Earnings of Immigrants
A Comparative Analysis

Arnold deSilva

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Foreword

During the 1980s, well over a million immigrants came to Canada. One third of them were of European origin, and the remainder came from Asia, Africa, Latin America, and the Caribbean.

Given the large inflow of immigrants, the question arises as to what effect immigration has on the welfare of Canadians. This was the main theme of a Council statement, *New Faces in the Crowd*, which was published in February 1991. That Statement examined the economic and social impact of immigration on the host population.

The present study was undertaken as a background research study for the above project. Its main focus is on the economic performance of immigrants to find out how well they have adjusted themselves to the Canadian environment. A study of the economic performance of immigrants is important for several reasons. One is to see whether, after an appropriate period of adjustment, immigrants are able to earn a salary in accordance with their qualifications. If this is not the case and if discrimination against immigrants in general or against specific immigrant groups is found to lower their economic performance, it would produce discontent and social friction and reduce the welfare of both hosts and immigrants. Another reason for examining the economic performance of immigrants is to ascertain whether the public perception of Canada as a hospitable and humanitarian country corresponds to reality. If so, the positive feeling of doing good represents a significant gain.

At present, there is little agreement on how immigrants fare after their arrival. Some studies show that, within a short period of their arrival, immigrants are able to earn as much as the native-born with similar qualifications. Others argue that this is not true of all immigrants, particularly the visible minority groups. Many of these studies provide only a partial analysis of the economic adjustment of immigrants, since they look at only a limited number of factors affecting their relative earnings. Furthermore, the majority of these studies are based on the 1971 and 1981 censuses.

The present study attempts a more comprehensive analysis of how well immigrants have done in Canada and uses the most up-to-date full data set available – the 1986 census. The study also utilizes a novel sampling approach that allows a more stringent test of discrimination. The study was prepared by Arnold deSilva who is a Senior Researcher at the Council.

Judith Maxwell
Chairman

READER'S NOTE

The reader should note that various conventional symbols similar to those used by Statistics Canada have been used in the tables:

. . . figures not appropriate or not applicable

– nil or zero.

Details may not add up to totals because of rounding.

1 Introduction

From a policy point of view, what matters most in immigration is how it affects the welfare of Canadians. This was the main focus of a recently published Council study [Economic Council of Canada 1991], of which this research was part of the background work. Strictly speaking, this study, which focuses on the economic performance of immigrants, is only peripherally related to the Council's focus on how immigration affects the well-being of Canadians. Nevertheless, it was an aspect that the Council considered worth examining, for three reasons.

First, the performance of immigrants relative to their own expectations has an effect on the ease with which they integrate into Canadian society. If, after an appropriate adjustment period, immigrants do not do as well as their qualifications lead them to expect, they will become discontented. That could cause social frictions, especially if the gap between reality and expectations is greater for the so-called "visible minority" immigrants – those whose skin colour sets them apart from the white majority. Since social frictions damage hosts as well as immigrants, the question whether discrimination lowers the economic performance of immigrants, either as a group or only of those who belong to a visible minority, impinges directly on the well-being of the hosts.

Second, there is a public perception, important to many Canadians' self-esteem, that Canada is a hospitable nation to immigrants. It is widely believed that immigrants do well by coming to this country. It is important to know if that perception is correct. The feeling of doing good represents a genuine gain to the hosts, if justified.

Third, there is some interest in knowing how well immigrants do, as a simple matter of knowledge. Moreover, most immigrants do become Canadians eventually, so that their economic success or failure is of interest to the nation on this account.

The present study thus addresses the issue of how well immigrants fare after their arrival, relative to comparably qualified Canadian-born persons. While several studies have been devoted to the economic performance of immigrants by comparing their earnings with those of Canadian-born persons with similar qualifications, there still are certain aspects which have not received the attention that they deserve.[1] A good example is labour market discrimination against immigrants. While most studies refer to it only in passing, a few have tried to examine the issue in some depth. Unfortunately, even in these the analysis often turns out to be incomplete as it is based only on a limited number of variables affecting the earnings differential between immigrants and the native-born. As a result, we really do not know whether and how much discrimination there is against immigrants in general and against specific immigrant groups. One major objective of the present study, therefore, is to address this issue by undertaking a more comprehensive analysis of discrimination.

Even on the broader question of the economic performance of immigrants, the evidence from existing studies (which will be reviewed later) is patchy and inconclusive. Some of these studies claim that immigrants have done quite well by pointing out that within about 20 years after their arrival, immigrants have been able to match the earnings level of the native-born. However, other studies argue that this is not true of all immigrant groups, especially of some of the new groups who came during the 1980s. Thus there is no consensus on the subject. Moreover, many of these studies are based on data from the 1971 and 1981 censuses and hence may be somewhat outdated. We attempt here to reexamine the issue of the economic performance of immigrants, and in doing so also incorporate new evidence from the 1986 census.

The rest of the study is organized as follows. Chapter 2 discusses the characteristics of immigrants, and Chapter 3 deals with the integration of immigrants into the labour force. Chapter 2 provides the necessary background on the key differences between immigrants and the native-born. A central point here is the changing nature of immigration, towards much higher proportions of nontraditional origins, and the resulting growth in the proportion of visible minorities. It is this growth which makes the issue of potential discrimination so important, and also makes essential a distinction between the question of discrimination against immigrants in general, and discrimination against visible minorities in particular. The reader who is already familiar with recent immigration patterns and changes in them may wish to skip Chapter 2 and move directly to the rest of the

study, which focuses on the core issues relating to absorption of immigrants into the labour market (Chapter 3) and the earnings differential between immigrants and the native-born and the measurement of discrimination (Chapter 4). The study ends with a summary of the main conclusions in Chapter 5. The conclusions were reached by a novel sampling of immigrant and nonimmigrant workers and by a new decomposition of earnings differentials.

2 Characteristics of the Immigrant Population

To put the problem in its proper perspective, we start out with a brief discussion of the characteristics of the immigrant population. In 1971 the population of Canada was about 21.6 million. Of this, about 3.3 million or 15.3 per cent consisted of foreign-born persons [Statistics Canada 1985]. The corresponding figure for 1986 is 15.6 per cent [Statistics Canada 1989*a*]. Hence it appears that the proportion of foreign-born persons in Canada's population has remained relatively constant between 1971 and 1986.

Origins

Of the total immigrant population in 1986, the majority were of European origin representing about 63 per cent of the total (Table 2-1). Next in importance were the Asian and the Afro-Caribbean groups which accounted for 16 and 10 per cent, respectively. Then came the Americans whose share of the immigrant population was 7 per cent. The remainder was accounted for by persons from South and Central America and from other places such as Oceania.

The majority of European and American immigrants arrived before 1967, whereas many of the Asian, African, Caribbean, and South and Central American immigrants came during the subsequent period. In this study, we refer to the former group as persons of traditional immigrant origin (TIOs) and to the latter group as persons of new immigrant origin (NIOs).

There is general belief that TIOs are mainly white immigrants whereas the NIOs are predominantly the non-whites. While this appears to be basically true, the correlation between a classification of immigrants by country of origin and a classification based on the colour of the person is far from perfect. Take, for example, the Africans. They include South Africans who are predominantly white and

Table 2-1
Distribution of Immigrant Population by Place of Birth and by Period of Arrival, Canada, 1946-86

			Period of immigration				
	Total number	Per cent	Before 1946	1946-66	1967-77	1978-82	1983-86
					(Per cent)		
Place of birth							
United States	282,025	7.2	19.4	3.8	7.8	6.3	7.6
Caribbean	193,435	5.0	0.4	1.5	12.0	6.8	5.7
South and Central America	147,305	3.8	0.3	1.0	5.7	7.0	11.3
Africa[1]	180,170	4.6	0.3	1.9	7.2	7.8	9.9
Europe	2,435,090	62.4	77.9	87.3	45.6	32.1	23.7
Asia	626,850	16.1	1.5	3.9	22.1	39.8	40.5
Other	43,275	0.9	0.2	0.6	1.6	1.2	1.2
Total number of persons	3,908,145	100.0	406,300	1,557,555	1,218,710	481,880	243,705

1 Includes the Middle East.
SOURCE Statistics Canada [1989*b*, Table 1, 1-5 to 1-8].

those from other parts who are predominantly non-white. Census data for 1986 permit a breakdown of African immigrants according to whether they came from Southern Africa or from the Northern, Eastern, or Western parts. Note, however, that Southern Africa includes not only the Republic of South Africa but also several other countries such as Botswana, Swaziland, and Namibia. Hence a breakdown of Africans into those from Southern Africa and the rest does not necessarily mean that we have been able to correctly identify white and nonwhite Africans. Similar problems also arise with respect to other regions. A case in point is South and Central America. Persons from that region include not only those of Spanish and Portuguese origins who are predominantly white but also others of Caribbean and Asian descent.

Bearing these reservations in mind and for want of better data, we refer loosely to NIOs as visible minorities and TIOs as nonvisible minorities.

Classes

A second important development related to the above is the shift in the composition of immigrants from independents to family-class immigrants and refugees.[1] During the early 1970s independent immigrants formed the bulk of immigrants to Canada, accounting for about three quarters of the total immigrant inflow, while the family class and refugees accounted for the remaining one quarter (Table 2-2). But from the mid-1970s to the mid-1980s, the proportion of independents declined, while the shares of refugees and family-class immigrants increased. More recently, however, the percentage of independents has increased, whereas the percentage of refugees and family-class immigrants has declined. In 1989, the most recent year for which the data are available, family class and refugees accounted for 51 per cent of the total immigrant arrivals, while the independents accounted for the rest.

Origin/Class Interrelationships

The countries from where most of the family-class immigrants have come during the 1980-89 period are South and East Asia, Southeast Asia, the Caribbean, and South and Central America, while most of the refugees and designated classes have arrived from Eastern and Central Europe, South and Central America, and Southeast Asia (Table 2-3). The leading source countries for independents are East Asia, the United Kingdom, and the United States. Independents have to score sufficient points to qualify for entry whereas the other two groups are normally exempt from the points system. Hence the popular view is that independents are likely to make a more rapid adjustment to the Canadian economic environment than refugees and family-class immigrants.

The increased inflow of new immigrant groups consisting mainly of family-class immigrants and refugees resulted from major policy decisions undertaken during the period since the early 1960s aimed at the liberalization of immigration.[2] These immigrant groups are the ones which are believed to have experienced the most severe adjustment problems.

Table 2-2
Immigrant Arrivals by Class, 1970-89

	Total arrivals	Family class	Refugees and designated persons	Independents
			(Per cent)	
1970-74	158,857	24.7	1.3	74.0
1975-79	130,127	42.8	9.4	47.8
1980-84	114,206	44.1	17.4	38.5
1985-89	137,501	37.4	17.9	44.7

SOURCE For the period 1970-79, the data are from W. L. Marr and M. B. Percy, "Immigration policy and Canadian economic growth," in *Domestic Policy Mix and International Trade*, John Whalley, a study done for the Royal Commission on the Economic Union and Development Prospects in Canada (Ottawa: Supply and Services Canada, 1987), 113, Table 3-B1. For the period thereafter, the data are from Employment and Immigration Canada.

Table 2-3
Immigrant Flows by Immigrant Class and Place of Birth, 1980-89

Place of birth	Number of persons	Percentage of total[1]	Family class	Refugees and designated classes	Independents
			(Per cent)		
All immigrants	1,179,378	100.0	39.3	17.5	43.2
United States	76,880	6.5	8.6	0.1	7.2
Caribbean	68,057	5.8	10.4	0.1	3.8
South and Central America	110,650	9.4	10.5	12.5	7.1
United Kingdom	98,812	8.4	6.5	0.1	13.4
Other Westerm Europe	39,365	3.3	1.8	0.2	6.0
Central Europe	100,668	8.5	4.6	25.1	5.4
Southern Europe	66,283	5.6	6.8	0.4	6.7
Eastern Europe	15,481	1.3	0.8	4.3	0.6
Northern Europe	7,403	0.6	0.6	0.1	0.9
Africa	52,162	4.4	3.1	5.0	5.4
South Asia	96,200	8.2	15.9	0.9	4.1
Southeast Asia	193,515	16.4	11.9	43.8	9.4
East Asia	158,692	13.3	12.8	0.7	19.2
West Asia	77,737	6.6	3.6	6.6	9.3
Oceania and other	17,473	1.5	2.1	0.1	1.5
		100.0	100.0	100.0	100.0

1 Due to rounding, the individual components do not exactly add up to the total.
SOURCE Based on data from the Canada Employment and Immigration Commission.

Demographic Characteristics

The majority of immigrants arrive in Canada as young adults. The median age of immigrants at the time of entry was reported to be 24.9 years for 1971 but has increased to 27.1 years in 1986 [Beaujot and Rappak 1988, Table 4, 30]. However, when we look at the median age of the current immigrant stock, a different picture emerges. The median age of immigrants in 1986 is about 40 years, compared with 30 years for the native-born.[3] Thus immigrants tend to be older relative to the native-born although, more importantly, at the time they enter Canada, they are younger than the native-born. The apparent paradox resolves itself if we observe that native-born persons at "the time of entry" are aged zero. That fact lowers the median age of the current native-born stock.

The average dependency ratio among immigrants is much lower than among the native-born. The dependency ratio refers to the proportion of children aged 14 years and less and persons aged 65 years and over in the population aged 15 to 64 years. For 1986, the dependency ratio was 28 per cent for immigrants, compared with 50 per cent for the native-born.[4] This is another reflection of immigrants' higher age at entry. Immigrants have as many children as do native-born persons, but very many of their children are native-born.

The sex composition shows that about 51 per cent of the immigrant stock in 1986 consisted of women, compared with 50 per cent for the native-born [Statistics Canada 1989*b*]. The evidence from the 1981 census also shows a similar pattern [Beaujot et al. 1988, 28].

Settlement Patterns

The majority of immigrants, old or new, are located in Ontario. Of the immigrant population in 1986, 53.2 per cent

lived in Ontario, 16.1 per cent in British Columbia, 15.3 per cent in the Prairies, and 13.6 per cent in Quebec. The remaining 1.8 per cent was located in the Maritimes [Statistics Canada 1989*c*]. However, when we look at the number of immigrants living in a province as a percentage of the provincial population, we find a much more even distribution of immigrants than previously noted. In 1986, immigrants accounted for 23.1, 22.1, and 13.3 per cent of the populations in Ontario, British Columbia, and the Prairies, respectively. In Quebec and the Maritimes, immigrants accounted for only 8.2 and 3.6 per cent of the provincial populations respectively.

Many of the immigrants are attracted to large cities. For 1986, 78.5 per cent of immigrants lived in urban areas with a population of 100,000 or more, compared with 45.9 per cent for the native-born.[5]

Educational Attainments

It is generally believed that education is a major prerequisite for success in the labour market. Hence it is important to find out how well immigrants compare with the native-born in terms of their educational attainments. The evidence shows that compared with the native-born, immigrants aged 15 years and over have a higher proportion of less educated people, as can be seen from a comparison of those with less than grade 9 education (Table 2-4). Next, in terms of vocational education, native-born persons report a slightly higher percentage than immigrants. But with regard to university education, immigrants are ahead of the native-born.[6] There is a view popular in some quarters [Seward 1988; and Beaujot and Rappak 1988, Table 4, 30] that recent immigrants tend to be less educated than those who arrived earlier. If this is true, it should show up in a comparison of the educational attainments of various immigrant cohorts. Such a comparison reveals that immigrants who came during 1983-86, which is the most recent period for which the data are available, have roughly the same educational levels as those who came in 1967-77 and 1978-82, except in the category of vocational education where there has been a considerable decline. Thus the evidence shows that there has been only a very slight deterioration in the educational attainments of immigrants during recent years.

