

Language and Earnings in Quebec: Trends over Twenty Years, 1970-1990

DANIEL M. SHAPIRO

*Faculty of Business Administration
Simon Fraser University
Burnaby, British Columbia*

MORTON STELCNER

*Department of Economics
Concordia University
Montreal, Quebec*

Les disparités salariales parmi les groupes linguistiques au Québec (francophones, anglophones et allophones) ont fait l'objet de biens des préoccupations ces trentes dernières années. Utilisant les données du recensement de 1991, cet article porte sur les disparités salariales selon le sexe en 1990, et compare les résultats à ceux obtenus à partir des données des recensements de 1971 et 1981. Ce qui ressort principalement, c'est que depuis l'adoption de la Loi 101 en 1977, les disparités salariales entre les anglophones (unilingues et bilingues) et les francophones bilingues sont effectivement disparues. Cependant, la situation salariale des allophones (quelque soit les langues officielles dont ils font usage) s'est aggravée, de même que celle des francophones unilingues.

Earnings differentials among Quebec's linguistic groups (francophones, anglophones, and allophones) have been the subject of concern over the past three decades. Using data from the 1991 Census, this paper examines linguistic earnings disparities by gender in 1990, and compares the results to those obtained from the 1971 and 1981 Census data. The main findings are that, since the passage of Bill 101 in 1977, the earnings gap between (unilingual and bilingual) anglophones and bilingual francophones has indeed closed. However, the earnings situation of allophones (regardless of official languages spoken) has worsened as did that of unilingual francophones.

INTRODUCTION

During the past three decades the fate of Quebec's various linguistic groups has been a subject of continued concern among policymakers, politicians, and the public at large. At the centre of the controversy is Quebec's language law, *la Charte de la langue française* (Bill 101), adopted in August 1977. In the mid-1990s, both prior to and after the

30 October 1995 referendum on sovereignty, the debate over the "language issue" has been re-kindled and is likely to remain in the spotlight for many years.

The politics of language in Quebec are inevitably related to ethnicity. The three main ethnic/linguistic groups are: anglophones (mother-tongue English), francophones (mother-tongue French) and

allophones (mother-tongue neither English nor French, and coming from a wide variety of ethnic backgrounds).¹ As of 1991, the population of Quebec was 6.81 million, of whom 82 percent were francophones, 9.2 percent were anglophones, and 8.8 percent were allophones. Over the past 20 years, the francophone share has remained roughly constant, while the percentage of anglophones has declined, offset by a corresponding increase in the percentage of allophones. The Montreal Census Metropolitan Area (population 3.13 million) comprised 68.5 percent francophone, 15.7 percent anglophone, and 15.8 percent allophone, while the linguistic composition of the Island of Montreal (population 1.82 million) was 56.8 percent francophone, 20.6 percent anglophone, and 22.6 percent allophone.²

There is now a reasonable body of evidence indicating that the economic position of francophones in Quebec improved considerably since 1970. In a previous study Shapiro and Stelcner (1987) suggested that earnings disparities between anglophones and francophones had all but disappeared by 1981. However, allophones were found to earn significantly less than other linguistic groups, regardless of their ability to speak French or English. This led to the conclusion that the "policy priority in terms of earnings disparities is one relating to ethnic minorities (including foreign-born francophones) ..." (p. 101).³

Other studies confirmed and extended these empirical findings.⁴ Vaillancourt (1991) also noted an improvement in the relative position of francophones, but found that by the mid-1980s anglophones actually earned less than francophones, other things being equal. His results also indicate that allophones were significantly disadvantaged in terms of earnings.

The objective of this paper is to update the data on earnings disparities among linguistic groups in Quebec and to examine their trends over 20 years. We employ data from the 1991 Census to obtain new

estimates for 1990, and compare these with comparably estimated results for 1970 and 1980. In addition, we extend the 1990 results to further explore both estimation and sample selection biases. An updated analysis of the returns to knowledge of Canada's official languages (English and French) in a predominantly French-speaking society provides additional evidence regarding the impact of language policies and laws on the labour market.

POLICY BACKGROUND

With the "Quiet Revolution" of the 1960s and the emergence of a separatist movement, language became a predominant factor in political debates in Quebec. There was considerable debate about how best to preserve and foster the French language and Quebec culture, and to improve the economic position of francophones. An impressive number of studies in the late 1960s and early 1970s documented the relatively low usage of French and the inferior economic status of the numerically-dominant group (francophones) in the workplace.

The publication of the Gendron Report (Quebec 1972) on the situation of the French language led the Liberal government to pass Bill 22 (1974) which declared French as the official language of Quebec. In 1976, the "souverainiste" Parti Québécois came to power and a year later enacted Bill 101. Despite some 200 modifications by the subsequent Liberal government elected in 1985, especially Bill 86 (1993), and alterations imposed by court decisions, the core of Bill 101 remains basically intact and is still the centrepiece of language policy in Quebec.⁵

The objectives of Bill 101 are to promote and enhance the position of the French language and to improve the relative position of French-speakers in the workplace in terms of income, occupations, and enterprise control. The main instrument used to achieve a greater and improved francophone presence ("francophonisation") in the workplace was "francisation." This policy measure makes

obligatory the use of French as a working language, and organizations (with 50 or more employees) are granted "francisation" certificates indicating that they have complied with the law. The underlying reasoning is that "francisation" would increase the demand for French-language skills and thus increase the demand for francophones in managerial and other high-income occupations. It should be emphasized that it is not the *explicit* intent of Bill 101 to increase "francophonisation" by using group-defined quota programs, such as "affirmative action" or "employment equity."

The "francisation" of the workplace is buttressed by provisions that affect commercial signs and education. Commercial signs can be displayed externally only in French; internally, signs in English must be less prominent. The schooling provisions restrict access to English-language elementary-secondary schools to children who have at least one parent/grandparent who completed most of their primary education in English in Canada (the Canada clause), but only prior to 1977. Immigrant children, even if they come from English-speaking countries, must enroll in French schools. Only at the postsecondary level can a person choose the language of instruction.

The passage of Bill 101 did not end either the debate over, or study of, language policy. The Parti Québécois was reelected in 1994, and in the spring of 1996 the government released the final version of an interministerial report on the status of the French language. (Quebec 1996). We call this report the Legault-Plourde (L-P) report.⁶ The Report maintains that the French language is still vulnerable, especially in Montreal, and claims that French is still not the "normal, everyday language of work" (p. 211). Legault and Plourde blame past governments for *laissez-faire* attitudes, "hesitation" or "reluctance" in strictly enforcing the language laws. The report also expresses particular concern about the lack of integration of allophones into the francophone milieu and culture.⁷ In June 1996, the government tabled a series of amendments — Bill

40 — to strengthen the provisions of the language laws and further discourage the use of English.⁸

THE IMPACT OF BILL 101 ON THE LABOUR MARKET

As noted above, there is a considerable body of evidence indicating that the labour market disadvantages of francophones during the 1960s and 1970s were largely redressed by the 1980s, even to the point that some non-francophones interpreted the results as indicating that they are the victims of labour market discrimination. The regression-based findings using Census data of Shapiro and Stelcner (1987) and Vaillancourt (1991) have been largely confirmed by the results of surveys conducted in the 1990s by the Conseil de la langue française (1995) and by the findings of the L-P report. There is agreement that francophones have made significant advances in the workplace in terms of earnings as well as in other dimensions, such as representation in highly-paid professions and managerial positions and ownership of enterprises.⁹ In addition, the use of French in the workplace (francisation) continues to increase and, as aptly put in the L-P report, "the historic link between francophone workers and low income is gone" (p. 68).

The Conseil's annual reports and the L-P report clearly showed that Bill 101 contributed to substantial increases in the use of French in the workplace, which was also accompanied by impressive gains in the francophonisation of the private sector. These reports also showed a steady increase from 1980 in the proportion of businesses that obtained their francisation certificates. In 1984 about 37 percent of enterprises with 50 or more employees were awarded these certificates. By 1994 the proportion more than doubled to 77 percent. Among companies with 50 to 99 employees the rate was about 84 percent (41 percent in 1984) compared to 68 percent (33 percent in 1984) for firms with 100 or more workers. For the same year (1994) the surveys also showed that in the Montreal area, French is the

language of the workplace in almost 70 percent of smaller enterprises (fewer than 50 employees) and 60 percent of firms with 50 or more employees. In addition, the proportion of senior managerial positions held by francophones rose steadily from 31 percent in 1959 to 38 percent in 1977, and to 58 percent in 1988, while for anglophones it decreased steadily from 60 percent in 1959 to 45 percent in 1977, and to 26 percent in 1988. The proportions among allophones rose from 9 percent in 1959 to 17 percent in 1977, and then decreased slightly to 16 percent in 1988. Also noteworthy is the increased bilingualism among all language groups between 1971 and 1991. During this period, bilingualism among anglophones increased from 37 percent to 61 percent and from 26 percent to 32 percent among francophones, while knowledge of French among allophones rose from 47 percent (33 percent bilingual) in 1971 to 69 percent (47 percent bilingual) in 1991.

METHODOLOGY

This study uses 1991 Census data to obtain new earnings estimates for 1990, and compares these with the previously obtained results for 1970 and 1980. We proceed in two stages. First, we examine the 20-year trend in earnings disparities among full-year and full-time workers. This analysis, based on the model of Shapiro and Stelcner (1982, 1987), is restricted to workers who worked at least 35 hours/week and at least 40 weeks/year. The econometric specification of the earnings equation, sample restrictions, and estimation method (ordinary least squares) are identical (to the extent possible) to those used in the previous studies which used the 1971 and 1981 Censuses.¹⁰ Ready comparisons over the span of two decades can be made because the main set of earnings regressions for 1990 are replications of those estimated for 1970 and 1980. The study also extends the analysis for 1990 by estimating the potential effects of sample selection bias using the Heckman (1980) technique.¹¹

In the second stage, we consider the trend in earnings disparities among all workers (full- and part-time), using the model of Vaillancourt (1991) who has also tracked earnings disparities since 1970. His model is similar to that of Shapiro and Stelcner (1987), but his sample is based on workers who reported positive earnings and positive weeks worked. In both cases previously published estimates for 1970 and 1980 are compared with the new estimates for 1990. We elaborate this analysis for 1990 by examining the effects of employment status (full-time and part-time work) on linguistic earnings disparities.¹² The model of Vaillancourt (1991) is a useful way to examine the effects of work status over time.

