Gender, Immigrant Status, and Unemployment Rate Sensitivity During Recessions

By
Jessica Ghansiam

A Thesis Submitted to
Saint Mary's University, Halifax, Nova Scotia
in Partial Fulfilment of the Requirements for
the Degree of Bachelor of Commerce.

April 2014, Halifax, Nova Scotia

Approved:

Dr. Ather Akbari
Thesis Supervisor

Approved:

Dr. Atul Dar
Economics Department Chair

Date: April 23, 2014

Gender, Immigrant Status, and Unemployment Rate Sensitivity During Recessions

By
Jessica Ghansiam

A Thesis Submitted to
Saint Mary's University, Halifax, Nova Scotia
in Partial Fulfilment of the Requirements for
the Degree of Bachelor of Commerce.

April 2014, Halifax, Nova Scotia

Approved:

Dr. Ather Akbari
Thesis Supervisor

Approved:

Dr. Atul Dar
Economics Department Chair

Date: April 23, 2014

Gender, Immigrant Status, and Unemployment Rate Sensitivity During Recessions

by Jessica Ghansiam

Abstract

This study examines the unemployment rates of Canadians comparing men and women, immigrants (any foreign-born Canadians) and native-born to see if there are any groups that are more sensitive than their counterparts during periods of economic downturn (ie. they rise faster than their counterpart group). The results show that neither gender is particularly sensitive although unemployment gaps exist. The gap between native-born and foreign-born is persistent although the results show that it was not especially sensitive during the 2008 global financial crisis.

Quarterly data from Statistics Canada was used to run Ordinary Least Squares (OLS) regressions in which the unemployment gaps of each group (men, women and immigrants of both genders) were the dependent variables. The independent variables were GDP, GDP from the industrial sectors which employs the most persons of each group and a dummy variable indicating the appearance of a major recession.

April 23, 2014

Table of Contents

1.0 Introduction

1.1 Objective of the Study:

The purpose of this study is to examine the sensitivity of unemployment rates among Canadians by gender, and also by their immigrant status, to economic downturn. Specifically, this study will investigate if any of these groups have unemployment rates that are hypercyclical, i.e., if the unemployment rates rise faster for men than for women, and for immigrants than for non-immigrants, during recessions and fall slower during periods of economic expansion. One would expect differential unemployment rate response within these groups to economic fluctuations due to several reasons. Some of these differences could include differential job mobility patterns, differential unionization rates, employer preferences, etc.

1.2 Rationale for the Study:

The Canadian Employment Equity Act of 1995 is designed to protect women, aboriginals, disabled persons and visible minorities from discrimination in the labour market. Although the values of equality are espoused in Canadian workplaces, women and visible minority immigrants are disadvantaged in many respects in the labour market. For example, recent immigrants have a much higher unemployment rate than native-born Canadians as seen in Figure 1 below.

Figure 1: Unemployment rates of native-born Canadians v. recent immigrants

Quarterly Data (%)

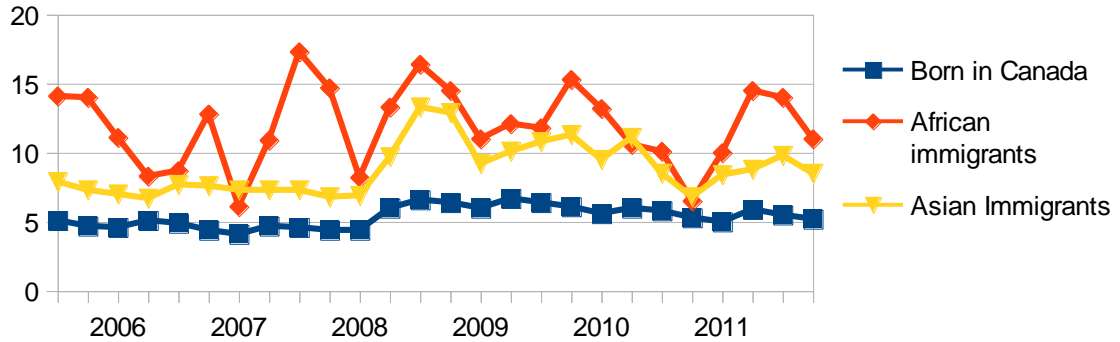Source: Statistics Canada, CANSIM table 282-0107
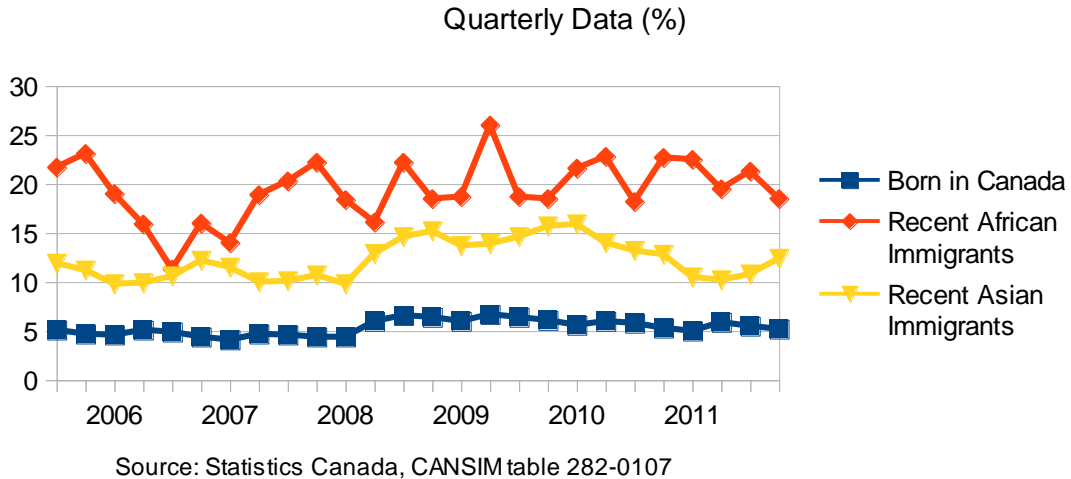
The National Household Survey of 2011 revealed that there were 6,264,000 Canadians who identified themselves as belonging to a visible minority group, close to one-sixth of total population. Visible minorities account for 78 percent of recent immigrants (immigrants who have landed within the past five years of the census). Before 1971, only 12.4 percent of recent immigrants had identified themselves as belonging to a visible minority group. The largest visible minority immigrant group in Canada is of South Asians with 1,567,400 people comprising 25 percent of the total visible minority population. The second largest group is that of Chinese with a population of 1,324,700 people which represents 21.1 percent of the total visible minority population. They are followed by Blacks, 945,700 people comprising 15.1% of the total visible minority population (National Household Survey, 2011).