We consider next the educational levels of immigrants by country of origin and by period of immigration. In this discussion, we consider the proportions of people with only elementary education and those with university education in the immigrant population aged 15 years and over. These two indicators are used as two crude proxies of educational attainment – the former to measure the prevalence of less educated persons among immigrants and the latter as an indication of the importance of highly educated persons. For the sake of comparison, the corresponding proportions for the native-born population are also given.

Table 2-4
Educational Attainments of Immigrants and the Native-Born,[1] by Period of Immigration, 1946-86

	Native-born	Immigrants	Period of immigration				
	Total	Total	Before 1946	1946-66	1967-77	1978-82	1983-86
			(Per cent)				
Educational level							
Less than grade 9	15.9	23.1	43.6	26.1	14.7	16.9	19.2
Completed grades 9 to 13	41.9	31.2	32.5	28.7	32.1	34.7	34.9
Vocational and non-university	24.5	23.9	15.2	26.2	25.3	22.5	18.8
University	17.6	21.8	8.7	19.0	27.9	25.9	27.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1 Based on population aged 15 years and over.
SOURCE Statistics Canada, [1989*b*, 1-5 to 1-8].

The evidence indicates that immigrants from the United Kingdom, Africa, the United States, and the Caribbean report lower proportions of people with only elementary education compared with the native-born, whereas the other countries have higher proportions (Table 2-5). The highest percentage of persons with only elementary education is reported for immigrants from Southern Europe. Compared with the late 1970s, the 1980s have witnessed a slight increase in the proportion of immigrants with only elementary education. The countries that show a decline are mainly the traditional immigrant countries, whereas many of the new immigrant countries show an increase.

With regard to university education, immigrants from the new immigrant countries, except for the Caribbean and South and Central America, comprise higher proportions of persons with university education than immigrants from all of the traditional immigrant countries, except the United States (Table 2-6). The cohorts that show declines in the proportion of persons with university education during the 1980s are mainly from new immigrant countries, though their proportions remain much higher than that of the native-born. Increases are frequently associated with the traditional immigrant countries.

Language Proficiency

Proficiency in either of Canada's official languages is often considered to be one of the prerequisites for successful entry into the Canadian labour market. Table 2-7 shows the home language of native-born persons and of immigrants. In 1986, 57.5 per cent of immigrants spoke English at home, compared with 71.3 per cent for the native-born. With respect to that last statistic, however, it should be pointed out that Quebec tends to attract fewer immigrants than the rest of Canada and must therefore be considered separately in the analysis of immigrant language proficiency.

Table 2-5
Native-Born Persons and Immigrants 15 Years of Age and Over with Only Elementary Education, by Place of Birth and Period of Immigration, 1961-86

	Number of persons	Per cent[1]	Period of immigration			
			1961-69	1970-74	1975-79	1980-86
			(Per cent)			
Native-born	939,690	8.8	...	...	...	...
Immigrants	372,765	15.5	15.2	11.8	10.4	13.0
Place of birth						
United States	6,405	4.3	1.3	1.2	1.3	1.0
Caribbean	9,875	7.3	4.4	7.6	8.3	12.6
South and Central America	11,450	12.6	10.9	10.3	10.6	17.4
United Kingdom	12,540	2.7	0.9	1.1	1.2	1.4
Other Western Europe	17,325	11.0	3.8	2.6	2.1	2.4
Central Europe	33,500	11.4	6.0	4.9	3.9	3.0
Southern Europe	207,185	43.5	41.4	41.6	38.7	40.0
Eastern Europe	12,305	22.1	18.3	9.9	5.7	4.4
Northern Europe	4,175	11.4	8.8	5.0	3.7	2.3
Africa	3,160	4.1	2.3	4.2	4.7	5.1
South Asia	10,135	9.2	4.8	7.8	9.8	14.5
Southeast Asia	15,675	11.8	2.2	2.0	9.4	20.2
East Asia	21,690	14.6	9.9	8.7	13.1	19.6
West Asia	5,510	11.6	10.7	13.2	14.1	7.9
Oceania	1,380	5.8	3.0	6.7	10.6	6.2

1 The numbers in this column refer to the number of persons with only elementary education as a percentage of the total number of persons in each category.

SOURCE Special tabulations based on a 20-per-cent sample of the 1986 census data from Statistics Canada.

Table 2-6
Native-Born Persons and Immigrants 15 Years of Age and Over with University Education, by Place of Birth and Period of Immigration, 1961-86

	Number of persons	Per cent	Period of immigration			
			1961-69	1970-74	1975-79	1980-86
			(Per cent)			
Native-born	2,411,980	22.6	...	...	...	...
Immigrants	660,755	27.5	28.5	31.8	31.3	30.9
Place of birth						
United States	76,760	51.0	56.8	57.5	55.2	64.0
Caribbean	29,085	21.6	29.4	19.8	15.6	13.5
South and Central America	22,295	24.6	26.7	24.0	25.3	21.1
United Kingdom	123,245	26.5	27.8	24.1	23.8	24.7
Other Western Europe	40,435	25.6	32.1	36.2	35.7	36.0
Central Europe	73,760	25.1	27.4	29.0	30.8	35.6
Southern Europe	46,515	9.8	9.4	7.4	10.4	14.3
Eastern Europe	16,730	30.0	35.1	51.7	54.4	49.9
Northern Europe	8,475	23.1	21.5	26.8	33.3	31.5
Africa	35,460	45.5	53.7	42.3	40.0	44.3
South Asia	46,965	42.8	58.7	43.6	38.7	32.3
Southeast Asia	56,875	42.9	70.3	64.6	44.0	26.3
East Asia	56,890	38.3	50.3	47.0	35.6	29.2
West Asia	18,505	38.8	38.6	33.3	33.2	47.5
Oceania	7,590	31.9	41.5	26.6	22.1	25.2

SOURCE Special tabulations based on 1986 census data from Statistics Canada.

Of the immigrants living in Quebec in 1986, 23 per cent spoke French at home, 25 per cent spoke English, and the remaining 52 per cent spoke other languages. The corresponding figures for the native-born in that province were 86.2, 9.2, and 4.6 per cent, respectively. Thus French-language proficiency is much higher among immigrants in Quebec than it is at the national level, although in Quebec itself it remains considerably lower among immigrants than among the native-born population.

Returning to the national situation described in Table 2-7, the evidence shows that slightly more than one third of immigrants in 1986 spoke a language other than English or French at home. The evidence also reveals that, except for the Caribbean, new immigrant countries report English-language proficiency levels that are significantly below the immigrant average. On the other hand, the only traditional immigrant areas displaying below-average levels are Eastern and Southern Europe. Knowledge of English has declined with each new wave of immigrants. The evidence from the earlier censuses shows a similar pattern [Beaujot and Rappak 1988, Table 3, 71; and Richmond and Kalbach 1980*a*]. Naturally, the use of English at home tends to increase with the duration of residence in this country because the earlier cohorts have had more time to learn the language. This may also apply to the use of French at home, which, according to Table 2-7, also declined slightly with the 1980-86 arrivals. Over time, compared with earlier cohorts, recent immigrant cohorts show a higher proportion of persons who speak languages other than English or French.

Summary

In the preceding discussion, it was argued that during the past few decades, the composition of immigrants has shifted dramatically in favour of persons of new immigrant origin from the Third World and away from persons of traditional immigrant origin from Europe and the United States. Many of the new immigrant groups are members of visible minority groups. Along with this development, there has

Table 2-7
Language Proficiency[1] of Native-Born Persons and Immigrants 15 Years of Age and Over, by Place of Birth and Period of Immigration, 1961-86

	Total number of persons				Period of immigration											
					1961-69			1970-74			1975-79			1980-86		
		English	French	Other	English	French	Other	English	French	Other	English	French	Other	English	French	Other
								(Per cent)								
Native-born	10,669,170	71.3	25.4	3.3	...	...	...	...	...	...	...	...	...	...	...	...
Immigrants	2,405,285	57.5	3.3	39.2	59.8	4.1	36.1	54.2	3.2	42.6	45.9	3.7	50.4	35.2	2.9	61.9
Place of birth																
United States	150,375	92.4	4.9	2.7	93.6	3.7	2.7	94.8	3.2	2.0	93.8	3.0	3.3	95.8	1.0	3.2
Caribbean	134,370	86.0	6.9	7.1	92.9	4.3	2.8	86.3	7.0	6.7	81.7	9.1	9.2	74.0	10.3	15.7
South and Central America	90,740	57.4	1.6	41.0	72.8	1.5	25.7	59.0	1.5	39.5	48.2	1.8	50.0	49.6	1.6	48.8
United Kingdom	465,795	98.6	0.2	1.2	99.0	0.2	0.8	97.7	0.2	2.1	97.7	0.1	2.2	97.5	0.1	2.4
Other Western Europe	158,065	67.0	19.2	13.8	53.1	34.1	12.8	53.5	32.3	14.2	43.7	36.2	20.1	37.8	36.3	25.9
Central Europe	293,910	58.4	1.5	40.1	58.3	2.0	39.7	48.0	2.4	49.6	36.6	3.6	59.8	17.0	1.6	81.4
Southern Europe	475,745	26.8	1.7	71.5	25.2	1.6	73.2	18.3	1.2	80.6	14.4	1.5	84.1	13.2	1.6	85.2
Eastern Europe	55,740	42.0	0.8	57.2	44.7	2.0	53.3	29.8	3.2	67.0	20.6	1.0	78.4	13.8	0.8	85.4
Northern Europe	36,630	71.0	0.7	28.0	65.7	0.6	33.7	61.9	0.9	37.2	49.0	1.0	50.0	40.6	2.0	57.0
Africa	78,005	46.8	16.1	37.1	43.2	28.1	28.7	49.9	10.8	39.3	47.0	11.0	42.0	40.9	11.1	48.0
South Asia	109,710	35.7	0.1	64.2	59.6	0.2	40.2	35.0	0.1	64.9	26.9	0.1	73.0	20.4	0.1	79.5
Southeast Asia	132,680	21.6	1.0	77.3	47.2	2.4	50.4	33.9	0.8	65.3	17.6	0.9	81.5	11.5	0.9	87.6
East Asia	148,375	15.8	0.1	84.1	25.7	0.2	74.1	17.5	0.1	82.4	9.7	0.0	90.2	5.1	0.0	94.8
West Asia	47,640	30.7	4.1	65.2	42.0	5.5	52.5	31.0	4.3	64.7	20.8	4.0	75.2	18.4	3.0	78.6
Oceania	23,815	73.4	1.5	25.1	85.3	1.2	13.5	67.5	0.8	31.7	55.8	2.0	42.2	63.7	1.4	34.9

1 Refers to language most frequently spoken at home.
SOURCE Special tabulations based on 1986 census data from Statistics Canada.

also been a major shift from independents to the family class and refugees. With respect to education, while immigrants tend to be much more university educated than the native-born, they also report a higher proportion of persons with only elementary education, compared with the native-born. However, contrary to popular thinking, differences in the educational attainments between recent immigrants and earlier arrivals are very minor. With respect to language spoken at home, immigrants tend to have a disadvantage in both English and French relative to the native-born, and the disadvantage seems to be most severe among the recent immigrants. However, the evidence also reveals that home language proficiency increases with the duration of residence in Canada.

3 Integration of Immigrants into the Labour Force

Our analysis of the economic performance of immigrants is in two parts. In this chapter, we discuss whether immigrants find jobs at all, what kind of jobs, how quickly, and so forth. Thus we look at labour market integration, as measured by labour force participation, unemployment, occupational structure, self-employment, and dependence on welfare assistance. In the next chapter, we consider earnings made in the jobs and whether discrimination exists. In the discussion of labour market integration in this chapter, a question of special interest is whether there is validity in a popular view that immigrants who arrived during the 1980s are experiencing adjustment difficulties to a much greater extent than earlier immigrants and the native-born. It is also important to find out whether these difficulties are more pronounced for new immigrants relative to traditional immigrants and also for refugees relative to other immigrant classes.

Labour Force Participation

We start with the labour force participation rate which is the proportion of the total population who are working or looking for work. It is a measure of entry into the labour market. For 1986, the participation rate for immigrants is 64.7 per cent, compared with 66.9 per cent for the native-born [Statistics Canada 1989*d*]. Thus it seems that immigrants have a slightly lower participation rate than the native-born. However, the comparison unfairly disfavours immigrants since the participation rates have not been adjusted for differences in age, due to major data problems. The 1986 census provides a breakdown of labour force participation rates by two age groups – 15 to 24 years and 25 years and over. However, these age groups are too broad to make an adjustment of participation rates by age. If such adjustments were made, the data would probably show that immigrants have a somewhat higher participation rate than the native-born, which was the case in 1981. The 1981 data reveal that immigrant men reported a participation rate, adjusted for age, of 79.1 per cent, compared with 77.8 per cent for the native-born men (Table 3-1). Immigrant women also report a higher rate than their native-born counterparts, and the discrepancy is somewhat more pronounced than in the case of men.

There are two other points that can be made on the basis of the 1981 data. First, there is no strong evidence to suggest that NIOs have consistently lower participation rates relative to TIOs. Whereas in the case of male immigrants, participation rates are slightly higher for many of the TIOs than for the NIOs, in the case of female immigrants, the highest rates are reported for those from the Caribbean and Southeast Asia, while the lowest rates are reported for those from West Asia, other Western Europe, and South Asia. Thus the pattern is quite mixed. The second point with respect to the 1981 data is that the evidence shows that participation rates tend to increase with the duration of residence. This is also generally true for the other census years [Statistics Canada 1989*e*; and Richmond and Kalbach 1980*b*]. Thus the tendency for labour force participation to increase with the period of residence may be a normal phenomenon, which could be explained by the fact that more years of residence give the immigrant more time to learn the language and education and gain access to networks in the Canadian labour market.

Unemployment

Another measure of labour force activity is the rate of unemployment. If immigrants tend to experience unemployment to a greater extent than the native-born, it means that their dependence on welfare assistance would also be greater relative to the native-born. Unemployment may also produce various social problems such as an increase in crime and ethnic conflict. Thus an examination of the unemployment experience of immigrants relative to the native-born would provide valuable insights into the issue of how well immigrants are adjusting to the labour market.

Census data for 1986 show that immigrants have a lower unemployment rate than the native-born – 8.2 per cent *vs.* 10.8 per cent [Statistics Canada 1989*d*]. The evidence also shows, however, that the unemployment rate increases with the recency of arrival. Immigrants who came moderately recently, during the 1978-82 period, report an unemployment rate of 11.5 per cent, slightly higher than the 10.8 per cent for the native-born. Those who arrived very recently, during 1983-86, report an unemployment rate of 16 per cent.

