

Closing the 49th Parallel: An Unexplored Episode in Canadian Economic and Political History

by

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Abstract

We draw attention to, and begin to consider the implications of the severe restrictions on emigration by Canadians to the United States introduced under the U.S. Immigration Act of 1965. These restrictions came into effect in 1968 and lasted until mobility began to increase to some extent under the free trade agreements in the early 1990s. This is an unusual episode in Canadian history, one whose implications for the Canadian economy and for Canadian public policy appear to have received little attention.

We assemble evidence that suggests that the near closing of the border led towards uncoupling of Canadian and U.S. labor markets and to a decrease in the elasticity of labour supply in Canada. Implications for Canadian fiscal policy of a decline in labor elasticity are then derived using a model of equilibrium fiscal structure. We show that these predictions, including heavier taxation of labour income and an increase in the overall size of the public sector, are consistent with what occurred over the two decades after the near closing of the U.S. border, as well as with the partial reopening following the free trade agreements. The analysis continues by acknowledging additional factors that determine the structure and size of the public sector, and by considering the near closing of the border in a broader historical context. We conclude with a prediction about the future course of Canada-U.S. migration policy that follows from our analysis.

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1. Introduction

The purpose of this paper is to draw attention to, and begin to consider the possible implications for Canada of the near closing of the Canada-U.S. border to emigration in the late 1960s. This closure resulted from a substantial change in immigration regulations affecting Canada that came into force in 1968 under the U.S. Immigration Act of 1965. The period of near closure lasted until the mobility provisions of the free trade agreements began to have their effect in the early 1990s. Historically this is an unusual episode in economic and social relations between Canada and the United States. Whether there has been an important causal relationship between the openness of the border and the nature of the Canadian economy and Canadian public policy, in our view, are interesting questions that have not yet been asked. We pose those questions and begin to explore how they may be answered.

In the 1960s, *both* countries terminated their longstanding “hemispheric exemptions” to immigration quotas, which had allowed qualified immigrants born in the Western Hemisphere to enter either country without numerical limit.¹ Canadians were not entirely locked out of the U.S. They could still travel there freely for vacation and business purposes. But visas had long been required for permanent resettlement (see Ramirez, 2001), and under the 1965 U.S. Immigration Act, beginning on July 1, 1968 Canadians had to compete for an annual total of 120,000 visas for the whole of the Western Hemisphere.² Labour certification rules were also tightened up sharply by the 1965 Act, making it more difficult for Canadian workers to obtain clearance to take jobs in the US (Tomasi and Keely, 1975, pp. 8,9). Canada’s immigration reform of 1962, under which the preferred class of origin countries, which had included the US, was abolished, had a similar effect on U.S. immigrants to Canada, whose entry was further affected by the implementation of our points system on Oct. 1, 1967.³

The new immigration system in the United States, and the abolition of the hemispheric exemption for migrants in both directions between Canada and the United States represents an important regime change. Coinciding with this change there was a sharp fall in emigration from Canada to the US, as Figure 1 illustrates. While emigration had been relatively high from 1960 to 1965, averaging 48,345 official migrants per year, the flow crashed after 1968, reaching a trough of 11,215 in 1975. Taking a longer view, emigration to the U.S. from Canada in the two decades 1951-60 and 1961-70 averaged 39,563 persons annually. These numbers fell to 16,994 per year from 1971 to 1980 and then to 15,694 from 1981 to 1990, and this despite the increase over the same periods in the ability of Canadians to afford to move.

[Figure 1 here]

There are a variety of special reasons why Canadians may have been less interested in moving south in the late 1960s and 1970s than formerly: real wages rose in Canada; there was civil unrest in U.S.

¹ See Hatton and Williamson (2005) for discussion of this type of immigration policy reform, which they indicate occurred in several developed countries after 1960.

² This Act introduced a system of preference classes, emphasizing family reunification and skill priorities. However, the preference classifications were not applied to Western Hemisphere immigrants until 1976.

³ See Green (1995) for a concise outline of changes in Canadian immigration policy over time.

cities; and young men wanted to avoid being drafted to fight in Vietnam. However, these factors had largely ceased to operate by the 1980s. The continued low rate of migration from Canada to the United States after the War in Vietnam and U.S. civil disturbances were well over, and in the face of high unemployment in Canada during and after the 1981-82 recession, appears to confirm the effectiveness of the new restrictions on migration from Canada to the U.S. imposed by the 1965 U.S. Immigration Act.

While the period of strong restrictions on Canadian emigration to the U.S. did not come to an end until the HB-1 and TN temporary visas came into wide use after 1990 under the Free Trade Agreement (FTA) and its successor, the North American Free Trade Agreement (NAFTA), there were some changes in U.S. regulations in the intervening period that may be noted. In October 1978 the separate hemispheric limits were abolished in favor of a single worldwide annual limit of 290,000 - equal to the sum of the former hemispheric limits. This global limit was reduced to 280,000 in 1980 and 270,000 in 1981, indicating a tightening of immigration restrictions. That policy was reversed by the 1990 Immigration Act, however, which raised the annual limit. By 1998 the global annual limit had risen to 366,000. This change in U.S. policy on permanent immigration has reinforced the role of temporary migration under the FTA and NAFTA in increasing cross-border labour mobility.

To enter into an analysis of the consequences of the near closing of the border between 1965 and the free trade agreements (as well as of its partial reopening), we proceed as follows. In section two we assemble some evidence that suggests that the border closing led towards uncoupling of Canadian and U.S. labor markets and to a decrease in the elasticity of labour supply in Canada. Some complementary evidence concerning the nature of the constraint imposed on Canadian policy choices by Canada-U.S. labour migration is also provided. Looking at the effect on labour supply is an obvious way to start a consideration of the economic impact of the border closing. Implications for Canadian fiscal policy of a decline in labor elasticity are then derived using a model of equilibrium fiscal structure in section three. These implications include heavier reliance on labour income taxes and an increase in the overall size of the public sector. We then show that these predictions appear to be consistent with what occurred over the two decades after the near closing of the U.S. border. We also consider the reversal in the nature of fiscal policy that coincides with the partial re-opening of the border following the signing of the free trade agreements.

The analysis continues in section four with a consideration of additional factors (that we do not consider at length in this paper) that should be part of further analyses of the effect of the closing on the Canadian public sector. In section five we consider the closing of the border from the perspective of the broader historical experience, and offer a prediction about the future of Canada-U.S. immigration policy that follows from our discussion. A final section summarizes the arguments of the paper.

2. Evidence of the effects of closing the border on labour market integration and Canadian labour supply

An obvious place to commence the analysis is with the implications of the 1965 change in U.S. immigration law for Canadian labour markets. In this respect two, perhaps obvious, questions arise: First, did Canadian and U.S. labour markets become less integrated after 1968 when the new policy

became effective, at least up to the time when the mobility provisions of the free trade agreement came into force in the early 1990s? Second, was there a significant drop in the elasticity of aggregate labour supply in Canada after 1968? The evidence we present in this section appears to indicate that the answers to both of these questions are: yes.

We also consider a third issue: namely, whether or not there is any evidence that cross-border labour migration in response to policy changes may have been substantial enough to constrain Canadian policy choices.

2.1 *Labour market integration*

Economic historians have devoted much attention to labour market integration, both within and across countries (See for example, Coe and Emery, 2004 and Hatton and Williamson, 1998, 2005). They find that correlation of wages and particularly of wage changes across markets provides a useful test. Here we show such correlations for a selection of periods in Table 1. The correlation in levels suggests strongly that Canadian and U.S. labour markets became increasingly unconnected after the change in U.S. immigration policy. It exceeds 0.990 in the post-war period up to 1968, and then drops to 0.190 for 1969-90 and -0.235 for 1969-2008.⁴

[Table 1 here]

The table also shows that the wage change correlation across countries, like that for wages, is relatively high for 1950-68, at 0.635, and drops thereafter, although the declines after 1968 are less dramatic than when one looks at wage levels. Still, overall the evidence on wage correlations supports the view that something important happened in the 1960s so that an integrated labour market was gradually replaced by two more separated markets.⁵

Further evidence that labour markets were becoming uncoupled is provided by the evolution of the distribution of incomes in the two countries. In the early postwar period income inequality in both countries was much lower than it had been before the war and showed little trend. This continued to be true in Canada for total family income until the mid-1990s. But income inequality started to trend upwards steadily in the U.S. beginning in the mid-1970s, as shown here in Table 2. (Note that inequality in *market* incomes did begin to rise in Canada in the early 1980s, as shown in the first column of Table 2, but this is generally attributed to the severity of the 1981-82 recession in Canada and lingering high unemployment after that, rather than to competitive labour market pressures from the U.S.)

Labour economists have traced one reason for the diverging nature of inequality in the two countries since the mid-1970s to the relatively bigger increase in the supply of university graduates

⁴ It is 0.942 for 1921-39, and 0.995 for 1946-48.

⁵ Over the 1921-1939 period, the wage change correlation is 0.198, and is low probably due to the fact that few people could either afford to migrate or find a job in the Depression. It was not due to a closed border during the Depression (See Green and Green, 2008). The wage change correlation for 1946 - 1968 was also low, at 0.033. This may be due to the fact that until the end of the war, Canadian wages were unusually depressed relative to U.S. wages, while during the 1945-50 period the wage rise in Canada was faster than in the U.S.: the ratio of Canadian to U.S. wages increased from 0.769 in 1945 to 0.839 in 1950.

in Canada over this period, which may have prevented as large a rise in the university/high school graduate wage differential as that seen in the U.S. (See Murphy et al., 1998). Such an explanation relies importantly on the border being closed. If it had been open, there would have been a greater outflow of Canadian university graduates to the U.S. and likely greater similarity of distributional trends. A further reason for the divergence in inequality trends may be the equalizing impact of the larger transfer payments that were part of the expansion of government spending in Canada during this period that we discuss at some length below.

[Table 2 here]

While the classic Heckscher-Ohlin model of international trade predicts that labour immobility will not interfere with factor price equalization, in the real world departures from factor price equality are often observed across borders where there is imperfect factor mobility. (See for example, Harris and Schmitt, 2005.) We should therefore expect that in a period with severe limits on Canada-U.S. labour mobility, the distributions of wages and salaries in the two countries will become less similar, just as Table 2 indicates. We should also expect that the elasticity of labour supply will decline, an issue to which we now turn.

2.2 *Labour supply elasticity*

There is a lack of recent empirical evidence on aggregate labour supply, not only in Canada but more widely. Time series studies of aggregate labour supply died out, at least in the academic literature, in the late 1960s, to be replaced by intensive study at the micro level. There are many summaries of the evidence, which broadly agree on an average elasticity in the range 0.1 – 0.4. Benjamin et al. (2007) pick 0.25 as an 'illustrative representative' value. These numbers only take account of the intensive margin, however. To get an idea of the aggregate elasticity one also must take into account the extensive margin, which includes the effects both of labour force participation and migration decisions.

We try to throw light on the impact of emigration to the U.S. on the aggregate labour supply elasticity in Canada in two ways. First, we perform simple time series regressions for the postwar period up to 1968 and the period afterward, and compare the estimated wage elasticities. Second, we use results of the empirical study of migration between Canada and the U.S. by Hunt and Mueller (2010) to estimate a lower bound on the impact of migration on aggregate labour supply elasticity with an open border.⁶

Table 3 presents our least squares labour supply regression results. Here we regress *changes* in the log of aggregate labour supply in Canada, as shown by the size of the civilian labour force, on changes in Canadian wages, U.S. wages, and population, all in log form. Note first that for the 1946-1968 period, the coefficients on Canadian and U.S. wages are positive and negative respectively,

⁶ Iqbal (2000) reports a time series regression of emigration from Canada to the U.S. using "income gap", "tax gap" and unemployment gap as explanatory variables. Coefficients on the income and tax gap variables are significant and have the expected positive sign. However, the definitions of variables are unclear and the reader is cautioned in a footnote not to place too much confidence in the results. We are not aware of any other attempts to estimate the determinants of emigration from Canada to the U.S. using econometric techniques.

and both significant, which is consistent with an open border and migration being responsive to wages. The estimated elasticity of labour supply with respect to the Canadian wage is 0.43 - somewhat above the Benjamin et al. 'best guess' micro elasticity, as is consistent with bringing the extensive margin into play.

After 1968 the results are different. The U.S. wage becomes insignificant, consistent with the near closing of the border, and the coefficient on the Canadian wage - the aggregate wage elasticity - drops by more than a half compared to the 1946-68 result. While more investigation is needed to establish this as a robust result, the drop in the estimated elasticity from the pre-1968 to post-1968 periods in the OLS regressions is again consistent with the view that the border closing did affect the Canadian labour market significantly, even if the result needs to be treated with caution.

