

Just How Much Bigger is Government in Canada? A Comparative Analysis of the Size and Structure of the Public Sectors in Canada and the United States, 1929–2004

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Dans cette étude, nous comparons la taille et la structure des secteurs publics au Canada et aux États-unis, de 1929 à 2004, à l'aide de données de comptabilité nationale et de données sur l'emploi. Nous abordons et nous illustrons le défi que représente la tâche de définir, à des fins de comparaison, ce qui constitue un secteur public, particulièrement en ce qui concerne les secteurs à but non lucratif. Nous soulignons aussi un certain nombre de similitudes et de différences surprenantes (et qui pour l'instant restent inexplicables) dans l'évolution des deux pays sur ce plan. En utilisant un nouveau déflateur de type Fisher dans le cas du Canada, nous montrons enfin que, dès 2003, les dépenses réelles du gouvernement par rapport au revenu réel représentaient environ 27 pour cent du produit intérieur brut (PIB) dans les *deux* pays.

Mots clés : taille du gouvernement, structure des dépenses publiques, analyse comparative, comptabilité nationale, Canada et États-Unis, « gonflement »

We compare the size and structure of the public sectors of Canada and the United States from 1929 to 2004 using national accounting and employment data. The challenge of defining the public sector for comparative purposes is explored and illustrated, especially with respect to the treatment of non-profits, and a number of intriguing similarities and differences in the comparative evolution of the public sectors are identified that remain to be explained. Use of a new Fisher-type government deflator for Canada indicates that, as of 2003, real government spending relative to real income was about 27 percent of Gross Domestic Product (GDP) in *both* countries.

Keywords: size of government, structure of public expenditure, comparative analysis, national accounting, Canada vs. United States, the bulge

If Tory Canada has become, in Robertson Davies' words, a "socialist monarchy," the United States tries to follow Thomas Jefferson's dictum, "That government governs best, which governs least...." The evidence on this score is abundant and clear.

—Seymour Martin Lipset (1990, 136)

INTRODUCTION

There is a widely held presumption running through Canadian public policy analysis that government plays a much larger role in economic activity in Canada than it does in the United States. Such is the thrust of Lipset's (1990) remarks above from his seminal book comparing the values and institutions of Canada and the United States. The "fact" that the relative size of government in Canada, measured as the ratio of nominal government spending to Gross Domestic Product (GDP), is much larger in Canada than in the United States is often cited as just such evidence.

In this paper we reexamine this stylized fact for the 1929–2004 time period.¹ In doing so, we suggest that what in principle should be counted as government rather than the private sector is inherently ambiguous, and that what in practice has been included is often arbitrary and possibly misleading. Hence we show that despite recent attempts to foster greater cross-country uniformity in the treatment of national accounts by the creation of the System of National Accounts (Commission of European Communities et al. 1993), exactly how the line is drawn to separate public from private activity varies and can matter for interpreting the impact and scope of public policy and, in particular, for making relevant cross-country comparisons.² After

examining the data, we conclude that reasonable measures of relative public sector size indicate that now, at the beginning of the 21st century, the two countries have public sectors that are similar in size in relation to aggregate income.

As part of our investigation, we compare the evolution and structure of public expenditures in Canada and the United States. While one may not be fully in agreement with Lipset's assertion that "nations can be understood only in comparative perspective" (1990, xiii), such a perspective is undoubtedly revealing. Our investigation proceeds by using a series of diagrams to illustrate how selected measures of the size and the composition of government spending in Canada and the U.S vary over time.³ Along the way we grapple with several interesting national accounting issues. As will become apparent, the measures of size and composition do not remain constant, neither individually nor relative to each other. Nor do all measures of size simply grow. The diagrammatic approach underscores visually a second general conclusion, that from a comparative perspective the key questions of interest may relate as much to the expansion or shrinking of size differences over time as to their absolute difference in levels at a particular date.

Our ability to make meaningful comparisons of the size of the Canadian and American public sector is made easier by the physical and cultural proximity of Canada to its economically dominant neighbor to the south, currently about nine times larger in terms of population.⁴ This comparison is reinforced by the similarity of their economic performance. As Figure 1 shows, overall performance, as measured by the growth rate of real per capita GDP, has been roughly equivalent over the 1929–2003 period.⁵ Throughout that period, the US

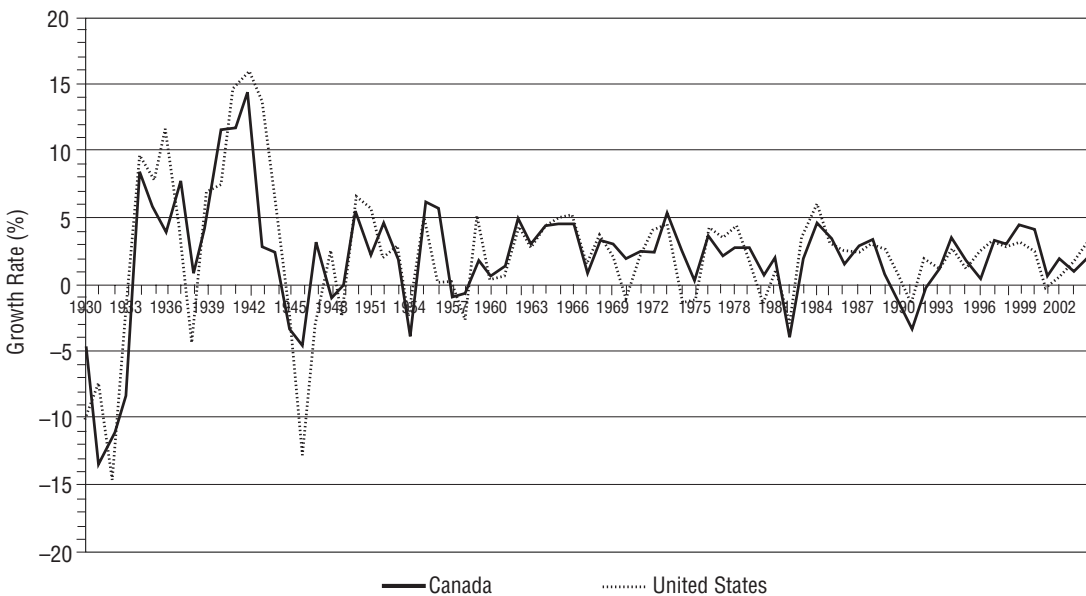
growth rate was about 7 percent higher than Canada's, with only moderately more volatility as measured by a coefficient of variation that is about 9 percent higher.⁶ What is most striking has been the general pattern of co-movement, as shown by the figure.

The similarity in the movement of GDP across countries is important in reassuring us that variations in the ratios of government expenditure relative to GDP in Canada and the US (discussed below) arise more from variations in the numerator than in the denominator. This similarity, in turn, challenges us to explain why, despite such a high degree of integration—the massive flows of trade, capital, people, and ideas that daily cross the longest (more or less still) undefended border between two nations—a different pattern of development over time

has emerged in various aspects of the two public sectors. While we shall not refrain completely from speculating at various points on the reasons why Canada made different collective choices, our primary purpose is to describe differences that can be documented rather than to formulate hypotheses to explain them. Raising questions about these differences may serve as a useful starting point for further comparative work.

Before turning to the first of our measures of comparative size, some caveats are appropriate. First, we should note that the data we utilize in this paper are in the main based upon national income accounting. We leave for future research, attempts to compare the two countries using alternative indices of public sector output such as those discussed by Atkinson (2005) in his recent report for the

FIGURE 1
Growth of Real GDP Per Capita, Canada and the United States, 1930–2004



Note: United States: mean = 2.187, coefficient of variation = 2.31. Canada: mean = 2.044, coefficient of variation = 2.12.
Source: See Appendix B – Data Sources.

British government. Our main exception is that (in Appendix A) we make use of some comparative measures of size based on public sector employment (see also Iorwerth 2006).

Second, it is important to acknowledge that government involvement in the economy extends well beyond its purchase of goods and services, and provision of public services. Governments also intervene in the economy indirectly to alter relative prices and economic performance through taxes/subsidies, and directly to regulate private sector performance (see Borcherding, Ferris, and Garzoni 2004).

And finally, it should be noted that even when there is agreement on the measurement of absolute government size, universal agreement does not exist on the appropriate ratio by which size *relative to the economy* should be measured. For example, Usher (1986, 126) in his thoughtful study of the growth of the public sector in Canada argues that government expenditure should be divided by national income at factor cost—gross national expenditure less indirect taxes plus subsidies—to reflect “the share of productive capacity devoted to the production of public services.” We follow the more traditional approach of looking at public expenditure relative to total final expenditure. This approach reflects our inclusion of the substantial part of government activity that involves redistribution and our belief that, on balance, a GDP-based measure of government’s share better captures this dimension than one that focuses on the capacity for productive services. The difference made to measures of government size by deflating by national income rather than by GDP is briefly addressed in Appendix A, where it is shown that patterns over time are not substantially affected by which denominator one uses.

The paper proceeds as follows. First, we present a series of national account measures of government size for Canada and the US from 1929 to 2004. We begin with a basic consumption measure of government size, before adding first public investment and

then transfers to persons and business. In all cases the data for the government sector is comprehensive in that it encompasses the expenditures of federal, state or provincial, and local governments. Spending is thus consolidated and net of inter-governmental transfers. Next, we describe some of the most important differences in the way Canada and the US categorize government activity, and we illustrate how size differences diminish as common activities are categorized symmetrically.

We then deal with the different ways that capital expenditures are treated across countries, with emphasis on national defence. The combination of defining government activities symmetrically and adjusting accounting differences provides our preferred, most comparable measure of government size. We digress to look at national defence as an important subcomponent of government spending and what comparisons of size would look like without this component. We go on to examine the cost of providing government services, and investigate whether differences in the rate at which these costs have changed over time could resolve the otherwise unexplained gap in size arising between the two countries in the 1970s and 1980s.

In the final section we summarize the recurring themes of the paper, and briefly restate a number of provocative questions about the comparative evolution of the two public sectors that have arisen in the course of our investigation. Appendix A presents some ancillary data and provides an alternative comparison of government size based on public sector employment, and Appendix B describes data sources.

GOVERNMENT SIZE AS MEASURED BY THE NATIONAL INCOME AND EXPENDITURE ACCOUNTS (CANADA) AND THE NATIONAL INCOME AND PRODUCT ACCOUNTS (UNITED STATES)

We begin by plotting two traditional national accounts measures of government size in Figures 2

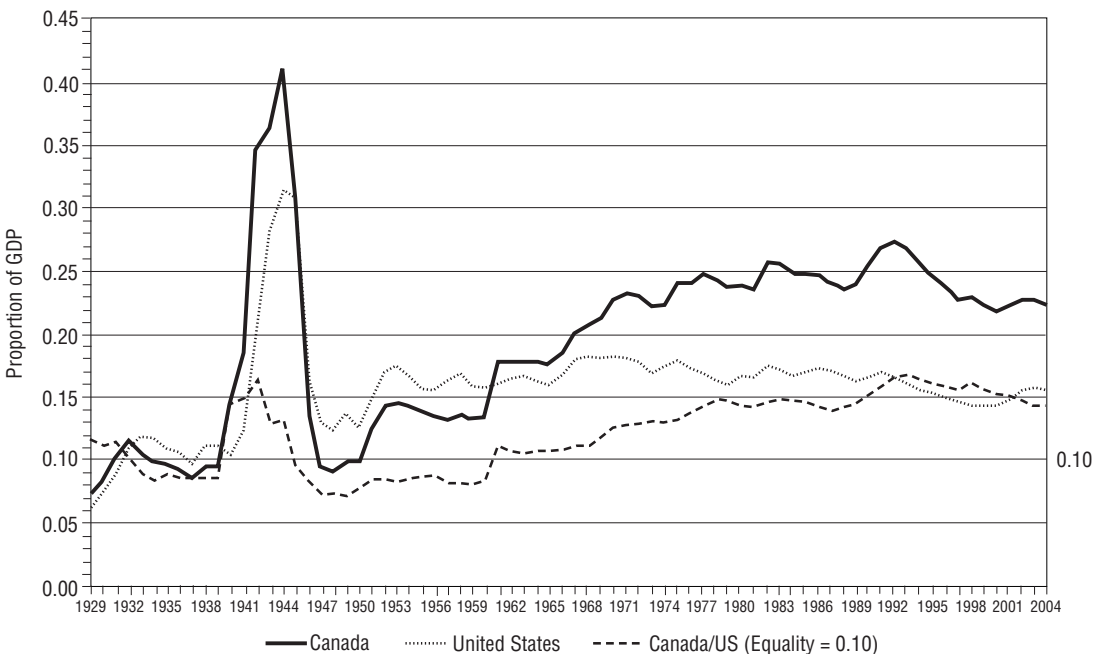
and 3, where size is defined as the ratio of different categories of government spending to GDP. Here the Canadian government sector includes all provinces and territories, while the American government sector encompasses all 50 states but does not include Puerto Rico or US territories.⁷ Note that in these figures and most of those that follow, the line representing the ratio of the Canadian to the US figure is normalized so that 0.1 represents equality. The absence of colour and the continuous crossing of lines makes this normalization easier for the eye to take in than does the use of a right-hand side scaled with 1 as equality.

