An Economic and Fiscal Comparison of Alberta and Other North American Energy Producing Provinces and States

BY LIVIO DI MATTEO, JASON CLEMENS, AND JOEL EMES

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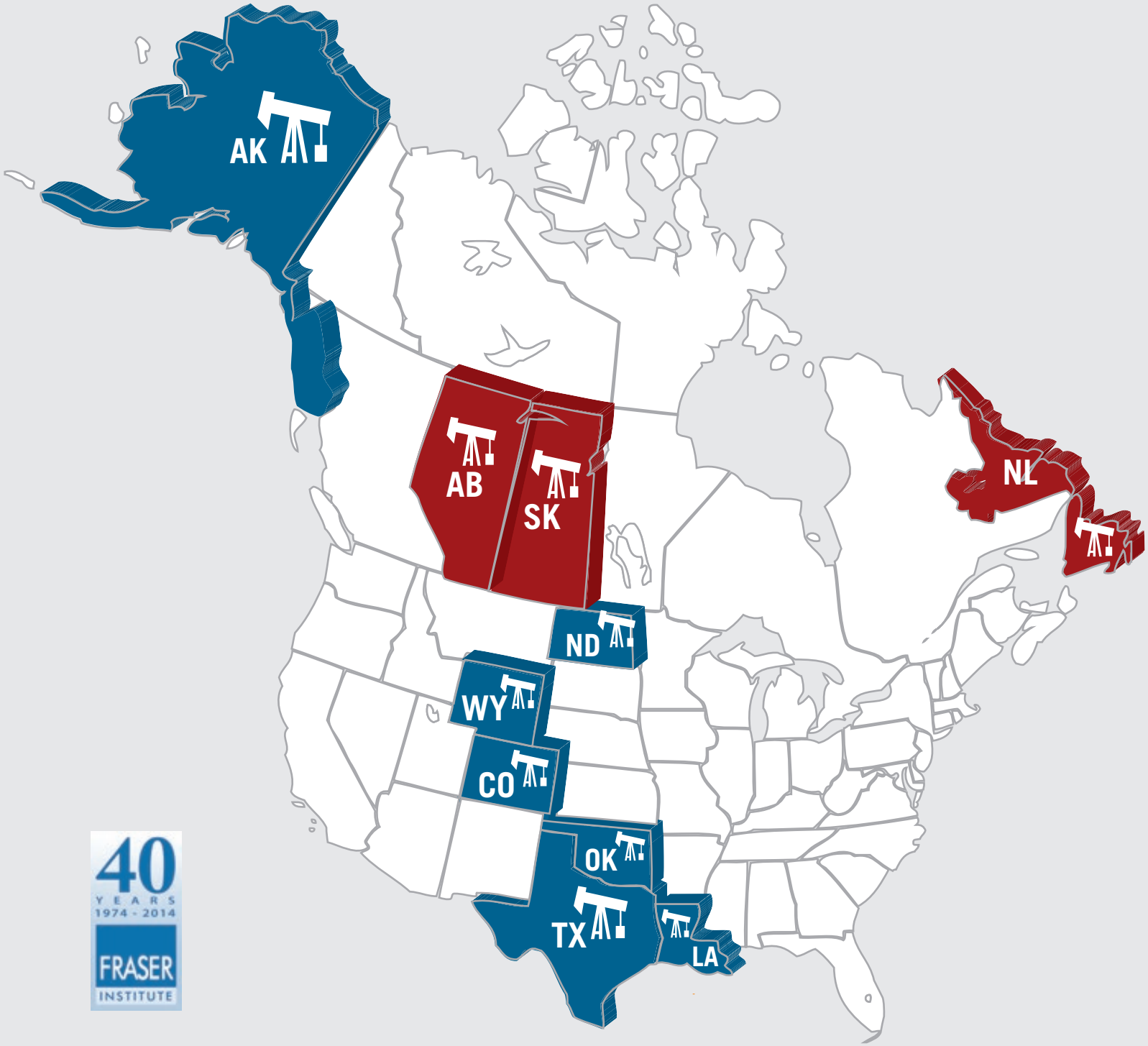

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Executive summary

For more than two decades, Alberta has been a bulwark of the Canadian economy. Other jurisdictions in North America, however, have also experienced growth and prosperity from the economic opportunities afforded by natural resource development.

Alberta's comparative economic and fiscal success has been repeatedly confirmed within the Canadian context. However, an important and to-date largely absent comparison is how well Alberta performs when compared to other resource-based economies in North America. This paper begins the process of comparing and contrasting the economic and government financial performance of Alberta with other Canadian provinces and U.S. states with large energy sectors.

Economic performance

The study compares provinces and states using income growth, job creation and unemployment rates, and productivity levels to gauge their relative economic performance over the last decade or so.

Overall, Alberta's economy performed relatively well during this time when compared with other energy-producing provinces and states although there are areas of concern.

Alberta enjoyed the second highest average rate of real economic growth (2001-2012) and the second highest level of real GDP per person (2012). However, there is a concern about the growth in real per capita GDP, which ranked second last among the provinces and states measured during the 2001-2012 period.

In some ways this illustrates the struggle that Alberta has experienced in improving its productivity, which measures the ability of the economy to

transform various inputs into useable outputs. Over the 2001-2012 period, Alberta ranked last with respect to its average growth rate in real per worker GDP. Simply put, these two indicators—growth in per worker GDP (as a measure of productivity) and average growth in per capita GDP—indicate that much of the province's economic growth is coming from expanding inputs like labour rather than improving the productivity, and thus the income, of individual workers.

Alberta's performance is less stellar when compared with North Dakota and Wyoming with respect to economic growth. North Dakota records the highest levels of both real GDP growth and real per capita GDP growth. It also moved from having the third lowest per capita GDP level to having the third highest real per capita level of GDP amongst the 10 jurisdictions in this study.

Wyoming also stands out for comparatively strong performance across the various measures of GDP growth. It recorded the fifth highest average annual increase in real GDP and the fourth highest average annual increase in real per capita GDP. Wyoming also ended the period with one of the highest levels of per capita GDP. Both jurisdictions offer Alberta real policy lessons with respect to economic and productivity growth.

Over the last decade Alberta has been a jobs machine with an average annual growth in total employment of 2.6%, which is more than 70% higher than the second-placed Texas (1.5%). Part of that success is explained by Alberta's strong gains in private sector employment. On average, Alberta increased private sector employment by 2.8% between 2001 and 2012. This is more than 50% higher than second-placed Texas, which registered average private sector employment gains of 1.8%. However, Alberta also recorded the highest level of average increases in public sector employment over this period. Indeed, Alberta's public sector increased, on average, by 2.9%, which is slightly more than the average increase recorded in Alberta's private sector employment over the same period.

Alberta's average unemployment rate (second lowest) as well as its employment-to-working age population ratio (second highest) both indicate an incredibly strong labour market.

In sum, while Alberta enjoyed a comparatively strong economy over the last decade, there are warning signs with respect to productivity. In particular, Alberta policy-makers should be concerned that most of the economic growth experienced came from expanding inputs rather than improving productivity.

Government financial performance

Prior to the recession of 2008-09, Alberta enjoyed large surpluses as a share of provincial spending but moved to large deficits post-recession. Specifically,

Alberta went from an average surplus of 20.6% of provincial spending between 2000-01 and 2007-08 to an average deficit of 4.2% of provincial spending between 2008-09 and 2012-13. Both Alberta and Newfoundland & Labrador backtracked in 2012-13 with larger deficits than in the previous year. Specifically, Alberta's deficit in 2011-12 was just 0.1% of total spending but increased markedly to 6.9% of provincial spending in 2012-13.

Alberta's fiscal balance has not rebounded as strongly as the other energy-producing jurisdictions. Several U.S. states are enjoying large surpluses while Alberta's most recent comparative statistics indicate a fairly large deficit. Indeed, in 2011-12, the most recent year with comparative stats for both U.S. states and Canadian provinces, Alberta was one of only three energy-producing jurisdictions to be in deficit. The presence of deficits while other energy-producing jurisdictions are in surplus coupled with the general strength of the Alberta economy as highlighted in the first section of this paper should give cause for concern about the general state of Alberta's government finances.

When resource revenues are removed, Alberta moves from having the fourth highest average surplus (per capita) over the 2000-2011 period to having the second largest average per capita deficit. Specifically, Alberta goes from an average per person surplus of $763 when resource revenues are included to an average per person deficit of $1,626 when resource revenues are excluded. Alberta as well as Newfoundland & Labrador, Saskatchewan, Alaska, and Wyoming have a disproportionate reliance on resource revenues compared to other energy-producing jurisdictions.

Since 2005-06, the provincial government in Alberta has increased program spending by $22.1 billion more than needed to account for inflation and population growth. Had the government of Alberta simply maintained the real value of per person spending in the province, Alberta would have recorded successive balanced budgets. It is this marked increase in real per capita spending that has caused deficits over the last number of years rather than any particular dearth of revenues.

Alberta's net debt position has declined from a net asset position of $31.5 billion in 2007-08 to a net asset position of $12.1 billion in 2012-13. In other words, Alberta has depleted its asset or rainy day accounts by $19.4 billion since 2007-08 through deficit spending and capital expenditures. At the same time, Saskatchewan reduced its net debt by $2.2 billion and Newfoundland and Labrador reduced their net debt by $1.6 billion.

Alberta's savings from its resource revenues—the Heritage Fund—which forms part of its assets, is unique in Canada and is the third largest in terms of total value among the jurisdictions reviewed. However, fund value per capita is one-twentieth the value of Alaska's, one-third the value of Wyoming's, and less than half the value of New Mexico's. Also, at 24%,

Alberta's fund has seen the slowest growth of the funds in existence between 2000-01 and 2012-13. New Mexico's grew by one-third, Alaska's by three-quarters, and Wyoming's has more than tripled.

In terms of the size of government, Alberta maintains the fourth highest level of per capita spending but the third smallest government sector as a share of the economy. This apparently contradictory conclusion is rooted in the high income of the province compared to other jurisdictions. Alberta's high comparative income level allows for a smaller share of the economy to be spent in the government sector but translates into a fairly high level of per capita dollar spending.

Government spending is funded by taxes and Alberta has an opportunity to improve its tax mix in a revenue neutral manner (meaning no reduction in revenues) by shifting from personal and corporate income taxes towards a sales tax. Critically, three of the jurisdictions included in this analysis do not impose income taxes, Alaska, Texas, and Wyoming, while two, Wyoming and Texas, do not impose corporate income tax. In addition, Alberta's tax rates vis-à-vis the U.S. states that do maintain personal and/or corporate income taxes tend to be higher. By reforming the tax system to rely more on consumption taxes and less on income taxes, Alberta would not only bring its mix of taxes more in line with competing energy producing provinces and states but would also improve the efficiency of its tax system.

Introduction

For the better part of two decades, Alberta has been a bulwark of the Canadian economy. Comparatively sound public policies focused on economic competitiveness and reasonable use of the vast natural resources the province is endowed with resulted in a period of marked prosperity.[1] Other jurisdictions in North America, however, have also experienced prosperity based on a similar mix of sound public policies combined with the resources and opportunities available to them.

Alberta's comparative economic and government fiscal success has been repeatedly confirmed within the Canadian context. However, an important and to-date largely absent comparison is how well Alberta performs economically and in terms of government finances when compared to other resource-based economies in North America. This paper begins to rectify this deficiency by comparing and contrasting the economic and government financial performance of Alberta with other Canadian provinces and U.S. states with large energy sectors.

1 Natural resources have been an important driver of general Canadian economic prosperity. For Canada, Keay (2007) finds that the exploitation of Canada's natural resources during the 20th century made direct and indirect contributions to the size and efficiency of the Canadian economy and had a substantial positive impact on the level of real per capita GDP, contributing about 20%. Another comprehensive study by Baldwin and MacDonald (2012) also finds natural resources and trade to be important contributors to Canadian real gross national income between 1870 and 2010. Natural resources generally can serve as a propulsive booming sector in the economy. For regional historical studies of booming sector models and natural resource exports, see Di Matteo (1993) and Di Matteo, L., J.C.H. Emery and M.P. Shanahan (2014). For traditional discussion of the role of resources in Canadian economic history see Innis (1984, 1978, 1969). Natural resource exports were also an important source of American industrial success, see Wright (1990).

To-date, Alberta is largely, and quite rightly, seen as a policy leader in Canada. This paper, a first step in a larger process, aims to identify whether there are other energy-intense jurisdictions in North American that outperform the province and could offer lessons for improvement.

The first part of this paper explains the criteria by which provinces and U.S. states were selected for inclusion. The second part of the paper presents the analysis comparing the selected jurisdictions across a host of economic performance measures, including income growth and a variety of labour market performance indicators. The third part of the paper compares Alberta's performance across a host of public finance measures against the performance of the other Canadian provinces and U.S. states.

I. Selecting the jurisdictions for comparison

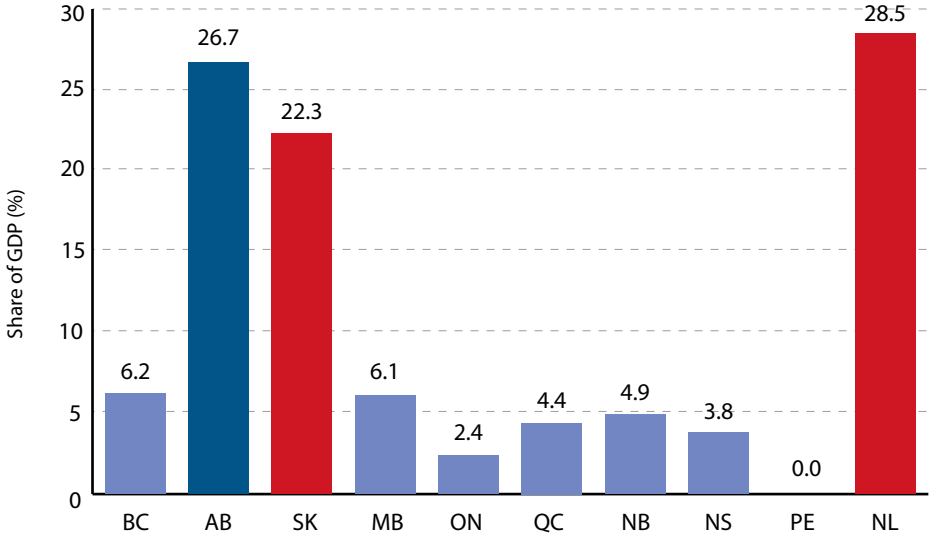
Selecting jurisdictions for comparison is a complex endeavour and there are a number of options by which to consider jurisdictions for inclusion.[2] The method employed in this paper to select provinces and states for analysis is the share of a province's economy (GDP) represented by the energy sector and the share of a state's economy (GDP) represented by the oil and gas sector. The oil and gas sector definition for the states includes oil and gas extraction, support activities for oil and gas (estimated), and pipeline transportation. The energy sector definition used for provinces includes those sectors plus coal mining, other metal ore mining, electric power generation, transmission and distribution, natural gas distribution, and petroleum refineries.[3] Simply put, we used a measure of the importance of the energy sector to each province and U.S. state to determine those jurisdictions that had meaningful shares of their economy represented by the energy sector.