The unemployment rate gap between native-born and foreign-born appears to

get narrower the longer the latter have been in Canada as shown by Figures 2 and 3:

Figure 2: Unemployment Rates of Native-Born Canadians v. Immigrants Landed 5-10 Years

Quarterly Data (%)

Source: Statistics Canada, CANSIM table 282-0107

Figure 3: Unemployment Rates of Native-Born Canadians v.
Immigrants Landed More Than 10 Years

Quarterly Data (%)
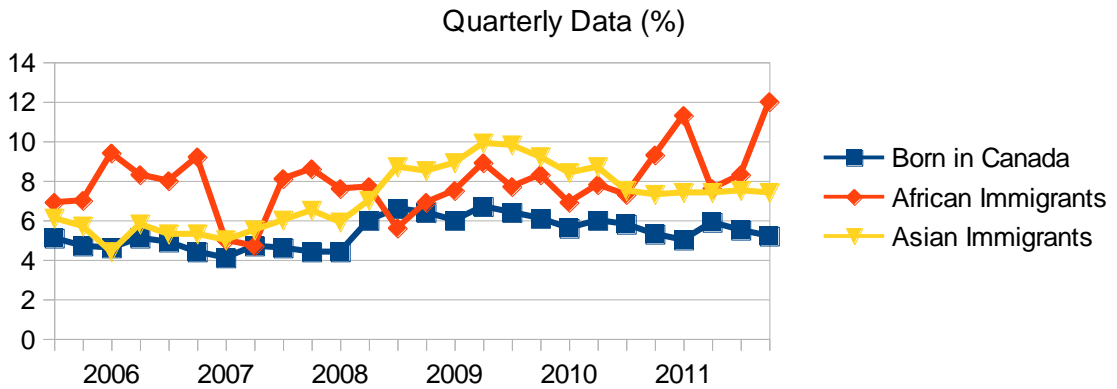
Source: Statistics Canada, CANSIM table 282-0107

Women's unemployment rates do not seem to be hypercyclical as shown in
Figure 4.

Figure 4: Male and Female Unemployment Rates

Quarterly Data (%)
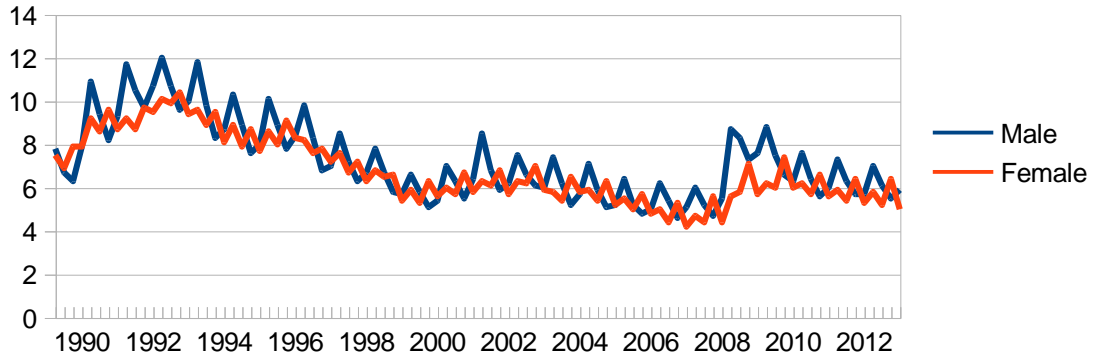
Source: Statistics Canada, CANSIM table 282-0003

The men's unemployment rate seem to be more volatile. Women are also disadvantaged in other ways in the labour market. For example, the gender-wage gap only narrowed slightly in a 21 year period, when the wage rate of women rose from 58.4 to 66.7 percent, as is revealed in Figure 5.

Figure 5: Female-to-Male Average Earnings Ratio

Annual Data (%)
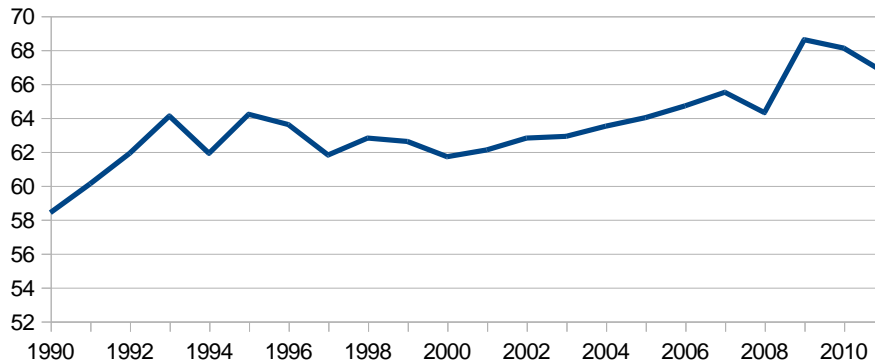
Source: Statistics Canada, CANSIM, table 202-0102

During the recessions of 1990-1992 and 2008-2010, men's earnings actually

decreased while women's earnings increased Unemployment rates and earnings for men seem to be more sensitive even though women face more discrimination in the workplace.

According to the Organization for Economic Cooperation and Development (OECD, 2001), women in Canada are most represented in the healthcare sector while men and the overall immigrant labour force are most represented in manufacturing. All three groups have a large representation in the retail trade sector (See Appendix for employment by industrial sector). Between October 2008 and February 2013 the share of the workforce employed in manufacturing declined from 11.4 percent to 9.8 percent, while in the health care sector, the share of workforce employed increased from 11.2 percent to 12.2 percent. It would stand to reason that declines in demand in these industries would contribute to fluctuations in unemployment rates among Canadians.