Figure 2 presents the smallest of the size measures. Here government is viewed as providing simply public services and administration activities, and represented by its total expenditures on non-durable

goods and services. For both countries, consumption expenditures exclude transfers to persons and businesses, while administration includes expenditures on staff, security, and justice. Figure 3 expands the scope of government beyond service and administration by including gross expenditures on investment. These expenditures reflect the accumulation of capital by such means as increasing the stock of government buildings and expanding the network of public highways.⁸

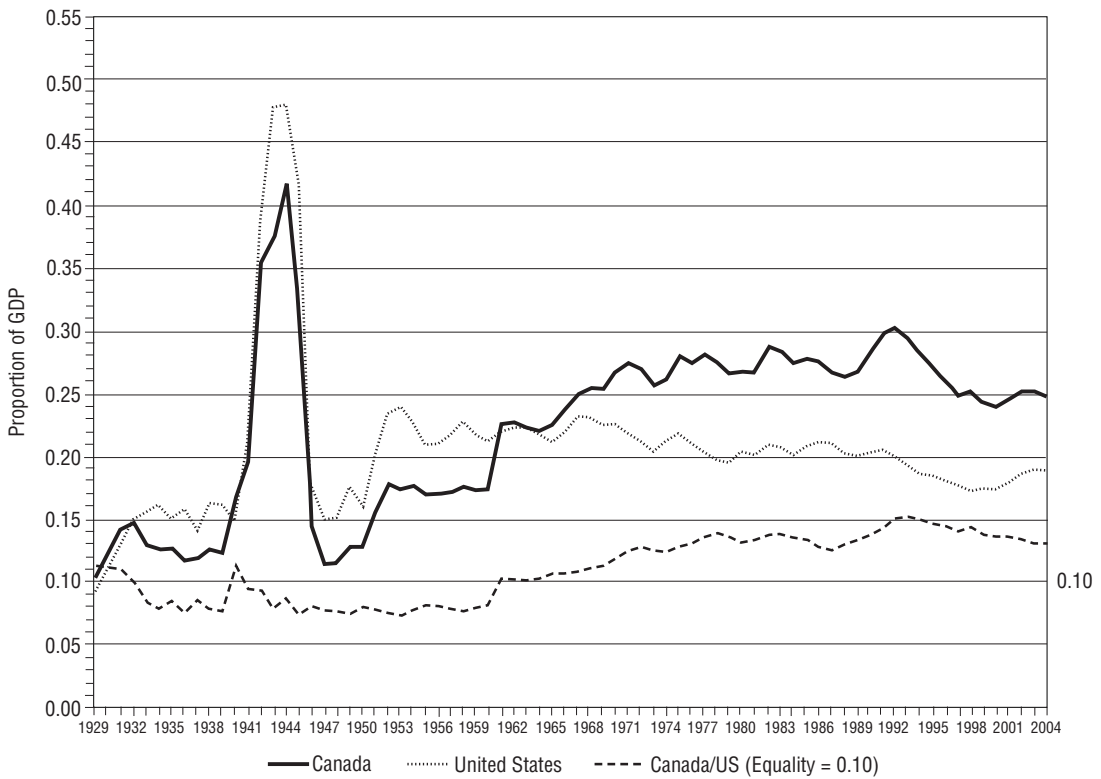
While Figures 2 and 3 present a similar pattern over time, the diagrams capture one important difference in the way that Canada and the US categorize similar types of government spending. This difference appears as the reversal in the relative size of government during WWII. The investment-inclusive measure of government size in Figure 3 suggests

FIGURE 2
Government Consumption Measure of Government Size, 1929–2004



Source: See Appendix B – Data Sources.

FIGURE 3
Government Consumption Plus Investment Measure of Government Size, 1929–2004



Note: Coefficient of variation of (Govt C + Govt I) / GDP, 1950–2004. United States = 0.082; Canada = 0.175.
 Coefficient of variation of (Govt C + Govt I), 1950–2004. United States = 0.906; Canada = 0.976
 Govt C = government consumption. Govt I = government investment.
 Source: See Appendix B – Data Sources.

that government in Canada remained smaller than in the US for the entire period running from the Great Depression in the early 1930s through to 1960. On the other hand, Figure 2 suggests that government size in Canada surpassed that of the US for much of the war period. What the size reversal illustrates graphically is that Canada has followed the international convention of classifying war and defence expenditure as consumption, unlike the US that views many of the same expenditures as investment activities yielding a flow of defence services

into the future. This difference is just one example of the difficulty of placing too much weight on any single measure of government size.⁹

Placing the treatment of military expenditures to one side, the two figures paint a similar picture across time. For example, both charts give evidence of a Peacock-Wiseman (1967) upward step or “displacement effect” in size following WWII.¹⁰ In the US this appears as a discrete step upwards, whereas in Canada it appears as both an upward step and an

upward trend. Second, both graphs indicate the same switch in relative size across time. That is, from the early 1930s through to 1960, government size appears to have been somewhat larger in the US than in Canada. However, from 1960 onward, government size has become larger in Canada, and increasingly so.¹¹

When we turn to look at each country in isolation, the US data present no evidence that government size has grown since the end of the Korean War (whether size is measured on a consumption or consumption plus investment basis). The consumption measure of size in Figure 2 has remained more or less constant since the early 1950s, while the consumption plus investment measure in Figure 3 has actually fallen over the same time period. Canada, on the other hand, conforms more closely to the textbook stereotype of a country with an ever-expanding public sector, at least until the end of the recession in the early 1990s. Both consumption and the consumption plus investment measures in Canada grew rapidly and continuously from 1950 to the early 1990s, with the broader measure of size being more variable in Canada than in the United States. Following the 1990–91 recession, however, the size of the Canadian government reverted strongly back to levels more closely associated with the early 1970s. While Figure 2 shows that this reversal occurred partly in consumption, and Figure 3 shows the sum of consumption and investment, a closer look at the underlying series for government investment (detailed in the spreadsheet; see Appendix B) indicates that the reversal of size in Canada was also due in part to retrenchment in investment spending.¹² This dramatic decline in relative size in Canada is a matter that we will return to at length later.

It is when both the redistributive role of government—including transfers to individuals and subsidies to business—and the consequences of accumulated deficits (i.e., net interest payments) are accounted for that we find the textbook picture of ever-growing government size, often pointed to as

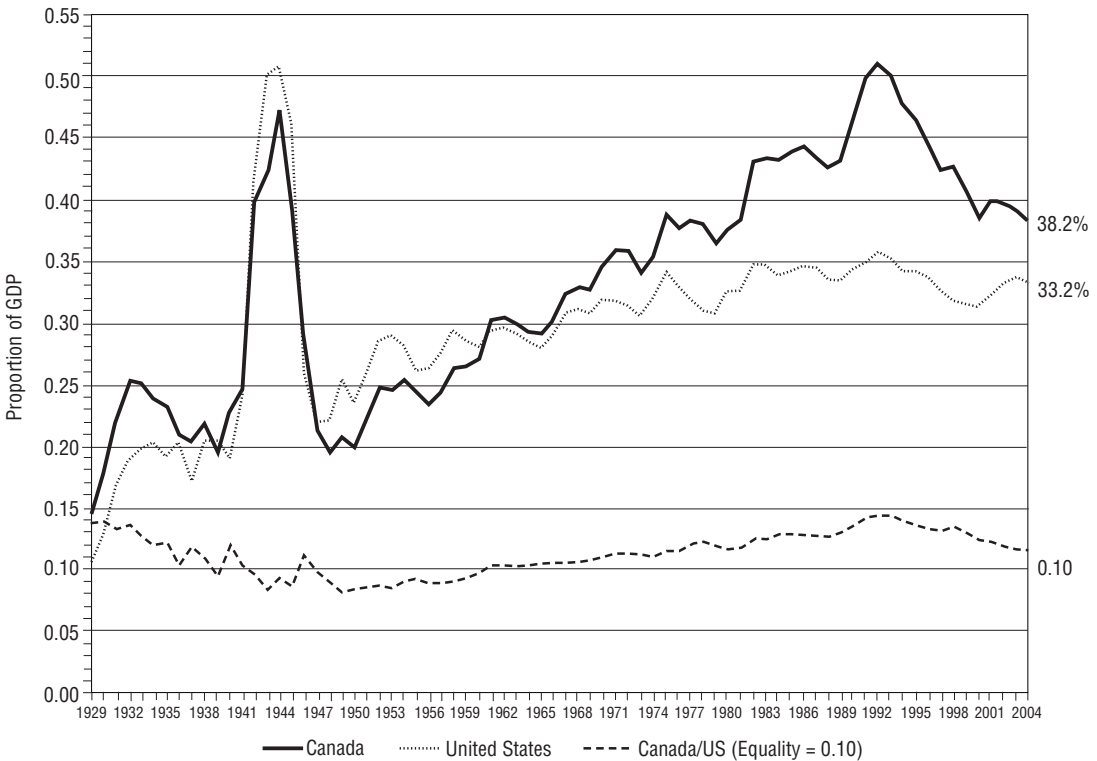
evidence of Wagner’s law of expanding state activity, for *both* countries.¹³ This expansion is illustrated in Figure 4 in which transfers, subsidies, and net interest payments are added to total government spending. We also allow for depreciation according to national accounts’ methods, and subtract capital consumption allowances. Hence government size as defined here is total, consolidated government spending, net of depreciation, relative to GDP. Transfers between levels of government are still netted out.

One important observation from Figure 4 is that the personal transfer-inclusive measure of size eliminates the discrete jump in size for Canada around 1960 that appeared in both Figures 2 and 3. This suggests that the transfer-inclusive measure of government size presents a more consistent and reliable measure of aggregate government size for comparative purposes.¹⁴ Comparisons based on previous measures evidently reflect the reclassification of similar activities among different categories of government spending.

The data illustrated in Figure 4 show that aside from a brief period between 1950 and 1960 when the US measure was temporarily higher, Canada’s transfer-inclusive measure of size has always been larger than that of the United States. Moreover, since 1960 this measure on average grew faster in Canada so that the two diverged increasingly. From 1960 to 2004, the US measure rose from 28 percent to roughly 33 percent of GDP, whereas from the same starting percentage, Canadian government size grew to over 38 percent of GDP.¹⁵

At its peak in 1992, the national accounts, transfer inclusive, measure of government size in Canada was 15.3 percentage points larger than in the United States—51.1 percent for Canada versus 35.8 percent for the US. By 2004, however, the gap had closed to 5.0 percentage points (38.2 percent for Canada compared to 33.2 percent for the US). Figure 4 thus highlights for the first time what we will refer to as “the bulge” in the two government size

FIGURE 4
National Accounts (Transfer Inclusive) Measure of Aggregate Government Size, 1929–2004



Note: Expenditure includes transfers to persons and business and net interest payments and is net of capital consumption allowances and intergovernmental grants.

Source: See Appendix B – Data Sources.

ratios. The extent of this bulge will be altered somewhat by the successive adjustments discussed below, but will never go away. The durability of this observation leads to one of the most important stylized facts in the comparative history of Canada-US government size in the post-World War II time period.

