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THE WAGE GAP BETWEEN FRANCOPHONES AND ANGLOPHONES:
A CANADIAN PERSPECTIVE, 1970 TO 2000

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The Wage Gap between Francophones and Anglophones: A Canadian Perspective, 1970 to 2000

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ABSTRACT

The wage differential between Francophone and Anglophone men from 1970 to 2000 fell by 25 percentage points within Quebec, but only by 10 points Canada-wide, largely because the wages of Quebec Anglophones fell by 15 points relative to other Canadian Anglophones. Accordingly, the Canadian measure of the Francophone wage gap better reflects the changing welfare of Francophones than the Quebec measure. Over half of the reduction in the Canadian Francophone wage gap is explained by rising Francophone education levels. In Quebec, the declining number and relative wages of Anglophone workers is best explained by a falling demand for English-speaking labour.

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1 Introduction

Wage differences between Francophones, native French-speakers, and Anglophones, native English-speakers, have long been a sign of the socioeconomic disparities between the two major linguistic cultures of Canada. In the past, Francophones held few well-paying jobs, even within the province of Quebec, where Francophones make up a substantial majority.

Since Quebec's "Quiet Revolution," a period of rapid modernization starting around 1960, the once large hourly wage difference between Francophone and Anglophone males – or "Francophone wage gap" – fell remarkably. Previous research – including Shapiro and Stelcner (1997), Breton (1998), Vaillancourt and Touchette (2001), and Béland (2003) – focused on measures within Quebec and concluded that the Francophone wage gap between workers with similar skills had almost disappeared by 1985. This disappearance is often credited to laws promoting the French language, passed mostly in the 1970's, and to growing control of the Quebec economy by Francophones. Further reduction of the Francophone wage gap between workers of all skills is credited to educational reforms begun in the 1960's, which boosted Francophone schooling levels.¹

When it is measured in Canada as a whole, a different picture of the Francophone wage gap emerges, a picture that has received far less attention.² As shown below, the wage gap between similarly-skilled workers was much smaller in Canada than in Quebec in 1970, and while it disappeared over the 1980s, it has since reappeared. Meanwhile, in Quebec,

1 See Bloom and Grenier (1992) for a comprehensive survey of the earlier literature on the Francophone wage gap.

2 Boulet and Lavaleé (1983) look at the Francophone wage gap in Canada in 1970 and 1980, and note that the wage gap within Montreal was "primarily attributable to the presence there of a highly paid Anglophone elite." Their study does not provide an explicit decomposition or control for differences in characteristics, and their insights have not been applied to later periods. Chiswick and Miller (1988) and Bloom and Grenier (1992) also look at the wage gap within Canada, but by including provincial controls in their regression, their estimates are based on within-province variation, similar to the Quebec-only measures.

Francophones now earn significantly more than similarly-skilled Anglophones. The Francophone wage gap measures in Quebec and Canada differ mainly because the measure in Quebec uses only the idiosyncratic minority of Anglophones in Quebec as a comparison group. This small group of Anglophones once earned much more than other comparable Anglophones in Canada and now earns significantly less. The population of Anglophones in Quebec also fell as many emigrated to other provinces.³ Previously, the Francophone wage gap in Quebec was much larger than in Canada because Anglophones in Quebec earned more than Anglophones outside the province; now the Francophone wage gap in Quebec has reversed against Anglophones partly because Quebec Anglophones now earn less than other Anglophone Canadians.

The population of all Canadian Anglophones provides a superior benchmark for measuring the relative productivity and welfare of Francophones, as Quebec Anglophones exhibit unstable wages and other idiosyncrasies. Of course, using a national measure of the wage gap glosses over provincial wage differences, but these appear to be unimportant as Quebec has a wage structure similar to the rest of Canada, and as the Francophone gap outside of Quebec is similar to the gap Canada-wide.⁴ Furthermore, trying to control for provincial differences in wage levels has limited value as the economic welfare of Francophones depends inextricably on the economic performance of Quebec, a performance which has been uneven in recent years (Fortin 2001).

Analyzing the Francophone wage gap from a Canadian perspective sheds additional light on why Francophone and Anglophone wages differ. This issue is complicated, since being

³ Coulombe (2000) notes that the relative wages of Anglophones in Quebec fell relative to those in Ontario, although he makes no connection between this and the Francophone wage gap, nor does he control for skills.

⁴ The representativeness of the Francophone gap outside of Quebec for all Francophones is questionable as Francophones outside Quebec appear to have partly assimilated into English culture, with almost two thirds working in English and over a third speaking English at home and raising Anglophone children (see O'Keefe 2001).

Francophone or Anglophone is defined by mother tongue, i.e. which language the person first learned and still understands. Mother tongue indicates more than just language skills, but also ethnicity and education, as each group has different schooling systems. One reason for the Francophone wage gap is that the demand for French-language skills may differ from the demand for English-language skills. Another reason is that Francophones may possess different non-language skills than Anglophones, some observed in data, such as education, and others not, such as motivation. Third, since Anglophones once held disproportionate economic power, Francophones may have been discriminated against by predominantly Anglophone employers. Fourth, most Francophones prefer to live in Quebec, and thus may be willing to take lower-paying jobs in order to live there rather than in higher-wage areas in the rest of Canada. While the previous literature has considered at least the first three reasons, it has done little to measure the relative importance of each, or how each reason has changed since 1970.

The literature has broadly credited the fall in the Francophone wage gap in Quebec to three explanations, discussed in Section 3: educational reforms, the passage of language laws, and increasing Francophone control of the economy. Evidence in Section 4 indicates that differences in non-language skills, mainly education and experience, account for much of the raw Francophone wage gap in Canada and in Quebec. Furthermore, relative increases in these skills for Francophones explain two thirds of the gap closure in Canada between 1970 and 2000, albeit less of the larger gap closure in Quebec. Thus, in Canada educational reforms seem largely responsible for improving the relative welfare of Francophones, although language laws and increased Francophone control of the economy may have raised the return to schooling, encouraging Francophones to pursue higher studies. The direct effects of language laws and greater Francophone economic power – which presumably increased the demand for French

skills and reduced discrimination – are more difficult to measure. Yet, one point previously overlooked is that these latter two explanations played larger role in closing the gap within Quebec than in all of Canada, as they helped to depress Anglophone wages in the province as well as raise Francophone wages. Section 5, which compares the wages of French-English bilinguals relative to unilinguals, finds the estimated return to bilingualism rose for Anglophones and fell for Francophones, supporting the hypothesis that the demand for French rose in Quebec while the demand for English fell.

The fall in the demand for English-speaking labour may be due to the language laws, which increased the costs of hiring English speakers, Quebec's separatist movement, which induced some firms to leave the province (Tirtiroglu et al. 2004), and the gradual displacement of Montreal by Toronto as "Canada's Metropolis" (e.g. Higgins 1986, Polese 1990). As discussed in Section 6, a negative demand shift for English-speaking labour explains why so many Anglophones left Quebec over this period better than a negative supply shift, which would imply, counterfactually, that Anglophones remaining in Quebec be paid even higher wages relative to Anglophones in the rest of Canada. The demand-shift hypothesis is consistent with the view that Anglophones left Quebec in the pursuit of better jobs rather than from their dissatisfaction with Quebec politics, a greater need to speak French outside of work, or other quality-of-life factors. At the same time, the relative immobility of Francophones does not appear to be a major cause of the Francophone wage gap, as Francophones outside Quebec have long earned wages similar to those in Quebec, suggesting that added mobility would not have much of an effect on Francophone wages.

To keep the analysis as tractable and brief as possible, this paper focuses on Canadian-born males between the ages of 20 and 59 who are either Francophone or Anglophone. The

majority of this analysis is based on the Public Use Microdata Files on Individuals (or PUMFI) available from the Canadian Census for years 1971 (1% sample of the population), 1981 (2%), 1986 (2%), 1991 (3%), 1996 (2.8%), 2001 (2.7%), whose availability determine the time period of this analysis. Annual wage data – taken as the sum of “wages and salaries” and “self-employment income” in the previous year – are taken from a limited “wage sample” of those who report having worked full-time and at least 26 weeks in the previous year, so that all observations contain credible hourly wage measures.⁵

Mean characteristics of the sample for 1970 and 2000 are shown in Table 1, which separates the population by mother tongue and residence in Quebec. Column 9 displays the relative change in characteristics between all Francophones and Anglophones in Canada between 1970 and 2000.⁶

2 Decomposing the Francophone Wage Gap in Canada by Region

2.1 Regional Decomposition of Mean Wage Differences

The discrepancy between measures of the Francophone wage gap in Canada versus Quebec can be explained by decomposing the Canadian Francophone wage gap into Quebec and non-Quebec components, and the wage gap between Anglophones in Quebec and outside Quebec. Let w refer to mean log wages, the subscript t for time, the superscript F refer to Francophone and A to Anglophone, and, when it appears, the second superscript Q to refer to Quebec, N to Non-Quebec, with an omission implying all of Canada. Thus, w_t^F refers to mean log wages of all

⁵Additional information on the data and its construction are provided in an on-line appendix on the NBER website. Treatment of multiple responses of mother tongue, starting in 1986, is given here, as well as additional analyses, tables, and graphs.

⁶ As most Francophones live in Quebec and most Anglophones live outside Quebec, national statistics for Francophones and Anglophones are closely approximated by Quebec Francophones and Non-Quebec Anglophones.