One would normally expect new immigrants to experience a higher unemployment rate than earlier immigrants

Table 3-1
Labour Force Participation Rates, Adjusted for Age, of the Native-Born and Immigrant Population, by Sex, Place of Birth, and Period of Immigration, Canada, 1960-81

		Period of immigration				
	Total	Before 1960	1960-69	1970-74	1975-79	1980-81
			(Per cent)			
Place of birth						
Males						
Native-born[1]	77.8	...	...	...	...	...
Immigrants	79.1	85.9	80.8	78.7	77.8	69.2
United States	77.8	83.6	80.3	76.8	75.8	70.9
Caribbean	76.3	87.9	80.0	77.5	74.8	64.3
South and Central America	79.8	87.9	82.0	80.5	81.2	69.6
United Kingdom	80.1	86.0	82.0	81.3	81.0	78.2
Other Western Europe	80.1	86.9	79.6	79.4	78.2	72.1
Central Europe	80.1	86.4	80.8	79.3	76.1	66.1
Southern Europe	81.4	86.0	81.1	81.3	82.5	76.1
Eastern Europe	78.3	81.8	82.0	81.3	77.6	75.6
Northern Europe	78.8	85.0	82.7	77.2	75.0	73.6
Africa	79.0	86.1	79.9	80.3	75.8	71.3
South Asia	78.9	87.1	81.0	78.2	79.2	69.7
Southeast Asia	76.7	87.9	80.9	74.9	79.4	67.6
East Asia	74.0	84.6	78.5	76.4	73.7	61.6
Western Asia	77.5	85.5	78.8	78.5	76.6	62.4
Oceania and other	76.5	86.1	79.3	76.7	76.8	65.9
Females						
Native-born[1]	51.0	...	...	...	...	...
Immigrants	54.6	59.1	57.3	56.7	52.5	41.2
United States	51.6	56.8	55.5	54.7	46.5	39.3
Caribbean	63.2	67.5	68.0	65.2	59.6	49.8
South and Central America	53.9	55.9	59.3	58.9	52.1	33.2
United Kingdom	56.8	61.9	59.6	57.7	55.7	45.3
Other Western Europe	50.8	54.8	54.2	50.4	50.8	36.5
Central Europe	54.8	59.0	57.0	55.8	50.1	37.6
Southern Europe	53.5	58.8	54.2	53.8	49.1	41.8
Eastern Europe	53.5	55.0	58.6	57.7	56.8	45.4
Northern Europe	52.6	56.3	53.2	50.9	46.2	37.1
Africa	56.8	61.7	60.1	58.1	52.2	43.0
South Asia	51.3	65.1	59.8	52.2	48.2	35.9
Southeast Asia	59.3	71.3	66.9	64.6	60.8	45.3
East Asia	55.5	63.8	60.8	57.1	54.7	41.5
Western Asia	43.7	60.9	53.6	43.5	37.6	22.6
Oceania and other	58.1	70.5	63.2	54.9	52.8	42.5

1 Includes 15,825 immigrants who were born in Canada.
SOURCE R. Beaujot et al. [1988, 39].

because they need some time to "settle in." One way of checking the validity of this assertion is by taking a look at previous censuses to find out whether the tendency for new immigrants to experience higher unemployment was observable even in those periods and, if so, whether their relative unemployment disadvantage was higher or lower then than now. Unfortunately, such information is not available.

Another reason for the higher unemployment experienced by newer immigrants may be the severity of the economic downturn during the mid-1980s. When the economy goes into a slump, new immigrants are likely to experience more unemployment than others for a host of reasons including lack of seniority on the job, lack of labour market contacts, and so on. During the 1983-86 period the national unemployment rate was 10.8 per cent, compared with 8.3 per cent during the 1978-82 period. Thus it would be interesting to compare the unemployment experience of immigrants who came in 1978-82 with those who came in 1983-86 during their initial years of residence. Unfortunately, the relevant data are again not available from the earlier censuses.

A third explanation for the higher unemployment of immigrants who came during 1983-86 relative to those who came in 1978-82 may be that they have less education, less experience, and less proficiency in Canada's official languages than immigrants who came earlier. To check the validity of this argument, we can look at some of the key characteristics of immigrants who came during the 1978-82 and 1983-86 periods. Such a comparison shows that the dissimilarities between the two cohorts are not large enough to constitute a plausible explanation of the unemployment rate difference. First, the median age of the two cohorts is the same, 30 years. Second, as discussed earlier, the educational levels of the two cohorts are also similar (Table 2-4). Third, 68 per cent of the 1983-86 cohort is proficient in English, compared with 74 per cent for the 1978-82 cohort. Moreover, the two groups report exactly the same level of French proficiency – 6.4 per cent. Only in terms of the proportion of persons who speak neither English nor French (allophones), is there a difference. Whereas allophones accounted for 9 per cent of the 1978-82 cohort, their share had risen to 18 per cent in the case of the more recent cohort. There is no obvious way, however, in which a change from a very small (9 per cent) to a small (18 per cent) minority of allophones could significantly affect the unemployment rate. We conclude that relative to earlier immigrants, there is very little evidence to suggest that the higher unemployment of recent immigrants can be attributed to changes in their characteristics.

The average unemployment rate is important, but it is not the only issue. It matters how quickly immigrants find jobs when they first arrive, and differences in the unemployment experience between classes of immigrants are also important. There is a public perception that refugees experience unemployment to a much greater extent than independents and that NIOs also suffer more unemployment than TIOs. Censuses do not provide data to address these issues and, therefore, we have to turn to other data sources.

Several longitudinal analyses have been undertaken on the time taken by immigrants to find jobs immediately after their arrival and on their unemployment experience. Although somewhat outdated, some of these studies deserve mention since they are the only sources of information available on some of these issues. One study [Samuel 1984] examined the unemployment experience of six refugee groups which arrived in Canada at different times during the period 1957-79. The names of the groups are given in Table 3-2. Among the aspects examined in the study were the time taken to find employment and the rate and duration of unemployment of these refugee groups during the initial years. The evidence seems to suggest that a considerable number of refugees in the sample found employment in a relatively short period of time and the average duration of their unemployment was also rather short. For example, the refugees who experienced the greatest difficulty in finding jobs were the Indochinese who came in 1979 when Canada's unemployment rate varied between 7.5 and 8.5 per cent. But even they were able to find jobs in about 16 to 20 weeks and were unemployed on the average for only 18 weeks during the first 15 months after their arrival.

Another study [Samuel and Woloski 1984] used a longitudinal survey to examine how a sample of immigrants who came in 1979 had fared in the labour market during the next three years. The survey restricted itself only to those who had some earnings to report during each year. The sample consisted of 3,687 immigrants which accounted for 3 per cent of total immigrant arrivals in 1979. Unemployment was measured by the number of weeks during which unemployed persons received unemployment insurance benefits. As a result, the actual period of unemployment is somewhat understated. The study found that the unemployment spells experienced by recently arrived immigrants were rather short, even as early as the first year after arrival, 1980. The maximum was actually in 1982, a recessionary year (Table 3-3). It also found the unemployment experience of immigrants to be roughly similar to that of the native-born. However, there were some minor differences among the various immigrant classes. Independents reported the shortest periods of unemployment, whereas the family class and refugees reported the longest spells. Assisted relatives occupied an intermediate position. When the same study looked at the unemployment experience of immigrants by

Table 3-2
Unemployment Experience of Refugees, 1957-79

	Period of arrival	Canada unemployment rate	Period until found first job	Rate of unemployment	Average duration of unemployment
		(Per cent)			
Regular immigrants	1969-71	5.0–6.0	4 to 7 weeks	10–15 per cent after 6 months 7–9 per cent after 1 year 4–5 per cent after 3 years	2 weeks in the first year 3–4 weeks in the second year 3 weeks in the third year
Hungarian refugees	1957-58	4.0–5.0	55 per cent found jobs in less than a month	. . .	61 per cent had less than 4 weeks of total unemployment in 1958
Czechoslovak refugees	1969	5.0	16 weeks. 29 per cent found jobs in less than 4 weeks	7.8 per cent after 1 year 9.1 per cent after 2 years 8.3 per cent after 3 years	7 weeks in the first year 5 weeks in the second year 4 weeks in the third year
Ugandan Asian refugees	1972	6.0–7.0	. . .	13.7 per cent after 6 months 6.7 per cent after 1 year	9.1 weeks in the first year
Tibetan refugees	1971-72	6.0–7.0	. . .	8.0 per cent in September 1974	. . .
Chilean refugees	1973-75	7.0–8.0	. . .	12.5 per cent in 1975	56.0 per cent had less than 4 weeks of total unemployment in the first year
Indochinese refugees	1979	7.5–8.5	16 to 20 weeks	10.4 per cent in 1981	18.3 weeks during the first 15 months

SOURCE Samuel [1984, 45 and 47].

Table 3-3
Average Total Weeks of Unemployment of Immigrants and the Native-Born, 1980-82

	Average total weeks of unemployment		
	1980	1981	1982
Immigrant category			
Family class	2.1	3.5	6.2
Refugees and designated classes	1.4	5.2	11.3
Assisted relatives	1.5	2.9	6.9
Independents	1.3	1.9	4.4
All immigrants	1.6	3.6	7.6
Native-born	3.7	3.7	6.3

NOTE The sample used here was constructed by matching Employment and Immigration Canada's Longitudinal Labour Force Data Base (LFDB) with the same department's Landed Immigrant Data Base (LIDB). LFDB contains data on such matters as social insurance numbers, taxes paid, records of employment, and participation in Canada manpower training programs. It makes no distinction between immigrants and the Canadian-born. LIDB, on the other hand, contains records of persons who came to Canada on landed immigrant visas.
SOURCE Samuel and Woloski [1984, 8 and 16].

country of origin, the main message was again found to be similar to that reported earlier, namely, the shortness of the unemployment spells (Table 3-4). The evidence also indicates that some immigrant groups such as those from the Caribbean, Laos, Vietnam, and Eastern Europe are somewhat more vulnerable to unemployment than others. However, the evidence is not strong enough to warrant the conclusion that new immigrant groups experience significantly more unemployment than traditional immigrant groups. Our conclusion from this admittedly old evidence is that, in the past, immigrants were able to find work rather quickly. Whether this is still the case cannot be reliably detected, the relevant data not being available, and census data, as discussed above, not being a reliable guide in this instance.

Occupational Composition

According to the 1986 census data, there are slightly more immigrant men employed in managerial and professional jobs relative to their native-born counterparts (Table 3-5). It is not clear, however, whether this is related to the differences in the age distribution between immigrants and the native-born. There are also more male immigrants working in the service, processing, and fabricating occupations relative to the native-born. However, when we look at the occupational distribution of male immigrants who arrived during the 1978-86 period, some of the above conclusions no longer hold. First, recent immigrants occupy many fewer managerial jobs relative to the native-born. Second, the proportion of recent immigrants working in the service and fabricating jobs is much higher than before, relative to the

Table 3-4
Average Total Weeks of Unemployment of Immigrants by Place of Last Permanent Residence, 1980-82[1]

	Average number of weeks of unemployment		
	1980	1981	1982
World areas			
Britain and Ireland	0.9	1.8	4.4
United States	2.2	2.3	6.9
Australia and New Zealand	2.8	2.1	5.1
Northern and Western Europe	1.3	2.3	4.6
Southern Europe	2.4	2.9	7.7
Eastern Europe	2.4	6.5	9.2
South Africa	0.7	0.1	4.0
Other Africa	2.2	5.0	5.3
India	3.8	4.5	7.4
Hong Kong	0.8	2.1	2.8
Vietnam	1.4	5.0	11.2
Laos	1.6	6.2	11.9
Philippines	1.4	2.2	5.9
Oceania and other Asia	1.7	2.9	5.5
Caribbean	2.1	5.4	8.8
Guyana	2.8	4.6	6.9
South and Central America	1.2	2.8	7.7
All immigrants	1.6	3.6	7.6

1 See note at the bottom of Table 3-3.
SOURCE Samuel and Woloski [1984, 20].

Table 3-5
Occupational Distribution of the Native-Born and Immigrant Populations, by Sex and Period of Immigration, 1978-86

	Men				Women			
	Native-born	Immigrants	Period of immigration		Native-born	Immigrants	Period of immigration	
			1978-82	1983-86			1978-82	1983-86
	(Per cent)							
Occupations								
Managerial	12.4	13.5	9.0	8.3	7.8	7.5	4.7	3.7
Professional	12.4	16.1	15.8	13.9	21.3	18.9	16.2	13.5
Clerical	7.0	5.9	6.4	6.4	34.7	28.2	23.3	18.9
Sales	9.1	7.4	6.2	6.4	9.6	8.5	6.7	6.9
Services	9.9	11.6	17.1	18.4	15.8	17.5	22.5	27.4
Primary	8.8	3.9	3.5	3.9	2.6	2.2	2.8	3.1
Processing	7.8	10.0	12.1	11.3	2.2	3.1	4.0	4.0
Fabricating	9.4	12.4	14.9	15.5	2.9	10.1	14.9	16.9
Construction	10.1	10.0	6.0	6.4	0.3	0.3	0.3	0.3
Other	13.1	9.1	9.0	9.5	2.8	3.7	4.6	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number of persons	5,929,610	1,364,605	152,880	61,425	4,451,535	994,480	123,280	47,845

SOURCE Statistics Canada [1989*b*, 1-9 to 1-12].

native-born. Similar findings apply to female immigrants as well. The fact that most of the recent immigrants have taken jobs in service industries rather than managerial jobs does not necessarily mean that their performance is inferior to that of earlier immigrants and the native-born. We need to go deeper into this to find out what effect the occupational distribution has had on the relative earnings of immigrants. This will be attempted in the next section.

An important aspect of the occupational structure which was not discussed earlier is the extent of self-employment among immigrants relative to the native-born. If immigrants go into self-employment to a larger extent than the native-born, they may provide employment opportunities to either other immigrants or the native-born, or both. This was the rationale behind the Entrepreneurial Immigration Program started in 1978 [Nash 1987] but which was expanded during the late 1980s to encourage self-employed persons, entrepreneurs, and investors to come to Canada. It is currently known as the Business Immigration Program. Some or all of the businesses created by the program, however, may be at the expense of Canadian-owned businesses, actual or potential. Hence it is not enough to simply count the number of businesses opened by immigrant entrepreneurs and attribute it to the success of the program. To be termed successful, the program ought to create businesses which would not be forthcoming otherwise. Unfortunately, the amount of incremental employment attributable to the Business Immigration Program is extremely difficult to measure. The problem is exacerbated by severe data limitations. Existing data refer to the employment *intentions* of immigrant businessmen rather than to the *actual* employment created. There is, however, a 1985 study [Wong et al.] prepared by consultants for Employment and Immigration Canada which examined the actual number of jobs created by the previous Entrepreneurial Immigration Program during the period 1978-84. Note, however, that it did not deal with the issue of incrementality. Of the 353 immigrant entrepreneurs included in the sample, 23 per cent had not established business operations during the period under review. Of the remainder, 15 per cent did not hire any full-time employees, while another 38 per cent reported employing on average three or fewer persons on a full-time basis. Overall, 67 per cent of the entrepreneurs who had set up businesses during the period of the study reported having only five or fewer persons on their full-time staff. Thus, the main conclusion of the study is that, quite apart from the question of incremental employment, even the actual employment generated by the program during the period in question was very small.

Returning to the question of self-employment, the evidence shows that in 1981, 7.9 per cent of immigrants were self-employed compared with 6.8 per cent for the native-born.[1] The corresponding figures for 1986 are 11.6 and 9 per cent for immigrants and the native-born respectively [Statistics Canada 1989*f*]. Thus the proportion of immigrants in self-employment has increased faster relative to the native-born. Nevertheless, the important point is that the differences between immigrants and the native-born are very small and might vanish when corrected for the differences in the age distribution.[2]

Another issue that is related to the occupational distribution is the public perception that refugees end up taking dead-end jobs. If that is true, it means that refugees would have a higher rate of unemployment and a greater dependence on the welfare system than the other immigrant classes. Unfortunately, this aspect cannot be discussed at this time due to major data limitations, although there is some evidence available on regular immigrants.[3] For example, the earlier discussion on the occupational distribution of immigrants could not examine either immigrant class or place of birth. And even if the above information was available, it still would not be enough to shed light on whether refugees take dead-end jobs or not since the occupational breakdown is too broad.