Figure 6: Unemployment Rate in Manufacturing Sector

Monthly Data (%)
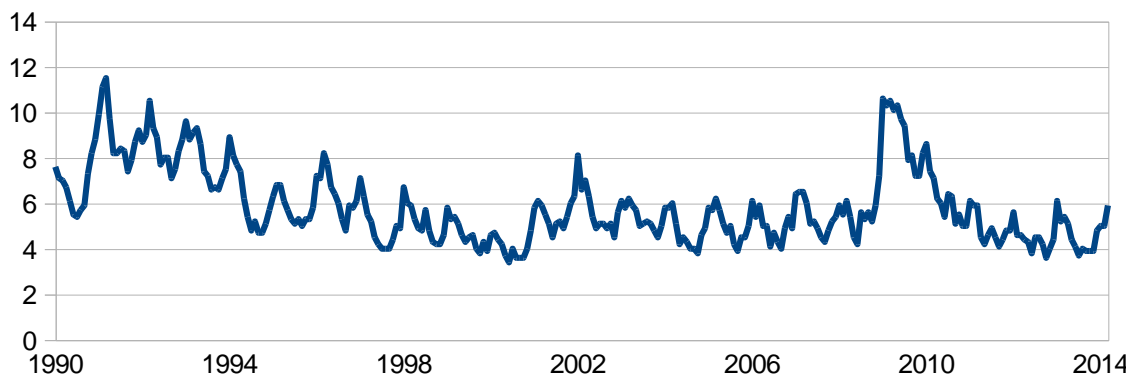
Source: Statistics Canada, CANSIM, table 282-0007

In Figure 6 above, spikes in unemployment in the 1990s recession and the 2008 global financial crisis are apparent.

According to the 2006 census, the most prevalent occupations for women in Canada were retail salespersons and sales clerks, cashiers, registered nurses and general office clerks. In 2011, the top occupations were the same but in different amounts. The only decrease in employment was for retail salespersons and sales clerks. Between 2006 and 2011, men's unemployment decreased in the most prevalent male dominated occupations, which are truck drivers and retail salespersons.. Unemployment among retail trade managers increased (see Table 1).

Table 1: Most Popular Occupations by Gender

Men	2006 employment	2001 to 2006 employment change	2011 Employment	2006 to 2011 employment change
Retail salespersons and sales clerks	285800	63600	285050	-750
Truck drivers	276200	40900	253385	-22815
Retail trade managers	192200	-8100	211685	19485
Janitors, caretakers and building superintendents	154100	18800	145510	-8590
Women				
Retail salespersons and sales clerks	400000	68600	371345	-28655
Cashiers	255500	35500	260190	4690
Registered nurses	249400	33800	270425	21025
General office clerks	244200	23100	316565	72365

Source: Statistics Canada, Census 2006 and 2011, National Household Survey, 2011.

1.3 Method of analysis

The present analysis of unemployment rate sensitivity by gender to economic downturn is conducted for the period of 1990 – 2012 and is for individuals who were

aged 25-54. During this period, there were two recessions that affected Canada's labour market. Statistics Canada (2011) indicates the dates of the first recession as starting in the first quarter of 1991 and ending in the first quarter of 1992. The second recession is dated from the fourth quarter of 2008 to the fourth quarter of 2010. The age range, 25-54, was chosen to rule out the unemployment rates among younger adults, many of whom have not yet entered the labour market fully as many attend educational institutions, and also to exclude retirees. Regression equations are estimated separately for each province. Territories are excluded because of the lack of data.

To compare the unemployment rates of women with men, Ordinary Least Squares (OLS) regressions are estimated with the difference in the unemployment rates of men and women as the dependent variable. The independent variables are Gross Domestic Product (GDP), GDP of the healthcare sector, GDP of the retail and wholesale trade industries and a dummy variable indicating the 1990s recession and the 2008 recession. The regressions testing the sensitivity of men's unemployment rates were run in the same way except that instead of GDP from the healthcare industry, GDP from the manufacturing industry is used as an independent variable because the manufacturing industry employs the most men in Canada.

To study the effect of recessions on the unemployment rate of immigrants aged 25-54, OLS regressions were run using the unemployment rate gap between immigrants and native-born Canadians by period of landing between 2006 and 2013 as the immigrant status information is available from the Labour Force Survey only after 2005. .

The periods are 1) landed within the last five years (recent immigrants), 2) landed between 5 and 10 years previous and 3) landed 10 years or more previous.

1.4 Data

All of the data used are from Statistics Canada. Quarterly data on immigration unemployment rate were pooled across provinces. These data are based on Labour Force Survey (LFS) and start from 2006, the year immigration question was added to LFS. This means the effect of 1990s recession cannot be incorporated in this part of the study. Data for unemployment rate by immigrant status for each of the Atlantic provinces were not available for each year. Hence aggregated data for the Atlantic region had to be used. Likewise, data for Manitoba and Saskatchewan were used in aggregated form as they were also not available as separate provinces. Some values for Manitoba and Saskatchewan were missing for 2006-2007 and had to be interpolated using averages from available quarterly data for these years. The data were obtained from Canadian Socio-Economic Information Management System (CANSIM) tables 282-0003 and 282-0101.

Quarterly data on GDP, GDP by industry and a dummy variable to indicate the global recessions were the independent variables. The industries included are the manufacturing, retail and wholesale trade, and healthcare sectors. Quarterly data were obtained from CANSIM tables 379-0027 and 380-0063.

2.0 Background Information

2.1 The 2008 crisis and its effect on Canadian employment

According to Bergevin (2008), the 2008 global financial crisis did not affect Canada as harshly as the US or the European Union because of the strength and stability of the Canadian banking industry. The 2008 global financial crisis started with the collapse of the US housing market. Sub-prime mortgages were granted to Americans with poor credit history. These sub-prime mortgages were bundled into tradable financial instruments such as collateralized debt obligations (CDOs). Housing prices fell and mortgage interest rates rose resulting in leaving borrowers unable to pay off their mortgages. Once the home-owners started defaulting on their mortgages, investors in CDOs and similar financial instruments suffered heavy losses. Many US banks either went bankrupt or needed government bail outs. Canadian banks were more fortunate because they were less involved in trading risky financial instruments. In 2006, sub-prime loans accounted for less than 5 percent of new mortgages in Canada where in the US 22 percent of new mortgages were sub-prime. Because Canada's banking industry was relatively stable, Canada fared better than other countries during the crisis. Canada performed the best out of all the G7 countries (Bergevin, 2008).

Compared to the 1981-1982 and 1990-1991 recessions, the 2008-2009 crisis was not as deep and did not last as long in Canada (Canada's economy was in decline for 8 continuous months) and employment rates were affected less severely (Statistics Canada, 2011). At the beginning of the crisis, employment declined by about   431,000

jobs over a nine month period. It took about 18 months to recover. In the 1980s recession, 32 percent of workers were in industries that either constantly declined in GDP during the period, like the agriculture sector, or did not recover at all, like the manufacturing sector, compared to 20 percent in the most recent recession. In the post-recovery period, January 2011 to February 2013, employment gains overall were 463,000 jobs. Manufacturing lost 52,000 in the same period (Uppal, 2013).