Canadian Francophones, and w_t^{QF} refers to the mean log wages of Quebec Francophones. Furthermore, use ϕ_t to denote the fraction of Canadian Francophones in Quebec, and α_t to denote the fraction of Canadian Anglophones in Quebec. The mean wages of Canadian Francophones and Anglophones are equal to the weighted sum of wages of each group in and out of Quebec:

$$w_t^F = \phi_t w_t^{QF} + (1 - \phi_t) w_t^{NF} \quad (1a)$$

$$w_t^A = w_t^{QA} + (1 - \alpha_t) w_t^{NA} \quad (1b)$$

Subtracting equation (1b) from (1a), the Canadian Francophone gap $g_t = w_t^F - w_t^A$ can be expressed as a weighted sum of the Quebec Francophone gap, $g_t^Q = w_t^{QF} - w_t^{QA}$, the Non-Quebec Francophone gap, $g_t^N = w_t^{NF} - w_t^{NA}$, and the “Quebec gap” for Anglophones, $a_t = w_t^{QA} - w_t^{NA}$:

$$g_t = \phi_t g_t^Q + (1 - \phi_t) g_t^N + (\phi_t - \alpha_t) a_t \quad (2)$$

This identity gives a regional decomposition of the Canadian Francophone gap for a given year: the first two terms are due to differences within regions, while the third term is due to differences in wage levels between regions. Because ϕ_t is close to one and α_t is close to zero, this decomposition is approximated by $g_t \approx g_t^Q + a_t$; equivalently, $g_t^Q \approx g_t - a_t$, i.e., the Quebec Francophone gap is roughly the sum of the Canadian Francophone gap, which likely reflects fundamental differences in productivity, minus the Quebec gap for Anglophones, which likely reflects the idiosyncrasies of Anglophones in Quebec.

We begin by looking at the Francophone gap unadjusted for skills in 1970 and 2000 within Quebec, outside Quebec, and for Canada. These are reported in Panel A in Table 2, under columns 1 and 2, with their change reported in column 3. The Quebec gap for Anglophones is

reported in Panel B. Figure 1 also graphs these gaps for intermediate years.⁷ In 1970 the Francophone gap in Quebec was large at 27 points, although in Canada it was only 13 points as the Quebec gap for Anglophones was 14 points in their favour. Outside Quebec, the Francophone gap was closer to the national average at only 10 points.

As seen in the graph, between 1970 and 1980, the Canadian Francophone gap fell to one point. Meanwhile, the Quebec gap for Anglophones fell to an 8-point advantage, but because the Francophone gap in Canada had largely disappeared, what remained was the primary cause of the remaining 9-point Francophone gap in Quebec. The Canadian Francophone gap remained small after 1980, while the Quebec gap for Anglophones disappeared by 2000, causing the Quebec Francophone gap to largely disappear as well.⁸ Changes in the Francophone gap outside Quebec followed a similar time pattern to the entire nation, supporting the notion that the Francophone gap within Quebec in 1970 was exaggerated by the high wages Anglophones once earned in Quebec.

2.2 *The Distribution of Changes in the Wage Gap*

We can examine changes in the Francophone and Quebec gaps across the wage distribution by looking at the 10th, 50th, and 90th percentiles, graphed in Figure 2. The patterns are similar to that

⁷ In Table 1 we see that, since 1970, the number of full time workers diminished, although Francophones saw a relative shift towards full-time work. This shift would be expected to lower the relative wages of Francophones in the sample, increasing the Francophone wage gap, but attempts to correct for this do not affect estimates substantially (Shapiro and Stelcner 1997).

⁸ Looking further back, Minns (2003), using the 1901 and 1971 Census, calculates that the annual wage gap between native-born Francophone and Anglophone males did not change between 1901 and 1970: both years saw a gap of about 14 points in Canada and 26 points in urban Quebec. In 1970, the annual and hourly wage gaps were nearly identical, as both groups worked similar hours. Although publicly available Census microdata between 1901 and 1971 are unavailable, previous research from the *Royal Commission on Bilingualism and Biculturalism* (1969, pp. 15-23) and Vaillancourt (1978) suggests that in 1960 the annual wage gap was larger than in 1970 by an additional 6 points in Canada and an additional 15 points in Quebec. The gaps are based on French and English ethnicity, not mother tongue, and are calculated for the logarithm of the mean, instead of the mean of the logarithm.

of mean wages, with some interesting departures.⁹ Both in Canada and Quebec, the Francophone gap is larger at the upper end of the distribution than at the lower end. This is because Francophone wages are on average lower but less dispersed than Anglophone wages.

- At the 10th percentile, Francophones made their largest gain nationally, mostly between 1970 and 1980. The Quebec gap for Anglophones fell by 20 points, mostly since 1985, so that in 2000 Anglophones in Quebec earn about 8 percent *less* than Anglophones outside Quebec. Francophones at the low end of the distribution now make more than their Anglophone counterparts, particularly in Quebec.
- At the 50th percentile, the wage gaps between workers are rather similar to that for means.
- At the 90th percentile, differences are most extreme: in 1970, the Francophone gap was at 18 points nationally, but at 42 points in Quebec, primarily as the Quebec gap for Anglophones was 26 points. Between 1970 and 1980, a shift occurs: Francophones almost close the gap nationally, while Quebec Anglophones lose 15 points relative to their non-Quebec peers. Yet, since 1980 Francophones have not made progress in Quebec, and have lost ground nationally.¹⁰

3 Explaining Changes in Francophone and Quebec Wages

Three principal explanations are typically given for why Francophone wages have caught up with Anglophone wages in recent decades (e.g. Levine 1990, Vaillancourt 1996): reforms which improved access to education for Francophones, laws passed which favour the French language in Quebec, and increased control of the Quebec economy by Francophones. Quebec also

⁹ Although percentile gaps cannot be decomposed linearly the way a mean gap can, it still holds that the Canadian Francophone gap is roughly the sum of the Francophone Quebec gap and the Quebec gap for Anglophones.

¹⁰ Saez and Veall (2005) find related results using tax return data on very high earners. They conjecture that highly skilled Anglophones in Canada may be earning more due to increasing competition from the United States.

underwent a number of regional economic changes due to the threat of secession, the departure of many businesses and Anglophone workers from the province, and the decline of Montreal relative to Toronto as Canada's economic centre.

At the beginning of Quebec's "Quiet Revolution," major reforms changed the province's education system, improving access to education for Francophones at the secondary, college, and university levels. As seen in Table 1, overall education levels rose for both Francophones and Anglophones between 1970 and 2000, but Francophones caught up relative to Anglophones in both primary and secondary education. Francophones have also aged relative to Anglophones. As already remarked in earlier studies (e.g. Lacroix and Vaillancourt 1981), improvements in Francophone education and experience were doubtless factors in closing the unadjusted Francophone wage gap.¹¹

Starting in 1969, a number of laws were passed in Quebec promoting the use of French in schools, at work, in business, and in government, the most prominent being Bill 101 in 1977.¹² This bill makes it more difficult to attend public schools in languages other than French, increasing the number of French speakers, and with them the future supply of French-language skills and the demand for French-language products. It also makes Quebec less appealing to Anglophone parents. Bill 101 requires firms with more than fifty employees to undergo a certified process of "francization," mandating greater French communication within firms, and that members of professional associations make their services available in French. This process was not instantaneous: in 1980 only a small fraction of businesses possessed a francization certificate, although by 1995 this fraction had risen to three quarters (Quebec 1996).

¹¹ In 2000, Francophone males also had an average of 1.0 years of college relative to 0.8 years for Anglophones. Years of college are unavailable for 1970, but in 1975 Francophones and Anglophones both had 0.5 years of college, implying a relative gain of 0.2 years of college for Francophones.

¹² The most important bills include Bills 63, 22, 101, 52, 142, 178, and 86. The first five bills are summarized and analyzed in Vaillancourt (1992). More detail is found in Official Languages Law Group (2000).

Requirements that businesses post signs in French were instituted more quickly. The government of Quebec also made French the only official language, although government services are still widely available in English.¹³ Presumably, these laws helped to increase the demand for French-language skills, in part by making it more expensive to hire English-language skills.

Even before the first language laws were passed, French was already gaining ground as the primary language of business in Quebec, as Francophones took greater control of the provincial economy. Ultimately, this change in economic control is the product of many deeper forces, including improved Francophone education, language laws, an increasingly regional focus of Montreal towards French Quebec, and deliberate efforts of the Quebec government to give Francophones greater access to public and private capital through institutions such as the *Caisse de dépôt et placement* (Levine 1990).¹⁴ Thus, greater Francophone economic control was in many ways as much an outcome of change as it was a cause of it. Whatever the case, Francophones first gained control in the public sector and later in the private sector, where the percentage of firms controlled by Francophones rose steadily (Vaillancourt et al. 2007). This greater Francophone control may have lessened discrimination of Anglophone employers against Francophone workers, at the risk of introducing reverse discrimination. Increased economic control should have also raised demand for French-language skills, since presumably Francophone employers communicate more productively with Francophone employees.

¹³ Outside of Quebec more limited measures were taken to promote the French language. At the Federal level two Official Languages Acts were passed in 1969 and 1988 to ensure the provision of federal services in both English and French where population size warrants it. The three provinces containing the most Francophones outside of Quebec – Ontario, New Brunswick and Manitoba – also took efforts at providing certain government services in French, possibly increasing the demand for French-speaking civil-servants outside of Quebec.

¹⁴ Another theory for why the gap has closed is that Francophones and Anglophones are now more similar in their attitude to work. Some (e.g. Higgins 1986) claim that Francophones have traditionally held commercial work in lower esteem than other activities and that this changed substantially during the Quiet Revolution.

While the language of Quebec's economy became increasingly French, Quebec's relative importance in the Canadian economy fell, especially as Montreal lost its economic dominance to Toronto (Polese 1990).¹⁵ This change was punctuated by the displacement of the head offices of a number of large English-Canadian firms to the rest of Canada. Many factors likely contributed to this relative decline, including weaker population growth in Quebec, language laws, and the upheaval created by the Quebec secession movement. Although both referenda for secession from Canada were defeated in 1980 and in 1995, some businesses cited the uncertainty brought as their main reason for leaving the city (Tirtiroglu et al. 2004).¹⁶ Thus, while Francophones now earn a greater share of Quebec's income, Francophones may have earned more had Quebec remained more central within the Canadian economy.