Not only does the transfer-inclusive measure of government size grow faster and decline more rapidly in Canada following WWII, but government size also appears to have become more responsive to the business cycle. The tendency for government ex-

penditure in Canada to move counter-cyclically—to rise dramatically in the recessions following the oil shocks in 1973 and 1979, and in recessions of the early 1980s and 1990s—is clearly visible in Figure 4. Even without transfers included, the coefficient of variation of the size ratio (as shown in Figure 3) is larger in Canada (see Ferris and Winer 2003). Whether more detailed statistical analysis supports this conjecture about comparative responsiveness to the business cycle remains to be seen.¹⁶

It might be expected that because of Canada's alleged "socialist" tendencies relative to the US that

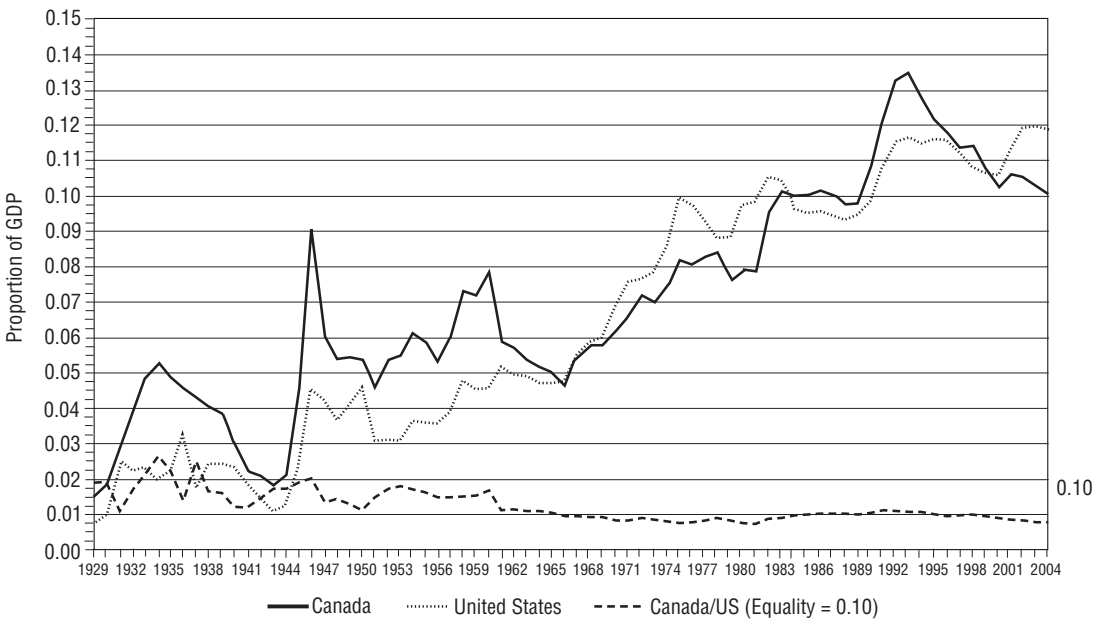
the dramatic relative rise in the transfer-inclusive measure of government size would be reflected primarily in the dramatic growth of personal transfers in Canada. Similarly, the “Jeffersonian” orientation of the United States might be expected to show up as a US preference for business subsidies relative to personal transfers. Hence a separation of the individual roles played by the two types of transfers across countries, as revealed in Figures 5 and 6, may be insightful. In Figure 5, we present government transfers to persons as a percentage of GDP. In Figure 6, we present the ratio of business subsidies to personal transfers. Note that constancy in this latter ratio would imply that subsidies to business change in the same proportion to GDP as transfers to persons.

over 10 percent of GDP by 2004. This trend confirms that growth in government transfers to persons is an important component of the overall growth of government. What is surprising, however, is that personal transfers in “Jeffersonian” America have risen roughly in line with those in “socialist” Canada. Prior to 1960, Canadian transfers to persons were approximately double those made by the United States.¹⁷ But since then, the only difference between the two countries has been that personal transfers in the United States have grown more smoothly and continuously than in Canada. This implies that very little of the bulge in government size arising between the two countries can be attributed to differences in the history of personal transfers.

From Figure 5 it is apparent that government transfers to persons rose dramatically in both countries, from less than 2 percent of GDP in 1929 to

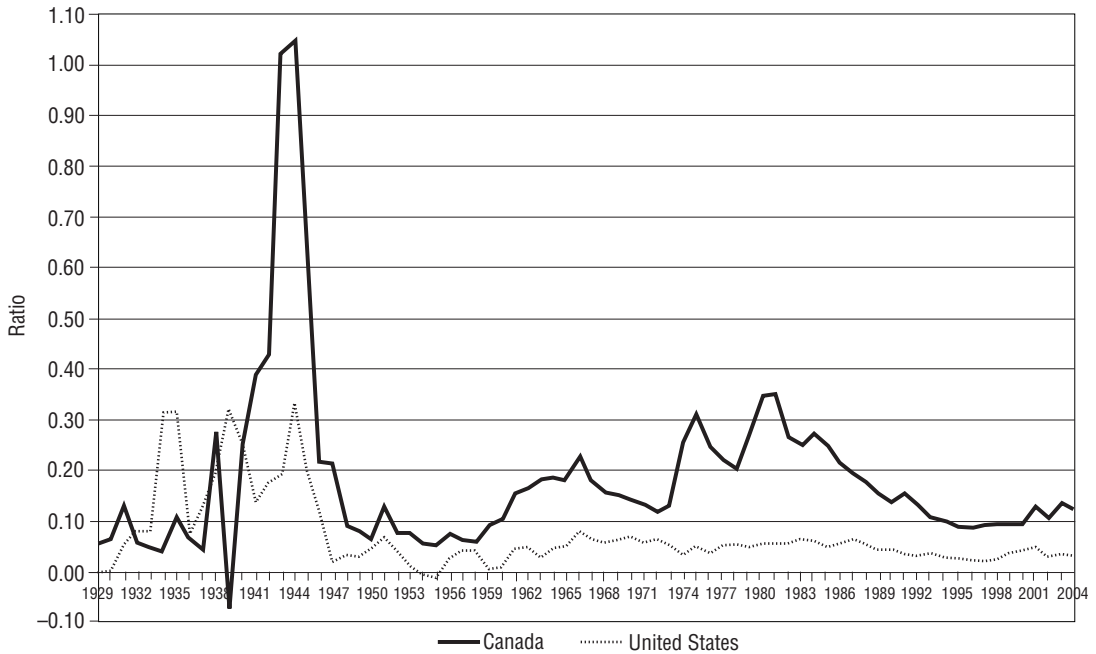
More specifically, even though the relative size of transfers to persons reversed between the two countries from 1968 to 1992, the greater generosity

FIGURE 5
Government Transfers to Persons as a Proportion of GDP, 1929–2004



Source: See Appendix B – Data Sources.

FIGURE 6
Ratio of Transfers to Business To Transfers to Persons, 1929–2004



Source: See Appendix B – Data Sources.

of the US in the later 1960s and 1970s worked to narrow rather than widen the size gap. It is only following the recession of 1981–82, when Canada's personal transfer share of GDP came to surpass that of the US, that differences in personal transfers worked to increase the size of the overall Canada-US expenditure gap. By 1992, only 2 percentage points of the overall size gap of 15.3 percentage points (shown in Figure 4) can be attributed to this type of public expenditure.

The similarity exhibited by personal transfers since the late 1950s is quite remarkable given the differences in the politics of transfer programs in the two countries; more so, in view of the fact that between the late 1950s and the recession in 1990–91 Canada adopted a succession of key transfer

programs that are often thought to be integral to Canadian national identity. These programs included Hospital Insurance (1957), revised Old Age Security (1965), the Canada Pension Plan (1965), the Canada Assistance Plan (1966)—an important federal grant program funding provincial expenditure, the Guaranteed Income Supplement to Old Age Security (1966), a revised and more generous Unemployment Insurance Act (1971), a new Family Allowances Act (1973), Spousal Allowances (1975), and the Child Tax Credit (1978).¹⁸ While these rapidly growing personal transfer payments played an important role in the expanding role of government in Canada, the same was also true in the United States. The reasons for the cross-country similarity in broad trend, and yet with difference in timing, are not obvious.

Following the early 1990s, government transfers to persons as a proportion of GDP fell dramatically in Canada. A significant part of this decrease was deliberate, due to the 1990 and 1993 reforms of the unemployment insurance program.¹⁹ But transfers to persons, especially unemployment insurance, also fell in the United States. Only after 2000 did the relative tightening of Canadian personal transfers result in a reversal of the size of these transfer programs relative to the United States.

Transfers and subsidies to business as a ratio of personal transfers are shown in Figure 6. Although there may be a presumption, especially among those who observe business lobbying in congress, that the United States is relatively more supportive of business, the data suggest otherwise. In the period leading into WWII, the ratio of business to private transfers was quite similar in the US and Canada, whereas in the period since, the Canadian ratio has grown consistently larger. Moreover, the rise in this ratio for Canada means that it is the growth of business transfers rather than of personal transfers that contributes to the growing bulge in government size before 1992, as shown in Figure 4. Overall, business subsidies and transfers rose faster than personal transfers in Canada through to the mid-1980s. In contrast, the US ratio has remained relatively constant from 1961–62 to the present.²⁰

With the post-1992 decline in personal transfers, shown in Figure 5, the maintenance of the same business to personal transfer ratio in Canada means that business transfers fell just as rapidly. Together with the fall in government consumption and investment relative to GDP (Figure 3), the decline in both types of transfer payments explains the reversal in the large size bulge that had arisen between Canada and the United States. Figure 3 shows that roughly 4 percentage points of the 10.3 percent fall in the size of the bulge highlighted in Figure 4 (i.e., the fall from 15.3 to 5 percentage points between 1992 and 2004) can be attributed to the fall in the consumption plus investment measure of government

size. Hence 6.3 percentage points of the 10.3 percent reduction between 1992 and 2004 is due to personal and business transfers (and net interest payments).²¹ In other words, what Figures 3 through 6 illustrate as a whole is that expenditure cutbacks in Canada following the 1990 recession—which are historically important in magnitude—were broadly based and affected virtually all of the major categories of spending.

GOVERNMENT SIZE MEASURED IN RELATION TO COMPARABLE ACTIVITIES

In our comparison thus far, we have treated the categories of the national accounts in both countries as if they measured the same set of activities. Fortunately, the statistical agencies in both Canada and the United States do provide sets of national accounts that are broadly consistent with each other and with the worldwide guidelines laid down under the System of National Accounts adopted internationally (Commission of the European Communities et al. 1993). These guidelines were designed to produce conformity across countries in the way that real output is both measured and categorized for cross-country comparison. Nevertheless, there remain a number of important specific instances where the US and Canada measure similar activities differently and, where they measure them similarly, include similar activities in different categories.²²

In this section we focus on the latter—on the different ways that Canada and the US categorize quasi-governmental or non-profit institutions. How the two countries place “non-profit, non-governmental organizations” into the binary categorization of either government or private activity has different implications for the measure of government size, particularly in the areas of health care services (hospitals) and education (universities).

The basic problem of categorization arises because in both Canada and the US, hospitals and

universities are not always run on a for-profit or private basis, nor are their outputs always sold in well-functioning private markets. For this reason, hospitals and universities cannot be categorized easily as either government or private institutions. Because Canada and the US have different criteria for categorizing non-profit organizations (the method has been altered over the years in Canada), these differences change the measure of government size even when the same services are provided in often comparable ways. In Canada, non-profit organizations are now categorized as being either public or private on the basis of their financing, with 50 percent financing the dividing line for whether any such activity should be included in the government sector.²³ On this basis, most Canadian non-profit organizations and, in particular, all hospitals and universities are included within the government sector.²⁴

In the United States, control rather than finance is the basis for determining whether an activity is in the government sector. To be included within government, a US non-profit institution must be controlled by the government, irrespective of how much of its activity is financed by government. Under this definition, most US non-profit organizations are categorized outside of the government sector in their own separate category of the private sector. In practice, only hospitals and universities that are run explicitly by state and/or local governments are included as part of the government sector. This was also the Canadian way of categorizing activity prior to the revision of its national accounts in the early 1960s. It follows that, in relative terms, Canada's current treatment of hospitals and universities broadens its measure of government size relative to that of the United States.

What difference would it make if hospitals and universities were treated on the same basis for the measure of government size? One way of illustrating the change is presented in Figure 7. All non-profit hospitals and university expenditures in

both countries are reclassified as part of the government sector, along with all private expenditures (such as tuition payments) on these items not already included in government accounting. For Canada this means adding pre-1961 private consumption expenditures on hospitals and universities into the reported figure for government spending, since these expenditures were then considered part of private expenditure.²⁵ For the United States this means incorporating non-profit universities and hospitals, as well as private expenditure on activities not already included in government accounting, such as tuition payments.²⁶

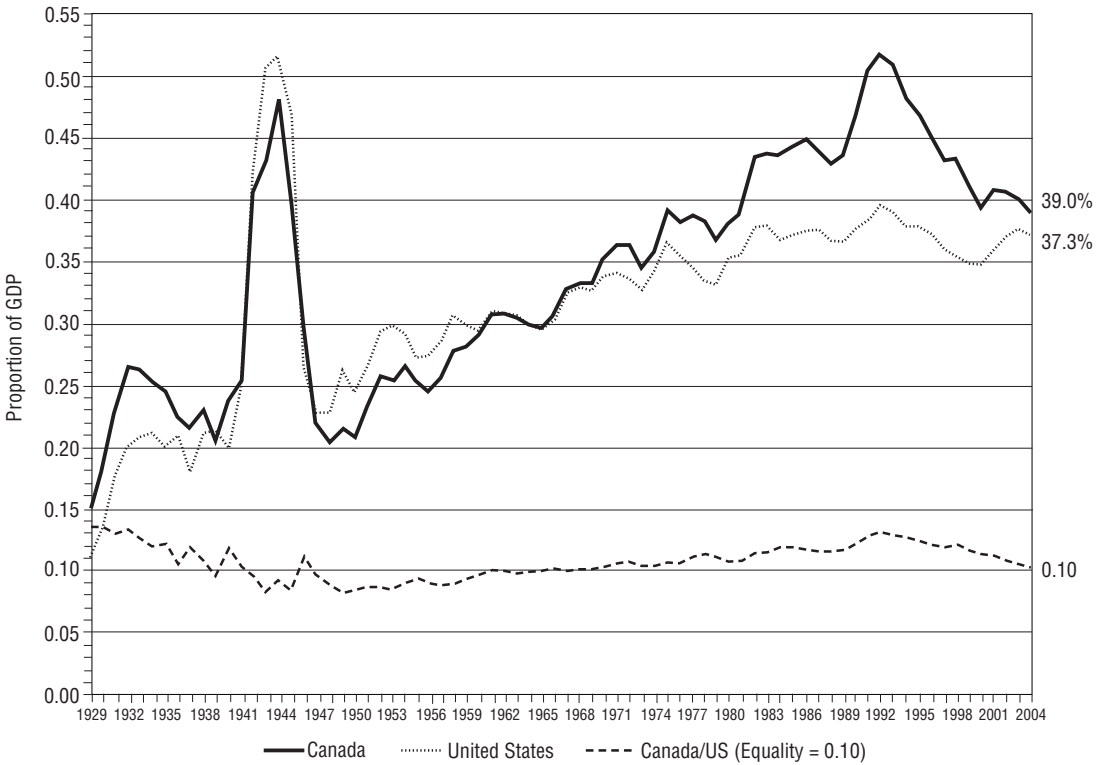
What is apparent from Figure 7 is that when figures for both countries are adjusted (adding about 4 percentage points to the US figures in 2003) so that the treatment of hospitals and universities is more or less comparable, much of the difference in government size appearing in Figure 4 disappears! Under the similar treatment of these non-profits, government size now exhibits a more rapid and continuous rate of growth in the United States. Nevertheless, it remains true that since 1960 government size has still grown more rapidly in Canada than in the US, but the size of the resulting gap is now halved. These revisions produce a discrepancy in size between the two countries that peaks at 12.2 percentage points in 1992 (51.7 in Canada versus 39.5 in the US), then falls to 1.7 percentage points by 2004 (39.0 versus 37.3). Compared to the (absolute percent point) gap depicted in Figure 4, these adjustments have reduced the peak size of the gap in 1992 from 15.3 to 12.2 percentage points and the final difference in 2004 from 5.0 to 1.7 percentage points.