2.2 Labour Profile of Canadian Immigrants and Visible Minorities

Figure 7: Total Immigration to Canada

Quarterly Data (persons)
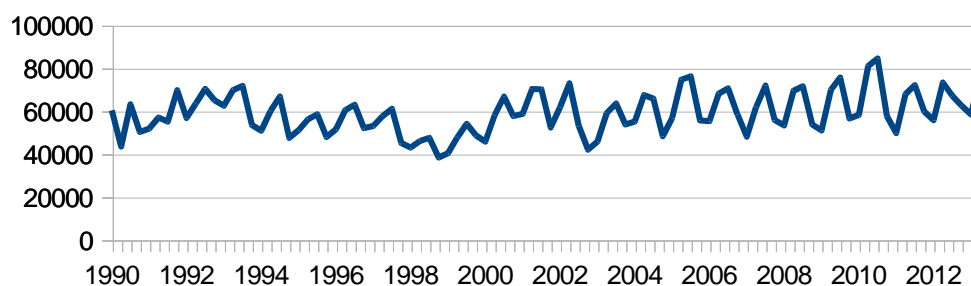
Source: Statistics Canada, CANSIM, table 051-0006

Inflows of immigrants in Canada have increased since 1991. In 2006, the total immigrant population in Canada was 6,186,950 comprising 19.8 percent of national population. In 2011, the total immigrant population increased to 6,775,800, which was about 20.6 percent of the total population. A total of 1,162,900 immigrants had arrived in Canada during the 2006-2011 period. These recent immigrants made up 17.2 percent of the total foreign-born population in Canada and 3.5 percent of Canada's total population. Of the G8 countries, Canada has the highest foreign-born population

(National Household Survey, 2011). Of the recent immigrants (those who landed between 2006 and 2011) 56.9 percent came from Asia. Before 1970, only 8.5 percent of the foreign-born population were from Asia. Most recent immigrants (62.5 percent) settle in Toronto, Vancouver and Montreal where 32.5 percent of all Canadians reside.

Canada's second-generation[1] and third-generation[2] immigrant population is relatively young compared to the overall population. The median age for all Canadians in 2011 was 40.1 years. For first generation Canadians (those who are foreign-born) the median age was 46.3. Second generation Canadians (those with at least one parent born outside of Canada) were the youngest cohort with a median age of 31.9. Third generation Canadians had a median age of 38.9. The median age of second generation Canadians varies province to province which reflects the waves of immigration in Canada over time. The youngest second generation Canadians are in Quebec, Ontario and British Columbia (the median ages are 22.7, 29.7 and 36.2 respectively). These Canadians are the Canadian-born children of recent cohorts of immigrants. Second generation Canadians in the Prairies and Atlantic Canada are relatively older. The median age of second generation Canadians in Saskatchewan is 63. Most of them had parents that immigrated to Canada from Europe or the United States.

3.0 Literature Review

Berthoud (2009) found that, in the United Kingdom (UK), fluctuations in the unemployment rates of ethnic minorities were hypercyclical, rising faster than the

---

1 A second-generation immigrant is a Canadian who has at least one foreign-born parent.
2 A third-generation immigrant is a Canadian who has at least one foreign-born grandparent.

unemployment rates among majority white population during recessions, but also falling slower during periods of economic growth. His findings support the notion that ethnic minority groups are exceptionally sensitive to recession. Ewing (2002) found similar results for the US. While real output growth reduced the unemployment rate of all demographic groups in the US, the effect was larger and more persistent for blacks than whites and for men than for women. Fosu (2000) also found that blacks had higher unemployment rates than whites, and gender wise, men had higher unemployment rates than women although the gender gap was closing. Because most Canadians are of European origin, and also because the source countries of immigrants in Canada are similar to those in UK and US, it is expected that social attitudes towards ethnic minorities as well as towards women are similar. A more recent article from the Netherlands found that during the global financial crisis of 2008 non-western immigrants were not more sensitive to economic downturn than native-Dutch workers. The unemployment rates of both groups fell in similar proportions (Cerveny, 2013).

Several studies have found that a portion of the unemployment rate gap can be explained by factors other than racial discrimination. Leslie, Drinkwater and O'Leary (1998) found in the UK in 1991 that while UK-born members of ethnic minorities have better earnings prospects than their foreign-born counterparts, their unemployment rates remained high. Fieldhouse (1999) found that in London, the unemployment rate was higher for ethnic minorities than for the white population. Bangladeshis and Pakistanis were the most disadvantaged. Housing and education were factors that could

explain the disparity between white and non-white unemployment rates but the study found that racial discrimination could not be totally ruled out. Stratton (1993) found that only 20 to 40 percent of the unemployment rate gap between black and white men can be explained by education.

Two studies from 1994 and 1996 have formed the basis for including demand in industries where a group is most represented in the model. Holzer (1994) found that falling demand in certain industries was also a factor contributing to black unemployment rates. Blacks had higher employment in industries that had poor economic performance in the US after the 1970s. Another study by Brar (1996) found the racial differences in unemployment rates to be related to business cycle. During periods of prosperity, the black to white unemployment ratio tends to decrease. During recessions, unemployment rates of blacks rise faster than do the rates for whites. They attribute this difference not to discriminatory practices of employers as jobs become scarce during recessions, rather to the fact that recessions impact certain industries more severely than others. To the extent that the minority and white unemployment rates are unevenly distributed among industries, Brar's study concludes that stages of the business cycle could have more severe impact on minority employment. Another US study, Walden (2012), found that the decline of the manufacturing sector was a significant contributing factor to further market deterioration in the most recent economic crisis.

The effect of a recession on the gender gap in unemployment rates also depends

on the recession's differential impact on industries. Sahin (2010) found that women in the US fared better during the most recent recession because more men than women worked in industries that had larger GDP losses.

4.0 Regression model

The rationale for including the independent variables below is included in section 1.2 above. To analyze the sensitivity of women's unemployment rates, the following regression model was specified and estimated separately for each province.

Ugap = β_0 + β_1 gdp + β_2 gdpret + β_3 gdphea + β_4 dumrec + u

The variables are defined as follows:

Ugap - women's unemployment rate minus men's unemployment rate
gdp - GDP (x 1,000,000, dollars)
gdpret - GDP from retail and wholesale trade sectors
gdphea - GDP from health sector
dumrec- a dummy variable indicating the recessions in the 90s and 2000s. It takes on a value of 1 during recession, and 0 otherwise.
u – random error

Assuming that women are in fact a disadvantaged group during a recession, the expected signs of the coefficients of all the variables are negative, meaning that decreases in overall GDP, GDP by the industrial sectors which employ the most women (see Appendix for employment by industrial sector of native-born women), and the occurrence of a recession will result in a rise of the gender gap in unemployment rates.