[Table 3 here]

Hunt and Mueller (2010), have studied migration both within and between Canada and the U.S. using 2000/2001 census data from the two countries to estimate the likelihood that individuals would move over the period 1995 to 2001. They find that, holding years of education, experience, and other personal characteristics constant, earnings were 10.3 percent lower for males and 7.6 percent lower for females in Canada than in the U.S. Over 1996-2001 the simulated emigration rate for males from Canada to the U.S. was 0.94 percent and that for females 0.67 percent.⁷ Removing the Canada – U.S. wage differential completely in simulation reduced those emigration rates to 0.43 percent and 0.28 percent. The implied wage elasticities of emigration are 7.6 for males and 11.3 for females, for a weighted average of 9.0. Migration rates from the U.S. to Canada were very low, and relatively unresponsive to wage changes in the case of females. However, U.S. males were quite responsive to wages, and had an emigration elasticity of 8.9 with respect to wages. Averaging across the sexes, the elasticity for migration from the U.S. to Canada with respect to the Canada-U.S. wage ratio was 5.7.

Wage elasticities of 9.0 and 5.7 for cross-border migration are high numbers. Yet they are found for a period in which migration between the two countries was still subject to barriers. These figures can perhaps be taken as a lower bound on the elasticity that would have prevailed in the open border, pre-1968 period, in order to estimate how much of the wage elasticity of aggregate labour supply in Canada at the time, which was 0.43 according to our regression results, was due to migration.

Proceeding on that basis, we assume that immigration to Canada from non-U.S. sources, F , can be treated as exogenous, and neglect Canadians emigrating to countries other than the U.S.⁸ Aggregate labour supply elasticity, e , is then a weighted sum of the domestic labor supply elasticity, e_D , the wage elasticity of immigration from the U.S., e_I , and the (negative of the) wage elasticity of emigration, e_E :

⁷ These simulated migration rates differ a little from the observed rates. They provide a baseline for assessing the responsiveness of migration to simulation experiments.

⁸ Immigration from other countries has been sizeable throughout the postwar period but has no impact on the aggregate wage elasticity if the number of immigrant workers is imposed by quota. While immigrants will be more attracted to Canada if wages go up in Canada, this has no effect on labour supply if there is a cap on immigration, which is a reasonable approximation to the actual situation. Emigration by Canadians to countries other than the U.S. is small, and ignoring it has very little effect on our calculation.

$$(1) \quad e = w_D e_D + w_I e_I - w_E e_E.$$

where the weights w_D , w_I , and w_E are shares of the end-of-period labour supply, $D + F + I - E$.

In the period 1960-68 there were an average of 44,869 official migrants from Canada to the U.S., which was 0.64 percent of the average labour force for this period, suggesting $w_D = 0.0064$.⁹ In the same period immigration from the U.S. averaged 14,536, giving $w_I = .002$. Using these weights, and with $e_I = 5.7$ and $e_E = 9.0$ from Hunt and Mueller, we have that migration components accounted for 0.069, or 16 percent of the 0.43 wage elasticity of aggregate labour supply in Canada before the border was closed, according to this lower bound calculation.

2.3 *Quantitative significance of cross-border migration for public policy choices*

It might be argued that, despite the evidence presented so far, Canada-U.S. labour migration in the postwar period was too small for public policy in Canada to have been affected, so that further easing of any constraints on domestic policy choices posed by the threat of emigration to the U.S. would not have been quantitatively important. But such an observation is based on the relatively small flows in the open-border period before 1965. Under an open border, and with policy choices adjusted to ongoing economic conditions, one does not necessarily observe large migration flows, especially if the two countries are at a similar level of development and are both experiencing good economic and labour market conditions, which was true for Canada and the U.S. in the mid-1960s.

We can begin to get a sense of the constraints on Canadian policy that may have applied in the following manner. Beginning in the 1960s, a gap emerged between the total size of the public sector in Canada vs. the U.S. At its peak in the early 1990s, as shown in Figure 2, this gap stood at about 10 percent of GDP. If the burden of financing this expansion were to fall entirely on labour, either through income taxes, payroll taxes, or other taxes being shifted onto labour, the rise in the effective tax rate on labour would have been about 15 percent, since labour income is about two-thirds of GDP.

Starting from yearly movements between Canada and the U.S. at their 1960-68 level, and using the elasticities from Hunt and Mueller (2010), this would have induced an annual reduction of about 13,000 in the number of people immigrating from the U.S. and a rise in emigration by about 68,000. The net emigration effect would thus have been 81,000 people per year, or 1.1 percent of the labour force. This calculation is of course based on the *peak* difference between the size of government in Canada and the U.S., suggesting a smaller average effect. But the elasticities used, we argue, are lower bound numbers, which works in the opposite direction. We therefore use the 81,000 number for illustrative purposes, while recognizing its limitations.

⁹ Some emigrants would not have been in the labour force. This is offset by the fact that we are ignoring both emigration to countries other than the U.S., which may be influenced by Canadian wage rates, and unofficial emigration to the U.S. which anecdotal evidence suggests was not insignificant for the period examined as both Canadians and Americans could cross the border easily as visitors and work illegally, at least temporarily, with little risk.

[Figure 2 here]

A figure of 1.1 percent of the labour force may not seem large, but that is the impact in just one year. Over the typical four-year life of a government, it would add up to 4.4 percent. The net emigration effects would almost certainly have been larger for university graduates and other highly qualified manpower.

It should be noted that the flows we are talking about are larger than those seen in the 'brain drain' of the late 1990s and early 2000s which aroused considerable debate. Bucovetsky (2003) and Haupt and Janeba (2004) among others have studied the discipline that skilled emigration may impose on the authorities in skilled-worker sending countries by constraining the domestic ability to tax human capital. Concern in Canada about brain drain has receded in the last few years, perhaps due to the efficacy of tax cuts in reducing the drain, and public memory of the anxiety that attended the issue just a decade ago seems to have faded. Reminders can be found in DeVoretz (1999), Emery (1999), Finnie (2001, 2005) and Easton et al. (2005).

One can also compare actual and counterfactual changes in emigration with the increase in the labour force due to rising female labour force participation (LFP) in this period. From 1968 to 1990 the female LFP rate in Canada rose from 37.4% to 58.5%, for an average annual increase of 1.0 percentage points.¹⁰ In 1968 such an increase represented 71,000 women whereas by 1990 it meant 108,000. These numbers are of a similar magnitude to the increase in annual emigration by 81,000 that we have suggested might have been caused by labour income tax increases if the border had been open from 1968 to 1990.

Further evidence concerning the consequences of cross-border migration on domestic policy choices may be found in the evolution of fiscal policy, to which we now turn.

3. Possible effects of the border closing on Canadian fiscal policy

When its supply is elastic, labour does not sit still to bear new taxes thrust upon it. Less labour is supplied, and with an open border some of the reduction in labour supply, especially for higher income groups, may take the form of emigration. Higher taxes on labour will be partly shifted onto consumers and owners of immobile factors such as land or natural resources. As labour leaves the country, GDP may fall. Political competition forces governments to balance these consequences of tax increases against the benefits of increased tax revenues.

When labour supply elasticity is reduced by the closing of the border, as the evidence presented above suggests was the case after 1965, the situation moves in the opposite direction. In this section we consider the likely consequences of a decline in labour supply elasticity for tax structure and the size of government.

¹⁰The 1968 LFP rate is based on series D222 in Leacy (1983), *Historical Statistics of Canada*, with adjustment. It covers all females aged 14 or above. The 1990 rate is computed from CANSIM Table 282-0002 and is for females aged 15 and above. We have adjusted the 1968 figure (originally 34.4%) to make it consistent with post-1975 figures, which are based on a revised definition of the labour force by Statistics Canada.

3.1 *A basic model of a fiscal system in a competitive political equilibrium*

A simple graphical exposition of a model of the tax mix in a democracy, based on Hettich and Winer (1988, 1999) and Kenny and Winer (2006) is helpful in exposing the implications for fiscal structure of closing the border to emigration. The fiscal system in this model is a political equilibrium, one that reflects a continual balancing of opposing interests in the pursuit of political support and electoral success.

Assume that the incumbent party's sole objective is to get re-elected and that it pursues this aim by maximizing total expected support from a heterogeneous electorate. The probability of support from any voter is influenced positively by the provision of public goods and is affected negatively by the full cost of raising the revenues required to finance public services.

Taxation affects voters in two basic ways. First, disposable income is reduced. In addition, there is a welfare loss linked to economic adjustments made in response to taxation. We shall refer to the sum of these effects as the loss in full income and assume that opposition to, or the political cost of, taxation is positively related to the loss of full income. Individuals vary in several respects that are relevant to the full effects of taxation on them and to their political opposition to taxation. They differ with respect to the taxable activities they undertake, in their willingness to substitute between taxable (and other) activities in order to escape taxation, and in their costs of organizing political opposition. In addition, they have varying evaluations of public output, which affect the total marginal political benefits from changing the level of the public good.

Given these assumptions, it is then possible to illustrate the government's choices concerning the level of public output and the taxation of different activities using Figure 3. The figure depicts a simple case where there are only two taxable activities engaged in by taxpayers and one pure public good on which all tax revenues are spent. We may imagine the taxable activities to be employment income, and income from capital. Each tax base has associated with it a unique "Laffer curve" or tax rate - revenue relationship, as well as a different evaluation by the voters of the full cost of a given tax payment.¹¹

[Figure 3 here]

The rate applied to each base with its associated loss in full income for taxpayers is translated into marginal political opposition by the marginal political cost functions in the upper half of the panels corresponding to the two tax bases, where marginal political cost is expressed per dollar of revenue raised. As shown by curves through the points labeled as "1", marginal political cost per dollar functions differ across the two bases, reflecting differences in how voters evaluate the economic effects of taxation levied on each activity, and on how these evaluations are translated into political opposition.

¹¹Figure 3 is drawn on the additional assumptions that each Laffer curve can be drawn independently of taxation levied on the other base, as well as on the assumption that political support is separable in political benefits from public output and opposition to taxation. A more formal mathematical treatment does not require these assumptions. See Hettich and Winer (1999, chapter 4).

The third panel on the right side of Figure 3 shows the determination of budget size, with the total marginal political cost per dollar curve representing the horizontal addition of marginal political cost functions from the other two panels. Total marginal political benefit per dollar for the society, equal to the vertical sum of individual marginal political benefit functions, also expressed per dollar of revenue, is given by the downward sloping curve. The desired budget in the initial situation is at point 1, where the total marginal political benefit equals the total marginal political cost.¹²

The implications of the equilibrium for the structure of the fiscal system are readily understood if we realize that decision makers who maximize support will minimize total political costs for any given level of revenue collected. This requires that marginal costs per dollar of revenue be equalized across tax bases. Any government will then tax both activities and will do so at generally different tax rates. One such equilibrium is represented in Figure 3 by points labeled "1" with associated tax sources, tax rates t_A and t_B and government size R_1 .

Now let us consider the effects of closing the Canada - U.S. border to emigration. Such a shock will initially alter the Laffer curve for the employment income tax base which will now shift outwards and turn backwards at a higher tax rate than before, reflecting the fact that labour supply is, to a greater extent, now bottled up in the domestic economy and so has become more inelastic to the Canadian economy as a whole. The result of closing the border to emigration is that any given amount of personal income tax revenue can now be collected using a lower tax rate so that, at any given level of revenue, the loss in full income and hence the opposition to taxation will be reduced. The reduction in opposition is shown in panel A of Figure 3 by a downwards shift in the marginal political cost function associated with this tax source. The aggregate marginal political cost curve in panel C shifts down and as a result, and as shown in the figure, equilibrium will be reestablished only after political competition leads the incumbent party to rely more heavily on employment income taxes and less on capital income taxes, while the size of government is increased.

In the real world not all taxes can be neatly divided into those on employment income and those on capital income. This affects how one attempts to test the above predictions. In Canada, capital income is sheltered from personal income tax in important ways, so that personal income taxation (PIT) may be treated (approximately) as a tax on employment income. The PIT is the most important form of tax on employment income, but Canada and Quebec pensions and unemployment contributions, as well as other payroll taxes, should of course not be forgotten. Corporate income tax and property taxes may be thought of, roughly, as taxes on capital income.¹³

3.2 *Corroborating fiscal history*

Canadian fiscal history is, at least at first glance, consistent with the story told above: a shift in the tax mix towards increased reliance on taxation of employment income along with reduced reliance

¹² Note that individual marginal political benefit functions do not count in the determination of the equilibrium size of government; only their sum matters because of the nature of the public good.

