of controlling for cross-neighbourhood interaction does not exist when CMAs are used as the geographical unit. The distances between CMAs are great, making frequent interaction between the same group in different CMAs unlikely. It is the frequency of the interaction between people of the same origin group that is important, not the spatial proximity in which the interaction occurs. Smaller geographical units, such as Census Tracts, may be more relevant for the study of groups that are less mobile and are confined to interact within a smaller area. For example, children are limited by transportation so their interaction is limited to the immediate area and school. While the study of neighbourhood effects for children may be appropriate at the Census Tract level, the study of more mobile individuals is more suitable at the CMA level.

While the exposure index is the most commonly used measure of ethnic concentration, a second index will also be used to examine if the interpretation of the impact of enclaves on earnings growth is sensitive to the measure of ethnic concentration. The second index is the *relative cluster index*, which deflates the exposure index by dividing it by the percentage of the total population studied that each country of birth group makes up. This adjusts the exposure index by the proportion of the group *i* in the population studied. If the clustering index is equal to one, then the proportion of people from origin group *i* living in metropolitan area *j* would equal to what would be predicted if the group was randomly assigned to the studied CMAs based on a CMA's population. If the relative index is greater than one, then the group is overrepresented in

the CMA, while if the relative index is less then one, the group is underrepresented. Although the exposure index is more widely used since it is intuitively more appealing than the relative index, Bertrand, Luttermer and Mullianathan (2000) chose the relative cluster index as their measure of contact availability. They employ the relative index instead of the exposure index since they argue that if people do not disperse randomly within the CMA, the exposure index underweights the available contacts for smaller ethnic groups.

4. Model Specification

The 1981, 1986, 1991, 1996 and 2001 one-in-five Canadian Census microdata master files are employed to estimate the economic outcomes of both female and male immigrants separately.[9] [10] The methodology employed is similar to that of Borjas (2000a). A synthetic cohort approach is used where the earnings growth is calculated for the sample of foreign-born workers who come from country *i*, live in metropolitan area *j*, and arrived in Canada in calendar year *k* and is estimated by:

$$\Delta \ln W_{ijk} = \alpha \ln W_{ijk}(t_0) + \beta X_{ijk} + \delta \mathrm{S}_{\mathrm{ij}} + \eta_{\mathrm{i}} + \tau_{\mathrm{j}} + \gamma_{\mathrm{k}} + \theta_l + \mu_{ijk} \tag{1}$$

The dependent variable for the regression is the growth rate of the mean weekly earnings for the cell (*i*, *j*, *k*). Weekly earnings for each worker is calculated by dividing the total wage and salary of each worker by the number of weeks worked in the reference year. Weekly earnings is used over the hourly wage since only hours worked in the reference week are available which may give an inaccurate measure when trying to calculate hourly earnings. The effect of residential segregation on earnings growth is represented by S_{ij} and is measured by either the exposure index or relative index. The sample is restricted to immigrants 25 to 64 years old with positive earnings. This age restriction is used to remove those who are making the decision of

[9] Access to these files is restricted to Statistics Canada's premises in Ottawa to employees or deemed employees.
[10] Weekly earnings were converted into 2000 dollars using the Canadian Consumer Price Index.

whether to pursue post-secondary education or join the labour market.[11] The results are pooled across the base years with separate regressions run over the five-, ten-, fifteen- and twenty-year growth rates over the period from 1980 to 2000.[12] [13] For the five-year growth model, the average log weekly earnings of workers aged 25-59 in cell (*i*, *j*, *k*) is calculated for the base year in the respective Canadian Censuses, while the average log weekly earnings is then calculated for the same cells aged 30-64 in the Census that was taken five years later. The end age for the base earnings calculation is moved back by five, ten and fifteen years and the starting age for the end year earnings calculation is pushed up by five, ten and fifteen years for the ten-, fifteen- and twenty-year growth models respectively. For example, for the ten-year growth model, the average weekly earnings for the workers aged 25-54 is calculated for each cell in the base year then again for the workers aged 35-64 in the end year.

The initial log weekly earnings is included to control for convergence in earnings (see Duleep and Regrets, 1997 and Borjas, 2000a,b). To control for the demographic composition of the cells, education and age distribution variables were included in the regression. These demographic variables control for some of the possible self-selection of immigrants into ethnic neighbourhoods. If immigrants do not settle randomly with respect to ability, the effect of enclaves on earnings growth may be biased. If older and less-educated immigrants have a higher propensity to reside in enclaves and if a negative effect of enclaves is found, a negative economic impact may not be caused by enclaves, but may be attributable to the productivity of the immigrant. The education and age distribution variables control for the observable portion of the self-selection. For the educational attainment, the proportion of workers in the cell with high school or less (omitted category), trade-vocational school or college diploma and university

[11] The results are insensitive to the inclusion of people aged 18-24.
[12] All of the variables except the fixed effects should also have base year subscripts, however these subscripts are suppressed for simplicity.
[13] The regression results are weighted using the cell size adjusted to take into consideration the Census weights. The results were re-estimated using the simple cell size as the weight and were found to very similar both in terms of magnitude and level of statistical significance.

diploma was calculated.[14] The proportion of workers in the 25-34 and 35-44 age groups was also calculated.