EARNINGS DISPARITIES OVER TWENTY YEARS: FULL-YEAR AND FULL-TIME WORKERS

Table 1 presents our estimates of the earnings disparities among linguistic groups for 1970, 1980, and 1990, using the Shapiro-Stelcner model. Because the earnings patterns of men and women are so different, we estimate separate regressions for each. For each year the male and female samples are restricted to full-year and full-time wage and salary earners aged 18-65. The 1970 and 1980 results are those reported in Shapiro and Stelcner (1987), and the same methodology (described in their Appendix) is used to obtain the 1990 estimates. The results are therefore fully comparable across years.

The magnitudes in Table 1 are based on regression coefficients, and show the percentage difference in earnings between the relevant linguistic category and a reference category — unilingual anglophones — holding other things constant.¹³ In the context of Quebec, it is desirable to measure linguistic attributes by both mother tongue and ability to speak either or both of English and French. This results in eight linguistic categories including the reference group, unilingual anglophones. The

TABLE 1

Estimated Effects of Linguistic Attributes on Earnings, 1970, 1980 and 1990

Linguistic Group	<i>Total Sample – Males</i>							
	<i>Employment Characteristics – Excluded</i>				<i>Employment Characteristics – Included</i>			
	1970	1980	1990	1990-S	1970	1980	1990	1990-S
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	-2.2	0.2	3.3	2.3	-1.0	1.0	1.8	2.3
Unilingual francophones	-19.6 *	-7.3 *	-9.1 *	-7.4 *	-16.9 *	-4.5 *	-7.5 *	-6.1 *
Bilingual francophones	-11.2 *	-2.6	-0.3	-1.8	-9.4 *	-1.6	-0.4	-1.7
Allophones								
Unilingual – English Only	-16.6 *	-10.1 *	-14.4 *	-13.8 *	-12.8 *	-7.9 *	-12.9 *	-12.4 *
Unilingual – French Only	-18.3 *	-14.6 *	-18.9 *	-17.1 *	-16.1 *	-13.1 *	-17.5 *	-16.1 *
Both English and French	-6.7 *	-5.5 *	-8.0 *	-7.5 *	-3.6	-4.2 *	-6.2 *	-5.8 *
Neither official language	-28.8	-30.4 *	-31.4 *	-28.3 *	-23.9 *	-28.7 *	-25.4 *	-22.7 *
<i>Total Sample – Females</i>								
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	0.5	4.1	2.7	2.8	2.4	5.1	2.9	3.0
Unilingual francophones	-11.8 *	-5.7 *	-10.7 *	-11.1 *	-10.3 *	-2.9	-7.5 *	-7.6 *
Bilingual francophones	-3.3	1.2	0.1	-0.4	-2.7	2.7	1.6	1.8
Allophones								
Unilingual – English Only	-4.1	1.9	-2.9	-3.2	-4.3	4.6	0.6	0.4
Unilingual – French Only	6.5	-6.4	-11.6 *	-11.3 *	4.4	-2.0	-7.7 *	-7.5 *
Both English and French	9.2	2.6	-2.0	-1.9	7.8	5.1	1.1	1.2
Neither official language	-6.8	12.9	-15.8 *	-16.0 *	-1.3	12.2	-12.7 *	-12.8 *
<i>Quebec-born – Males</i>								
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	7.0 *	2.2	7.5 *	4.8	8.2 *	2.1	6.8 *	3.8
Unilingual francophones	-11.0 *	-5.3 *	-3.9	-3.5	-8.6 *	-3.4	-3.5	-3.2
Bilingual francophones	-1.3	-0.4	5.1	2.2	-0.1	-0.6	3.9	1.4
<i>Quebec-born – Females</i>								
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	0.3	6.8	-0.5	-0.3	2.4	7.9 *	0.7	0.7
Unilingual francophones	-9.7 *	-3.8	-13.5 *	-13.5 *	-8.7 *	-2.0	-10.0 *	-10.0 *
Bilingual francophones	-1.4	3.6	-4.1	-3.9	-0.8	4.3	-1.7	-10.2

Notes: An (*) indicates that the underlying coefficient is statistically significant (two-tailed test). Other magnitudes are presented for completeness' sake, but should be interpreted as zero. As shown by Halvorsen and Palmquist (1980), the percentage impact of a categorical variable (e.g., linguistic attribute) on earnings is calculated as follows: if b is the coefficient, then the percent change in earnings $r = e^b - 1$. Employment characteristics refer to control variables for occupation and industry.

The regressions are based on samples of wage and salary earners 18 to 65 years who resided in Quebec in 1991 and who worked at least 35 hours/week and at least 40 weeks/year. Excluded from the samples are farm residents, full-time students, unpaid family workers, self-employed and individuals whose occupation and/or industry was primary, construction and "other." For details, see Shapiro and Stelcner (1981, 1982). Quebec-born is restricted to wage and salary earners born in Quebec. The column labelled "1990-S" contains estimates corrected for selectivity bias.

Source: Authors' compilation.

magnitudes in Table 1 are to be read relative to the reference category. The asterisks (*) indicate that the magnitudes are statistically different from zero (two-tailed test).

The empirical strategy was to estimate an equation with the log annual earnings as the dependent variable and a large number of control or explanatory variables which are described in Shapiro and Stelcner (1987) and in the Appendix. We present two sets of updated estimates: (i) with controls for human capital (e.g., education, work experience, languages), related personal characteristics (e.g., marital status, periodicity of immigration, and place of residence), and labour supply (e.g., weeks and hours worked); and (ii) with additional controls for type of occupation and industry ("employment characteristics"), which are based on the definitions used in the Census.¹⁴

Main Findings: 1970 to 1980 (Table 1)

We begin by summarizing the results previously obtained for 1970 and 1980. In 1970, unilingual or bilingual francophone men earned less than comparable anglophones. For example, the earnings gap for unilingual francophone men was 17 to 20 percent (with and without employment characteristics), and 9 to 11 percent for bilingual francophones. The differences among women were less pronounced: only unilingual francophone women suffered an earnings penalty of 10 to 12 percent. Thus, the earnings disadvantage of the linguistic majority was certainly an important factor leading to language legislation in Quebec.

The estimates for 1980, however, clearly indicated that earnings disparities between anglophones and francophones had diminished over the decade. The earnings gap between unilingual francophone men and anglophone men declined to between 5 and 7 percent, while that of bilingual francophones disappeared. The earnings deficit of unilingual francophone women decreased to 6 percent, but disappeared when controls for employment characteristics were included. The considerable narrowing

of the anglophone-francophone earnings differential was further confirmed when the sample was restricted to those born in Quebec. In this case, the disparities among males disappeared. While there might be some debate as to whether these changes were the result of language policy, the increased education of francophones, or the massive out-migration of well-paid anglophones, it was clearly the case that knowledge of French was becoming more valuable in Quebec, and that francophones were becoming less and less a disadvantaged majority in the labour market.

Although the anglophone-francophone earnings gap did indeed close, this was not the case for allophone men. The results indicated that allophone males were the most disadvantaged group in both 1970 and 1980. In 1970 allophone men who (in addition to their mother-tongue) spoke only French earned 16 to 18 percent less than unilingual anglophones; by 1980 the gap had shrunk to 13 to 15 percent. For allophone men who spoke English only, the earnings disadvantage fell from 13-17 percent in 1970 to 8-10 percent in 1980, while for bilingual (in reality trilingual) allophones it remained about the same: 0 to 7 percent in 1970 and 4 to 6 percent in 1980. Allophone women experienced no earnings gap in either 1970 or 1980.

An important finding of the 1970-1980 comparison is that knowledge of French among allophone men led to just a modest improvement in their relative economic status over the decade. These results led to the conclusion that policy in Quebec should be directed toward the economic integration of allophones.

Main Findings: 1990 (Table 1)

The new results for 1990 can now be understood in their context. Two sets of results for 1990 are presented. The first, displayed in the column labelled *1990*, is estimated in exactly the same way as for 1970 and 1980, and is therefore directly comparable. The second set of results for 1990, in the column labelled *1990-S* contains estimates corrected

for selectivity bias. The 1970 and 1980 results were not corrected for selectivity bias, and so are not directly comparable. However, we wished to determine whether the current results were biased, and by extension to determine whether previous results were biased. As can readily be seen from Table 1, the effect of this bias is minimal.

We begin with the male results. When the entire sample of males is considered, we observe that the earnings disadvantage of unilingual francophones rose to about 8-9 percent in 1990 from 5-7 percent a decade earlier. However, earnings of bilingual francophone men remained on par with those of anglophones.

When the sample is restricted to Quebec-born men, there are no earnings differences between francophones and unilingual anglophones. However, there is some evidence that Quebec-born bilingual anglophones fared better by about 7 percent. However, we note that when selectivity bias effects are incorporated, the linguistic earnings gap disappears. Thus, any remaining disadvantage of unilingual francophone males continues to be related to the lower earnings of French-speaking migrants from other provinces or countries. Many of these will likely have immigrated from poor countries in which French is widely used, for example, Haiti (Creole mother-tongue), Lebanon, the Maghreb countries, and Viet Nam.¹⁵

In considering the results for allophones it should be emphasized that the regressions do include controls for periodicity of immigration. A notable feature of the 1990 findings is that the relative position of allophone men — regardless of official languages spoken — has deteriorated considerably. French-speaking allophone men suffered a penalty of about 18 percent compared to about 15 percent in 1980. Similarly, English-speaking allophone males had an earnings disadvantage of 13 to 15 percent in 1990 versus 8 to 10 percent in 1980, while the earnings disadvantage of bilingual allophones increased from 4-6 percent in 1980 to 6-8 percent in 1990.

In sum, the earnings position of male allophones has deteriorated markedly regardless of whether they speak English or French. For allophone males it was and continues to be the case that knowledge of English alone is more valuable than knowledge of only French, but being bilingual is most valuable. As might be expected, the inability to speak either French or English results in the most serious earnings disadvantage.

As regards women, the situation is different in some respects from that of men. It has been the case historically that linguistic earnings disparities among women have been lower than among men. With the clear exception of unilingual francophone women, earnings differences among women did not exist prior to 1990. This can be attributed in part to the fact that women are disproportionately represented in low-paying occupations where language skills may not be important, or in other occupations such as teaching and health occupations where wages are determined through centralized collective bargaining.

It is therefore of some interest that the 1990 analysis revealed an earnings deterioration among unilingual francophone women. The earnings disadvantage of unilingual francophones increased to 8 to 11 percent in 1990 from 0 to 6 percent in 1980. Among Quebec-born women, unilingual francophones continue to suffer an earnings penalty of 10 to 14 percent, an increase over the 1980-90 period, and an outcome somewhat different from the experience of men.¹⁶

Increasing disparities were also observed between allophone and other women. For the period 1970-80, allophone women were not disadvantaged, but in 1990 French-speaking allophone women earned 8 to 12 percent less than their anglophone and bilingual francophone counterparts, and about the same as unilingual francophones. The situation of allophone women speaking neither official language deteriorated by even more. As was the case for allophone men, knowledge of only French is not

rewarded in the Quebec labour market if you are an allophone woman.

