

JUNE 2015



AN ANALYSIS OF **PUBLIC AND PRIVATE SECTOR EMPLOYMENT** TRENDS IN CANADA, 1990–2013

by Livio Di Matteo

PUBLIC SECTOR (FEDERAL, PROVINCIAL, LOCAL)



PRIVATE SECTOR



2003

2013

Contents

Executive summary / iii

Introduction / 1

Data and analysis / 3

Implications of a growing public sector share of employment / 15

Conclusions / 22

References / 24

About the author / 28

Acknowledgments / 28

Publishing information / 29

Supporting the Fraser Institute / 30

Purpose, funding, & independence / 31

About the Fraser Institute / 31

Editorial Advisory Board / 32

Executive summary

This paper examines the evolution of public and private sector employment at both the national and provincial levels. While the public sector share of employment in Canada declined during the 1990s, its growth resumed during the first decade of the 21st century. Specifically, there was a decline in the public sector share of employment starting in 1992, from 26.1 percent to 22.3 percent by 2003. Subsequently, an increase began, with a peak of 24.4 percent reached in 2010 and then a slight decline to 24.1 percent by 2013.

The public sector share of employment today has recovered to levels not seen since the early 1990s—an era of large government deficits, debt, and then fiscal restraint. The decline in the public sector share of employment in the 1990s was a response to the fiscal crisis brought about by large deficits and debts at both the federal and provincial levels. In the wake of the 2008–09 fiscal crisis and recession, deficits have again grown at the federal and provincial levels, resulting in some measures of fiscal restraint; but the public sector share of employment has to date remained stable at its recovered level.

With the exception of Newfoundland and Labrador, which saw a decline, all the other provinces have seen an increase in their share of public sector employment over the 2003 to 2013 period. The biggest increase was in Ontario, which saw its public sector share of employment grow from 20.0 to 23.2 percent. That 3.2 percentage point increase represents growth in the share of 16.0 percent.

Canada has seen the public sector's share of employment grow because the number of public sector employees has increased faster than the number of private sector employees. Specifically, from 2003 to 2013, Canada's public sector employment growth rate (22.6 per cent) was more than double the private sector rate (10.7 per cent). During this period, the growth rate of private sector employment was greater than the public sector rate in only one province: Newfoundland and Labrador (14.0 percent compared to 11.8 percent). In Ontario, the public sector employment growth rate (27.6 percent) topped the private sector rate (5.6 percent) by 22 percentage points.

While government spending and employment may serve as a complement to private sector activity by providing infrastructure for private sector activity, there may also be adverse effects. The balance between public and private sector employment is of policy importance given the importance of

private sector wealth generation as the foundation for resources that are used for public sector service provision and subsequent employment generation.

An important dimension of this relationship is that public sector employment growth may also crowd out private sector employment, leaving unemployment rates either unchanged or possibly higher. While correlation is not causation, simple exploratory correlations suggest that, for Canada's provinces over the 1990 to 2013 period, larger public sector employment shares are accompanied with lower growth rates of private sector employment and show a flat relationship with per-capita GDP growth rates.

A full evaluation of whether or not the public-private employment balance has an effect on employment growth and unemployment rates requires controlling for the government's budget balance, the state of the business cycle on public sector employment, as well any potential complementarities between public and private sector employment. Nevertheless, these correlations are of interest in demonstrating the importance of the public-private employment balance on economic performance and the need for further work that rigorously assesses causation and confounding factors.

Introduction

Public sector employment in Canada recently resumed growing faster than private sector employment.¹ Public and private sector economic activities do not exist in separate, watertight compartments and can affect each other—sometimes with significant positive as well as negative spillover effects.² Public sector employment growth may indeed even crowd out private sector employment, leaving unemployment rates either unchanged or possibly higher.³ Indeed, the impact of the growing share of public sector employment on employment growth, private sector employment, the unemployment rate, and per-capita income growth is an important area for research and analysis.

This study examines the evolution of public and private sector employment at both the national and provincial levels. While the public sector share of employment in Canada declined during the 1990s, its growth resumed during the first decade of the 21st century. Specifically, there was a decline in the public sector share of employment⁴ starting in 1992 from 26.1 percent to 22.3 percent by 2003. Starting in 2004, an increase began, with a peak of 24.4 percent reached in 2010 and then a slight decline to 24.1 percent by 2013. The public sector share of employment today has recovered to levels

1. The term public sector rather than government employment is used because government employment is a more narrow term and does not generally cover the broader public sector that includes those who work for a crown corporation or a government funded establishment such as a school (including universities) or hospital.

2. Mainstream public finance theory stresses the distinction between a private sector and a public sector. Another view of government and the public sector, known as the Italian School of public finance, focuses on the role of institutions. Associated with the work of Antonio De Viti De Marco, it does not see the public and private sectors as watertight compartments. De Viti De Marco (1936) viewed public and private activity as intertwined, recognizing the mutual interdependence of the two sectors.

3. As Behar and Mok (2013: 4) note: “It is arguably the case that a private-sector job is more desirable than a public-sector job from a public policy point of view, because no change in unemployment means government resources could have been allocated elsewhere.”

4. This measure of employment excludes the self-employed.

not seen since the early 1990s—an era that was marked by large government deficits, high debt, and then fiscal restraint.

Robust private sector employment growth is an important characteristic of a successful market economy. Private sector employment flourishes best in an environment of free markets that provide individual opportunity within a stable and secure set of government institutions.⁵ The public sector provides the social and physical infrastructure needed to support and complement private sector employment activity, as well as to generate employment by providing those goods and services that citizens have elected to collectively provide through the tax and expenditure system.⁶ However, increases in government spending and employment may also have a negative impact on private sector economic activity and employment via their effects on real wages or interest rates resulting in crowding out.⁷

The remainder of this report is divided as follows. The first section describes the data and examines employment in Canada and its breakdown into public sector, private sector, and self-employment over time and across Canada's provinces. The second section addresses the policy implications of growing public sector employment shares, and reviews some of the empirical literature on the impact of public sector employment on private sector employment. Finally, an exploratory analysis using simple correlations between public sector employment shares and economic performance variables is presented using provincial-level data.

5. The important role of institutions in affecting economic performance such as secure property rights and economic freedom is well documented in the Fraser Institute's work on economic freedom. See <<http://www.fraserinstitute.org/uploadedFiles/fraser-ca/Content/research-news/research/publications/economic-freedom-of-the-world-2014.pdf>>. For further work on the role of institutions in economic performance, see North (1987, 1990). As well, trust, well-functioning bureaucracies, and low levels of corruption have been examined as institutional factors determining economic growth. See Abdiweli (2003), Asoni (2008), Sturm and De Haan (2001), Rodrik (2007), and Rodrik et al. (2004). The central roles of trust and social capital are explored in Fukuyama (1996) and Knack and Keefer (1997).

6. Key public goods that are important ingredients for private sector activity include defence, police, and contract enforcement.

7. See Malley and Moutos (1996: 290).

Data and analysis

This section examines the data on the levels of public and private sector employment in Canada, their evolution over time, and their distribution across Canada's provinces. The next section briefly discusses the possible economic and employment effects of public sector employment. The employment data for this analysis was obtained from Statistics Canada (2014a) and consists of annual estimates of employment by class of worker for the period 1990 to 2013 using the North American Industry Classification System. The *total employed* are for all industries and total employment is defined as private sector employees, public sector employees, and the self-employed, for both sexes.

The period 1990 to 2013 is significant in Canada in that it marks the end of a period of post-war expansionist state activity and ever increasing deficits and debt. The 1990s witness the federal fiscal crisis and reforms to transfer payments, as well as the return to fiscal balance. There are public sector reforms and deregulation during this period, both at the federal level and across the provinces.⁸ The period of fiscal adjustment during the early 1990s was followed by a period of substantial economic growth, coinciding with a commodity price boom that continued until the fiscal crisis and Great Recession in 2008–09.⁹

8. The 1995 federal budget put in place important fiscal reforms that reduced nominal spending and led to a decline in the size of government relative to the economy, budget surpluses, and a fall in the net debt to GDP ratio. For a discussion see Veldhuis, Clemens, and Palacios (2011). At the provincial level, for example, Ontario saw the launch of a series of economic and public sector reforms. These changes were broad based and involved an attempt at public sector restructuring that included hospital consolidation, municipal amalgamation, shifting services to municipalities, consolidating school boards, property tax reform, and transfer cuts to transfer partners such as municipalities, schools, and universities. There was also electricity reform with the proposed deregulation and privatization of Ontario's electricity system. See Di Matteo, Clemens, and Palacios (2014).

9. From 1995 to 2008, real GDP in Canada grew at an average of 3 percent annually. In 2009, real GDP shrank by 2.7 percent but then resumed growth, though at a lower average rate. Between 2010 and 2013, the average annual rate of real GDP growth was 2.6 percent (Statistics Canada, 2015, and author's calculations).