Figure 1 presents the data for the Canadian provinces with respect to the size of the energy sector in each provincial economy. There are clearly three provinces with large energy sectors relative to their overall economy:

2 For example, one could rank provinces and states by employment share in the energy sector, by the energy sector share of GDP, or simply by the share of national energy production.

3 A narrower measure of oil and gas activity could have been used for the Canadian provinces but would have required a specialized data request from Statistics Canada. Such an analysis would have yielded similar results to those found using the broader measure. For example, over the period 1971 to 2013, Canadian crude oil production in cubic metres was largest in Alberta, Saskatchewan, and East Coast offshore (with Hibernia dominating the East Coast production) (Canadian Association of Petroleum Producers, 2014). Using the narrower measure of oil and gas activity would have selected the same three provinces for inclusion: Alberta, Saskatchewan, and Newfoundland & Labrador.

Figure 1: Energy sector as a share of GDP (%) for Canadian provinces, 2012



Source: Statistics Canada, 2014b and 2014h.

Newfoundland & Labrador, Alberta, and Saskatchewan. It is important to recognize, however, that the overwhelming majority of the energy production in these three provinces is constituted by oil and gas activity, which includes exploration, extraction, refining, and transportation.

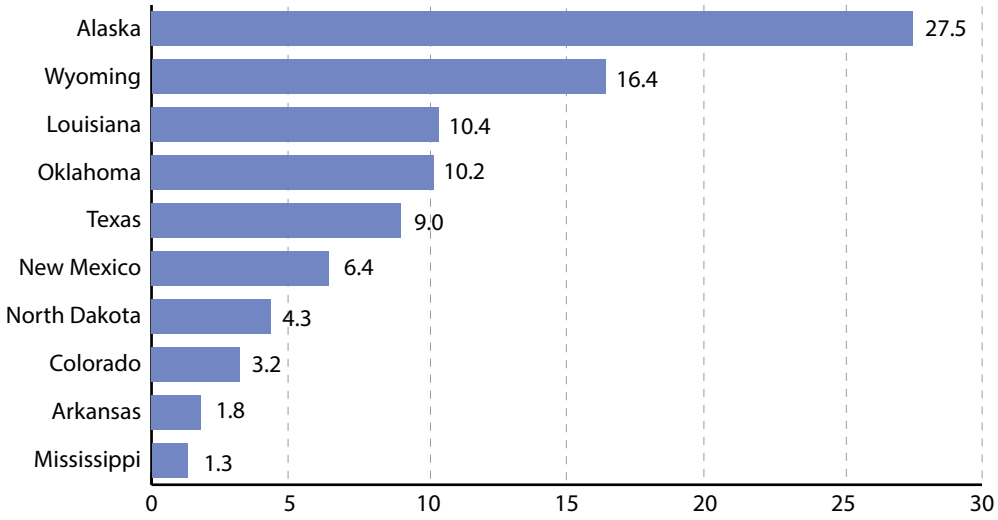
Selecting U.S. states was slightly more difficult due to the larger variation in the nature of energy production observed there. For example, there are several states that possess large coal and hydroelectricity sectors, which are quite distinct compared to the activity observed in Alberta and other Canadian provinces with respect to the oil and gas sector. To overcome this problem, a narrower filter was used for the U.S. that assessed the share of a state's economy (GDP) represented by oil and gas activity.

Figure 2 illustrates the size of the oil and gas sector relative to the overall economy for the top ten U.S. states for 2011, the most recent year for which data was available. Based on the data presented in Figure 2, the first five U.S. states included for comparison were those with an oil and gas sector roughly one-tenth or more of GDP: Alaska, Wyoming, Louisiana, Oklahoma, and Texas.

New Mexico, North Dakota, and Colorado bordered on inclusion. New Mexico was excluded while both North Dakota and Colorado were ultimately included. While the GDP accounts by sector for the U.S. are only available as of 2011, there is ample information available on oil and gas production by state for 2012 (oil and gas) and 2013 (oil only).[4] The reason for the importance of this

4 U.S. Energy Information Administration (2014, February 28). *Natural Gas Gross Withdraws and Production*. Available at http://www.eia.gov/dnav/ng/ng_prod_sum_a_epg0_fpd_mmcf_a.htm>, as of March 7, 2014; and U. S. Energy Information Administration

Figure 2: Oil and gas activity as a share of GDP (%) for US states, 2011



Source: U.S. Bureau of Economic Analysis, 2014a and 2014b.

information is the explosive growth of oil and gas production in some states, particularly gas, based on fracking technology. Such increases indicate the likelihood of certain state's GDP including much larger oil and gas sectors by 2012-13.

The oil and gas sector only accounted for 4.3% of state GDP in North Dakota in 2011 (figure 2). However, between 2011 and 2013, oil production increased in North Dakota by 105% (from 153 million barrels to 313 million barrels). In addition, gas production increased by 84% in 2012.[5] There is, therefore, a strong likelihood that as of 2012 North Dakota's oil and gas sector as a share of its total economy would be larger than New Mexico and large enough for inclusion in our analysis.

Similarly, Colorado experienced a marked increase in its oil production over the same period. Specifically, oil production increased by 58% between 2011 and 2013. Gas production also increased in 2012 but by only 5%. Like North Dakota, Colorado was also included in the analysis based on the assumption that oil and gas would represent a much larger share of state GDP in 2012.

New Mexico was ultimately excluded because its gas production has been falling since 2005 and the share of its economy represented by oil and gas is well below the 2008 peak of 9.6%.

(2014, February 27). *Crude Oil Production*. Available at http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm, as of March 7, 2014.

5 U.S. Energy Information Administration (2014, February 28). *Natural Gas Gross Withdraws and Production.* Available at http://www.eia.gov/dnav/ng/ng_prod_sum_a_epg0_fpd_mmcf_a.htm, as of March 7, 2014; and U. S. Energy Information Administration (February 27, 2014). *Crude Oil Production*. Available at http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm, as of March 7, 2014.

The framework for analysis for the remainder of the paper is to compare Alberta with Saskatchewan, Newfoundland & Labrador, Alaska, Wyoming, Louisiana, Oklahoma, Texas, North Dakota, and Colorado across a host of economic performance measures such as GDP growth as well as fiscal or public finance measures such as deficits and debt. The aim is to determine Alberta's relative performance compared to other energy-intense jurisdictions in North America.

II. Economic performance comparison

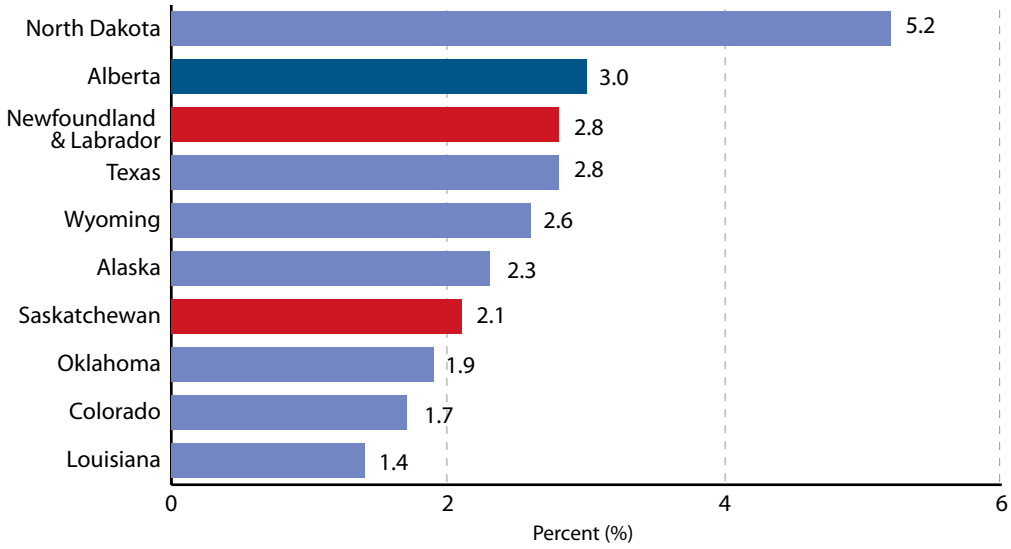
Comparing economic performance[6] for the jurisdictions in this study involves a simple ranking based on average performance over time across a number of basic economic indicators including economic growth, the unemployment rate, and employment growth. In light of the boom and bust nature of resource economies, the comparisons include averages over an extended time period—the years 2000 to 2012. Comparison over a longer-term period may also mitigate the effect of atypical economic years such as the period of the 2008 to 2009 recession.

All figures will be in U.S. dollars and in the case of the three Canadian provinces converted to U.S. PPP dollars using the International Monetary Fund's World Economic Outlook database [IMF WEO] 2013 Implied PPP conversion rate for Canada for the appropriate year.[7] This allows as best as possible a comparison of dollars between Canadian provinces and U.S. states.

6 Measuring fiscal and economic performance can be complex and involves combining a number of variables or presenting a range of indicators. Indeed, economic and fiscal comparisons in the literature often involve constructing an index of activity or performance. For example, Lammam, Palacios, Karabegović, and Veldhuis (2010) rank provincial fiscal performance via a ranking of Canada's premiers that involves constructing an index based on performance in restraint of government spending, lower taxes, and lower debts and deficits. Emes (2001) presents a fiscal performance index of the Canadian provinces and U.S. states with 15 variables reflecting changes in spending, government revenues and tax structure. More recently, Arnett (2014) ranks all 50 U.S. states for fiscal performance in 2012 using eleven indices for variables such as cash, budget, long-run solvency, and service level solvency.

7 International Monetary Fund (2013). *World Economic Outlook Database, 2013*. <http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/download.aspx>, as of July 3, 2014.

Figure 3: Average annual real GDP growth (%), 2001-2012



Note: Canada in chained 2007 dollars; U.S. in chained 2005 dollars.
Source: Statistics Canada, 2014c and 2014d; U.S. Department of Commerce, Census Bureau, 2014.

1) GDP and income

This first set of measures focuses on changes in income as measured by Gross Domestic Product (GDP). GDP is a broad measure of income that includes the total value of all goods and services produced in a specific jurisdiction.

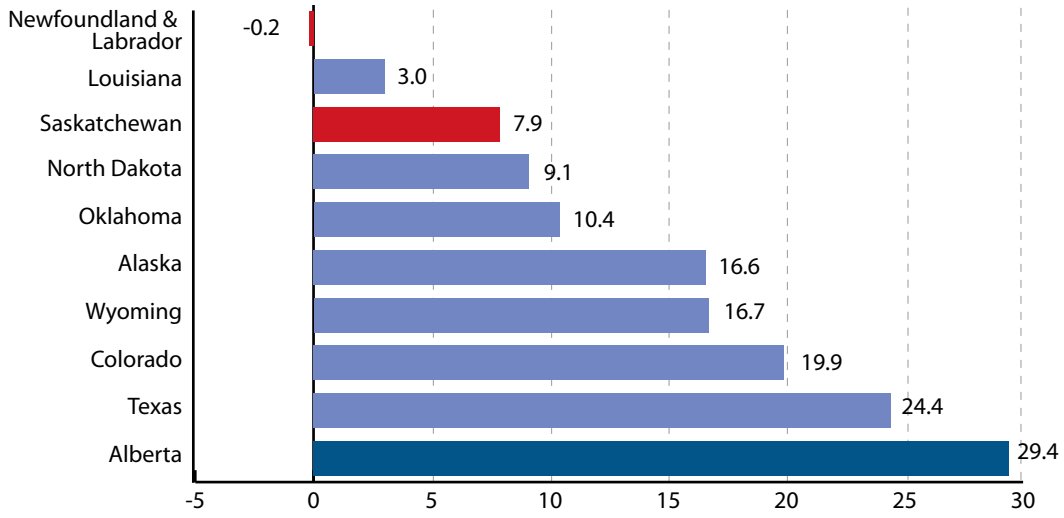
Figure 3 illustrates the average growth in real GDP between 2001 and 2012. North Dakota records the largest average annual increase in real GDP over this period at 5.2%. Alberta enjoyed the second highest average annual increase in real GDP of 3.0%. North Dakota's annual average growth rate, however, was a little over 72% higher than second-ranked Alberta.

Newfoundland & Labrador ranked third just behind Alberta with average growth of 2.8%. Saskatchewan ranked seventh with average growth of 2.1%, which was below the average for the group (2.6%).

There is an important aspect missing from the analysis contained in Figure 3: population growth. To a certain extent some of the growth in GDP observed in Figure 3 is a function of the increases in the population experienced by each of the jurisdictions.

Changes in population are important to consider when assessing income growth. An expanding GDP (income) may simply reflect the fact that people are moving to the jurisdiction and expanding the overall income without increasing per capita income. Alternatively, another jurisdiction may experience low or even zero population growth while also experiencing an

Figure 4: Percent change in population, 2000-2012



Source: Statistics Canada, 2014c; U.S. Department of Commerce, Census Bureau, 2014a.

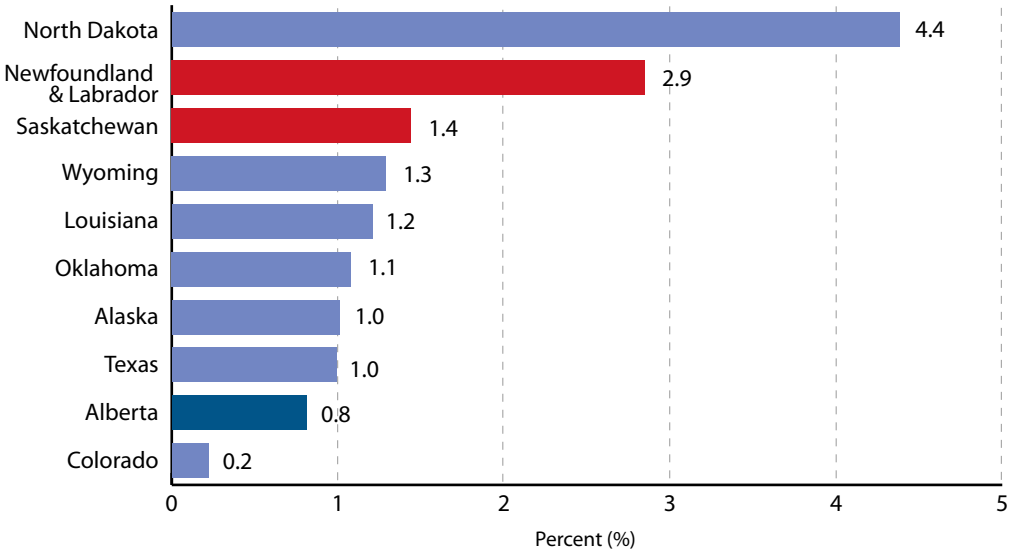
increase in GDP. This latter example means that per person income (GDP) in the jurisdiction is increasing.[8]

Figure 4 illustrates changes in population between 2000 and 2012 for the ten energy-producing jurisdictions.[9] As depicted in Figure 4, nine of the ten jurisdictions experienced an increase in their populations between 2000 and 2012; only Newfoundland & Labrador recorded a decrease in their population (0.2%). Alberta had the highest rate of growth in their population during this period: 29.4%. Texas followed closely at 24.4%. These changes in population are important to consider when assessing income and economic growth.