¹³ Canada has also had explicit taxes on corporate capital at times, at both the federal and provincial levels. Sales taxes on business inputs may also be thought of, approximately, as a tax on capital income.

on other forms of taxation, and general government growth. The change in tax structure is particularly clear.

Table 4 illustrates the dramatic increase in reliance on the personal income tax - the tax that directly affects mobile suppliers of labour services. Between 1960 and 1970, relative reliance on this tax rose in Canada from just over 20 percent of total tax revenue to just under 35 percent, and as a per cent of GDP, reliance on this tax almost doubled from 5.1 to 10 percent. At the same time, reliance on corporate, various indirect and local taxes fell from 18.6 to 16.2 percent of GDP.

[Table 4 here]

Along with income taxation, payroll taxation is well suited to taxation of labour in the face of mobility because it is proportional to income up to a limit that leaves the incomes of higher income and relatively more mobile taxpayers relatively less burdened. No doubt the increase in social insurance taxes including payroll taxes before 1970 is partly or even mainly due to the introduction of the Canada and Quebec Pension Plans in 1966. But the increasing reliance on this tax source is made easier by the reduction in labour supply elasticity. Table 4 shows that social insurance taxation as a proportion of GDP doubled by the time the free trade agreements came into effect in 1990.¹⁴

The movement of marginal income tax rates reinforces the story we are telling. In Figure 4 one can see that the average marginal personal income tax rate – an important indicator of the tax disincentive for labour supply - increased quickly after 1965. Marginal tax rates on the very highest income earners (who are also the most mobile group) also increased in the five years or so after the closure of the border was announced, leveled off sooner than did the average marginal rate, and then jumped a bit (along with the average marginal rate) in the aftermath of the reforms provoked by the Royal Commission on Taxation in the early 1970s. By about 1975 the marginal rates shown settled down, with the exception of the rate on the very top incomes which declined to some extent.

[Figure 4 here]

Growth of total government spending relative to that in the United States following the decline in emigration to the U.S. is seen in Figure 2, as we saw earlier. Since any increase in revenues made possible by the border closing are fungible, it is the total size of government that is most relevant here.

However, Figure 2 also shows that the growth in government size in Canada began in the 1960s. In succession we saw the introduction of the Canada and Quebec pension plans (1965), lowering of the Old Age Security age of eligibility to 65 (gradually implemented beginning in 1965), the onset of Medicare under the Medical Care Act of 1966, and the introduction of the Guaranteed Income Supplement, also in 1966. Other spending programs also increased, and in 1971 the Unemployment Insurance eligibility rules were relaxed and benefits raised. Such programs undergo a period of gestation in the electorate, in political parties and in the bureaucracy, and surely predate in origin

¹⁴ For further discussion of the history of payroll taxation in Canada, see Lin et al (1996).

the border closing.

The size and financing of these programs as they evolve over time is another matter. To see more clearly if emigration to the U.S. might be involved in the evolution of government size over time, we constructed a regression model of the longer run trend in federal non-interest spending. This model accounts for the usually included major sources of Canadian government growth in addition to emigration to the United States. The statistical analysis is patterned after that of Ferris, Park and Winer (2008), except that those authors do not make any allowance for emigration.¹⁵

Detailed results are provided in Part 2 of the Appendix. The estimated equations indicate that the size of the federal public sector (relative to GNP) in Canada may indeed have increased to some extent when emigration to the U.S. declined.¹⁶ The counterfactual in Figure A3 - based on simulating the model in column (6) of Table A1 with and without the border closing - indicates that the U.S. immigration reform could have led to an increase in federal government size relative to GNP over the 1968 to 1990 period by 3.4 percentage points, or by about 19 per cent. This is the largest estimate implied by the models shown in the table. If one uses the elasticity form of the equations shown in column (7), the 80 per cent decline in emigration relative to population that occurred between 1965 and 1975 has the effect of increasing federal government size by about 10 per cent, while equation (10) suggests the increase due to the border closing is just over 5 per cent if we accept the point estimate, and possibly zero if we use confidence intervals.

The variation in these estimates is characteristic of work on the difficult problem of modeling government growth (see Tridimas and Winer 2005 for a review of such research). But all the estimates, using either actual emigration to the U.S., or a dummy variable for closure of the border, indicate that the effect on government size is generally positive, and significant in 7 of the 9 equations where the border closing appears in some form.

We may go beyond the aggregate size of government to argue that the structure of public spending as well as of taxation might be affected by immigration policy. For example, it can be argued that investment in public education will tend to decline relative to spending on public health care after the border is closed. With a closed border, the political benefits of any additional health care spending will not be diluted by immigration from the U.S., and there is less pressure to reduce brain drain by subsidizing higher education. However, empirical models of the composition of public expenditure that can test such hypotheses remain to be developed.

We shall return to the fiscal consequences of the closing of the border later.

3.3 *Free trade and the consequences of the partial reopening of the border: further evidence*

¹⁵The study of federal government size stems in part from the lack of pre-war historical data on provincial finances on a consistent and interprovincially comparable basis.

¹⁶ A statistical model of the evolution of tax structure remains to be constructed. But we leave this research for another paper. For ideas about how a statistical model of tax structure might be constructed, see Hettich and Winer (1999, chapter 10) and Kenny and Winer (2006).

Under the U.S. Immigration Act of 1985 the limits on the number of immigrants to the U.S. each year were significantly loosened. Then in 1989 the Canada – U.S. free trade agreement, under which new classes of temporary migrants were created, came into force. Under this agreement, and its successor, NAFTA, which came into force in 1994, it has been possible for workers with the required qualifications (usually a Bachelor's degree suffices) in a list of specified occupations to enter the U.S. on a temporary visa. Under NAFTA the most important visa type has been the TN-1, which is issued for one year only but which can be renewed indefinitely for further one-year periods. There was, accordingly, a large increase in the number of 'temporary' migrants from Canada to the US after 1990. DeVoretz (1998, Table 3) reports that the flow of Canadian non-immigrant professionals and their family members rose from 2,817 in 1989, the first year of the FTA, to 34,681 by 1996.¹⁷

Finnie (2001) cautions, however, against jumping to the conclusion that the growing number of 'temporary' Canadian workers in the United States greatly swells the true ranks of emigrants. He uses tax filer data to try to establish the number leaving permanently, giving lower and upper bounds that average out to numbers similar to those reflected in our Figure 1, which shows the number of Canadians obtaining permanent residence status according to U.S. immigration statistics. The rate of emigration has, however, clearly been rising, in part because of the conversion of temporary Canadian workers to permanent migrants. Thus the average number of permanent migrants according to U.S. immigration statistics rose from 16,654 in 1985-89 to 23,462 in 2000-2004.

An important feature of this increased labour mobility between Canada and the United States is that it affected mostly highly qualified workers. Both countries assessed prospective immigrants in part on the basis of their education and domestic labour market requirements. It became even easier for Ph.D.'s in many fields, executives, and professionals of certain kinds to migrate. Further, the emigration opportunity spread to information technology experts and the like who did not necessarily have graduate degrees. But in contrast to the situation before 1965, blue collar and middle income workers could not share very much in this new, freer Canada - U.S migration.¹⁸ They generally did not fit the criteria for 'temporary' movement under the NAFTA rules, and their chances of getting a green card in the U.S. or landed immigrant status in Canada were slim. This meant that the competitive pressures in terms of personal taxes became important at the top end, but were still absent for low and middle income Canadians. Consistent with this thinking, in Figure 4 we see marginal tax rates for top income earners beginning to fall after 1995, a development that culminated in the federal budget of 2001 under which the threshold at which the highest rate of federal income tax (29 percent) applied was raised from \$60,009 to \$100,000. The elimination of federal surtaxes on high earners was also completed in 2001.

Not only did the ease of movement, and the numbers moving, from Canada to the U.S. begin to rise after 1990, but public concern about the movement rose as well, as we noted earlier. By the mid-1990s the brain drain had become a political issue in Canada, and there were calls to reduce

¹⁷Ferris (2000) shows empirically that the FTA resulted in a substantial increase in cross-border travel. Such travel may include people crossing regularly to work in the U.S.

¹⁸ DeVoretz (1998) reports that the absolute number of unskilled migrants from Canada to the US approximately doubled in the early 1990s, but it remained at a very low level relative to the number of unskilled workers in Canada, as well as in comparison with the number of skilled migrants.

taxes in order to stem it. (See Harris and Schmitt, 2005, for a recent contribution to the ensuing debates, as well as the Hunt and Mueller simulations used earlier). There was also a concerted move to spend more on research both in universities and elsewhere in order to promote the knowledge based economy and, recently, programs to entice Canadian academics to remain in or return to Canadian universities.¹⁹

We are thus suggesting that, just as the decline of competitive discipline as a result of the threat of migration may help to explain changes in fiscal structure in Canada after 1965, so too the partial re-imposition of that discipline after 1990 may be one factor underneath more recent fiscal and other policy developments.

4. A more comprehensive view - supply and demand in explanations of government financing and growth

The financing and growth of government are complex issues, and are the result of forces of demand and supply filtered through political institutions. A more comprehensive view than we have presented so far would acknowledge these additional factors. In the first place, as shown in Figure 5 where defense spending is omitted, not only did public sector growth in Canada start in the 1950s, but so did growth in government size relative to that in the United States.

[Figure 5 here]

The part of the history illustrated in Figures 4 and 5 that we have emphasized above - one that has not been explored extensively in Canada so far - concerns the supply side of government growth, namely a decline in the elasticity of labour supply due to reduced emigration, the impact of which is to reduce the economic implications, and hence the full cost of, personal and especially of employment income taxation.

The elasticity of labour supply itself is a multi-faceted issue that is likely not driven only by the change in U.S. emigration law. Even if Canadians had been free to move to the U.S. in larger numbers they may not have done so in the late 1960s or early 1970s because of concerns about the Vietnam War, race riots, high crime rates, and poor public services as we noted earlier. In other words, the elasticity of labour supply in Canada is likely a product of several economic and social developments in both countries.

Moreover, there may well be other supply side factors that also lead to higher levels of government spending. For example, entry of women into the labour force, an important phenomenon occurring all over the West throughout the period we are discussing, allows government to tax economic activity that previously could not be reached. Kau and Rubin (2002) argue that part of the growth in the public sector in the United States since 1929 is attributable to the decline in the cost of raising revenue that resulted from the growing labour force participation of women. (Winer et al., 2008 have revised their estimates substantially downwards, but their story still stands to some extent.)

¹⁹ Here we are referring, for example, to the Canada Research Chairs program.

An additional supply side shock in the 1960s that deserves further consideration is the increased sensitivity of capital flows to taxation that followed liberalization of capital markets and further post-war declines in the cost of international transactions. It is interesting to analyze the effect of this shock using the model of a fiscal system introduced earlier. Figure 6 illustrates. Since the Laffer curve for capital income is now shifted in and turns backwards at a lower rate of tax (see panel B of the figure), the marginal political cost associated with this form of taxation increases: the same capital income tax revenue now requires a higher rate of taxation. In response to the now higher marginal political costs associated with this tax base, political parties are forced to reduce the emphasis on this form of taxation in favor of increased taxation of labour income. Thus the model predicts that developments in capital markets in the 1960s and 1970s will move the tax mix in the *same* direction as does the closing of the U.S. border to Canadian emigration. And as previously shown in Table 1, relative reliance on corporate taxation did indeed fall in the decade after 1960, from 4 to 3.4 per cent of GDP.

[Figure 6 here]

Note, however, that there is an essential difference between the shocks analyzed in Figures 3 and 6. A reduction in the cost of personal taxation that follows the closing of the border, as analyzed in Figure 2, leads to a larger equilibrium government size. In contrast, increasing the cost of capital income taxation, as in Figure 6, *reduces* equilibrium size as well as altering tax structure towards increased reliance on personal income taxation. So we can conclude that, while other supply side factors besides closing the border to emigration are likely involved in explaining the shift towards income taxation and the total growth of government after 1965, there must be more to it than responses to an increase in the sensitivity of capital income to domestic taxation.

Of course there are demand factors at work too. It is not as if there were no earlier developments on the demand side in Canada, giving rise for example to the Unemployment Insurance Act in 1940 and the Family Allowance program in 1944, along with expansion of public education and other public services in response to the post-war baby boom, urbanization, and growing prosperity, as we noted earlier.