Data description

Public sector employees are defined as those who work for a local, provincial, or the federal government, for a government service or agency, a crown corporation, or a government funded establishment such as a school (including universities) or hospital. Private sector employees are defined as those who work as employees of a private firm or business. If a worker is not in an employer-employee relationship, then they are deemed to be self-employed. In 2013, public sector employees accounted for 21 percent of total employment, while private sector employees accounted for 64 percent and the self-employed 15 percent.

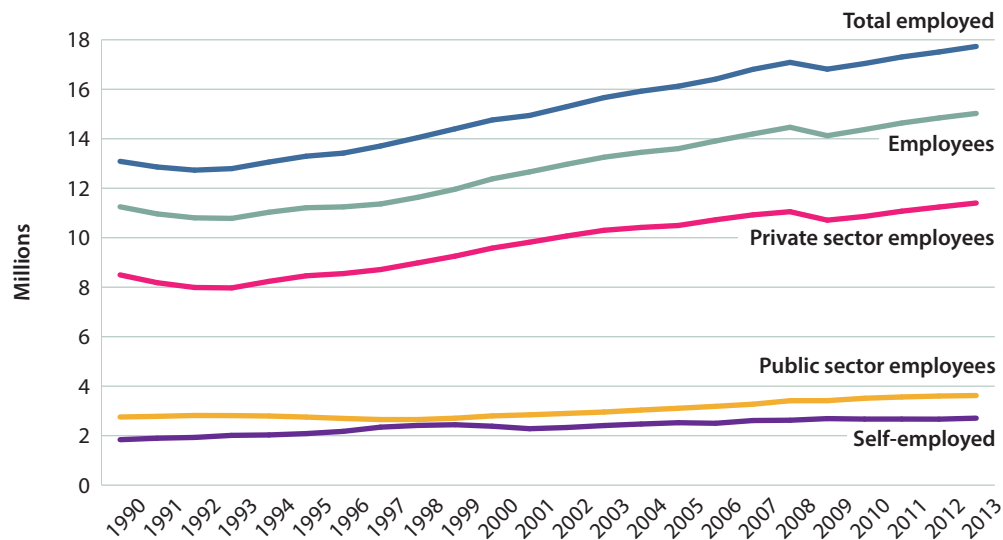
It should be noted that these are official definitions employed by Statistics Canada, but there may indeed be some potential for overlap in terms of these classifications. The self-employed are not public sector employees but as they are not in an employer-employee relationship, they are categorized separately from private sector employees. It should also be noted that one can be self-employed and be working on contract to the government, or a private sector firm may have government contracts with its employees engaging in work on behalf of the public sector. It is not possible to disentangle these potential features from the data as constructed by Statistics Canada.

Canada

Total employment (private, public, and self-employed) in Canada grew from 13.1 to 17.7 million between 1990 and 2013, with an average annual growth rate of 1.3 percent ([figure 1](#), [figure 2](#)).¹⁰ Over the period 1990 to 2013, the number of public sector employees grew from 2.8 to 3.6 million—an annual average growth rate of 1.2 percent—while the number of private sector employees grew from 8.5 to 11.4 million for an annual growth rate of increase of 1.3 percent. While the self-employed represent the smallest proportion of the total employed, their numbers grew from 1.8 to 2.7 million between 1990 and 2013, exhibiting the fastest average annual growth rate of 1.7 percent.

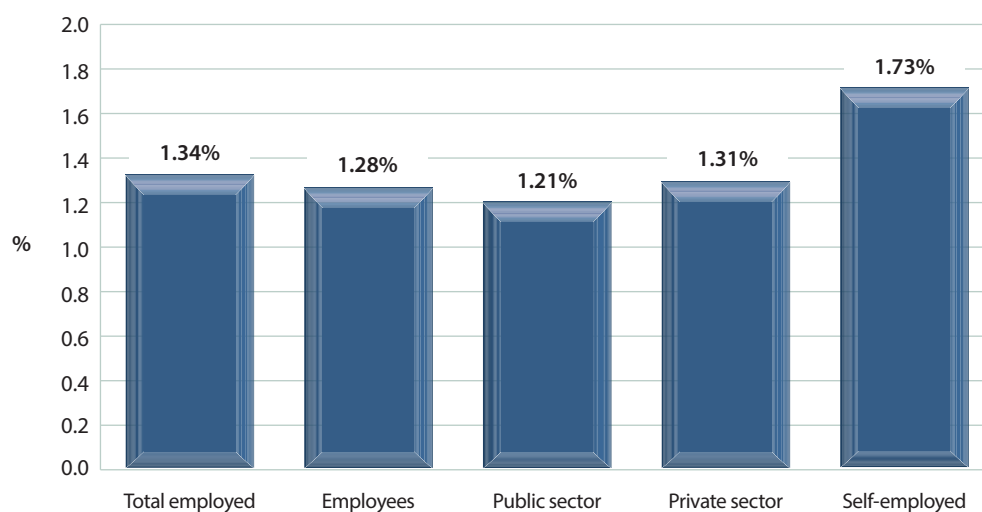
¹⁰ When only the number of employees (private and public employees with the self-employed excluded) is considered, growth is from 11.2 to 15.0 million, representing an average annual growth rate also of 1.3 percent.

Figure 1
Employment in Canada (millions), 1990–2013



Source: Statistics Canada, 2014a.

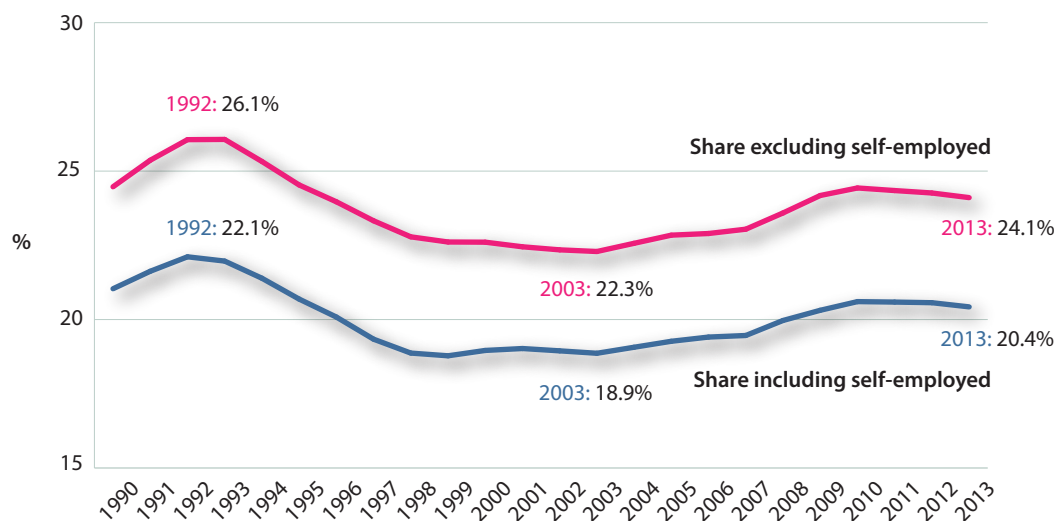
Figure 2
Average annual employment growth in Canada, 1991–2013



Source: Statistics Canada, 2014a.

Figure 3

Public sector share of employment in Canada, including and excluding self-employed, 1990–2013



Source: Statistics Canada, 2014a; author's calculations.

Figure 3 illustrates changes in the share of public sector employment over time in Canada as a share of employment, both including and excluding the self-employed. While shares differ, the trend over time in the public sector share of employment is the same, whether or not the self-employed are accounted for. There was a decline in the public sector share of employment (excluding the self-employed) starting in 1992 from 26.1 percent and continuing into the early 21st century. The public sector share of employment was smallest in 2002 and 2003 at 22.3 percent. Afterwards, an increase began, peaking at 24.4 percent in 2010 followed by a slight decline to 24.1 percent by 2013.¹¹ While the effects of the 2009 recession were undoubtedly a factor in some of this increase, expansion of the public sector share of employment was underway prior to 2009.

The public sector share of employment today has recovered to levels not seen since the early 1990s—an era of large government deficits, debt, and then fiscal restraint. The decline in the public sector share of employment in the 1990s was a response to the fiscal crisis brought about by large deficits and debts at both the federal and provincial levels. In the wake of the 2008–09 Great Recession, deficits have again grown at the federal and provincial levels, resulting in some measures of fiscal restraint, but the public sector share of employment has to date remained stable at its recovered level.