8 To some extent the results illustrated in Figures 3 and 5 reflect differences in what is referred to as extensive vs. intensive economic growth. Extensive economic growth refers to changes in GDP that are a result of the expansion of the quantity of inputs. For instance, increases in population increase the labour input in GDP. Intensive growth, on the other hand, refers to economic growth that comes about through increases in efficiency; meaning that the economy can produce more from the same level of inputs due to innovation or other technological improvements. Extensive growth may also be a precursor to intensive economic growth. For a discussion of extensive vs. intensive economic growth, please see Irmen, 2005.

9 Part of the data results presented in Figure 4 are a function of people moving from other provinces. For example, Alberta experienced the highest rate of migration from other provinces over the 2000-2012 period (latest data available) with a net in-migration of 6.1 people per 1,000 of population. Louisiana, on the other hand, experienced the largest out-migration during this period—which included the tragic effects of Hurricane Katrina—with 6.2 people per 1,000 of population leaving the state. Saskatchewan, interestingly, reversed decades of consistent out-migration (net) in 2006 when it started to experience a consistent in-migration (net) of people. See Statistics Canada (2014a) and U.S. Department of Commerce, Census Bureau (various years, 1999-2012) for further information.

Figure 5: Average annual real per capita GDP growth (%), 2001-2012



Source: Statistics Canada, 2014b and 2014d; US Bureau of Economic Analysis, 2014b; U.S. Department of Commerce, Census Bureau, 2014a.

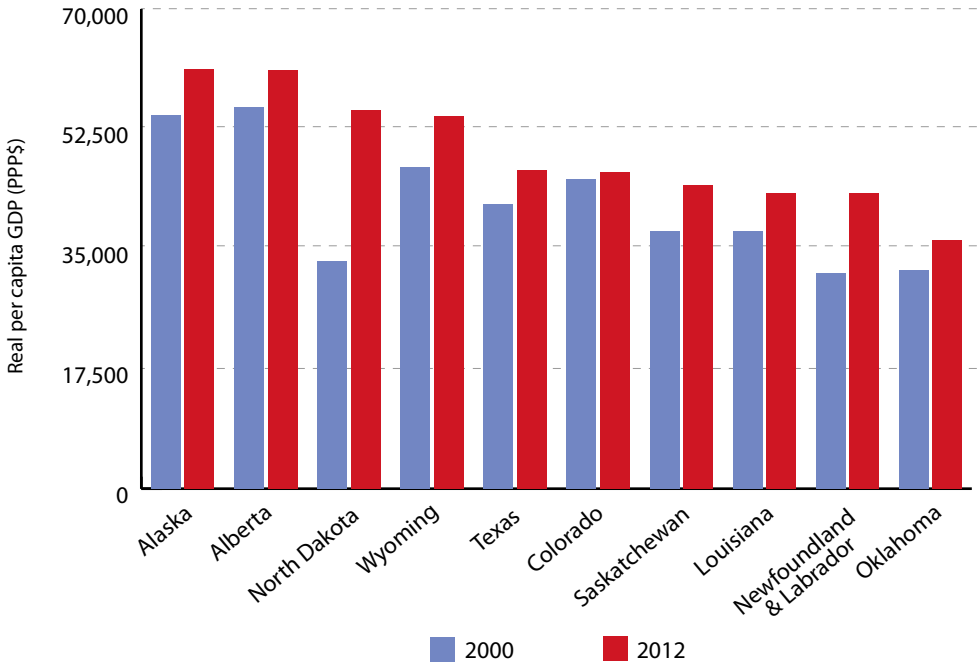
Figure 5 takes population into account by adjusting the average growth in GDP to reflect population levels, which include migration differences as noted above. That is, GDP growth is now calculated on a per person basis to reflect population growth. Specifically, Figure 5 depicts the rankings for the ten jurisdictions in terms of the average annual rate of growth in real per capita GDP over the 2001 to 2012 period.

The striking result from making this single adjustment is that Alberta falls from having the second highest average annual growth rate in real GDP (Figure 3) to having the second lowest average annual increase in real GDP per capita. Specifically, Alberta enjoyed strong economic growth between 2001 and 2011 with average annual increases in real GDP of 3.0% (Figure 3). However, when GDP is adjusted to reflect changes in the population, the average annual growth in per capita GDP is only 0.8%. Only Colorado had a lower average annual increase in real per capita GDP (0.2%) during this period.

North Dakota, on the other hand, which had the highest average annual increase in GDP (Figure 3), also enjoyed the highest average annual increase in real per capita GDP of 4.4%. Newfoundland & Labrador ranked second with an average annual increase in real per capita GDP of 2.9% while Saskatchewan ranked third with 1.4%.

That said, it is worthwhile to recognize that the jurisdictions analyzed started at different positions with respect to per capita GDP. Figure 6 illustrates the real per capita GDP levels for each of the jurisdictions for both 2000 and 2012. There are several aspects of Figure 6 worth noting.

Figure 6: Real per capita GDP, 2000 & 2012 (U.S. PPP$)



Source: Statistics Canada, 2014c and 2014d; U.S. Bureau of Economic Analysis, 2014b; International Monetary Fund, 2013; U.S. Department of Commerce, Census Bureau (2014a).

First, Alberta starts the period with the highest level of real per capita income and ends the period with the second highest level of real per capita income (slightly below Alaska).

Second, as a general rule for the jurisdictions included in the analysis, those that started with comparatively lower levels of average real per capita GDP experienced higher rates of growth over the time period in their average real per capita GDP. For instance, North Dakota and Newfoundland & Labrador maintained two of the lowest real per capita levels of GDP amongst the 10 jurisdictions in 2000 but experienced the highest rates of growth in their average real per capita GDP: 66.5% and 36.7%, respectively. Also, the two jurisdictions with the highest levels of per capita GDP in 2000, Alaska and Alberta, had two of the lowest average growth rates in real per capita GDP: 12.2% and 9.7%.

Third, the performance of North Dakota and its ability to increase GDP stands out from the other jurisdictions. Not only did North Dakota record the highest levels of both real GDP growth and real per capita GDP growth, but it also moved from having the third lowest per capita GDP level to having the third highest real per capita level of GDP amongst the 10 jurisdictions.

Wyoming also stands out for comparatively strong performance across the various measures of GDP growth. It recorded the fifth highest average annual increase in real GDP and the fourth highest average annual increase in real per capita GDP. Wyoming also started and ended the period among the highest levels of per capita GDP.

Alberta's performance was less impressive than these jurisdictions. On the positive side, Alberta recorded the second highest rate of average annual increase in GDP over the 2001-2012 period, although its growth was markedly less than first ranked North Dakota. Alberta started the period (2000) with the highest level of real per capita income and ended the period (2012) with the second highest level. However, it ranked second last amongst the ten jurisdictions with respect to the average annual increase in real per capita GDP. This indicates that much of Alberta's growth in GDP over this period was extensive—that is, linked to increases in the quantity of inputs such as labour. In other words, Alberta's economic growth over this period was strongly tied to increases in population and the expansion of other inputs. This stands in contrast to jurisdictions that increased their output by becoming more efficient with a given set of inputs through innovation and technological advances. While Alberta enjoyed strong economic growth over this period, some caution is warranted given both its comparative performance to states like North Dakota as well as the more extensive rather than intensive nature of the underlying economic growth.

2) Labour market performance

The next set of indicators focus on labour market performance, specifically job creation and unemployment rates. These indicators assess the degree to which each jurisdiction was able to generate jobs for those interested and able to work.

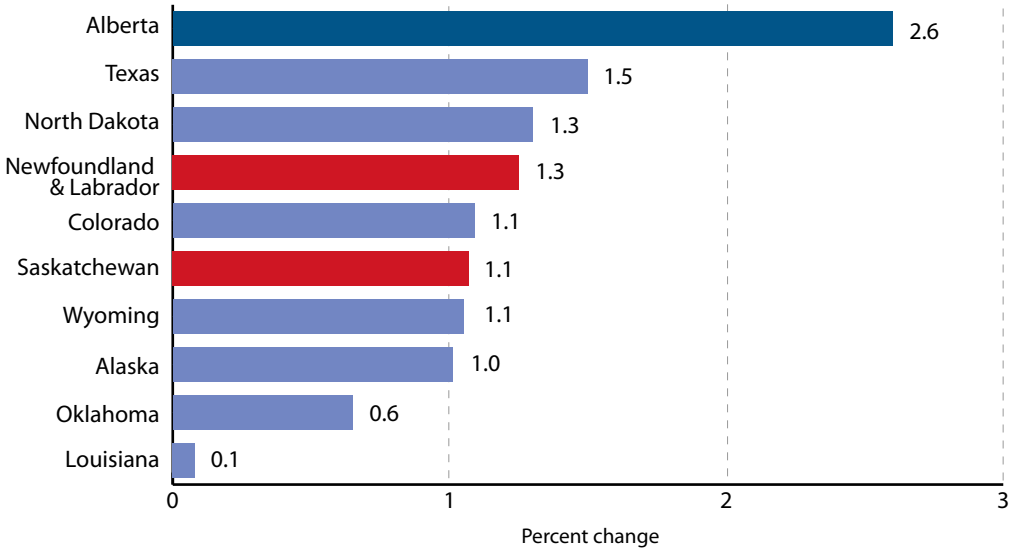
Three measures are used to assess the performance of each jurisdiction in creating employment. The first is simply the average annual growth rate of total state or provincial employment. The subsequent two measures then assess the nature of the employment created by measuring the average annual growth rates of both private and government sector employment.

Figure 7a presents the ranked results for the average annual change in total employment between 2001 and 2012 for the ten jurisdictions.[10] It is clear that Alberta was performing at a level unparalleled with other energy producing provinces and states over this time period. Alberta's average annual rate of total employment growth (2.6%) was almost double the comparable rate in second-placed Texas (1.5%).[11]

10 These differences in employment growth across the Canadian provinces and U.S. states reflect, to some degree, the different impact of the 2009 recession on the two countries. Canada weathered the recession better than the U.S. and much of the G-7 as a result of its strong resource and commodity sectors, the general strength of its financial sector institutions, and the resilience of the housing sector. Canada has generally outperformed all the other G-7 economies in job creation over the recession recovery and its labour market has performed better than that of the U.S. (United States Government, 2014).

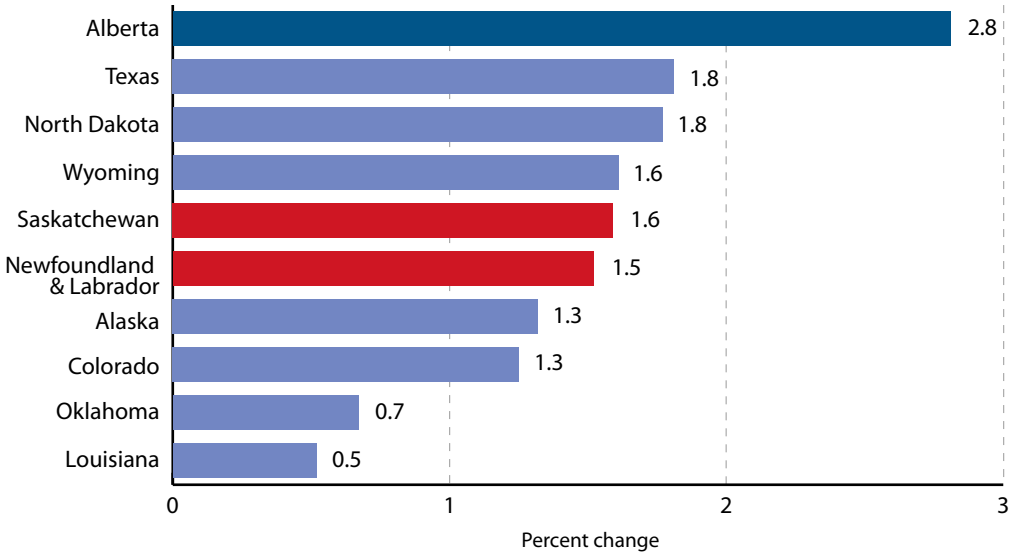
11 An alternative way to examine the growth in employment is to measure the employment levels at the start (2000) and end of the period (2012). By this measure, Alberta expanded its employment by 35.8% compared to second-placed Texas, where employment increased

Figure 7a: Average annual rate of total employment growth (%), 2001-2012



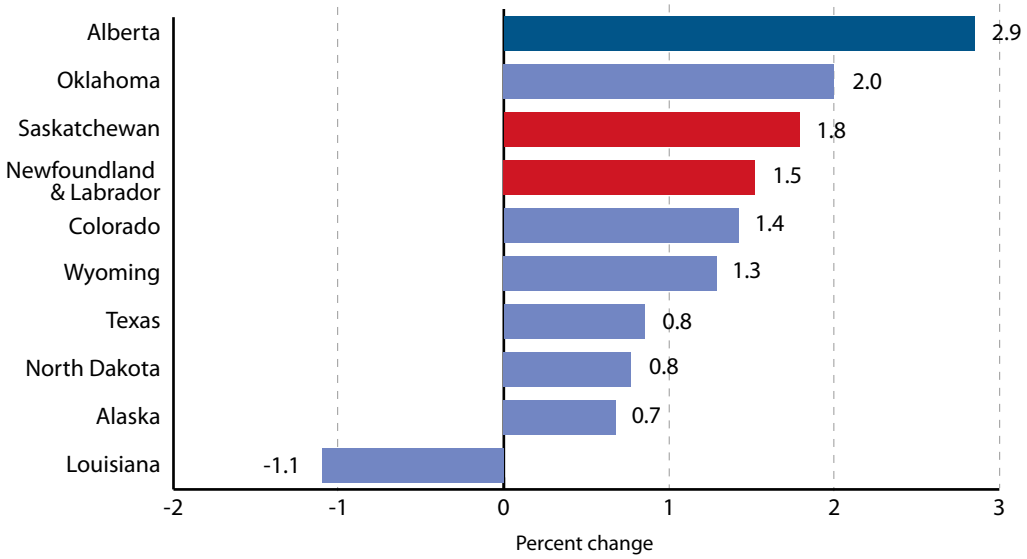
Source: Statistics Canada, 2014e; U.S. Department of Labor, Bureau of Labor Statistics (various years, 2000-2012).

Figure 7b: Average annual rate of private sector employment growth (%), 2001-2012



Source: Statistics Canada, 2014e; U.S. Department of Labor, Bureau of Labor Statistics (various years, 2000-2012).