Nevertheless, even after controlling for observable mean characteristics it is still possible that there remains uncontrolled self-selection based on non-observable qualities of immigrants. It is conceivable that immigrants with the same level of education and same age may still have different aptitudes for success in the Canadian labour market. For example, more risk-averse immigrants may be drawn to enclaves, while more industrious and risk-inclined immigrants may settle outside of enclaves, where they will have a harder initial settlement, but where greater opportunities for labour market success may lie, which would increase the negative effect of residential segregation.[15] Unfortunately, it is not possible to control for the self-selection of immigrants with the Canadian Census.[16] Also, while neighbourhood peer effects are commonly used to try to explain outcomes of its residents, Manski (1993) criticizes this approach since he argues that findings of peer effects on outcomes may not be due to a causal relationship and therefore the impact of a common unobservable will lead to the impact of enclaves being overestimated.

An important feature of the model is the fixed effects that are employed to net out: cohort (y_k), regional labour market (r_j) and national origin (n_i) fixed effects. These fixed effects serve to isolate the impact of residential segregation on weekly earnings growth, controlling for differences in arrival cohorts, CMAs and countries of birth. The cohort groups used for the regression are denoted by the subscript k. The arrival cohort groups are those who immigrated between 1995 to 1999, 1990 to 1994, 1985 to 1989, 1980 to 1984, 1975 and 1979, 1970 to 1974, 1965 to 1969, 1960 to 1964, 1950 to 1959 and those who immigrated before 1950. Immigrants

[14] Information on the total years of schooling is not available in the 1981 Canadian Census.
[15] Conversely, Borjas (2000a) argues that immigrants tend to be attracted to metropolitan areas with faster-growing wages, which would push down the negative effect of residential segregation.
[16] Looking at refugees in Sweden, Edin, Fredriksson and Aslund (2003) are able to control for sorting since the Immigration Board assigned the initial place of residence for most refugees. However, in most countries and in most studies, place of residence is chosen by the immigrant.

who immigrated in the base year are omitted from each regression analysis since the income reported in the Census is the income earned in the year of arrival. The base-year dummies θ_l are included to capture different overall macro conditions.[17]

While natives have traditionally been used as a comparison or control group when studying the outcomes of immigrants, the same is not true for models dealing with ethnic enclaves. Models examining ethnic enclaves do not use natives since the comparison of interest is the outcomes of immigrants from high- and low-ethnic concentrated locations. In immigrant earnings assimilation literature, natives have been used to capture changes in labour market conditions. However, the CMA fixed effects make the use of natives unnecessary since these fixed effects control for any differences in the regional labour markets.[18]

The largest 40 immigrant groups in the population studied were used where immigrants are classified as having immigrated to Canada and having been born outside of Canada. [19] [20] Immigrants from countries having both language and culture similar to that of the majority of the Canadian population were removed from the sample. The omitted countries include; the United Kingdom, the United States, Ireland, New Zealand and Australia. As well, immigrants from France living in French or bilingual cities were not included.[21] It is not possible to create an accurate measure of ethnic concentration given that these groups are very similar to the native population in language and culture and therefore it is not clear if the measure of exposure for these immigrants should include just the people from the given country of origin or also natives.

[17] All of the results were rerun with the base-year dummies interacted with the control variables to allow for changes in the coefficients over time. The interpretation of the results for the exposure index was found to be unaffected.
[18] It is possible to subtract the native earnings growth for each city from the earnings growth of immigrants from the same city, however, the CMA fixed effects would fully absorb the native CMA earnings growth.
[19] The calculation of the most numerous groups was done separately for males and females and is based on the weighted number of immigrants age 25-59 in 1981. The 60-64 age group is excluded for this calculation since this age range is never utilized in any of the base year calculations.
[20] All of the results were rerun using the top 90 immigrant groups and found to be very similar to what was found using the top 40 countries with little change in magnitude and level of statistical significance of results and no change in the overall interpretation.
[21] French CMAs include all the Quebec CMAs while the bilingual CMAs include Ottawa and Saint John.