The 1990 results for full-time workers therefore make it apparent that the returns to human capital embodied in language skills differ by linguistic group and, to a lesser extent, by gender. One exception is the case of bilingual anglophones and francophones where, for the most part, knowledge of *both* French and English is rewarded equally.¹⁷ However, anglophones who speak English only do not fare worse than their bilingual counterparts, whereas francophones who speak only French do. The rise in the earnings deficiency of unilingual francophones between 1980 and 1990 clearly indicates that Bill 101 notwithstanding, knowledge of English carries a significant labour market return for francophones.

The pattern and trend in returns to language are most different for allophones. Allophones not only earn less than anglophones or francophones, but their relative position has deteriorated over time. Knowledge of English remains important in Quebec for all people, but is most important for allophones. Among those who speak English or French, allophones who speak only French are the worst-paid group in Quebec. They are also relatively worse off than they were in 1980. The resistance of allophones to being totally integrated into the dominant language milieu is thus partly explained by these results. If this group has been and is reading labour market signals correctly, then it is quite clear that knowing only French carries with it earnings penalties. The knowledge of both English and French is, of course, the most desirable option.

THE ROLE OF EMPLOYMENT STATUS: FULL-TIME AND PART-TIME WORK (TABLE 2 AND TABLE 3)

The results discussed above were based on samples restricted to full-year and full-time workers. Those results clearly do not indicate that anglophones in

Quebec experience any earnings disadvantage, a result that might be seen as surprising, given both the concerns frequently expressed in the anglophone community, and the empirical evidence provided by Vaillancourt (1991).¹⁸ Vaillancourt has also tracked earnings disparities among linguistic groups over time using a model specification similar to that of Shapiro and Stelcner. However, a major difference is that Vaillancourt includes in his estimation samples individuals who reported positive earnings and positive weeks worked, but any number of hours per week. Vaillancourt therefore includes both full- and part-time workers, while the Shapiro-Stelcner samples are restricted to full-year and full-time workers.

We have estimated the Vaillancourt model for 1990, and these results together with his earlier ones for 1970 and 1980 are displayed in Table 2. The numbers are interpreted in the same way as those in Table 1: they represent percentage differences in earnings between the reference group (unilingual anglophones) and the indicated linguistic category. As before, results are presented with and without employment characteristics, and separately for men and women.

The results are both similar to, and different from those based on full-year/full-time samples. The similarity resides in the fact that there was a clear relative improvement in the position of francophones between 1970 and 1980, with little change in the next decade. These estimates also indicate a deterioration in the relative earnings of allophones (especially males) over the entire 20-year period. Thus, the inclusion of part-time workers does not affect the main conclusions arrived at using the full-time sample.¹⁹

However, the same is not true for disparities between anglophones and francophones, especially unilingual anglophone males. Looking at the sample of all male workers, we see that in 1970 unilingual anglophone men earned 6 to 7 percent *less* than bilingual anglophones, about 8 to 9 percent *more* than unilingual francophones, and 1 to 2

TABLE 2

Estimated Effects of Linguistic Attributes on Earnings, 1970, 1980 and 1990: Vaillancourt Model

<i>Linguistic Group</i>	<i>Total Sample – Males</i>							
	<i>Employment Characteristics – Excluded</i>				<i>Employment Characteristics – Included</i>			
	<i>1970</i>	<i>1980</i>	<i>1990</i>	<i>1990-S</i>	<i>1970</i>	<i>1980</i>	<i>1990</i>	<i>1990-S</i>
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	6.2 *	7.4	9.8 *	4.2	6.7 *	6.1	8.2 *	6.7 *
Unilingual francophones	-9.2 *	7.7 *	5.1 *	1.4	-7.7 *	4.3 *	3.3	2.0
Bilingual francophones	2.3 *	13.2 *	13.4 *	7.7 *	0.6 *	8.3 *	10.4 *	8.7 *
<i>Allophones</i>								
Unilingual – English Only	-9.2	-9.8 *	-21.0 *	-21.2 *	-8.3	-7.1 *	-14.1 *	-14.5 *
Unilingual – French Only	-4.7	-13.9 *	-22.8 *	-24.6 *	-6.6	-16.7 *	-18.3 *	-19.1 *
Both English and French	-3.7 *	0.8 *	-8.4 *	-10.6 *	-1.4 *	1.1 *	-5.2 *	-5.9 *
Neither official language	-25.2 *	-40.9 *	-36.0 *	-34.6 *	-24.1 *	-39.6 *	-24.5 *	-24.4 *
<i>Total Sample – Females</i>								
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	-3.0	3.5	5.4	2.7	-1.4	4.4	6.3 *	6.6 *
Unilingual francophones	-5.2	4.7 *	-3.5	-4.7	-5.7 *	5.3 *	3.3	3.5
Bilingual francophones	4.0 *	12.5 *	12.0 *	7.4 *	3.8 *	11.4 *	12.9 *	13.4 *
<i>Allophones</i>								
Unilingual – English Only	-0.1	4.2	-3.7	-5.4	1.8	7.2	1.5	1.7
Unilingual – French Only	16.4 *	2.4	-12.5 *	-12.9 *	13.0 *	5.2	-7.7 *	-7.7 *
Both English and French	5.3 *	7.2	-3.3	-5.4	3.4	10.2	0.5	0.7
Neither official language	-7.0	11.5	-19.2 *	-18.9 *	-11.1	10.7	-15.6	-15.6

Notes: An (*) indicates that the underlying coefficient is statistically significant (two-tailed test). Other magnitudes are presented for completeness' sake, but should be interpreted as zero. As shown by Halvorsen and Palmquist (1980), the percentage impact of a categorical variable (e.g., linguistic attribute) on earnings is calculated as follows: if b is the coefficient, then the percent change in earnings $r = e^b - 1$. Employment characteristics refer to control variables for occupation and industry.

The values for 1970 and 1980 are drawn from regressions reported in Vaillancourt (1988, 1991); those for 1990 are based upon regressions that are available from the authors. The regressions are based on samples of individuals of any age who reported positive earnings and positive weeks worked. Part-time refers to those individuals who worked at least one week and less than 30 hours/week. Full-time refers to those who worked at least one week and at least 30 hours/week.

Source: Authors' compilation.

percent less than bilingual francophones. In 1980, the gap between unilingual and bilingual anglophones disappeared. However, unilingual anglophones earned 4 to 8 percent less than unilingual francophones and 8 to 13 percent less than bilingual francophones. By 1990, bilingual anglophone men earned 8 to 10 percent more than their

unilingual counterparts, but unilingual anglophone men suffered a penalty of at most 5 percent relative to unilingual francophones, and earned 10 to 13 percent less than bilingual francophones. Thus by 1990, unilingual anglophone males earned less than either bilingual or unilingual francophones and bilingual anglophones.

The results for women are also somewhat different. In 1970, only bilingual francophones received a *language* premium of 4 percent, and this rose to about 12 to 13 percent in 1980 and 1990. Unlike 1970 when unilingual francophone women incurred a penalty of at most 6 percent, in 1980 they received a premium of 5 percent, but this disappeared by 1990. Finally, only in 1990 did bilingual anglophone women earn a premium of at most 6 percent. By 1990 bilingualism was rewarded for both anglophone and especially francophone women.

This set of results for anglophones and francophones lead us to the conclusion that, when considering both full- and part-time workers, by 1990 bilingualism was highly rewarded in Quebec, particularly for anglophones and francophones, men and women. Both sets of results also suggest the relative position of unilingual francophones has deteriorated in the period 1980-90.

Employment status (full-time or part-time work) is important to understanding the relative position of unilingual anglophones in Quebec. Although unilingual anglophones employed on a full-time basis in 1990 experienced no earnings disadvantage, part-time workers did.²⁰ The earning disadvantage of unilingual anglophones who work part-time is emphasized in Table 3, where the estimates based on the Vaillancourt model for 1990 are presented for both full- and part-time workers.

The results for part-time male workers show that unilingual anglophones earn 23 to 27 percent less than unilingual francophones and about 33 percent less than bilingual francophones. Among women part-time workers, unilingual anglophones suffer a penalty of 14 to 19 percent relative to unilingual francophones and 24 to 27 percent relative to bilingual francophones. In many ways this pattern of results is not surprising. Unilingual anglophones who are employed full-time in areas such as teaching, medicine and dentistry, or accounting can earn high incomes by working in linguistically congenial (i.e., English-speaking) communities. Licensed

professionals, for example, nurses and accountants, are, however, required to pass a French language exam.

As regards bilingual anglophone part-time workers, men earn 3 percent less than unilingual francophones and 13 percent less than bilingual francophones; women earn 6 percent less than unilingual francophones and 14 percent less than bilingual francophones.

The pattern of estimated results for allophones using the samples of all workers is qualitatively similar to that based on full-year/full-time workers. Quantitatively, the results obtained with the Vaillancourt specifications paint a bleaker picture of the relative earnings status of allophones in Quebec labour markets in 1990. For example, based on the male sample of all workers, French-speaking allophone men earn 23 percent less than unilingual anglophones, 28 percent less than unilingual francophones and 36 percent less than bilingual francophones. The corresponding magnitudes based on the male full-year/full-time sample were 19 percent, 10 percent, and 19 percent, respectively.

However, the situation for allophones who work part-time is somewhat different, at least vis-à-vis unilingual anglophones. In general, allophones who work part-time do relatively better than allophones who work full-time, a result quite different from that for anglophones.