Figure 7c: Average annual rate of public sector employment growth (%), 2001-2012



Source: Statistics Canada, 2014e; U.S. Department of Labor, Bureau of Labor Statistics (various years, 2000-2012).

Indeed, most of the jurisdictions performed at similar rates ranging between seventh-placed Wyoming at 1.1% and second-placed Texas at 1.5%. Louisiana ranked last with a paltry average annual growth rate of total employment of just 0.1%.

Figure 7b presents the same statistical measure as Figure 7a except it includes only private sector employment growth. This is an important consideration since the resources required to finance public sector employment must be extracted from the private sector.

Alberta continues to perform well when only private sector employment growth is measured although the difference between it and the second-place jurisdiction, Texas, is smaller than when total employment growth is measured.[12] Specifically, Alberta enjoyed an average annual increase in private sector employment of 2.8% between 2001 and 2012 compared to second-placed Texas' rate of 1.8%.

It is also worth noting that several jurisdictions experienced changes in their ranking when only private sector employment growth was measured. For instance, both Newfoundland & Labrador and Colorado experienced declines in their rankings from total employment growth (fourth and fifth, respectively) to private sector employment growth (sixth and eighth, respectively).

Figure 7c illustrates the average annual change in public sector employment during this same period. Alberta recorded the highest level of average

by 19.4% over the period.

12 Alberta's average annual total employment growth was 73.3% higher than second-placed Texas while its average annual private sector employment growth was 54.7% higher.

increases in public sector employment between 2001 and 2012 compared to the other energy-producing provinces and states. Specifically, Alberta's public sector increased, on average, by 2.9% annually over this period. This is slightly more than the average increase recorded in Alberta's private sector employment over the same period. It is also markedly above the level recorded by Oklahoma, which ranked second with average annual increases in its public sector of 2.0%.

Both remaining Canadian provinces, Saskatchewan and Newfoundland & Labrador, rank high with respect to the average annual increase in their public sector employment: 1.8% and 1.5%, respectively. Louisiana was the only jurisdiction to record a contraction—at -1.1% in its public sector employment over this time period.

The flip-side of job creation measures relate to unemployment or the inability of workers to secure employment. The standard measure of unemployment is the share of the labour force wishing to work who cannot secure employment. The unemployment rate used for Canada was "R3", which matches the definition used in the United States.[13] Figure 8 illustrates the comparable average unemployment rate for the 10 jurisdictions between 2000 and 2012.

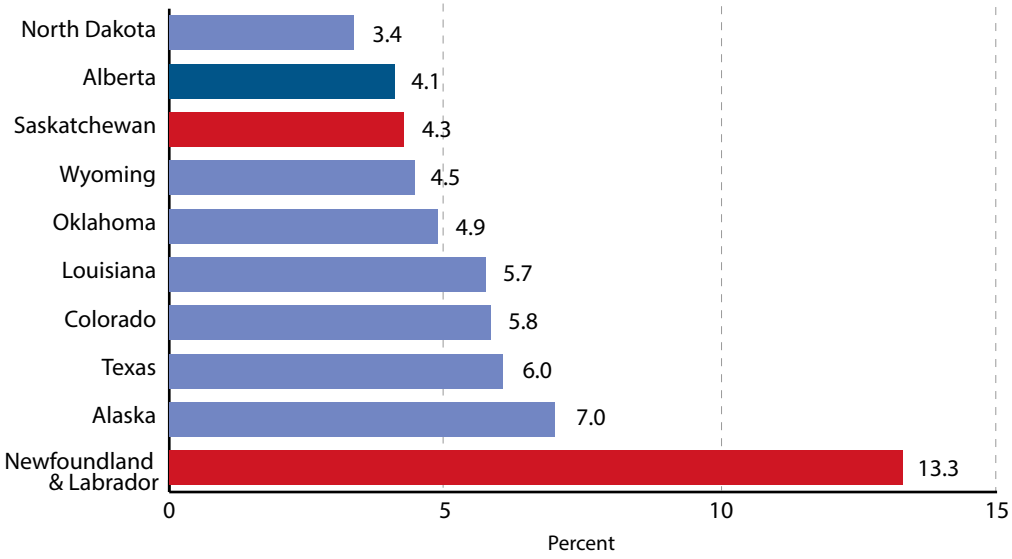
North Dakota enjoyed the lowest average annual unemployment rate during the 2000 to 2012 period at 3.4%. Alberta ranked second with an average unemployment rate of 4.1% during the same period followed closely by Saskatchewan (4.3%) and Wyoming (4.5%). Newfoundland & Labrador experienced the highest unemployment rate at 13.3%, almost four times the rate experienced in North Dakota and more than three times the rate of Alberta and Saskatchewan.

An alternative and increasingly popular method by which to measure unemployment is to compare employment levels with the working age population. This measure overcomes one of the deficiencies observed in the standard unemployment rates, which is that people are required to actively seek employment to be counted as unemployed. This criteria means that people who drop out of the labour force and are no longer actively looking for work are not counted as unemployed. The employment-to-working age population overcomes this problem by simply comparing the number of people employed to the number of potential people employed.

Figure 9 presents the average employment-to-working age population (18-64) for each of the ten energy-producing provinces and states for the period 2000 to 2012. North Dakota maintains the highest ratio of employment to its working age population at 85.5%. Alberta ranks

13 Specifically, the R3 unemployment rate in Canada excludes full-time students. For a discussion and analysis of alternative unemployment rates available in Canada, please see http://www.statcan.gc.ca/studies-etudes/75-001/archive/1992/5023057-eng.pdf.

Figure 8: Average annual unemployment rate (%), 2000-2012



Source: Statistics Canada, 2014f; U.S. Department of Labor, Bureau of Labor Statistics (2014a).

second with a ratio of 82.8% of employment to working age population, on average. Newfoundland & Labrador ranks last with an employment-to-working age population of just 62.1%, markedly below most other jurisdictions.[14]

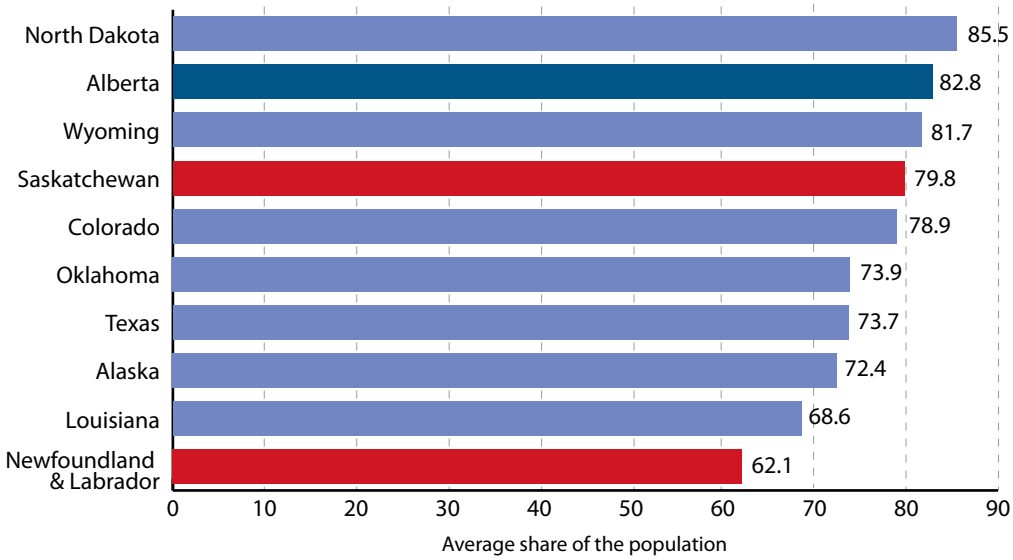
3) Productivity

Another important set of economic performance measures[15] to consider relate to productivity. Productivity refers to the ability of an economy to transform a given set of inputs like labour and capital into useful outputs (i.e.,

14 Additional details are available for employment-to-working age population statistics. However, there is a major limiting factor in being able to use this data for this analysis. A number of researchers have identified and explained how changes to national policy in the U.S. have affected its unemployment rate, job creation, and employment-to-population ratios. For instance, several researchers have explained how extension of the country's unemployment insurance to 99 weeks influenced labour market participation. These national policies have, to varying extents, influenced the labour market performance of the subsidiary states. For further information on how national policies have impeded the U.S. recovery with particular emphasis placed on the labour market, please see Mulligan (2012) and Moore (2012).

15 A critical measure of economic performance is investment, which gauges not only current economic performance but is also the best predictor of future economic performance. Unfortunately data is not available for investment at the state level in the U.S. This is a major problem for measuring economic performance at the sub-national level. Data is, however, available for the Canadian provinces.

Figure 9: Employment as a share of the 18-64 population (%) , 2000-2012



Source: Statistics Canada, 2014def; U.S. Department of Labor, Bureau of Labor Statistics , various years 1990-2012; U.S. Department of Commerce, Census Bureau, 2012 and 2013.

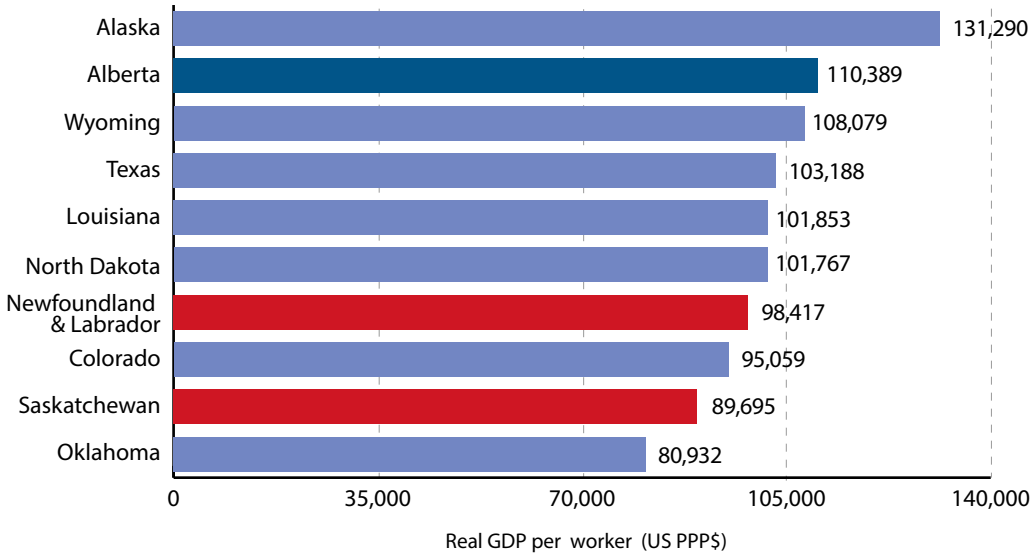
goods and services). It is a complicated[16] but nonetheless critical measure of both current and future prosperity since income and the goods and services available are a direct result of a society's productivity.

One of the basic measures used to assess productivity is real GDP per worker. It is meant to measure the level of output (GDP) generated by each worker. Figure 10a illustrates the level of real GDP per worker for each of the 10 energy-producing jurisdictions for 2012.

Alaska maintains the highest level of real output per worker (2012) at $131,290. Alberta ranks second with $110,389 in real output per worker, which is 84.1% of the level of Alaska. Alberta is essentially at the head of six or even seven jurisdictions with fairly close levels of real GDP per worker (Figure 10a). Unfortunately, both Newfoundland & Labrador (seventh) and Saskatchewan (ninth) rank in the bottom half of the energy-producing provinces and states for real GDP per worker.

16 Noted economist and internationally recognized productivity expert Erwin Diewert of the University of British Colulmbia recently published a paper questioning the accuracy of Canada's productivity statistics from a methodological perspective. It is an important paper from several perspectives including the identification of potential problems in our statistics. Please see Erwin Diewart (2012). *The Challenge of Total Factor Productivity Measurement*. Centre for the Study of Living Standards. Available at http://www.csls.ca/ipm/1/diewert-un-en.pdf; and for an overview of the general issues related to productivity and its measurement please see Marc Law (1999). *Productivity and Economic Performance: An Overview of the Issues*. Fraser Institute. Available at http://oldfraser.lexi.net/publications/pps/37/.

Figure 10a: Real GDP per worker, 2012 (U.S. PPP$)



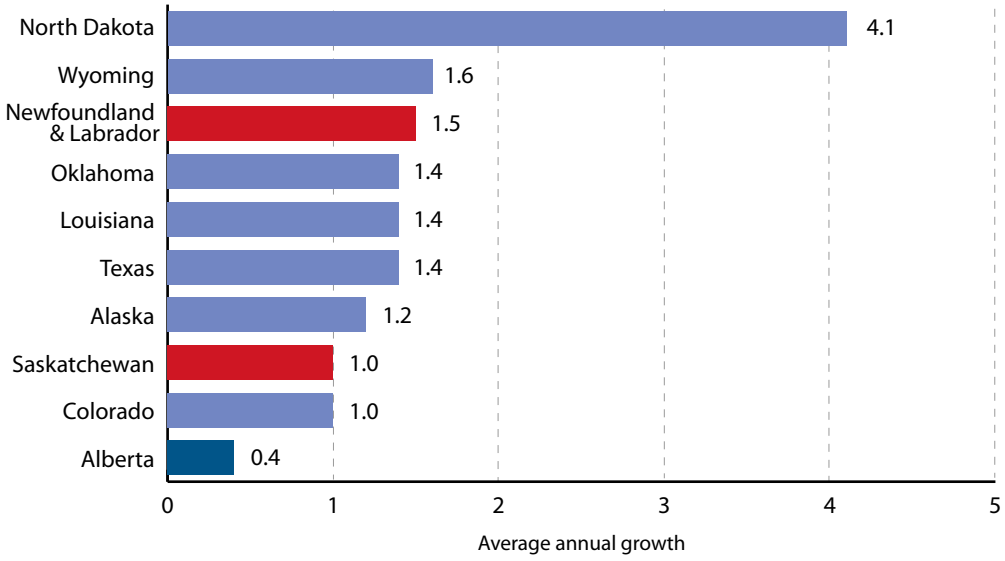
Source: Statistics Canada, 2014c and 2014g; U.S. Bureau of Economic Analysis, 2014b; U.S. Department of Labor, Bureau of Labor Statistics, 2014b.

Another key measure of productivity is the growth in real output (GDP) per worker over time. Figure 10b illustrates the average annual growth in real GDP per worker between 2001 and 2012 for the ten energy-producing provinces and states. North Dakota recorded a stunning increase in productivity over this period, achieving an average growth in real GDP per worker of 4.1%. This was more than two-and-a-half time the growth rate experienced in second-ranked Wyoming (1.6%). Unfortunately, Alberta ranked last among the ten energy-producing jurisdictions for its ability to increase real output per worker. Specifically, Alberta experienced a 0.4% increase in real output per worker, on average, between 2001 and 2012.