GOVERNMENT SIZE ADJUSTED FOR DEFENCE AND DEPRECIATION DIFFERENCES

There is a second measurement reason why Canadian and American size measures differ, though not of the same magnitude as that discussed above. This relates to how depreciation—the cost of maintaining

FIGURE 7

Broader Measure of Government Size: Non-Profit Hospitals and Universities Included in Government for Both Countries, 1929–2004



Source: See Appendix B – Data Sources.

the capital stock—is treated across the two countries. In particular, Canada assumes that depreciation arising on its government capital goods is linear with respect to time, whereas the US assumes that the relationship is geometric. What this implies in practice is that Canada writes off its capital expenditures more quickly than does the United States. Because the absence of a market price means that the value of government output must be measured by its cost, and because depreciation on capital forms one important element in the calculation of that cost, writing off capital faster increases depreciation cost

faster as well as the measures of both government output and final GDP. Moreover, because the addition of a constant to the numerator and the denominator of a fraction will increase its size, the higher depreciation rate increases the relative size measure of government. It follows that the linearization of depreciation in Canada results in a larger measure of government size solely because of the way that it has chosen to depreciate its assets. Lal reports (2003, 31) that in 2001 the use of linear rather than geometric depreciation made the size of the Canadian government sector larger by

about one-half of one percentage point. If we take this difference out of the gap in size presented in Figure 7, the measured difference in comparable government size falls to 1.2 percentage points by 2004.²⁷

While the use of linear depreciation methods has overstated Canadian government size relative to the US, there is another feature of how the two governments categorize spending that does the opposite. This involves decisions on what purchases should be counted as capital versus consumption. As a general rule, the US considers a larger portion of its purchases as capital items than does Canada. For comparative purposes, however, the most important difference is that while Canada and the US both treat defence expenditures on structures as purchases of capital, the two countries treat their expenditures on weapons and equipment differently. In accordance with the United Nations accounting system, Canada regards the purchase of weapons and defence equipment as consumption, while the US treats weapons and equipment acquisitions as increases in the stock of defence capital, providing a flow of security or defence services over time. The latter decision implies that weapons and equipment procurement requires ongoing depreciation expense to maintain the stock of security capital.

Because the United States includes depreciation on weapons and equipment as part of the current value of its defence services, the gross cost of US defence expenditures, and hence government size, will appear larger than if the same purchases were made by Canada. Thus for defence spending to be treated comparably, either the depreciation on Canadian weapons and equipment needs to be added to defence spending in Canada, or the adjustment for depreciation on weapons and equipment must be taken out of the US total with corresponding adjustments in the definition of GDP. Since the US publishes a separate series for the consumption of the two types of capital in defence, it is more convenient to take this out of the US total.

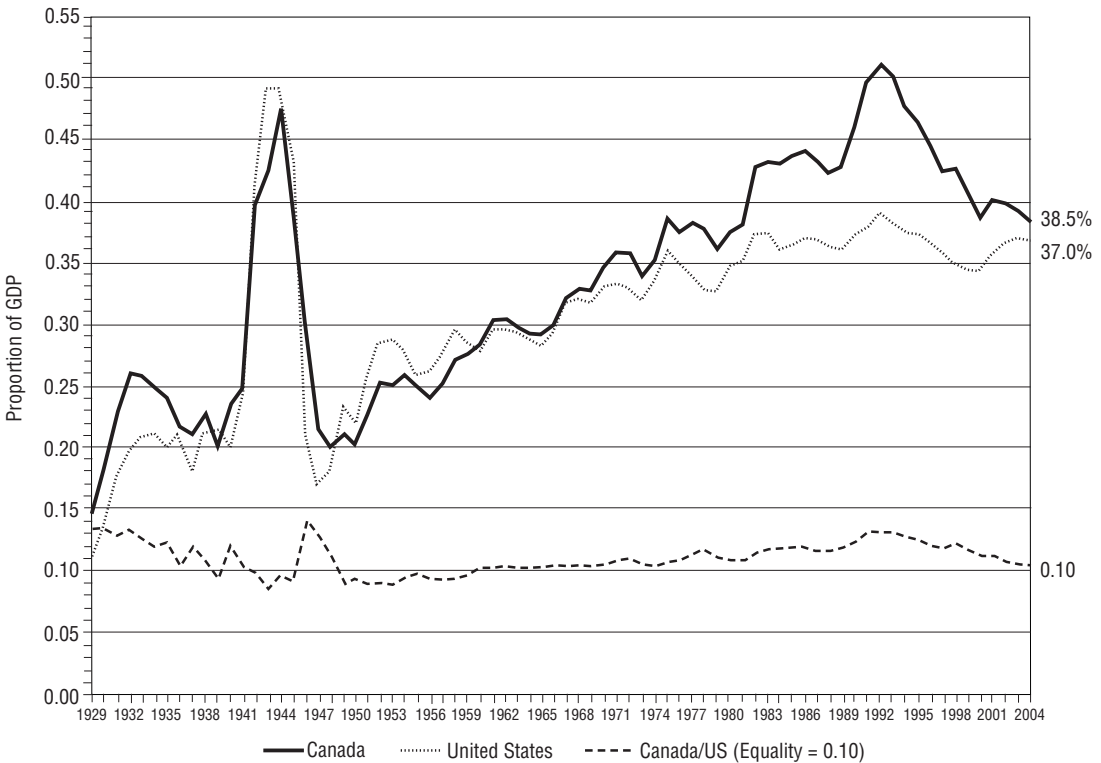
In Figure 8, then, we illustrate the difference that the adjustments for comparability in the treatment of depreciation make to our broader measure of government size (in which hospitals and universities are consistently regarded as part of the government sector, as shown in Figure 7). First, we subtract 0.5 percent from the broader Canadian measure of size to compensate for Canada's use of linear versus geometric depreciation. Second, to provide for similar treatment of depreciation in defence, we subtract previously included depreciation on US defence expenditures on weapons and equipment from the US measure and, as required for consistency, from the US GDP as well.²⁸ The result is our most comprehensive measure for comparing government size based on similar activities employing a similar a set of criteria.²⁹

The two sets of adjustments lower somewhat the measure of government size in both countries, but leave their difference virtually unchanged. Hence the capital-adjusted measures continue to show that government size was larger in Canada from the Depression through WWII, and that following a short period between WWII and 1960 when they were roughly the same size, the government sector in Canada grew relative to the United States. By 1992 the gap had grown to its largest extent of (51.2 – 39.0 =) 12.2 percentage points, the same as the (51.7 – 39.5 =) 12.2 gap shown in Figure 7. But by 2004 the gap had been substantially though not completely eliminated, falling to 1.7 percentage points.

What is perhaps most remarkable is that for the period 1929–2004 as a whole, the size of government has remained so similar. From just prior to WWII when the governments in both countries represented roughly 20 percent of GDP, the public sectors in Canada and the United States have grown more or less consistently, despite taking different routes, to about 37–38 percent of GDP by 2004.

As a final adjustment to the measure of government size, we consider the difference that the mix

FIGURE 8
 Comprehensive Measure of Government Size: Defence and Depreciation Adjusted with Non-Profit Hospitals and Universities Included Consistently, 1929–2004



Source: See Appendix B – Data Sources.

of current taxation and deficit financing makes to the measure of government size across countries by netting out interest payments on government debt. Postponing current payment for government expenses increases government debt and so interest payments. Government net interest payments as a proportion of GDP are graphed in Figure A2 of the Appendix. There it can be seen that despite temporary increases during the Depression and WWII, US net interest payments fluctuated in a band between 1 and 2 percent of GDP for the entire period from 1929 through to the second oil shock of 1979.

Canada, on the other hand, exhibited greater fluctuations in net payments over the same period, with payments rising dramatically in the Depression, rising again during WWII, and then consistently falling toward zero through to 1980. In the period following the economic recessions of early 1980s, net interest payments grew quite rapidly in both countries. For the US, net interest payments doubled from 1.8 to 3.6 percent of GDP between 1991 and 1995, then declined. In relative terms, net government interest payments in Canada exploded from roughly zero in 1980 to over 5.5 percent of GDP in the mid-

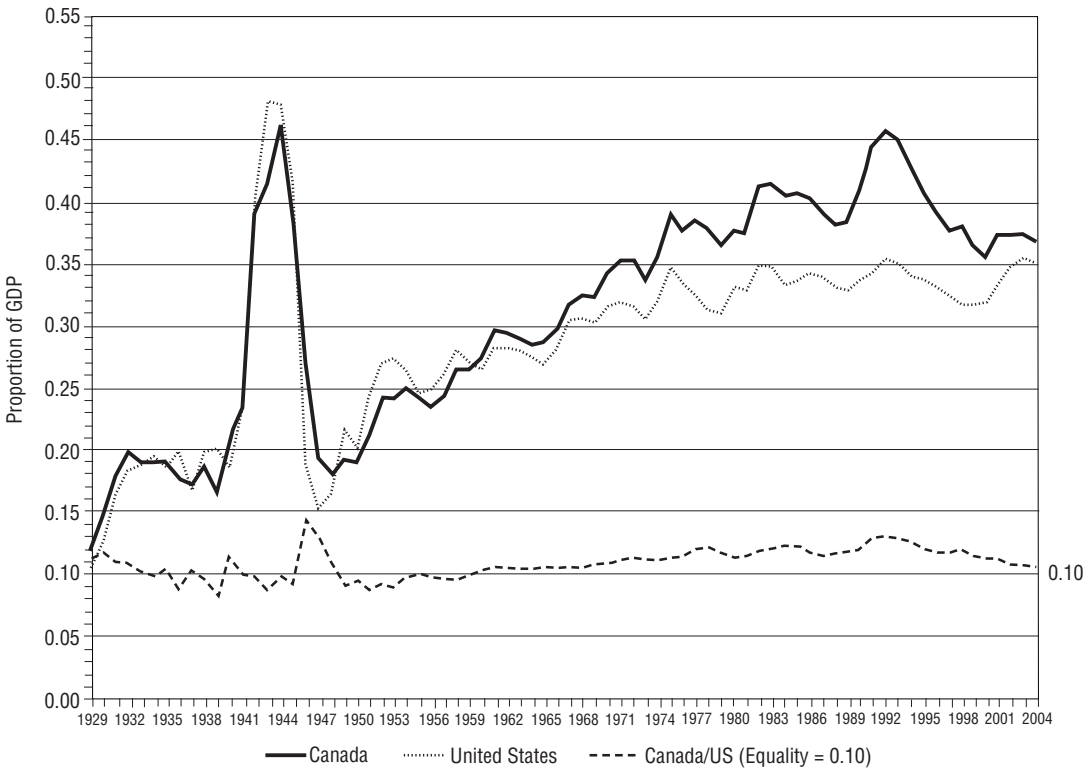
1990s, before falling steeply to the American level by 2004.

Figure 9 shows the result of removing net interest payments from the measure of government size. Despite the dramatic rise and decline of deficits in Canada after 1980, the difference from Figure 8 over the whole period is not dramatic. The removal of net interest payments from government spending still leaves evidence of the previous bulge with a peak in 1992, although the departure and its return are both smaller and more gradual than when interest payments are included. The pattern over the entire period from 1929 is similar, indicating that

deficit financing is not a major source of long-run differences between the two countries.

On the other hand, Figures 8 and 9 suggest that Canadian government size overshoot before returning to the level relative to GDP established by the United States in the late-1970s, where the divergence was financed to some extent by larger ongoing deficits. A more complete understanding of the evolution of comparative government size across these two countries will then need to include an analysis of the comparative history of deficits and interest rate policies in the early 1980s.