To test the sensitivity of men's unemployment rates the following model was estimated for each province

Ugap = β_0 + β_1 gdp + β_2 gdpret + β_3 gdpman + β_4 dumrec + ε

The variables are defined as follows:

Ugap - women's unemployment rate minus men's unemployment rate
gdp - GDP (x 1,000,000, dollars)
gdpret- GDP from retail and wholesale trade sectors
gdpman - GDP from manufacturing sector
dumrec - a dummy variable indicating the recessions in the 90s and 2000s. It takes on a value of 1 during period of recession and 0 otherwise.
ε – random error

Assuming men are in fact a disadvantaged group during a recession, the expected signs of the coefficients of all the variables are negative, meaning that decreases in overall GDP, GDP by the industrial sectors which employ the most men (see Appendix for employment by industrial sector of native-born men), and the occurrence of a recession will result in a rise of gender gap in unemployment rates.

To analyze immigrant status gap in unemployment rates, the following regression equation was specified and estimated using pooled time series data on provinces:

$$Ugap = \beta_0 + \beta_1\, gdp + \beta_2\, gdpman + \beta_3\, gdpret + \beta_4\, dumrec + v$$

The variables are defined as follows:

Ugap- immigrant unemployment rate minus native-born unemployment rate
gdp - GDP (x 1,000,000, dollars)
gdpman - GDP from manufacturing sector
gdpret - GDP from retail and wholesale trade sectors
dumrec- a dummy variable indicating the recessions in the 90s and 2000s. It takes on a value of 1 during period of recession and 0 otherwise.
v – random error

Assuming immigrants are in fact a disadvantaged group during a recession, the

expected signs of the coefficients of all the variables are negative, meaning that decreases in overall GDP, GDP by the industrial sectors which employ the most immigrants of both genders (see Appendix for employment by industrial sector of immigrants of both genders), and the occurrence of a recession will result in a rise of gender gap in unemployment rates.

5.0 Analysis of Results

5.1 Results of OLS regressions on unemployment rate gap for women:

For all regressions the R-square and R-square-adjusted values are low, close to zero, meaning that this model does not explain much of the unemployment gap between women and men. The highest R-square values are in the regressions for Ontario, New Brunswick and Prince Edward Island. The highest R-square adjusted value is for Ontario at 0.2141 meaning, at most, only 21.41% of the unemployment gap can be explained by this model.

The only regressions that yielded significant t-values (having a corresponding p-value less than 0.05) for the coefficients were for Canada, Ontario and Saskatchewan. In the OLS regression for all women in Canada, the only variable with a significant t-value in this test is for GDP from the healthcare sector. The coefficient indicates that if GDP in the healthcare sector dropped by $1,000,000 (constant 2002 dollars) the unemployment gap would widen by 0.017 percentage points. The effect is inverse as predicted.

Table 5.1, OLS Results for all women in Canada:

Variable (t-value)	Canada
GDP	0.77017E-05 (1.476)
GDP retail	-0.50654E-04 (-1.002)
GDP health	-0.17286E-03 (-2.186)
Dummy for recession	-0.44368E-01 (-0.1330)
Constant	8.0734 (2.030)
R-Square	0.0910
R-square (adjusted)	0.0487
Number of observations	90
ANOVA (mean) F-value (p-value)	2.152 (0.081)
ANOVA (zero) F-value (p-value)	5.3232 (0.000)

The OLS test for Ontario yielded significant t-values for all variables except the dummy variable. GDP and GDP from wholesale and retail trade and healthcare affect the unemployment inversely although the changes are small. This result predicts a $1,000,000 (constant 2002 dollars) decrease in the wholesale and retail trade and healthcare sectors would cause the unemployment gap to widen by 0.01 percentage points and 0.03 percentage points respectively. The t-value for GDP is significant. It predicts that economic growth would cause the unemployment gap to widen. This is not the expected result.

Table 5.2, OLS Results for women in Ontario:

Variable (t-value)	ON
GDP	0.15620E-04 (2.840)
GDP retail	-0.10514E-03 (-1.974)
GDP health	-0.33526E-03 (-4.023)
Dummy for recession	-0.11554 (-0.3287)
Constant	16.408 (3.914)
R-Square	0.2490
R-square (adjusted)	0.2141
Number of observations	90
ANOVA (mean) F-value (p-value)	7.129 (0.000)
ANOVA (zero) F-value (p-value)	5.828 (0.000)

Table 5.3, OLS results for women in Saskatchewan:

Variable (t-value)	SK
GDP	0.11430E-04 (1.534)
GDP retail	-0.12389E-03 (-1.717)
GDP health	-0.48085E-04 (-0.4260)
Dummy for recession	-0.07921 (-0.1664)
Constant	2.9004 (0.5108)
R-Square	0.0742
R-square (adjusted)	0.0312
Number of observations	90
ANOVA (mean) F-value (p-value)	1.724 (0.152)
ANOVA (zero) F-value (p-value)	4.203 (0.002)

The regression for Saskatchewan (see table 5.3) has a significant t-value for the GDP from retail and wholesale trade variable. The model predicts that a $1M loss in GDP from trade would result in a 0.01 percentage point increase in female unemployment relative to male unemployment.

The regressions for the Atlantic provinces, Quebec and the Western provinces did not have significant t-values, R-squared or R-squared adjusted values. See tables 5.4 and 5.5 on the following pages.

Table 5.4, OLS Results for Women in the Atlantic Provinces:

Variable (t-value)	PEI	NL	NS	NB
GDP	0.44062E-05 (0.4195)	-0.57177E-05 (-0.4690)	0.17554E-05 (0.2159)	0.51693E-05 (0.5402)
GDP retail	-0.81451E-04 (-0.8008)	0.23210E-04 (0.1966)	-0.31938E-04 (-0.4057)	-0.11194E-03 (-1.208)
GDP health	-0.27596E-04 (-0.1734)	0.92946E-04 (0.5032)	-0.27343E-04 (-0.2220)	0.67090E-04 (0.4628)
Dummy for recession	0.53177 (0.7921)	0.63566E-01 (0.8158E-01)	0.36974 (0.7116)	0.29727 (0.4861)
Constant	4.4529 (0.5562)	-4.6757 (-0.5031)	1.9297 (0.3114)	-0.50176 (-0.0688)
R-Square	0.1882	0.0779	0.0988	0.1733
R-square (adjusted)	0.1512	0.0350	0.0569	0.1349
Number of observations	90	90	90	90
ANOVA (mean) F-value (p-value)	5.006 (0.001)	1.815 (0.133)	2.357 (.060)	4.508 (0.002)
ANOVA (zero) F-value (p-value)	8.949 (0.000)	19.350 (0.000)	14.433 (0.000)	22.729 (0.000)