The impact of enclaves on learning the native language is also examined. Earlier in the paper it was suggested that a negative impact of living in an enclave may occur due to the reduction in the need to learn the native language and the Canadian social culture. While it is difficult to measure acquisition of social culture, it is possible to measure attainment of language skills. In the Canadian Census, there is a question pertaining to the respondent's assessment of his/her ability to conduct a conversation in the official languages. Therefore, the effect of enclaves on the likelihood that an immigrant has knowledge of the local official language is examined and is estimated by:

$$prob(Knowledge = 1) = \beta X \ + \delta \mathrm{S}_{\mathrm{ij}} + \eta_{\mathrm{i}} \ + \ \tau_{\mathrm{j}} \ + \ \gamma_{\mathrm{k}} \ + \theta_{l} + \mu \qquad (2)$$

Knowledge is equal to one if the individual has knowledge of the local language and zero otherwise.[22] The local language is English for English CMAs and French for French CMAs, and English or French for bilingual CMAs. The four Census base years are pooled and probit regressions are run on individuals whose mother tongue is neither French nor English.[23] As well, people who come from countries where English and/or French is an official language are also removed to eliminate people who may have been heavily exposed to one of these languages prior to their arrival in Canada.[24] Given that immigrants who immigrated at a younger age would have also been heavily exposed to the local language, the age is restricted to those who were 30 or older when they immigrated.[25] The vector X includes controls for age, age squared and highest degree obtained dummies. Again fixed effects are used to net out regional labour market (r_j), cohort (y_k) and national origin (n_i) fixed effects and base-year dummies are also includes.

[22] The individual subscripts are suppressed for simplicity.
[23] The initial list of countries for the probit regressions is restricted to the top 90 immigrant countries based on the weighted number of immigrants age 25-59 in 1981.
[24] Even with these restrictions, there still remained a few countries where knowledge of the native language was perfectly predicted. Immigrants from these countries are also dropped.
[25] This is especially true for immigrants who immigrated as children since they would have been taught in English and/or French at school.

5. Empirical results for earnings growth

5.1 Growth of mean earnings

The results for equation (1) examining the impact of ethnic enclaves on earnings growth are shown in Table 1.[26] The results are first run without controlling for the base-year earnings and are presented in the top half of Table 1. While the exposure index is negative and statistically significant for only the fifteen-year growth model for males, for all except the fifteen-year growth model for females, the exposure index is both negative and statistically significant. The inclusion of the base-year earnings is used to capture earnings convergence. The results with the base-year earnings included are presented in bottom half of Table 1. Consistent with findings by Duleep and Regets (1997) and Borjas (2000a,b), the coefficient on the base-year earnings is negative and highly statistically significant, indicating that immigrants with higher initial earnings have lower earnings growth.[27] Once the base-year earnings is included, the coefficient on the exposure index becomes much more negative for males and is now statistically significant at least at the 10 percent level for three of the four growth models.[28] The inclusion of the base-year earnings does not have much effect on the coefficient for the exposure index for females, except for the ten-year growth model where the exposure index becomes statistically significant at the 1 percent level now.[29] [30] It should be noted that if there is measurement error in earnings, the coefficient on the base year earnings will be biased downwards.

[26] Means and standard deviations of the exposure index, relative index and wage growth for Table 1 are given in the appendix in Table A1.
[27] All subsequent results include the initial earnings but the coefficient is not shown since the estimate of convergence is very consistent and also, the coefficient on the exposure index is the parameter of interest.
[28] Pendakur and Pendakur (2002b) find that small enclaves have a negative impact on the earnings of its members but as the size of the enclave increases this negative effect tends to zero or becomes positive for males and becomes positive for females. With a quadratic included in equation (1), it was found that at low levels of concentration, an increase in the level of concentration has an additional negative impact on earnings growth but at a decreasing rate.
[29] After excluding individuals who lived outside their current CMA five years prior to the later time period of the growth model, the results were found to be very similar to those in Table 1.
[30] The results are robust to dropping immigrants in Montreal and Toronto.

The results in Table 1 were rerun with weekly earnings replaced by the hourly wage and by annual earnings to examine the sensitivity of the results to the specification of earnings.[31] For most of growth periods, the results are fairly similar for the three different measures of earnings. The only notable differences are that the ten-year growth model is no longer statistically significant when either the hourly wage or yearly earnings are used as the dependent variable for males while the twenty-year growth model for males becomes very negative (-1.133) and statistically significant when the hourly wage is used. The results were also rerun interacting the base-year dummies with the exposure index. Looking at the five-year growth model, the results became much more negative for the later base years.