Dependence on Welfare Assistance

An extremely important aspect of the economic performance of immigrants is the extent of their dependence on welfare assistance compared with the native-born. A commonly held view is that many of the recent immigrants are unable to find jobs due to low educational levels, language problems, and so on, and hence end up on welfare assistance. If this is true, it is a serious matter because it indicates major adjustment problems. The data we have on this come from the census for 1986, which deals with welfare assistance from both federal and provincial sources. It refers to welfare recipients at a point in time rather than for a continuous period. Also, there is no mention of the length of receipt of payments. Subject to these limitations, the evidence shows that 12.5 per cent of the immigrants who came during the 1981-86 period received government welfare assistance, compared with 6.7 per cent of immigrants who came during the period immediately before, 1976-80, and compared with 13.8 per cent for the native-born.[4] Strictly speaking, in the above comparison we should have adjusted for such factors as age and sex. Unfortunately, this was not possible because of data limitations. Thus the most that can be said is that the preliminary evidence suggests that, contrary to popular thinking, the number of welfare recipients among recent immigrants is small and not significantly different from that of the native-born.[5]

Hours of Work and Multiple Job Holding

We now consider a few other matters of further interest before closing this section. One is the number of hours that immigrants work and the number of jobs they do. Both are important indicators of the economic performance of immigrants. If immigrants are not doing well relative to comparable native-born persons or if they are more ambitious than the native-born, one would expect them to put in longer hours and/or moonlight to a greater extent relative to the control group. While the census does not contain any information on multiple job holding, it does deal with hours of work. The data for 1986 show that immigrants and the native-born report roughly the same number of hours – 39.50 and 39.85 hours per week for the native-born and immigrants respectively.[6] Strictly speaking, however, one should look at hours of work by both period of arrival and by immigrant class since the general impression of the public is that it is the refugees who put in longer hours and/or moonlight more than any other immigrant group. Unfortunately, census data do not provide a breakdown of hours of work by date of arrival or by immigrant class. A few case studies[7] do address the issue with respect to refugees, but they do not present a control group to serve as the basis for comparison, and the sample size is also extremely small.

Summary

The previous discussion brings out the following interesting points. First, immigrants in general have a lower unemployment rate than the native-born. However, recent immigrants report a higher unemployment rate than earlier immigrants as well as the native-born, which probably is a reflection of the settling-in period. Second, some old evidence suggests that immigrants have been able to find employment in a relatively short period of time after their arrival. Unfortunately, there is no way of checking whether this is true today because of the lack of data. Third, preliminary evidence shows that the dependence of new immigrants on social welfare assistance is small and significantly different from that of the native-born. Thus the overall conclusion is that immigrants have done fairly well in the labour market. However, this discussion is incomplete since it left out the relative earnings of immigrants. This is one of the key aspects addressed in the rest of the paper.

4 Immigrant Earnings and Discrimination

Review of the Literature on Immigrant Earnings and Discrimination

This chapter begins with a survey of the literature dealing with the main issues, the methodology used by previous writers, and their main findings. Building on the methodology used in past studies, we then present a detailed discussion of the approach adopted in the present study, the various hypotheses being tested, and the principal findings.

The most popular explanation of earnings differentials among individuals is couched in part in terms of human capital theory plus spatial variations in productivity and other factors such as gender and labour market discrimination. According to studies which have used this approach in the United States – for example, Becker and Chiswick [1966] and Mincer [1970] – differences in the earnings of individuals can be explained in terms of differences in education and experience while controlling for other variables such as place of residence and gender.

In Canada, several studies have been undertaken to analyse the earnings differential between immigrants and the native-born. Tandon [1977] utilized the human-capital approach to examine the differences in earnings between native-born and immigrant adult males in Toronto. Using data from the 1971 census, he expressed annual earnings as a function of the years of schooling, labour market experience, industry, occupation, weeks worked during the year, and the duration of residence in Canada. Later on in his analysis, the author split the schooling and experience variables into their pre- and post-immigration levels. He found the effect of Canadian schooling and Canadian experience on immigrant earnings to be more significant than schooling and experience acquired abroad. When the author desegregated the immigrant population by country of origin, he found that immigrants from the United States earned consistently more than the native-born. Immigrants from the United Kingdom, on the other hand, initially earned less than the native-born, but after a period of time reported earnings in excess of those of the native-born. In contrast to these two groups, earnings of immigrants from Western Europe, Southern Europe, Asia, Latin America, and the Caribbean tended to lag behind the earnings of the native-born and of other immigrants, when education and experience were held constant. Tandon's analysis suggests that these earnings differentials may be due to discrimination, although the author did not subject the hypothesis to empirical testing.

Marr [1976] analysed the earnings profiles of foreign-born and Canadian-born men in Ontario as part of a larger study dealing with the labour market implications of immigration policy for Ontario. For this purpose, he used data from Statistics Canada's 1973 microdata file on labour mobility. This is a data set containing observations on over 44,000 individuals, 18 years of age and over, and who were not full-time students in March 1973. Marr's sample was restricted to a group of 7,624 individuals who lived in Ontario. Of this, the foreign-born segment was 2,376. The author found that the payoff to education in terms of earnings is slightly higher for immigrants with secondary education. But, for those with 14 or more years of education, the earnings of the Canadian-born were found to be almost 50 per cent higher than for the foreign-born. The author interpreted this result to imply that other things remaining constant, the amount of discrimination grows with the level of education. However, no attempt was made to subject the discrimination hypothesis to closer scrutiny.

In addition to Tandon and Marr, several other studies have analysed the earnings of individuals using the 1971 census data. Although some of these studies do not directly address the issue of differences in earnings between native-born and foreign-born individuals, some inferences can be drawn from them. For example, Kuch and Haessel [1979] analysed the variations in employment earnings of persons aged 15 years and over. They presented empirical estimates of earnings desegregated by ethnic group and birthplace. Three birthplace dummy variables were included in their model to distinguish the foreign-born according to the length of stay in Canada. The study found that the duration of residence did not have a significant effect on earnings. This finding is at variance with the result of many other studies which report a strong positive relationship between the length of residence and earnings.

Richmond and Kalbach [1980*a*] analysed the earnings of men and women aged 15 years and over, using the 1971 census data. A major finding of this study is that over a 10-year period, 1961-71, the median income of postwar immigrants increased at a faster rate than the median income of the native-born. On the basis of this, the authors

concluded that the period of residence in Canada has a strong positive influence on the earnings of immigrants. The study also found that immigrants from the United Kingdom and the United States reported the highest earnings while those from Asia and Southern Europe had the lowest earnings. But the study found that although birthplace, ethnicity, and language have a statistically significant influence on earnings, the size of their impact, judging from the magnitude of the regression coefficients, is relatively small.

In a more recent study, Richmond [1989] examined the economic performance of Caribbean immigrants in Canada, using the 1981 census data. He found that, after controlling for age and education, Caribbean-born male immigrants earned 18 per cent less than Canadian-born men, while Caribbean-born female immigrants earned 11 per cent less than their Canadian-born counterparts. These earnings differentials were found to exist despite the absence of any major linguistic barrier, since 82 per cent of Caribbean immigrants in the sample spoke English. These findings tend to indicate a possibility of discrimination against Caribbean immigrants. A case for discrimination, however, needs to control for more variables than age and education and explain why, if the differential was due to prejudice, discrimination against women was less than that against men.

Carliner [1980] analysed wage differences among language groups, using the 1971 census data. He found that workers who were not proficient in either of the two official languages earned the lowest wage. Native-born French-speaking persons who learnt English experienced significant wage increases. But, native-born English-speaking persons who learnt French did not receive a significant wage premium over others. Carliner's results also indicated that while recent immigrants were at an earnings disadvantage, compared with the native-born, those who arrived in Canada more than 10 years ago earned higher wages than native-born Canadians. These differences, however, were found to be not always significant. Another important finding reported by the author is that the native-born children of immigrants earned significantly more than the children of the native-born. On the basis of the last two findings mentioned above, Carliner arrived at the conclusion that "the speed of adjustment to Canada is very rapid, at least for immigrants from English-speaking countries" [p. 395]. However, no attempt was made to check whether this conclusion would hold for immigrants from different English-speaking regions – e.g., South Asia and the Caribbean or for immigrants from other regions which are non-English speaking.

Chiswick and Miller [1988] analysed the determination of income for male immigrants and the male native-born, using census data for 1971 and 1981. For 1981, they found that the average newly arrived immigrant earned about one quarter less than a comparable Canadian-born. However, immigrants' earnings were shown to rise with their length of stay. After 22 years of residence in Canada, immigrants were able to achieve equality with the native-born in terms of their earnings. The pre- and post-immigrant levels of labour market experience were also computed and analysed along with the effect of schooling. It was found that pre-immigration experience had a much smaller effect on earnings than post-immigration experience, a finding which is consistent with that reported by Tandon and which was discussed earlier. With regard to schooling, it was reported that its effect on earnings was greater for immigrants from the English-speaking developed countries than for other immigrants. The study also reported significant differences in earnings for immigrants from different countries. Compared to immigrants from the United States, which was used as the benchmark for comparison, those from the United Kingdom were reported to have a significant earnings advantage, when all other variables were held constant. The earnings of immigrants from Southern and Western Europe were found to be roughly the same as those from the United States. But the earnings of immigrants from Eastern Europe and Asia were found to be less than the earnings of immigrants from the United States by 5 and 12 per cent, respectively.

Another important finding of the Chiswick-Miller study relates to the children of immigrants. It found that for the census year 1971, the Canadian-born children of immigrants earned 2 per cent more than the children of the native-born, other things remaining the same. Incidentally, the authors mention that this finding is consistent with the results they had obtained previously for the United States and Australia, where the native-born sons of immigrants were found to earn 5 and 1 per cent, respectively, more than the sons of native-born parents, other things remaining the same. The finding that the children of immigrants do better than the children of the native-born shows that immigrants adapt to conditions of the host country quite well. Thus it tends to weaken the argument that there is discrimination against immigrants. Note, however, that Chiswick and Miller did not go past 1971 because of the lack of data. Nor did they undertake a sufficiently desegregated analysis to shed light on the question of whether the relatively superior performance of immigrant children also applies to the children of visible minority groups from Asia, the Caribbean, and Africa.

Meng [1987] studied the earnings profile of immigrants and the native-born, using data from the 1973 labour mobility survey undertaken by Statistics Canada. This, incidentally, is the same database which was used by Marr

[1976]. Meng's sample was restricted to a group of men, aged 22 to 64, who had reported some income for 1972. A major feature of this database is that it contains direct information on the labour market experience of individuals. The other studies mentioned before used a proxy for experience. The results of Meng's study indicate that foreign-born men initially earn less than native-born men, but experience a rapid growth in earnings as they acquire more Canadian labour market experience. After 14 years, the earnings of male immigrants are found to be equal to the earnings of the male native-born. The main conclusion of the study is that immigration does not present major adjustment problems. Meng also considered the adjustment problems of immigrants from the United States, the United Kingdom, Western Europe, Eastern Europe, Southern Europe, and the rest of the world and found that none of these groups faced any serious adjustment problems.

The foregoing argument that immigrants adjust rapidly to the economic conditions of the host country has come under criticism from Borjas [1988]. Borjas points out that cross-section studies based on a single year rely on a variable representing the years of residence in the host country (*YRC*) to measure the labour market success of immigrants relative to the native-born. However, *YRC* also represents the date of entry into the host country. As a result, the coefficient of *YRC* measures both labour market progress (the assimilation effect) and the effect of the average difference in unmeasured factors across successive entry cohorts (the cohort effect). For this reason, Borjas claims that cross-section analysis based on a single year is inappropriate to measure the economic adjustment of immigrants. The ideal solution is to use longitudinal data which are hard to find. As a crude alternative, Borjas resorts to pooled regression analysis based on two census years, 1971 and 1981. His analysis covered the United States, Canada, and Australia, and the results show that there has been a decline in the quality of immigrants over time and that, as a consequence, the assimilation process is much slower than suggested by the cross-sectional studies.

In the above research, Borjas, unfortunately, made no adjustment for such factors as productivity growth and inflation which certainly influenced wage growth between the two census years. A recent Canadian study by Bloom and Gunderson [1989] demonstrates that, after these adjustments have been incorporated, cross-section analysis based on one year provides results which are similar to those derived from pooled regressions using Borjas' technique.

Another Canadian study by deVoretz and Fagnan [1990] examined the issue of quality decline among immigrants during the period 1971-86. It did not, however, make any adjustment for productivity change and inflation, as suggested by Bloom and Gunderson. The main findings of deVoretz and Fagnan are the following. First, with respect to male immigrants, their quality has declined between 1971 and 1981 but not thereafter. But it is not clear why the deterioration in quality stopped in 1981. Second, male immigrants employed in the professional categories did not experience a decline in quality at any time during the period under examination. Thus the study argues that the quality decline occurred only among the less skilled immigrants. Third, immigrant women seem to have been immune to the deterioration in quality, although the reason for this is not immediately apparent.

Beaujot and Rappak [1988] addressed the issue of assimilation by examining the earnings differentials of traditional immigrant groups and new immigrant groups. But this study did not employ Borjas' method of analysis. Its main message is that new immigrant groups, especially those who arrived during the 1980s, face significant problems adjusting to the Canadian labour market because of lower educational attainments and language problems. The study suggests that there has been a deterioration in the quality of immigrants coming to Canada during the 1980s. Beaujot et al. [1988] report findings similar to those of Beaujot and Rappak. Their study shows that some immigrant groups were unable to match the earnings of native-born persons with similar qualifications, even after living in Canada for 20 years. This applies mainly to those from Southeast Asia, Southern Europe, Oceania, the Caribbean, South and Central America, and West and East Asia.

To sum up this section, the main thrust of the preceding discussion is to highlight that there is indeed often an apparent disparity in earnings between immigrants and the native-born. While some studies show that many immigrants have done well in the host country, other studies claim that this is not true of all immigrants. They argue that the earnings of certain immigrant groups have consistently lagged behind the earnings level of comparable Canadian-born persons even after many years of stay in this country. Many of these are believed to be new immigrant groups. One explanation for this phenomenon put forward by Borjas and others[1] is a deterioration in the "quality" of immigrants arriving in Canada as a result of a less restrictive immigration policy. Another explanation for the lower earnings of immigrants relative to the native-born is the possibility of labour market discrimination against immigrants. Unfortunately, carefully controlled formal analyses of discrimination against immigrants have rarely been done.[2]

In what follows, we try to examine to what extent the differences in earnings between immigrants and the native-

born can be attributed to such factors as education, experience, and language, and to what extent they are due to discrimination in the labour market.

Some Issues in the Analysis of Earnings Differentials between Immigrants and the Native-Born

Many of the studies reviewed in the preceding section concentrate on the working population rather than on the total population. This procedure has been criticized by some authors. Akbari [1988] argues that the important question is not so much how an employed immigrant performs over his life cycle compared to an employed native-born, but how an immigrant fares compared to a native-born person. The argument is that the analysis should focus on the entire immigrant population and also on total income rather than employment income. Several points can be made about limiting the analysis to only employment income. First, labour income is by far the most important component of total income. Hence, by studying labour income, we can get valuable insights into the behaviour of total income. Second, total income includes not only wages and salaries but also many other components such as dividends and interest income, old age security pension, guaranteed income supplements, and so on. It is not immediately clear how these components are causally related to many of the explanatory variables discussed earlier such as the period of residence and education. Third, if the focus of the study is on the economic adaptation of immigrants, then it is preferable to discuss it in the context of labour market conditions. For these reasons, the present study confines itself to employment earnings.

A second general criticism of many of the above studies is that they only deal with men. However, immigration statistics in Canada reveal a significant proportion of women in recent immigrant arrivals. During the 1978-85 period, women have accounted for over 50 per cent of immigrants to Canada. Hence, for a more thorough analysis of immigrant earnings, one should consider both men and women. This argument has considerable validity. Hence this study examines the earnings profile of all immigrants and compares it with the earnings profile of comparable native-born persons.