One possible confounding factor affecting wages over this period is what Fortin (2001) called "the Big Bubble of 1975-1985," whereby increased labour demand for construction projects, generous wage settlements given to unions, and a high provincial minimum wage temporarily depressed profits and raised wage levels in Quebec. Without this wage bubble, Canada-wide Francophone wages would not have risen so quickly in 1980, and Quebec Anglophone wages would have fallen more precipitously.

4. Accounting for Skill Changes in the Francophone Wage Gap

4.1 Changes Explained and Unexplained by Improvements in Non-Language skills.

To begin assessing theories of why the Francophone wage gap exists and has changed over time, it is useful to decompose the gap to see how much is due to observable differences in education,

¹⁵ Based on time-series evidence, Coulombe (2000) argues that changes in the Quebec economy starting in 1970 have pushed it towards a lower long-run equilibrium growth path.

¹⁶ Other events in this upheaval include terrorist action by the *Front de libération du Québec* in 1970 and the election of the *Parti Québécois* in 1976.

experience, and other non-language skills.¹⁷ Using the same subscript and superscript notation as Section 2.1, let X refer to the vector of mean skills for a given group, including a constant, and β refer to the vector of fitted returns for skills in that group, estimated using ordinary least squares, so that the mean log wages of Francophones and Anglophones at time t can be written

$$w_t^F = X_t^F \beta_t^F \quad (3a)$$

$$w_t^A = X_t^A \beta_t^A \quad (3b)$$

Subtracting (3b) from (3a), and adding and subtracting $X_t^F \beta_t^A$, gives the skill decomposition of the Francophone wage gap:

$$g_t = (X_t^F - X_t^A) \beta_t^A + X_t^F (\beta_t^F - \beta_t^A) \quad (4)$$

The first term of the decomposition is the wage difference predicted by differences in skills, while the second term is the residual difference due to differences in the returns for skills. Assuming that the β coefficients are estimated accurately, the residual difference could be due to differing demand for French-language skills, differences in unobserved skills, pure labour-market “discrimination,” geographic immobility, measurement error, or other causes.

Decompositions for 1970, 2000, and their change are presented in Table 3. The characteristics used include eight education indicators, a quartic in potential experience, and nine industry indicators.¹⁸ The results in column 1 indicate that in 1970 average differences in education between Canadian Francophones and Anglophones accounted for roughly three-fifths

¹⁷ This is a standard Oaxaca (1973) decomposition, also attributed to Blinder (1973). The regional decomposition in equation (2) can be reinterpreted as the case where X contains only a constant and a Quebec dummy.

¹⁸ The education variables indicate less than grade 8, grade 9 or 10, grade 11 or higher, 1 to 2 years of university, 3 to 4 years of university, or 5 or more years of university as well as trade certificate and bachelors degree holding. The industry categories are given by agriculture, other primary, manufacturing, construction, transportation & utilities, trade, finance & real-estate, services, and public administration. Arguably industry characteristics do not belong in the skill decomposition as they are not “skills” or even “pre-market” characteristics, but their inclusion has too little effect on the results to merit showing results excluding industry characteristics separately. Important observable characteristics left out of the decomposition include bilingualism, discussed in Section 5, and urban residence, discussed in the online Appendix.

of the 13 point Francophone wage gap in Canada. Other factors such as experience and industry composition helped Francophones slightly, and six points of the wage gap remain unexplained. In 2000, seen in column 2, the residual Francophone wage gap fell to only 2.5 points, while the predicted gap disappears almost completely. Almost all of the explained convergence, totalling 6.5 points, is due to relative improvements in Francophone education, although the relative increase in experience of Francophone workers also contributed one point.

The time trends of the predicted and residual gaps are graphed in Figures 3a and 3b, using the β coefficients estimated for all Canadian Anglophones. The Francophones gap shrinks monotonically, although it shrunk most between 1970 and 1980, as the initial beneficiaries of the educational reforms of the 1960s join the sample. At the same time, the predicted Quebec gap for Anglophones does not change significantly over time, and thus, the rise in the predicted Francophone wage gap in Quebec is similar to the rise in Canada.

The story is quite different when looking at residual changes in the Francophone gap, particularly after 1980. Nationally, after a 6-point reduction in the residual gap between 1970 and 1980 – making it temporarily positive, possibly because of the “Big Bubble” – it begins to disfavour Francophones again in 1990. In Quebec, Francophone wages continue to rise relative to Anglophones, until in 2000 they earn 4 percent more than Anglophones with the same observable skills, who make 6 percent less than comparable Anglophones outside Quebec. Thus, the different trajectories of the Francophone gaps inside and outside of Quebec are not explained by changes in the observable characteristics of Anglophones in Quebec, but are due to more mysterious changes.

Taking the Canada-wide benchmark, the results above suggest that educational reforms were the most fundamental cause of the long-run decline in the Francophone. To understand why

the previous literature did not emphasize education as greatly, note how in Quebec the residual Francophone gap rises more than the predicted gap. Thus, the increase in Francophone educational attainment was seen as one, but not necessarily the most important, cause of rising Francophone wages. Seeing that residual changes are mainly due to Anglophone wages falling in Quebec, attention shifts to the question of why Anglophone wage levels in Quebec fell so precipitously, which is addressed in Section 6.

Nevertheless, the question remains why in Canada the residual Francophone wage gap closed by four points between 1970 and 2000. It could be due to language laws, other factors associated with the greater Francophone control of the Quebec economy, or even unmeasured improvements in education or schooling quality.¹⁹ Disentangling the relative contribution of these different explanations is difficult, especially with limited microdata that is available only since 1970. Given that Bill 101 was passed in 1977, it may have effected change most in the late 1970s through the rapid implementation of certain policies and possibly through an announcement effect. The period between 1970 and 1980 does coincide with the most rapid decrease in the Francophone wage gap, both nationally and within Quebec.

It is difficult to be certain that the language laws are the primary cause of this change, especially since we do not have yearly data and we do not know the trend prior to 1970. Furthermore, after 1980 the wages of Francophones fell relative to Anglophones in Canada, although it continued to rise relative to Anglophones within Quebec. One possible interpretation is that the language laws may have helped Francophones replace Anglophones in well-paying jobs (Raynauld and Vaillancourt 1984, Vaillancourt and Carpentier 1989), by making it more

¹⁹ Because of limited education data in the 1971 Census only coarse education measures are used (see Appendix 1). Using more detailed education data from the 2001 Census – including years of college, field of study, and other degrees earned – the differentials in 2000 due to education and industry fall to -1.7 and zero points, respectively.

expensive to hire English labour. But in the long-run these laws served to drive businesses away, causing wages in Quebec to gradually fall, especially after the “Big Bubble” ended. As the language laws likely did not raise overall labour productivity, and as there were only a small number of more productive Anglophone jobs in Quebec for Francophones to acquire, it is not surprising that gains measured nationally are fairly small.

4.2 *The Distribution of the Francophone Wage Gap Unexplained by Skills*

Information on how changes in the residual wage gap are distributed can be obtained by applying the decomposition technique of Dinardo, Fortin, and Lemieux (1997). It produces a counterfactual distribution of wages that Francophones would be paid if they were paid like Anglophones with similar skills. The difference between this distribution and the actual distribution of Francophone wages is a residual similar to the skill decomposition used above: in fact, at the mean it produces nearly identical results. These residual gaps for the 10th, 50th, and 90th percentiles are graphed in Figure 4.

Canada-wide in 1970, the residual Francophone gap was distributed evenly at 5 percent across percentiles. By 1980 the gap shrank for all groups, although by 2000 the gaps at the 50th and 90th percentiles reverted to their size in 1970. In the long-run, the residual Francophone gap shrank only at the 10th percentile, possibly because Anglophone wages at the bottom were dropping similarly to changes seen in the United States (Katz and Autor 1999).

Across the distribution, the residual Quebec gap for Anglophones shows an unusual pattern. In 1970, the gap was much larger at the upper end of the distribution than at the bottom of the distribution. Over the 1970s, the upper end of the gap fell by more than 10 points, it then stabilized over the next fifteen years, only to fall below zero after 1995. At the lower end the Quebec gap did not change until after 1985, when it fell sharply by about 15 points. It is not

clear why Anglophone wages fell first at the upper end and later at the lower end. One possible explanation is that the departure of large firms from Montreal in the late 1970s drove down the upper end of the wage distribution, while the recession of the early 1990s, particularly severe in Quebec, eliminated many of the jobs in industries, such as textiles, that employed Anglophones at the bottom of the distribution. Another explanation is that better workers from the upper end of the distribution left before workers from the lower end, as seen below, the evidence for this latter explanation appears weak.²⁰

4.3 *The Wage Structure and Changes in the Return to Skill for Francophones*

If Quebec's language laws or other changes did help Francophones take jobs that only highly-skilled Anglophones were once privy to, then presumably the wages of highly-skilled Francophones should have risen disproportionately. Figure 5a plots the average wages of Francophones relative to Anglophones in the same skill group across Canada in 1970 and 2000, where skill groups are defined by five education and five experience categories interacted.²¹ In 1970, the Francophone gap was larger for more highly skilled workers, located to the right; this lower return to skill for Francophones might be indicative of lower demand for French or discriminatory practices in higher-skilled jobs. By 2000, these differences had largely disappeared, consistent with the theory that highly-skilled Francophones were indeed taking

²⁰ According to Juhn, Murphy, and Pierce (1991) overall increases in wage inequality over this period could have contributed to increases in the residual wage gap. Applying the Juhn-Murphy-Pierce procedure here suggests that increased inequality in the Anglophone wage distribution may have increased the residual Francophone gap in Canada by 0.8 points (s.e. = 0.1 points).