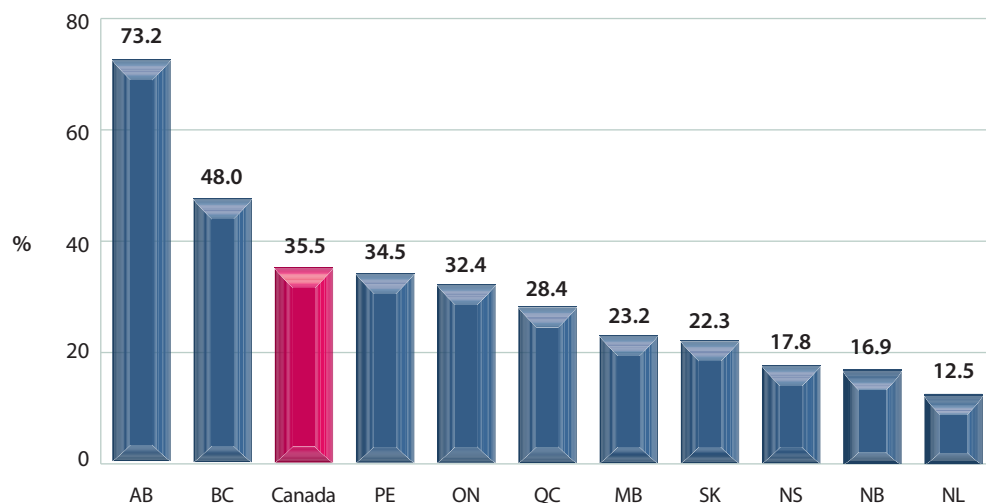
¹¹ When analyzed as a share of total employment, public sector employment declined from 22.1 percent in 1992 to 18.8 percent by 1999. It then remained stable and started rising after 2003, reaching 20.6 percent by 2010.

The Provinces

There is also variation in the extent of public and private sector employment across Canada's provinces. **Figure 4** presents the growth in total employment (including the self-employed) in Canada and the provinces over the period 1990 to 2013. Recall that the data by province includes public sector employees from all levels of government (local, provincial, and federal). Alberta and British Columbia dominated total employment growth during this period at 73.2 and 48 percent respectively—both growing above the Canadian rate of 35.5 percent. They are followed by Prince Edward Island, Ontario, and Quebec, then Manitoba, Saskatchewan, Nova Scotia, New Brunswick, and finally Newfoundland and Labrador in last place at 12.5 percent.

Figure 4

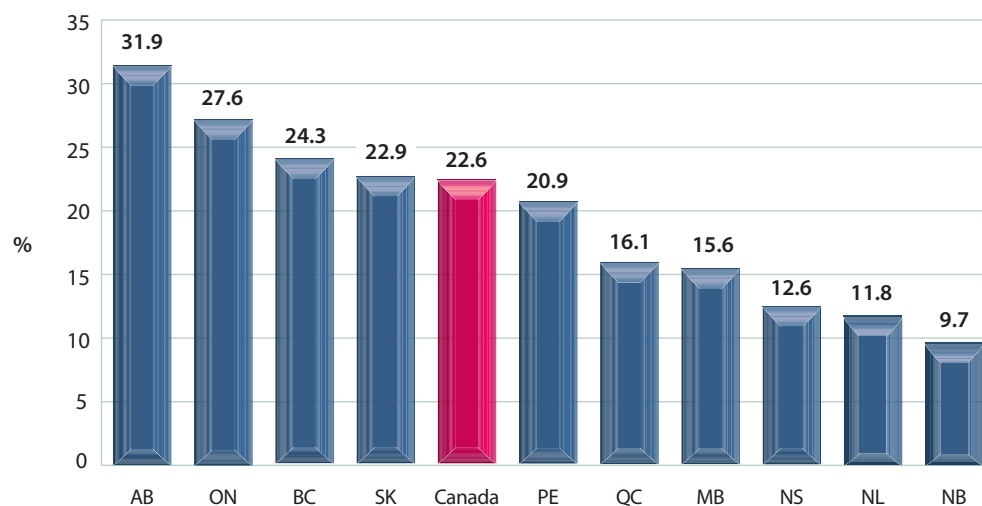
Percent growth in total employment (including self employed),
Canada and Provinces, 1990–2013



Source: Statistics Canada, 2014a.

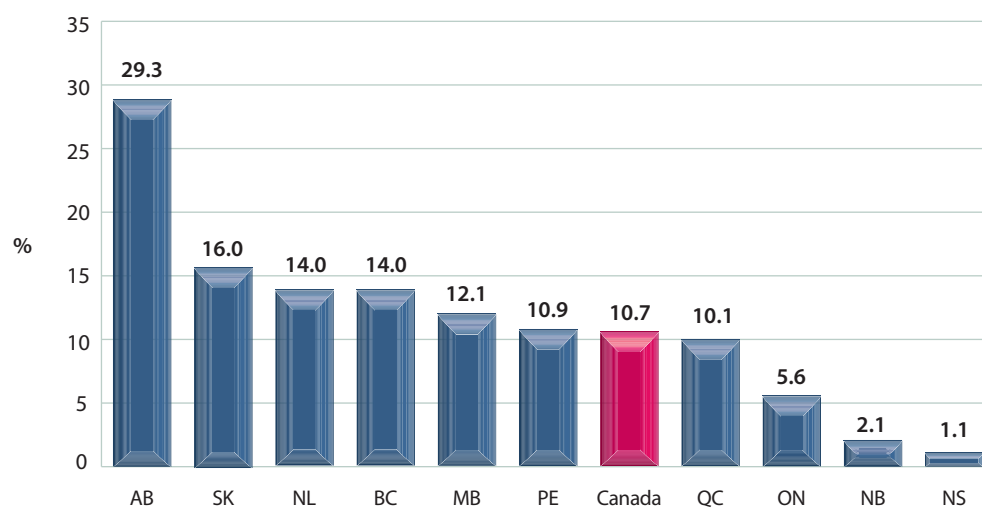
Figures 5a, 5b, and 5c present the growth rate across the three categories making up total employment for each province over the ten-year period 2003 to 2013. With respect to public sector employment growth over the 2003 to 2013 period, it was the largest in Alberta at 31.9 percent, followed by Ontario at 27.6 percent and then British Columbia and Saskatchewan at 24.3 and 22.9 percent respectively. The lowest growth in public sector employment was for New Brunswick at 9.7 percent, with the other low public sector employment growth provinces being Quebec, Manitoba, Nova Scotia, and Newfoundland and Labrador.

Figure 5a
Percent growth in public sector employment, 2003–2013



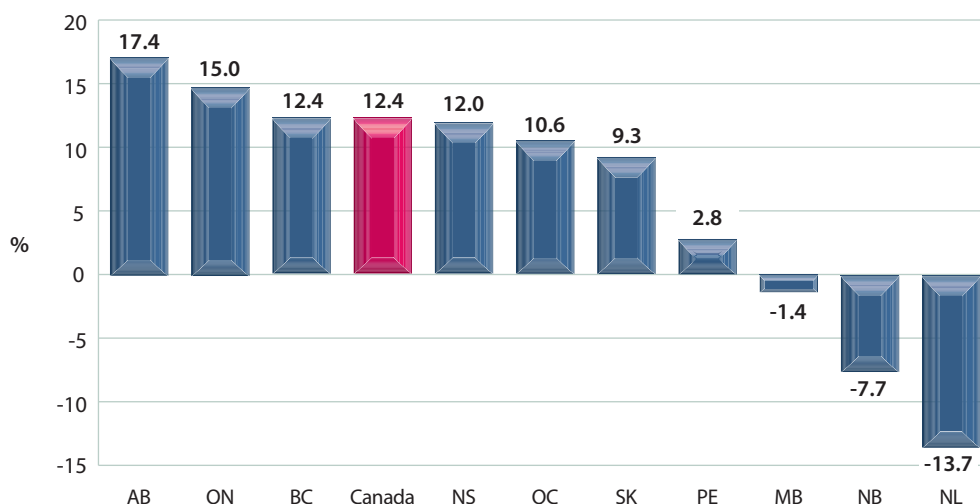
Source: Statistics Canada, 2014a.

Figure 5b
Percent growth in private sector employment, 2003–2013



Source: Statistics Canada, 2014a.

Figure 5c
Percent growth in self-employment, 2003–2013



Source: Statistics Canada, 2014a.

Alberta leads the provinces in private sector employment growth over this period with an increase of 29.3 percent, followed by Saskatchewan and Newfoundland and Labrador as the next highest at 16.0 and 14.0 percent respectively. The lowest private sector employment growth during this period was in Nova Scotia at 1.1 percent; the bottom five private sector employment growth performers also included Prince Edward Island, Quebec, Ontario, and New Brunswick. Robust private sector employment growth during this period especially marked the more resource intensive provinces.

Finally, self-employment growth between 2003 and 2013 was greatest in Alberta, Ontario, and British Columbia at 17.4, 15 and 12.5 percent respectively. Nova Scotia and Quebec were next at 12.0 and 10.6 percent, followed by Saskatchewan and Prince Edward Island at 9.3 and 2.8 percent. There was actually a decline in self-employment in Newfoundland and Labrador (-13.7 percent) New Brunswick (-7.7 percent) and Manitoba (-1.4 percent) during this period.

Of course, growth in public and private sector employment can also be considered in relation to each other. If public sector employment grows faster than private sector employment, this will cause the share of public sector employment to increase. **Table 1** displays the growth rates of public and private sector employment from 2003 to 2013 and the percentage point difference, while **figure 6** presents the percentage point difference in the growth rate between public and private sector employment for the 2003 to 2013 period, ranked from highest to lowest.¹² The table shows that, for Canada as a whole, public sector employment grew much faster than private sector employment. In fact, at 22.6 percent, public sector employment grew by more than double the rate of private sector employment (10.7 percent), resulting in an 11.9 percentage point differential.