A third criticism is the specification of the earnings model in many of the above-mentioned studies. Most of these studies have utilized the basic post-schooling earnings model of Mincer [1974], according to which earnings are a function of the number of years of schooling, the number of years of post-schooling experience in the labour market, experience squared (to capture the diminishing returns to experience), and the number of weeks worked during the year as a labour-supply variable. Data on the experience variable are not often available. As a crude measure of experience, Mincer used age minus years of schooling minus five. This estimating procedure involves the assumption that at any given point in time, an individual is either employed or in school. According to Blinder [1973], Mincer's definition is appropriate only for "groups with continuous work histories uninterrupted by childbearing, service in the armed forces, spells of unemployment, and the like. How one might go about identifying these people in the absence of actual work histories is a good question." The difficulties mentioned by Blinder may be relevant to certain groups such as immigrants and females who do not have continuous employment.

Meng's [1987] study provides some evidence on the above issue. He estimated the earnings model for immigrants and the native-born using separately the actual work experience data and Mincer's proxy variable. The average gap between Mincer's proxy and the actual work experience was found to be 3.13 years for the native-born and 4.11 years for immigrants. Meng's results show that when Mincer's proxy variable is used, the rate of return on experience in the case of immigrants was 2.83 per cent, compared with 3.71 per cent when actual work experience data were used. In the case of the native-born, the rate of return on experience was 3.3 per cent with Mincer's proxy, whereas it was 3.18 per cent with the actual work experience variable. The reason for these discrepancies appears to be the large gaps between the actual work experience and the proxy measure. This led Meng to use actual work experience data instead of proxy variables. However, in the absence of data on actual work experience, there is very little that can be done to rectify the problem. Hence in this study we have used Mincer's proxy variable.

Another important issue relates to the distinction between pre- and post-immigration experience. As mentioned in the literature, post-immigration experience is likely to have a more significant effect on earnings than pre-immigration experience since it is more closely geared to the Canadian labour market and may be of higher quality. One way of capturing the differential effects of pre- and post-immigration experience is to include an experience variable (*EXP*) and a years-of-residence variable (*YRC*) in the immigrant earnings equation. This is what Chiswick and Miller did. Note, however, that Mincer's *EXP* proxy, refers to total pre- and post-immigration experience. Thus *EXP* includes *YRC*, the latter being a proxy for Canadian experience. Hence the technique used by Chiswick and Miller involves double counting. A more satisfactory solu-

tion is to calculate the difference between *EXP* and *YRC* and use that as a crude measure of pre-immigration experience (*EXPB*). In this study, we have relied mainly on *EXP* as our experience variable. But in some regressions, we have also used *YRC* and *EXPB* as measures of post- and pre-immigration experience respectively.

The use of *YRC* as a proxy for Canadian experience, however, is open to question since for many immigrants there is an initial period of familiarization which is not quite the same as labour market experience. Unfortunately, none of the studies reviewed earlier has looked at this aspect. To take account of this "settling in period" in a crude manner, we ran some regressions with *YRC* minus one year for want of a better measure. This probably is a rather conservative measure since the "settling in period" may take more than a year for some immigrants who initially are not proficient in Canada's official languages and/or lack the education and experience needed in the labour market. However, our results are not reported since they showed that it really did not matter whether we used *YRC* or *YRC* minus one.

Another issue which has been discussed in the literature on immigration relates to the inclusion of labour supply effects in the model. Human capital theory assumes that an individual's objective is to maximize his or her lifetime earnings. Hence, as noted by Blinder [1976], the earnings equation relates to potential rather than actual earnings. Thus, if the logarithm of annual earnings is the dependent variable and the individual chooses to work only part of the year or part-time, then some control for labour supply should be included. For this reason, Mincer [1974] suggested that the natural logarithm of the number of weeks worked be included in the earnings equation. However, the inclusion of a labour-supply variable leads to a simultaneity problem. This is because labour supply itself is a function of earnings. This problem has led to a discussion in the literature regarding the appropriate dependent variable to be used – that is, whether to use annual earnings or the wage rate. But the issue still remains unresolved mainly because of a lack of clarity in the empirical studies about the relationship involving annual earnings, wage rates, and labour supply. Many studies have ignored these complications for the sake of simplicity and have included weeks of work as an explanatory variable. Initially, we also adopted the same procedure and found that when the dependent variable was the logarithm of annual employment income, the value of the regression coefficient of the logarithm of weeks worked was high – in the neighbourhood of 0.80. Several other writers have also reported similar high values. The estimated value of the regression coefficient of the logarithm of weeks worked in the Chiswick-Miller study [1988] was 0.96, while Meng [1987] obtained estimated values ranging from 0.673 to 0.895. Because of the high values obtained for the weeks variable, we have used the following strategy – that is, to divide annual employment income by weeks worked during the year and derive a measure of average weekly earnings. Thus the dependent variable used in this study is the natural logarithm of average weekly earnings. Simultaneity of wages and hours, however, still is a problem because of the inclusion of an hours-of-work variable in our regression analysis. However, several studies that resorted to two-stage least squares produced results broadly similar to those derived from ordinary least squares [Mincer and Polachek 1974; and Sandell and Shapiro 1978].

Econometric Analysis of Immigrant Earnings

Broadly speaking, we want to know how far immigrants succeed in matching the earnings of comparably qualified native-born persons, over what period, and whether any persisting wage gap traceable to discrimination exists. In the latter case, we wish to further find out whether the wage gap is greater for visible minorities than for other immigrants or whether it exists only in the case of visible minorities.

To measure the extent of discrimination against immigrants, it is first necessary to disentangle it from the other variables which also influence the wage differential between immigrants and the native-born. The technique used for this purpose is regression analysis. It basically involves comparing results from four regression equations, in which the dependent variable is earnings of immigrants or the native-born, as the case may be. A wide variety of independent variables were used, of which the most important ones are those pertaining to human capital and language proficiency. The key human-capital variables are education and experience. Some would argue that language should also be considered as a human-capital variable.

As should be obvious from the previous survey of the literature, both education and experience should be positively related to earnings. However, in the case of both of these variables, their rates of return are likely to vary between immigrants and the native-born because of differences in quality. The general expectation is that, because of higher quality, Canadian education and experience should command a premium over foreign education and experience. Such quality differences may be either genuine or merely based on the perceptions of prospective employers. Unfortunately, the regression analysis used here cannot shed any light on this issue. Nor can it answer the question whether prospective employers use these quality differences as an excuse to discriminate against immigrants.

Besides education, experience, and language proficiency, previous studies have used many other independent variables such as occupation, province of residence, urban/rural living, public/private sector employment, sex, marital status, and country of origin. Although the rationale for some of these variables is not entirely clear, we have also included them in our regressions for the sake of comparability with earlier studies. One thing, however, that is not found in many of the previous studies is any attempt to adjust for quality differences in education and experience between immigrants and the native-born which, as mentioned before, may be quite important. The failure to control for such quality differences leads to an upward bias in the estimate of discrimination.

To address the previous issue, the present study created two groups of immigrants. One group consists of persons who came to Canada after receiving some of their education and labour market experience in their home countries. Let us call this Sample A. The other group includes immigrants who received all of their education and experience in Canada (Sample B). Corresponding to these two immigrant samples, we created two samples of native-born persons. They are referred to as Samples NA and NB. The procedure we followed in the construction of the two native-born samples was to match the average age of each native-born sample with that of the corresponding immigrant sample. This led us to include all native-born persons in the 40-to-55 years age bracket in Sample NA, and those in the 20-to-34 years age group in the case of Sample NB. Apart from age, no other criteria were taken into account.

In the case of Sample A immigrants, their earnings may differ from those of comparably qualified native-born persons for a variety of reasons including discrimination, quality differences in education and experience, and differences in the amount of access to labour market networks. Thus, if there exists an earnings differential between Sample A immigrants and their native-born counterparts, we cannot attribute it solely to discrimination. By contrast, in the case of Sample B immigrants, this problem is less pronounced. Given that these immigrants received all of their training in Canada, there cannot be quality differences in education and experience between themselves and native-born persons in Sample NB. Furthermore, Sample B immigrants are likely to have the same accent and similar access to labour market networks as native-born persons in Sample NB. For these reasons, one would expect immigrants in Sample B to receive the same earnings as native-born persons in Sample NB. But, if such is not the case, then we can assert with reasonable confidence that the wage gap is due to discrimination based on colour. Thus Sample B serves as the control group in the measurement of discrimination.

In the preceding discussion, the main issue related to the derivation of a purer estimate of discrimination by indirectly adjusting for quality differences in education and experience between immigrants and comparably qualified native-born persons. However, there are other factors which may also have an important influence on the relative earnings of immigrants but which had to be excluded from the present analysis because of data limitations. These include such factors as motivation, natural ability, and family background. Thus, while we have tried to be as thorough as possible, there is no guarantee that we have been able to control all the factors which influence the relative earnings of immigrants.

In addition to testing for discrimination against immigrants, the regression analysis used in this study also enabled us to test several other questions relating to immigrant earnings. Based on the earlier discussion on education, experience, and language proficiency, issues that can be examined include: (i) whether rates of return on education differ between immigrants and the native-born; (ii) whether it makes a difference to immigrant earnings if work experience was obtained in Canada or in the country of origin; (iii) whether the impact of experience on earnings increases at an increasing, constant, or decreasing rate over time; (iv) whether language proficiency, in English or French or both, makes a difference to earnings.

Specification of the Earnings Equation

We start with two earnings equations, one for immigrants and another for the native-born.

Following previous studies, the most general type of earnings equation for the ith immigrant is given in semi-logarithmic form as:

$$\begin{aligned}\ln Y_{i,F} &= \alpha_{0i,F} + \alpha_1 ED_{i,F} + \alpha_2 EXP_{i,F} \\ &+ \alpha_3 EXP^2_{i,F} + \alpha_4 SEX_{i,F} + \alpha_5 DEG_{i,F} \\ &+ \alpha_6 ENG_{i,F} + \alpha_7 BIL_{i,F} + \alpha_8 ALLO_{i,F} \\ &+ \alpha_9 EAS_{i,F} + \alpha_{10} SEAS_{i,F} + \alpha_{11} SAS_{i,F} \\ &+ \alpha_{12} WAS_{i,F} + \alpha_{13} NAF_{i,F} + \alpha_{14} OAF_{i,F} \\ &+ \alpha_{15} SCAM_{i,F} + \alpha_{16} CARIB_{i,F} \\ &+ \alpha_{17} SEU_{i,F} + \alpha_{18} EEU_{i,F} \\ &+ \alpha_{19} GOVT_{i,F} + \alpha_{20} MARIT_{i,F} \\ &+ \alpha_{21} CMA_{i,F} + \alpha_{22} BC \\ &+ \alpha_{23} ONT_{i,F} + \alpha_{24} PRAIRIE_{i,F} \\ &+ \alpha_{25} ATL_{i,F} + \alpha_{26} \ln HRS_{i,F} \\ &+ \alpha_{27} MANAG_{i,F} + \alpha_{28} NATSC_{i,F} \\ &+ \alpha_{29} SOCSC_{i,F} + \alpha_{30} TEACH_{i,F} \\ &+ \alpha_{31} MED_{i,F} + \alpha_{32} ART_{i,F}\end{aligned}$$

$$+ \alpha_{33} CLERIC_{i,F} + \alpha_{34} SALES + \alpha_{35} SERVICE_{i,F} + \alpha_{36} FARM_{i,F} + \alpha_{37} PRIMARY_{i,F} + \alpha_{38} MACHIN_{i,F} + \alpha_{39} CONSTR_{i,F} + \alpha_{40} TRANSP_{i,F} + \alpha_{41} OTHER_{i,F} + e_{i,F}. \quad (1)$$

Where

$\ln Y$ = natural logarithm of average weekly earnings of the ith immigrant (the subscript $_{i,F}$ stands for the ith foreign-born person or immigrant);

ED = education represented by years of schooling ($\alpha_1 > 0$);

EXP = experience which is estimated as age – *ED*–5 ($\alpha_2 > 0$);

EXP^2 = to reflect the declining marginal returns to *EXP* ($\alpha_3 < 0$).

In some regressions, we split the experience variable into its Canadian (*YRC*) and foreign experience (*EXPB*) components. As discussed in the earlier section, one would normally expect the coefficient of *YRC* to be positive and greater in magnitude than the coefficient of *EXPB*. The sign of *EXPB* cannot be determined a priori. Corresponding to these two variables, we also included YRC^2 and $EXPB^2$ to take into account the diminishing marginal returns to both Canadian and foreign experience.

SEX = a dummy variable for gender. Women are believed to earn less than men for various reasons including discrimination. Hence $\alpha_4 < 0$;

DEG = a dummy variable for the possession of a university degree. According to some writers – Chiswick and Miller [1988] and Meng [1987] – *DEG* has an independent effect on earnings that is not captured by the other educational and experience variables. Their reasoning is that since it is often difficult to evaluate the skills of immigrant job applicants for various reasons – e.g., lack of knowledge of their homelands, difficulties of checking references, and so on – employers tend to use the possession of a university degree as a screening device. Hence *DEG* should have a greater effect on immigrants than the native-born. To capture this effect a dummy variable is used, assuming the value of 1 if the respondent has a university degree; 0 otherwise, ($\alpha_5 > 0$);

ENG = a dummy variable signifying official language proficiency in English only. Relative to those proficient in French only, those who speak English (*ENG*) are expected to receive higher earnings. Hence $\alpha_6 > 0$;

BIL = a dummy variable representing bilingualism. Relative to those proficient in French only, bilingual persons are expected to earn more. Hence $\alpha_7 > 0$;

ALLO = a dummy variable for allophones who speak neither English nor French. Their earnings are expected to be lower relative to those who speak French ($\alpha_8 < 0$).

The following country dummy variables were also included:

EAS, *SEAS*, *SAS* and *WAS*
= East Asia, Southeast Asia, South Asia, and West Asia;

NAF and *OAF*
= Northern Africa and other Africa (excluding Southern Africa);

SCAM and *CARIB*
= South and Central America and the Caribbean;

SEU and *EEU*
= Southern Europe and Eastern Europe. The reference group consists of Western Europe, Northern Europe, the United States, Southern Africa, Australia, and New Zealand.

There is a public perception that the quality of the education and experience of immigrants in the reference group is similar to that of the native-born, whereas in the case of the 10 other groups included in the regression, the quality of their education and experience is believed to be lower than that of the native-born. If this is true, it means that these 10 immigrant groups included in the regression should receive lower earnings relative to the reference group of immigrants. Labour market discrimination may be another factor contributing to these earnings differentials. Hence, if there is discrimination, α_9 to α_{18} would be negative.

Besides these variables, we have included the following additional variables, which have also been used in previous work.

GOVT = a dummy variable to capture the effect of government employment. Many writers – e.g., [Chiswick and Miller 1988] have found that the government sector pays more than the private sector. If this is true, $\alpha_{19} > 0$ which in turn implies that the government either does not discriminate or discriminates less than private employers;

MARIT = a dummy variable for married persons. The reasons why married persons may earn more than unmarried individuals are not entirely clear. It may be that they have greater motivation than persons who are not married. This would imply that $\alpha_{20} > 0$;

CMA = a dummy variable to represent living in large urban areas. This variable is intended to capture the effect of the high relative cost of urban living on earnings. Hence $\alpha_{21} > 0$;

ONT, BC, PRAIRIE and ATl
= four dummy variables representing the province of residence. Quebec is used as the reference group. One would generally expect provinces with rapid growth relative to Quebec to experience higher earnings. This means that α_{23} and $\alpha_{22} > 0$ while $\alpha_{25} < 0$. The expected sign of α_{24} is uncertain.

ln *HRS* = Natural logarithm of average hours worked per week. Note that census data are for the reference week. Previous studies have used a part-time dummy variable. We experimented with both of these variables but found the results to be essentially the same ($\alpha_{26} > 0$).