²¹ Education categories are grade 8 or below, grade 9 or 10, grade 11 and above, some university, and bachelor's degree or higher. Only groups with at least 30 observations of both Francophones and Anglophones in both years are used to ensure comparability and that the skill-group means are close to normally distributed, resulting in 25 or fewer groups. The fitted regression lines are based on Card and Lemieux's (1996) one-dimensional skill model.

better jobs formerly available only to Anglophones.²² In Figure 5b, we see that highly-skilled Francophones overcame an even larger wage gap within Quebec, although by 2000 Francophones were doing better than Anglophones in lower skill groups. Overall, this increase in the return to skills for Francophones may have encouraged Francophones to attain higher levels of education, although the increase may also be due to unmeasured increases in Francophone schooling or school quality.

Comparing the Anglophones in and out of Quebec in Figure 5c, Anglophones in 1970 were better paid in Quebec across skill groups. Yet, in 2000, only the most-skilled Anglophones in Quebec earned as much their equivalents outside of Quebec and less-skilled Anglophones in Quebec do worse than both Anglophones outside Quebec and Francophones in Quebec. Interestingly, when Francophones and Anglophones are pooled together, as in Figure 5d, relative wages in Quebec are similar to the rest of Canada, except for a small constant. Thus, it appears that Quebec's employment structure has long been similar to the rest of Canada – consistent with Coffey and Polese (1999) – but that jobs may have been reshuffled between Francophones and Anglophones.

These results seem to contradict the previous finding in Figure 4 that the bottom of the Francophone distribution gained more than the top, skilled workers gained more than unskilled workers. However, most of the variation seen in Figure 4 is within (observable) skill groups rather than between skill groups, seen in Figure 5. Thus, within skills groups, the bottom end was lifted up, even while highly-skilled groups gained more on average.

²² Accordingly if the skill-decomposition in Table 3 is done using coefficients estimated off of Francophones, the residual wage gap is slightly larger in 1970.

5 Changes in the Wages of French-English Bilinguals

Thus far, the importance of language skills remains murky. Fortunately, the Census has a helpful measure of the languages a respondent claims to speak, although it does not indicate the degree of proficiency. The skill-decomposition from above is not easily adapted to this measure. Francophones who report speak both French and English are likely to speak French relatively better, while Anglophones who report the same, are likely to speak English better. Furthermore, the return to learning English for a Francophone is likely to be different than the return to learning French for an Anglophone; these returns are also likely to depend on region. Nevertheless, these measures may help us understand changes in the residual Francophone gap if the return to speaking French has risen for Anglophones, the return to speaking English has fallen for Francophones, or if Francophones increasingly speak English.

One method to estimate the return to language skills is to look at how much more French-English bilinguals are paid relative to their unilingual counterparts, controlling for observable non-language skills. The estimates for four groups – Francophones and Anglophones in Quebec and outside Quebec – in 1970, 2000, and their change, are presented in Table 5, Panel D. Additionally, Panel A gives the proportion of each group that is bilingual; Panel B, the total wage difference, regardless of skills; and Panel C, the wage gap predicted by observable non-language skills. Figure 6 graphs the residual differences.

Unobservable selection issues may be a serious problem with these estimates. As seen in Panel C, bilinguals have better observable skills, indicating that they may also have better unobserved skills, leading to an upward bias in the return to bilingualism. However, the change in the measured return to bilingualism may reliably reflect changes in the return to language skill if the proportion of bilinguals and the wage gaps predicted by observable skills remain roughly

constant, as this would suggest that changes in unobserved skills are probably small.

Between 1970 and 2000, the measured return to learning English for Quebec Francophones fell from 11 to 8 percent, suggesting that the demand for English-language skills fell in Quebec. While the proportion of Francophone bilinguals rose only slightly, the first row of Panel C reveals that bilingual Quebec Francophones have relatively lower predicted wages than before, and thus fewer observable skills, suggesting that they may also have fewer unobserved skills, which could also account for the measured change. For Anglophones in Quebec, the return to learning French has risen from roughly zero to about 5 percent; although the change using only 2000 is not significant, it is if data from 1995 and 2000 are pooled together. Anglophones in Quebec became increasingly bilingual, and in 2000 these bilinguals has better observed skills, making it difficult to rule out that unobservable characteristics are not the cause. However, the increase in the supply of bilinguals together with the increase in the relative wage of bilinguals does suggest an increasing demand for French-language skills in Quebec.

Outside of Quebec, there is no significant return to learning French for Anglophones. On the other hand, the return to learning English for Francophones has fallen, although one should be cautious in interpreting this change, as the proportion of Francophones who are unilingual is small and falling quickly. Overall, the estimates suggest, albeit inconclusively because of selection issues, that in Quebec the demand for French-language skills rose and the demand for English-language skills fell.²³

²³ Much of the previous literature immediately separates unilingual and bilingual Anglophones and Francophones. This is avoided for two reasons here: first the number of different gaps across regions would make this onerous to present. Second, since bilingualism is generally chosen, selection bias issues are a serious concern, as shown here. Further information on the return to language skills is available from Allophones – those whose mother tongue is neither French nor English – who may speak English, French, both, or neither. The online appendix explains how small samples pose obstacles for using this information, although Anglophone wages did fall relative to Allophone

6 The Quebec-Anglophone Wage Gap and Emigration

While the wages of Anglophones in Quebec fell relative to the rest of Canada, Anglophones were emigrating *en masse* from Quebec. Using Census figures on migration, which exclude those who left the country altogether, the Quebec Anglophone population which peaked at approximately 800,000 in 1976, saw approximately 350,000 leave Quebec, while only 135,000 entered, leaving a population of approximately 590,000 Quebec Anglophones in 2001. As seen in Table 1, in 1970, 6 percent of Canadian Anglophones lived in Quebec; in 2000, only 3 percent did.²⁴

The previous literature (e.g. Higgins 1986, Polese 1990, Levine 1990, Locher 1988, Amit-Tali 1993, Watson 1996, Stevenson 1999) mentions a number of reasons why Anglophones left (or stopped entering) Quebec, among them fear of Quebec secession, discontent with the language laws and provincial politics, and the lack of employment opportunities. Except for some evidence based on interviews, the literature does not give much guidance on how important each of these reasons are, or whether they operate through changes in the supply of or demand for Anglophone workers.²⁵

Neoclassical models of worker mobility across areas (e.g. Roback 1982, Bound and Holzer 2000, Albouy 2007) permit the use of standard supply-and-demand analysis to model the Anglophone exodus, using a graph with the number of Anglophone workers on the horizontal axis, and the relative wage of Anglophones, given by the Quebec gap for Anglophones, on the vertical axis. The supply of Anglophone workers is represented by an upward sloping curve, with

wages in Quebec. Robinson (1988) provides an interesting model of language acquisition and choice, which for various reasons is not used here.

²⁴ Exact counts depend on the treatment of multiple responses in the Canadian Census. Other discrepancies depend on emigration from Canada, differences between fertility and mortality, and measurement error.

²⁵ Based on interviews Locher (1988) finds Anglophones moved primarily because of dissatisfaction with Quebec politics and language laws; Amit-Tali (1993) finds Anglophones moved primarily for job opportunities elsewhere.

a slope that increases in the variance of moving costs or tastes for Quebec-specific amenities, and which shifts inwards if Anglophones see their relative quality of life diminish or their relative cost of living increase. The demand for Anglophone workers is represented by a downward sloping curve, with a slope that decreases in the substitutability of Anglophone labour with other factors, including Francophone labour, and which shifts in if the productivity of English-speaking labour falls, or the cost of such labour increases.

Using standard comparative statics, it is plain to see that falling Anglophone employment in Quebec together with lower relative wages is consistent with a negative demand shift, and not with a negative supply shift, which would predict rising relative wages. While this analysis remains speculative, it suggests that Anglophones left Quebec primarily because of lost job opportunities, rather than because the changing political and linguistic situation in Quebec diminished their quality-of-life.²⁶ A negative supply shift may also have contributed to the Anglophone exodus, but such a shift alone would imply that Anglophones remaining in Quebec should be paid higher wages. In 2000, Anglophones remaining in Quebec were paid lower wages, meaning they lost considerable welfare. Anglophones who left Quebec, in contrast, had lower moving costs, weaker tastes for life in Quebec, or better opportunities elsewhere, and thus were not made as worse off as those who stayed.²⁷

This raises the question of what caused demand for Anglophone labour to fall so precipitously in Quebec. One possible explanation is that the language laws raised the cost of hiring English speaking labour. However, direct estimates of these costs have typically been

²⁶ Price data rules out a negative supply shift from a higher cost-of-living: the Consumer Price Index (all items) between 1971 and 2000 increased by 4.2 percentage points less in Montreal than in Toronto, and 1.3 points less than in Canada as a whole. Therefore, the relative cost-of-living in Quebec probably fell over this period.

²⁷ This analysis also raises the question of why Anglophones in Quebec had such high wages in 1970. As most Quebec Anglophones live in Montreal, this may be due to an urban wage premium, reflecting the higher productivity of workers in a large city, which compensate for higher costs-of-living. As seen in the online appendix, wage levels in Montreal were close to those in Toronto until after 1980.

small (Vaillancourt 1996), rarely exceeding one percent of total output. Yet, if these costs are fully capitalized into Anglophone wages, this could have a substantial effect: for example if Anglophones make up 15 percent of labour costs, then costs equal to one percent of the total wage bill could lower Anglophone wages by 7 percent. Furthermore, the measured costs are likely a lower bound of the true costs as some costs are hard to observe, and as firms could have already shifted resources inefficiently in order to avoid these costs. Another explanation is that there was an exogenous drop in the productivity of Anglophone labour in Quebec, possibly from secular regional shifts or from risk related to political instability in Quebec.

An alternate, supply-driven, explanation is that Anglophone workers with high unobservable skills disproportionately left Quebec, causing wage levels to fall because of unobserved selection. This explanation may be partly true, but it seems too extreme to explain the entire 14 point drop in the Quebec gap for Anglophones, especially when so many Anglophones did not move, and as observable skill levels of Quebec Anglophones remained high and relatively constant between 1970 and 2000, as seen in Figure 3a. For selection to be the sole explanation of the wage drop, the positive selection out of Quebec would have had to change unobservable skills dramatically, without changing observable skills. It is hard to imagine how this kind of selection would operate.