While the exposure index is the most commonly used measure of ethnic concentration, a second index is examined in Table 1 to investigate whether the interpretation of the impact of enclaves is sensitive to the measure of ethnic concentration. As previously discussed, the exposure index may underrepresent the available contacts in a CMA for the smaller groups. This second measure, the relative index also shows a negative impact of enclaves on earnings growth indicating that residing in a city where your group is overrepresented has a negative impact on earnings growth. Also, the relative index is less sensitive than the exposure index to the inclusion of the base-year earnings. The relative index is almost always statistically significant with or without the inclusion of the base-year earnings. For males, the inclusion of the base-year earnings makes the coefficient on the relative index more negative, while for females it usually becomes slightly less negative.[32]

The negative effect of enclaves on earnings growth concurs with findings for the United States (see Borjas, 2000). In addition, the magnitude of the negative effect of exposure to one's

[31] These results are not presented here but are available from the author.

[32] The results displayed in Table 1 were rerun for full-year workers (worked 40 or more weeks in the reference year), full-time workers (30 or more hours worked in the reference week) and full-year full-time workers (40 or more weeks worked and 30 or more hours worked in the reference week). The results are very similar to those reported here with no effect on the conclusions. As well, the results were rerun excluding those with positive self-employment earnings composing a high proportion of their total

Table 1: Growth of Mean Weekly Earnings

	Males				Females			
	5 year	10 year	15 year	20 year	5 year	10 year	15 year	20 year
Without initial earnings								
(1)								
Exposure Index	-0.240	0.022	-0.870**	0.014	-0.805***	-0.758**	-0.729	-1.673*
	[0.294]	[0.437]	[0.378]	[0.648]	[0.273]	[0.371]	[0.537]	[0.856]
R^2	0.16	0.14	0.21	0.21	0.09	0.09	0.17	0.20
(2)								
Relative Index	-0.005**	-0.005	-0.012***	-0.003	-0.005*	-0.010***	-0.011**	-0.026***
	[0.002]	[0.003]	[0.004]	[0.006]	[0.003]	[0.004]	[0.005]	[0.008]
R^2	0.16	0.14	0.21	0.21	0.09	0.09	0.17	0.20
With initial Earnings								
(3)								
Initial log earnings	-0.758***	-0.833***	-0.815***	-0.819***	-0.812***	-0.891***	-0.890***	-0.896***
	[0.013]	[0.015]	[0.024]	[0.042]	[0.012]	[0.015]	[0.022]	[0.034]
Exposure Index	-0.731***	-0.511*	-1.063***	-0.300	-0.849***	-0.942***	-0.754	-1.374*
	[0.229]	[0.305]	[0.376]	[0.665]	[0.238]	[0.321]	[0.510]	[0.811]
R^2	0.42	0.39	0.38	0.36	0.40	0.41	0.42	0.42
(4)								
Initial log earnings	-0.761***	-0.834***	-0.817***	-0.821***	-0.812***	-0.890***	-0.889***	-0.894***
	[0.012]	[0.015]	[0.024]	[0.042]	[0.012]	[0.015]	[0.022]	[0.034]
Relative Index	-0.014***	-0.010***	-0.016***	-0.008	-0.006***	-0.006**	-0.009**	-0.021***
	[0.002]	[0.003]	[0.004]	[0.006]	[0.002]	[0.003]	[0.004]	[0.007]
R^2	0.42	0.39	0.38	0.36	0.40	0.41	0.42	0.42
Cells	12390	8325	4873	2065	11107	7466	4280	1817
Obs.	400769	259170	145555	59677	306440	195738	107140	42599

Significance levels are indicated by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent. Standard errors calculated using White's (1980) heteroskedasticity-consistent covariance matrix estimator are in brackets. The dependent variable is the difference in log weekly earnings. Regressions also included country of birth, CMA, cohort fixed effects and controls for the proportion in educational and age groups. Base-year dummies are also included. The sample is restricted to workers with positive earnings, age 25 to 64 living in a CMA. The number of cells and number observations used to create these cells are presented in the last two rows.

own group is usually larger than what was found in the United States. With a ten-year growth model spanning 1980 to 1990, hourly wage as the measure of earnings and fixed effects controlling for arrival cohorts, metropolitan areas and countries of birth, Borjas obtained a coefficient of -.369 for the exposure index. Using the exposure indices from row (3) of Table 1, the Canadian results indicate that a one percentage point increase in exposure to one's own group causes a decrease in the earnings growth of between 0.5 and 1 percentage points for males and

earnings (self-employment + wages and salaries) with very little effect on the results and again no effect on

0.8 and 1.4 percentage points for females.[33] The results found in the U.S. by Borjas (2000), indicate a decrease in the wage growth of around 0.4 percentage points for a one percentage point increase in exposure to one's own group.