Finally, it should be pointed out that while it is necessary to look at the demand side to understand the evolution of the public sector, an increase in the demand for public goods and services is not sufficient to explain greater reliance on personal income taxation and reduced reliance on capital income taxation. We need both supply and demand side factors. The reader can verify that an upward shift in the marginal political benefit curve in Figures 3 or 6, as would follow any positive demand-side shock, leads to an equilibrium increase in reliance on all tax bases, a result Kenny and Winer (2006) refer to as a scale effect, and one they confirm for a large sample of countries. To replicate the stylized fiscal facts for Canada in the 1960s, 70s and 80s, we need to contemplate the role of factors that result in changes in the relative political cost of financing public expenditure in different ways.

To summarize our discussion at this point, we can say that it is not hard to make the case that changes in fiscal structure after 1965 likely were the result of various demand and supply factors, several of which have nothing to do with the Canada - U.S. migration regime. On the other hand, there are reasons to think that the border closing also played some role: (i) labour markets in

Canada appear to have become uncoupled from the U.S. after 1965; (ii) the elasticity of cross-border migration to changes in Canada-U.S. tax differentials appears to be substantial; (iii) post-border closing changes in tax structure include increased taxation of labour incomes and taxation of lower rather than of higher incomes, as one would expect; (iv) a preliminary statistical analysis indicates that there is some role for the border in an explanation of the evolution of non-interest federal government size; and, finally (v) the re-opening of the border to highly trained professionals after 1990 is correlated with reduced tax progressivity at the high end after 1990 along with concern with brain drain.

The sense that migration and its relationship to fiscal structure in Canada is an under-studied topic is further strengthened if one recalls that in the mid-1960s the border did not just close in one direction. A few years before the U.S. imposed numerical limits on Canadian immigrants, Canada did the same thing to Americans through the immigration reform of 1962. Thus, we could establish one of the world's most generous welfare states without becoming a welfare magnet for low income Americans. If the border had been open for Americans to enter Canada in unlimited numbers, it is possible (no one knows for sure) that low income Americans would have relocated here for the sake of our free health care and so on. (It is not irrelevant to note here that many Americans did migrate to Canada in the late 1960s to avoid participation in the U.S. military during the war in Vietnam.) Substantial immigration of this type would be likely to put pressure on Canadian governments to reduce spending. Thus, even if Canadians had not been interested in leaving the country to escape rising tax burdens, there certainly could have been fiscal discipline on Canadian governments from labour mobility *to* Canada, rather than *from* it.

5. The historical migration experience, and Canada's migration future

5.1 *Canada before 1965*

In assessing the consequences for Canada of the U.S. Immigration Act of 1965, it is useful to set this event in a broader perspective. We do so briefly in this section.

The period of tight restrictions between 1968 and 1990 was a very unusual one for Canada - U.S. migration. Up to 1968 there were no quantitative restrictions.²⁰ During the period from Confederation to 1900 there was a huge emigration from Canada to the U.S. (See Figure A1 in the Appendix). A total of about nine hundred thousand people migrated according to U.S. immigration statistics²¹, taking French Canadian culture into New England, hockey into the major northern U.S. cities, and even the composer of Oh Canada into self-imposed exile. When one considers that the population of Canada in 1867 was close to 3.5 million, it is easy to understand why this movement deserved the name it was given at the time, that is, 'the Exodus'.

²⁰ A visa requirement was instituted in the 1890s (Ramirez, 2001). Due to the great length of the border and the ease of informal cross-border movements, particularly in Western Canada, visa requirements were not always successfully enforced although enforcement became more stringent over time.

²¹ Immigration statistics in both Canada and the U.S. suffered from inconsistent definitions and practices in the 19th century. It is not until about 1905 in both countries that the figures become reasonably reliable. Hence the figure for Canadian migration to the U.S. between 1867 and 1918 is suggestive rather than precise.

In the early 1920s it became clear that the U.S. would clamp down on immigration and there were fears that Canadians would be affected. A total of 317,701 Canadians moved to the U.S. in 1923 and 1924 alone, in order to get in before the door closed. As things transpired, the Immigration Act of 1924, while shutting down immigration from the Old World, made a 'hemispheric exemption' for the New World. Persons born in the Western Hemisphere would be admitted without numerical limit. While qualitative restrictions remained in force in order to allow the exclusion of groups deemed to be undesirable, these restrictions were not important for Canada – U.S. migration.

Over the 1920s as a whole, almost one million Canadians moved to the U.S. The importance of this population movement was recognized on both sides of the borders, as indicated, for example, by the publication of a major study on the Canadian born in the U.S. in the early 1940s (Truesdell, 1943).

While Canadian emigration to the U.S. was not significant in the 1930s or during the subsequent war years, it became important again in the post-war period. The late 1950s and early 1960s were difficult times for the Canadian economy. From 1955 to 1965, 490,962 Canadians left for the United States. No doubt the open border eased required adjustments to the time considerably. For example, when the Avro Arrow interceptor program was abruptly terminated by the Diefenbaker government in 1959, it has been reported that several thousand engineers released from the program moved to the U.S. After 1965, and before the free trade agreements, such a large and sudden migration across the border would have been impossible.

Economists showed significant interest in the implications of Canada-US migration. Dales (1966) developed a model of the Canadian labour force receiving injections of European labour at the same time that it bled Canadian-born emigrants to the south. Dales argued that the rate of departure to the United States was boosted by the enduring protectionist 'National Policy' first implemented by John A. MacDonald's Conservative government in 1876. Tariff distortions made Canada a less desirable location for business than the U.S., and with free labour mobility there was an inevitable tendency for factors to relocate to the U.S., reducing the growth rate of the Canadian economy and retarding the country's development. Dales does not appear to have considered the possibility of a relationship between migration and the size and structure of government in Canada.

Even from this quick historical overview, it is clear that the last 40 years or so have been very unusual ones in Canadian migration history. Prior to 1965, and over the previous 400 years of European presence in North America, there had never been any quantitative limit on the number of people who could move between Canada and what is now the United States. We have drawn attention to some of the economic and fiscal aspects of this very distinct period in Canadian political economy. No doubt there are other dimensions to be explored as well.²²

5.2 *Canada-U.S. migration futures*

Before we conclude this effort to draw attention to an unexplored and potentially important episode in Canadian economic and political history, we use our analysis as a background against

²² For further discussion of the issues, see Wildasin (2003, 2006).

which to briefly speculate about the likely future of Canada - U.S migration arrangements.

Predicting the full impacts of increased labour mobility between Canada and the U.S. over the past century or more is a difficult task, one that deserves study in a separate paper. However, we will tentatively make three observations. One is that the Exodus conditions referred to earlier of the late 19th century and 1920s were likely aggravated by the highly protectionist Canadian trade regime of the time. With the larger volume of trade relative to the economy as a whole occurring under NAFTA, this factor has now been removed. To a reasonable approximation Canada is as good a location as the U.S. for industry. Thus there seems to be little risk of a wholesale relocation of population and industry to the south, as happened in the late 19th and early 20th centuries, if the border should become much more open to emigration to the United States.

A second observation, stimulated by the general argument of Mueller (1998), is that if Canadians want a higher level of public services, and get good value for their tax dollars, Canada can have a larger public sector than that enjoyed by Americans without precipitating exit even under completely free migration.

Our final observation is that completely free labour mobility would allow low income Americans to move to Canada. If this prospect came to pass, it could result in electoral pressure on Canadian governments to reduce social benefits and increase taxes at the lower end of the income distribution even if, on average, tax burdens and public services remained relatively high. In other words, low income migration northward could lead to pressure to reduce the redistributive aspect of the Canadian public sector. For this reason, and because highly trained people can already move under existing arrangements to some extent, in our view it is likely that any further migration liberalization will take the form of easing the movement of highly qualified workers further. This will create even greater brain drain pressure on Canadian governments, a pressure which can be accommodated by further reducing personal income taxes at the top end, and by making various public spending and regulatory adjustments that would be valued by highly qualified workers. Such adjustments could, for example, include even higher spending on post-secondary education and research, as well as allowing two tier health care.

Since these adjustments can, in principle, be made without serious scaling back of the redistributive social programs that now seem to be part of a political equilibrium, it seems a reasonable guess that opening the border wider to the highly qualified, but not to lower income groups, would be less disruptive politically and socially. We suspect that this is the route that will be favored by Canadian politicians and negotiators. Because of the wider implications should low wage migration be made easier, our guess is that the U.S. will not oppose this approach. We therefore suggest that it will be the one adopted in any further liberalization of Canada - U.S. labour migration.

6. Concluding remarks

Descriptive statistics concerning wage correlations and Gini coefficients, along with labour supply regressions and calculations of possible impacts of policy changes using existing work on cross-border migration, suggest that the near closing of the border in 1968 to migration to the U.S. led

towards uncoupling of Canadian and U.S. labour markets. We have suggested that this uncoupling carried with it implications for the evolution of income inequality and the aggregate labour supply elasticity in Canada, and that the magnitudes involved in responses of cross-border labour flows to changes in Canada-U.S. policy differentials may have been large enough to affect Canadian policy choices.

Using a model of equilibrium fiscal policy as a guide, a first look at the facts suggests that these developments likely had an effect on tax structure in the following two decades, leading to increased reliance on personal income taxation in the tax mix and higher marginal income tax rates. We have also suggested that the closing of the border - a supply side factor not usually considered - may have contributed (along with other demand and supply factors) to growth of government in Canada, and have explored this hypothesis with some success using long-run government size regressions.

We have set the closing of the border in a broader migration context with respect to the history of Canada. It is clear that the U.S. Immigration Act of 1965, which closed the border in 1968, was an important break with the past for Canadians. Prior to 1968 there had never been quantitative limits on the emigration of Canadians to the U.S. This allowed large labour movements across the border to occur during periods of higher growth in the U.S. than Canada (Lines, 1978, Ramirez, 2001). With the increased mobility allowed under the Canada-U.S. free trade agreement and NAFTA, we have now moved back somewhat in the direction of the free mobility that used to reign.

The increased cross-border mobility that has been seen in the period of the free trade agreements, particularly for highly qualified workers, is predicted by our analysis to lead to a shift in tax mix away from labour income and to a reduced size of government. Consistent with this view, the 1990s saw growing concern in Canada with brain drain and new efforts on the part of governments to reduce spending and eliminate deficits along with further reduction of personal income tax rates (that began a little later).

Our primary objective in the paper has been to point to an important event in Canadian economic and social history that has not been given the attention we think it warrants. The ending of the hemispheric exemption from U.S. immigration quotas in the mid-1960s reduced Canadian emigration to the U.S. dramatically in the following two decades. It would not be surprising to find, on further study, that a shock of this kind had significant impacts on several dimensions of Canadian public policy. The historical consequences for the public sector of the substantial out migrations of the 19th and early 20th centuries, and the role that cross-border migration may play in shaping future Canadian policy choices, also deserve further attention.

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Appendix: Part 1 Data Sources for Labour Market Variables and Wage Regressions

Part 1 of this Appendix provides sources of data for time series of average wages and size of the civilian labour force for Canada and average wages for the U.S., from 1921 to 2008. For Canada it was necessary to splice together recent series with historical series. For each splice there were overlapping years. The more recent series was used for all overlapping years. The earlier series was adjusted by the factor needed to make the value for the old series coincide with that of the new series in the first year of overlap. The wage variable for each country was converted to 2008 dollars using the CPI of the respective country.

In the notes below Leacy (1983), that is the volume *Historical Statistics of Canada, 2nd Edition*, is denoted "HSC". CANSIM is Statistics Canada's database. Statistics Canada (1995b) refers to 'Annual Estimates of Employment, Earnings and Hours, 1983-1994 (Historical)', Catalogue 72F0002, Ottawa.

Canada: Labour Force

1921-45: HSC Series D128, Civilian labour force 14 years of age or more as of June 1st of each year.

1946-1975: HSC Series D138, Civilian labour force 14 years of age or more, annual averages.

1976-2008: CANSIM Table 282-0002, Civilian labour force 15 years of age or more, annual averages.

Canada: Wage

1921-1960: HSC Series E202, Index of average wage rate in manufacturing, 1949 base.

1961-1969: HSC Series E212, Index of average wage rate in manufacturing, 1961 base.

1970-1982: Dominion Bureau of Statistics, *Canada Year Book*, various issues, Average hourly earnings for employees paid by the hour.

1983-1990: Statistics Canada (1995b), Average hourly earnings for employees paid by the hour.

1990-2008: CANSIM Table 281-0030, Average hourly earnings for employees paid by the hour.