To explore inter-provincial migration further, statistics on Anglophone movers and non-movers are presented in Table 6. The Census from 1981 to 2001 track respondents who moved over the previous five years, covering moves between 1975 and 2000. The first column reports the average characteristics of Anglophones outside of Quebec who did not move in the 5 years prior to the Census day, averaged over all Census years, weighted by inverse sampling probabilities. The other columns report the average characteristics of four groups *relative to the*

group of non-movers outside Quebec: non-movers in Quebec, and movers who left Quebec, arrived in Quebec, or moved between any other provinces. Because migration flows are not constant, it is necessary to control for timing issues, and thus in the table a group's mean characteristics are differenced with *contemporary* non-movers outside Quebec from the same Census year before being averaged over all years, weighted by inverse sampling probabilities.²⁸

Relative to contemporaries who did not move and other inter-provincial movers, those who left Quebec are better educated and had higher post-move wages; they also older and more likely to move to Ontario than the typical migrant.²⁹ Anglophones who moved into Quebec are also well-educated, but they arrived in small numbers, resulting in a net “brain-drain” from Quebec, albeit too small to have a major effect on the relative skill levels of Quebec Anglophones. Still, the loss of skilled Anglophones may – through lost agglomeration effects from spillovers or complementarities – have endogenously lowered the overall productivity of Anglophone labour.

To examine whether the drop in the residual Quebec gap for Anglophones is related to selective migration, the average residual wage Quebec emigrants is reported at the bottom of Panel A in Table 6. Emigrants from Quebec do have a residual wage premium of 3 points in their post-move wages. Given that less than half of Anglophones left Quebec, this change should not explain more than 1.5 points of the 14-point drop in the residual Quebec gap for Anglophones, unless pre-move wages of Quebec leavers were higher than their post-move wages. While possibly present, selective migration does not appear strong enough to fully explain why the Quebec gap for Anglophone fell so tremendously.

²⁸ This produces results like a regression coefficient on a group indicator dummy variable, using non-moving non-Quebecers as a reference, in a regression which includes Census year indicators as control variables.

²⁹ Pre-move earnings are not available in Census data. Grenier (1987) examined Quebec leavers between 1976 and 1981, finding them to be younger and better educated than Quebec stayers. However other inter-provincial movers tend to be even younger, although less educated, than those leaving Quebec.

The timing of changes observed across the wage distribution also raises the issue of whether Anglophones with greater unobserved skills left Quebec first, perhaps spurring a decrease in Anglophone labour demand through the effects described above. This issue is explored in Panel C by looking at the pattern of explained and unexplained wages of Anglophones who left Quebec over time. Here there is no obvious pattern except that the highest paid workers appear to have left last, between 1995 and 2000.

7 Conclusion

Analyzing the Francophone wage gap in Canada, rather than in Quebec alone, gives a more balanced picture of what happened to the wages of Francophones and Anglophones since 1970, as well as a better sense of the economic effects of policies meant to preserve the French language and improve the welfare of Francophones. Improvements in Francophone educational attainment – due primarily to reforms in the Quebec education system, but also perhaps to a higher return to education for Francophones – had the clearest and most prevalent effect on Francophone wages by directly raising productivity. Less clear are the direct effects of language laws and other policies meant to increase the demand for French-speaking labour and reduce discrimination against Francophone workers. Changes in relative wages unexplained by observable skills, especially within Quebec, suggest that these helped to raise demand for labour of the French majority, although at a cost to the English minority. The improvement of Francophone welfare and the sustained vitality of French in Quebec may indeed justify this cost, but it is essential that policy makers and evaluators do not confuse “Anglophone pains” with “Francophone gains” by only analyzing wage differences within the province.

While the relative wages of unilingual and bilingual workers, controlling for observable skills, does suggest that the return to French-language skills may have increased, it also appears

that unobservable selection issues make it difficult to interpret this relative wage measure as a return to additional language skills. Additional research might help to separate the role of demand for language skills from the role of discriminatory practices in creating the Francophone wage gap, although the two seem difficult to separate using conventional datasets: perhaps more could be done using other evidence. Finally, thirty years after the passage of Bill 101, policy makers might benefit from additional research on the labour market in Quebec for Anglophones, who may now suffer from reverse discrimination.

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TABLE 1
 Characteristics of Francophone and Anglophone Males in and out of Quebec

Year Region Mother Tongue	1970				2000				Rel. Change: All (9)
	Quebec		Non-Quebec		Quebec		Non-Quebec		
	Franco (1)	Anglo (2)	Franco (3)	Anglo (4)	Franco (5)	Anglo (6)	Franco (7)	Anglo (8)	
<i>Panel A: All Males, Ages 20 to 59</i>									
Percent of Group in Region	0.83	0.06	0.17	0.94	0.86	0.03	0.14	0.97	
Age	36.4	38.1	36.9	36.9	39.6	38.5	40.6	38.4	+1.8
Cumulative Education:									
at least Grade 9	0.54	0.74	0.53	0.75	0.90	0.95	0.91	0.96	+0.16
at least Grade 11	0.31	0.53	0.30	0.50	0.77	0.84	0.74	0.85	+0.11
at least Bachelor's Degree	0.07	0.15	0.05	0.09	0.15	0.26	0.14	0.17	+0.002
Bilingual	0.44	0.55	0.89	0.05	0.49	0.78	0.94	0.06	+0.03
Percent in Wages Sample	0.75	0.79	0.74	0.80	0.64	0.61	0.62	0.66	+0.03
<i>Panel B: Wage Sample Only</i>									
Work in English Only	n/a	n/a	n/a	n/a	0.05	0.67	0.67	0.997	-
Hours Worked per Week	44.2	43.0	43.9	44.2	43.1	44.8	45.7	46.4	-3.0
Hourly Wages	\$16.4	\$22.2	\$16.9	\$18.7	\$20.6	\$22.3	\$21.2	\$21.9	+\$1.3
Wages Sample Size	8368	1189	1667	18945	27843	2131	4539	73999	

Canadian Census sample includes only Canadian-born males ages 20 to 59. Wage sample is restricted to individuals working full time, 30+ hours per week, 27+ weeks per year, reporting weekly wages over \$60 and hourly wages over \$2. 1970 wages deflated to 2000 dollars using the CPI-All Items. "n/a" = not available.

TABLE 2
Regional Decomposition of the Francophone Wage Gap

Year	1970 (1)	2000 (2)	Difference (3)
<i>Panel A: Francophone Wage Gap</i>			
All of Canada	-0.128 (0.007)	-0.029 (0.004)	+0.100 (0.008)
Within Quebec	-0.270 (0.020)	-0.019 (0.014)	+0.250 (0.025)
Outside Quebec	-0.095 (0.015)	-0.011 (0.009)	+0.084 (0.018)
<i>Panel B: Quebec Wage Gap</i>			
All Individuals	-0.084 (0.007)	-0.030 (0.004)	+0.053 (0.008)
Anglophones	0.145 (0.019)	-0.013 (0.014)	-0.158 (0.025)
Francophones	-0.030 (0.016)	-0.021 (0.010)	+0.009 (0.018)
<i>Panel C: Cross-Sectional Decomposition of the Francophone Wage Gap for All of Canada</i>			
Within Quebec Component	-0.225 (0.016)	-0.017 (0.012)	+0.208 (0.021)
Outside Quebec Component	-0.016 (0.003)	-0.002 (0.001)	+0.014 (0.003)
Anglophone Difference Component	0.112 (0.015)	-0.011 (0.012)	-0.123 (0.019)

For male workers in the wage sample, ages 20 to 59. Bootstrapped standard errors based on 1,000 iterations shown in parentheses. Based on wage sample described in Table 1. See equation 2 for the decomposition formula and the text for further detail

TABLE 3
Skill Decomposition of the the Francophone Wage Gap in Canada

Year	1970	2000	Change
	(1)	(2)	(3)
Total Francophone Gap	-0.128 (0.007)	-0.029 (0.004)	0.100 (0.008)
Total Predicted	-0.069 (0.004)	-0.004 (0.002)	0.065 (0.005)
Education	-0.086 (0.004)	-0.032 (0.001)	0.054 (0.004)
Experience	0.008 (0.002)	0.019 (0.001)	0.011 (0.002)
Industry	0.009 (0.002)	0.009 (0.001)	0.000 (0.002)
Total Residual	-0.060 (0.006)	-0.025 (0.004)	0.034 (0.007)

For male workers in the wage sample, ages 20 to 59. Bootstrapped standard errors based on 1,000 iterations shown in parentheses. Skill decomposition given in equation 3. Education is captured by eight indicators of highest grade, years of university, bachelors degree, and trade certificate. Experience is given by a quartic in potential experience (age-education-5), and industry by eight indicator variables. See text for further detail.

TABLE 4
Regional Decomposition of the Residual Francophone Wage Gap

Year	1970	2000	Difference
	(1)	(2)	(3)
<i>Panel A: Francophone Wage Gap</i>			
All of Canada	-0.060 (0.006)	-0.025 (0.003)	+0.034 (0.007)
Within Quebec	-0.135 (0.015)	0.039 (0.013)	+0.174 (0.020)
Outside Quebec	-0.029 (0.013)	-0.020 (0.008)	+0.009 (0.015)
<i>Panel B: Quebec Wage Gap</i>			
All Individuals	-0.041 (0.006)	-0.030 (0.004)	+0.011 (0.007)
Anglophones	0.075 (0.015)	-0.067 (0.012)	-0.142 (0.019)
Francophones	-0.031 (0.014)	-0.009 (0.009)	+0.023 (0.016)
<i>Panel C: Cross-Sectional Decomposition of the Francophone Wage Gap for All of Canada</i>			
Within Quebec Component	-0.113 (0.013)	0.033 (0.011)	+0.146 (0.017)
Outside Quebec Component	-0.005 (0.002)	-0.003 (0.001)	+0.002 (0.002)
Anglophone Difference Component	0.058 (0.011)	-0.056 (0.010)	-0.114 (0.015)

For male workers in the wage sample, ages 20 to 59. Bootstrapped standard errors based on 1,000 iterations shown in parentheses. See text for decomposition formula. Residual wages calculated as in Table 3. See Table 2 and text for further detail.