SUMMARY AND CONCLUSIONS

Quebec represents an interesting and possibly unique jurisdiction in which to analyze the returns to language skills. Within its borders a francophone majority coexists with a number of linguistic and ethnic minorities. Among the latter are anglophones, who also belong to the majority language group in Canada and North America, and use the *lingua franca* of world commerce. In these circumstances, the rewards to language skills are complicated

TABLE 3

Estimated Effects of Linguistic Attributes on Earnings: Vaillancourt Model – By Work Status – 1990

Unadjusted for Selectivity Bias

<i>Linguistic Group</i>	<i>Males</i>				<i>Females</i>			
	<i>Employment Characteristics</i>				<i>Employment Characteristics</i>			
	<i>Excluded</i>		<i>Included</i>		<i>Excluded</i>		<i>Included</i>	
	<i>Full-time</i>	<i>Part-time</i>	<i>Full-time</i>	<i>Part-time</i>	<i>Full-time</i>	<i>Part-time</i>	<i>Full-time</i>	<i>Part-time</i>
<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	8.4 *	14.7	6.1 *	19.7 *	4.7	11.4	5.5 *	13.3 *
Unilingual francophones	0.2	27.2 *	- 0.2	22.6 *	- 7.6 *	14.3 *	- 2.0	19.2 *
Bilingual francophones	9.4 *	31.8 *	6.3 *	33.3 *	8.0 *	24.3 *	8.3 *	26.7 *
<i>Allophones</i>								
Unilingual – English Only	-21.2 *	-17.7 *	-14.7 *	- 7.6	-15.0 *	22.5 *	- 8.9 *	25.1 *
Unilingual – French Only	-28.8 *	6.0	-23.7 *	8.0	-20.0 *	2.8	-11.7 *	2.0
Both English and French	-11.1 *	5.0	- 8.5 *	11.8	- 7.3 *	6.8	- 2.7	8.3
Neither official language	-36.1 *	-33.5 *	-24.1 *	-23.2	-44.1 *	61.2 *	-37.3 *	52.8 *

Adjusted for Selectivity Bias

<i>Unilingual anglophones – reference</i>								
Bilingual anglophones	4.7	15.2	4.6 *	21.2 *	3.6	13.7 *	6.0 *	14.7 *
Unilingual francophones	- 0.8	34.4 *	- 1.1	27.6 *	- 6.9 *	18.7 *	- 2.0	21.6 *
Bilingual francophones	5.0 *	31.6 *	4.4 *	33.9 *	6.0 *	27.5 *	9.3 *	28.6 *
<i>Allophones</i>								
Unilingual – English Only	-19.7 *	- 8.6	-14.4 *	0.4	-14.9 *	27.1 *	- 8.9 *	27.8 *
Unilingual – French Only	-27.4 *	25.1 *	-23.0 *	27.1 *	-20.5 *	1.6	-11.4 *	1.3
Both English and French	-12.2 *	8.5	- 8.6 *	15.8	- 8.0 *	8.6	- 2.3	9.5
Neither official language	-32.9 *	-25.2	-22.7 *	-14.2	-44.3 *	58.5 *	-37.1 *	51.3 *

Notes: An (*) indicates that the underlying coefficient is statistically significant (two-tailed test). Other magnitudes are presented for completeness' sake, but should be interpreted as zero. As shown by Halvorsen and Palmquist (1980), the percentage impact of a categorical variable (e.g. linguistic attribute) on earnings is calculated as follows: if b is the coefficient, then the percent change in earnings $r = e^b - 1$. Employment characteristics refer to control variables for occupation and industry.

The values for 1970 and 1980 are drawn from regressions reported in Vaillancourt (1988, 1991); those for 1990 are based upon regressions that are available from the authors. The regressions are based on samples of individuals of any age who reported positive earnings and positive weeks worked. Part-time refers to those individuals who worked at least one week and less than 30 hours/week. Full-time refers to those who worked at least one week and at least 30 hours/week.

Source: Authors' compilation.

indeed. One would expect that people who did not speak the majority language would not be able to function in the labour market and would be correspondingly penalized in terms of earnings. In Quebec, this was not the case historically, and is not completely the case today, although there has been some movement in that direction. One would also expect that knowledge of English would be rewarded

for those whose mother tongue is other than English. This has for the most part been the case historically, and remains largely true today. One would also expect that, other things being equal, rewards to language skills would tend to equalize over time for all groups. While this has been the case for anglophones and francophones, it has not been the case for allophones.

It is quite clear that in the decade between 1970 and 1980 there was a major improvement in the relative earnings of most francophone workers, full-time or part-time, in Quebec. In the subsequent decade, the position of francophones relative to anglophones did not change very much, although there was a worsening of the relative position of unilingual francophone women, particularly among full-time workers. Bilingualism is important for both anglophones and francophones in Quebec, particularly for full-time workers who earn premiums for knowledge of the other language.

As regards anglophones, the picture is mixed. The position of bilingual anglophones in fact changed little over 20 years. Indeed, there may well have been some improvement in the relative position of bilingual anglophones between 1980 and 1990. The situation of unilingual anglophones depends critically on employment status. Unilingual anglophones employed on a full-time basis did earn a premium in 1970, but that was eliminated by 1990; unilingual anglophones as a whole (i.e., including part-time workers) also saw the premium erode, and in the case of males it had become a deficit by 1990. Thus, the ability to speak English only and at the same time be among the highest earners in Quebec had become limited by 1990.

The situation is considerably different for allophones, whose relative position worsened over the 20-year period, regardless of their language capabilities. While it is true that bilingual allophones are better off relative to other allophones, they still earn less than francophones or anglophones, and the difference generally became greater over the period. If language skills are simply forms of human capital, then they should be rewarded equally, absenting from outright discrimination or problems of accurately measuring these skills.

The improvement in the relative position of francophones is to a large extent related to the role of language policy in Quebec, and the changes it has caused in the supply and demand for people with

specific language skills. This policy is designed to explicitly encourage the use of French (francisation), but also is likely to have a favourable effect on the employment of francophones (francophonisation). There are few, if any, areas in the world that have comparable policies relating to language of workplace, professional certification, language of schooling, and public signs. Bill 101 has undoubtedly increased the demand for French and those who speak French in the workforce, and hence the returns to knowledge of that language. The law has also likely been responsible for the increase in the percentage of non-francophones who speak French.

However, knowledge of English remains important in Quebec. Bilingual francophones command an earnings premium. Moreover, the improvement in the relative position of unilingual francophones observed in the 1970s did not continue into the 1980s, and in fact deteriorated. To some degree, this may reflect the positive correlation between bilingualism and educational attainment. The relative deterioration was most severe among unilingual francophone women. While these women have less education than other groups, they may also be segregated in relatively low-paying jobs in small non-unionized firms where no English is required. A low proportion (8 percent) of unilingual francophone women hold managerial jobs relative to bilingual women (16 percent).

Language policies have been met with some resistance by non-francophones. Not surprisingly, both voice and exit strategies have been employed (Hirschman 1970). Anglophones have adopted both, with a considerable number having chosen the latter. As the outflow of more mobile (and likely higher-income) unilingual anglophones increased, and as the inflow of highly-paid unilingual anglophones diminished, their representation in the workforce not only declined, but lowered the average income of those who remained. Bill 101 contributed to these trends directly by making it more difficult for the children of new entrants to Quebec to obtain education in English, and by altering the

political climate so that unilingual anglophones felt pressure either to leave or to learn French. By the late 1980s many of these adjustments had been made and while net outmigration of anglophones continued, the rate had diminished. The outmigration of anglophones has therefore also been a factor determining the relative rewards to language.²¹

The situation of allophones is somewhat different from that of anglophones. Our results clearly indicate that language and ethnicity are related. The returns to language in Quebec are lower for allophones, holding constant other factors such as education, age, and date of immigration. The lower estimated returns are therefore not the result of lesser qualifications or more recent immigration. The returns to language are lower across-the-board for all allophones, regardless of their education or time of arrival in Canada.

There are two possible explanations: simple discrimination (the unequal treatment of equally qualified allophones in the labour market) and measurement error. Discrimination implies lower earnings based on ethnic status alone.²² Measurement error could occur because language capabilities are really self-assessed in the Census and certainly do not reflect degree of competence. It is possible that allophones are simply on average less competent in English or French and this is reflected in their earnings. We note, however, that the regression equations include a term accounting for the date of immigration, a term that should be related to the ability to speak English or French. In addition, there is no reason to believe that allophones speak either English or French less well than francophones who speak English or anglophones who speak French. In either case, the fact that the situation of allophones has deteriorated in relative terms suggests that there is some need for remedial action to ensure the full integration of allophones into Quebec labour markets.

Despite the requirement of Bill 101 that children whose parents were not educated in English in

Canada must attend French schools, the percentage of allophones speaking only French increased only marginally. There was, however, an increase in the percentage of allophones who were bilingual, normally in the range of a 50-percent increase over 1970. Thus, the increase in the demand for knowledge of French coupled with the educational requirements of Bill 101 did cause allophones to become increasingly proficient in French. These requirements did not, however, cause them to abandon acquiring English language skills. Despite their increasing acceptance of French, allophones clearly did not benefit from the increased demand for workers with knowledge of the dominant language of Quebec.

While the preceding discussion was phrased generally, the returns to language can differ by employment status and gender. These differences do not alter the basic conclusions discussed above. In addition, we find that earnings disparities among female linguistic groups have increased over time and have come to resemble more closely the pattern of differences observed among men. This may reflect the increasing participation of women in all parts of the labour market.²³

It is also apparent that the returns to language depend on employment status, although this is more important for men than for women. Bilingualism is rewarded more highly among part-time workers than among full-time workers, and unilingual anglophones who work part-time do much worse than their full-time counterparts. Whereas there are a few high-paying niches for full-time unilingual anglophones, the same is not true for part-time employment. These results almost surely reflect the fact that much part-time work is in the low-wage end of the service sector. In the Quebec of the 1990s it would be extremely difficult to work in the service sector without knowledge of French. While knowledge of English may be helpful, if not required, knowledge of English only is not sufficient.

Earnings are, of course, only one component in the debate over language policy. While our results

tend to suggest that the battle by francophones to be rewarded for knowledge of French was largely won by 1980, the continuing controversies over language policy suggest the importance of these other issues. However, our results also suggest that the relative position of unilingual francophones has deteriorated. While this may result in a demand for the strengthening of language laws, it may also indicate their limitations. The interests of unilingual francophones may well be better served by enhancing their ability to learn English.

Finally, our results suggest that the role of ethnic and linguistic minorities in Quebec will continue to be widely debated. Concerns among allophones that speaking French is a necessary but not sufficient condition for economic success are confirmed by our results. While that is not yet true for all anglophones, there is now evidence to suggest that anglophones who work part-time are becoming relatively worse-off.

We therefore have no reason to believe that tensions over language will abate in Quebec. Each linguistic group has reason to feel itself threatened, and no current policy proposals seem able to address all concerns.

NOTES

Partial funding for this research was provided by the Social Sciences and Humanities Research Council of Canada. The authors thank Charles Beach and two anonymous referees for their constructive suggestions. We also benefited from the comments of participants at a seminar sponsored by Research on Immigration and Integration in the Metropolis (RIIM), Simon Fraser University, where an earlier version of this paper was presented. The competent research assistance of Natasha Joyal is gratefully acknowledged. The views expressed in this paper are those of the authors only.

¹Some readers may not be familiar with the word “allophone,” which was first introduced in the 1972 Gendron Report on the state of the French language in Quebec. It is derived from the Greek “allos,” meaning

“other.” See Jedwab (1996) for a discussion of the definitional issue of linguistic identification.