Table 5.5, OLS Results for Women in Quebec and Western Provinces

Variable (t-value)	QC	MB	SK	AB	BC
GDP	-0.46588E-06 (-0.07152)	0.10048E-04 (1.415)	0.11430E-04 (1.534)	0.68305E-05 (1.313)	0.47411E-05 (0.8971)
GDP retail	0.18454E-04 (0.2926)	-0.72741E-04 (-1.058)	-0.12389E-03 (-1.717)	-0.55982E-04 (-1.111)	-0.30570E-04 (-0.5974)
GDP health	-0.82705E-04 (-0.8380)	-0.15457E-03 (-1.437)	-0.48085E-04 (-0.4260)	-0.97768E-04 (-1.240)	-0.82851E-04 (-1.035)
Dummy for recession	0.93995E-01 (0.2258)	0.94954E-01 (0.2093)	-0.07921 (-0.1664)	-0.26916 (-0.8093)	-0.10114 (-0.2995)
Constant	3.2425 (0.6531)	6.6435 (1.228)	2.9004 (0.5108)	5.1139 (1.289)	3.1559 (0.7834)
R-Square	0.0914	0.0791	0.0742	0.0628	0.0535
R-square (adjusted)	0.0492	0.0363	0.0312	0.0203	0.0095
Number of observations	90	90	90	90	90
ANOVA (mean) F-value (p-value)	2.164 (0.080)	1.847 (0.127)	1.724 (0.152)	1.466 (0.220)	1.216 (0.310)
ANOVA (zero) F-value (p-value)	13.453 (0.000)	2.045 (0.080)	4.203 (0.002)	16.32(0.160)	3.761 (0.004)

5.2 Results of OLS regressions on unemployment rate gap for men:

As with the results for the female unemployment gap tests, the highest R-square values are in the regressions for Ontario, New Brunswick and Prince Edward Island. At its best, this model can only explain 18.98 percent of the unemployment gap between men and women in Ontario.

Table 5.6, OLS Results for all men in Canada

Variable (t-value)	Canada
GDP	-0.39154E-05 (-0.9684)
GDP retail	0.63507E-04 (1.145)
GDP manufacturing	-0.19732E-04 (-2.091)
Dummy for recession	0.78242E-02 (0.0224)
Constant	1.2500 (1.342)
R-Square	0.0869
R-square (adjusted)	0.0444
Number of observations	91
ANOVA (mean) F-value (p-value)	2.045 (0.095)
ANOVA (zero) F-value (p-value)	5.222 (0.000)

Table 5.7, OLS Results for men in Ontario

Variable (t-value)	ON
GDP	-0.77839E-05 (-1.803)
GDP retail	0.12275E-03 (2.072)
GDP manufacturing	-0.36456E-04 (-3.617)
Dummy for recession	0.08681 (0.2323)
Constant	1.5988 (1.608)
R-Square	0.2255
R-square (adjusted)	0.1895
Number of observations	91
ANOVA (mean) F-value (p-value)	6.260 (0.000)
ANOVA (zero) F-value (p-value)	5.129 (0.000)

The results for all men in Canada are similar to the regression for women; one variable had a significant t-value. This result has the predicted sign meaning a $1M decrease in GDP in manufacturing would cause male unemployment to exceed female unemployment by 0.002 percentage points.

In the results for men in Ontario, the model predicts that a $1M increase in GDP in wholesale and retail trade would cause the gap to widen by 0.012 percentage points. A direct relationship was not predicted. The model also predicts that a $1M decrease in GDP from the manufacturing sector would cause the gap to increase by 0.004 percentage points.

The remaining regressions had no significant t-values for the coefficients, R-squared or R-squared adjusted values. See Tables 5.8 and 5.9 below.

Table 5.8, OLS results for men in the Atlantic provinces:

Variable (t-value)	PEI	NL	NS	NB
GDP	-0.11144E-05 (-0.1373)	-0.11978E-05 (-0.1270)	-0.46562E-05 (-0.7458)	-0.58279E-05 (-0.7886)
GDP retail	0.43583E-04 (0.3914)	0.42364E-04 (0.3273)	0.85957E-04 (1.003)	0.94904E-04 (0.9359)
GDP manufacturing	0.67440E-05 (0.3560)	-0.73555E-05 (-0.3341)	-0.16006E-04 (-1.098)	0.10643E-04 (0.6171)
Dummy for recession	-0.30786 (-0.4384)	-0.46107 (-0.5649)	-0.67470 (-1.249)	-0.21377 (-0.3343)
Constant	-3.3777 (-1.807)	0.41279 (0.1900)	0.0832 (0.0579)	-3.2414 (-1.905)
R-Square	0.1898	0.0763	0.1107	0.1749
R-square (adjusted)	0.1521	0.0334	0.0694	0.1365
Number of observations	91	91	91	91
ANOVA (mean) F-value (p-value)	5.036 (0.001)	1.777 (0.141)	2.678 (0.037)	4.558 (0.002)
ANOVA (zero) F-value (p-value)	8.979 (0.000)	19.290 (0.000)	14.859 (0.000)	22.806 (0.000)

Table 5.9, OLS results for men in Quebec and Western Provinces

Variable (t-value)	QC	MB	SK	AB	BC
GDP	-0.18159E-07 (-0.3641E-02)	-0.37023E-05 (-0.6676)	-0.86881E-05 (-1.507)	-0.35532E-05 (-0.8783)	-0.56590E-06 (-0.1377)
GDP retail	0.21795E-04 (0.3184)	0.40256E-04 (0.5290)	0.10238E-03 (1.294)	0.46378E-04 (0.8354)	0.16657E-05 (0.0295)
GDP manufacturing	-0.17892E-04 (-1.537)	-0.67439E-05 (-0.5210)	0.72851E-06 (0.0541)	-0.69783E-05 (-0.7390)	-0.76667E-06 (-0.0799)
Dummy for recession	-0.30772 (-0.7130)	0.12546 (0.2615)	0.21342 (0.4279)	0.34559 (0.9872)	0.28542 (0.8025)
Constant	1.5712 (1.368)	1.2381 (0.9694)	-0.56647 (-0.4267)	-0.01532 (-0.0165)	0.94983 (1.003)
R-Square	0.1085	0.0600	0.0723	0.0531	0.0418
R-square (adjusted)	0.0670	0.0163	0.0292	0.0091	-0.0027
Number of observations	91	91	91	91	91
ANOVA (mean) F-value (p-value)	2.617 (0.041)	1.372 (0.250)	1.676 (0.163)	1.206 (0.314)	0.939 (0.446)
ANOVA (zero) F-value (p-value)	14.040 (0.000)	1.653 (0.155)	4.158 (0.002)	1.418 (0.226)	3.505 (0.006)