Table 1

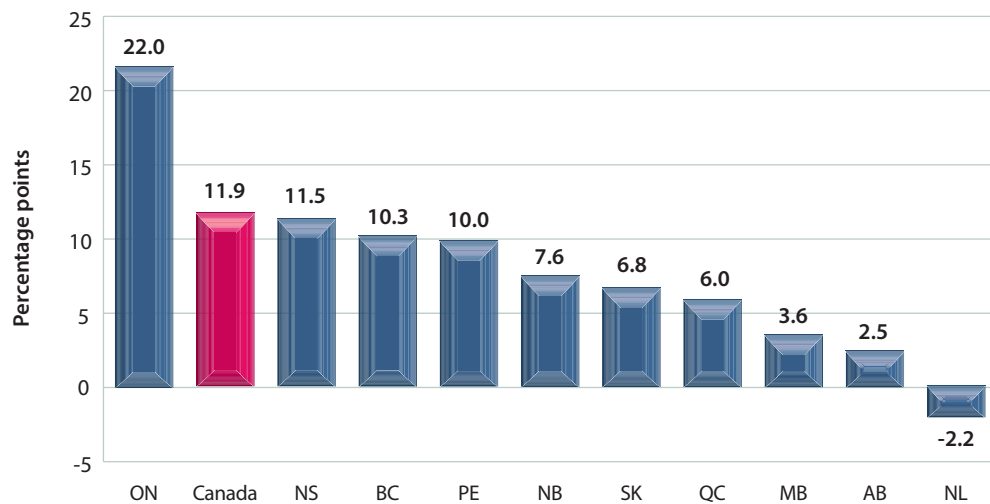
Growth rates for public and private sector employment and percentage point differential, 2003–2013

	Public sector (%)	Private sector (%)	Differential (pp)
ON	27.6	5.6	22.0
Canada	22.6	10.7	11.9
NS	12.6	1.1	11.5
BC	24.3	14.0	10.3
PE	20.9	10.9	10.0
NB	9.7	2.1	7.6
SK	22.9	16.0	6.8
QC	16.1	10.1	6.0
MB	15.6	12.1	3.6
AB	31.9	29.3	2.5
NL	11.8	14.0	-2.2

Source: Statistics Canada, 2014a.

12. It should be noted that if done for the entire 1990 to 2013 period, public sector employment growth in Alberta (38 percent) is much lower than private sector employment growth (86 percent), resulting in a negative 48 percentage point difference. Nova Scotia, Manitoba, New Brunswick, Quebec, and Newfoundland and Labrador also have public sector employment growth that is less than private sector employment growth, with differentials ranging from -7.5 to -4.5 percentage points. In the remaining provinces, the growth rate of public sector employment exceeded that of the private sector, generating a differential ranging from positive 3.6 percentage points in Saskatchewan to 23.3 percentage points in Prince Edward Island.

Figure 6
Percentage point difference between public and private sector employment growth rates, 2003–2013



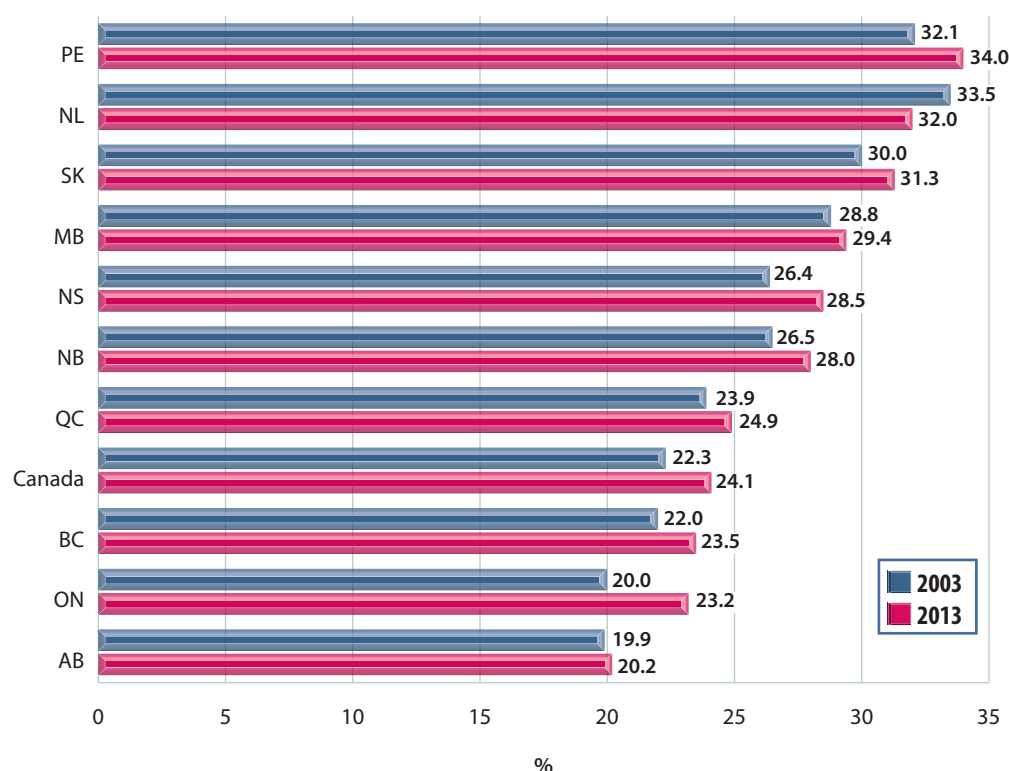
Source: Statistics Canada, 2014a.

During this period, the growth rate of private sector employment was greater than that of the public sector in only one province—Newfoundland and Labrador—with private sector employment growth of 14.0 percent versus public sector growth of 11.8 percent resulting in a positive 2.2 percentage point difference. In all of the remaining provinces, the growth rate of public sector employment exceeded that of the private sector, generating a negative differential ranging from 2.5 percentage points in Alberta to 22 percentage points in Ontario.

Finally, **figure 7a** presents the public sector share of employment (excluding self-employment) in 2003 and 2013 for Canada and the provinces, and ranks them based on their share in 2013. Because all provinces, except Newfoundland and Labrador, saw the growth in public sector employment outpace that of the private sector, the public sector share of employment is higher in 2013 than in 2003. In 2013, Alberta, Ontario, and British Columbia had the lowest public sector shares of employment while Prince Edward Island, Newfoundland and Labrador, and Saskatchewan had the highest. With the exception of Newfoundland and Labrador, which saw a decline, all the other provinces have seen an increase in their share of public sector employment over the ten years leading up to 2013. The biggest increase (of just over 3 percentage points) was for Ontario, which saw its public sector share of employment grow from 20.0 to 23.2 percent.

Figure 7a

**Public sector share of employees (excluding self-employment),
Canada, 2003 and 2013**



Source: Statistics Canada, 2014a; author's calculations.

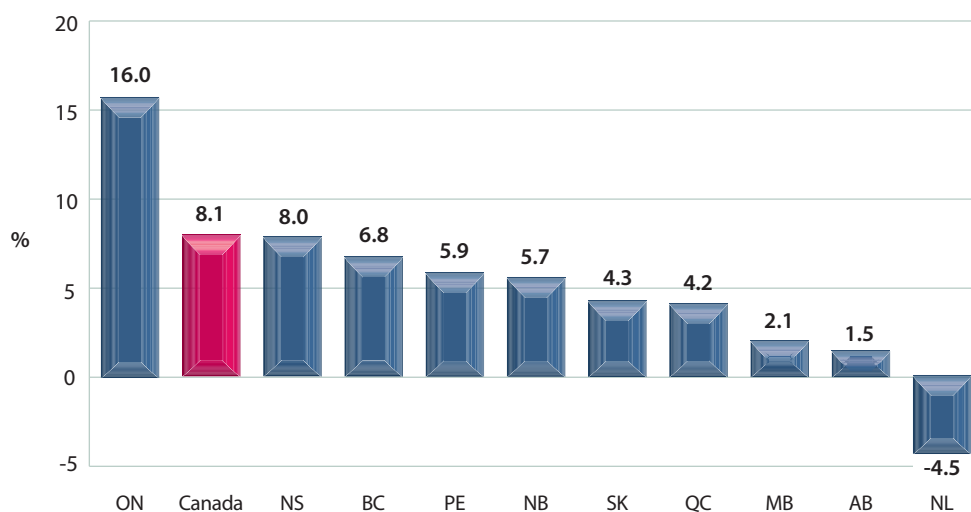
Figures 7b and **7c** illustrate the size of the increases. In terms of the percent change in the public sector share of employment, the largest was in Ontario at 16.0 percent, followed by Nova Scotia at 8.0 percent and British Columbia at 6.8 percent (figure 7b). When ranked by the percentage point change alone (figure 7c), the biggest increase of over 3 percentage points was for Ontario, which saw its public sector share of employment grow from 20.0 to 23.2 percent. Next is Nova Scotia at 2.1 percentage points and then Prince Edward Island at 1.9 percentage points. Whether using change in percent or percentage points, Manitoba, Alberta, and Newfoundland rank the lowest in the increase in their public sector share of employment between 2003 and 2013.