²In 1971 the anglophone and allophone shares of the total population were 13.1 percent and 6.2 percent, respectively. The corresponding proportions in the Montreal CMA were 24.9 percent and 8.8 percent, and on the Island of Montreal, 23.7 percent and 15.1 percent. Interprovincial and international migration is a key consideration underlying the decline in the proportion of anglophones and the rise in that of allophones. In particular, a large outmigration of anglophones was offset by an influx of allophones. Allophones also represent an increasing percentage of international immigration. For details, see Conseil de la langue française (1992), Dumas and Bélanger (1996); Harrison and Marmen (1994); and Renaud and Costa (1995).

³While we do not claim to be numerologists, one cannot ignore the page number on which this statement was made.

⁴See, for example, Boulet and Lavalée (1983); Grenier (1985, 1987); Stelcner and Dyer (1986); Vaillancourt (1997, 1991, 1988, 1985); and Vaillancourt and Lacroix (1985). These studies also showed a considerable improvement in the relative earnings position of francophones. However, they also revealed that allophone men were significantly disadvantaged in terms of earnings, regardless of their ability to speak Canada’s official languages.

⁵See Levine and Termote *et al.* (1993) and Vaillancourt (1978) for a discussion of the underlying demographic and economic concerns that led to Bill 101. Also see Gagnon (1993) for discussions of the transformations Quebec has experienced in the last three decades. The evolution of language legislation is described in an interministerial report on the status of the French language in Quebec. See Quebec (1996).

⁶Josée Legault, a political science professor at the Université du Québec à Montréal, coordinated the study; Michel Plourde, former head (1979-1985) of the Conseil de la langue française, was the chief editor, and Nicole René of the Office de la langue française chaired the interministerial committee. The report was commissioned in the fall of 1995 by Louise Beaudoin, the minister responsible for language laws. A task force was established with the mandate to produce, by the end of 1995, a “descriptive and factual” report on the status of the French

language and its usage, and to examine language laws as they affect the workplace, education, integration of immigrants, and commercial signs.

⁷For example, the report (pp. 148, 216, and ch. 3.7) points out that the majority of allophones (largely concentrated in the Montreal region) prefer to read English-language newspapers, watch English-language television, videos and films, and, because it is more readily available, buy English-language software. They also tend to enrol in English-literacy courses, and opt for attending English-language CEGEPS and universities. At the same time the report notes that two-thirds of allophones who arrived between 1976 and 1991 speak French, 40 percent of allophone workers use mainly French at work, and only 14 percent know only English.

⁸Bill 40 resurrects one of the most resented institutions among non-francophones, the Commission de protection de la langue française, the agency that was abolished in 1993 by the Liberal government. According to Bill 40, the inspectors of this language-law enforcement agency have wide investigative authority, which includes the right to "enter an establishment at any reasonable time ... examine any products or documents, make copies and photographs ... and require any relevant information." Another controversial part of Bill 40 concerns French-language software. Software distributors and retailers *must* offer a French version of the software — if such a version exists anywhere in the world — "on terms, except price, that are no less favourable."

⁹See Vaillancourt (1993,1997); Leblanc and Vaillancourt (1993).

¹⁰In Shapiro and Stelcner (1987, 1982), the estimation samples of men and women were limited to wage and salary earners who were 18-65 years of age, worked at least 35 hours/week and at least 40 weeks/year. Excluded from the samples were farm residents, full-time students, unpaid family workers, the self-employed, and individuals whose occupation and/or industry was primary, construction, and "other."

¹¹Parameter estimates based on OLS techniques may be biased and inconsistent when estimated over restricted and non-randomly selected samples of wage-earners only. Heckman (1980) provides a two-step method to correct for selectivity bias, and we use this technique in our estimations. The first step is to estimate a probit equation that predicts inclusion in the wage sample. The explanatory

variables for this estimation are: age (and its square), years of schooling, mother tongue and official language(s) spoken, immigration, mobility, residence, marital status, family size, age and structure of children, age and education of spouse (where relevant), shelter costs, and non-labour income (total family income less earnings of the individual). The probit equation yields the inverse of Mills' ratio, lambda, for each observation in the wage sample. The second step involves OLS estimation of the earnings equation with lambda as an additional regressor. Although this procedure has been widely used, concerns have been expressed about its reliability because it may be prone to underidentification, as well as sensitivity to specification and to assumptions about the underlying error distribution that underlies the model. (See Manski 1989.) Because of these reservations, the "corrected" results should be interpreted with caution. The probit estimates and the selectivity-corrected earnings regressions are available upon request from the authors.

¹²We also examined the situation in metropolitan Montreal (where the vast majority of non-francophones live) and in the rest of Quebec. The results for Montreal were essentially the same as those for all Quebec. In general, there was little variation in the estimates across the samples.

¹³The percentage impact of a categorical variable on the log of earnings is calculated as follows: if b is the regression coefficient, then the percent change in earnings $r = e^b - 1$. For details, see Halvorsen and Palmquist (1980); Derrick (1984); and Kennedy (1981).

¹⁴The addition of occupation and industry control variables allows one to capture the effects of occupational and industrial representation on linguistic earnings differences. The industry variables are based on the 1980 standard industrial classification. As regards occupation, we ran regressions with both the 1980 and 1990 (employment equity related) standard occupational classifications. Detailed regression results are available from the authors.

¹⁵The regression equations did control for immigration status, but there are obvious difficulties in completely sorting out immigration status and mother tongue.

¹⁶The earnings disadvantage of unilingual francophone men disappears when the sample is restricted to Quebec-born males and to residents outside Montreal. However, for unilingual francophone women the disadvantage persists regardless of sample restrictions (i.e., Montreal

residents, Quebec-born, non-Montreal residents). It is also present in 1990 when selection bias effects are considered.

¹⁷We do note, however, that bilingual anglophone men who are born in Quebec reap a 7-percent premium for their knowledge of the two official languages.

¹⁸Vaillancourt's analysis uses 1986 Census data, and he finds that unilingual anglophones earn less than francophones or bilingual anglophones.

¹⁹Although there are minor specification differences between the Vaillancourt and Shapiro-Stelcner models, we attribute differences in results to differences in sample selection. This was verified by running the Shapiro-Stelcner model using Vaillancourt's sample selection criteria. The results did not change in any significant way.

²⁰This statement was verified by running a separate regression for part-time workers using either the Vaillancourt specification, or our own. The result is also robust in that it holds for alternative definitions of part-time (i) positive weeks per year and less than 30 hours per week, which is used in our discussion, or (ii) less than 30 hours per week and less than 30 weeks per year.

²¹We note that net internal migration losses have risen sharply and net international immigration (immigrants less emigrants) has decreased considerably during the period 1994 to 1996.

²²In a separate analysis, we examined earnings differentials among over 40 so-called "visible" and "not visible" ethnic groups in Quebec. The regression results largely confirmed our findings in this study, namely: several "not visible" ethnic groups such as Greeks, East Europeans, and Latin Americans incurred large and significant earnings penalties, as did "visible minorities" such as Arabs, Blacks, Chinese, South and West Asians, and Native Peoples. The regression results are available from the authors. These results are consistent with those of Pendakur and Pendakur (1995) and Baker and Benjamin (1995) for Canada as a whole.

²³The increased disparities in returns to language among women may indicate that male and female labour markets are becoming more similar. Indeed the *observed* female-male earnings ratio rose from 61 percent in 1970 to 67 percent in 1980 and to 70 percent in 1990. However, estimates of gender discrimination, obtained using the decomposition approach developed by Blinder (1973)

and Oaxaca (1973) and discussed in more detail in Shapiro and Stelcner (1987), have increased since 1970. In 1970 the "unexplained" portion of the gender earnings gap ranged from 57 percent (when effects of occupation and industry are included) and 71 percent (when these employment characteristics are excluded); in 1980 the range was 61 percent and 76 percent, and in 1990 it was 69 percent to 83 percent. Incorporating the effects of selectivity bias (1990 only) raises the respective magnitudes to 83 percent and 92 percent, while the Vaillancourt specification for 1990 yields estimates of 65 percent to 84 percent. Detailed results are available from the authors.

REFERENCES

- Baker M. and D. Benjamin (1995), "Ethnicity, Foreign Birth and Earnings: A Canada/U.S. Comparison" (Toronto: Department of Economics, University of Toronto).
- Blinder, A.S. (1973), "Wage Discrimination: Reduced Form and Structural Estimates," *Journal of Human Resources* 8(4):436-55.
- Boulet, J.-A. and L. Lavallée (1983), "L'évolution des disparités linguistiques de revenus du travail au Canada de 1970 à 1980," Discussion Paper No. 245 (Ottawa: Economic Council of Canada).
- Canadian Heritage/Patrimoine canadien (1997), *New Canadian Perspectives: Official Languages and the Economy*, papers presented at a colloquium hosted by the Official Languages Support Programs Branch, Department of Canadian Heritage held on 5 May 1995, Catalogue No. CH3-2/5-1996E (Ottawa: Public Works and Government Services Canada).
- Conseil de la langue française (1992), *Indicateurs de la situation linguistique au Québec: édition 1992* (Québec: Conseil de la langue française).
- ____ (1995), *Indicateurs de la langue du travail au Québec, édition 1994* (Québec: Les Publications du Québec).
- Derrick, F.W. (1984), "Interpretation of Dummy Variables in Semi-Logarithmic Equations: Small Sample Implications," *Southern Economic Journal* 50(4):1185-88.
- Dumas, J. and A. Bélanger (1996), *Report on the Demographic Situation in Canada 1995*, Catalogue No. 91-209E (Ottawa: Statistics Canada).
- Gagnon, A.-G. ed. (1993), *Quebec State and Society* (Scarborough, ON: Nelson Canada).
- Grenier, G. (1985), "Bilinguisme, transferts linguistiques