FIGURE 9
Non-Interest Version of Comprehensive Government Size, 1929–2004



Source: See Appendix B – Data Sources.

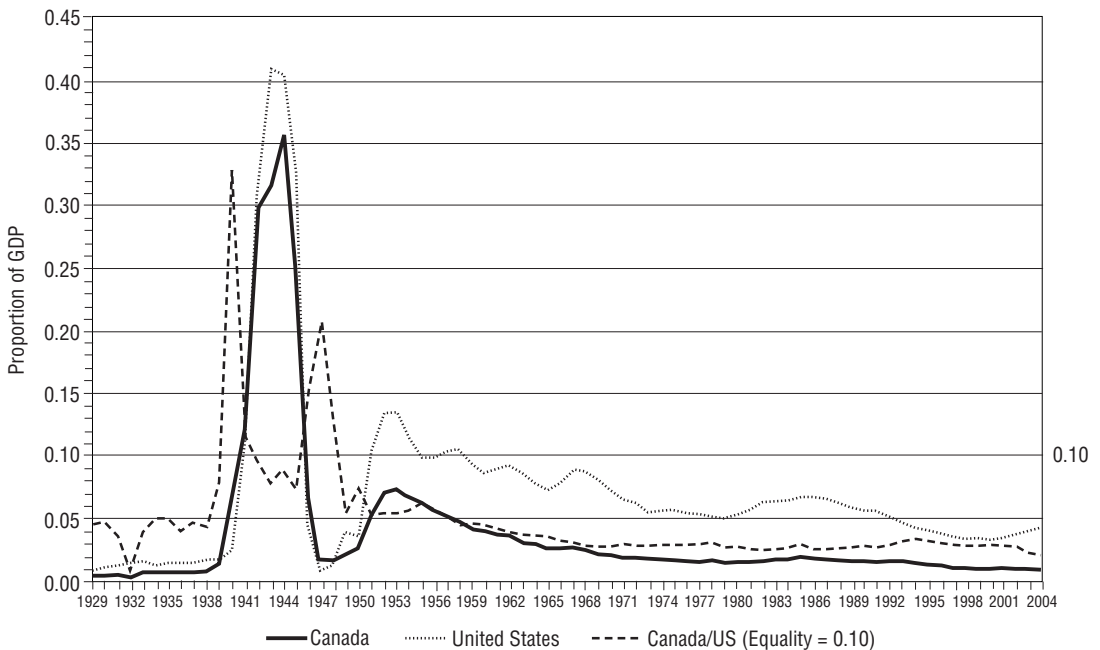
DIFFERENCES IN DEFENCE AND NON-DEFENCE MEASURES OF SIZE

In the previous sections we focused on the development of a consistent cross-country measure of government size for Canada and the United States at the aggregate level. Here we pause to consider an important compositional difference in government spending between the two countries.

In Figure 10a we present the ratio of government defence expenditures to GDP. Once again the US measure has been adjusted to remove depreciation expenses on weapons and equipment for cross-country comparability. The figure illustrates that both the US and Canada devoted a relatively small proportion of their GDP to national defence prior

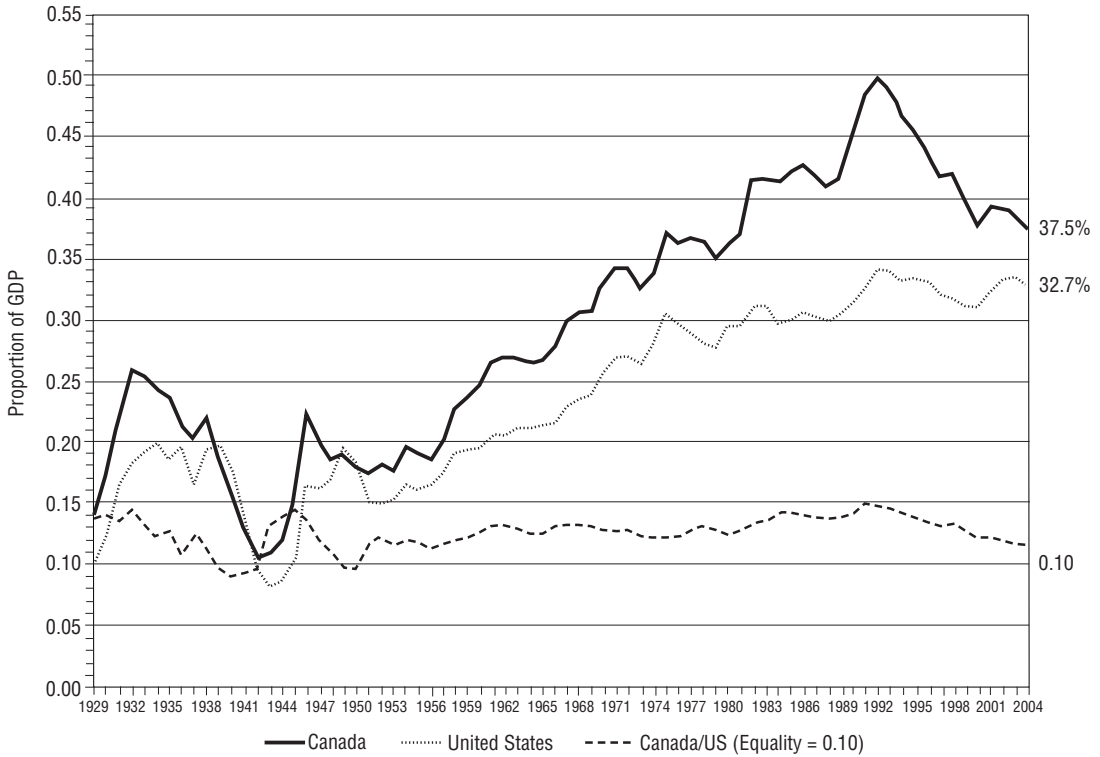
to WWII, and considerably more thereafter.³⁰ For both countries, the defence ratio following WWII is three to four times higher than it was previously. Second, with the exception of WWII, the US has always devoted more than twice as much of its GDP to defence than Canada. Third, both countries have experienced a slow downward trend in defence spending from the Korean War onward, broken in the US by periods of upsurge in defence spending—notably Vietnam (1965–1975), “Star Wars” (in the early-to-mid-1980s) and, most recently, by the renewed defence spending following the 9/11 attack of 2001 and the invasion and wars in Afghanistan and Iraq. The US also experienced periods of relatively more rapid decline in defence spending such as in the early and mid-1970s, perhaps as a result of the shift in NATO strategy to one of flexible response

FIGURE 10a
Depreciation-Adjusted Defence Expenditures as a Proportion of (Comparable) GDP, 1929–2004



Source: See Appendix B – Data Sources.

FIGURE 10b
Comprehensively Defined Non-Defence Government Spending as a Proportion of (Comparable) GDP, 1929–2004



Source: See Appendix B – Data Sources.

from mutually assured destruction,³¹ and following the collapse of the Soviet Union after 1989. Throughout most of the post-war period, Canadian defence expenditures continued their steady decline, with Canada free riding, either by default or design, on the security provided by its immensely more powerful neighbour.

Given the broad similarity in government size at the aggregate level, major differences in the proportion of resources devoted to defence imply similar large differences in the proportion of GDP devoted to the non-defence uses of government spending. This is what is depicted in Figure 10b.

Canadian non-defence expenditures as a percentage of GDP are consistently larger than those of the US—roughly 25 percent larger over the entire post-WWII time period. What is again of interest is the timing of this departure. That is, both countries entered WWII with roughly the same non-defence government size. Then, for both countries, WWII led to the crowding out of non-defence activities by the demands of the war effort. However, for reasons that are unclear, the war effort seems to have crowded out non-defence government spending to a much larger degree in the United States than in Canada, so that the US exited the war at a proportionately lower level than did Canada.

This immediate post-WWII difference has been maintained over the long period from the late 1940s through 2004. While there is again the suggestion of a bulge in the non-defence measure of Canada's government size relative to the US that peaks in 1992, Figure 10b is dominated by the close to parallel movement of two series from 1950 to the early 1990s. If we had used a non-interest measure of government spending, the parallel movement would have been even more apparent.³² For both diagrams, only from the early 1990s onward is there any indication that government size net of defence spending is moving back toward equality.

Finally, the different downward trends in the ratio of defence spending across the two countries after the Korean War has a somewhat ironic meaning for our comparison of government size. As shown in Figure 10a, one reason for the somewhat more rapid *growth* in government size in Canada relative to the US over the 1960–1990 period was the more rapid *contraction* of US defence expenditures over the same time period.

CHANGES IN THE RELATIVE COST OF GOVERNMENT BETWEEN 1961 AND 2003

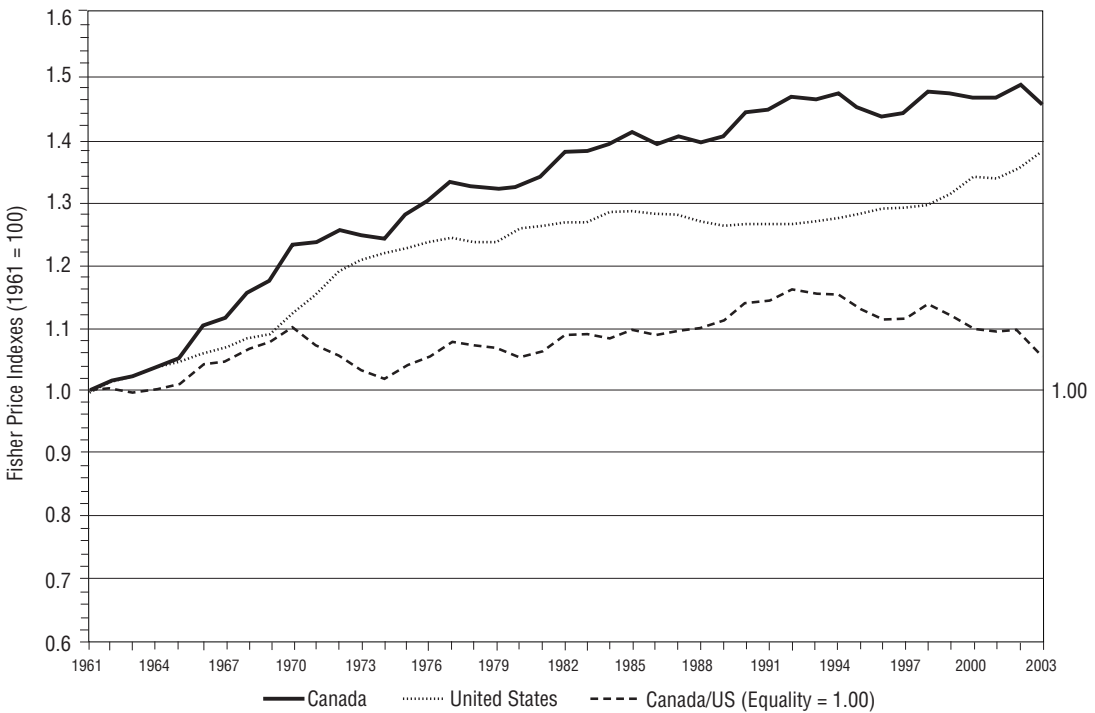
When government size is calculated as the ratio of two nominal magnitudes, the “real” quantities represented in this measure of size are based on the assumption that the nominal numerator and denominator can both be divided by the same price index. This traditional measure of real government size requires, in turn, that the cost of providing government services relative to all other goods and services has remained constant over the period. But what if the “price” of government rose more quickly in Canada between 1961 and 1992 than in the US, and more slowly thereafter? In such a case the real quantities of government service relative to all other goods and services could have stayed roughly constant in the two countries, with the rising relative cost of providing these services in Canada account-

ing for the persistent bulge in the ratio of nominal measures that we have seen peaking in 1992. In Figures 11 and 12, then, we examine how the cost of providing government services has changed between the two countries over this time period and the consequences of this change in relative cost for a comparative measure of government size.

In Figure 11, we present for Canada and the US the relative cost of providing government services, P_g/P , measured as the ratio of two chained Fisher price indices—the numerator being the price index for government services P_g , and the denominator being the GDP price deflator P —rescaled to 1 for 1961.³³ As Figure 11 illustrates, the relative cost of providing government services has risen for both countries over the 40-year period as a whole, but at two different rates. At the beginning of the period, the relative cost of government services rose more or less in tandem for both countries. However, from the mid-1960s to 1992, the relative cost of providing government services rose much faster in Canada than in the US such that the gap between the two relative price series increased constantly.³⁴

Following 1992, however, the relative cost of providing government remained constant in Canada while in the US it continued to climb. Hence, even though the relative cost of providing government in Canada has remained above its US counterpart through the end of our time period in 2003, the gap between the two has narrowed. Over the period as a whole, the relative cost of government rose by about 45 percent in Canada and 35 percent in the United States. It follows that changes in these relative costs between 1961 and 2003 are consistent with the hypothesis that at least some of the observed increase in the traditional measure of government size in Canada relative to the US through to 1992 was due to the more rapid rise in the relative cost of producing government goods and services in Canada. The more rapid rise in the cost of providing US government services since 1992 is consistent with the more recent closing of the traditional size gap.