The large increase in the share of public sector employment in Ontario after 2003 coincides with a period accompanied by tax increases, increases in public sector spending, and increased public sector employment, as well as a slowdown in Ontario's economic growth.¹³ Indeed, the period from 2001 to 2012 saw Ontario with the lowest rate of growth in real per-capita GDP in the country (Di Matteo, Clemens, and Palacios, 2014: 10).

¹³. For a discussion, see Di Matteo, Clemens, and Palacios (2014).

Figure 7b

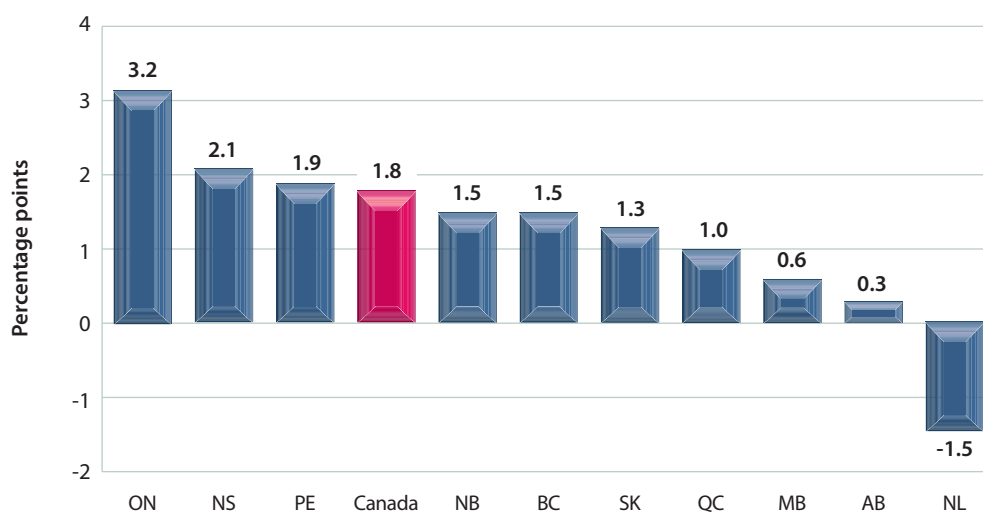
**Percent change in public sector share of employment
(excluding self-employed), 2003–2013**



Source: Statistics Canada, 2014a; author's calculations.

Figure 7c

**Percentage point change in public sector share of employment
(excluding self-employed), 2003–2013**



Source: Statistics Canada, 2014a; author's calculations.

There does appear to be a broad relationship between a government's fiscal situation, changes in the public sector share of employment, and economic growth that is worth noting for the period from 1990 through 2013. According to data from the 2014 Federal Fiscal Reference Tables, from 1991 to 1997 (recession and recovery), the average annual deficit across all three levels of government was \$39.399 billion; from 1998 to 2008 (more robust growth), there was an average annual surplus of \$21.011 billion; and from 2009 to 2013 (recession and slower growth), there was an average annual deficit of \$48.490 billion (Canada, 2014: tables 33, 34; author's calculations). Meanwhile, average annual real GDP growth for the period 1991 to 1997 was 2.1 percent, for 1998 to 2008 it was 3.0 percent, and for 2009 to 2013 it was 1.5 percent (Statistics Canada, 2015; author's calculations). Periods of slower economic growth are accompanied by larger fiscal deficits.

As well, the public sector shares of employment were higher in the 1991 to 1997 and post-2009 periods relative to the 1998 to 2008 period. These results suggest that lower public sector deficits and a lower public sector share of employment were accompanied by higher real GDP growth. Part of the reason for this relationship may lie in the greater sensitivity of private sector employment to fluctuations in the economy. When recessions occur, they typically affect employment in the private sector first, while public sector employment is less impacted by shocks driven by the business cycle (see Kopelman and Rosen, 2014).

At the same time it should be noted that, even during the period of more robust economic growth from 1998 to 2008, public sector employment in some provinces actually grew faster than private sector employment. For example, during the period 1998 to 2008, public sector employment in Ontario and Manitoba grew at average annual rates of 2.9 and 1.9 percent respectively, while their private sector employment growth averaged 2.1 and 1.7 percent. Meanwhile, since 2003, Alberta has been experiencing an economic boom and its public sector employment actually grew faster than private sector employment. It is worth further exploring the implications of larger public sector employment and the balance with private sector employment.

Implications of a growing public sector share of employment

A key feature of the relationship between public and private sector employment¹⁴ is that public sector employment is ultimately financed by taxation and tax revenues that are a function of private sector activity.¹⁵ The private sector is the main source of wealth creation in an economy, and of the resources needed to provide public goods and ultimately generate public sector employment. However, the activities of the public sector can have both positive and negative effects on private sector wealth generation.

Macroeconomic theory maintains that changes in government expenditure may result in crowding-out effects.¹⁶ A dollar spent by government may displace a dollar of private sector spending. If government finances its spending by borrowing, it may drive up interest rates, which in turn lead to a reduction in private sector investment. However, these effects are the largest in an economic environment where resources are fully employed. If there are unemployed resources in an economy—as for example during a

14. The relationship between public and private sector employment is based on the distinction between private and public sector activity as laid out in public finance theory. Boadway and Wildasin note: “The purpose of an economic system is to allocate the scarce resources of an economy to the production of goods and services for the use of individuals in society” (1984: 13), and this can be done via firms operating under the institutional mechanism of the price system—the private sector—or it can be done by resources from the private sector allocated via government—the public sector.

15. Governments can also fund their activities by running deficits, but these are merely deferred taxes.

16. For a classic exposition of crowding out, see Carlson and Spencer (1975). See also some traditional textbook expositions of the crowding out effects of fiscal policy using the IS-LM macroeconomic model such as Dornbusch, Fisher, and Sparks (1993: 129–35) and Galbraith and Darity (1994: 150–53). Some of the recent literature has focused on the impact of government expenditure shocks on consumption, output and wages. For an example, see Engemann, Owyang, and Zubairy (2008).

recession—then government spending need not crowd out private sector spending.¹⁷

Increases in government employment can have a negative impact on private sector employment by increasing real wages, and can also reduce labour supply and ultimately employment via the taxes needed to finance the increase in government employment. The crowding out of private employment by government can be further divided into direct and indirect effects.¹⁸ When government expenditure and employment creation affects prices in markets such as real wages or real interest rates, there is an indirect displacement effect. However, if government directly displaces private employment by employing labour in activities that can be performed by the private sector—such as railways or public utilities—then there is a direct displacement effect, which can reduce employment. This displacement can be compounded by the fact that compensation in the public sector for types of work similar to those done in the private sector is often higher.¹⁹

If government employment provides goods that complement private production, then it could increase total employment. On the other hand, if government employment supplants what the private sector does, then it reduces total employment. The degree of crowding out also depends on the responsiveness of both labour demand and labour supply to real wages, as well as the general state of the labour market in terms of whether the economy is at or near full employment.

There is an empirical literature on public sector employment and its effects on employment—private sector employment in particular—with respect to the degree of crowding out. That is, any positive effect on employment through public sector job creation may be offset by a reduction in private sector employment elsewhere in the economy by changing local wages and prices. The degree of crowding out is a function of the substitutability of public and private sector employment, as well as of the size of any economic job rents provided in the public sector (Faggio and Overman, 2012: 3).

¹⁷. Much of the macroeconomic literature on crowding out focuses on fiscal policy. An increase in government demand financed by either taxes or public debt may displace private demand by an equal amount, resulting in a failure to stimulate total economic activity. As a result, there would be no lasting effect on either real income or employment—in other words, the government expenditure multiplier would be zero. Afonso and Sousa (2009), in their analysis of the macroeconomic effects of government fiscal policy, find that government expenditure shocks do not have a significant effect on private consumption but can have a negative effect on private investment leading to crowding-out effects. For an elementary discussion of the effects of government fiscal policy, see also Krugman, Wells, Au, and Parkinson (2014: 419–20). For another view, see Veldhuis and Lammam (2010).

¹⁸. See Malley and Moutos (1996: 290).

¹⁹. See Lammam, Palacios, Ren, and Clemens (2015a, 2015b, 2015c),

Edin and Holmlund (1997), using data for 22 OECD countries from the late 1960s to 1990, found a rise in public sector employment only reduced unemployment rates in the short run and had no significant effect on changing the unemployment rate in the long run. Boeri, Nicoletti, and Scarpetta (2000) used a sample of 19 OECD countries over the period 1985 to 1992 and found that 10 additional public sector jobs resulted in the reduction of 3 private sector jobs.