United States: Wage

1921-2008: US Census Bureau, *Statistical Abstract of the United States*, various issues, Average hourly earnings in manufacturing.

Appendix: Part 2

Cointegrating Regressions for Non-interest Federal Government Spending Relative to GNP

In Part 2 of the Appendix, we present a preliminary model of the longer run, or trend in, the size of the federal government's non-interest spending relative to GNP, based on Ferris Park and Winer (2007) and Winer and Ferris (2008). Since some data for emigration to the U.S. is missing before 1900 and the data are a bit better after 1921, we emphasize estimation from 1921 up to the end of the 20th century. Our purpose here is to consider whether or not reduced emigration to the United States from Canada between 1921 and 2000 (or from 1900 to 2000 in one regression) is associated statistically, and importantly, with increased public expenditure in Canada over longer periods of time, after controlling for a set of factors commonly used in studies of government size. We note that emigration to the United States is not a factor considered by the studies cited above.

Our discussion will be brief, omitting references to the literature and, for the most part, omitting discussion of expected signs of coefficients which can be found in the papers just referred to. Data sources are provided below.

We consider federal non-interest expenditure because it has been consistently measured by Gillespie from 1867 (1991, updated by Ferris and Winer, 2008). This measure relies on adjusted public accounts data, and is approximately the same as the national income accounts measure of government spending after 1929 which is used in constructing Figures 2 and 5 and which does not extend back past 1929. We note that data on total provincial spending and its composition is not available on a consistent basis for the period before the second world war.

The history of emigration based on U.S. immigration statistics over the period 1900 – 2000 is shown on Figure A1, along with federal non-interest spending relative to GNP since 1870 in Figure A2. The non-shaded parts of the figures represent the sample considered in the statistical work. The 'exodus' referred to in the text in the 19th century is clearly evident in the data in Figure A1, as is a large but somewhat smaller (relative to population) outmigration in the 1980s. The emigration that peaked in the mid-1960s is clearly evident, as is the fact that this more recent episode of out-migration was not of the same order of magnitude as those of the 19th and early 20th centuries.

[Figures A1 and A2 here]

Turning then to the specification of a long run model of government spending, we begin with the usual economic factors: real income per capita (REAL INCOME), a measure of the urban/rural composition of the economy – here represented by the proportion of the labour force in agriculture (AGRICULTURE) - and a demographic variable, the per cent of population less than 17 years in age (%YOUNG).²³ Population size often appears as a test of the publicness of government services. But we do not include this variable here as it is very highly correlated with real income per capita (at about 0.98 for 1900 – 2000). The sources for these and other data are given below.

²³Female labour force participation is also sometimes added (see Winer et al., 2008). However in the Canadian case, this variable is available on a continuous basis only from 1946, and it is so highly correlated with real income per capita that it is not possible to do a regression with both variables included. We choose to keep real income in the equation.

For a country like Canada where immigration flows have been substantial, the immigration to population ratio (IMMIGRATION) is another demographic characteristic that may shape long run government size, especially in the period before the First World War. This variable in principle includes some immigration from the U.S. We shall also add emigration to the U.S. relative to Canadian Population (EMIGRATION_US) to our model. We expect a negative sign for this variable – less emigration to the U.S should be associated with increases in government size in Canada.

As an alternative to EMIGRATION_US, we also employ indicator variables reflecting different Canada - U.S. emigration regimes. These are the effective restriction following the U.S. legislation of 1965, which came into full force in 1968 (EMIGRATION_1968_1990), and the introduction of the FTA in 1990, effective in 1991 and continuing later under the NAFTA (EMIGRATION_FTA). Both indicators are equal to 1 in the relevant periods. These regime indicators are likely to be exogenous to federal government size, while EMIGRATION_US may also reflect factors, such as recessions, that simultaneously impact both migration and government spending. We expect the emigration regime of 1968 to 1990 to result in larger government (i.e. have a positive coefficient), and that following the Free Trade Agreement to be associated with reduced government size.

Another factor that has come into prominence in studies of government size is the degree to which an economy is exposed to foreign shocks, measured here by the sum of exports and imports relative to GDP (OPENNESS). Openness in this sense is included here as a measure of the exposure of the economy to external shocks. In the 19th century, it may also serve as a proxy for the tax base of the tariff. We include a dummy variable indicating when the exchange rate was fixed (FIXED EXCHANGE), to reflect the importance of balance of payments constraints on domestic policy choices. It is interesting to see how the results for the emigration variables compare to those for openness and the exchange regime, because both sets of factors represent external conditions underlying domestic policy considerations.

Finally, we include a set of dummy variables to incorporate the influence of several substantial external shocks in our time period: World War One (WWI); World War Two (WWII); and a Peacock-Wiseman type displacement effect after WWII often included in models of government size (WWIIaftermath = 1 from 1947 on). We also experimented with inclusion of a shift dummy representing the long run effect of the OPEC oil shock of the mid 1970s (OILSHOCK SHIFT = 1 from 1974 on). However, the latter factor does not substantially alter the regression results, and equations using this shift are omitted in what follows.

The regression results are presented in Table A1. (The results for the 1945-2000 period remain almost the same if the period 1947 – 2000 is used instead.) Here all variables except the dummies are used in log form, and the reported t statistics are robust with respect to heteroskedasticity and autocorrelation. Two estimation methods are used: ordinary least squares, and dynamic least squares (or DOLS – see Stock and Watson 1993 and Saikkonen 1991) applied to OLS equations that all turn out to be cointegrating regressions. The DOLS method allows for possible serial correlation between (potentially endogenous) regressors in a cointegrating relationship.

[Table A1 here]

As can be seen from the Adjusted Dickey-Fuller and Phillips - Perron statistics, the OLS regressions can be considered cointegrating relationships representing the longer run evolution of non-interest federal government spending relative to GNP. Columns (4) to (6), (9) and (10) present results using the Dynamic OLS method. Here leads, lags and the current value of the change in all regressors except for the dummy variables are added to the original equation. Two leads and lags are used, and only the coefficients on contemporaneous variables are shown.

Before turning to the role of emigration to the United States, we briefly review the results concerning other variables, taking the table of results as a whole. It can be seen in Table A1 that the coefficient on income is positive but variable in size and significance. This is characteristic of government size regressions (see Tridimas and Winer 2005).

The proportion of the labor force in agriculture tends to have a positive effect on government size, which also tends to be insignificant, while the coefficient on percent of the population that is young is unstable and switches sign across the samples and equations. And the wars have their usually expected positive effects.

The role of openness of the economy and the exchange regime are negative and significant in 9 of the 10 equations: more openness and a fixed exchange rate tend to reduce federal government size, perhaps by enhancing constraints on domestic policy choices. These results foreshadow those for emigration, which also imposes constraints on domestic policy.

We then come to the role of migration, the focus of this appendix. Immigration from all countries (relative to the population) appears to reduce the size of government somewhat, though the size and significance of this factor is not clear.

Of key interest is the fact that emigration to the United States (EMIGRATION_US) always has a negative coefficient, and it is significant in 4 of the 5 equations, including the DOLS equations for 1921-2000 (col 4) and for 1945-2000 (col 9).²⁴ It is negative but not significant (in a two-tailed test) in the DOLS equation for 1900-2000 in column (5).²⁵ So less emigration to the U.S. appears to be associated with a smaller federal public sector. Moreover, the emigration regime indicator EMIGRATION_1968_1990 always has a positive coefficient as expected, and is significant in the DOLS equations for 1921-2000 (col 6) and the OLS equation for 1945-2000 (col 8).

The indicator of a relaxed emigration regime after the free trade agreements in 1990 and 1993 is positive, and significant in two of the four equations where it appears. This positive coefficient is unexpected. It may result from the confounding of the opening of free trade with the effect of the serious recession of 1990-92 on federal spending.

To assess the quantitative importance of key results, Figure A3 compares the prediction for government size using the regression equation in column (6) that employs the emigration regime indicator EMIGRATION_1968_1990, with predicted government size based on this equation when

²⁴It is of interest to note that the results in column (1) without EMIGRATION_US are quite similar to results in column (2) with this variable, suggesting that the role of this factor is orthogonal to that of the others.

²⁵We note that the results in column 5 are quite similar to those in column 4 except with respect to Immigration.

the emigration restriction is removed. It can be seen that the federal government's non-interest predicted spending relative to GNP is lower without the restriction, and it turns out that this is so by about 3.4 percentage points, or by about 19 per cent as reported in the main text. This is the largest estimate implied by the models using the emigration regime indicator, which is less than 5 percent using equation (10). If one uses the elasticity form of the equations shown in column (7), the 80 per cent decline in emigration relative to population that occurred between 1965 and 1975 has the effect of increasing federal government size by about 10 per cent.

[Figure A3 here]

We interpret these results as suggesting that reduced emigration to the United States in the 1968 to 1990 period is associated both statistically and substantively with larger government spending in Canada, and that further study of the role of international migration in Canadian public finance is likely warranted.

Data Sources For Part 2

Based on Winer and Ferris (2008) at www.carleton.ca/~winers, and additional sources

AGRICULTURE = proportion of the labour force in agriculture.

1871-1926: Urquhart, (1993), 24-55; 1926-1995 Cansim series D31251 divided by D31252; 1996-2001: Cansim II series V2710106 divided by V2710104.

EXPORTS and IMPORTS = exports and imports, millions.

1870-1926, Urquhart, (1993) Table 1.4; 1927-1960, Leacy et al, (1983), Series G383, 384; 1961-2001: CANSIM series D14833 & D14836.

EMIGRATION_US_NUMBER = numbers of permanent migrants from Canada (country of last origin) to the United States

Carter et al. (2006) Table Ad163 for 1946-1997 and *Statistical Abstract of the United States*, various editions, for 1998-2005.

EMIGRATION_US = emigration to the United States from Canada as a per cent of Canadian population.

Calculated as: $EMIGRATION_US_NUMBER / (POP * 1000)$, in per cent.

EMIGRATION_1968_1990 = 1 for 1968 – 1990; = 0 otherwise.

EMIGRATION_FTA = 1 from 1991 on; = 0 otherwise.

The FTA became effective in 1991. The NAFTA was effective in 1994.

FEDERAL EXPENDITURE = total federal government expenditure net of interest payments, in millions.

1870-1989: Gillespie (1991), pp.284-286; 1990-1996: Public Accounts of Canada 1996-97; 1997-2000: Federal Government Public Accounts, Table 3 Budgetary Revenues Department of Finance web site, September 2001. Updated by Ferris and Winer (2008). To this we add the return on government investment (**ROI**) originally subtracted by Gillespie for his own purposes. Expenditure is net of interest paid to the private sector. Data on **ROI**: 1870 to 1915: Public Accounts 1917 p.64; 1915-1967: Dominion Government Revenue and Expenditure: Details of Adjustments 1915-1967 Table W-1; 1916-17 to 1966-67: Securing Economic Renewal - The Fiscal Plan, Feb 10, 1988, Table XI; 1987-88 to 1996-97: Public Accounts 1996, Table 2.2. Interest on the Debt (**ID**) was subtracted out (with adjustment for interest paid to the Bank of Canada (**BCI**) ultimately returned to the government). Data on **ID**:

1870-1926: Historical Statistics of Canada, Series H19-34: Federal Government budgetary expenditures, classified by function, 1867-1975; 1926-1995: Cansim D11166. 1996-2000: Cansim D18445. Finally, data for **BCI**: copied by hand from the Annual Reports of The Bank of Canada, Statement of Income and Expense, Annually, 1935-2000. Net Income paid to the Receiver General (for the Consolidated Revenue Acct). Note: all government data are converted from fiscal to calendar years, and allows for a change in the definition of the fiscal year in 1906/07, as described in Gillespie (1991, Appendix C).

FEDERAL SIZE = non-interest federal government expenditure relative to GNP.

Calculated as: (FEDERAL EXPENDITURE) / (GNP).

FIXED EXCHANGE RATE = 1 if exchange rate fixed; = 0 otherwise.

Periods when exchange rates were fixed (or 'heavily' managed) in Canada are: 1870-1914, 1926-1931, 1939-1951, and 1960-1972.

GNP = gross national product, in millions of current dollars.

1870-1926: Urquhart (1993), pp. 24-25 (in millions); 1927-1938: Leacy et al (1983), Series E12, p.130; 1939-1960 *Canadian Economic Observer, Historical Statistical Supplement 1986*, Statistics Canada Catalogue 11-210 Table 1.4. CANSIM D11073 = GNP at market prices. 1961-2001 Cansim I D16466 = Cansim II V499724 (aggregated from quarterly data).