Conclusions—Economic performance

Overall, Alberta's economy performed relatively well over the last decade when compared with other energy-producing provinces and states although there are areas of concern. In terms of expanding GDP, Alberta enjoyed the second highest average rate of real economic growth (2001-2012) and the second highest level of real GDP per person (2012). However, the growth in real per capita GDP ranked second last among the provinces and states measured during the 2001-2012 period. In some ways this illustrates the struggle that Alberta has experienced in improving its productivity, which measures the ability of the economy to transform various inputs into useable outputs. Over the 2001-2012 period, Alberta ranked last with respect to its average growth rate in real per worker GDP. Simply put, these two

Figure 10b: Average annual growth rate (%) in real GDP per worker, 2001-2012 (U.S. PPP$)



Source: Statistics Canada, 2014c and 2014g; U.S. Bureau of Economic Analysis, 2014b; U.S. Department of Labor, Bureau of Labor Statistics, 2014b.

indicators—Alberta's growth in per worker GDP (as a measure of productivity) and average growth in per capita GDP—show that much of the province's economic growth is coming from expanding inputs like labour rather than improving the productivity (and thus income) of individual workers.

To some extent these results are observed in the overwhelming strength of Alberta' labour market. Over the last decade Alberta has been a jobs machine with an average annual growth in total employment of 2.6%, which is more than 70% higher than second-placed Texas (1.5%). Part of that success is explained by Alberta's strong gains in private sector employment. On average, Alberta increased private sector employment by 2.8% between 2001 and 2012. This is more than 50% higher than second-placed Texas, which registered average private sector employment gains of 1.8% annually. However, Alberta also recorded the highest level of average increases in public sector employment over this period. Indeed, Alberta's public sector increased, on average, by 2.9% annually, which is slightly more than the average increase recorded in Alberta's private sector employment over the same period.

Alberta's average unemployment rate, as well as its employment-to-working age population ratio, indicate an incredibly strong labour market.

In sum, while Alberta enjoyed a comparatively strong economy over the last decade, there are warning signs. In particular, Alberta policy-makers should be concerned about the fact that most of the economic growth experienced in the province was the result of expanding inputs rather than improved productivity.

III. Government fiscal comparison

The second set of analyses presented in this study compares the fiscal performance of the provincial and state governments of the various energy-producing jurisdictions by looking at government surpluses/deficits, the amount of government debt, and the size of government (i.e., government spending).[17]

Provincial and state fiscal indicators are not as readily comparable as economic indicators. Canadian provinces and U.S. states have different institutional arrangements with municipalities in their jurisdictions and the federal government, different constitutional restrictions, as well as differences in data definitions.

U.S. states, for example, have their own constitutions that affect their fiscal powers whereas the powers of Canadian provinces in relation to the federal government are set out in the 1867 British North America Act and the 1981 Constitution Act. This is particularly important to consider when examining fiscal measures such as deficits and debt since 48 states have constitutional requirements imposed on them for balanced budgets.[18] Furthermore, the local government share of combined state-local spending in the U.S. is generally higher than the local share of provincial-local spending in Canada.[19]

17 Natural resource economies can be subject to volatility as a result of fluctuations in commodity prices. For example, Alberta's economic and fiscal performance is sometimes described as being subject to boom and bust cycles based on the performance of oil prices. For an overview, see Emery and Kneebone (2009).

18 The importance of the constitutional requirement for states to balance their budgets is often over stated. The reason being that many states' constitutional requirement for a balanced budget only pertains to their operating account and excludes other spending facilities that may allow for deficits and debt. For further information, please see Clemens, Veldhuis, and Joffe (2013).

19 For a discussion of some of these differences, see Ferris and Winer (2007).

Another example of differences between Canadian provinces and U.S. states that is particularly germane to this study is the definition of natural resource revenues. Canadian provinces generally use resource rents and royalties whereas in the U.S. such levies are predominately known as severance taxes—taxes imposed on the removal of natural products and levied on the quantity or volume of the resource extracted. In the U.S., most of the resource extraction occurs on privately owned land whereas in Canada the resource extraction occurs mainly on publicly owned land. In this study, natural resource revenues for the U.S. states are from two sources: state levied severance taxes as reported by the U.S. Census Bureau and disbursements of revenue generated by energy production on public lands and offshore waters as reported by the U.S. Department of the Interior.[20]

There are also differences in fiscal years with Canadian provinces ending March 31st and many U.S. states ending on June 30th. Furthermore, the differences in public accounting can affect variables such as net public debt or spending measures. The fiscal data used in the comparison for Canada's provinces are from their respective provincial public accounts, which follow Generally Accepted Accounting Principles (GAAP) and are independently audited. U.S. state data are from the U.S. Census Bureau's Survey of State Government Finances, which are compiled from government accounting records. As such, the U.S. data are consistent but do not follow a specific accounting standard. Where possible, we have commented on what the results would have been had we used the only other comprehensive source available, the State Data Lab compiled by Truth in Accounting using State Comprehensive Annual Financial Reports (CAFR), which like provincial public accounts, follow GAAP and are independently audited.

1) Fiscal balance: surplus/deficit

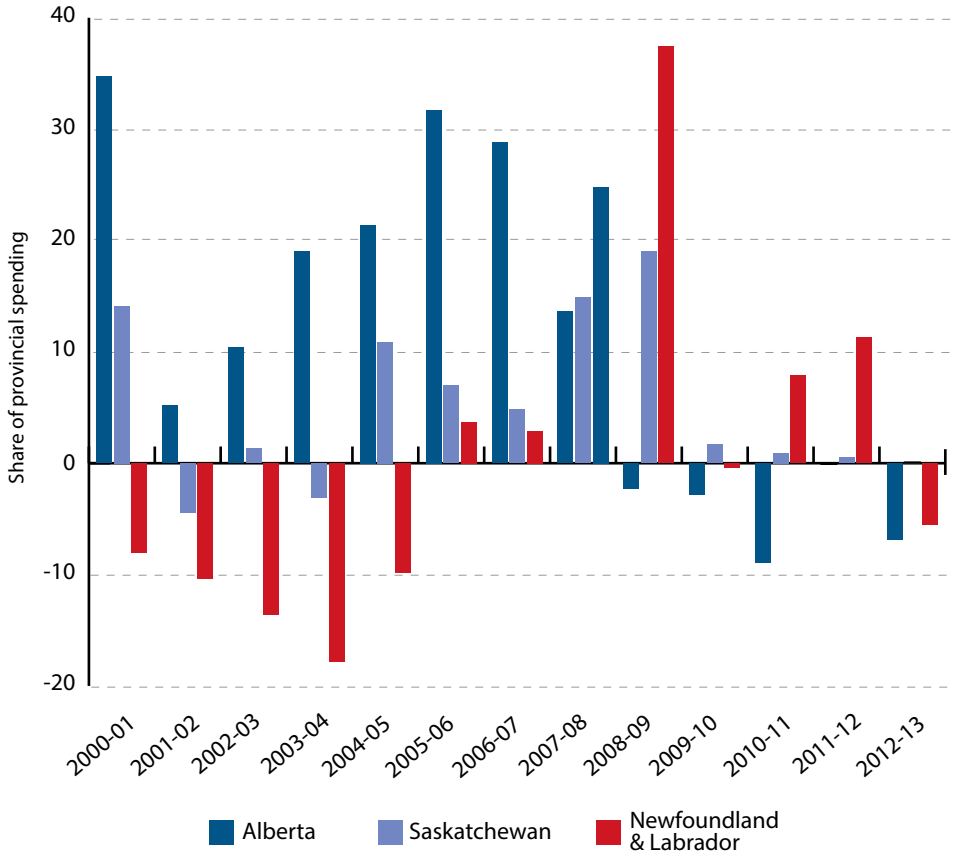
Fiscal balance refers to the difference between what governments collect in revenues such as taxes and fees and their spending. When governments collect more in revenues than they spend, a budget surplus results that is either used to pay down debt or saved. On the other hand, when revenues are less than spending, deficits occur which require governments to borrow money.

Surplus/deficit as a share of provincial/state spending

There are a number of methods by which to gauge the fiscal balance (i.e., surplus or deficit) of governments. Several measures are used in this paper in order to capture different aspects of the deficits or surpluses of the various jurisdictions. The first measure, which is one of the standard approaches to

20 These disbursements flow to states from the federal government and of the states included in this study are only a significant share of total resource revenues in Colorado and Wyoming.

Figure 11a: Provincial surplus/deficit as a share of total government spending (%)



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014d.

measuring fiscal balance (i.e., deficits and surpluses) is to compare the value of the deficit or surplus against total spending by the government. It provides a measure of the size of fiscal balance relative to the total amount of money spent by government.[21]

For presentation purposes and due to the fact that an extra year of data (2012-13) is available for the Canadian provinces, this measure is separated into two figures, one for the Canadian provinces and another for the U.S. states. Figure 11a illustrates the fiscal balance of the three Canadian provinces as a share of total provincial spending over 2000-01 to 2012-13.[22]

21 In some cases a narrower measure of government spending is used: program spending. The difference between total spending and program spending is the inclusion of debt charges in the former, which makes it a broader measure of spending.

22 It is important to note that the Fiscal Reference Tables, which summarize the Public Accounts of the federal and provincial governments (http://www.fin.gc.ca/pub/frt-trf/index-eng.asp) show two values for Saskatchewan's fiscal balance: (1) deficit or surplus, and (2) reported balance.

Figure 11b: State surplus/deficit as a share of total government spending (%)