For further interpretation of the Canadian results, let us consider an example from the data. In Table A2 in the appendix, examples of the exposure and relative indices are presented. Consider an immigrant from Hong Kong who decides to live in Montreal rather than Vancouver. The proportion of the working age population that immigrants from Hong Kong compose is 0.27 percent for Montreal versus 5.51 percent for Vancouver. By living in Montreal instead of Vancouver, the immigrant's weekly earnings growth over a five-year period will be around 4 percentage points higher (using the coefficient on the exposure index equal to -0.731 from row (3) column 1 in Table 1, so $(5.51 - 0.27)\times 0.731 = 3.83$). The same analysis can be conducted for the relative index. Again consider an immigrant from Hong Kong. The relative index for immigrants from Hong Kong in Montreal and Vancouver is 0.17 and 3.34 respectively. While immigrants from Hong Kong make up around one-fifth of the working age population of Montreal that would be expected if immigrants were randomly assigned based on a CMA's population, they make up around three times more of the population in Vancouver than we would expect. By living in Montreal instead of Vancouver, the immigrant's weekly earnings growth over a five-year period will be around 4.4 percentage points higher (using the coefficient on the relative index equal to -0.014 from row (4) column 1 in Table 1).

Overall, both the exposure and relative indices indicate a similar negative impact of ethnic concentration on earnings growth for both males and females. [34] For the remainder of the paper only the results for the exposure index will be presented.

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the conclusions.

[33] The results are slightly more negative for males and slightly less negative for females when the top 90 immigrants groups are used instead of the top 40 immigrant groups.

[34] Similar results negative impacts of enclaves were found when either ethnicity or mother tongue was used as the measure of ethnic enclaves instead of country of birth. See Warman (2005).

5.2 Age of immigration

Age of immigration has been found to be an important determinant of immigrant outcomes. Schaafsma and Sweetman (2001) found that immigrating at a later age had a negative impact on earnings of immigrants in Canada. The effect of age of immigration has been ignored when examining the impact of ethnic enclaves. However, it is likely that the impact of enclaves will also depend on the age of immigration. To examine the effect of age of immigration on weekly earnings growth, the (i, j, k) cells are further broken down to separate those that immigrated as adults (19 or older) and those that immigrated prior to the age of 19.[35]

Looking at the results in Table 2, enclaves consistently have a more negative effect for immigrants who came to Canada as adults for each of the growth periods. The only difference that is not statistically different at least at the 10 percent level is for ten- and fifteen-year growth model for males. The dissimilarity is greatest for females, where living in an enclave has a particularly large negative impact for females that immigrated as adults. Enclaves seem to have little impact on immigrants who immigrated at a young age. The exposure index for immigrants who immigrated prior to the age of 19 is less negative and is only statistically significant for the fifteen-year growth model for males. For immigrants who immigrated as children, they would have had schooling conducted in Canada and therefore would have been exposed to the dominant native language and culture. For immigrants who immigrated as adults, it is likely that they will not have been as exposed to the host country's language and culture at a young age and being exposed to people of the same background is more likely to inhibit the accumulation of skills required to succeed in the larger labour market.

[35] Cohorts for a given base year were only included if it was possible that the cohort could include both respondents that immigrated both prior to the age of 19 and as adults. For example, the 1990-94 cohort is not included since it is not possible for immigrants from this cohort who immigrated prior to the age of 19 to be included in the working age restriction.

Table 2: Impact of Ethnic Enclaves on Earnings Growth by Age of Immigration

	Males				Females			
	5 year	10 year	15 year	20 year	5 year	10 year	15 year	20 year
Exposure Index	-0.067	-0.440	-0.936**	0.324	-0.318	-0.166	0.194	-1.001
	[0.244]	[0.355]	[0.420]	[0.738]	[0.300]	[0.383]	[0.542]	[0.961]
Expo×imm as an adult	-0.923***	-0.214	-0.558	-1.009*	-1.050***	-1.620***	-1.555***	-1.992**
	[0.238]	[0.319]	[0.352]	[0.570]	[0.293]	[0.359]	[0.490]	[0.843]
R^2	0.39	0.37	0.38	0.34	0.39	0.38	0.40	0.38
Cells	15236	9766	5281	2090	13422	8645	4632	1776
Obs.	342318	222065	122485	48360	257270	165804	89843	34258

Significance levels are indicated by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent. Standard errors calculated using White's (1980) heteroskedasticity-consistent covariance matrix estimator are in brackets. The dependent variable is the difference in log weekly earnings. Regressions also included country of birth, CMA, cohort fixed effects, the base-year earnings and controls for the proportion in educational and age groups. Base-year dummies are also included. The sample is restricted to workers with positive earnings, age 25 to 64. Immigrants who arrived as adults are defined as those that immigrated at the age of 19 or older.