IMMIGRATION_NUMBER = immigration to Canada from all countries, thousands.

1868 - 1953: Firestone (1958), Table 83, Population, Families, Births, Deaths; Updated by Cansim D27 (1955 to 1996). Cansim Sum of X100615 (Females) plus X100614 (Men) for 1954; 1997-2001, Cansim D27 (sum of quarters).

IMMIGRATION = immigration relative to Canadian population.

Calculated as: IMMIGRATION_NUMBER/POP.

Ln = the log operator.

OPENNESS = openness of the economy to trade.

Calculated as: (EXPORTS + IMPORTS) / GNP.

P = GNP deflator before 1927 and GDP deflator after (1986 = 100).

1870-1926: Urquhart, (1993), 24-25; 1927-1995 (1986=100): Cansim data label D14476; 1996-2001 Cansim D140668. All indexes converted to 1986 = 100 basis.

POP = Canadian population, thousands.

1870-1926: Urquhart, (1993), 24-25; 1927 - 1995: CANSIM data label D31248; 1995 - 2001: Cansim D1 (average of four quarters).

REAL INCOME = real income per capita.

Calculated as: (GNP*1000)/((P/100)*POP).

WWI = 1 for 1914 - 1919; = 0 otherwise.

WWII = 2 in 1940, 1 for 1941 - 1945, 2 in 1946 ; = 0 otherwise.

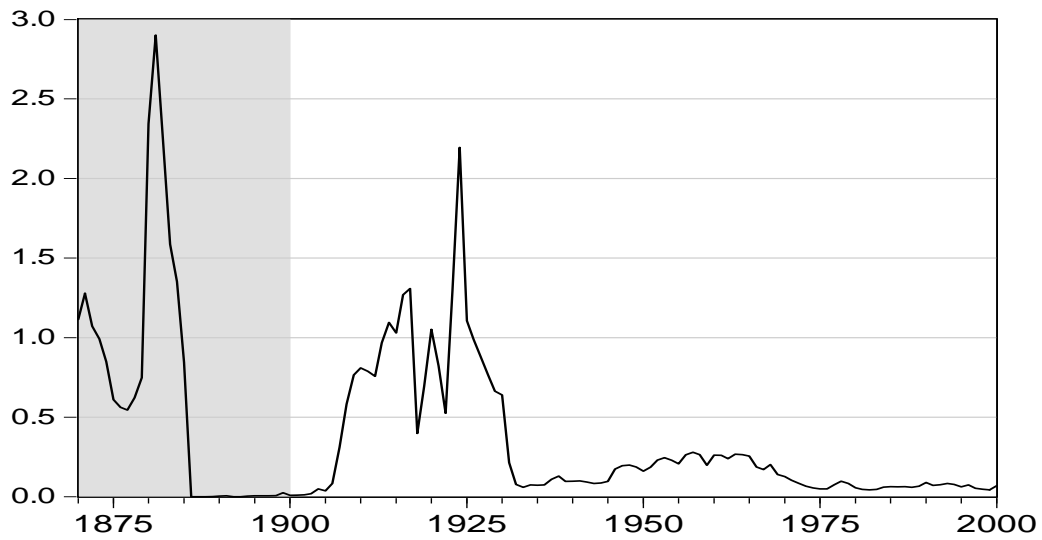
WWIIAftermath = 1 from 1946 onward; = 0 otherwise.

The WW1 and WW2 dummies apply to spending *relative to* GNP, and take into account the actual result of mobilization and demobilization as revealed by LnGSIZE in each of the world wars.

%YOUNG = percentage of the population below 17.

1870-1920 Leacy et al (1983). Interpolated from Census figures Table A28- 45 sum of columns 29, 30, 31, and 32 all divided by 28 (adjusted to make 1921 the same); 1921-2001 Cansim C892547.

Figure A1
Permanent Emigration to the U.S. as a Percent of Population
Canada, 1870 - 2000



Note to Figure A1: Missing data for 1886-88 and 1892-93 set equal to zero.

Figure A2
Federal Government Non-interest Spending Relative to GNP
Canada 1870 - 2000

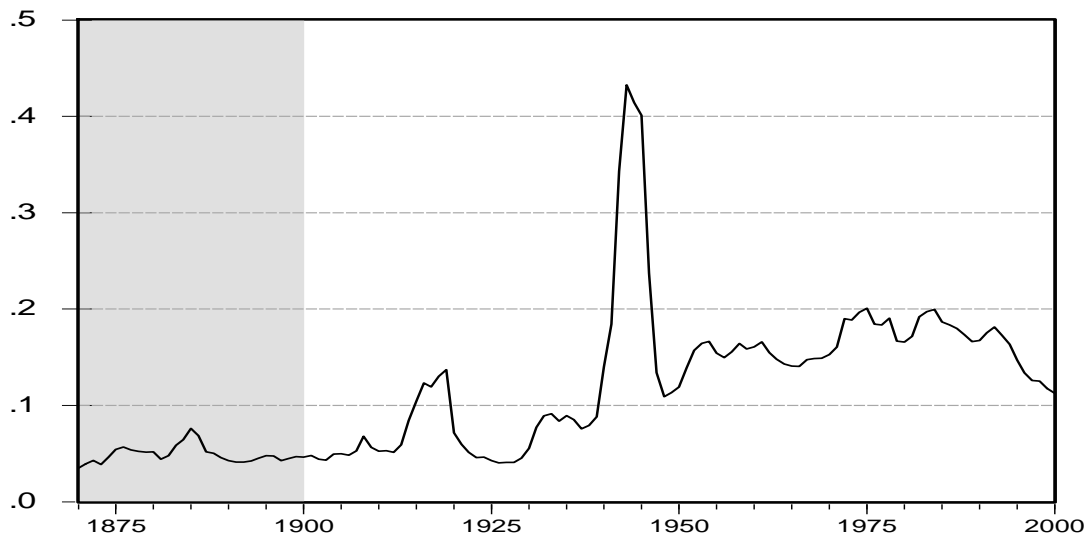
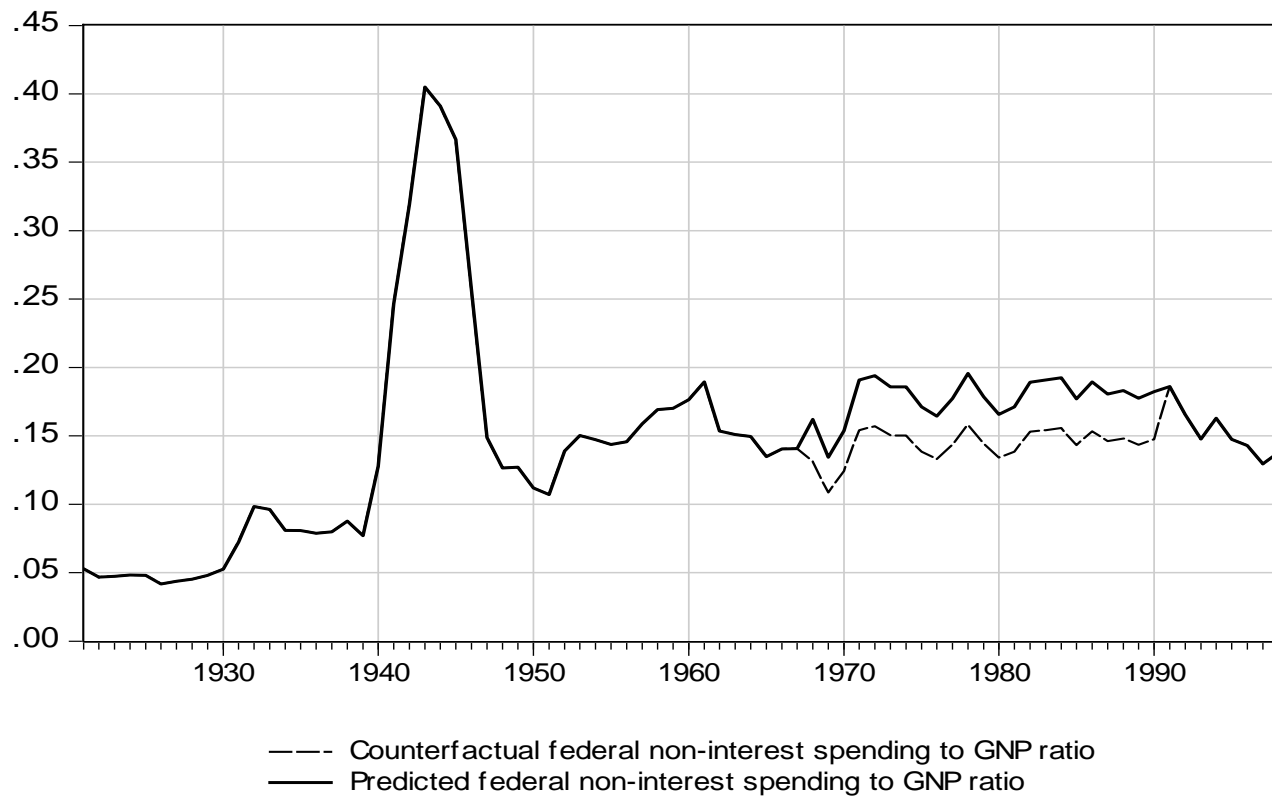


Figure A3*

Predicted and Counterfactual Federal Spending to GNP Ratios



*Based on equation (6) in Table A1

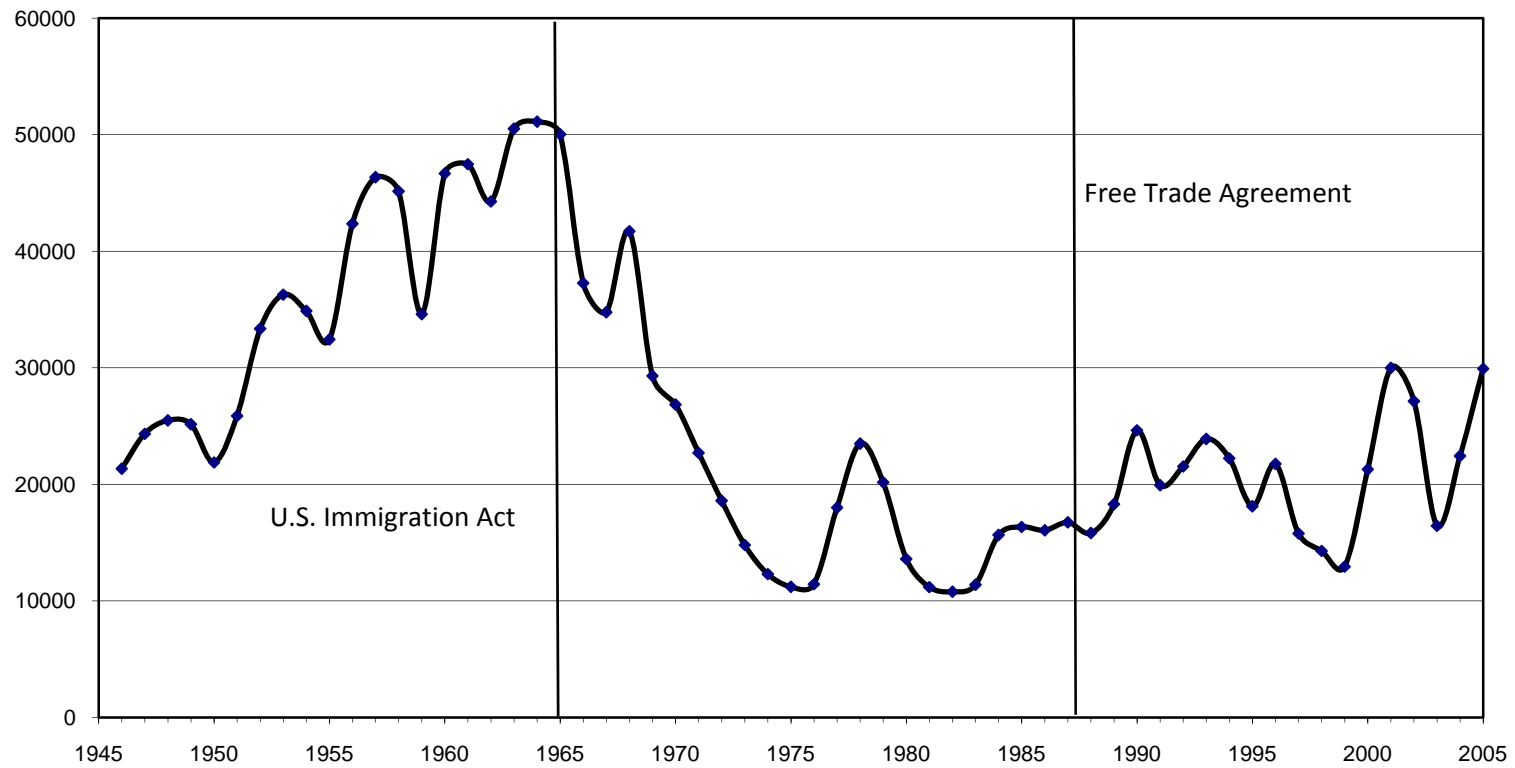
Table A1: A Preliminary Model of Federal Government Non-interest Expenditure Relative to GNP (FEDERAL SIZE), 1921 – 2000
OLS and DOLS estimation (absolute value of t statistics based on HAC standard errors)