In addition to the above, 15 occupational variables are also included, with PROCESSING as the reference group. These occupational groups are the following:

MANAG = managerial;
NATSC = natural sciences;
SOCSC = social sciences;
TEACH = teaching;
MED = medicine;
ART = recreation and fine arts;
CLERIC = clerical;
SALES = sales;
SERVICE = services;
FARM = farming;
PRIMARY = other primary occupations;
MACHIN = machining;
CONSTR = construction;
TRANSP = transportation;
OTHER = other groups not elsewhere specified, except processing.

There is, however, the usual problem that, as with tests of discrimination against women, streaming into unfavourable occupations can be a method of discrimination.

One would expect the signs of the coefficients of *MANAG*, *NATSC*, *SOCSC*, and *MED* to be positive (relative to processing). But for the other categories, it is not clear whether the coefficients would be positive or negative.

$e_{i,F}$ which is the last variable in equation (1) is an error term.

The foregoing relates to the earnings equation for immigrants. The comparable equation for the native-born has the same variables as the equation for immigrants but with the omission of the allophone and country variables. The complete earnings equation for the jth native-born person is:

$$\begin{aligned}\ln Y_{j,N} &= \alpha_{0j,N} + \alpha_1 ED_{j,N} + \alpha_2 EXP_{j,N} + \alpha_3 EXP^2_{j,N} \\ &+ \alpha_4 SEX_{j,N} + \alpha_5 DEG_{j,N} + \alpha_6 ENG_{j,N} \\ &+ \alpha_7 BIL_{j,N} + \alpha_8 GOVT_{j,N} + \alpha_9 MARIT_{j,N} \\ &+ \alpha_{10} ONT_{j,N} + \alpha_{11} BC_{j,N} + \alpha_{12} PRAIRIE_{j,N} \\ &+ \alpha_{13} ATL_{j,N} + \alpha_{14} \ln HRS_{j,N} \\ &+ \alpha_{15} MANAG_{j,N} + \alpha_{16} NATSC_{j,N} \\ &+ \alpha_{17} SOCSC_{j,N} + \alpha_{18} TEACH_{j,N} \\ &+ \alpha_{19} MED_{j,N} + \alpha_{20} ART_{j,N} \\ &+ \alpha_{21} CLERIC_{j,N} + \alpha_{22} SALES_{j,N} \\ &+ \alpha_{23} SERVICE_{j,N} + \alpha_{24} FARM_{j,N} \\ &+ \alpha_{25} PRIMARY_{j,N} + \alpha_{26} MACHIN_{j,N} \\ &+ \alpha_{27} CONSTR_{j,N} + \alpha_{28} TRANSP_{j,N} \\ &+ \alpha_{29} OTHER_{j,N} + e_{j,N.} \end{aligned} \quad (2)$$

After running these equations, we can find out whether the hypotheses mentioned earlier can be accepted or rejected. Furthermore, by comparing the immigrant and the native-born equations, we can determine whether there is any discrimination against immigrants in general, as opposed to discrimination against specific immigrant groups relative to other groups.

Measurement of Discrimination

The type of discrimination which is subject to scrutiny in this study is wage discrimination – that is, whether immigrants receive equal pay for equal work relative to native-born persons with similar qualifications. That is the only

form of labour market discrimination discussed here.[3] To detect discrimination, if it exists, we have to compare the immigrant and the native-born equations. They are different, as regards the variables included and the parameters estimated.

There are three types of variables to be considered. The first refers to variables which describe the endowments common to both immigrants and the native-born and hence appear in both equations. Let us call them X variables. Thus we have for the two population groups:

$$X_0^I, X_1^I, X_2^I \ldots X_n^I. \tag{3}$$

$$X_0^N, X_1^N, X_2^N \ldots X_n^N. \tag{4}$$

where the superscripts I and N refer to immigrants and the native-born respectively and X_0^I and X_0^N are the constant terms which are also included among X variables.

Next, there is a second group of variables called R variables which describe characteristics specific to immigrants and thus appear only in the immigrant equation:

$$R_1, R_2 \ldots R_r. \tag{5}$$

For theoretical completeness, we also include a third set, which is empty in this case, of variables called S variables which describe characteristics specific to the native-born and thus appear only in the native-born equation:

$$S_1, S_2 \ldots S_s. \tag{6}$$

Now we can write the two earnings equations in their complete form as follows:

$$\overline{Y}_I = a_0^I X_0^I + a_1^I X_1^I + \ldots a_n^I X_n^I + b_1 R_1 + b_2 R_2 + \ldots b_r R_r. \tag{7}$$

$$\overline{Y}_N = a_0^N X_0^N + a_1^N X_1^N + \ldots a_n^N X_n^N + c_1 S_1 + c_2 S_2 + c_S S_S. \tag{8}$$

The next step is to perform the following experiment. This involves giving immigrants the native-born endowments or characteristics. Call the earnings of such immigrants $Y_I^{(NE)}$. This yields the following equation:

$$Y_I^{(NE)} = a_0^I X_0^N + a_1^I X_1^N + \ldots a_n^I X_n^N + b_1 R_1 + b_2 R_2 \ldots b_r R_r. \tag{9}$$

The earnings differential between immigrants and the native-born – that is, equations (8) and (7) can be broken down into two parts – the portion attributable to endowment differences – that is, equations (9) and (7), and the remainder attributable to discrimination which is equations (8) and (9).

The endowment effect is given by

$$\overline{Y}_1 - Y_1^{(NE)} = \sum_{j=1}^{n} a_j^I (X_j^I - X_j^N). \tag{10}$$

Equation (10) shows the value of the disadvantage in endowments possessed by immigrants as evaluated by the immigrant earnings equation.

The discrimination effect is given by

$$\overline{Y}_N - Y_I^{(NE)} = \sum_{j=0}^{n} X_j (a_j^I - a_j^n) = C_1 S_1 \ldots C_5 S_5 - b_1 R_1 + \ldots b_r R_r). \tag{11}$$

The first sum in equation (11) is the difference between how the immigrant equation would value the characteristics of the native-born and how the native-born equation actually values them. Note that this sum exists only because the market evaluates differently the identical bundle of characteristics if possessed by members of different demographic groups. Hence it is a reflection of discrimination. The second sum, which is also a component of discrimination, is the residual difference between the two demographic groups because of different included variables in the two equations.

Since the foregoing methodology treats discrimination as an unexplained residual, measurement errors and omitted variables would tend to provide biased estimates of the discrimination coefficient. The issue of omitted variables has already been discussed. In addition, there could be measurement problems. For example, the use of the Mincer proxy to measure experience is not entirely satisfactory for reasons given earlier. Similarly, the use of $EXP - YRC$ to measure foreign experience is at best only a crude approximation. The effect of these missing variables and measurement errors will be reflected in the intercept term and could produce a bias of unknown size and sign in the estimate of the discrimination coefficient.

The Data

The data used in the regressions are from the Public Use Sample Tape for the census year 1986. The study is limited to wage earners in the immigrant and native-born labour force between the ages of 20 and 64 and who reported some earnings during the year. Self-employed persons were

excluded from the analysis because of our interest in testing the effect of discrimination on wage earners.

Since census data do not mention whether the immigrant received his education and experience in Canada or abroad, it is important to explain the method employed to derive this information.

The criterion for selecting immigrants for Sample A is quite straightforward. It includes all immigrants with $EXPB > 0$. That is, immigrants who have had foreign experience before coming to Canada. The method used for creating Sample B is the following. If all of the immigrant's education and experience were acquired in Canada, $YRC = ED + EXP$. This means that age – $YRC = 5$, since we assume that the school-going age is five years. Thus we selected for Sample B all of the observations with age – $YRC \leq 5$.

In Table 4-1, the first and third columns deal with the native-born samples NA and NB, while the second and fourth columns deal with immigrant Samples A and B. Thus Sample A is to be compared with Sample NA and B with NB.

Immigrants in Sample A have been in Canada for approximately 18 years and have roughly the same levels of education and experience as the native-born in Sample NA (Table 4-1, columns 1 and 2). Eighty-one per cent of these immigrants are proficient in English, whereas only 3 per cent are proficient in French. The proportion of allophones among them is very small – only about 5 per cent. Sixty-six per cent of them have come from traditional immigrant countries such as Western Europe and the United States, while the remainder have come from Asia, Africa, and South and Central America.

Immigrants in Sample B have been in Canada for 29 years. And as in the case of Sample A immigrants, Sample B immigrants also report roughly the same years of education and experience as the comparable native-born in Sample NB (Table 4-1, columns 3 and 4). Nearly 80 per cent of these immigrants are fluent in English, whereas only 1 per cent of them are proficient in French. There are hardly any allophones among Sample B immigrants. About 92 per cent of them have come from traditional immigrant countries, while the remaining 8 per cent have arrived from new immigrant countries.

The Results

Tables 4-2 and 4-3 present the results of regression analysis of average weekly earnings for both immigrants and the native-born for census year 1986. The first thing to note is that many of the variables are statistically significant and have the correct sign. The explanatory power of the equations is also reasonably good when one considers the large number of observations used in the regressions.

Results for Type A Samples

We consider first the equations for immigrant Sample A appearing in columns 1 and 2 of Table 4-2 and the comparable native-born (Sample NA) equation given in column 1 of Table 4-3. The other equations will be discussed later. *YRC* is highly significant and has the expected positive sign in the immigrant equation. An extra year of residence in Canada increases weekly earnings of immigrants by about 3.0 per cent, which, incidentally, is slightly higher than the estimate of 2.2 per cent obtained by Chiswick and Miller [1988] for male immigrants in Canada, using the 1981 census data. By contrast to Canadian experience, foreign experience (*EXPB*) is not significant. Thus the first round of regressions seems to show that foreign and Canadian experience do not have the same impact on immigrant earnings.

YRC^2 is significant and bears a negative sign indicating diminishing marginal returns to Canadian experience. $EXPB^2$ is also significant and has a negative sign, implying that foreign experience is subject to diminishing marginal returns.

Education is a significant determinant of earnings for immigrants in Sample A and the native-born in Sample NA. An extra year of schooling raises immigrant earnings by 2.4 to 2.5 per cent and native-born earnings by 5 per cent. These estimates are comparable with those found in Chiswick and Miller. They reported rates of return on education ranging from 2.5 to 3.9 per cent for immigrants and 3.9 to 5.2 per cent for the native-born, using 1981 census data. Thus the evidence shows that the return on education is significantly lower for immigrants in Sample A relative to the native-born in Sample NA, thereby leading us to conclude that foreign education is not valued as highly as Canadian in the Canadian market.

The possession of a university degree raises the earnings of immigrants by about 11 to 12 per cent, depending on the equation, and by 7.0 per cent for the native-born. Thus a university degree has a greater impact on the earnings of immigrants than on the earnings of comparable native-born which is consistent with the view that employers use a university degree as a device to screen prospective job applicants among immigrants. Similar findings have been

Table 4-1
Means of the Variables Used in Regression Analysis, 1986

	Native-born	Immigrants	Native-born	Immigrants
	NA	A	NB	B
	(1)	(2)	(3)	(4)
Age (years)	46.47	45.02	30.44	30.89
Average weekly earnings ($)	455.70	400.00	402.00	364.20
Average number of weeks	47.68	46.78	46.05	45.05
Average number of hours	39.62	40.06	39.72	38.86
Education (years)	11.49	11.45	12.46	12.94
Experience (years)	29.99	28.57	12.98	12.95
Residence in Canada (years)	...	18.22	...	28.61
		As a percentage of the labour force		
English proficiency	63.7	81.4	63.6	79.4
French proficiency	14.1	3.4	14.2	0.7
Bilingual proficiency	22.2	10.7	22.2	19.8
Allophones	0.0	4.6	0.0	0.1
Urban living	45.1	80.4	44.4	71.1
Married persons	92.0	93.1	92.0	71.7
Living in British Columbia	10.1	13.5	10.5	13.2
Living in Ontario	34.7	58.4	34.1	58.1
Living in Quebec	27.9	12.8	27.7	10.9
Living in the Prairies	16.9	13.7	17.5	14.4
Living in the Atlantic	9.7	1.5	9.7	3.1
Females	39.4	40.4	41.4	44.6
Degree holders	10.9	12.1	15.4	16.7
Government employees	9.9	4.4	10.9	7.5
Occupations				
Managerial	13.9	8.3	12.6	10.6
Natural sciences	3.2	4.9	4.2	5.4
Social sciences	1.5	1.0	2.3	2.5
Other groups	6.1	7.5	5.6	5.9
Teaching	7.0	3.4	7.8	6.4
Medicine	4.8	4.8	5.9	4.3
Recreational and fine arts	0.8	1.0	1.2	1.5
Clerical	17.4	12.7	17.8	22.8
Sales	10.5	7.4	9.8	10.8
Services	9.3	13.8	8.5	9.3
Farming	1.5	1.4	1.1	1.6
Other primary occupations	1.5	0.4	1.5	0.5
Processing	3.3	4.8	3.4	2.7
Machining	8.7	19.7	8.8	7.9
Construction	5.7	6.9	5.5	4.9
Transportation	4.8	1.9	4.0	2.8
Place of birth				
United States	...	4.1	...	7.4
Western Europe	...	12.5	...	25.7
Northern Europe	...	18.5	...	30.8
Southern Europe	...	22.8	...	23.2
Eastern Europe	...	6.9	...	3.0
East Asia	...	6.4	...	1.6
Southeast Asia	...	6.5	...	0.3
South Asia	...	5.3	...	0.9
West Asia	...	1.6	...	0.8
Northern Africa	...	1.1	...	0.5
Southern Africa	...	0.5	...	0.3
Other Africa	...	1.8	...	0.4
South and Central America	...	4.0	...	1.8
Caribbean	...	6.5	...	1.8

SOURCE Public Use Sample Tape, 1986.