However, a concern with breaking down the cells to examine the impact of enclaves by age of immigration is that the average number of observations within each cell shrinks. Given this concern, the results were rerun with cells composed of immigrants from country birth *i*, living in a given CMA *j*, either arriving as an adult or arriving prior to the age of 19.[36] By removing the cohort component of the cell, the average number of observations per cell increased greatly. For example, for the five-year growth model, the average number of observations per cell increases to 73 for males and 60 for females. These results are very similar in terms of both magnitude and level of statistical significance to the results presented in Table 2, giving confidence in the results.

5.3 Impact of enclaves for different skill levels

It is also likely that the impact of enclaves will be different for low- and high-skilled immigrants. Research has found conflicting effects of enclaves on low-skilled workers. Edin, Fredriksson and Aslund (2003) found that enclaves in Sweden acted as networks that benefited low-skilled workers by increasing their earnings. Conversely, finding a large negative effect of enclaves on wage growth for the low-educated immigrants in the United States, Borjas (2000a) concludes that since low-skilled workers have more difficulty locating opportunities outside their

enclave, they are confined to the limited opportunities available within the community.[37] For high-skilled immigrants, both Edin, Fredriksson and Aslund (2003) and Borjas (2000a) found no impact of residing in an enclave.

Table 3: Impact of Enclaves on Earnings Growth by Skill Level

	Males				Females			
	5 years	10 years	15 years	20 years	5 years	10 years	15 years	20 years
Full Sample								
Exposure Index	-0.564***	-0.533*	-1.424***	-0.622	-0.860***	-1.061***	-1.128**	-1.753**
	[0.214]	[0.315]	[0.428]	[0.730]	[0.234]	[0.342]	[0.538]	[0.831]
Exposure × High skill	-3.001***	-2.855***	-1.706*	-0.630	-0.519	-0.192	0.041	1.365
	[0.824]	[1.104]	[0.961]	[2.046]	[0.991]	[1.142]	[1.326]	[1.334]
R^2	0.38	0.32	0.32	0.30	0.36	0.37	0.39	0.36
Cells	17058	11196	6315	2657	14658	9686	5392	2264
Obs.	395783	254019	141710	57903	302480	191784	104621	41541
Immig. at age 25 or older								
Exposure Index	-1.000***	-0.235	-0.720	-0.670	-0.911**	-1.107	-2.720**	-1.586
	[0.358]	[0.506]	[0.977]	[2.068]	[0.448]	[0.733]	[1.218]	[2.377]
Exposure × High skill	-6.317***	-8.214***	-8.562***	-7.378**	-4.721***	-2.402	-2.003	-0.703
	[0.934]	[1.414]	[2.228]	[3.486]	[1.545]	[2.290]	[2.952]	[6.028]
R^2	0.34	0.30	0.27	0.25	0.35	0.33	0.32	0.27
Cells	10853	6680	3416	1341	8762	5453	2765	1047
Obs.	166266	96490	48328	18722	121389	69580	33914	12495

Significance levels are indicated by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent. Standard errors calculated using White's (1980) heteroskedasticity-consistent covariance matrix estimator are in brackets. The dependent variable is the difference in log weekly earnings. Regressions also included country of birth, CMA, cohort fixed effects, the base-year earnings and controls for the proportion in educational and age groups. Base-year dummies are also included. The sample is restricted to workers with positive earnings, age 25 to 64. High-skilled workers are defined as those with a university degree.

To investigate the effect of enclaves on immigrants of different skill levels, immigrants are separated by highest degree obtained where immigrants are considered high skilled if they have a university degree (see Table 3). In contrast to the results found in the United States, the Canadian results indicate that for males, enclaves are most harmful for the highly skilled. Given that enclaves may also affect the attainment of education, the results were rerun for immigrants who immigrated at age 25 or older to remove those that would have attained their education in

[36] The proportion of workers from each cohort was also controlled for.
[37] Edin, Fredriksson and Aslund categorize immigrants with 10 years of schooling or less as low skilled and immigrants with 11 years of schooling or more as high skilled. Borjas classified those with 11 years of schooling or less as low skilled and those with 12 years of school or more as high skilled.

Canada. The results show that enclaves are particularly harmful for highly skilled immigrants who immigrated as adults. For most of the results for females, there are no statistically significant differences between the low- and high-skilled groups for the complete sample and only the five-year growth model indicates a statistically significant difference for immigrants who immigrated at age 25 or older.