TABLE 5

Wages of French-English Bilinguals relative to Unilinguals

Year	1970 (1)	2000 (2)	Difference (3)
<i>Panel A: Proportion Bilingual</i>			
Quebec Francophones	0.474 (0.006)	0.516 (0.003)	+0.042 (0.006)
Non-Quebec Francophones	0.923 (0.006)	0.965 (0.003)	+0.042 (0.007)
Quebec Anglophones	0.548 (0.015)	0.817 (0.009)	+0.270 (0.017)
Non-Quebec Anglophones	0.044 (0.001)	0.064 (0.001)	+0.020 (0.002)
<i>Panel B: Total Wage Gap between Bilinguals and Unilinguals</i>			
Quebec Francophones	0.288 (0.011)	0.190 (0.007)	-0.098 (0.013)
Non-Quebec Francophones	0.341 (0.058)	0.211 (0.048)	-0.130 (0.075)
Quebec Anglophones	0.029 (0.034)	0.100 (0.036)	+0.072 (0.050)
Non-Quebec Anglophones	0.113 (0.021)	0.106 (0.010)	-0.008 (0.023)
<i>Panel C: Predicted Gap between Bilinguals and Unilinguals</i>			
Quebec Francophones	0.179 (0.007)	0.110 (0.004)	-0.069 (0.008)
Non-Quebec Francophones	0.142 (0.022)	0.073 (0.020)	-0.069 (0.030)
Quebec Anglophones	0.006 (0.018)	0.050 (0.016)	+0.044 (0.025)
Non-Quebec Anglophones	0.134 (0.012)	0.099 (0.005)	-0.035 (0.013)
<i>Panel D: Residual Wage Gap between Bilinguals and Unilinguals</i>			
Quebec Francophones	0.109 (0.011)	0.081 (0.006)	-0.028 (0.012)
Non-Quebec Francophones	0.199 (0.054)	0.138 (0.045)	-0.061 (0.070)
Quebec Anglophones	0.022 (0.029)	0.050 (0.032)	+0.028 (0.042)
Non-Quebec Anglophones	-0.021 (0.018)	0.007 (0.008)	+0.028 (0.020)

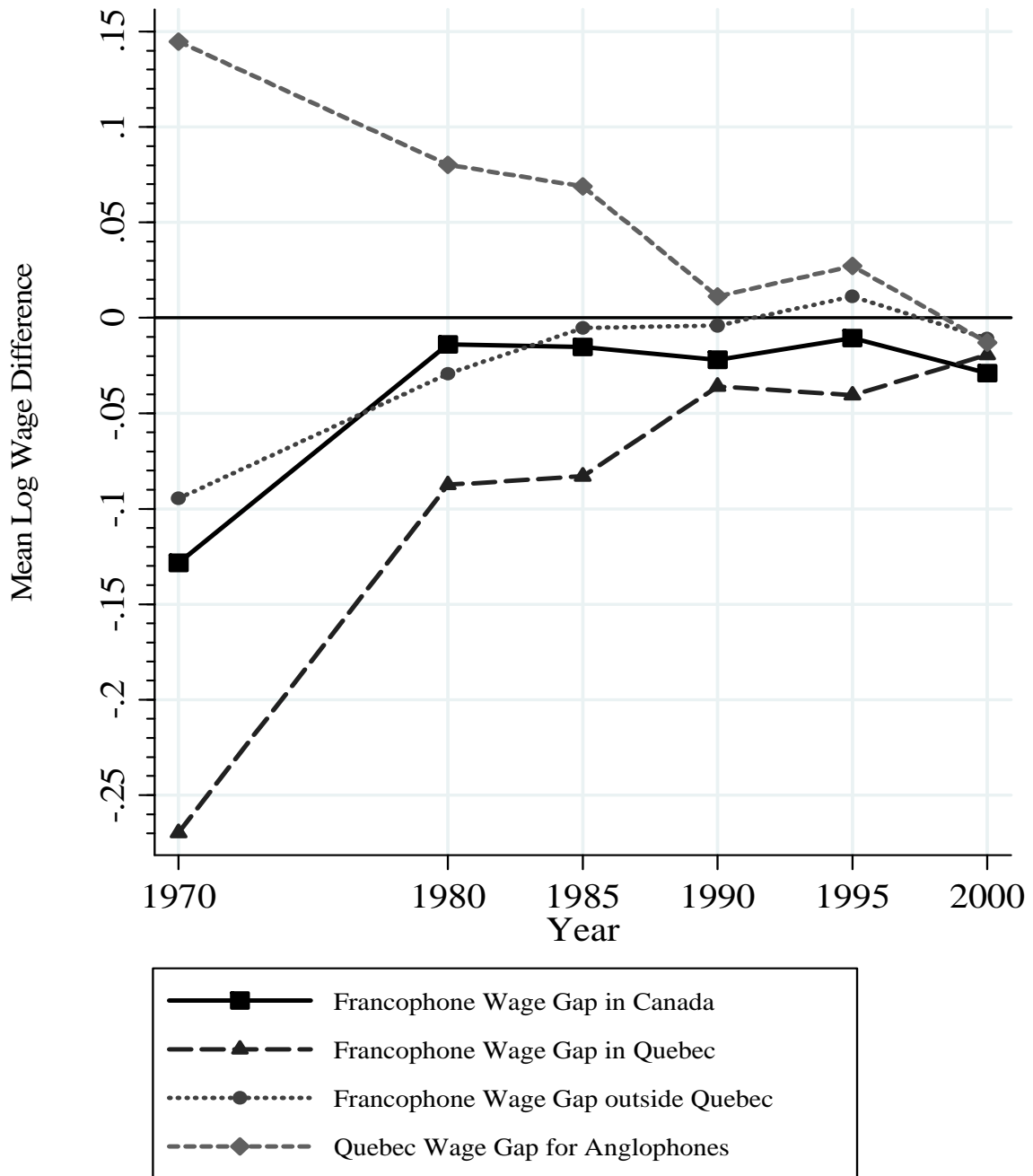
For male workers in the wage sample, ages 20 to 59. Bootstrapped standard errors based on 1,000 iterations shown in parentheses. "Bilingual" indicates that the individual claims to speak both English and French; "unilingual" indicates that the individual claims to speak only his mother tongue (and possibly languages other than French or English). Residual wages calculated as in Table 3. See text for further detail.

TABLE 6
 Characteristics of Anglophone Interprovincial Movers and Non-Movers in Quebec relative to Non-Movers outside Quebec

	Non-Mover Anglophones Outside Quebec (1)	Difference Relative to Column (1)			
		Non-Mover Anglophones In Quebec (2)	Interprovincial Movers		
			Quebec Leavers (3)	Quebec Arrivers (4)	Other Movers (5)
<i>Panel A: All Men, 20 to 59</i>					
Province of Residence:					
Ontario	0.47	-0.47	+0.18	-0.47	-0.27
Age	36.9	+0.8	-3.1	-4.4	-4.5
Cumulative Education:					
at least Grade 11	0.76	+0.00	+0.15	+0.13	+0.07
at least Bachelor's degree	0.15	+0.06	+0.21	+0.23	+0.06
Bilingual	0.06	+0.69	+0.53	+0.49	+0.03
<i>Panel B: Wage Sample Only</i>					
Total Log Wage	2.90	+0.03	+0.09	+0.04	-0.04
Residual Wage	0.00	-0.01	+0.03	+0.00	-0.02
<i>Panel C: Residual Wages of Quebec Leavers by Year They Left Quebec</i>					
Years Left	Log Wage	Residual Wage	Sample		
1976-1980	+0.10	+0.01	438		
1981-1985	+0.11	+0.05	252		
1986-1990	+0.11	-0.02	232		
1991-1995	+0.10	-0.03	215		
1996-2000	+0.19	+0.13	252		