- et revenus du travail au Québec: quelques éléments d'interaction," in *Économie et langue*, ed. F. Vaillancourt (Québec: Conseil de la langue française).
- ____ (1987), "Earnings by Language Group in Quebec in 1980 and Emigration from Quebec Between 1976 and 1981," *Canadian Journal of Economics* 20(4):774-91.
- Halvorsen, R. and R. Palmquist (1980), "The Interpretation of Dummy Variables in Semilogarithmic Equations," *American Economic Review* 70(3):474-75.
- Harrison, B. and L. Marmen (1994), *Focus on Canada: Languages in Canada*, Statistics Canada, Catalogue No. 96-313 E (Scarborough, ON: Prentice-Hall Canada).
- Heckman, J.J. (1980), "Sample Selection Bias as a Specification Error," in *Female Labor Supply: Theory and Estimation*, ed. J.P. Smith (Princeton: Princeton University Press).
- Hirschman, A. O. (1970), *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States* (Cambridge, MA: Harvard University Press).
- Jedwab, J. (1996), *English in Montreal: A Layman's Look at the Current Situation* (Montreal: Les Éditions Images).
- Kennedy, P.E. (1981), "Estimation with Correctly Interpreted Dummy Variables in Semilogarithmic Equations," *American Economic Review* 71:801.
- Leblanc M. and F. Vaillancourt (1993), *La propriété de l'économie du Québec en 1991 selon le groupe d'appartenance linguistique* (Québec: Office de la langue française).
- Levine, M.V., and M. Termote *et al.* (1993), *Contextes de la politique linguistique québécoise: Analyses juridique, démographique, économique et culturelle présentées au séminaire du conseil de la langue française, du 12 au 14 novembre 1992*, Conseil de la langue française, Dossier 36 (Québec: Les Publications du Québec).
- Manski, C. (1989), "Anatomy of the Selection Problem," *Journal of Human Resources* 24(3):343-60.
- Oaxaca, R. (1973), "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review* 14(3):693-709.
- Pendakur, K. and R. Pendakur (1995), *Earnings Differentials among Ethnic Groups in Canada* (Ottawa: Canadian Heritage, Reference, SRA-34).
- Quebec (1996), Legault-Plourde Report, *Le français langue commune: Enjeu de la société québécoise, Bilan de la situation de la langue française au Québec en 1995*, Rapport du comité interministériel sur la situation de la langue française (Québec: Les Publications du Québec).
- Quebec. Gendron Commission (1972), *La situation de la langue française au Québec française* (Québec: Editeur officiel du Québec).
- Renaud, V. and R. Costa (1995), "Immigrants in Quebec," *Canadian Social Trends*, No. 37, Catalogue No. 11-008E (Ottawa: Statistics Canada).
- Shapiro, D. and M. Stelcner (1981), "Earnings Determination: The Role of Language and Sex, Quebec: 1970," Working Paper No. 1981-1 (Montreal: Department of Economics, Concordia University).
- ____ (1982), "Language Legislation and Male-Female Earnings Differentials in Quebec," *Canadian Public Policy/Analyse de Politiques* 8(1):106-13.
- ____ (1987), "Earnings Disparities Among Linguistic Groups in Quebec, 1970-1980," *Canadian Public Policy/Analyse de Politiques*, 13(1):97-104.
- Stelcner, M. and N. Dyer (1986), "Selectivity Bias and Male-Female Wage Differentials in Quebec," Working Paper No. 1986-2 (Montreal: Department of Economics, Concordia University).
- Vaillancourt, F. (1978), "La charte de la langue française au Québec: un essai, d'analyse," comment by K. McRoberts (p. 325) *Canadian Public Policy/Analyse de Politiques*, 4(3):284-308.
- ____ ed. (1985), *Économie et langue* (Québec: Editeur officiel du Québec).
- ____ (1988), *Langues et disparités de statut économique au Québec, 1970-1980* (Québec: Conseil de la langue française).
- ____ (1991), *Langue et statut économique au Québec: 1980-1985* (Québec: Conseil de la langue française).
- ____ (1993), "The Economic Status of the French Language and Francophones in Quebec," in *Quebec: State and Society*, ed. A-G. Gagnon (Scarborough, ON: Nelson Canada).
- ____ (1997), "Economic Costs and Benefits of the Official Languages: Some Observations," in Canadian Heritage/Patrimoine canadien (1997), *New Canadian Perspectives: Official Languages and the Economy*, papers presented at a colloquium hosted by the Official Languages Support Programs Branch, Department of Canadian Heritage held on 5 May 1995, Catalogue No. CH3-2/5-1996E (Ottawa: Public Works and Government Services Canada).
- Vaillancourt, F. and R. Lacroix (1985), "Revenus et langue au Québec 1970-1980: Une revue des écrits," in *Économie et langue*, ed. F. Vaillancourt (Québec: Editeur officiel du Québec).

APPENDIX

DEFINITIONS OF VARIABLES IN EARNINGS EQUATIONS: SHAPIRO-STELCNER

DEPENDENT VARIABLE	LNERN — Natural log of annual earnings
EXPLANATORY VARIABLES	
EXPR	- Potential work experience (age – years of schooling – 6)
EXPSQ	- Experience squared / 100
YRSC	- Years of formal schooling
EXPYS	- Education X experience
VOCAT	- Vocational training = 1 if person has a trade certificate, 0 otherwise.
BABES, BABESQ	- Number of babies ever born alive; babies born squared /100
MARITAL STATUS	Reference – Single (never married)
MAR	- currently married or as if
OTHR	- widowed, divorced, or separated
LABOUR SUPPLY	Reference - 40-48 weeks worked per year - 35-39 hours worked per week
W4952	- 49 or more weeks worked per year
H4044	- 40-44 hours per week
H4549	- 45-49 hours per week
H5099	- 50 or more hours per week
LINGUISTIC	<i>Mother Tongue and Official Language(s) Spoken</i>
Reference	- English English only
MLN13	- English English and French
MLN22	- French French only
MLN23	- French English and French
MLN31	- Other English only
MLN32	- Other French only
MLN33	- Other English and French
MLN34	- Other Neither English nor French
IMMIGRATION	Reference – Canadian Born
IMG01	- Immigrated before 1961
IMG02	- Immigrated 1961-1970
IMG03	- Immigrated 1971-1980
IMG04	- Immigrated 1981-1985
IMG05	- Immigrated 1986-1990
MOBILITY	Reference – Resided in same Census division in 1986
MIG01	- Resided in different Census division in 1986
MIG02	- Resided in different province in 1986
MIG03	- Resided outside Canada in 1986
RESIDENCE	Reference – not a Census Metropolitan Area
CMAFAM	- Census Metropolitan Area
OCCUPATION	Reference – Clerical
OCC01	- Managerial, administrative and related
OCC02	- Natural sciences, engineering and mathematics

... continued

OCC03	- Social sciences and related
OCC04	- Teaching and related
OCC05	- Medicine and health
OCC06	- Artistic, literary, recreational and related
OCC08	- Sales
OCC09	- Services
OCC12	- Processing
OCC13	- Machining, product fabricating, and assembling
OCC15	- Transport equipment operating
INDUSTRY	Reference – Government Services (Federal and Other)
IND03	- Manufacturing
IND05	- Transportation and storage
IND06	- Communications and other utilities
IND07	- Wholesale trade
IND08	- Retail trade
IND09	- Finance, insurance and real estate
IND10	- Business services
IND13	- Educational services
IND14	- Health and social services
IND15	- Accommodation, food and beverage services
IND16	- Other services

DEFINITIONS OF VARIABLES IN EARNINGS EQUATIONS: VAILLANCOURT

DEPENDENT VARIABLE

LNERN	- Natural log of annual earnings
-------	----------------------------------

EXPLANATORY VARIABLES

EXPR	- Potential work experience (age – years of schooling – 6)
EXPSQ	- Experience squared / 100

EDUCATION

	Reference – less than grade 9
E02	- Grades 9 – 10
E03	- Grades 11 – 13
E04	- High school graduate with diploma
E05	- Trades certificate or diploma
E06	- Other non-university, without diploma
E07	- Other non-university, with trades diploma
E08	- Other non-university, with other diploma
E09	- University, without diploma or degree
E10	- University, with diploma below bachelor
E11	- University, with bachelor or first professional degree
E12	- University, with diploma above bachelor
E13	- University, with master's degree
E14	- University, with earned doctorate

MARITAL STATUS

	Reference – Married or as if
SNQ	- single, never-married
OTHR	- widowed, divorced, or separated

... continued

LABOUR SUPPLY	Weeks worked in 1990
LINGUISTIC	<i>Mother Tongue and Official Language(s) Spoken</i>
Reference	- French French only
MLN11	- English English only
MLN13	- English English and French
MLN23	- French English and French
MLN31	- Other English only
MLN32	- Other French only
MLN33	- Other English and French
MLN34	- Other Neither English nor French
MOBILITY	Reference – Resided in same province in 1986
MIG02	- Resided in different province in 1986
MIG03	- Resided outside Canada in 1986
RESIDENCE	Reference – not a Census Metropolitan Area
CMAFAM	- Census Metropolitan Area
OCCUPATION	Reference – Other occupations
OCC01	- Managerial, administrative and related
OCC02	- Natural sciences, engineering and mathematics
OCC03	- Social sciences and related
OCC04	- Teaching and related
OCC05	- Medicine and health
OCC06	- Artistic, literary, recreational and related
OCC07	- Clerical
OCC08	- Sales
OCC09	- Services
OCC10	- Farming, horticulture, and animal husbandry
OCC11	- Other Primary
OCC12	- Processing
OCC13	- Machining, product fabricating, and assembling
OCC14	- Construction trades
OCC15	- Transport equipment operating
INDUSTRY	Reference – Agriculture
IND02	- Other Primary
IND03	- Manufacturing
IND04	- Construction
IND05	- Transportation and storage
IND06	- Communications and other utilities
IND07	- Wholesale trade
IND08	- Retail trade
IND09	- Finance, insurance and real estate
IND10	- Business services
IND11	- Government services: Federal
IND12	- Government services: Other
IND13	- Educational services
IND14	- Health and social services
IND15	- Accommodation, food and beverage services
IND16	- Other services

SHAPIRO-STELCNER MODEL

TABLE A1

Earnings Equations for Males and Females – All Quebec, 1990 – Full-Year and Full-Time Workers
The dependent variable is: In annual earnings