Algan, Cahuc, and Zylberberg (2002) examine the consequences of public sector employment on labour market performance in 17 OECD countries over the period 1960 to 2000 and find an important crowding-out effect on the private sector that increased unemployment. Their evidence estimates that the creation of one public sector job resulted in the reduction of 1.5 private sector jobs.

Faggio and Overman (2012) examine British labour market data at the local level for the 2003 to 2007 period and find that, while public sector employment appears to have had no identifiable effect on total private sector employment, it did affect sectoral composition. Each additional public sector job created 0.5 jobs in construction and services while crowding out 0.4 jobs in the manufacturing sector.

Behar and Mok (2013) examine a large cross-section of developing and advanced economies and regress private sector employment rates and unemployment rates on measures of public sector employment. They find substantial crowding out. Data for up to 194 countries over the period 1988 to 2011 show that high rates of public employment have a large negative impact on private employment rates, and do not reduce overall unemployment rates.

Finally, the relationship between public sector employment and economic performance is important from another perspective. Baumol's cost-disease argument maintains that service-based activities are labour intensive and have lower productivity growth than more capital intensive activities such as manufacturing. Since government is primarily a service activity and labour intensive, any growing demand for government services as the economy and income grow means that government employment will grow.

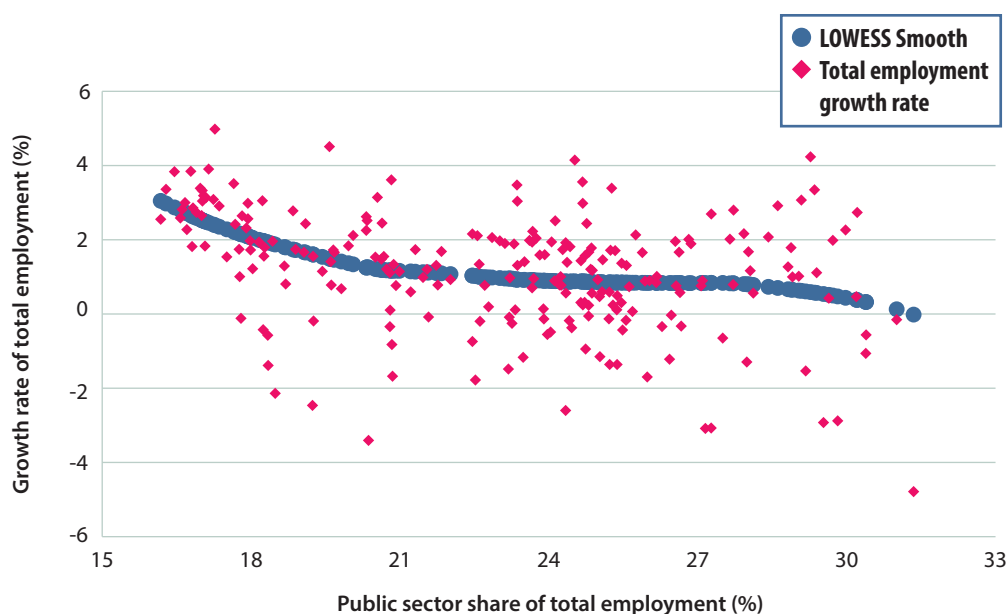
Cost disease argues that the production of government output is labour intensive and lower productivity, while the demand for government output is income elastic. Therefore, as income rises, government production grows and absorbs a rising share of national output, but output grows at a slower rate (Baumol, 1967, 1993; Baumol and Bowen, 1966). As a result, greater public sector employment today can mean slower growth and ultimately less private sector employment growth in the long run.

The potential implications of the balance between public and private sector employment for economic performance are explored in figures 8 to 11 to determine whether larger public sector employment shares are correlated with weaker economic performance and employment growth.

Figure 8 presents a smoothed relationship between total employment growth and public sector employment share using a simple curve fitting technique known as LOWESS.²⁰ Figure 8 plots the growth rate in total employment (including the self-employed) against the public share of total employment for the provinces for the 1991 to 2013 period. The relationship is found to be negative. That is to say, larger public sector shares of total employment are correlated with lower growth rates of total employment.

Figure 8

LOWESS smooth of provincial total employment growth rate versus provincial public sector shares of total employment (bandwidth = 0.8), 1991–2013



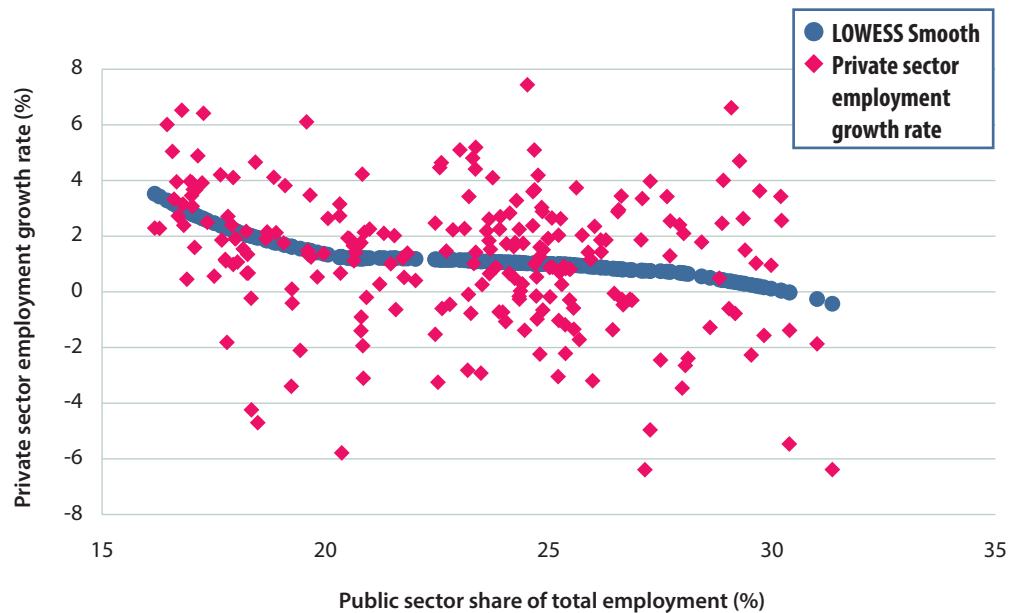
Source: Statistics Canada, 2014a.

20. LOWESS (locally weighted scatterplot smoothing) is a non-parametric regression technique, which estimates a line of best fit without assuming a specific functional form and is not as sensitive to the presence of outliers in the data. In fitting LOWESS curves, the crucial decision involves the size of the smoothing parameter or bandwidth over which the locally weighted regressions used in the estimation process are estimated. Larger bandwidths provide greater degrees of smoothing while smaller bandwidths provide more variation in the final smoothed curve. For references on LOWESS see Cleveland (1979, 1985, 1993).

Figure 9 examines the relationship differently by plotting the smoothed relationship between annual provincial private sector employment growth and the provincial public sector share of total employment for the period 1991 to 2013. Again, there is a negative relationship. That is to say, larger public sector shares of total employment are correlated with lower growth rates of private sector employment.

Figure 9

LOWESS smooth of provincial private sector employment growth rate versus provincial public sector shares of total employment (bandwidth = 0.8), 1991–2013



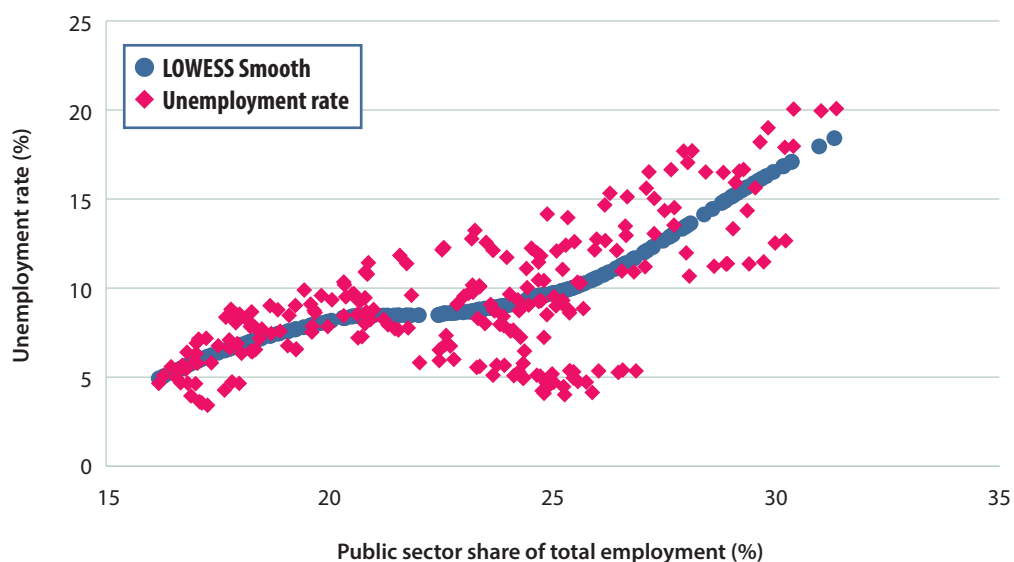
Source: Statistics Canada, 2014a.