Figure 11b (i): Wyoming

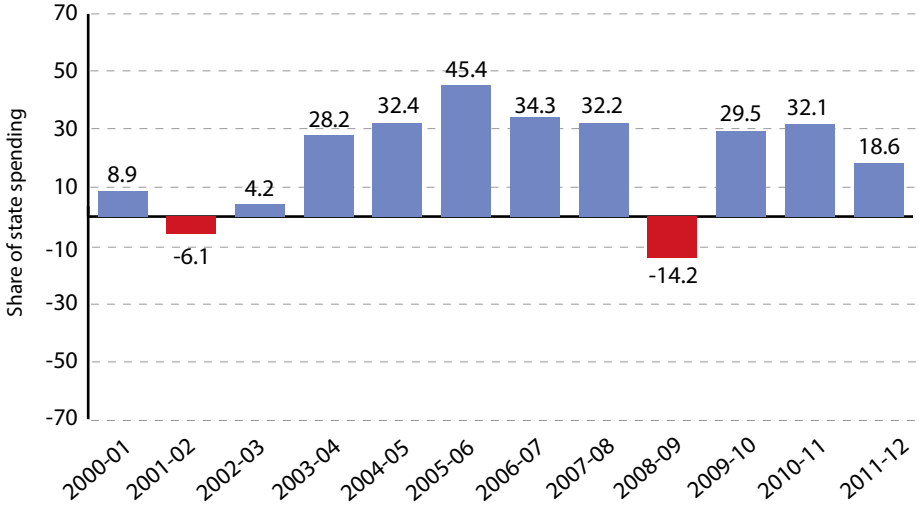


Figure 11b (ii): Alaska

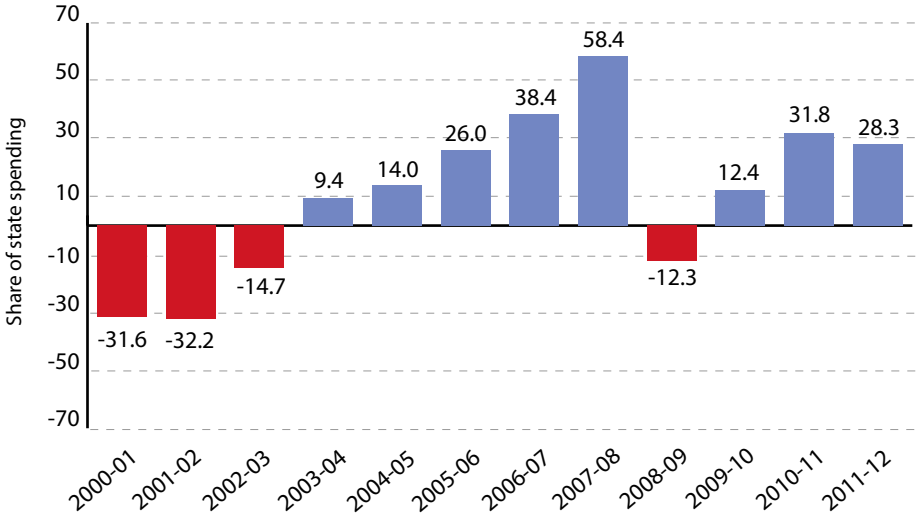


Figure 11b (iii): North Dakota

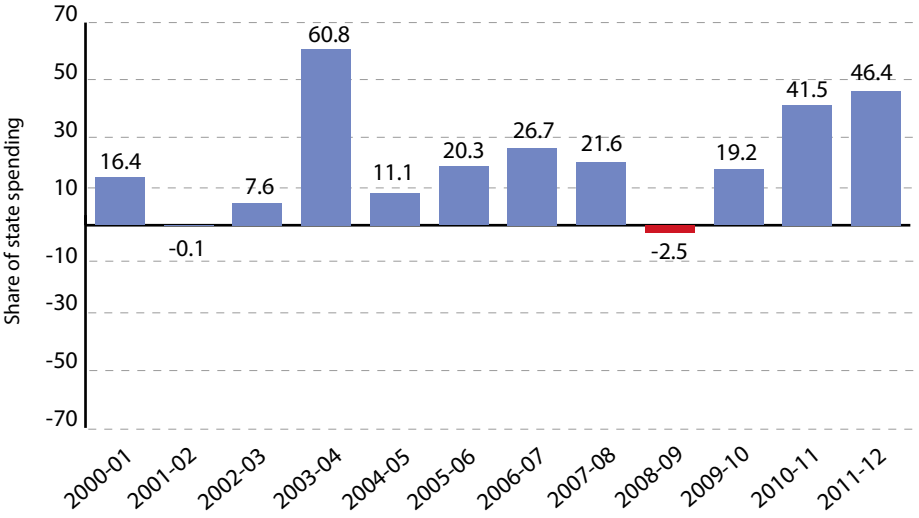


Figure 11b (iv): Texas

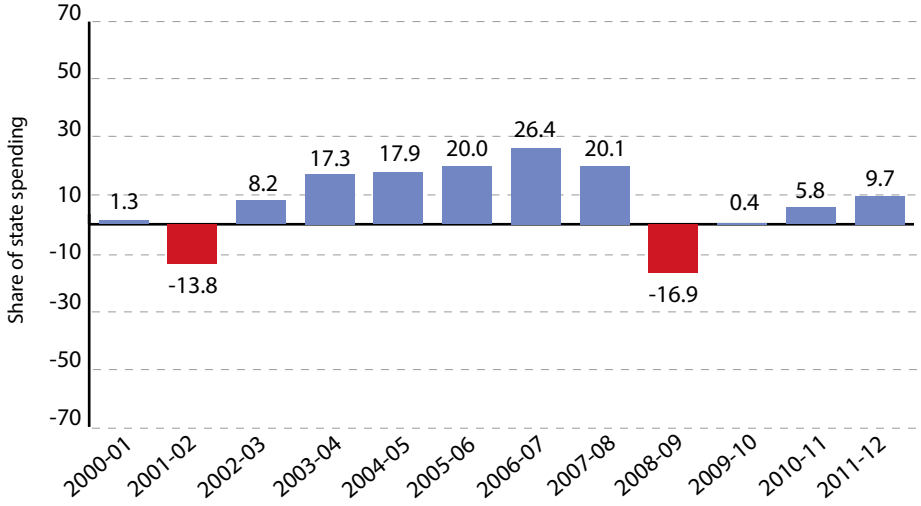


Figure 11b (v): Oklahoma

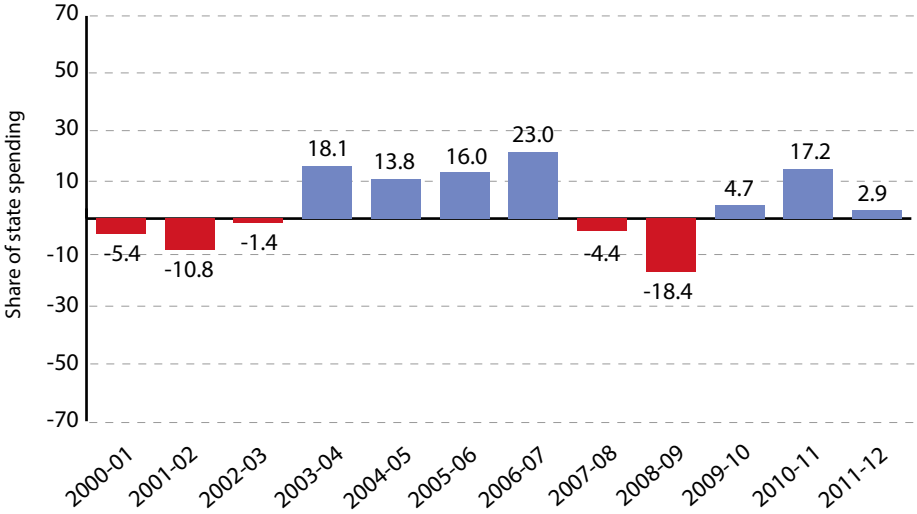


Figure 11b (vi): Colorado

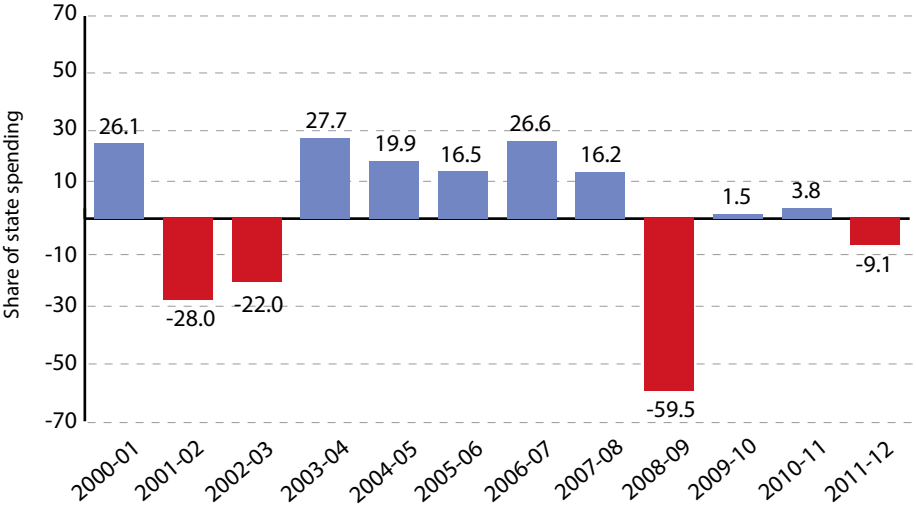
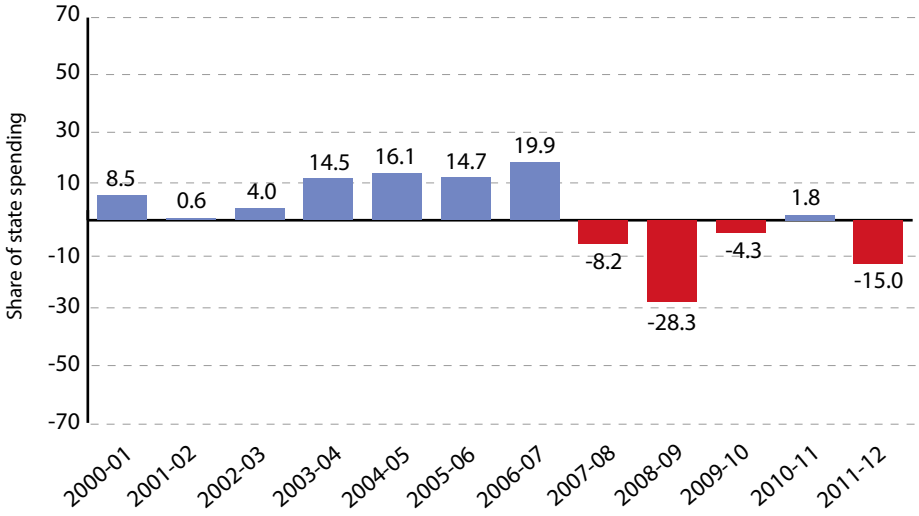


Figure 11b (vii): Louisiana



Source: U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2009-2011, 2012, and 2014a; International Monetary Fund, 2013..

There are several aspects of Figure 11a worth noting. First, Alberta moves from enjoying the largest surpluses as a share of spending pre-recession in 2008-09 to the largest deficits as a share of spending. Specifically, Alberta reversed from an average surplus of 20.6% of provincial spending between 2000-01 and 2007-08, to an average deficit of 4.2% of provincial spending between 2008-09 and 2012-13.

Second, Alberta, as well as Newfoundland & Labrador, experienced improvement in their fiscal balance in 2011-12 but backtracked in 2012-13 with large deficits. Specifically, Alberta's deficit in 2011-12 was just 0.1% of total spending but increased markedly to 6.9% of provincial spending in 2012-13.

Third, Saskatchewan is the only province of the energy-producing Canadian provinces to consistently record surpluses throughout the period. And finally, both Saskatchewan and Newfoundland & Labrador bucked the trend in the recession of moving to deficit. Both provinces actually experienced large increases in their size of their surpluses in 2008-09 although both also recorded large-scale declines in the surpluses the following year to the point of basically breaking even in 2009-10.

Figure 11b illustrates the same data for the U.S. states except that it only extends to 2011-12 due to a lack of data for 2012-13. The general trend observed in Figure 11b is similar to that of Figure 11a for the Canadian provinces. Most of the U.S. states enjoyed surpluses pre-recession and then moved to deficit as the economy contracted in 2008-09. Again, there are several aspects of Figure 11b worth noting.

The reported balance in the Fiscal Reference Tables is consistently higher than the deficit/surplus figure. For conservative presentation purposes, we rely on the deficit/surplus figure.

First, unlike Saskatchewan and Newfoundland & Labrador, all seven states moved to deficit positions in 2008-09 as the recession took hold in the U.S. As noted previously, the U.S. economy suffered a much deeper recession than the Canadian economy.

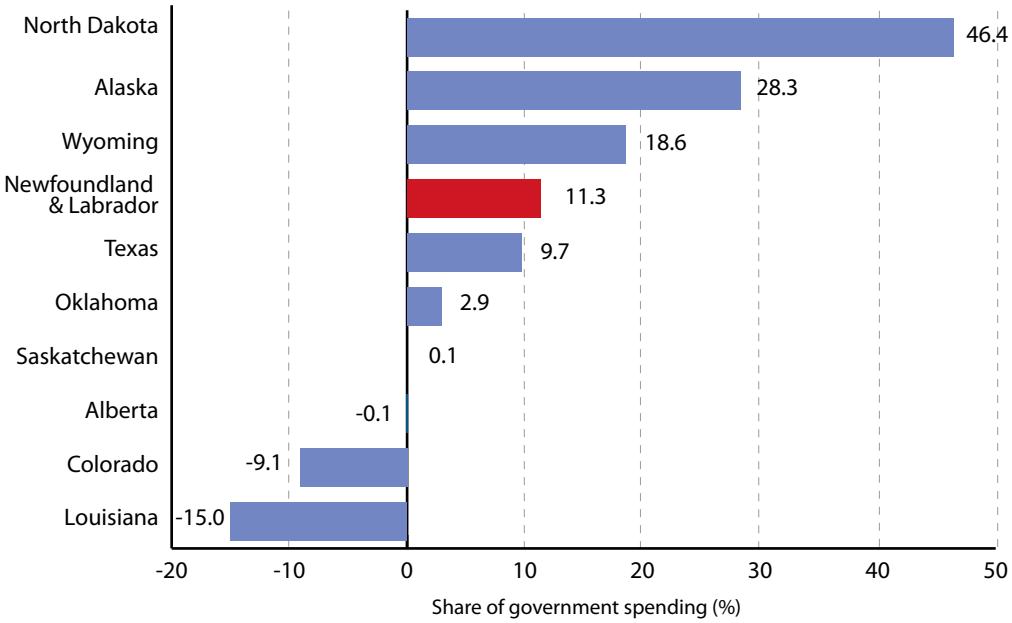
Second, six of the seven U.S. states quickly rebounded to surplus positions in 2009-10. Only Louisiana remained in deficit in 2009-10. Indeed, several of the states including Wyoming, Alaska, and North Dakota moved to large surplus positions in 2009-10, averaging in excess of 20% of state spending.

Finally for comparative purposes, Figure 11c illustrates the deficit/surplus position of the Canadian provinces and U.S. states for 2011-12, the most recent year for which comparable data is available. Alberta ranks eighth of the ten jurisdictions with a deficit of 0.1% of provincial spending. Only two other jurisdictions recorded deficits in 2011-12, Colorado and Louisiana. Recall, however, that Alberta's deficit worsened in 2012-13 and Newfoundland & Labrador moved from a surplus in 2011-12 to a deficit in 2012-13.

The remaining seven jurisdictions enjoyed surplus relative to total spending ranging from an incredible 46.4% in North Dakota to an essentially balanced budget in Saskatchewan (surplus of 0.1% of provincial spending).

The insight from Figures 11a-c is that Alberta's fiscal balance has not rebounded as strongly as the other energy-producing jurisdictions. Several states are enjoying large surpluses while Alberta's most recent statistics indicate

Figure 11c: Provincial and state deficit/surplus as a share of government spending (%), 2011-12



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014d; U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2001-2009, 2009-2011, 2010-2011, 2012, and 2014a; International Monetary Fund, 2013.

a fairly large overall deficit. The presence of deficits while other energy-producing jurisdictions are in surplus coupled with the general strength of the Alberta economy as highlighted in the first section of this paper should give pause for concern about the general state of Alberta's government finances.

Per capita statistics for surplus/deficit

Another method by which to measure surpluses and deficits is to rank them based on their per capita values. That is, this measure adjusts the fiscal balance figures to reflect the population of each jurisdiction.

Figure 12a illustrates the average per person surplus or deficit over the 2000 to 2011 period, denominated in comparable U.S. PPP dollars. All ten jurisdictions enjoyed an average surplus during this period with Wyoming maintaining the largest average surplus at $1,792 per person. Louisiana ranked last of the ten jurisdictions with an average per capita surplus over the period of $5.

Alberta ranked fourth with an average annual surplus of $763, which was less than half of the value of Wyoming. Indeed, there is quite a drop in the average per person surplus after North Dakota, which ranked third ($1,501).[23]

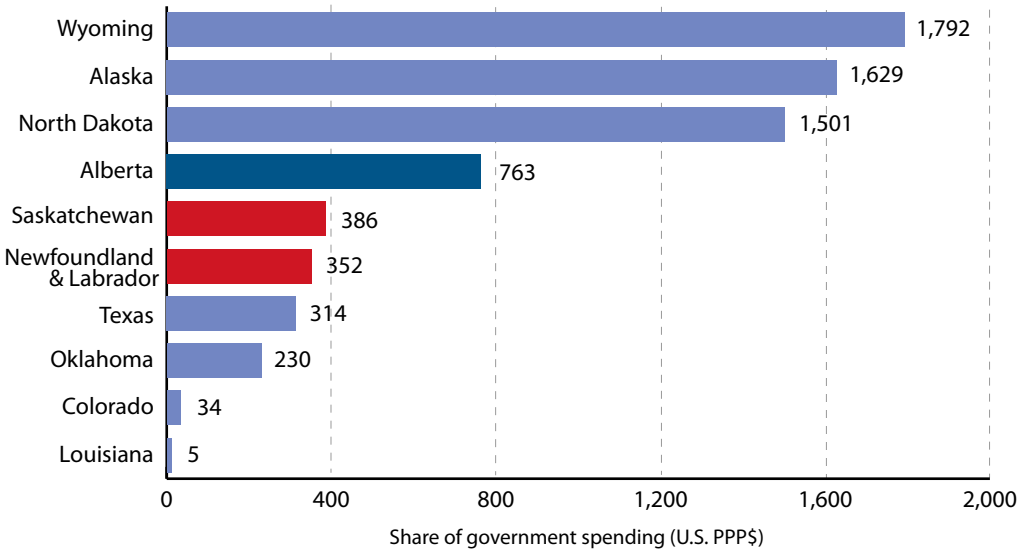
Figure 12b makes one adjustment to the data presented in Figure 12a: it removes natural resource revenues. This provides an alternative measure of the average per person surplus or deficit in the jurisdictions that takes account of the jurisdiction's reliance on resource revenues.[24]

The results presented in Figure 12b are significantly different from those in Figure 12a. First, only three of the ten jurisdictions are in surplus once resource revenues are removed compared to the previous result when

23 The CAFR data compiled by Truth in Accounting and presented as the State Data Lab (SDL) show a different ranking but this is mainly due to the different time periods available. Three of the ten jurisdictions have the same rank in the 2000-2011 Census Bureau (CB) data and 2004-2011 SDL data, six move one place and only one jurisdiction moves two places. When we calculate the averages using 2004-2011 data for both series (CB and SDL), eight jurisdictions maintain their rank and two switch places. That most of the difference was due to the time period chosen weighed heavily in our decision to use Census Bureau data as the analysis base. Using SDL data: Wyoming's average surplus was higher at $2,663 but Alaska ranked first with an average surplus over 2004-2011 of $6,138; Louisiana ranked last with an average surplus of $67; and, Alberta ranked fifth with an average surplus roughly one-quarter of Wyoming's and one-tenth of Alaska's

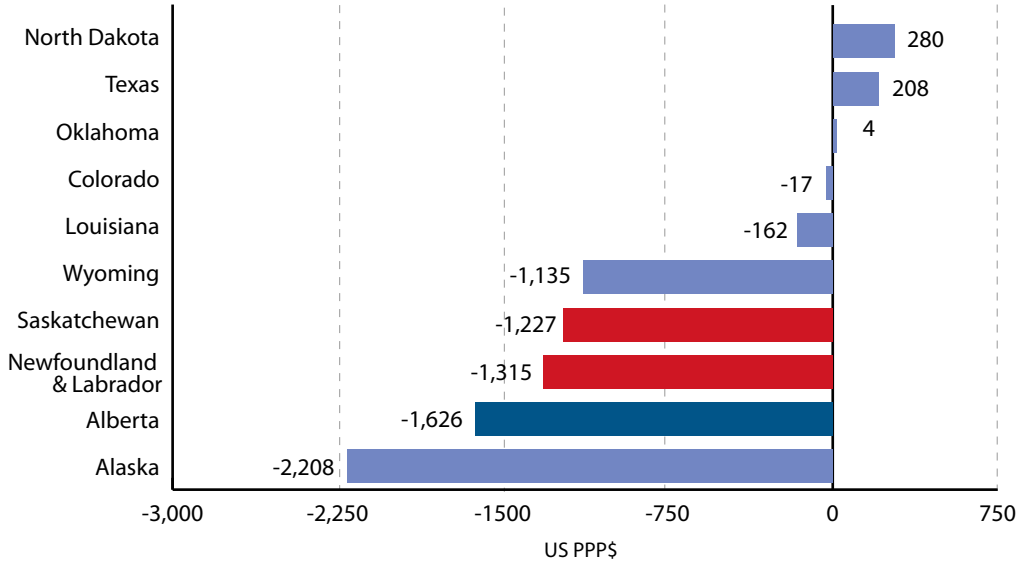
24 Using alternative figures from the State Data Lab results in a similar result although values and some ranks are slightly different. Specifically, the top four and the bottom jurisdictions maintain their ranks; Texas shows a smaller surplus and Oklahoma a larger one. The main difference is that Colorado moves from deficit to surplus and Louisiana posts a much smaller deficit. The result for Alberta is a drop from eighth to ninth place and a substantial decrease in the gap between it and the worst performing jurisdiction.