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
C	1.0000	1.0000	8.8616 (204.29)	8.5079 (182.38)	8.7190 (204.97)	8.7989 (194.92)	8.9276 (205.56)	9.0791 (198.67)
EXPR	20.8275 (11.56)	18.9939 (11.22)	0.0570 (26.32)	0.0525 (21.19)	0.0533 (24.97)	0.0457 (19.09)	0.0479 (22.85)	0.0386 (16.72)
EXPSQ	5.6748 (5.61)	4.8673 (5.01)	-0.0723 (24.91)	-0.0670 (20.12)	-0.0683 (23.96)	-0.0590 (18.52)	-0.0619 (22.20)	-0.0497 (16.18)
YRSC	13.4382 (4.28)	13.4232 (3.73)	0.0742 (41.46)	0.0841 (36.77)	0.0639 (34.37)	0.0614 (26.17)	0.0570 (30.68)	0.0521 (22.72)
EXPYS	253.6166 (131.99)	233.2683 (129.14)	-0.0009 (10.60)	-0.0010 (9.01)	-0.0008 (9.52)	-0.0009 (8.45)	-0.0007 (8.36)	-0.0007 (7.20)
VOCAT	0.1813 (0.39)	0.1409 (0.35)	-0.0193 (2.51)	-0.0563 (5.66)	-0.0115 (1.47)	-0.0334 (3.48)	-0.0054 (0.71)	-0.0331 (3.56)
MAR	0.8218 (0.38)	0.6904 (0.46)	0.1400 (13.78)	-0.0031 (0.31)	0.1312 (13.06)	-0.0037 (0.39)	0.1169 (12.12)	-0.0067 (0.73)
OTHR	0.0722 (0.26)	0.1417 (0.35)	0.0599 (3.96)	-0.0055 (0.40)	0.0598 (3.99)	-0.0002 (0.01)	0.0505 (3.50)	0.0029 (0.24)
W4952	0.8832 (0.32)	0.8644 (0.34)	0.0941 (9.12)	0.0922 (8.23)	0.0838 (8.24)	0.0835 (7.80)	0.0839 (8.38)	0.0900 (8.65)
H4044	0.4918 (0.50)	0.3277 (0.47)	0.0013 (0.19)	-0.0699 (9.07)	0.0181 (2.63)	-0.0534 (7.06)	0.0316 (4.54)	-0.0056 (0.75)
H4549	0.0887 (0.28)	0.0457 (0.21)	0.0469 (3.96)	0.0004 (0.02)	0.0501 (4.23)	-0.0015 (0.08)	0.0782 (6.69)	0.0543 (2.90)
H5099	0.1654 (0.37)	0.0684 (0.25)	0.0801 (7.73)	-0.0288 (1.52)	0.0812 (7.82)	-0.0210 (1.16)	0.1225 (11.86)	0.0337 (1.90)
MLN13	0.0639 (0.24)	0.0634 (0.24)	0.0323 (1.27)	0.0264 (0.94)	0.0270 (1.09)	0.0214 (0.79)	0.0254 (1.04)	0.0289 (1.13)
MLN22	0.3810 (0.49)	0.4493 (0.50)	-0.0949 (4.25)	-0.1136 (4.51)	-0.0896 (4.14)	-0.1004 (4.16)	-0.0779 (3.62)	-0.0775 (3.41)
MLN23	0.4450 (0.50)	0.3798 (0.49)	-0.0029 (0.13)	0.0006 (0.02)	-0.0049 (0.23)	0.0090 (0.37)	-0.0039 (0.19)	0.0160 (0.70)
MLN31	0.0150 (0.12)	0.0133 (0.11)	-0.1559 (4.30)	-0.0295 (0.68)	-0.1628 (4.60)	-0.0167 (0.41)	-0.1383 (3.99)	0.0063 (0.16)
MLN32	0.0131 (0.11)	0.0171 (0.13)	-0.2091 (5.79)	-0.1230 (3.00)	-0.2118 (6.01)	-0.0940 (2.34)	-0.1924 (5.49)	-0.0804 (2.03)
MLN33	0.0546 (0.23)	0.0464 (0.21)	-0.0833 (3.03)	-0.0206 (0.70)	-0.0856 (3.20)	-0.0078 (0.27)	-0.0642 (2.43)	0.0111 (0.41)
MLN34	0.0018 (0.04)	0.0031 (0.06)	-0.3765 (4.98)	-0.1718 (3.04)	-0.3508 (4.75)	-0.1497 (2.56)	-0.2926 (4.09)	-0.1361 (2.25)

... continued

TABLE A1 (CONT'D.)

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
IMG01	0.0235 (0.15)	0.0178 (0.13)	0.0262 (0.95)	0.0591 (1.96)	0.0216 (0.80)	0.0718 (2.54)	0.0207 (0.78)	0.0721 (2.63)
IMG02	0.0318 (0.18)	0.0309 (0.17)	-0.0506 (2.23)	-0.0513 (2.03)	-0.0495 (2.24)	-0.0341 (1.37)	-0.0228 (1.05)	-0.0194 (0.79)
IMG03	0.0310 (0.17)	0.0280 (0.16)	-0.1346 (5.85)	-0.1250 (4.79)	-0.1280 (5.69)	-0.1031 (4.13)	-0.0988 (4.42)	-0.0906 (3.70)
IMG04	0.0103 (0.10)	0.0104 (0.10)	-0.2400 (6.19)	-0.2555 (6.28)	-0.2185 (5.84)	-0.1917 (4.97)	-0.1732 (4.64)	-0.1593 (4.25)
IMG05	0.0115 (0.11)	0.0097 (0.10)	-0.3781 (10.15)	-0.4039 (8.94)	-0.3623 (9.76)	-0.3303 (7.79)	-0.3209 (8.67)	-0.3020 (7.17)
MIG01	0.1550 (0.36)	0.1520 (0.36)	0.0290 (3.56)	0.0137 (1.39)	0.0256 (3.19)	0.0041 (0.44)	0.0187 (2.41)	0.0015 (0.16)
MIG02	0.0183 (0.13)	0.0155 (0.12)	0.0793 (3.40)	0.0387 (1.16)	0.0879 (3.85)	0.0235 (0.71)	0.0592 (2.66)	-0.0034 (0.11)
MIG03	0.0040 (0.06)	0.0036 (0.06)	-0.0064 (0.12)	-0.1069 (1.87)	0.0015 (0.03)	-0.1021 (1.74)	-0.0135 (0.26)	-0.1231 (2.18)
CMAFAM	0.6925 (0.46)	0.7223 (0.45)	0.0409 (6.12)	0.0742 (9.01)	0.0473 (7.11)	0.0716 (9.11)	0.0456 (7.02)	0.0601 (7.92)
BABES		1.2232 (1.29)		-0.0458 (6.72)		-0.0463 (7.17)		-0.0413 (6.60)
BABESQ		0.0316 (0.06)		0.2505 (1.66)		0.2846 (1.99)		0.2451 (1.75)
OCC01	0.2250 (0.42)	0.1744 (0.38)			0.2486 (22.18)	0.2240 (23.16)	0.2935 (26.40)	0.2450 (26.69)
OCC02	0.0870 (0.28)	0.0299 (0.17)			0.2291 (18.76)	0.2667 (14.19)	0.2271 (18.29)	0.2401 (13.03)
OCC03	0.0199 (0.14)	0.0308 (0.17)			0.1769 (6.58)	0.2198 (11.20)	0.2230 (8.22)	0.1969 (9.91)
OCC04	0.0403 (0.20)	0.0594 (0.24)			0.1559 (10.18)	0.2978 (19.88)	0.2220 (11.91)	0.2369 (13.14)
OCC05	0.0266 (0.16)	0.0989 (0.30)			0.2244 (10.15)	0.2466 (22.18)	0.3060 (11.98)	0.2445 (17.80)
OCC06	0.0186 (0.14)	0.0159 (0.13)			0.0832 (3.21)	0.1721 (6.27)	0.1222 (4.81)	0.1751 (6.70)
OCC08	0.1070 (0.31)	0.0662 (0.25)			0.0450 (3.23)	-0.0491 (2.95)	0.1185 (8.34)	0.0557 (3.36)
OCC09	0.1026 (0.30)	0.0912 (0.29)			0.0073 (0.54)	-0.1891 (12.54)	0.0871 (6.26)	-0.0689 (4.39)
OCC12	0.0681 (0.25)	0.0191 (0.14)			0.1422 (10.12)	0.0455 (1.78)	0.1331 (9.20)	0.0425 (1.64)
OCC13	0.1544 (0.36)	0.0558 (0.23)			0.1026 (9.04)	-0.1291 (7.26)	0.1149 (9.97)	-0.1596 (8.12)
OCC15	0.0685 (0.25)	0.0048 (0.07)			0.0694 (4.78)	0.1621 (3.73)	0.0469 (3.10)	0.0535 (1.13)

... continued

TABLE A1 (CONT'D.)

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
IND03	0.2631 (0.44)	0.1446 (0.35)					-0.0510 (4.84)	-0.1145 (8.01)
IND05	0.0750 (0.26)	0.0225 (0.15)					-0.0448 (3.26)	-0.0359 (1.57)
IND06	0.0514 (0.22)	0.0414 (0.20)					0.0432 (3.31)	0.1074 (6.48)
IND07	0.0702 (0.26)	0.0376 (0.19)					-0.1218 (8.32)	-0.1956 (9.76)
IND08	0.1259 (0.33)	0.1046 (0.31)					-0.2681 (20.82)	-0.3767 (23.85)
IND09	0.0577 (0.23)	0.1218 (0.33)					-0.0834 (5.36)	-0.1265 (10.68)
IND10	0.0622 (0.24)	0.0568 (0.23)					-0.1146 (7.27)	-0.1515 (9.20)
IND13	0.0651 (0.25)	0.0966 (0.30)					-0.1178 (8.28)	-0.0409 (2.69)
IND14	0.0528 (0.22)	0.1813 (0.39)					-0.1565 (10.07)	-0.1074 (8.22)
IND15	0.0328 (0.18)	0.0455 (0.21)					-0.4500 (20.94)	-0.4612 (20.38)
IND16	0.0380 (0.19)	0.0519 (0.22)					-0.3048 (16.22)	-0.3242 (15.67)
Adj. R-sq			0.265	0.284	0.291	0.354	0.329	0.409
F-stat.			311.180	211.242	251.493	207.005	232.924	209.459
No. of Obs	23186	15398						
Notes:								
Mean Dep logs	10.4262 (0.5245)	10.0736 (0.5027)						
Mean Dep \$	38,486 (21,560)	26,680 (13,201)						
Numbers in () are standard deviations (Means) or t-statistics.								