5.3 OLS regression results for unemployment rate gap by immigrant status:

Table 5.10 OLS results for Immigrants

Variable (t-value)	Recent Immigrants	Immigrants Landed 5-10 Years	Immigrants Landed 10+
GDP	-0.14422E-04 (-0.4940)	-0.88639E-05 (-0.4086)	-0.13430E-04 (-1.212)
GDP manufacturing	-0.19038E-03 (-1.716)	-0.28573E-04 (-0.3465)	-0.40271E-04 (-0.9563)
GDP retail	0.20493E-03 (0.3931)	0.30247E-04 (0.0781)	0.24069E-03 (1.216)
Dummy for recession	-3.8157 (-1.430)	-0.70501 (-0.3555)	-0.63620 (-0.6281)
Constant	39.466 (1.104)	20.718 (0.7795)	-2.9043 (-0.2140)
R-Square	0.1746	0.0810	0.0746
R-square (adjusted)	0.0246	-0.0860	-0.0936
Number of observations	135	135	135
ANOVA (mean) F-value (p-value)	1.164 (0.354)	0.485 (0.747)	0.444 (0.776)
ANOVA (zero) F-value (p-value)	91.084 (0.000)	32.813 (0.000)	34.209 (0.000)

For all groups of immigrants, none of the t-values of the coefficients for any immigrant group were small enough to render the corresponding coefficient statistically significant. The largest t-value was for GDP from manufacturing in the regression for recent immigrants.

For the men's and women's regressions, the tests could have an autocorrelation problem. The GDP and GDP from industrial sectors variable were highly correlated.

Table 5.11 Correlation matrix of Coefficients

Correlation matrix of coefficients for men's regressions:				
GDP	1.0000			
GDPRET	-0.99507	1.0000		
GDPMAN	0.63398	-0.68629	1.0000	
DUMREC	0.30137	-0.33840	0.62637	1.0000
CONSTANT	0.33327	-0.30340	-0.42323	-0.41730	1.0000
Correlation matrix of coefficients for women's regressions:				
GDP	1.0000			
GDPRET	-0.95862	1.0000		
GDPHEA	-0.80161	0.60428	1.0000	
DUMREC	0.38607	-0.24455	-0.57824	1.0000
CONSTANT	0.89208	-0.74255	-0.97735	0.52794	1.0000

6.0 Conclusions

All regressions estimated in this study had low R-square values. For the immigrant regressions only less than 10 percent of the unemployment gap between native-born and foreign-born Canadians can be explained with the included independent variables.

Most of the regressions for all three groups had very large F-values for the Analysis of Variance tests (ANOVA). This shows that even jointly, the variables included

do not matter. In many of the regressions for women the GDP variable had a positive sign which is not what the model had predicted. None of the coefficients of the recession dummy variable had significant t-values. This indicates that neither men or women nor immigrants, have particularly sensitive unemployment rates. This result is surprising because historical raw data (see Figure 4) show that unemployment rate among men increased faster than the unemployment rate among women during the most recent recession. The manufacturing sector seems to have had some influence over the gap.

For immigrants of any group, as defined by their length of stay in Canada, unemployment rates were not found to be hypercyclical. The unemployment rate gap exists and is persistent according to historical data but this model predicts that immigrants are not a disadvantaged group during a recession. This result may be misleading because not enough time-series data were available so that unemployment rate fluctuations could be examined in more than one recession. Another limitation of this study is the lack of explanatory variables. Other variables, such as education and the house prices could be used as control variables in examining the unemployment rate gaps over a business cycle.

List of References

Bergevin, P. December 2008. "The global financial crisis and its impact on Canada". Parliamentary Information And Research Service, Publication PRB 08-34E, January 2009

Berthoud, R. (2009). Patterns of non-employment, and of disadvantage, in a recession. *Economic & Labour Market Review, 3*(12), 62-73.

Brar, J. S., & Jamal, A. M. M. (1996). Business activity and racial differences in unemployment in the united states. *Management Research News*, 19(10), 35-41. Retrieved from http://search.proquest.com/docview/223540627?accountid=13908

Cerveny, J., & van Ours, J.,C. (2013). Unemployment of non-western immigrants in the great recession. *De Economist, 161*(4), 463-480. doi:http://dx.doi.org/10.1007/s10645-013-9216-2

Ewing, B. T., Levernier, W., & Malik, F. (2002). The differential effects of output shocks on unemployment rates by race and gender. *Southern Economic Journal, 68*(3), 584-599. Retrieved from http://search.proquest.com/docview/212142881?accountid=13908

Fieldhouse, E. A. (1999). Ethnic minority unemployment and spatial mismatch: The case of london. *Urban Studies, 36*(9), 1569-1596. Retrieved from http://search.proquest.com/docview/236293936?accountid=13908

Fosu, A. K. (2000). Racial and gender differences in unemployment patterns in an urban labor market: The case of detroit. *Review of Black Political Economy, 27*(3), 35-47. Retrieved from http://search.proquest.com/docview/203766096?accountid=13908

Holzer, Harry J. (1994). Black Employment Problems: New Evidence, Old Questions *Journal of Policy Analysis and Management* , Vol. 13, No. 4 (Autumn, 1994), pp. 699-722

Leslie, D., Drinkwater, S., & O'Leary, N. (1998). Unemployment and earnings among Britain's ethnic minorities: some signs for optimism. *Journal Of Ethnic & Migration Studies*, *24*(3), 489

National Household Survey: "Immigration and Ethnocultural Diversity in Canada" (2011). Catalogue no. 99-010-X2011001.

Sahin, A., Song, J., & Hobijn, B. (2010). The unemployment gender gap during the 2007 recession. *Current Issues in Economics and Finance, 16*(2), 1-7. Retrieved from http://search.proquest.com/docview/214219235?accountid=13908

Statcan study: "How did the 2008-2010 recession and recovery compare with previous cycles?" (2011), Canadian Economic Observer, Vol. 24, no. 1

Stratton, L. S. (1993). Racial differences in men's unemployment. *Industrial & Labor Relations Review, 46*(3), 451. Retrieved from http://search.proquest.com/docview/236328359?accountid=13908

Uppal, Sharanjit and Sébastien LaRochelle-Côté. 2013. "Employment changes across industries during the downturn and recovery." *Insights on Canadian Society,* April, Statistics Canada Catalogue no. 75-006-X.