Table 4-2
Results of Regression Analysis of Average Weekly Earnings of Immigrants, 1986

	Sample A				Sample B	
	(1)		(2)		(3)	
Intercept	4.2230	(58.954)**	4.1276	(56.085)**	3.1398	(15.879)**
Educ	0.0243	(10.338)**	0.0246	(10.375)**	0.0557	(7.254)**
YRC	0.0296	(15.261)**	–		–	
YRC^2	–0.0006	(12.037)**	–		–	
EXPB	0.0023	(1.355)	–		–	
$EXPB^2$	–0.0001	(2.116)*	–		–	
EXP	–		0.0264	(12.266)**	0.0724	(11.879)**
EXP^2	–		–0.0004	(10.572)**	–0.0016	(7.891)**
Sex	–0.4843	(43.837)**	–0.4832	(43.536)**	–0.3463	(12.904)**
Degree holders	0.1144	(6.031)**	0.1178	(6.164)**	0.0114	(0.260)
English	0.0399	(1.302)	0.0698	(2.275)*	0.0548	(0.422)
Bilingual	0.0574	(1.911)	0.0853	(2.835)**	0.0384	(0.299)
Allophones	–0.0315	(0.846)	–0.0705	(1.900)	–	
Government employees	0.1202	(5.251)**	0.1355	(5.899)**	0.1817	(4.127)**
Marital status	0.0310	(1.685)	0.0263	(1.422)	0.1804	(5.760)**
Ontario	0.0509	(2.749)**	0.0455	(2.446)*	–0.0656	(1.429)
British Columbia	0.0909	(4.120)**	0.0860	(3.883)**	–0.0542	(0.996)
Prairies	0.0422	(1.944)	0.0312	(1.431)	–0.0132	(0.245)
Atlantic	–0.0522	(1.214)	–0.0790	(1.831)	–0.0316	(0.399)
Urban living	0.0393	(3.135)**	0.0342	(2.725)**	0.0963	(3.559)**
Managerial	0.3404	(12.437)**	0.3459	(12.594)**	0.1592	(2.048)*
Natural sciences	0.2525	(8.201)**	0.2543	(8.224)**	0.1811	(2.156)*
Social sciences	–0.0396	(0.785)	–0.0329	(0.650)	0.0346	(0.345)
Other groups	–0.0273	(1.019)	–0.0318	(1.182)	–0.0866	(1.068)
Teaching	0.1952	(5.602)**	0.2039	(5.829)**	0.1078	(1.272)
Medicine	0.2478	(8.028)**	0.2608	(8.418)**	0.1040	(1.182)
Recreational and fine arts	–0.0630	(1.228)	–0.0589	(1.142)	–0.2473	(2.198)*
Clerical	0.0024	(0.095)	0.0122	(0.474)	–0.0939	(1.276)
Sales	–0.1580	(5.777)**	–0.1550	(5.646)**	–0.0866	(1.141)
Services	–0.2607	(10.645)**	–0.2701	(10.994)**	–0.2747	(3.537)**
Farming	–0.3852	(8.648)**	–0.3949	(8.834)**	–0.4868	(4.410)**
Other primary occupations	0.2750	(3.779)**	0.2861	(3.916)**	0.2961	(1.759)
Machining	–0.0027	(0.115)	–0.0055	(0.235)	–0.0174	(0.223)
Construction	0.1049	(3.834)**	0.1052	(3.830)**	0.0542	(0.649)
Transportation	–0.0589	(1.504)	–0.0530	(1.347)	0.0914	(0.966)
ln hours	0.3460	(26.855)**	0.3444	(26.607)**	0.3956	(14.660)**
West Asia	–0.1949	(5.190)**	–0.2346	(6.248)**	–0.1647	(1.356)
East Asia	–0.0847	(4.039)**	–0.1118	(5.342)**	–0.2079	(2.302)*
Southeast Asia	–0.1063	(5.075)**	–0.1545	(7.460)**	0.0325	(0.169)
South Asia	–0.0826	(3.740)**	–0.1011	(4.589)**	0.1150	(0.983)
North Africa	–0.0052	(0.114)	–0.0081	(0.179)	–0.2027	(1.291)
Other Africa	–0.0987	(2.774)**	–0.1328	(3.735)**	–0.0857	(0.518)
South and Central America	–0.1672	(6.759)**	–0.2004	(8.129)**	0.0016	(0.019)
Caribbean	–0.1129	(5.488)**	–0.1244	(6.058)**	–0.2691	(3.209)**
Southern Europe	–0.0532	(3.579)**	–0.0208	(1.412)	0.0206	(0.715)
Eastern Europe	–0.0355	(1.818)	–0.0410	(2.105)*	0.0911	(1.395)
$\bar{R}^2$	0.3160		0.3101		0.3808	
Number of observations	19,213		19,213		3,333	

NOTE Figures in parentheses are absolute *t*-ratios.
*Significant at the 95-per-cent level.
**Significant at the 99-per-cent level.

Table 4-3
Results of Regression Analysis of Average Weekly Earnings of the Native-Born, 1986

	Sample NA		Sample NB	
	(1)		(2)	
Intercept	4.1342	(41.548)**	3.2882	(44.334)**
Educ	0.0501	(24.644)**	0.0633	(22.216)**
EXP	0.0180	(3.169)**	0.0845	(11.854)**
EXP^2	–0.0002	(2.778)**	–0.0024	(9.075)**
Sex	–0.5751	(68.932)**	–0.3845	(44.012)**
Degree holders	0.0689	(4.706)**	0.0294	(1.914)
English	0.0156	(1.002)	–0.0112	(0.666)
Bilingual	0.0229	(1.892)	0.0441	(3.376)**
Government employees	0.1322	(11.848)**	0.2012	(16.527)**
Marital status	–0.0800	(6.755)**	0.1097	(9.681)**
Ontario	–0.0132	(1.024)	0.0031	(0.214)
British Columbia	0.0256	(1.599)	0.0813	(4.570)**
Prairies	–0.0330	(2.274)*	0.0290	(1.820)
Atlantic	–0.0835	(5.254)**	–0.0219	(1.253)
Urban living	0.0892	(12.909)**	0.0819	(10.946)**
Managerial	0.2172	(10.689)**	0.0611	(2.896)**
Natural sciences	0.1263	(4.930)**	0.0371	(1.571)
Social sciences	–0.0880	(2.753)**	–0.1797	(5.948)**
Other groups	–0.0721	(3.302)**	–0.1254	(5.722)**
Teaching	0.1746	(7.510)**	0.0213	(0.831)
Medicine	0.1638	(6.890)**	0.0646	(2.783)**
Recreational and fine arts	–0.1492	(3.771)**	–0.2138	(6.337)**
Clerical	–0.0820	(4.083)**	–0.1447	(7.309)**
Sales	–0.1750	(8.589)**	–0.2142	(10.368)**
Services	–0.2750	(13.179)**	–0.3555	(16.708)**
Farming	–0.6391	(20.351)**	–0.6214	(19.673)**
Other primary occupations	0.1956	(6.199)**	0.1274	(3.866)**
Machining	–0.0421	(2.039)*	–0.0679	(3.365)**
Construction	0.0275	(1.243)	–0.0303	(1.367)
Transportation	–0.0624	(2.730)**	–0.1021	(4.330)**
ln hours	0.3796	(45.916)**	0.3704	(41.709)**
$\bar{R}^2$	0.3997		0.2763	
Number of observations	33,192		29,631	

NOTE Figures in parentheses are absolute *t*-ratios.
*Significant at the 95-per-cent level.
**Significant at the 99-per-cent level.

reported by Meng [1987] and Chiswick and Miller [1988] for Canada.

The evidence reveals that women earn considerably less than their male counterparts. The male-female earnings differential is about 48 per cent for immigrants and 57 per cent for the native-born. Thus gender discrimination if it exists seems to be higher among the native-born than among immigrants. Akbari [1988] also reports a similar finding. According to his results, the male-female earnings differential is 54 per cent for the native-born and 35 per cent for immigrants. Note, however, that the experience variable used in our study as well as in Akbari's does not net out time spent on childbearing. If such an adjustment is made, it probably would lower the estimated amount of gender discrimination.

Besides Akbari, several other studies have also examined the issue of gender discrimination in Canada. Gunderson [1979*a*] found that gender discrimination accounted for about 63 per cent of the male-female earnings differential in 1970, while Robb [1978] reported that gender discrimination accounted for about 59 per cent of the male-female earnings differential in Ontario. In another study, Shapiro and Stelcner [1981] found that gender discrimination accounted for about 53 per cent of the male-female earnings differential in Quebec. Note, however, that, apart from Akbari, none of these other studies draws a distinction between immigrants and the native-born. Hence their results are not directly comparable with those reported here.

The performance of the language variables is not as good as one might have expected. None of the language variables is significant according to one immigrant equation, whereas according to the other immigrant equation, two of them, namely, the English and bilingual variables, are significant. Because of the mixed performance of the language variables, we cannot reach any reliable conclusion about the value of official languages for immigrant earnings.

Chiswick and Miller [1988] also studied the influence of language on the earnings of immigrants and the native-born. They drew a distinction between Quebec and the rest of Canada in their analysis. For immigrants living in Quebec, it was found that knowledge of either English or French led to significantly lower earnings compared with bilingualism. For immigrants in the rest of Canada, knowledge of English resulted in significantly lower earnings relative to bilingualism, whereas knowledge of French only had no significant effect. For native-born persons living in Quebec, proficiency in either of the official languages had no significant effect on earnings; while for native-born persons outside of Quebec, proficiency in English was associated with an earnings disadvantage, whereas proficiency in French only had no significant effect.

The poor performance of the language variables may be due to several reasons. One is the inappropriateness of the language variables used in the analysis, as pointed out by Abbott and Beach [1987]. They considered language at the workplace as a better determinant of earnings than one's mother tongue and found empirical evidence to support their contention. Unfortunately, census data do not permit us to use such a definition for the language variable.[4] Another reason may be the endogeneity of the language variables, since language proficiency improves with the period of residence in the host country. In a recent study, Chiswick and Miller [1990] tried to control for endogeneity and found many of the language variables to be highly statistically significant and have the correct signs.

Immigrants in Sample A who are employed in the government sector earn 12 to 13 per cent more than those employed in the private sector. Native-born persons employed in government service also enjoy an earnings advantage of similar magnitude over those in the private sector. The earnings differential between the public and private sectors has been the subject of considerable research in recent years. Gunderson [1979*b*] found that for 1970, women in the public sector earned 8.6 per cent more than those in the private sector, while men in the public sector earned 6.2 per cent more than their private-sector counterparts. In a more recent study, Shapiro and Stelcner [1989] found that the public- and private-sector wage differentials for men and women were 7.9 and 10.3 per cent, respectively, for 1980. Note, however, that these studies do not draw a distinction between immigrants and native-born persons.

Urban dwellers receive significantly higher earnings than their rural counterparts. The urban-rural earnings disparity is about 3 to 4 per cent for immigrants in Sample A, and about 9 per cent for the native-born in Sample NA.

The evidence on the relationship between marital status and earnings is mixed. In the case of Sample A immigrants, it was found that marital status was associated with an earnings advantage of about 3 per cent, whereas in the case of native-born persons in Sample NA, marital status had no significant impact.

The performance of the provincial variables is also mixed. In the case of immigrants in Sample A, those residing in Ontario and British Columbia earn significantly more than those residing in Quebec. However, for those living in the Prairies and the Maritimes, there is no significant difference between their earnings and the earnings of those living in Quebec. In the case of the native-born in Sample NA, there is no significant difference in earnings between those residing in British Columbia and Ontario and those in Quebec, whereas residents in the Maritimes and the Prairies earn significantly less than those residing in Quebec.

Of the occupational variables included in the Sample A immigrant equations, six lack statistical significance. They are the social sciences, art and recreation, clerical, machining, transportation, and miscellaneous occupations. Six occupational groups provide earnings which are significantly higher than in processing (the reference group). These are the managerial, natural sciences, teaching, medicine, primary, and construction categories. Immigrants in the sales, services, and farming occupations are found to earn significantly less than those employed in processing. In the corresponding native-born equation (Sample NA), all the occupational variables are significant except for construc-

tion. Of these, the occupations which provide earnings significantly higher than in processing are the same as those in the immigrant equations, except of course for construction.

The hours-worked-per-week variable is also highly significant in both the immigrant and native-born equations and its impact on earnings seems to be roughly the same for the two population groups.

The statistical evidence shows that Sample A immigrants from East Asia, West Asia, South Asia, Southeast Asia, South and Central America, the Caribbean, and other Africa (excluding Southern Africa) earn significantly less than immigrants from such regions as Western and Northern Europe, the United States, Australia, New Zealand, and Southern Africa. Immigrants from Southern Europe also earn significantly less relative to the reference group, according to one formulation. The relative earnings disadvantage is greatest for immigrants from West Asia, followed by those from South and Central America, the Caribbean, Southeast Asia, other Africa, and South Asia. Whether this is discrimination or something else is a question that we can settle by looking at Samples B and NB.

Results for Type B Samples

Turning next to the regressions dealing with Samples B and NB, we find that there is no significant difference in the rates of return on education for immigrants and the native-born. Thus, in this case, the rates of return to education are the same for immigrants and the native-born, not surprisingly, since education of both was Canadian. Similarly, there is no significant difference in the rates of return on experience for immigrants and the native-born, again not surprisingly, as immigrants in Sample B received the same quality of education and experience as the native-born. It should also be noted that compared with immigrants in Sample A, those in Sample B report significantly higher rates of return on education and experience. This is consistent with the evidence cited earlier for Sample A that the rates of return on Canadian education and Canadian experience are significantly greater than the rates of return on foreign education and foreign experience.

EXP^2 is significant and negative which means that the third null hypothesis regarding the absence of diminishing marginal returns to experience is refuted.

None of the language variables is significant in the immigrant equation, a result paralleling that for Samples Type A.

The provincial variables are also not significant in the immigrant equation. In the comparable native-born equation, only the British Columbia variable is significant.

Gender discrimination is about 38 per cent for the native-born and about 35 per cent for immigrants. A university degree has no significant impact on the earnings of both the native-born and immigrants. Hence the screening hypothesis mentioned earlier does not apply to immigrants who received all of their education and experience in Canada. The evidence shows that married persons earn significantly more than unmarried persons, and this is for both immigrants and the native-born. This is different from the previous results, where we found that marital status had no significant impact on the earnings of Sample A immigrants and had a significant negative impact on the earnings of the comparable native-born.

The urban-rural earnings differential is about 10 per cent for immigrants and about 8 per cent for the native-born. The premium enjoyed by government employees is about 20 per cent for the native-born compared with 18 per cent for immigrants. The impact of hours of work is higher for immigrants than for the native-born.

Only a few of the occupational variables are significant in the immigrant equation. Those employed in arts and recreation, farming, and the services earn significantly less than those in processing, whereas the opposite is true for those holding managerial and natural sciences jobs. In the case of the native-born, several occupations provide earnings which are significantly higher than in processing. They include managerial, medicine, and primary occupations. The remaining occupational categories, except for construction, teaching, and natural sciences provide earnings which are significantly lower than in processing.

Discrimination by Origin

The country variables in the Sample B immigrant equation are of special interest. If there is discrimination against visible minorities, it should be reflected in the variables representing immigrant groups from Asia, Africa, and the Caribbean. There is also a variable representing immigrants from South and Central America, but we are not sure how many of them would qualify as visible minorities.

Of the country variables mentioned above, only two – East Asia and the Caribbean – are statistically significant. Immigrants from the Caribbean and East Asia earn about 27 and 21 per cent, respectively, less than the reference group of immigrants. It is not clear why there is a difference for

these two immigrant groups and not for the others. In any case, given that there is no difference in earnings by origin for the vast majority of countries where visible minorities come from, the evidence is definitely not consistent with discrimination based on the colour of the person.

Contrasting Results for Samples Type A and B

What, then, are we to make of the Sample A results reported earlier? These show unambiguously that among immigrants who did not receive all of their education and experience in Canada, Asians, Africans, and West Indians earned less than immigrants from Northern and Western Europe and the United States, even after full correction for endowment differences. On the surface, this contradicts the conclusion that there is "no systematic discrimination," based on the analysis of Group B immigrants.

It seems difficult to maintain, however, that colour matters if you are not educated in Canada but does not matter if you are. Education can hardly remove pigmentation. We consider, therefore, that two alternative explanations of the Sample A results are more plausible. One is that accent matters, and more so for NIO immigrants from Asia, Africa, the Caribbean, and South and Central America than for immigrants from Southern and Eastern Europe.[5] Sample A immigrants will usually have noticeable accents, while Sample B immigrants will not. The other interpretation is that foreign education is not only valued less than Canadian, but that it is valued even less if it is obtained in Asia, Africa, or the Caribbean than if it is obtained in many parts of Europe or the United States. We suspect that the truth lies in a combination of these explanations.

Conclusion on Colour Discrimination

We conclude that the evidence goes against the view that there is systematic earnings discrimination against immigrants on the basis of colour. That said, Asians, Africans, and West Indians who have not been completely educated in Canada do earn less than other immigrants who are otherwise comparable, both in endowments and in not having been completely educated in Canada. The reason is likely a combination of prejudice against accent and relatively greater undervaluation of the non-Canadian education they have received. There is no way to tell, incidentally, whether that undervaluation represents prejudice against foreign educational credentials, ignorance of the true value of foreign credentials, or a genuinely lower usefulness of non-Canadian credentials in the Canadian labour market.