Again, given the shrinking average number of observations per cell when equation (1) is broken down to examine the impact of enclaves on immigrants of different groups, the results from Table 3 were rerun removing the cohort component of the cells.[38] While the statistically significant difference between the impact of enclaves on low- and high-skilled males disappears for the full sample (only the five-year growth model is statistically different), for immigrants who have the majority of their education attained outside of Canada, the results are identical in terms of levels of statistical significant and almost unchanged in terms of magnitudes from those presented in Table 3.

6. Impact of enclaves on learning the local native language

The impact of living in enclaves was found to be negative and statistical significant in most cases. One reason cited for the negative impact of enclaves has been that exposure to one's own group reduces the accumulation of skills specific to the host country's labour market. One component of human capital that has been found to have a very large impact on earnings and other labour market outcomes is language ability.[39] To examine this, the impact of enclaves on learning the local labour market official language is examined. Studies in Canada (see Chiswick and Miller, 2001) and in the United States (see Lazear, 1999; Chiswick and Miller, 2002a,

[38] Again variables controlling for the proportion of a cell that each cohort comprises are included. For the full sample in Table 4, the average number of observations in a cell for the five-year growth model for males is 87 and for females is 75. For the sample with immigrants who immigrated at age 25 or older, the average number of observations per cell is 48 for males and 41 for females.

[39] For instance, using the 1990 U.S. Census, Chiswick and Miller (2002a) find that immigrants from non-English speaking countries who are fluent in English experience a 14 percent earnings advantage over immigrants who are not fluent in English. There have been several other studies on the link between

2002b) have found a negative impact of linguistic concentration on language proficiency. The marginal effects displayed in the first two columns of Table 4, also indicate that enclaves have a negative impact of learning the local native language (see Table A3 in the Appendix for summary statistics for the variables in Table 4). For both males and females, the estimates are negative and highly statistically significant. The marginal effects indicate that a one percentage point increase in exposure to one's own group decreases the probability of knowing the local native language by 1.2 percent for males and 1.9 percent for females (see columns 1 and 2 of Table 4 respectively).

Table 4: Impact of Enclaves on Knowledge of the Local Native Language

	All countries [i]		Low knowledge countries [ii]	
	Male	Female	Male	Female
Exposure Index	-1.175***	-1.872***	-2.773***	-4.250***
	[0.097]	[0.168]	[0.234]	[0.376]
Observations	73888	48823	35543	21499

[i] "All countries" include immigrants aged 30 to 64 whose mother tongue is neither English nor French and who come from one of the top 90 immigrant sending countries, and neither English nor French is an official language in the sending country and for which not all of the immigrants from these countries has knowledge of the local native language.
[ii] "Low knowledge countries" include the bottom 15 lowest knowledge countries out of the "All countries".
Notes: Significance levels are indicated by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent. Standard errors calculated using White's (1980) heteroskedasticity-consistent covariance matrix estimator are in brackets. The dependent variable is knowledge of the local language, where the local language is defined as English for the English-speaking CMAs, French for the French-speaking CMAs and English or French for the bilingual CMAs. The marginal effects from a probit regression are reported. Regressions also included country of birth, CMA, cohort fixed effects, controls for the proportion in educational and age groups and the base-year earnings. Base-year dummies are also included.

For many of the countries included in the estimations in the first two columns of Table 4, although not every member has knowledge of the local native language, almost all of the members do. Given this, the effect of enclaves is re-examined looking at low-knowledge countries.[40] When the low-knowledge countries are examined (third and fourth column of Table 4), the impact of living in an enclave is much more negative. The marginal effect for males is –2.8 percent (column 3) and for females is –4.25 percent (column 4) and both are highly statistically significant, indicating a large decrease in the probability of learning the local

knowledge and fluency of the local language and earnings including for example; Veltman (1983), Grenier (1984), Chiswick and Miller (1992), Chiswick (1998) and Shields and Wheatley Price (2002).

language for immigrants living in higher ethnically concentrated areas. Ethnic enclaves have a detrimental impact on learning the native language, especially for immigrants from low-knowledge groups.

7. Conclusion

This article examines the impact of ethnic enclaves on the labour market outcomes of immigrants. Evidence of a negative impact of enclaves on weekly earnings growth of immigrants was found. Further, the overall negative impact of enclaves in Canada was generally found to be larger than what Borjas (2000a) found in the United States.