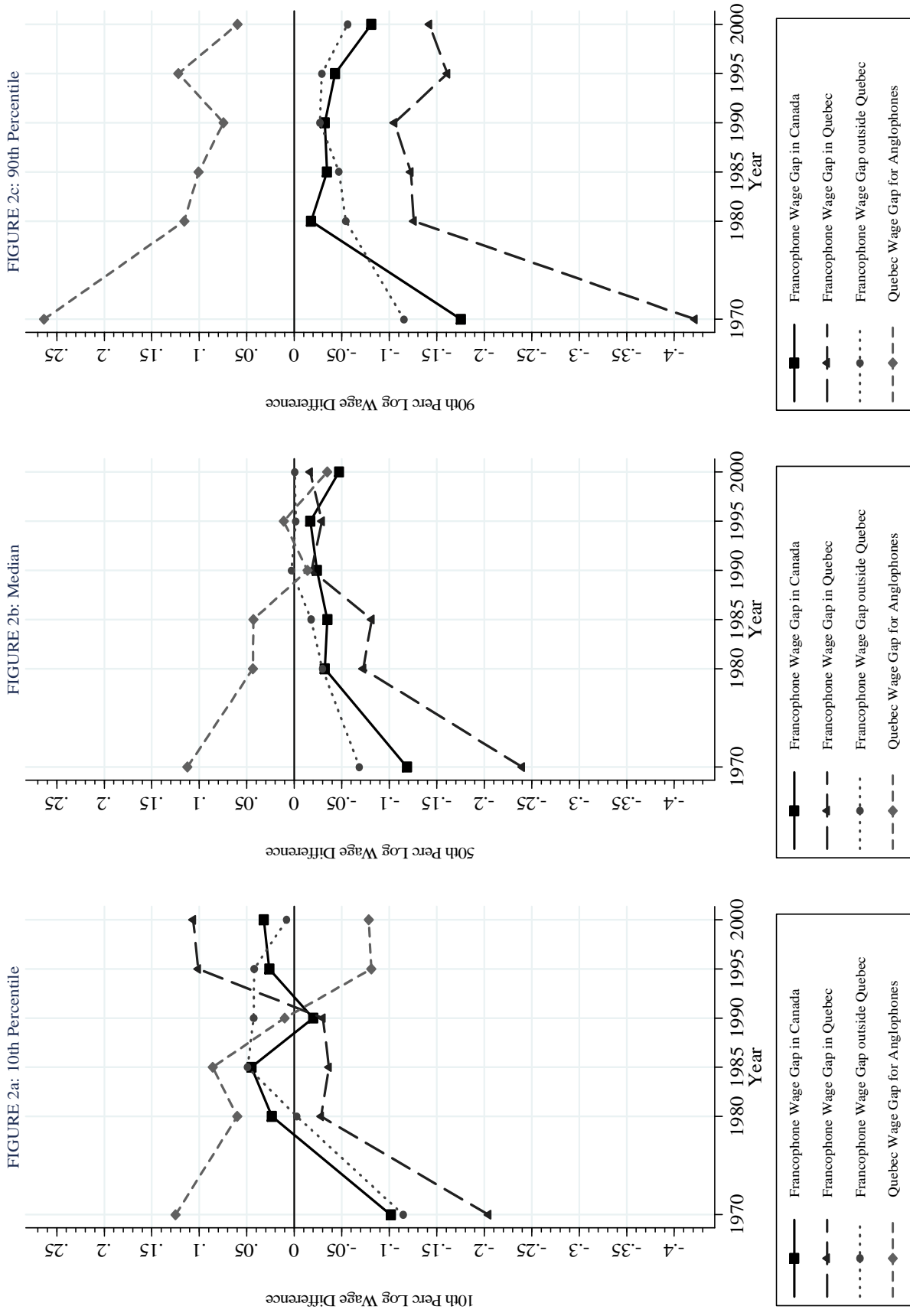
Mean characteristics and relative differences averaged over 1976 to 2000, weighted by population. Characteristics of groups deviated from non-movers not in Quebec from same Census Year, and then averaged over the five Census Years (1981, 1986, 1991, 1996, 2001), weighted inversely by sampling percentages. Residual wages calculated as in Table 3. See text for further detail.

FIGURE 1
Mean Hourly Wage Gap Between Groups



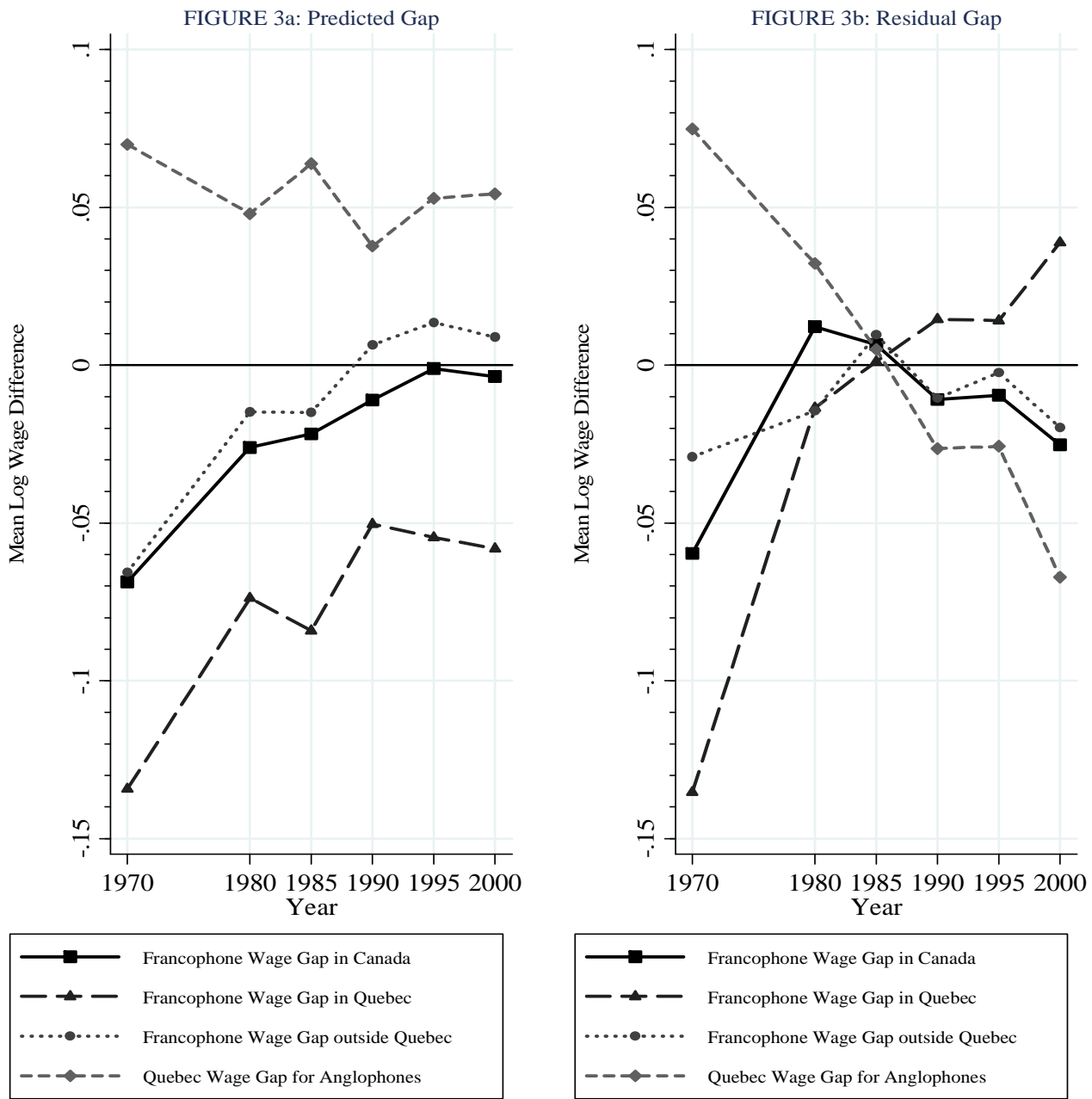
For males in the wage sample, ages 20-59. See text and Table 2 for further details.

FIGURE 2
Hourly Wage Gaps between Groups at the 10th, 50th, and 90th Percentiles



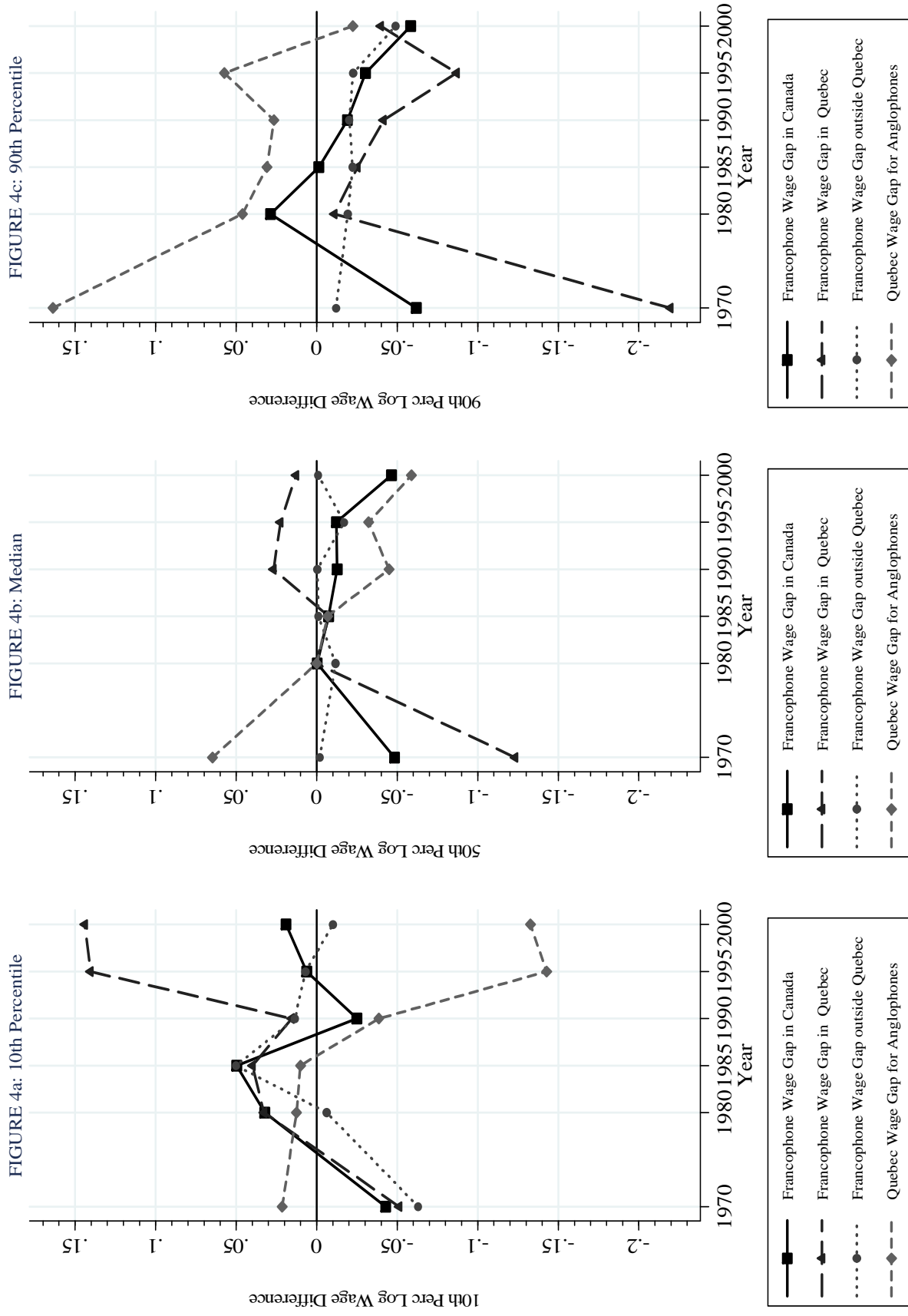
For males in the wage sample, ages 20-59. See text for further details.