Figure 12a: Average per capita surplus/deficit 2000-2011 (U.S. PPP$)



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014d; U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2009-2011, 2012 and 2014a; International Monetary Fund, 2013.

Figure 12b: Average per capita deficit without natural resource revenues, 2000-2011 (U.S. PPP$)



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014d; U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2009-2011, 2012 and 2014a; International Monetary Fund, 2013.

all ten jurisdictions were in surplus. It's worth noting that one of the jurisdictions still in surplus is North Dakota, which was identified in the first section for its strong comparative economic performance.

Second, the per capita surpluses for the three jurisdictions that are still in a surplus position are significantly lower once resource revenues are removed. For example, top ranked North Dakota's average per person surplus over the 2000-2011 period drops from $1,501 to $280.

Third, two of the top four jurisdictions from the previous measure, Alberta and Alaska, are now not only in a deficit position but constitute the two largest per capita average deficits for the entire comparison group of provinces and states. Specifically, Alberta goes from an average per person surplus of $763 (figure 12a) when resource revenues are included to an average per person deficit of $1,626 (figure 12b) when resource revenues are excluded.

Fourth and finally, all three Canadian provinces are now in deficit positions when resource revenues are excluded. In addition, it can be seen from the results for Figure 12b that the three Canadian provinces along with Alaska and Wyoming have a disproportionate reliance on natural resource revenues. Alternatively, North Dakota and Texas have a lower reliance on resource revenues despite their large and growing energy sectors.[25]

Before proceeding to the next measure, it is important to understand the source of the deficits observed in Alberta. Since 2005-06, the provincial government in Alberta has increased program spending by $22.1 billion more than needed to account for inflation and population growth.[26] In other words, since 2005-06, the inflation-adjusted value of program spending accounting for changes in population has increased by over $22 billion. Had the government of Alberta simply maintained the real value of per person spending in the province, Alberta would have recorded successive balanced budgets. It is this marked increase in real spending[27] in particular that has caused its deficits over the last number of years rather than any particular dearth of revenues.

25 Alberta's reliance on natural resource revenues in particular has also been noted in Kneebone and Gres (2013).

26 Mark Milke (2013). *Alberta's $22-Billion Lost Opportunity: How Spending Beyond Inflation + Population Growth Created Alberta's Red Ink*. Vancouver, BC: The Fraser Institute. Available at: http://www.fraserinstitute.org/uploadedFiles/fraser-ca/Content/research-news/research/publications/albertas-$22-billion-lost-opportunity.pdf.

27 It is also worth noting that public sector workers in Alberta continue to enjoy wage and benefit premiums over their private sector counterparts. An analysis completed in 2013 placed the average wage premium for public sector workers in Alberta at 10.3%, which is in addition to marked differences in benefits such as pensions and retirement. For further information, please see Karabegović and Clemens (2013).

2) Indebtedness

Gross debt

Closely linked to measures of surplus and deficits, is government debt, which is a function of accumulated annual deficits and capital spending.[28] Figure 13 illustrates provincial and state-level debt as a share of the economy based on their gross debt. Gross debt measures the total stock of debt of a province or state ignoring the presence of assets.

Figure 13 illustrates the value of gross debt as a share of the economy (GDP) for each province and state for both 2000 and 2012.[29] It illustrates both the change in the jurisdictions' debt-to-GDP over roughly the last decade as well as their current comparative level of gross debt relative to the other energy-producing jurisdictions. The order of jurisdictions in Figure 13 is based on their gross debt-to-GDP ratio as of 2012.

Texas ranks first with the lowest gross debt-to-GDP ratio of 3.5%. Six of the seven states maintain gross debt-to-GDP ratios of less than 10%. Only Alaska has a gross debt-to-GDP ratio in excess of 10%; 11.5%.

Alberta ranks ninth of the ten jurisdictions with a gross debt-to-GDP ratio of 11.7%. Newfoundland & Labrador stands out for having a markedly higher gross debt-to-GDP ratio compared to the other jurisdictions.

The second aspect of gross debt captured by Figure 13 is the change since 2000. Seven of the ten jurisdictions reduced the gross debt-to-GDP ratio over the period despite incurring deficits. The explanation for the decline in the debt ratio is the strong economic growth enjoyed by the jurisdictions during this period. Only Colorado (3.3 percentage points), Texas (1.2 percentage points), and Louisiana (0.4 percentage points) increased their gross debt-to-GDP ratios during this period. Alberta's debt ratio declined from 15.4% to 11.7%, a reduction of 3.7 percentage points.

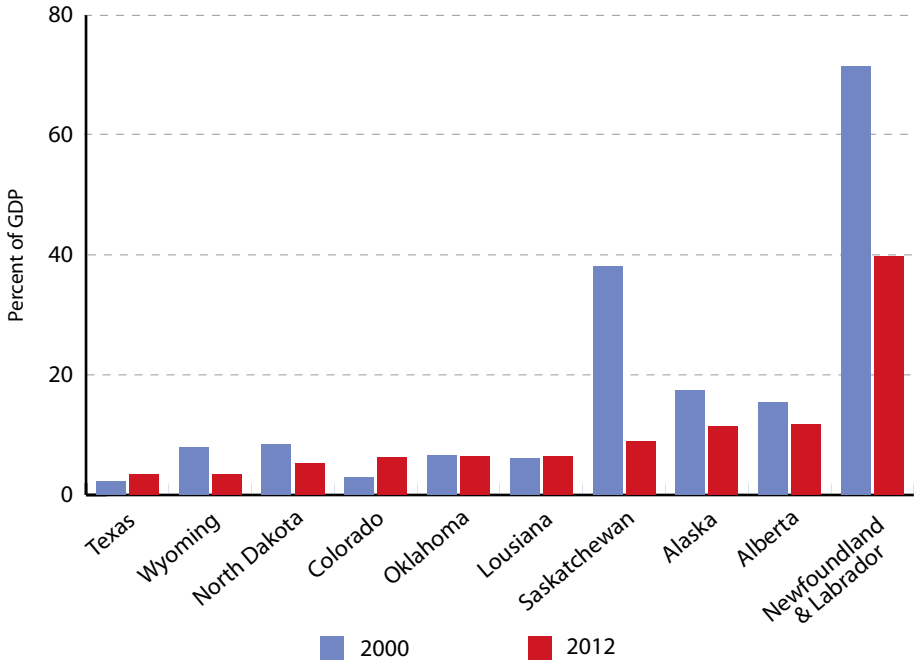
Net debt

Measures of gross debt only examine one side of a province or state's financial accounts: their total indebtedness. A more regularly used measure of indebtedness is net debt, which takes account of financial assets. Specifically, net debt is calculated by taking gross debt and subtracting the value of financial

28 For an excellent discussion of the nature of debt please see Jean-Francois Wen (2014). *Capital Budgeting and Fiscal Sustainability in British Columbia*. Vancouver, BC: The Fraser Institute. Available at http://www.fraserinstitute.org/research-news/news/display.aspx?id=21457.

29 Please note that these statistics do not include pension or related liabilities. They are specific measures of existing indebtedness rather than measures of both current indebtedness and future liabilities (pensions).

Figure 13: Gross public debt to GDP ratio, 2000 and 2012



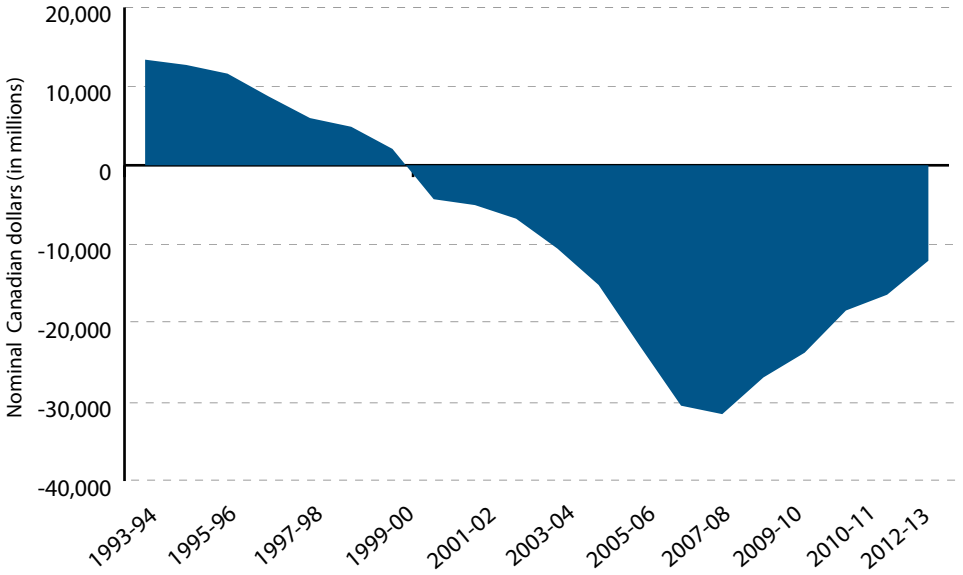
Source: Provincial Government Public Accounts, 1999/00-2010/11; Statistics Canada, 2014i; U.S. Department of Commerce, U.S. Census Bureau, 2001-2009; 2009-2011, and 2012; International Monetary Fund, 2013.

assets held by government. Unfortunately, net debt figures for the states are only available up to 2007, which poses an enormous barrier to their inclusion not only because of the sizeable time gap but also because of the timing of the end date. The pronounced recession in the U.S. in 2008 makes an analysis based on data ending in 2007 highly problematic.

However, data for net debt is readily available for Canadian provinces. Figure 14a plots the value of nominal net debt in Alberta starting in 1993-94 when it peaked at $13.4 billion. Between 1993-94 and 2007-08, Alberta experienced a consistent increase in the value of its assets relative to debt. Indeed, in 2000-01 Alberta went from having a net debt to being in a net asset position. It continued to accumulate net assets from 2000-01 through to 2007-08 when its net assets peaked at $31.5 billion. Unfortunately, the province has drawn down its assets consistently since 2007-08 (Figure 14a). Specifically, Alberta has drawn down $19.4 billion in assets since 2007-08 through both deficit spending and capital expenditures. Its net asset position now stands at $12.1 billion, less than 40% of its peak value in 2007-08.

Figure 14b illustrates the changes in net debt for the three energy-producing provinces post 2007-08. Please keep in mind that a positive change in Figure 14b means that the province was decreasing its net debt (gross debt minus financial assets). In other words, a decline illustrated in Figure 14b means that a province was paying down its debt or adding to its assets.

Figure 14a: Nominal net debt in Alberta, 1993-94 to 2012-13 (millions of $)



Source: Alberta Public Accounts, 1993/94-2012/13.

Two aspects of Figure 14b emerge upon first glance. First, Alberta has been increasing its net debt substantially since 2007-08. As illustrated in Figure 14a, Alberta's net asset position (meaning it has more savings than debt) has been deteriorating as the province operates in deficits and borrows to finance capital spending. As discussed above, Alberta has moved from a net asset position of $31.5 billion in 2007-08 to a net asset position of $12.1 billion in 2012-13.

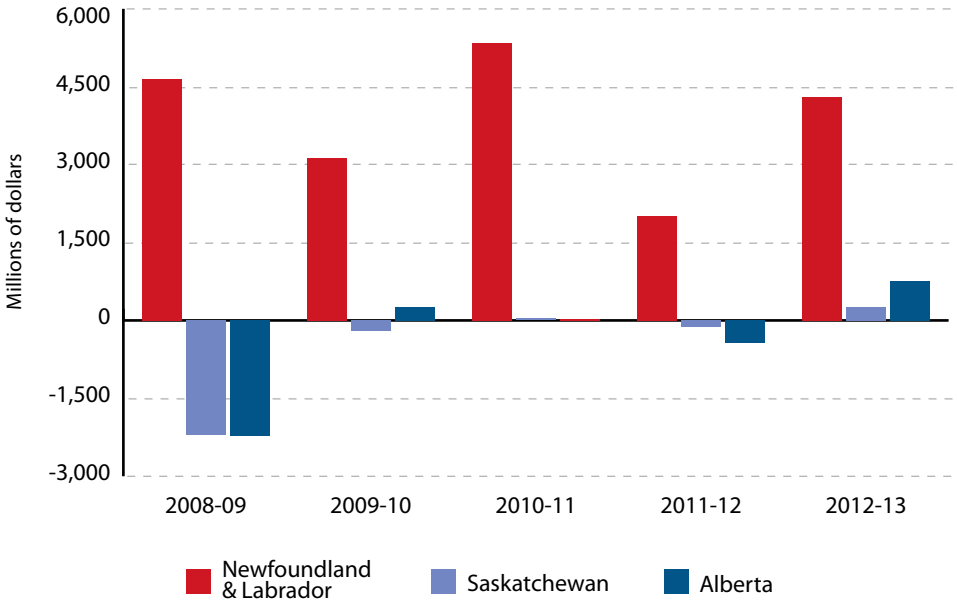
Second, both Saskatchewan and Newfoundland & Labrador have been reducing their net debt over the same period. Specifically, while Alberta ran down $19.4 billion of its assets, Saskatchewan reduced its net debt by $2.2 billion while Newfoundland & Labrador reduced their net debt by $1.6 billion.