The impact of enclaves depends on age of immigration, with higher exposure to one's own group being particularly harmful for immigrants who were adults when they immigrated. This was especially true for females. While there appears to be no negative impact of enclaves for females who immigrated as children or teenagers, a one percentage point increase in exposure to one's own group decreased earnings growth by between 1.4 and 3 percentage points for females who immigrated as adults. In terms of the impact of enclaves on immigrants with different skill levels, enclaves were found to be more detrimental to earnings growth for high-skilled male immigrants versus low-skilled male immigrants, especially for immigrants who have obtained the majority of their education outside of Canada. For females, not much evidence was found to suggest that there is a difference in the impact of enclaves on low- and high-skilled immigrants. The impact of enclaves on the accumulation of language skills was also examined. The findings indicate that enclaves cause a statistically significant decrease in the knowledge of the local native language. This was especially true for immigrants from countries with low knowledge of the local native language.

[40] The 15 countries with the lowest knowledge of the local native language are used as low-knowledge countries. Several other thresholds for the lowest knowledge countries were examined with little difference found between the results.

Although living in an ethnic enclave was found to impede an immigrant's economic progress, it is likely that the same immigrant gains utility from residing in an enclave through other non-labour market opportunities. Given that this study found that enclaves impede earnings growth and most other studies have found a negative impact of enclaves on labour market outcomes of immigrants, future research should focus on measuring the impact of enclaves on other aspects of utility. By examining how enclaves compensate for the lower economic opportunities with other benefits, a more complete story of the impact of living in an enclave can be presented.

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Appendix

Table A1: Means and Standard Deviations for Table 1

	Males		Females	
	Mean	Standard deviation	Mean	Standard deviation
5 years				
Wage growth	.047	.224	.069	.251
Exposure index (×100)	1.809	1.712	1.736	1.610
Relative index	1.774	1.144	1.840	1.174
10 years				
Wage growth	.049	.231	.116	.262
Exposure index (×100)	1.823	1.805	1.731	1.690
Relative index	1.772	1.149	1.845	1.183
15 years				
Wage growth	.052	.263	.159	.287
Exposure index (×100)	1.881	1.965	1.774	1.841
Relative index	1.780	1.155	1.856	1.175
20 years				
Wage growth	.059	.277	.173	.299
Exposure index (×100)	1.970	2.162	1.837	2.015
Relative index	1.792	1.179	1.869	1.176

Table A2: Exposure and Relative Indices for Selected Country of Birth Groups and CMAs

CMA	Exposure index (×100) = Nij/Nj (×100)					
	National origin group					
	India	Italy	Hong Kong	Portugal	Germany	Jamaica
Montreal	.508	2.395	.274	.767	.273	.216
Ottawa	.747	.859	.446	.522	.624	.438
Toronto	3.013	3.951	3.217	2.463	.871	2.616
Kitchener	.955	.450	.232	3.144	1.730	.494
Winnipeg	.934	.681	.358	1.121	1.119	.321
Calgary	1.302	.596	1.637	.168	1.068	.345
Vancouver	3.755	.818	5.509	.396	1.066	.159

CMA	Relative clustering index = [Nij / Nj] ÷ [Ni / N]					
	National origin group					
	India	Italy	Hong Kong	Portugal	Germany	Jamaica
Montreal	.330	1.227	.166	.722	.363	.263
Ottawa	.485	.440	.270	.491	.829	.535
Toronto	1.956	2.024	1.950	2.319	1.159	3.191
Kitchener	.620	.230	.141	2.961	2.300	.603
Winnipeg	.606	.349	.217	1.056	1.489	.392
Calgary	.845	.305	.992	.158	1.420	.420
Vancouver	2.438	.419	3.340	.373	1.418	.194

Notes: The exposure index gives the fraction of the population between the ages of 18 and 64 in each metropolitan area by country of birth (Nij/Nj). It is calculated by dividing the population of immigrant *i* living in CMA *j* (Nij) by the population of CMA *j* (Nj).
The relative index divides the exposure index by the total population that the immigrant group *i* comprise (Ni) divided by the total population of the areas studied (N). The example exposure and relative indices are from when 1995 is the base year.

Table A3: Means and Standard Deviations for Table 4

	Males		Females	
	Mean	Standard deviation	Mean	Standard deviation
All countries [i]				
Knowledge of official Language	.862	.345	.794	.405
Exposure index (×100)	1.627	1.740	1.535	1.645
Low knowledge countries [ii]				
Knowledge of official Language	.764	.425	.633	.482
Exposure index (×100)	2.258	1.955	2.121	1.853

[i] "All countries" include immigrants aged 30 to 64 whose mother tongue is neither English nor French and who come from one of the top 90 immigrant sending countries, and neither English nor French is an official language in the sending country and for which not all of the immigrants from these countries has knowledge of the local native language.
[ii] "Low knowledge countries" include the bottom 15 lowest knowledge countries out of the "All countries".