FIGURE 11
The Relative Cost of Government: The “Price” of Government Relative to the GDP Deflator, 1961–2003



Source: See Appendix B – Data Sources.

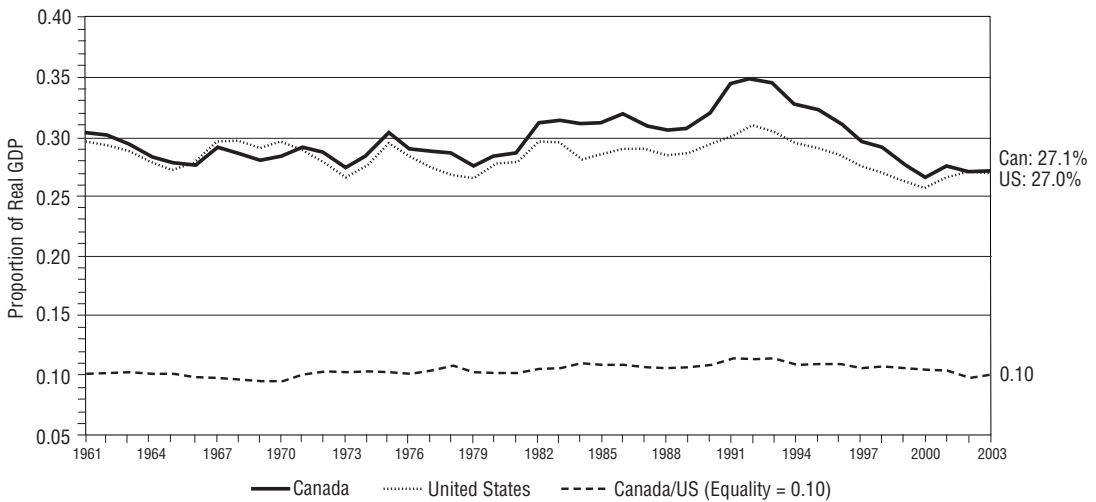
The difference that this rise in the relative cost of providing government services in Canada makes to the traditional measure of government size is illustrated by comparing the new measure of “real” government size in Figure 12 with the comprehensive measure of government size in Figure 8. To construct Figure 12, the comprehensive measure used in Figure 8 was divided by the relative cost of providing government shown in Figure 11 to derive a “real” quantity measure of government size that compensates for relative price changes.³⁵ This means that government expenditures in the numerator are now deflated by the relative cost of government services rather than by the GDP deflator. Relative costs are again re-centered on 1961 so that

Figure 12 reflects constant 1961 prices for both government services and all final goods and services.

Figure 12 suggests that after accounting for the rise in relative cost of providing government, neither country has experienced much if any increase in “real” size since 1961. Variations in real US government size appear to reflect a response to the oil shocks of 1973 and 1979, and to the recessions of 1981–82 and 1990–92, but produce no discernable upward trend overall. In Canada, the adjusted measure of government size follows the US pattern, with the more rapid US rise in relative cost through 1992 largely (but not completely) removing the bulge that had appeared in the ratio of nominal measures

FIGURE 12

Comprehensively Defined Real Government Expenditure as a Proportion of Real GDP:
 [Nominal G / "Price" of G] / [Nominal GDP / "Price" of GDP], 1961–2003



Note: G = government.

Source: See Appendix B – Data Sources.

presented in Figures 4, 7 and 8. Also highlighted by the measure in real terms is that government size in Canada does not follow the US in retreating back after the 1980–82 recession, and that it rises even more quickly through the recession of the early 1990s.

After 1992, Canada experienced a “real” fall in government size that more than offsets the more rapid increases in relative cost that took place in the US in that period. Hence for the period as a whole, Canada began with a government that in real terms used roughly the same 30 percent of GDP as did the US, and then ended in 2003 with a measured real size of government that was only one-tenth of a percentage point larger than that of the US. Over the entire period, *real* government size in both countries was some 3 percentage points *smaller* than it was in 1961!

CONCLUSIONS

What can be made of these comparative figures? First, it appears that there is a surprising degree of conformity in both the level and the rate of change of the relative expenditure size of government between Canada and the United States over a long period. Our reformulated comprehensive spending measure of government size, in Figure 8, indicates that the public sector grew in a broadly similar manner for both countries over the period 1929–2004, suggesting a broadly similar degree of involvement with the private economy. If we consider measures of aggregate *real* size, as in Figure 12, the broad similarity in evolution of total size over the period remains in the data, but the conclusion that government has continually grown does not hold. After accounting for the faster rate of government growth versus private cost in both countries, (real) government

size appears to have contracted marginally in both countries since the early 1960s.

Second, a comparative perspective allows us to highlight four distinct periods reflected in the data: the pre-war years that include the Great Depression, when Canada was the bigger spender; the immediate post-WWII period when Canadian spending was somewhat smaller; the years between 1960 and 1992, which contain what we have been calling the bulge arising between Canadian and American government; and the post-1992 period when the Canadian public sector contracted sharply relative to our neighbour. In this way, the data suggest that theories which can explain the timing and incidence of spending across time and across countries may be more revealing than are attempts to explain permanent differences in size. Note that even after removing defence expenditures, the source of one important compositional difference between the two countries, the data reveals that while non-defence government spending is permanently larger in Canada—by about 5 percentage points of GDP in 2004—the relative size of the two governments still exhibits the reversal of relative size in the mid-1950s and in the subsequent period of the bulge.

Historically, the removal of the bulge seems largely the product of deliberate government cut-backs in Canada following 1992. As we have seen, these cuts were broadly based, and spread over most of the major components of government spending considered in this paper, including transfers to persons (such as unemployment insurance), consumption (including civilian employment), investment, and subsidies to business. Retrenchment in government also encompassed federal grants to the provinces.³⁶ As the analysis makes clear, these cuts are historically important in magnitude when viewed from the perspective of Canadian and comparative fiscal history.

Third, while it is unclear exactly what price ratio should be used to deflate government services relative to all other goods and services when measuring

size, it does appear that the relative cost of providing government goods and services has risen for both countries and that differences in their rate of change exist. With the price indices used in this paper, the aggregate real size of government as of 2003 was virtually the same for the two countries: about 27.1 percent of real GDP in Canada versus 27.0 percent in the United States. This similarity suggests, somewhat more generally, that comparisons both within and across countries would benefit by at least recording differences in the rate of growth of these costs. Thus if it is true that the demand for government services is relatively inelastic and its relative cost is rising, as many empirical studies have found, then a measure of government size that implicitly deflates both nominal government and non-government outputs on the same basis will typically overstate real changes in the size of government over time. Observations on how these relative costs have changed both over the same period and across countries would help to correct for this bias.

Finally, a number of provocative and as yet unanswered questions have arisen in the course of our investigation, which we collect here as a way of suggesting avenues for further inquiry:

1. Given the broad similarity in trend that has emerged in aggregate government size between Canada and the United States over the last 75 years, why did “the bulge” arise in the comparative size of the two governments?
2. What accounts for the different policy response by the two governments during the Great Depression? Do the American use of government employment and the Canadian use of personal transfers signal a different objective or simply a different category of response?
3. Does government spending in Canada respond more strongly to economic shocks as some of our figures suggest and, if so, why?
4. What are the forces responsible for creating the surprisingly similar trend in the growth of

personal transfers given the seemingly different political ideologies in both countries? If the overall policy strategies have been broadly similar, what accounts for the difference in the timing of their implementation?

5. Why have business subsidies varied so much more in Canada, rising faster than personal transfers until the mid-1980s and falling so dramatically thereafter, whereas in the US the ratio between business subsidies and transfers to persons has remained more or less constant?
6. What accounts for the different ways that the Canadian and American governments chose to fund their expenditures over time? To what extent do differences in deficit policies influence the comparative measure of the size of government? Should government size be compared net of interest payments or inclusive of them?
7. Why did the price of government (the government GDP deflator) rise faster in Canada from 1961 to the mid-1980s, and faster in the US since then? Is this an important part of the explanation of the bulge? And how, if at all, is this related to the fact (discussed further in Appendix A) that the public sector in the US uses substantially more labour relative to total population than in Canada, and that total government employment in the US has fallen relative to its GDP since 1929 while rising in Canada?

We conclude by repeating our earlier caution that to equate any particular set of spending measures of government size with “the” measure of the degree of government involvement in the economy is to ignore the many other important ways in which the government interacts with the economy. Government regulation and tax policies also influence the private sector, yet have little if any direct effect on expenditure measures of government size. Nevertheless, while we exercise caution, we also note that at least one dimension of government involvement—that of real aggregate spending as measured in the national accounts—has evolved in a surprisingly similar way in the two countries. This congruity only

heightens interest in whether it is possible that the degree of government involvement through non-fiscal means has also evolved in the same way. At this stage, however, exactly how one would study this issue is unclear, and it remains a challenging topic for future research.

NOTES

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¹This paper is a shortened version of a longer 47-page paper, Ferris and Winer (2006). In the longer version we also consider employment measures of government size, included in briefer form here in Appendix A, as well as intergovernmental grants and fiscal federalism. Our research period was determined by the earliest date for which such data is commonly available and the latest date for which we had reliable information. The ending date is 2003 in some cases, and 2004 in others. We have tried not to speculate on the most recent developments in either country, which may or may not be revealing of new trends.

²Lal (2003) makes a related point in his extensive and most useful comparison of national accounting practices in Canada and the United States. Lal does not present time series or investigate differences in structure over time.

³The data used in this study are extensive, and what is not confidential is available on authors’ Home Pages at

either <http://www.carleton.ca/~winers> or <http://www.carleton.ca/~sferris>, including a spreadsheet detailing data sources. The disaggregated data used to form the aggregate Fisher implicit price index for government (in Canada) have not been released by Statistics Canada and so remain confidential. We thank Statistics Canada for allowing us its use in aggregate form.

⁴Canada's population has grown from 10.2 million in 1929 to 32.0 million in 2004, while over the same period the US grew from 123.2 to 293.9 million. Thus in terms of US population, over this period Canada has grown from 8.3 to 10.9 percent.

⁵Figure 1 does not compare growth at purchasing power parity since we consider longer time periods for which such measures are not available.

⁶The figures appear to support, to some extent, another often asserted stylized fact: that Canada trades off lower growth for greater stability. We do not pursue this issue here.

⁷The US territories are included to some extent in the US National Income and Product Accounts (NIPA) rest of world sector. To the best of our knowledge, they are not at present integrated into the government sector.

⁸Gross expenditures include government capital consumption allowances.

⁹The US Bureau of Economic Analysis sends somewhat adjusted figures to the Organisation for Economic Co-operation and Development (OECD), where defence is put on a consumption basis. See Mead, Moses, and Moulton (2004) for a detailed discussion of the differences between the NIPA (US) and the 1993 System of National Accounts used by the OECD and the United Nations.

¹⁰Our time period does not allow us to assess the displacement effect from a broader historical perspective predating 1929. For evidence of structural shifts over the entire post-Confederation time period in Canada, see Ferris, Park, and Winer (2006); and Dudley and Witt (2004).

¹¹One should also note that the graphs for the Great Depression years hide the fact that the United States responded to the Depression with public employment programs whereas Canada relied more on transfers to persons. This "difference in category" response to the Great

Depression is another example of the caution that must be exercised in interpreting any single measure of policy response across countries. This difference can be seen by comparing Figures 2 and 3 for the period of the Depression to the transfer-inclusive measure in Figure 4; it is also examined more closely in Appendix A.

¹²Consolidated government investment in Canada as a percentage of GDP was about 3 percent throughout the 1980s. In 1990 it began to fall, bottoming out at about 2 percent of GDP in 1999. This ratio then recovered (so to speak) to 2.6 percent by the end of our sample in 2004.

¹³For a discussion of Wagner's Law in the Canadian context see Bird (1970); Dudley and Witt (2004); and Ferris, Park, and Winer (2006).

¹⁴Both countries include only current payment of transfers to persons from all accounts, including Canada and Quebec pension payments in Canada and Social Security payments in the United States. The figures shown do not include future liabilities, such as those related to underfunded public pension systems, an observation that raises the question of whether and to what extent government accounting should be on an accrual basis. Accrual accounting is interesting as a guide to what may happen in the future, and there appears to be some evidence that public pensions are more unbalanced with respect to the burden on current versus future generations in the US than in Canada (see Gokhale, Page, and Sturrock 1999; Oreopoulos 1999). Nonetheless, cash flow or actual public accounts-based accounting is valuable, and is followed here, because what is a net liability (or asset) in the future depends on many assumptions about how governments will behave in the future.

¹⁵The next section, *Government Size Measured in Relation to Comparable Activities*, describes some of the effects produced by the revision of the national accounts in Canada in the early 1970s, including its effect on early figures which were revised accordingly.