VAILLANCOURT MODEL

TABLE A2

Earnings Equations for Males and Females – All Quebec, 1990 – All Workers

The dependent variable is: ln annual earnings

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
C	1.0000	1.0000	7.8845 (302.46)	6.9950 (252.77)	7.8435 (259.46)	7.1135 (158.09)	7.4028 (157.01)	6.7484 (106.73)
EXPR	21.4612 (12.75)	19.1012 (12.03)	0.0368 (32.35)	0.0315 (24.33)	0.0351 (30.94)	0.0267 (20.63)	0.0327 (29.12)	0.0240 (18.79)
EXPSQ	6.2306 (6.46)	5.0957 (5.49)	-0.0556 (23.50)	-0.0562 (19.15)	-0.0521 (22.18)	-0.0475 (16.30)	-0.0490 (21.18)	-0.0425 (14.78)
E02	0.0900 (0.29)	0.0760 (0.27)	0.0351 (1.82)	0.0193 (0.77)	0.0386 (2.02)	0.0033 (0.13)	0.0322 (1.71)	0.0207 (0.84)
E03	0.0709 (0.26)	0.0673 (0.25)	0.1431 (6.88)	0.1454 (5.55)	0.1487 (7.19)	0.0887 (3.39)	0.1325 (6.48)	0.0891 (3.45)
E04	0.1585 (0.37)	0.2116 (0.41)	0.2056 (12.27)	0.2192 (10.43)	0.2140 (12.79)	0.1352 (6.32)	0.1895 (11.50)	0.1094 (5.15)
E05	0.0839 (0.28)	0.0596 (0.24)	0.2514 (13.20)	0.2763 (10.41)	0.2297 (12.13)	0.1727 (6.44)	0.2122 (11.36)	0.1401 (5.28)
E06	0.0610 (0.24)	0.0703 (0.26)	0.2205 (10.54)	0.2517 (9.89)	0.2287 (10.91)	0.1496 (5.83)	0.2019 (9.77)	0.1250 (4.92)
E07	0.0758 (0.26)	0.0496 (0.22)	0.2818 (14.52)	0.2749 (9.98)	0.2638 (13.62)	0.1750 (6.33)	0.2407 (12.64)	0.1585 (5.80)
E08	0.0928 (0.29)	0.1342 (0.34)	0.4231 (22.99)	0.5116 (22.65)	0.3994 (21.24)	0.3306 (14.11)	0.3459 (18.70)	0.2745 (11.81)
E09	0.0224 (0.15)	0.0209 (0.14)	0.3581 (13.21)	0.4556 (13.62)	0.3498 (12.86)	0.2967 (8.95)	0.3080 (11.55)	0.2499 (7.70)
E10	0.0627 (0.24)	0.0872 (0.28)	0.4129 (20.51)	0.5870 (24.83)	0.3906 (18.81)	0.3714 (15.05)	0.3403 (16.59)	0.3167 (12.90)
E11	0.1019 (0.30)	0.0972 (0.30)	0.6509 (34.81)	0.8170 (34.32)	0.6020 (29.73)	0.5423 (21.06)	0.5450 (27.06)	0.4808 (18.72)
E12	0.0163 (0.13)	0.0134 (0.12)	0.6662 (21.61)	0.9173 (23.86)	0.6199 (19.41)	0.6253 (15.80)	0.5779 (18.19)	0.5732 (14.64)
E13	0.0302 (0.17)	0.0210 (0.14)	0.7658 (29.70)	0.9299 (27.84)	0.7042 (25.57)	0.6451 (18.30)	0.6527 (23.71)	0.5862 (16.69)
E14	0.0072 (0.08)	0.0026 (0.05)	0.9829 (29.63)	1.2294 (21.67)	0.9377 (26.75)	0.9136 (15.73)	0.8889 (25.53)	0.8555 (14.71)
SNG	0.1322 (0.34)	0.1421 (0.35)	-0.2655 (21.65)	0.0456 (3.75)	-0.2370 (19.57)	0.0564 (4.73)	-0.2122 (17.91)	0.0534 (4.57)
OTHR	0.0768 (0.27)	0.1264 (0.33)	-0.1178 (8.22)	0.0295 (2.21)	-0.1040 (7.35)	0.0381 (2.92)	-0.0969 (6.98)	0.0394 (3.08)
WEEKS	43.1342 (11.23)	40.9716 (13.08)	0.0351 (78.04)	0.0425 (99.56)	0.0358 (78.06)	0.0412 (96.14)	0.0354 (77.15)	0.0405 (94.75)
MLN11	0.0242 (0.15)	0.0260 (0.16)	-0.0359 (1.33)	0.0072 (0.24)	-0.0281 (1.05)	-0.0120 (0.40)	-0.0320 (1.22)	-0.0322 (1.08)

... continued

TABLE A2 (CONT'D.)

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
MLN13	0.0569 (0.23)	0.0568 (0.23)	0.0449 (2.60)	0.0639 (3.33)	0.0539 (3.18)	0.0474 (2.52)	0.0471 (2.81)	0.0293 (1.57)
MLN23	0.3907 (0.49)	0.3339 (0.47)	0.0746 (9.37)	0.1272 (13.56)	0.0811 (10.18)	0.1139 (12.30)	0.0667 (8.43)	0.0894 (9.76)
MLN31	0.0157 (0.12)	0.0152 (0.12)	-0.2239 (6.53)	-0.0328 (0.80)	-0.2121 (6.26)	-0.0155 (0.38)	-0.1843 (5.44)	-0.0172 (0.42)
MLN32	0.0161 (0.13)	0.0164 (0.13)	-0.2571 (7.33)	-0.1329 (3.58)	-0.2460 (7.10)	-0.1035 (2.71)	-0.2339 (6.74)	-0.1123 (2.95)
MLN33	0.0508 (0.22)	0.0423 (0.20)	-0.1216 (6.59)	-0.0309 (1.37)	-0.1099 (6.04)	-0.0238 (1.07)	-0.0855 (4.75)	-0.0271 (1.23)
MLN34	0.0027 (0.05)	0.0037 (0.06)	-0.4156 (4.76)	-0.2186 (2.08)	-0.3692 (4.29)	-0.2095 (1.98)	-0.3126 (3.62)	-0.2015 (1.89)
MIG02	0.0172 (0.13)	0.0162 (0.13)	0.0198 (0.74)	-0.0365 (1.06)	0.0310 (1.18)	-0.0239 (0.71)	0.0100 (0.38)	-0.0454 (1.38)
MIG03	0.0207 (0.14)	0.0039 (0.06)	-0.2960 (9.44)	-0.3268 (4.23)	-0.2723 (8.74)	-0.3161 (4.11)	-0.2461 (7.97)	-0.3023 (3.96)
CMAFAM	0.6383 (0.48)	0.6671 (0.47)	0.0299 (3.73)	0.0920 (9.53)	0.0471 (5.86)	0.0921 (9.66)	0.0396 (4.96)	0.0728 (7.74)
OCC01	0.1648 (0.37)	0.1150 (0.32)			0.1217 (6.79)	0.3541 (9.37)	0.2124 (12.06)	0.4041 (10.56)
OCC02	0.0649 (0.25)	0.0216 (0.15)			0.1209 (6.17)	0.4304 (10.37)	0.1307 (6.68)	0.4027 (9.60)
OCC03	0.0149 (0.12)	0.0268 (0.16)			-0.0308 (0.90)	0.1889 (4.30)	0.0611 (1.76)	0.1989 (4.43)
OCC04	0.0369 (0.19)	0.0684 (0.25)			-0.0039 (0.17)	0.3494 (8.79)	0.1196 (4.25)	0.3759 (8.63)
OCC05	0.0217 (0.15)	0.0991 (0.30)			0.0829 (2.92)	0.2852 (7.47)	0.2194 (6.51)	0.3129 (7.68)
OCC06	0.0186 (0.14)	0.0165 (0.13)			-0.0861 (2.78)	0.1260 (2.41)	-0.0063 (0.21)	0.1745 (3.37)
OCC07	0.0685 (0.25)	0.3339 (0.47)			-0.1383 (6.93)	0.1066 (2.91)	-0.1253 (6.38)	0.1214 (3.26)
OCC08	0.0823 (0.27)	0.0742 (0.26)			-0.0733 (3.75)	-0.1092 (2.75)	0.0340 (1.70)	0.0701 (1.72)
OCC09	0.0936 (0.29)	0.1353 (0.34)			-0.1889 (9.29)	-0.2231 (5.83)	-0.0508 (2.42)	-0.0678 (1.68)
OCC10	0.0117 (0.11)	0.0062 (0.08)			-0.1927 (4.74)	-0.1577 (1.93)	0.0543 (1.21)	0.1804 (2.00)
OCC11	0.0183 (0.13)	0.0016 (0.04)			0.2324 (7.08)	0.2917 (3.11)	0.0748 (2.06)	0.2783 (2.80)
OCC12	0.0563 (0.23)	0.0183 (0.13)			0.0184 (0.84)	0.1713 (3.75)	0.0027 (0.12)	0.1615 (3.56)
OCC13	0.1347 (0.34)	0.0561 (0.23)			0.0116 (0.64)	-0.0055 (0.13)	0.0176 (0.98)	-0.0496 (1.19)

... continued

TABLE A2 (CONT'D.)

Name	Mean Values		Human Capital Model		Controlling for Occupation		Controlling for Occupation and Industry	
	Males	Females	Males	Females	Males	Females	Males	Females
OCC14	0.0998 (0.30)	0.0030 (0.06)			0.1895 (9.78)	0.2086 (2.22)	0.1080 (5.22)	0.1368 (1.48)
OCC15	0.0627 (0.24)	0.0049 (0.07)			-0.0383 (1.76)	0.1684 (2.25)	-0.0646 (2.82)	0.0382 (0.48)
IND02	0.0267 (0.16)	0.0044 (0.07)					0.7147 (16.04)	0.5382 (6.39)
IND03	0.2372 (0.43)	0.1343 (0.34)					0.5594 (14.60)	0.5258 (11.12)
IND04	0.0952 (0.29)	0.0176 (0.13)					0.6104 (15.37)	0.4922 (9.29)
IND05	0.0648 (0.25)	0.0187 (0.14)					0.5767 (14.30)	0.6213 (11.15)
IND06	0.0463 (0.21)	0.0290 (0.17)					0.6942 (17.49)	0.7567 (15.49)
IND07	0.0554 (0.23)	0.0297 (0.17)					0.4836 (12.00)	0.4471 (8.78)
IND08	0.1013 (0.30)	0.1246 (0.33)					0.2961 (7.50)	0.1622 (3.42)
IND09	0.0406 (0.20)	0.0847 (0.28)					0.4793 (11.77)	0.5420 (11.59)
IND10	0.0484 (0.21)	0.0524 (0.22)					0.4224 (10.31)	0.4829 (10.09)
IND11	0.0267 (0.16)	0.0287 (0.17)					0.6064 (14.94)	0.7280 (14.81)
IND12	0.0610 (0.24)	0.0455 (0.21)					0.5750 (14.65)	0.5616 (11.63)
IND13	0.0572 (0.23)	0.1019 (0.30)					0.4153 (9.80)	0.4712 (9.58)
IND14	0.0434 (0.20)	0.1726 (0.38)					0.3932 (9.27)	0.4701 (9.99)
IND15	0.0349 (0.18)	0.0733 (0.26)					0.1199 (2.68)	0.1807 (3.60)
IND16	0.0436 (0.20)	0.0678 (0.25)					0.2513 (6.05)	0.2140 (4.26)
Adj. R-sq			0.350	0.405	0.366	0.431	0.387	0.452
F-stat.			839.926	910.499	586.001	660.376	476.160	533.044
No. of Obs	43575	37405						

Notes:

Mean Dep logs 10.1081 9.5118
 (0.9038) (1.0412)

Mean Dep \$ 32,128 19,328
 (21,243) (13,850)

Numbers in () are standard deviations (Means) or t-statistics.