Explanatory Variables	1921 – 2000 Without emigration	1921 – 2000 With emigration	1921 – 2000 Using emigration regimes	1921 – 2000 DOLS for (2)	1900 - 2000 DOLS with emigration	1921 – 2000 DOLS for (3)	1945 – 2000 With emigration	1945 – 2000 Using emigration regimes	1945 – 2000 DOLS for (7)	1945 – 2000 DOLS for (8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
REAL INCOME	0.17 (0.39)	0.35 (0.71)	0.14 (0.32)	0.96 (1.35)	1.09** (1.96)	1.60** (1.97)	0.40 (0.66)	-0.02 (0.04)	3.54 (1.16)	-0.25 (0.18)
AGRICULTURE	-0.02 (0.07)	0.14 (0.51)	0.02 (0.23)	0.16 (0.43)	0.24 (0.77)	0.66 (1.56)	0.13 (0.44)	-0.04 (0.16)	1.71 (1.14)	-0.09 (0.13)
%YOUNG	-0.29 (0.90)	0.73 (0.23)	-0.28 (-0.90)	1.94* (2.61)	1.45** (2.06)	1.86 (1.30)	-0.27 (0.95)	-0.45 (1.47)	0.50 (0.56)	-0.72 (1.51)
OPENNESS	-0.68* (4.03)	-0.69* (4.42)	-0.66* (3.46)	-0.36 (1.09)	-0.06 (0.21)	-0.50 (1.34)	-0.91* (4.93)	-0.77* (-4.96)	-1.54* (2.88)	-1.02* (3.47)
FIXED EXCHANGE	-0.15* (3.52)	-0.15* (5.45)	-0.14* (3.56)	-0.06 (1.40)	-0.13* (-2.33)	-0.18* (3.65)	-0.13* (4.76)	-0.14* (5.11)	-0.07*** (1.70)	-0.16* (7.14)
WWI					0.48* (3.85)					
WWII	1.50* (5.47)	1.49* (5.75)	1.52* (5.43)	1.14* (4.36)	1.05* (4.95)	0.96* (3.19)	1.33* (13.09)	1.35* (13.57)	1.85* (4.97)	1.41* (8.01)
WWII-AFTERMATH	0.82* (7.02)	0.69* (5.42)	0.86* (6.53)	0.06 (0.23)	0.20 (0.82)	0.35 (1.17)	0.18* (3.26)	0.10*** (1.74)	0.71* (2.19)	0.33** (2.23)
IMMIGRATION	-0.20* (6.16)	-0.06** (2.11)	-0.20* (5.70)	0.03 (0.37)	-0.18* (5.45)	-0.32* (4.98)	-0.01 (0.22)	-0.16 (0.33)	-0.02 (0.40)	-0.05 (1.10)
EMIGRATION_US		-0.18* (5.22)		-0.41* (4.30)	-0.05 (1.39)		-0.13* (3.29)		-0.32* (2.06)	
EMIGRATION_1968_1990			0.09 (1.18)			0.21** (2.01)		0.16** (2.17)		0.06 (1.25)
EMIGRATION_FTA			0.07 (0.55)			0.36** (2.15)		0.12 (0.90)		0.16*** (1.82)
Constant	-4.79 (1.06)	-6.94 (1.46)	-4.54 (1.05)	-18.13** (2.45)	-17.85* (3.01)	-21.77** (2.46)	-5.43 (0.97)	-0.96 (0.19)	-35.09 (1.24)	1.44 (0.12)
<i>Statistics</i>										
<i>Observations</i>	80	80	80	78	99	78	56	56	54	54
<i>Adj. R2</i>	0.93	0.94	0.92	0.97	0.96	0.97	0.86	0.86	0.99	0.98
<i>Durbin Watson</i>	1.21	1.45	1.27	1.49	1.18	1.35	1.27	1.17	2.27	2.61
<i>LM serial correlation: 2 lags (Obsvs * R²): P-value</i>	0.001	0.01	0.001	0.002	0.00	0.004	0.01	0.001	0.23 (1 lag)	0.004
<i>Adj. Dickey Fuller</i>	-6.10*	-6.90*	-6.39*	-7.04*	-6.36*	-6.36*	-5.74*	-4.51***	-8.27*	-9.97*
<i>Phillips-Perron</i>	-5.71*	-6.99*	-5.80*	-6.59*	-6.34*	-6.28*	-4.46***	-4.29	-24.89*	-26.85*

Notes to table A1: All variables in log form, except for FIXED EXCHANGE, WWII, WWI-AFTERMATH, EMIGRATION_1968_1990 and EMIGRATION_FTA.

*** = Significant at 1% (5%) 10%. MacKinnon (1996) critical values for test of cointegration, 6 variables (no constant, no trend), 53 Obsvs. at 1% = -5.37; at 5% = 4.671; at 10% = -4.32. The cointegration tests rely on the automatic lag selection procedure in Eviews 7. The DOLS method suggested by Stock and Watson (1993) and Saikkonen (1991) adds leads and lags of changes in all right side variables (excluding dummy variables) to allow for possible serial correlation between included regressors. Two leads and two lags are used here. See Hamilton (1994, chap 19) for details. The HAC errors in the DOLS equations are assumed to be distributed as a standard normal.

Figure 1
Number of Official Migrants from Canada to the United States, 1946 - 2005



Source: Carter et al. (2006) Table Ad162-172 for 1946-1997 and *Statistical Abstract of the United States*, various editions, for 1998-2005.

Table 1:Correlations of Mean Weekly Wages and Salaries, Canada and the United States,1921 – 2008

Period	Correlation of Mean Wage Levels	Correlation of Percent Changes in Mean Wages
1950-1968	0.993	0.635
1969-1990	0.190	0.426
1969-2008	-0.235	0.338

Source: See Part 1 of the Appendix

Table 2:Gini Coefficients for Family Income, Canada and the U.S., Five Year Averages, 1970 – 2005

Years	Canada: Market Income	Canada: Total Income	U.S.: Total Income
1965-1969	na	.328	.352
1971-1975	.378	.330	.356
1976-1980	.378	.326	.363
1981-1985	.396	.329	.381
1986-1990	.402	.331	.395
1991-1995	.422	.336	.415
1996-2000	.430	.352	.429
2001-2005	.417	.347	.437

Notes:For Canada 1965-1969 includes the years 1965, 1967 and 1969. Those are the only years available from 1965 to 1970. For the U.S. 1965-1969 includes each year from 1965 to 1969. Statistics Canada (2005) reports a historical revision for the period from 1990 forwards that increased estimated Gini coefficients. The above table uses the Gini coefficients published by Statistics Canada for 1965–2002 before the 2005 revision. For 2003-2005 this table uses the Gini coefficients published in Statistics Canada on the revised basis (2007), but reduces each one by the difference between 2002 Gini coefficients reported on the old and new bases.

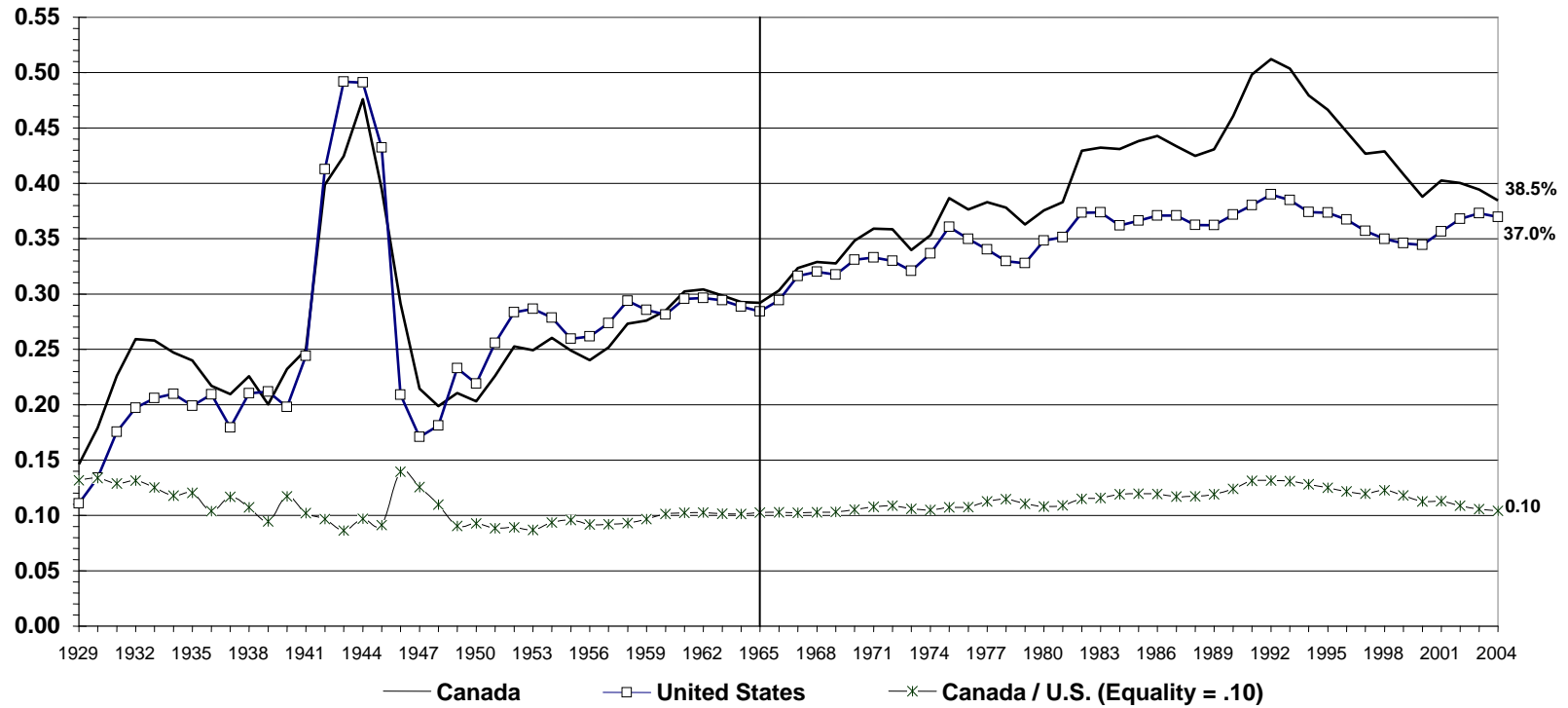
Sources:For Canada, 1965-1969 Love and Wolfson (1976, Table 5); 1971-2000 Kesselman and Cheung (2006, Table 12.4); 2001-2005 Statistics Canada (2007). For the U.S.: U.S. Census Bureau, Income website, <http://www.webcitation.org/query?url=http%3A%2F%2Fwww.census.gov%2Fhhes%2Fwww%2Fincome%2Fhistinc%2F01AR.html&date=2009-04-12>

**Table 3: OLS Regressions of Annual Changes in the Log of Civilian Labour Force on Wage Rates
Canada, 1946 – 1995**
(Absolute value of t- statistics)

Variable	1946-1968	1969-1990	1969-1995
Constant	0.0208* (4.84)	0.0239* (10.39)	0.0201* (7.73)
Canadian Wage	0.4324* (3.49)	0.1640*** (1.77)	0.1971*** (1.76)
U.S. Wage	-0.3988* (3.46)	-0.0338 (0.30)	-0.0287 (0.20)
R^2	<i>0.539</i>	<i>0.151</i>	<i>0.126</i>

Source: See Part 1 of the Appendix for data sources. *(**)* = Significant at 1% (5%) 10%.