Figure 10 takes the analysis one step further and plots the average annual monthly provincial unemployment rate versus the annual public sector share of total employment and then estimates a LOWESS smooth. Figure 10 shows a distinct positive relationship between the proportion of public sector employment and the unemployment rate in a province. That is, larger public sector shares of total employment are correlated with higher provincial unemployment rates.

Finally, **figure 11** plots annual real per-capita provincial GDP growth rates against the public sector share of total employment to estimate a LOWESS smooth and finds that the relationship is flat. The growth rate of real per-capita GDP appears to be relatively constant in the face of varying shares of public sector employment. While large public sector employment shares do not appear negatively correlated with real per-capita income growth, neither are they positive.

Figure 10

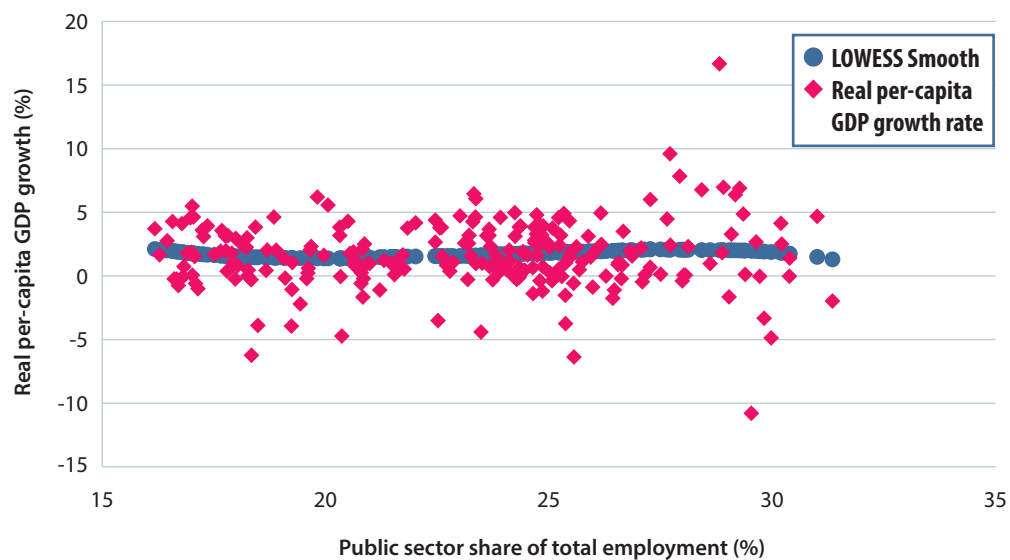
LOWESS smooth of provincial unemployment rate versus provincial public sector shares of total employment (bandwidth = 0.8), 1991–2013



Source: Statistics Canada, 2014a.

Figure 11

LOWESS smooth of real per-capita GDP growth rates versus provincial public sector shares of total employment (bandwidth = 0.8), 1991–2013



Sources: Statistics Canada, 2014a, 2014b, 2015.

However, these are correlations and not necessarily indicative of causation. Figures 8 through 11 do not control for any other confounding factors that might also affect employment growth or the unemployment rate, such as the state of the government's budget balance or the business cycle. For example, the argument can be made that public sector employment is naturally going to be more important during periods of economic downturn, while private sector employment may be more sensitive to economic growth than public sector employment once the economy improves.

Indeed, a full evaluation of whether or not the public-private employment balance has an effect on employment growth and unemployment rates requires a regression approach that controls for the government's budget balance and the effect of the business cycle on public sector employment, as well any potential complementarities between public and private sector employment. Nevertheless, these correlations are of interest in demonstrating the importance of the public-private employment balance on economic performance and the need for further work that rigorously assesses causation and confounding factors.

Conclusions

Between 1990 and 2013, total employment in Canada grew from 13.1 to 17.7 million representing a percentage increase of 35.5 percent. Over the same period, the number of public sector employees grew from 2.8 to 3.6 million—an increase of 31.6 percent—while the number of private sector employees grew from 8.5 to 11.4 million for an increase of 34.2 percent. While the self-employed represent the smallest proportion of total employment, between 1990 and 2013, their numbers grew from 1.8 to 2.7 million and exhibited the fastest growth rate at 47.4 percent.²¹

The ten years since 2003 have been marked by a resurgence in public sector employment in Canada and the provinces. Public sector employment in Canada grew 22.6 percent over the period 2003 to 2013, while private sector employment only grew 10.7 percent.

While the public sector share of employment in Canada declined during the 1990s, its growth resumed during the first decade of the 21st century. There was a decline in the public sector share of employment (excluding the self-employed) starting in 1992, from 26.1 percent to 22.3 percent by 2003. Afterwards, an increase began, with a peak of 24.4 percent reached in 2010 and then a slight decline to 24.1 percent by 2013. The public sector share of employment today has recovered to levels not seen since the early 1990s—an era of large government deficits, debt, and then fiscal restraint.

With the exception of Newfoundland and Labrador, which saw a decline, all the other provinces have seen an increase in their share of public sector employment over the 2003 to 2013 period. The biggest increase was in Ontario, which saw its public sector share of employment grow from 20.0 to 23.2 percent. That 3.2 percentage point increase represents growth in the share of 16.0 percent.

Public sector expenditure and employment may indeed serve as a complement to private sector activity by providing social or physical infrastructure for the latter. Nevertheless, the balance between public and private sector employment is of policy importance, given the importance of private sector

21. The percentages calculated in this paragraph are based on actual data which, due to rounding, may not equal the rates based on the displayed data.

wealth generation as the foundation for resources that are used for public sector service provision and subsequent employment generation.

An important dimension of this relationship is that public sector employment growth may also crowd out private sector employment, leaving unemployment rates either unchanged or possibly higher. While correlation is not causation, simple exploratory correlations suggest that for Canada's provinces over the 1990 to 2013 period, larger public sector employment shares are accompanied by lower growth rates of private sector employment growth, and show a flat relationship with per-capita GDP growth rates.

References

- Abdiweli, A. M. (2003). Institutional Differences as Sources of Growth Differences. *Atlantic Economic Journal* 31, 4: 348–62.
- Afonso, A., and R. M. Sousa (2009). *The Macroeconomic Effects of Fiscal Policy*. European Central Bank Working Paper Series No. 991.
- Algan, Y., P. Cahuc, and A. Zylberberg (2002). Public Employment and Labour Market Performance. *Economic Policy* 17, 34: 7–65.
- Asoni, A. (2008). Protection of Property Rights and Growth as Political Equilibria. *Journal of Economic Surveys* 22, 5: 953–87.
- Baumol, W. J., and Bowen, W. G. (1966). *Performing Arts: The Economic Dilemma*. Twentieth Century Fund.
- Baumol, W. J. (1967). Macroeconomics of Unbalanced Growth: The Anatomy of the Urban Crisis. *American Economic Review* 57: 415–26.
- Baumol, W. J. (1993). Health Care, Education and the Cost Disease: A Looming Crisis for Public Choice. *Public Choice* 77, 1: 17–28.
- Behar, A., and J. Mok (2013). *Does Public-Sector Employment Fully Crowd Out Private-Sector Employment?* IMF Working Paper/13/146.
- Boadway, R. W., and D. E. Wildasin (1984). *Public Sector Economics, Second Edition*. Little, Brown and Company.
- Boeri, T., G. Nicoletti, and S. Scarpetta (2000). Regulation and Labour Market Performance. In G. Galli and J. Pelkman (eds.), *Regulatory Reform and Competitiveness in Europe* (Edward Elgar), 324–80.
- Canada, Finance Canada (2014). *Federal Fiscal Reference Tables*. Government of Canada.

Carlson, K. M., and R. W. Spencer (1975, December). Crowding Out and Its Critics. *Federal Reserve Bank of St. Louis Review*, 2–17.

Cleveland, W. S. (1979). Robust Locally Weighted Regression and Smoothing Scatterplots. *Journal of the American Statistical Association* 74: 829–36.

Cleveland, W. S. (1985). *The Elements of Graphing*. Wadsworth.

Cleveland, W. S. (1993). *Visualizing Data*. Summit.

De Viti De Marco, A. (1936). *First Principles of Public Finance*. Jonathan Cape.

Di Matteo, L. J. Clemens, and M Palacios (2014). *Can Canada Prosper Without a Prosperous Ontario?* Fraser Institute.

Dornbusch, R., S. Fischer, and G.R. Sparks (1993). *Macroeconomics*. Fourth Canadian Edition. McGraw-Hill Ryerson Limited.

Edin, P. A., and B. Holmund (1997). Sectoral Structural Change and the State of the Labour Market in Sweden. In H. Siebert (ed.), *Structural Change and Labour Market Flexibility* (Mohr Siebeck), 89–121.

Engemann, K. M., M. T. Owyang, and S. Zubairy (2008). A Primer on the Identification of Government Spending Shocks. *Federal Reserve Bank of St. Louis Review* 90, 2: 117–32.