¹⁶Canada's employment insurance program has added considerable cyclical sensitivity to the federal budget. The matter has been studied at the institutional level by Hettich and Winer (1999), who argue that the parliamentary nature of Canadian political institutions allows governments in Canada to respond more quickly to shocks than does a Congressional system with higher transaction costs of deal-making within and across chambers. Finally, we note that comparisons across countries at any particular point

in time should account for cyclical spending differences, as the two countries may not be at precisely the same point in the business cycle. While cyclically adjusted expenditure figures might be employed to deal with the matter, we do not do so here. In any event, the longer-run trends identified and discussed in the text will not be substantially altered by the use of such cyclically adjusted data.

¹⁷We note again that the greater use of personal transfers in Canada during the Great Depression compared to the United States overstates Canadian largess by masking the existence of substantial US spending on government employment programs.

¹⁸Canadian transfer programs that preceded 1957 include Unemployment Insurance (1940); Family Allowances (1944); and Old Age Insurance (1957). In the United States, the mid-1960s saw the introduction of Medicare and Medicaid.

¹⁹Pressure for the reform of personal transfer programs in Canada became apparent after the failure of the personal transfer ratio to fall back following the 1981–82 recession and its dramatic rise in the recession of the early 1990s. In the 1990 Unemployment Insurance reforms, entrance requirements were tightened, the benefit period cut back, and penalties for quitting without just cause were increased. In 1993, benefits were reduced relative to insurable earnings, more restrictions for qualification were added, and benefits were ended for those quitting without just cause. Other personal transfer cutbacks in the early 1990s included a revised Old Age Security plan, and the cap on the Canada Assistance Plan which likely reduced provincial transfer spending.

²⁰Do subsidies to business embedded in US defence expenditure grow fast enough to overturn the comparison based only on explicit subsidies in Figure 6? This question cannot be answered here because we do not have data allowing us to separate these implicit subsidies from total US defence spending.

²¹Roughly one-third of this category's reduction of the bulge was due to greater net interest payment reductions in Canada versus the US (i.e., 2.07 points of the 6.3 percentage point reduction between 1992 and 2004).

²²This section relies on the recent comparison of similarities and differences in US and Canadian national accounting practices undertaken by Lal (2003). Other work by Lal (1991, 1994, 1998) is also helpful.

²³The argument used by Statistics Canada is that finance rather than control is observable and hence can be quantified more objectively.

²⁴Universities are over 70 percent financed by government, and hospitals entirely so (Lal 2003, 33).

²⁵For Canada, we added the following to the national accounts measure of government spending: all private consumption expenditures on hospitals both before and after 1961, all private consumption expenditures on universities before and after 1953 including tuition payments, and all private consumption expenditures on non-university post-secondary education from 1953 onward (it was essentially zero prior to 1953).

²⁶To the national accounts measure of government spending for the United States, we added all operating expenditures of non-profit hospitals and private (non-profit) universities including capital consumption allowances, and tuition paid to public universities. We did not add in private expenditures on non-profit hospitals as much of this is financed by Medicare and Medicaid, which in turn is already included in government transfers to persons. This will bias the US figures downwards by a small percentage of GDP.

²⁷When government is falling in size, as it has been in Canada since the early 1990s, the required adjustment may actually be reversed. Thus there may be some overcompensation for differences in depreciation methods embedded in our figures in the last decade of our time period.

²⁸The US Bureau of Economic Analysis does send somewhat adjusted figures to the OECD for its comparative national accounting data that begins in 1961. These data show the same Canada-US differences over time, namely, "the bulge."

²⁹This result becomes the numerator in the size ratio comparison of our GDP measure to Usher's (1986) net national income (NNI) measure of government size presented in Appendix A.

³⁰The spike in the relative size measure in 1939 reflects Canada's earlier entrance into WWII.

³¹Flexible response meant a decline in the ability of European powers to free ride on an American-Soviet strategy of mutually assured nuclear destruction. See Sandler (1992, 102-103).

³²See Figure 10c in our longer working paper (Ferris and Winer 2006) and in the accompanying spreadsheet.

³³The use of the chained Fisher, rather than Laspeyres or Paasche, price indices to represent price change is a relatively recent innovation. The US has recalculated its price indices back through 1929 but Canada has redone these indices (in general) only back to 1981. The price indices used in this section were calculated by Ting Sung for the consumption and investment portions of government spending from data kindly provided by Statistics Canada. The confidential nature of this data means that we can report only the method used to calculate the sector aggregate.

³⁴The source of this faster rise in cost in Canada is, as yet, poorly understood. Baumol (1967) argues that costs will rise faster in the public sector than in the private sector since the public sector is relatively labour intensive and so cannot adapt to technical change as effectively as the private sector. However, the ratio of government employment to total employment is consistently higher in the US, at about 8 percent of population since 1981, compared to roughly 4.5 percent in Canada (declining from 5.75 in 1981 to about 4 percent by 2003; see Appendix Tables A3 and A4); and the ratio of government employment to GDP has declined steadily in Canada from an index of about 3.2 in 1981 to less than 1 in 2003, while rising over the same period in the US (not shown, but see the spreadsheet at <http://www.carleton.ca/~winers> or <http://www.carleton.ca/~sferris>). Hence it is not easy to see how one would adapt Baumol's cost disease hypothesis in this comparative context.

³⁵Hence with G representing the level of nominal government spending, the real measure of government size is determined as $[(G/P) / (GDP/P)] / P_g/P = (G/P_g) / (GDP/P)$. The division of the entire numerator by the government services price index assumes that the cost of the transfer component of government spending rose at the same rate as the other elements of government spending. If the transfer subcomponent of government spending was deflated instead by the overall GDP price index, to reflect the value of transfers to recipients rather than the cost of production, the absolute measure of size would fall for both countries (Canada from .271 to .242; the US from .270 to .242) without affecting their comparative size. This is because in the recalculation, the effect of the replacement of the higher relative cost of government

services in Canada with the GDP deflator for the transfer component, which tends to make the Canadian public sector bigger, is offset by the relatively smaller (compared to the US) size in 2004 of transfers in Canada's measure of comprehensive government. This discussion provides yet another example of why it is difficult to define, measure, and compare public sectors across countries.

³⁶Retrenchment is evident from the spreadsheet available at <http://www.carleton.ca/~winers> or <http://www.carleton.ca/~sferris>. Federal grants to the provinces were about 3 percent of GDP in 1960, and averaged about 4 percent of GDP from the mid-1960s until the late 1980s. In the early 1990s, federal grants were substantially cut so that by 1995 they were again at about 3 percent of GDP, rising only slightly by the end of our sample period.

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APPENDIX A

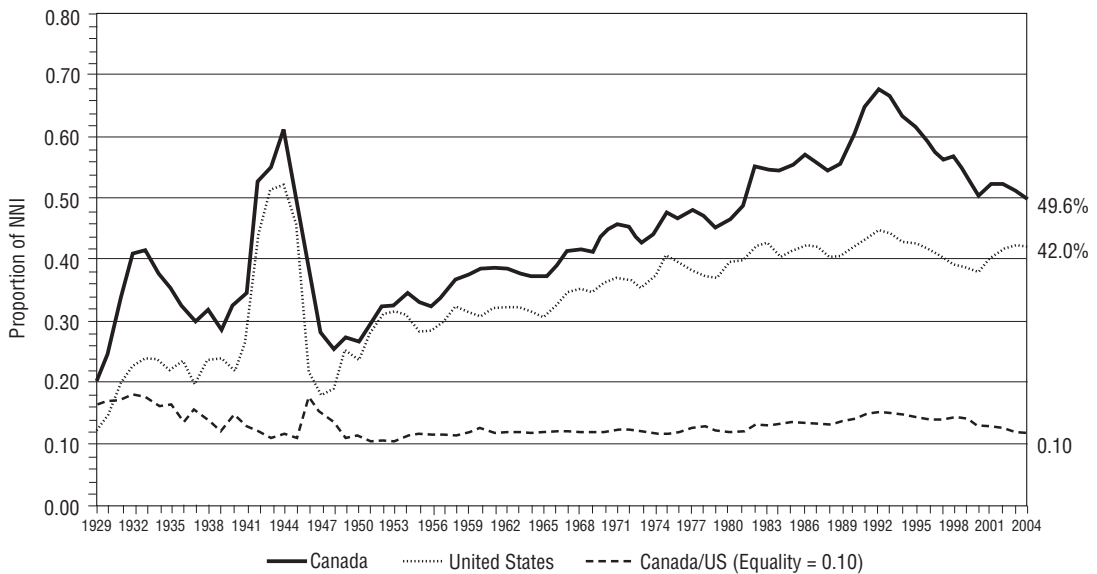
COMPARISON OF GOVERNMENT SIZE BASED ON PUBLIC SECTOR EMPLOYMENT AND OTHER MEASURES

The Size of Government Relative to Aggregate Productive Capacity

Figure A1 presents Usher’s (1986) preferred method of measuring the relative size of government. Here public expenditure is divided by national income at factor cost—gross national expenditure less indirect taxes plus subsidies—to reflect the share of productive capacity devoted to the production of public services. Figure A1 is to be compared to Figure 8. Since national income at factor cost is less than gross national expenditure, because indirect taxes are always greater than subsidies, the relative size of government in Usher’s approach is larger than if GDP (alone) is used in the denominator.

But while government size relative to each economy is somewhat different under Usher’s approach—both public sectors are larger as a fraction of each economy, because the denominator in the relative size measure is now smaller, and Canada is somewhat bigger in size compared to the US—the comparative pattern over time remains broadly similar. The evolution over time, including the “bulge” that peaks in 1992, remains more or less the same as discussed in the text. The size difference using the most comprehensive measure of expenditures in 2004 is now 7.6 percentage points (of national income at factor cost) rather than 1.5 percentage points (of GDP). Note that in comparing Figure 8 with Figure A1, tax structure now matters, as a shift from direct to indirect taxation increases the relative size of government.

FIGURE A1
Comprehensive Measure of Government Size as a Proportion of Net National Income at Factor Cost, 1929–2004

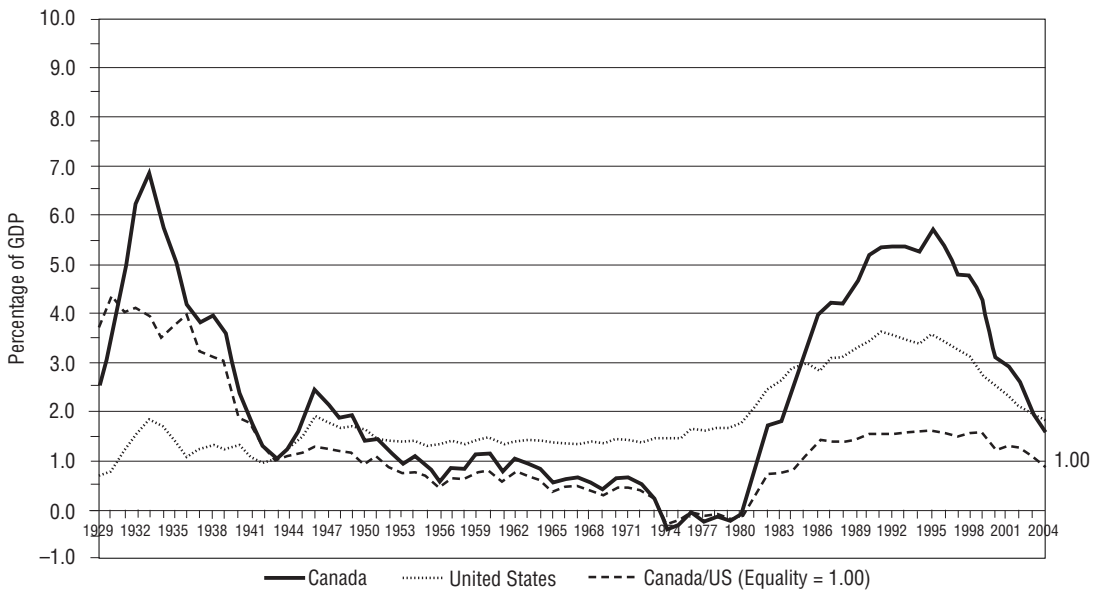


Note: NNI = Net National Income.
Source: See Appendix B – Data Sources.

Consolidated Government (Net) Interest Payments as a Proportion of GDP

Figure A2 shows net interest payments to the private sector as a proportion of GDP. It is interesting to note that from 1950 until the recessions of the early 1980s and early 1990s, the US appears to have consistently relied upon deficit financing to a greater extent than Canada, judging by the consistently greater expenditure on debt interest as a fraction of GDP.

FIGURE A2
Comprehensive Measure of Government Size as a Proportion of Net National Income at Factor Cost, 1929–2004



Source: See Appendix B – Data Sources.