Discrimination against Immigrants in General

Table 4-2 is relevant to the question of possible discrimination between one type of immigrant and another, notably visible minorities. It does not tell us directly, however, whether there is any discrimination against immigrants in general. The main findings with regard to the latter issue are presented in Table 4-4. Native-born persons in Sample NA earned 13.9 per cent more than the immigrants in Sample A. The endowment effect is 6.3 per cent and the remaining 7.6 per cent represents discrimination. But, as mentioned earlier, in the above comparison between Samples A and NA, no correction was made for quality differences in education and experience between the two groups. This was done indirectly in the comparison between Samples NB and B which, therefore, is a more reliable test of discrimination. Native-born persons in Sample NB earn 9.8 per cent more than immigrants in Sample B. As shown in Table 4-4, this earnings differential is entirely due to the endowment differential, as a result of which discrimination appears to be non-existent in the case of immigrants in Sample B.

On balance, then, the fact that there is no discrimination against immigrants in general means that the preceding analysis of the relative earnings of immigrants reinforces the earlier analysis of individual immigrant groups that there is no evidence of widespread wage discrimination against immigrants on grounds of colour.

An additional perspective comes from examining the earnings-experience profiles of immigrants in the two samples (Table 4-5). When an immigrant in Sample A initially enters the Canadian labour market, he or she receives only 88 per cent of the earnings of a comparably qualified Canadian-born person. But after 15 years, that person is able

Table 4-4
Discrimination against Immigrants, 1986

	Sample A	Sample B
	(Per cent)	
Earnings differential	13.9	9.8
Endowments	6.3	10.3
Discrimination	7.6	–0.5

SOURCE Based on Tables 4-1, 4-2, and 4-3.

Table 4-5
Experience-Earnings Profile of Immigrants and the Native-Born, Samples A and NA, and B and NB, 1986

	Average weekly earnings			
	Immigrants	Native-born	Immigrants	Native-born
	Sample A	Sample NA	Sample B	Sample NB
	(Dollars)			
Canadian experience (in years)				
0	305	345	213	212
5	349	375	294	305
10	390	403	392	419
15	430	430	546	563
20	470	456	693	729
25	504	480	860	865

SOURCE Based on Tables 4-1, 4-2, and 4-3.

to match the earnings of the Canadian-born. Given that the average age at which an immigrant in Sample A enters Canada is about 27 years, our results imply that he or she will be able to make a complete adjustment when he or she is in his or her early forties. In the case of an immigrant in Sample B, his or her earnings always closely match the earnings of a native-born person with similar qualifications.

Several other studies have also examined the experience-earnings profiles of immigrants in Canada. But since they did not follow the procedure used here of grouping immigrants into various samples according to whether they received their education and experience in Canada or abroad, their results are not directly comparable with those reported in this study. For what it is worth, the adjustment period reported in several of these studies is very similar to that reported in the present study.[6]

Some Possible Reservations

One criticism of the foregoing analysis is that it may not have been able to capture fully the amount of discrimination because the impact on earnings of some of the explanatory variables used in the regression varies among immigrant groups. For example, one immigrant group may consist of faster learners than other groups. But this is not captured in the above analysis since years of education are assumed to have the same effect on the earnings of all immigrants. One way of assessing such impacts is by introducing slope dummies into the analysis.[7] This we did but without much success. Many of the slope dummies turned out to be statistically insignificant.

Another possible objection to our analysis is that it may not provide a reliable measure of the assimilation of immigrants since it is based on a cross-sectional analysis relating to a single year. This is the criticism advanced by Borjas. His argument is that cross-sectional analyses based on a single year tend to overestimate the assimilation effect if the quality of immigrants has declined over time. To meet this criticism, we followed a methodology similar to that used by Borjas. This involved using pooled regression analysis based on data from two census years, 1971 and 1986, and introducing several period-of-immigration variables to represent cohort effects. The results, however, were found to be inconclusive due to multicollinearity between the variable representing years of residence in Canada and the period-of-immigration variables.[8] But in our earlier descriptive analysis we found that there was hardly any deterioration in the education and experience of immigrants who arrived during the 1980s, compared with those who came immediately before. Moreover, Gunderson and Bloom found that cross-sectional tests produce roughly the same results as those based on longitudinal data, when appropriate adjustments are made to take into account the influence of productivity and inflation on wage growth. For these reasons, we feel reasonably confident that the regression results reported in this study provide a fairly accurate picture of immigrant assimilation in this country.

5 Summary and Conclusions

Since 1970, there has been a major change in the composition of the immigrant population in favour of new immigrant groups from Asia, Africa, South and Central America, and the Caribbean and away from traditional immigrant groups mainly from Europe and the United States. Many of the former have come as family-class immigrants and refugees, while many of the latter came here as independents. And while there has been a slight increase in the proportion of less educated persons in recent years, immigrants from Third World countries still comprise a higher proportion of university educated persons than does the Canadian-born population.

A preliminary examination of some economic indicators shows that the labour force participation rate, adjusted for age differences, is slightly higher for both male and female immigrants than for their Canadian-born counterparts. Indeed, their participation rates tend to increase with the duration of their residence in Canada. The evidence also shows that immigrants experience relatively short periods of unemployment and that this is broadly similar to the experience of the native-born. Although there are some differences among immigrant classes, they are relatively minor.

Contrary to popular thinking, the proportion of recent immigrants on welfare assistance is extremely small and tends to be similar to that of the native-born.

A major part of the study was devoted to an analysis of discrimination against immigrants. In the course of this investigation, the study also looked at some of the other factors that influence the wage gap between immigrants and their Canadian-born counterparts, including effects of education, language, whether education and experience were or were not obtained in Canada, and whether education and experience are subject to diminishing marginal returns.

The main conclusion to emerge is that there is no significant discrimination against immigrants in general. There is one possible exception discussed in the next paragraph. More important, there is no detectable general tendency to discriminate against immigrants originating from Third World regions. That can be interpreted as there being no generalized tendency to discriminate against visible minorities. While two particular nontraditional immigrant groups – people from East Asia and from the Caribbean – have not done well relative to the native-born and to other immigrants, immigrant groups from other Third World regions – West Asians, Southeast Asians, South Asians, Africans, South and Central Americans – have done as well as native-born Canadians. We were unable to discover any documentable explanation for the two exceptions. An important instance of group discrimination was established, but it was against women, whether immigrant or Canadian-born.

Also significant is the evaluation of foreign *vs.* Canadian education and experience. There are strong indications that education and experience acquired abroad pay much less, in terms of earnings, than they do if obtained in Canada.[1] The regression analysis does not distinguish whether this is bias or whether it reflects a genuine difference in value, on the Canadian labour market, of foreign as opposed to domestically acquired education and experience. Its effect is that it takes all but the youngest immigrants up to 20 years to catch up to the earnings of Canadians, though catch up they nearly always do. This suggests that different values are placed on qualifications, not that there is a bias against visible minorities. Persons who came from Third World regions, but who arrived here young enough to obtain all of their education and experience in Canada, performed as well as native-born Canadians in nearly all cases.

In general, we found that the economic performance of immigrants compares favourably with that of comparably qualified native-born Canadians and that, using a variety of indicators, immigrants adjust reasonably well to our labour market.

Notes

Chapter 1

1 Apart from discrimination, the other issues which have been relatively neglected include the economic performance of immigrants by class and the performance of immigrant children relative to their parents. The neglect of these issues is mainly due to the lack of data, which continues to be a problem to the present day.

Chapter 2

1 Currently, there are four broad categories of immigrants to Canada. They are family class, assisted relatives, independents, and the refugees. Family-class immigrants include close relatives such as a spouse or unmarried children under 21 years whose sponsor is expected to take responsibility for their care and maintenance. They are not subject to the selection criteria applied to independent immigrants. Assisted relatives are normally a more distant relative such as a niece, uncle, or grandchild, or a close relative such as a son or daughter aged 21 years or over. Although they are expected to receive short-term economic assistance from the sponsor, they are also expected to be self-supporting in the long run. In the selection of these assisted relatives, some points are awarded for the assistance received from the sponsor. Beyond that, however, they are also subject to the same selection criteria applied to independent immigrants. The criteria include such things as education and training, demand for applicant's occupation, the existence of prearranged employment, and personal characteristics such as age, knowledge of English and French, and so on. Under this system, points are allotted to each of the factors mentioned above. The refugees, however, are exempt from the points systems just as family-class immigrants. It is also important to point out that the independent class presently also includes entrepreneurs, investors, retirees, and self-employed persons. Entrepreneurs are persons allowed into the country because of their intention to operate a business which will employ Canadians. Investors are those who have a proven track record in business and have accumulated wealth of $500,000 or more. Self-employed persons are those who intend to establish a business in Canada or who will contribute to the cultural and artistic life of the country. Retirees are persons who are at least 55 years of age and are financially secure and have no intention of working in Canada.

2 Briefly, the more important policy measures are the following. Until the early 1960s Canadian immigration policy was determined by the 1953 Immigration Act which allowed the Governor-in-Council to prohibit the entry of immigrants for a variety of reasons, including nationality and ethnic group. In effect, preference was given to persons of British origin, together with those from the United States and other Western European countries. The question of discrimination on the basis of the place of origin became a concern in the early 1960s and, consequently, the national origin restrictions to immigration were lifted in 1962. In 1967, the points system mentioned earlier was introduced for the selection of independent immigrants. This reinforced the nondiscriminatory aspects of immigration policy by clearly outlining the labour market skills under which immigrants were to be selected. In 1976, a new Act was passed under which a target level for immigration was to be set every year by the minister responsible for immigration. This level is to be determined after consultation with the provinces concerning regional demographic needs and labour market needs and after consultation with such other persons and organization as the minister deems appropriate. The new Act explicitly affirmed the fundamental objectives of Canadian immigration laws, including family reunification, non-discrimination, concern for refugees, and the promotion of Canada's demographic, economic, and cultural goals. Accordingly, it established four categories of immigrants, namely, family class, assisted relatives, independents, and refugees. In 1986, the Business Immigration Program was established for the purpose of encouraging entrepreneurs, self-employed persons, investors, and retirees to come to Canada. More recently, in January 1989, the government passed new refugee legislation in an effort to discourage the entry of economic refugees, while encouraging only genuine refugees.

3 Based on data from Statistics Canada [1989*b*].

4 Based on data from Statistics Canada [1989*b*]. A similar pattern also holds for 1981 when the dependency ratios for immigrants and the native-born were 31.0 and 50.0, respectively. On this, see R. Beaujot et al. [1988, Table 4, 28].

5 Based on the Public Use Sample Tapes for 1981 and 1986.

6 The same pattern holds even for the population aged 25 years and over. University-educated persons account for 27.9 per cent in the case of immigrants, compared with 23.7 per cent for the native-born.

Chapter 3

1 Based on the Public Use Sample Tape, 1981.

2 There are, however, some minor differences between immigrants and the native-born in terms of the sectors in which self-employed persons are found. A recent study based on 1981 census data reports that self-employed immigrants are mainly found in the community, business, and personal services sectors, followed by trade and agriculture, whereas in the case of the self-employed native-born, they are mainly concentrated in agriculture, followed by community, business, personal services, and trade. For more details, see Elliot L. Tepper [1988].

3 A recent study argues that a large proportion of immigrant women in the clothing industry have had only grade 10 education or less and that many of them are unable to speak either English or French. The study also reports that a little over one half of the immigrant women in the clothing industry are from Southern Europe, which suggests that they probably arrived as family-class immigrants rather than as refugees. On this, see Shirley Seward [1988].

4 Based on the Public Use Sample Tape, 1986.

5 Note, however, that the U.S. experience is different from the Canadian experience in this respect. Using 1980 census data, a recent study shows that immigrants who arrived during the 1975-80 period report a significantly higher proportion of welfare recipients than the native-born and earlier immigrant cohorts. On this, see George J. Borjas and Stephen J. Trejo [1990].

6 Based on the Public Use Sample Tape, 1986.

7 See, for example, Gertrud Neuwirth [1989*a* and 1989*b*]. The former study is restricted to a sample of 20 refugees, whereas the latter study is based on a sample of 30 refugees. Neither study considers a sample of native-born persons as the control group.

Chapter 4

1 Michael G. Abbott and Charles M. Beach [1987] also claim that there has been a deterioration in the quality of immigrants to Canada. See their study.

2 An exception is Paul L. Gabriel and Susanne Schmitz, "The relative earnings of native and immigrant males in the United States," *The Quarterly Review of Economics and Business* (Autumn 1982):91-101. This study finds considerable discrimination against immigrants in the United States.

3 The methodology developed here for the measurement of wage discrimination has been widely used in the literature. See, for example, Morley Gunderson [1989].

4 In a more recent study, Chiswick and Miller have reexamined the influence of language proficiency on immigrant earnings in both Canada and the United States, treating language as an endogenous variable. They found that Canadian immigrants who are proficient in either English or French earn about 49 per cent more than those who do not have such proficiency. For more details, see B. Chiswick and P. Miller [1990].

5 For some evidence supporting this view, see F. Henry [1990].

6 For example, S.A.H. Akbari [1988], using 1981 census data, found that immigrants of both sexes take about 15 years to equal the earnings of comparably qualified native-born persons. Similarly, R. Meng [1987] and M. G. Abbott and C. M. Beach [1987], relying on a 1973 database, found the adjustment period to be about 13 to 14 years. D. E. Bloom and M. Gunderson [1989] also report an estimate of 12.8 years as the adjustment period for immigrants. Note, however, that there are other studies which report a much longer adjustment period. B. Chiswick and P. Miller [1988] and D. J. deVoretz and S. Fagnan [1990] estimated the adjustment period to range from 22 to 24 years.

7 Consider the following immigrant earnings equation:

$$Y_i = \alpha_0 + \alpha_1 X_{1i} + \alpha_2 X_{2i} \ldots e_i,$$

where

Y_i = the earnings of immigrant i and X_1, X_2, and so on are the explanatory variables which are expected to influence Y_i. Suppose there is reason to believe that the impact of X on Y is different for African immigrants than for others. Then we can rewrite the equation as

$$Y_i = \alpha_0 + [\alpha_1 + \alpha_1 D_{AO}] X_{1i} + \alpha_2 X_{2i},$$

where

D_{AO} = is a dummy variable representing the Africans.

8 Three period-of-immigration variables were used in the analysis. They are 1961-69, 1970-79, and 1980-86. The reference period is the pre-1961 period. For the country variables, we used Asia, Africa, the Caribbean (including South and Central America), Eastern Europe, and Southern Europe. This is the best country breakdown possible with the data available. The reference group is Northern and Western Europe, the United States, and the United Kingdom. All the other variables are the same as those reported in the previous analysis. The results showed that while all three period-of-immigration variables were significant and had a negative sign, *YRC* was insignificant and negative. However, *EXPB* was significant and positive. Thus when cohort effects are accounted for, the results lead to the strange conclusion that what matters for immigrant earnings is foreign experience and not Canadian experience. This is totally inconsistent with our previous findings and runs counter to normal expectations. We suspect that the main culprit for this is a very high correlation between the period-of-immigration variables and *YRC*. In fact, when the pooled regressions were run again without the period-of-immigration variables, *YRC* was highly

significant and positive. *EXPB* was also significant but much smaller in magnitude than *YRC*. The difference between *EXPB* and *YRC* coefficients was found to be statistically significant.

Chapter 5

1 For a detailed discussion of this aspect, see Kathryn McDade [1988].

List of Tables

Tables

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Economic Council of Canada

P.O. Box 527
Ottawa, Ontario
K1P 5V6

Conseil économique du Canada

C.P. 527
Ottawa (Ontario)
K1P 5V6