Faggio, G., and H. G. Overman (2012). *The Effect of Public Sector Employment on Local Labour Markets*. Spatial Economics Research Centre, London School of Economics and Political Science, Discussion Paper 111.

Fukuyama, F. (1996). *Trust: The Social Virtues and the Creation of Prosperity*. Free Press Paperbacks.

Galbraith, J. K., and W. Darity Jr. (1994). *Macroeconomics*. Houghton Mifflin Company.

Knack, S., and P. Keefer (1997). Does Social Capital Have an Economic Payoff? A Aross-Country Comparison. *Quarterly Journal of Economics* 112, 4: 1252–88.

- Kopelman, Jason, and Harvey Rosen (2014). *Are Public Sector Jobs Recession-Proof? Were They Ever?* NBER Working Paper No. 20692. National Bureau of Economic Research.
- Krugman, P., R. Wells, I. Au, and J. Parkinson (2014). *Macroeconomics*. Second Canadian Edition. Worth Publishers.
- Lammam, C., M. Palacios, F. Ren, and J. Clemens (2015a). *Comparing Government and Private Sector Compensation in Alberta*. Fraser Institute.
- Lammam, C., M. Palacios, F. Ren, and J. Clemens (2015b). *Comparing Government and Private Sector Compensation in Quebec*. Fraser Institute.
- Lammam, C., M. Palacios, F. Ren, and J. Clemens (2015c). *Comparing Government and Private Sector compensation in Ontario*. Fraser Institute.
- Malley, J., and T. Moutos (1996). Does Government Employment ‘Crowd-out’ Private Employment? Evidence from Sweden. *Scandinavian Journal of Economics* 98, 2: 289–302.
- Moretti, E. (2010). Local Multipliers. *American Economic Review Papers and Proceedings* 100: 373–77.
- North, Douglass C. (1987). Institutions, Transaction Costs and Economic Growth. *Economic Inquiry* 25, 3: 419–28.
- North, Douglass C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Statistics Canada (2014a). *Table 282-0012: Labour Force Survey Estimates (LFS), employment by class of worker, North American Industry Classification System (NAICS) and sex, annual (persons)*. Statistics Canada.
- Statistics Canada (2014b). *Table 51-0001: Estimates of Population, by age group and sex for July 1, Canada, provinces and territories, annually (Persons unless specified)*. Statistics Canada.
- Statistics Canada (2014c). *Table 282-0087: Labour Force Survey Estimates (LFS), unemployment rate, by sex and age group, seasonally adjusted, monthly (Persons unless specified)*. Statistics Canada.

Statistics Canada (2015). *Table 384-0038: Gross Domestic Product, expenditure based, provincial and territorial, annually (Dollars)*. Statistics Canada.

Sturm, J. E., and J. De Haan (2001). How Robust is the Relationship Between Economic Freedom and Economic Growth. *Applied Economics* 33, 7: 839–44.

Veldhuis, N., J. Clemens, and M. Palacios (2011). *Learning from the Past: How Canadian Fiscal Policies of the 1990s Can Be Applied Today*. Fraser Institute.

Veldhuis, N., and C. Lammam (2010, May). Research or Rhetoric: Academic Studies Show Government Stimulus Spending Does Not Increase Economic Activity. *Fraser Forum*.

About the author



Livio Di Matteo

Livio Di Matteo is a Fraser Institute Senior Fellow and a Professor of Economics at Lakehead University in Thunder Bay, Ontario, where he specializes in public policy, health economics, public finance, and economic history. His recent research has focused on health care spending and its sustainability. Di Matteo is a member of the CIHI National Health Expenditure Advisory Panel and the Evidence Network (EvidenceNetwork.ca), and is a contributor to the economics blog *Worthwhile Canadian Initiative*. He has been listed in *Canadian Who's Who* since 1995 and holds a PhD from McMaster University, an MA from the University of Western Ontario, and a BA from Lakehead University.

Acknowledgments

The author thanks the anonymous reviewers for comments on early drafts. Any errors and omissions are the sole responsibility of the author. As the researcher worked independently, the views and conclusions expressed in this paper do not necessarily reflect those of the Board of Directors of the Fraser Institute, the staff, or supporters.

Publishing information

Distribution

These publications are available from <<http://www.fraserinstitute.org>> in Portable Document Format (PDF) and can be read with Adobe Acrobat® or Adobe Reader®, versions 7 or later. Adobe Reader® XI, the most recent version, is available free of charge from Adobe Systems Inc. at <<http://get.adobe.com/reader/>>. Readers having trouble viewing or printing our PDF files using applications from other manufacturers (e.g., Apple's Preview) should use Reader® or Acrobat®.

Ordering publications

To order printed publications from the Fraser Institute, please contact the publications coordinator:

- e-mail: sales@fraserinstitute.org
- telephone: 604.688.0221 ext. 580 or, toll free, 1.800.665.3558 ext. 580
- fax: 604.688.8539.

Media

For media enquiries, please contact our Communications Department:

- 604.714.4582
- e-mail: communications@fraserinstitute.org.

Copyright

Copyright © 2015 by the Fraser Institute. All rights reserved. No part of this publication may be reproduced in any manner whatsoever without written permission except in the case of brief passages quoted in critical articles and reviews.

ISBN

978-0-88975-353-2

Date of issue

June 2015

Citation

Di Matteo, Livio (2015). *An Analysis of Public and Private Sector Employment Trends in Canada, 1990–2013*. Fraser Institute. <<http://www.fraserinstitute.org>>

Cover design

Bart Allan; _SYWEZgffWfaU1bZafaYdSbZW? [UZSW6ž4dai`

Supporting the Fraser Institute

To learn how to support the Fraser Institute, please contact

- Development Department, Fraser Institute
Fourth Floor, 1770 Burrard Street
Vancouver, British Columbia, V6J 3G7 Canada
- telephone, toll-free: 1.800.665.3558 ext. 586
- e-mail: development@fraserinstitute.org

Purpose, funding, & independence

The Fraser Institute provides a useful public service. We report objective information about the economic and social effects of current public policies, and we offer evidence-based research and education about policy options that can improve the quality of life.

The Institute is a non-profit organization. Our activities are funded by charitable donations, unrestricted grants, ticket sales, and sponsorships from events, the licensing of products for public distribution, and the sale of publications.

All research is subject to rigorous review by external experts, and is conducted and published separately from the Institute's Board of Directors and its donors.

The opinions expressed by the authors are those of the individuals themselves, and do not necessarily reflect those of the Institute, its Board of Directors, its donors and supporters, or its staff. This publication in no way implies that the Fraser Institute, its trustees, or staff are in favour of, or oppose the passage of, any bill; or that they support or oppose any particular political party or candidate.

As a healthy part of public discussion among fellow citizens who desire to improve the lives of people through better public policy, the Institute welcomes evidence-focused scrutiny of the research we publish, including verification of data sources, replication of analytical methods, and intelligent debate about the practical effects of policy recommendations.

About the Fraser Institute

Our mission is to improve the quality of life for Canadians, their families, and future generations by studying, measuring, and broadly communicating the effects of government policies, entrepreneurship, and choice on their well-being.

Notre mission consiste à améliorer la qualité de vie des Canadiens et des générations à venir en étudiant, en mesurant et en diffusant les effets des politiques gouvernementales, de l'entrepreneuriat et des choix sur leur bien-être.

Peer review—validating the accuracy of our research

The Fraser Institute maintains a rigorous peer review process for its research. New research, major research projects, and substantively modified research conducted by the Fraser Institute are reviewed by experts with a recognized expertise in the topic area being addressed. Whenever possible, external review is a blind process. Updates to previously reviewed research or new editions of previously reviewed research are not reviewed unless the update includes substantive or material changes in the methodology.

The review process is overseen by the directors of the Institute's research departments who are responsible for ensuring all research published by the Institute passes through the appropriate peer review. If a dispute about the recommendations of the reviewers should arise during the Institute's peer review process, the Institute has an Editorial Advisory Board, a panel of scholars from Canada, the United States, and Europe to whom it can turn for help in resolving the dispute.

Editorial Advisory Board

Members

Prof. Terry L. Anderson	Prof. Herbert G. Grubel
Prof. Robert Barro	Prof. James Gwartney
Prof. Michael Bliss	Prof. Ronald W. Jones
Prof. Jean-Pierre Centi	Dr. Jerry Jordan
Prof. John Chant	Prof. Ross McKittrick
Prof. Bev Dahlby	Prof. Michael Parkin
Prof. Erwin Diewert	Prof. Friedrich Schneider
Prof. Stephen Easton	Prof. Lawrence B. Smith
Prof. J.C. Herbert Emery	Dr. Vito Tanzi
Prof. Jack L. Granatstein	

Past members

Prof. Armen Alchian*	Prof. F.G. Pennance*
Prof. James M. Buchanan* [†]	Prof. George Stigler* [†]
Prof. Friedrich A. Hayek* [†]	Sir Alan Walters*
Prof. H.G. Johnson*	Prof. Edwin G. West*

* deceased; [†] Nobel Laureate