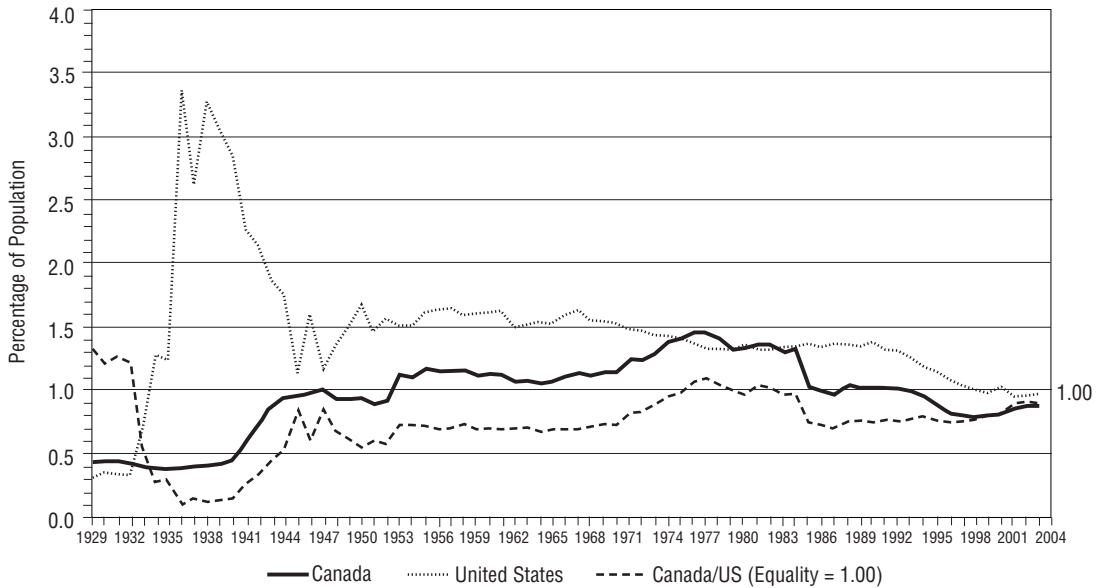
Using Employment to Measure Government Size

An alternative method of measuring the real resources absorbed by the government sector is to ask what proportion of the nation’s real resources have been absorbed into the production of these goods and services. Because information exists best with respect to labour inputs, we ask what differences have arisen in the proportion of the population employed in government across the two countries.

While good information exists for employment in all levels of government in the United States, a complete time series for employment in Canada exists only for federal civilian employment (excluding employment in government enterprises) for the entire 1929 to 2003 time period. These employment measures as a proportion of population size are shown in Figure A3.

FIGURE A3

Federal Civilian Employment (Excluding Employment in Government Enterprises) as a Percentage of Population, 1929–2003



Source: See Appendix B – Data Sources.

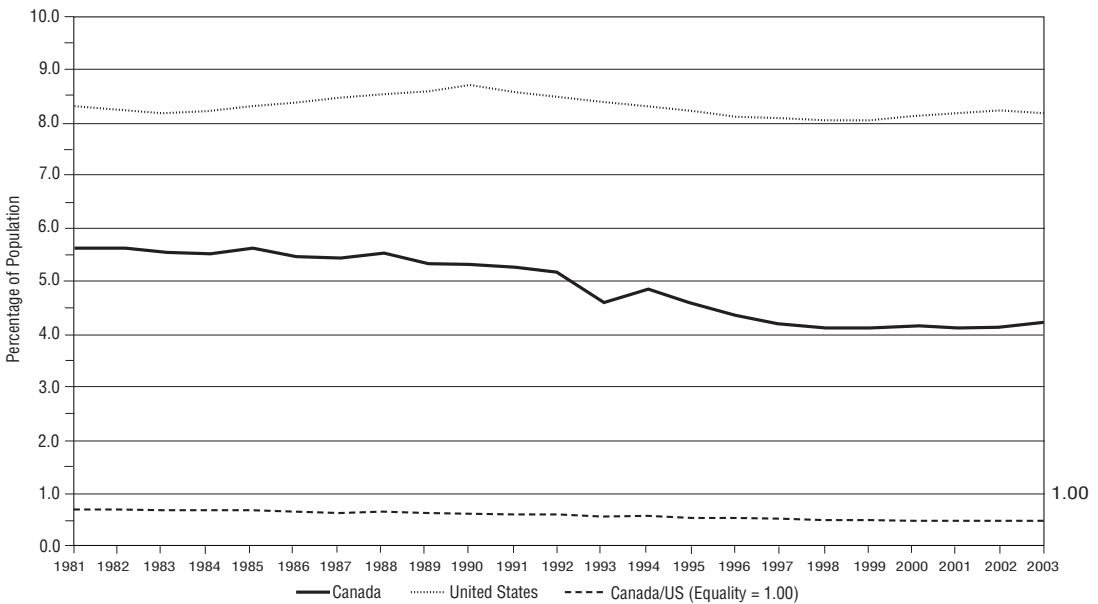
Here we see that except for a few years in the early 1930s before the US response to the Great Depression, and a short period in the late 1970s, the US federal government employed a much larger proportion of the civilian population than did Canada, though by the turn of 21st century the two levels have substantially converged. This appears anomalous given that the non-defence expenditure measures of relative government size discussed earlier show Canada to be persistently larger.

Aside from this difference in levels, two features of federal civilian employment in the US stand out. First, the government response to the Great Depression in the US was to use employment (e.g., work relief) to a much greater extent than did Canada when, as noted earlier in our discussion of Figures 4 and 5, transfers to persons rose substantially. This is an indication of how countries can adopt similar policies of assistance and fund them through different subcomponents of spending. An implication is that cross-country comparisons using single measures of government size as indicators of policy change (e.g., consumption versus total expenditure measures) can sometimes mislead through differences in the ways that these policies are implemented and accounted for in the National Accounts. Second, while Canada exhibits a dramatic, permanent doubling of the size of civilian government employment during WWII, the United States shows more variation in civilian government employment in relation to its more frequent military engagements (Korea, Vietnam, Afghanistan, and Iraq) in combination with falling defence expenditures more generally following the collapse of the Soviet Union after 1989.

As for the evolution of government employment over time, Figure A3 shows that the share of US federal employment has fallen slowly since its post-WWII peak in the early 1950s, whereas Canada's federal employment size rose continuously through the mid-1970s. Following its peak in 1977, the share of federal employment in Canada declined, especially in the historically large and precipitous drop about the time that the Mulroney Conservative government was first elected in 1984. A smaller but still noticeable drop occurred following the 1994 election of the Chrétien Liberal government. In contrast, the US employment share continued its slow decline over the course of several electoral periods until 1992, when the decline accelerated into the present.

In Figure A4 we present *total* government employment at all levels, *including* employment in government enterprises and the military. Total government employment is presented as a percentage of population, and represents the employment counterpart to the comprehensive measure of expenditure size in Figure 8. Although complete employment data for both countries were available only for the final 23 years in our sample,¹ from 1981 to 2003, these numbers indicate a rough constancy in the overall level for the US, at slightly over

FIGURE A4
All Government Employment Including Enterprises and the Military as a Percentage of Population, 1981–2003



Source: See Appendix B – Data Sources.

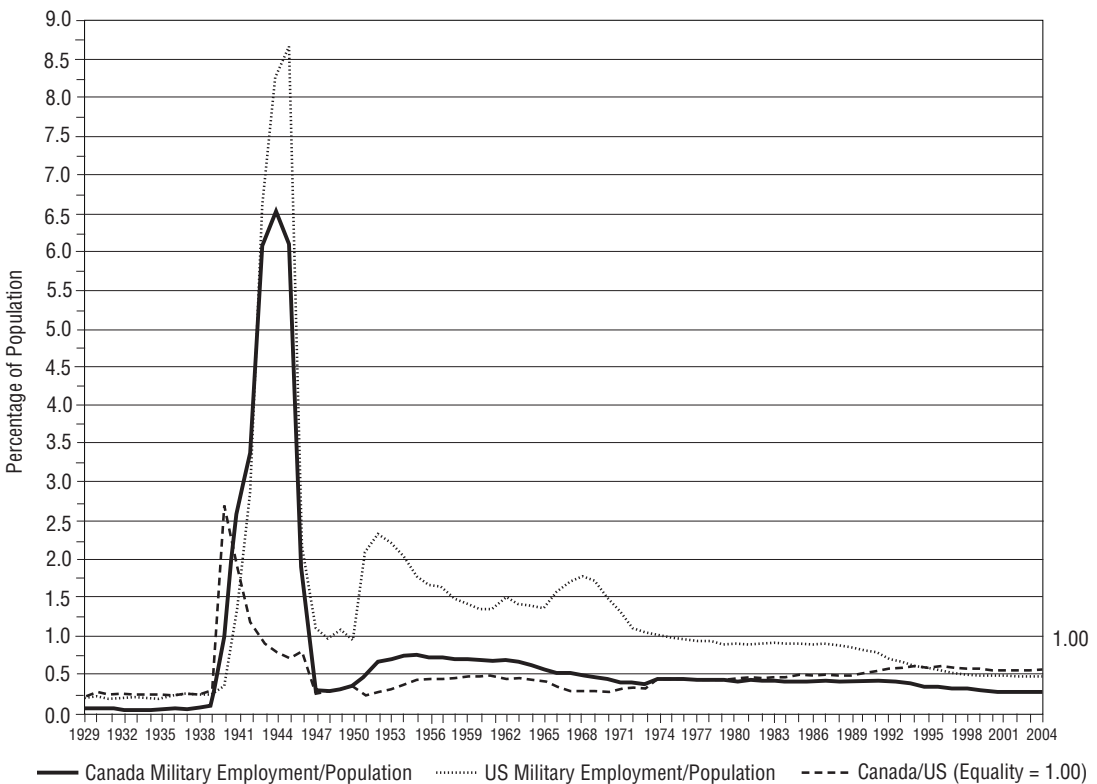
¹We were able to collect complete employment data for all government categories in the US since 1929. In Canada, however, we could find federal government enterprise employment figures only from 1954 onward, provincial numbers from 1959 onward, and local government enterprise employment numbers only from 1981. Hence a series incorporating all government employees is available for Canada only from 1981 onward.

8 percent of US population. The corresponding percentage for Canada is both lower and falling from about 5.5 percent in the 1980s to slightly more than 4 percent by 2003. The ratio of total employment to GDP as an index (with 2000 = 1), which is not shown in a chart here, has declined in Canada relative to GDP, from about 3.25 in 1981 to slightly less than 1 in 2003, while in the US, total government employment has risen relative to GDP from about 0.4 to slightly more than 1 by 2003.

The aggregate employment numbers thus indicate that by 2003, comprehensively defined government in the US utilized roughly twice as large a percentage of population as did Canada. Moreover, while the US ratio remained roughly constantly over the period, Canada's ratio fell by a third. Whether or not this pattern is anomalous in comparison with the expenditure measures and in view of the bulge in Canadian relative to American government size as measured by comprehensive spending depends of course on the evolution of public sector wages, indices that we have not been able to assemble on a comprehensive and comparable basis.

What *can* be established is how much of the difference in employment can be accounted for by the larger military establishment in the United States. In Figure A5 we plot the number of military personnel as a

FIGURE A5
Military Personnel as a Percentage of Population, 1929–2004



Source: See Appendix B – Data Sources.

percentage of total population. This figure mirrors closely the expenditure measure of defence size presented earlier in Figure 10a, a fact that suggests that defence requires roughly fixed proportions of labour relative to non-defence spending.² The measured difference in military size, however, can account for at most 0.5 of the 4-percentage-point difference in total government employment size between the United States and Canada.

It follows that a different perspective on government size arises when employment rather than expenditure is used to measure size. The removal of defence employment does not lead to the substantial increase in relative size in favour of Canada that the removal of defence spending did (see Figure 8 versus Figure 10b), nor does there appear to be any bulge in the pattern of employment in the later time period. Measured in terms of total employment as a percentage of total population, the US government size is always consistently larger.

It is likely that the larger size of public sector employment in the US is due to the greater number of governments (50 states versus 10 provinces, and the large number of county governments in the US). What this means for the efficiency of government in the two countries is another matter.

²One would expect this ratio to be more variable for non-defence spending. Writing larger numbers on a larger number of cheques to transfer recipients would not seem to require a proportionately larger number of public servants.

APPENDIX B
DATA SOURCES

Most of the data are from the Canadian National Income and Expenditure Accounts (Statistics Canada) and from the US National Income and Product Accounts (Bureau of Economic Analysis). Several other sources are also used, including unpublished data from Statistics Canada on which the government deflator for Canada is based. While not directly referred to in the paper, the historical work of Gillespie (1991) as updated by the authors has been helpful.

An extensive list of data sources is provided in an Excel spreadsheet available at the authors' Home Pages, <http://www.carleton.ca/~winers> and <http://www.carleton.ca/~sferris>. To be sure about which statistics lie behind a given chart in the spreadsheet, click on the data series in the chart to follow the spreadsheet to the source. The details of data sources are given below each sheet, and more than one sheet may have to be consulted to clarify the precise origin and construction of a particular series used in the figures. The numbering of the figures printed here is the same as in the online spreadsheet, except that Figures A3, A4, and A5 are Figures 13a, 13b, and 14 in the online version. The spreadsheet also includes charts that do not appear in the paper.