FIGURE 3
Skill Decomposition of Hourly Mean Wage Gaps between Groups



For males in the wage sample, ages 20-59. See text for further details.

FIGURE 4
Residual Wage Gaps between Groups at the 10th, 50th, and 90th Percentiles



For males in wage sample, ages 20-59. Residual wage gaps calculated by taking the difference between the actual distribution of wages for Francophones, and the distribution of wages for Anglophones, reweighted to have the same observable characteristics as Francophones, as in Dinardo, Fortin, and Lemieux (1996). See text for further details.

FIGURE 5
 Mean Wages of Skill Groups Compared

FIGURE 5a: Francophone vs. Anglophone, All of Canada

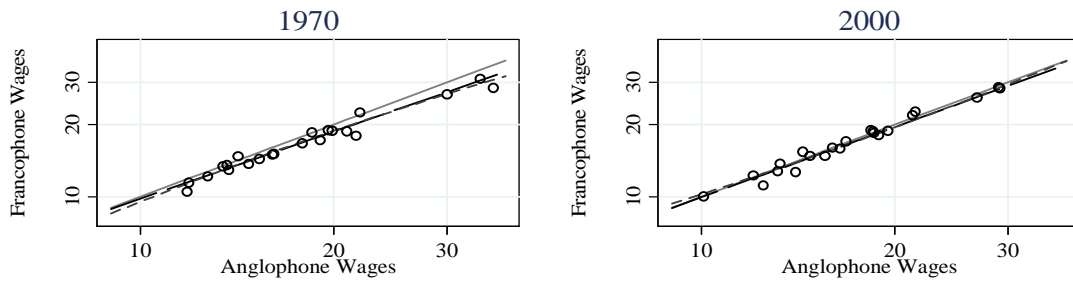


FIGURE 5b: Francophone vs. Anglophone, Quebec Only

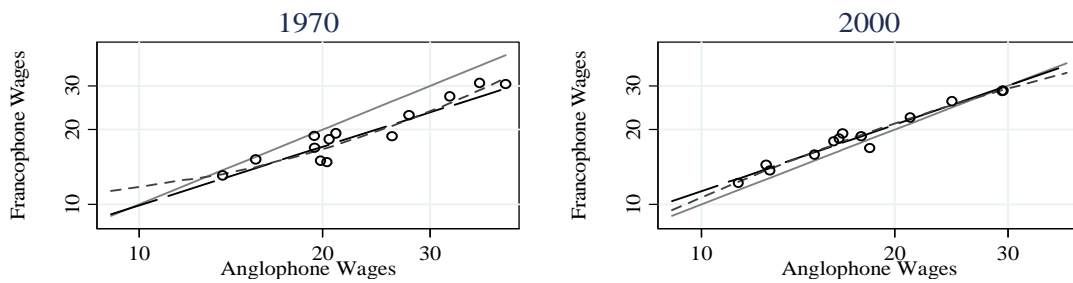


FIGURE 5c: Quebec vs. Non-Quebec, Anglophones Only

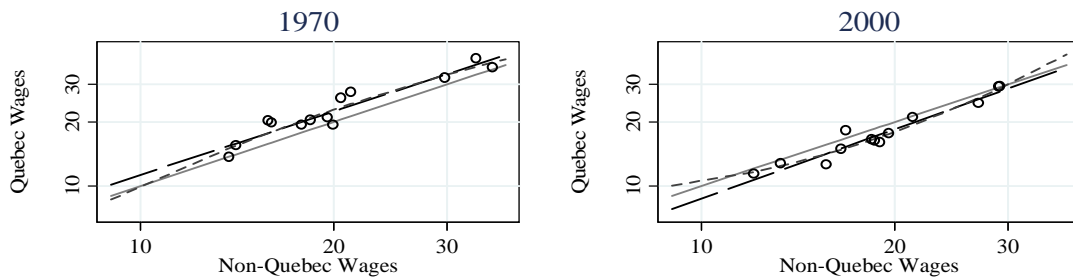
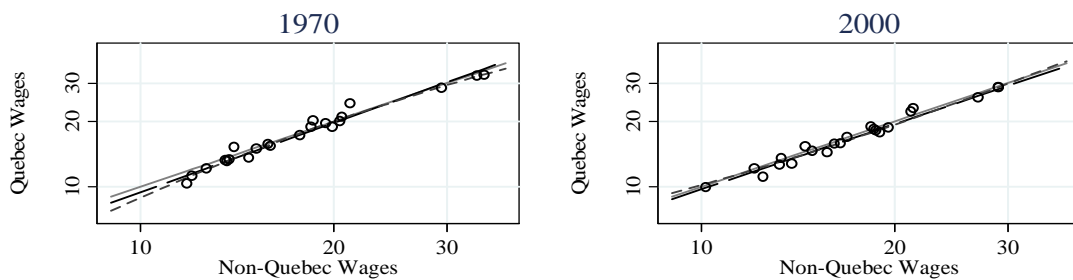
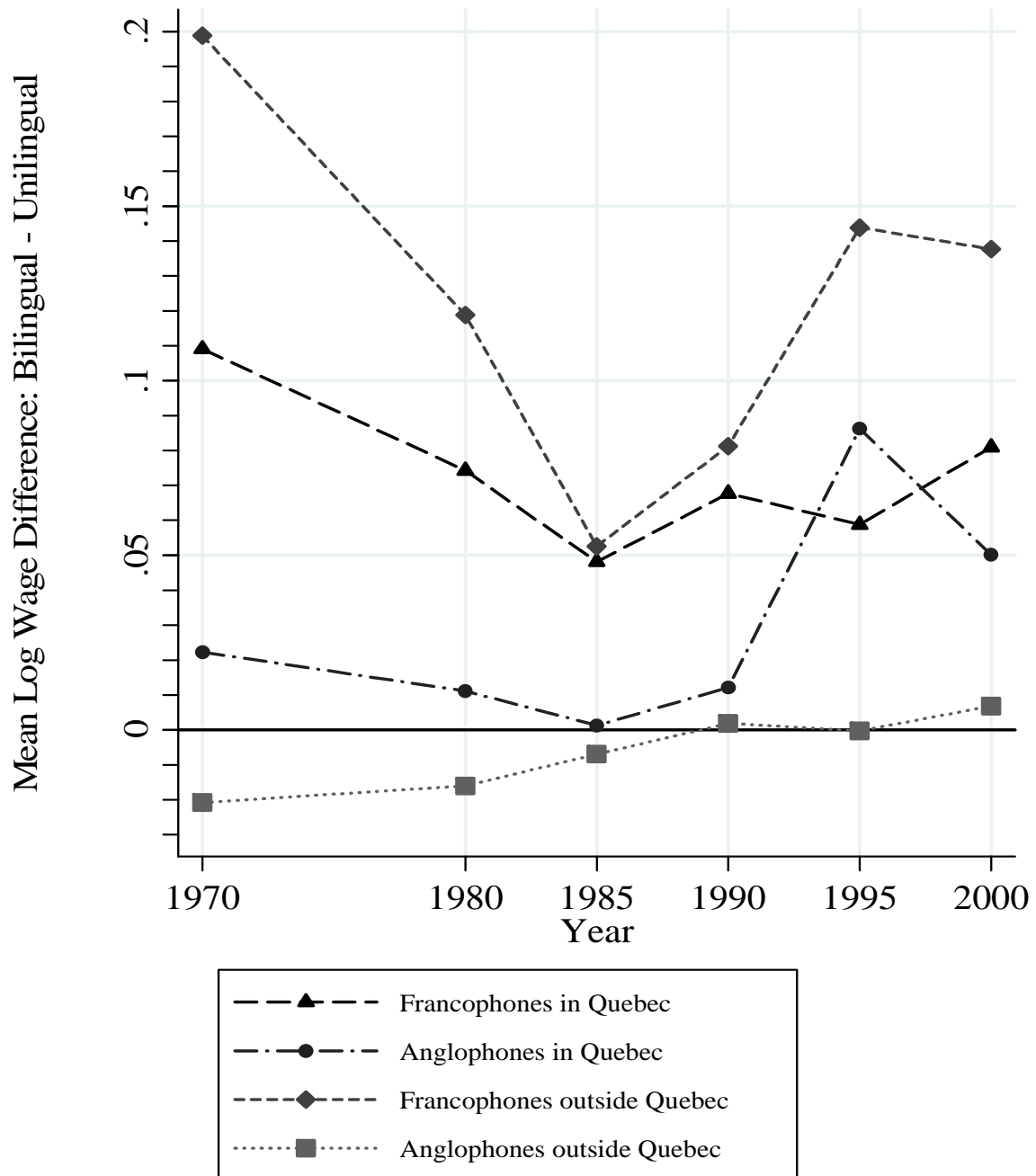


FIGURE 5d: Quebec vs. Non-Quebec, Anglophones and Francophones



Skill groups (represented by circles) defined by 5 experience and 5 education categories interacted. Diagonal given by the solid line. Linear (long dash) and quadratic (short dash) fit based on the one-dimensional skill model of Card and Lemieux (1996) with log wages. Point estimates, standard errors, and goodness of fit tests reported in online appendix. See text for more details.

FIGURE 6
Residual Wage Gap between Bilingual and Unilingual Francophones and Anglophones, by Region



For males in wage sample ages 20 to 59. See Table 5 and text for details.