Walden, M. L. (2012). Explaining differences in state unemployment rates during the great recession. *Journal of Regional Analysis & Policy, 42*(3), 251-257. Retrieved from http://search.proquest.com/docview/1316195012?accountid=13908

Appendix: Employment by industry sector

Table A1: Employment by Sector for Foreign-Born Women

		Foreign-born							
Education level		All levels of education							
Sex		Women							
Country of residence		Canada							
Country of birth		Africa	Asia	Europe	North America	Oceania	South and Central America and Caribbean	Other and unknown places of birth	All countries of birth
Sector									
All sectors		69980	502815	524365	76620	16660	192525	2875	1385840
Health and social		12680	69205	82260	13205	3610	42705	555	224220
Wholesale and retail		10965	81785	80805	9360	2170	26435	285	211805
Manufacturing		7275	94140	66360	5280	1260	28330	285	202930
Real estate, renting		10140	59100	74020	10290	2145	24730	480	180905
Hotels and		4635	55530	35095	3905	1785	13040	215	114205
Education		5980	24155	49440	12895	1415	9775	250	103910
Financial		5570	37550	30360	3330	1090	13825	140	91865
Other community,		4560	25945	35095	7260	970	9615	245	83690
Transport, storage		3170	19770	22100	2935	1030	9475	125	58605
Public administration		3445	12105	21115	3860	595	7565	100	48785
Agriculture and		225	5730	11395	2190	255	1950	90	21835
Private households		545	12615	4180	470	110	2620	35	20575
Construction		380	2800	8800	1035	120	1555	40	14730
Electricity, gas and		170	1220	1630	240	20	445	20	3745
Mining and quarrying		125	1025	1430	335	75	285	10	3285
Extra-territorial		115	140	280	30	10	175	..	750

Source: OECD, 2001

Table A2: Employment by Sector of Native-Born Women

		Africa	Asia	Europe	North America	Oceania	South and Central America and Caribbean	Other and unknown places of birth	All countries of birth
Place of birth	Native-born								
Education level	All levels of education								
Sex	Women								
Country of residence	Canada								
Country of birth									
Sector									
All sectors		..	..	..	5498680	..	..	..	5498680
Health and social work		..	..	..	974965	..	..	..	974965
Wholesale and retail trade; repair of		..	..	..	934675	..	..	..	934675
Real estate, renting and business		..	..	..	573605	..	..	..	573605
Education		..	..	..	547620	..	..	..	547620
Hotels and restaurants		..	..	..	457580	..	..	..	457580
Manufacturing		..	..	..	437020	..	..	..	437020
Other community, social and personal		..	..	..	368500	..	..	..	368500
Public administration and defence		..	..	..	355415	..	..	..	355415
Financial intermediation		..	..	..	312100	..	..	..	312100
Transport, storage and communications		..	..	..	242495	..	..	..	242495
Agriculture and fishing		..	..	..	130610	..	..	..	130610
Construction		..	..	..	76795	..	..	..	76795
Private households with employed		..	..	..	39000	..	..	..	39000
Electricity, gas and water supply		..	..	..	25100	..	..	..	25100
Mining and quarrying		..	..	..	22715	..	..	..	22715
Extra-territorial organisations and		..	..	..	485	..	..	..	485

Source: OECD, 2001

Table A3: Employment by Sector of Native-Born Men

		Africa	Asia	Europe	North America	Oceania	South and Central America and Caribbean	Other and unknown places of birth	All countries of birth
Place of birth	Native-born								
Education level	All levels of education								
Sex	Men								
Country of residence	Canada								
Country of birth									
Sector									
All sectors		..	..	..	6170490	..	..	..	6170490
Manufacturing		..	..	..	1149115	..	..	..	1149115
Wholesale and retail		..	..	..	1103140	..	..	..	1103140
Real estate, renting		..	..	..	705990	..	..	..	705990
Construction		..	..	..	564375	..	..	..	564375
Transport, storage		..	..	..	532170	..	..	..	532170
Public administration		..	..	..	405245	..	..	..	405245
Agriculture and		..	..	..	321730	..	..	..	321730
Other community,		..	..	..	275185	..	..	..	275185
Hotels and		..	..	..	274965	..	..	..	274965
Education		..	..	..	261355	..	..	..	261355
Health and social		..	..	..	207165	..	..	..	207165
Financial		..	..	..	171465	..	..	..	171465
Mining and quarrying		..	..	..	118780	..	..	..	118780
Electricity, gas and		..	..	..	74525	..	..	..	74525
Private households		..	..	..	4810	..	..	..	4810
Extra-territorial		..	..	..	475	..	..	..	475

Source: OECD, 2001

Table A4: Employment by Sector of Immigrants of Both Genders

Place of birth	Foreign-born							
Education level	All levels of education							
Sex	Men and women							
Country of residence	Canada							
Country of birth	Africa	Asia	Europe	North America	Oceania	South and Central America and Caribbean	Other and unknown places of birth	All countries of birth
Sector								
All sectors	168795	1091515	1190200	146765	34680	387595	6215	3025765
Manufacturing	25355	244900	214240	14525	4235	83615	1025	587895
Wholesale and retail trade, repair of	28290	185605	172915	18260	5585	56535	765	467955
Real estate, renting and business	28545	149300	176025	21600	4950	50935	1160	432515
Health and social work	19010	90660	103725	17115	4470	50175	715	285870
Hotels and restaurants	10655	117075	66325	6645	2850	22885	305	226740
Transport, storage and communications	12130	70170	72625	7590	2915	27885	320	193635
Education	11640	43725	81960	21310	2380	15905	435	177355
Other community, social and personal	9350	46750	63420	13390	1870	17155	410	152345
Financial intermediation	10130	63435	48800	5750	1655	20290	180	150240
Construction	3350	21470	90510	5155	1325	15805	350	137965
Public administration and defence;	7580	25685	47880	7440	1300	13395	220	103500
Agriculture and fishing	645	11390	31970	5020	480	7515	200	57220
Private households with employed	575	13245	4445	510	130	2785	35	21725
Electricity, gas and water supply	695	4505	7840	795	135	1625	40	15635
Mining and quarrying	635	3305	7035	1605	370	840	55	13845
Extra-territorial organisations and	210	295	485	55	30	250	..	1325

Source: OECD, 2001