Figure 2
Comprehensive Measure of Government Size: as a Proportion of GDP
Defense and Depreciation Adjusted with Nonprofit Hospitals and Universities Included Consistently
1929 - 2004



Source: Ferris and Winer (2007, Figure 8)

Figure 3
Fiscal Equilibria in a Competitive Political System Before and After the Near Closing of the Border

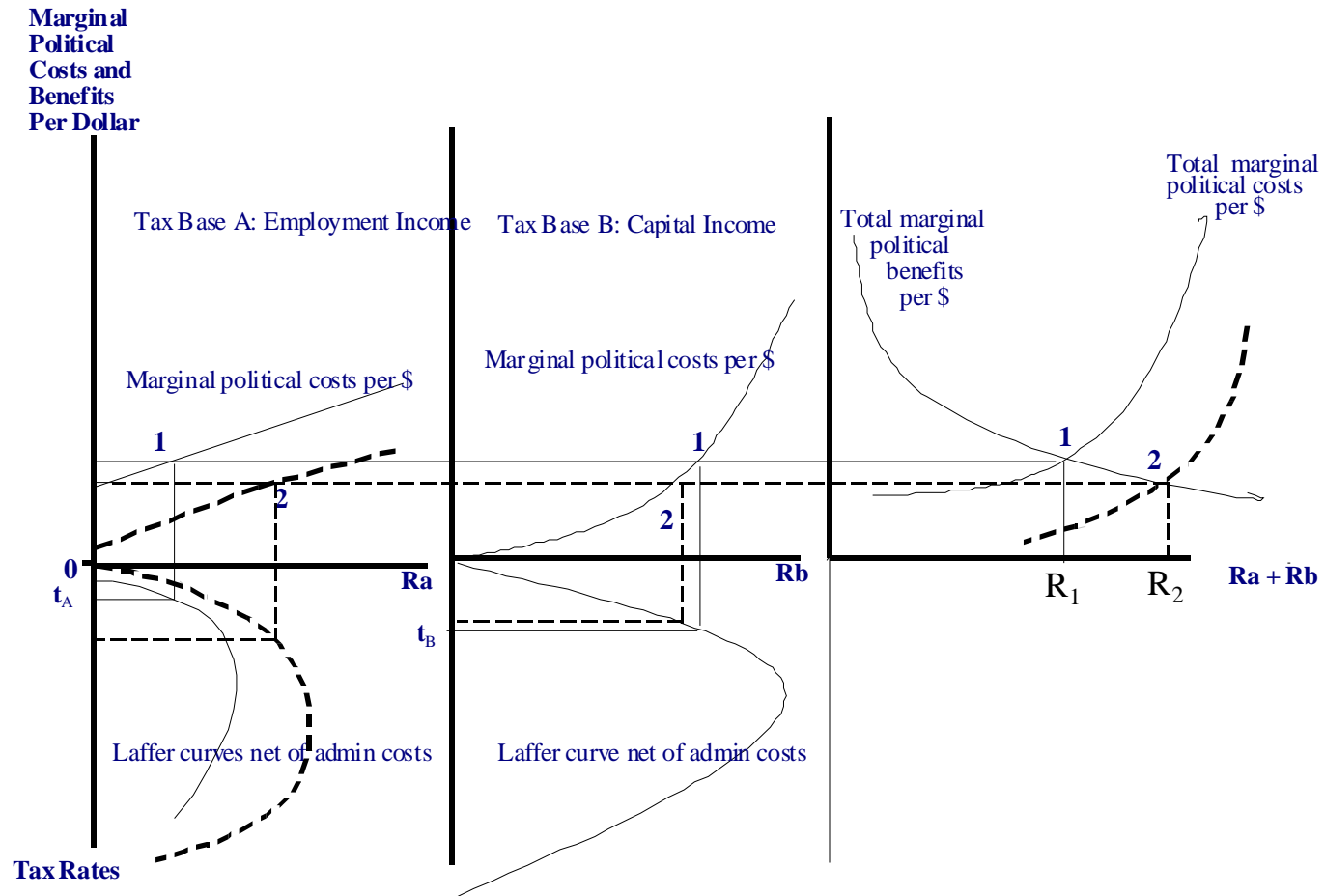


Table 4: The Tax Mix in Canada, Public Sector, 1950 - 2000

As A Percent of Total Taxes

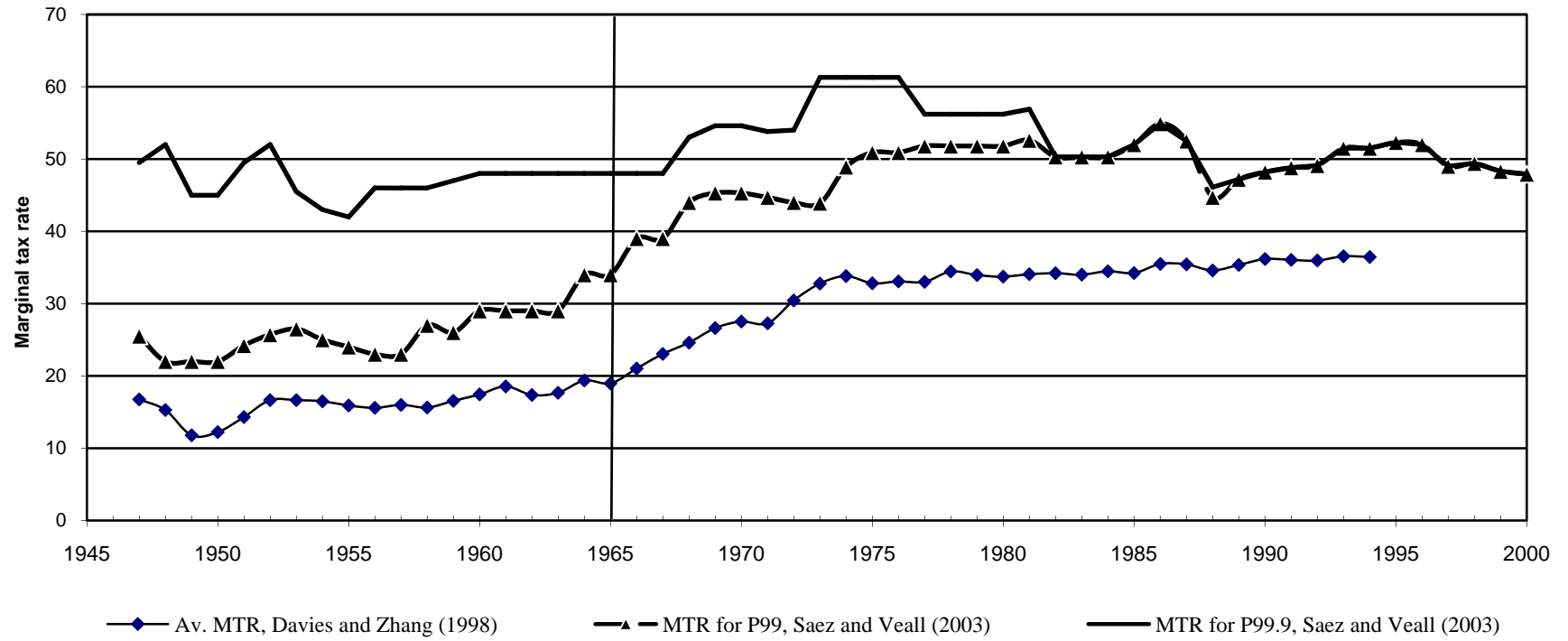
Year	Personal Income Tax	Corporate Income Tax	Social Insurance Taxes	Indirect Taxes	Local Taxes
1950	15.0	24.3	na	48.4	12.4
1960	21.1	17.0	na	44.9	17.0
1970	34.2	11.6	7.1	33.1	14.1
1980	35.3	13.3	9.3	30.3	11.8
1985	35.5	10.4	11.8	31.6	10.7
1990	40.3	7.1	12.1	30.0	10.4
1995	37.3	7.8	14.2	30.3	10.5
2000	37.4	12.5	12.9	28.5	8.6

As A Percent of GDP

Year	Personal Income Tax	Corporate Income Tax	Social Insurance Taxes	Indirect Taxes	Local Taxes	Total Taxes
1950	3.2	5.2	na	10.3	2.6	21.4
1960	5.1	4.0	na	10.6	4.0	23.7
1970	10.0	3.4	2.1	9.7	4.1	29.3
1980	10.2	3.9	2.7	8.7	3.4	28.9
1985	10.9	3.2	3.7	9.7	3.3	30.8
1990	14.1	2.4	4.3	10.6	3.7	35.1
1995	13.1	2.7	5.0	10.6	3.7	35.1
2000	13.4	4.5	4.6	10.2	3.1	35.7

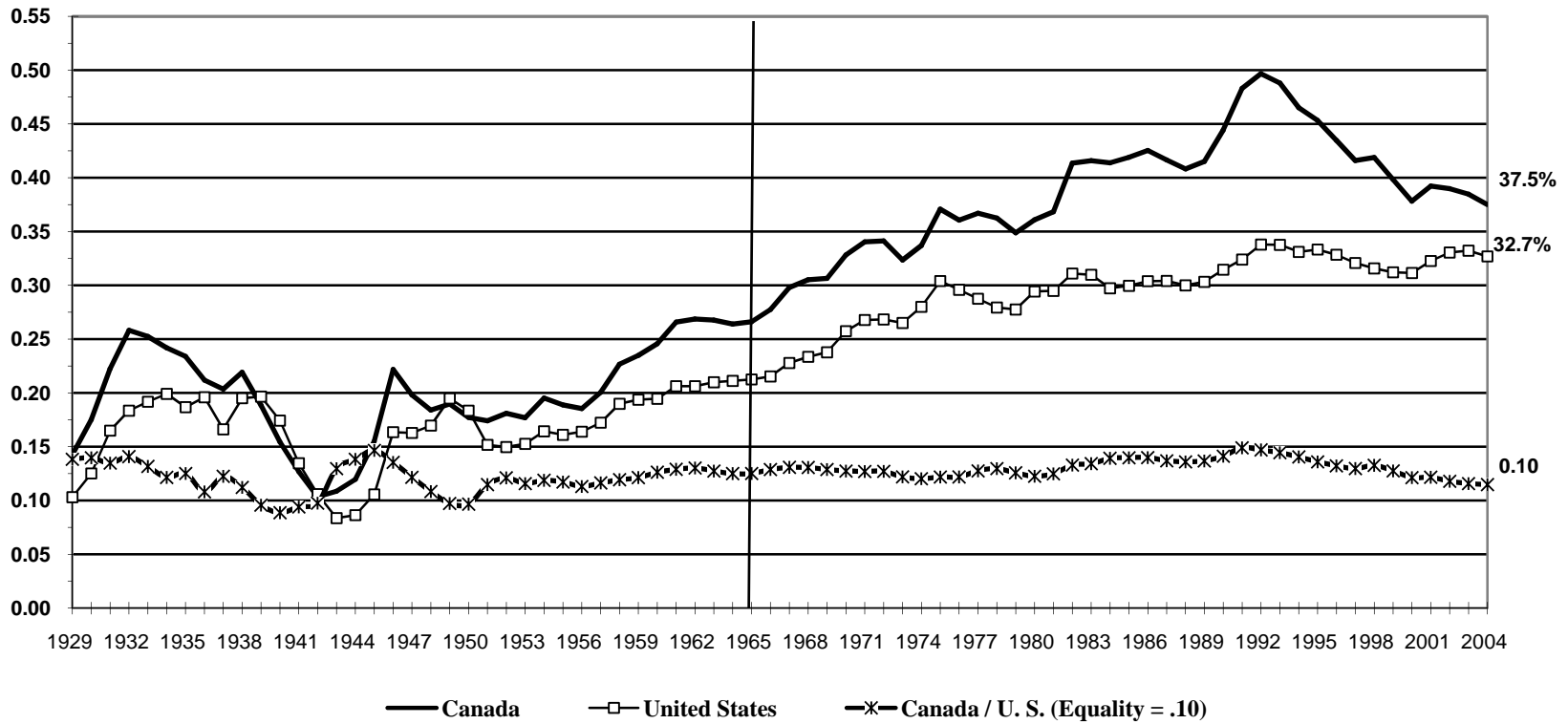
Source: Calculated from Table B.4, *Finances of the Nation*. Canadian Tax Foundation, 2005.
Numbers do not add up exactly due to rounding.

Figure 4
Marginal Income Tax Rates, Canada, 1947 – 2000*



Notes: MTR = Marginal effective tax rate. P99 refers to the 99th percentile tax bracket.

Figure 5
Comprehensively Defined *Non-Defence* Government Spending as a Proportion of GDP
1929 - 2004



Source: Ferris and Winer (2007, Table 10b)

Figure 6
Capital Income becomes More Sensitive to Taxation