Sovereign wealth funds

It is also worth digressing for a moment to explore the presence and development of sovereign wealth funds for the provinces and states that maintain such a savings fund. Seven jurisdictions possess such funds but do not correspond precisely with the 10 jurisdictions included in this study thus far. New Mexico and Alabama both maintain sovereign wealth funds but are not included in this analysis due to the size of their oil and gas sectors. Several states included in the analysis do not maintain such funds.

Nonetheless, it is useful to compare Alberta's savings fund with the other jurisdictions that have similar funds. Table 1 lists the states with such funds including both a ranking according to the total value of their fund as of 2012-13 and the accompanying per capita value of the fund.

Figure 14b: Changes in net debt, 2007-08 to 2012-13



Note: Alberta's Heritage Fund assets are not included in Alberta's financial assets in this figure.
Source: Alberta Public Accounts, 1999/00-2012/13; Newfoundland & Labrador Public Accounts, 2008-09 to 2012-13; Saskatchewan Public Accounts, 2008-09 to 2012-13.

Table 1: Value of sovereign wealth funds, 2012-13

Province/state	Total value (millions of U.S. PPP$)	Per capita (U.S. PPP$)
Alaska	44,853	61,321
New Mexico	15,472	7,419
Alberta	**11,994**	**3,084**
Wyoming	6,113	10,605
Alabama	2,301	477
Louisiana	1,207	262
North Dakota	1,195	1,708

Sources: Alberta, Ministry of Finance, various years; Alaska Permanent Fund Corporation, 2013; Alabama, Office of State Treasurer, 2014; Louisiana, Department of the Treasury, 2014; New Mexico State Investment Council, 2014; North Dakota Retirement and Investment Office, 2014); Permanent Wyoming Mineral Trust Fund, 2012; U.S. Department of Commerce, Census Bureau, 2014; Statistics Canada, 2014d; International Monetary Fund, 2013.

As of the end of fiscal 2012-13, Alaska's Permanent Fund had both the highest overall value ($44.8 million) and the highest per capita value of $61,321 (Table 1) among the seven jurisdictions that maintain such a fund. Alberta is the only Canadian province to maintain this type of savings fund and its value ranked third in terms of overall value ($11.9 billion U.S. PPP$) behind Alaska and New Mexico and fourth in terms of the per capita value of the fund. It's worth noting how much lower, the per capita value of the fund is relative to the other jurisdictions that ranked above Alberta. For example,

Alberta's per capita value was one-twentieth the value of Alaska's, one third the value of Wyoming's, and less than half the value of New Mexico's.[30] At 24%, Alberta's fund has also seen the slowest growth of the six funds in existence between 2000-01 and 2012-13. New Mexico's grew by one-third, Alaska's by three-quarters, and Wyoming's has more than tripled.

3) Size of government

Again, there are a number of methods by which to measure the size of government.[31] This paper relies on three different measures using two different methods to gauge the size of government in the provinces and states. Both methods, however, rely on spending rather than revenues as a marker of the size of government. In addition, all of the measures focus on provincial/state level spending and exclude spending by federal and local governments.[32]

The first measure, which is illustrated in Figure 15a is the average per capita level of government (provincial or state) spending between 2000 and 2011 adjusted for currency differences.[33]

At $14,033 Alaska maintained, by far the highest level of average per capita spending by government over this time period (2000–2011). Alaska's average per capita spending over this period was 53.1% higher than the second ranked jurisdiction Newfoundland & Labrador, which recorded average per person spending by the provincial government of U.S. PPP$9,167. It is important to note, however, that a material amount of the spending recorded by Alaska pertains to the dividend payments paid to Alaskan residents directly from the state's sovereign wealth fund.[34] This type of spending by government is unique within North America and therefore makes the nature of Alaska's

30 For a more detailed analysis of Alberta's Heritage Fund, please see http://www.fraserinstitute.org/uploadedFiles/fraser-ca/Content/research-news/research/publications/reforming-albertas-heritage-fund.pdf.

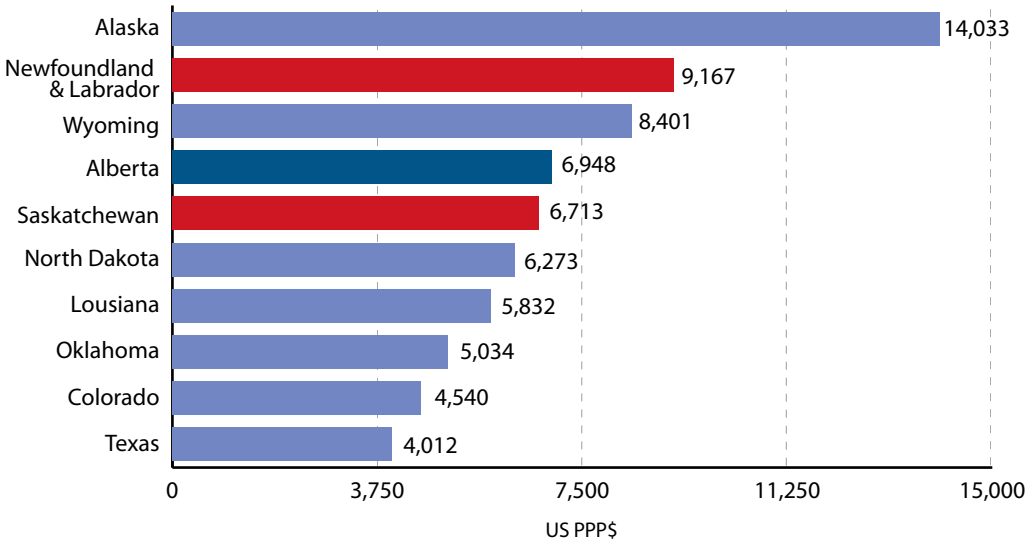
31 For a discussion of the economics of the size of government please see Di Matteo (2014).

32 An important difference between Canadian provincial spending and comparative U.S. state spending is health care although this difference tends to be overstated. Most public spending on health care in Canada is undertaken and recorded at the provincial level. Substantial public spending is done by the states through Medicaid, the U.S. health care program for low-income individuals and families. The public share of health care spending is higher in Canada than the U.S. (70% in Canada versus 48% in the U S in 2011) but the U.S. spends considerably more than Canada on health. As a result public health care spending per capita in the U.S. is actually higher than Canada ($3,183 U.S. PPP$ for Canada versus $4,066 U.S. PPP$ for the U.S. (OECD Health Statistics, 2013).

33 Reported in U.S. purchasing power parity (PPP) dollars.

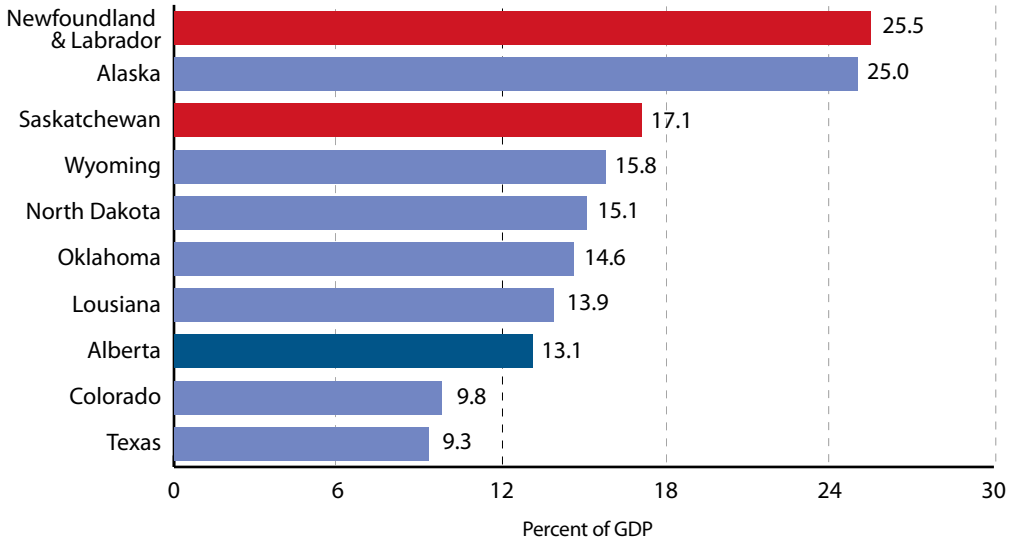
34 For further information on the state dividend payments in Alaska, please see: Murphy and Clemens (2013).

Figure 15a: Average per capita government expenditure, 2000-2011 (U.S. PPP$)



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014d; U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2009-2011, 2012 and 2014a; International Monetary Fund, 2013.

Figure 15b: Average government expenditure to GDP ratio, 2000-2011



Source: Provincial Government Public Accounts,1999/00-2010/11; Statistics Canada, 2014i; U.S. Department of Commerce, Census Bureau, various years, 2001-2008, 2009-2011, 2012 and 2014a; International Monetary Fund, 2013.

spending difficult to compare with the other states and Canadian provinces without making adjustments.

Alberta ranked fourth highest in terms of average per person spending by the provincial or state level government (U.S. PPP$6,948) over this period. Texas maintained the lowest average per person spending over this period by a provincial or state level government: $4,012.[35]

An alternative method by which to measure the size of government is to compare government spending against the size of the economy (GDP), which is illustrated in Figure 15b. Indeed, this latter measure is the most commonly used when gauging the size of government as it better captures the ability of a jurisdiction to finance government spending as well as indicating the broader economic impact of government spending.[36] Figure 15b illustrates average government spending for the select group of Canadian provinces and U.S. states as a share of their respective economies (GDP) over the 2000—2011 period.

The two jurisdictions with the largest provincial/state government spending on a per capita basis, namely Alaska and Newfoundland & Labrador, remain the two jurisdictions with the largest provincial/state governments as a share of the economy although they switch ranks. Newfoundland & Labrador maintains the largest provincial government sector as a share of the economy with 25.5% of GDP, on average, represented by government spending over the 2000–2011 period (Figure 15b). Alaska ranked second with government spending averaging 25.0% of state GDP.

Alberta ranked eighth with average government spending as a share of GDP of 13.1%. Alberta's government spending compared to the other large energy producing provinces and states ranks relatively high on a per capita basis but relatively low as a share of GDP.

4) Structure of taxes

Over the long run the level of taxes (and other government revenues) obtained from citizens is reflective of the level of government spending demanded by citizens and supplied by government. In other words, the level of government revenues will roughly match the level of government spending over time.

35 Differences in this indicator between a 2004-2011 Census Bureau base and a 2004-2011 State Data Lab base are not relevant to Alberta's performance. All ranks remain the same and the largest difference is that Colorado's SDL spending is $377 lower.

36 A further adjustment to government spending data as a share of GDP can be made to reflect the relative roles of provinces in Canada versus states in the U.S. For a complete discussion of this approach see Stansel and McMahon (2013). *Economic Freedom of North America 2013: Appendix A Methodology, Adjustment Factors:* 53.

Thus, as presented previously, the best measure for the burden of government is spending.

However, the structure of the tax burden is an additional consideration worth assessing. This relates to the mix and design of the various taxes imposed by government in order to finance government spending. The reason for being interested in the mix of taxation is that each type of tax can and will influence behaviour and incentives in different ways.[37] For example, consumption or sales taxes make savings relatively less expensive and consumption (i.e., spending) relatively more expensive. The incentive effect, therefore, of sales or consumption taxes is to encourage savings rather than spending. In the long run, greater savings can lead to greater pools of funds for investment and capital deepening. The size and strength of this incentive is dependent on the design of the specific sales or consumption tax in terms of rates levied, exemptions as well as whether lump sum or ad valorem.[38]

Figure 16 illustrates the mix of key taxes in each of the ten jurisdictions analyzed in terms of their contribution to the province or state's total revenues. Specifically, Figure 16 shows the share of total revenues for each province or state contributed to by three key taxes: (1) personal income taxes, (2) corporate income taxes, and (3) sales taxes.

As is quite clear from Figure 16, there is a great deal of variation across provinces and states in the reliance on personal income taxes, corporate income taxes, and sales taxes. The share of total revenues from these three sources ranges from a low of just 4.4% in Alaska to a high of 31.3% in Saskatchewan. Alberta ranks second with 30.4% of its revenues provided by these sources.

In terms of the specific taxes, we also see great variation. Alaska, Wyoming, and Texas do not levy personal income taxes but they account for 21.5% of total revenue in Alberta. Similarly, Wyoming and Texas do not impose corporate income taxes.[39] Alberta has the highest reliance on corporate income taxes with 8.9% of its total revenues coming in the form of corporate income taxes.

The use of sales taxes also varies considerably. Alberta and Alaska do not use general sales taxes while a number of jurisdictions such as Texas (17.8%), Wyoming (14.5%), and North Dakota (12.1%) all rely on sales taxes for a substantial share of their revenues.

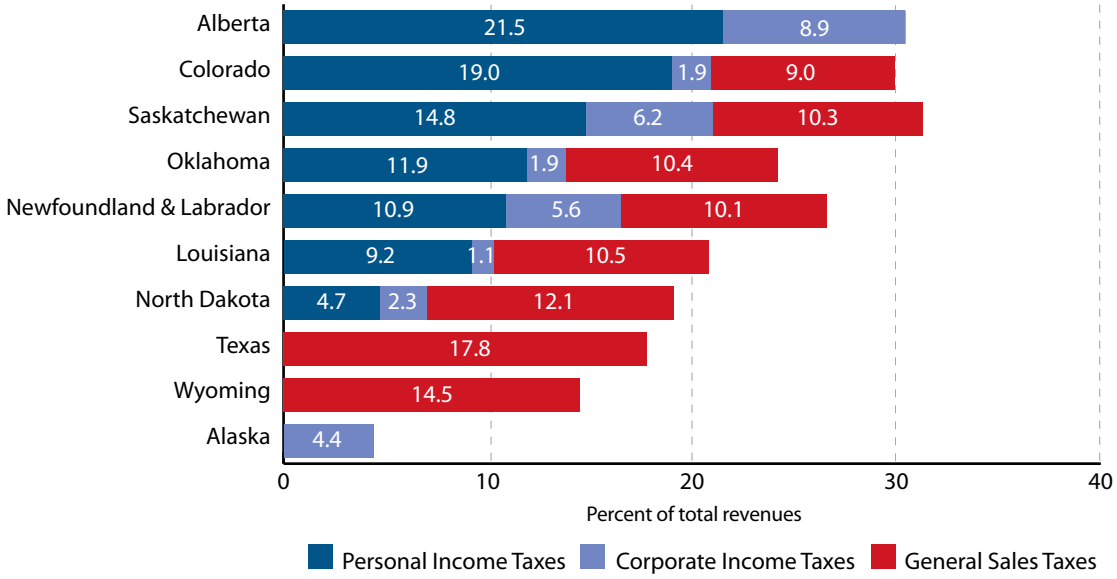
Put differently, Alberta is the exception in Canada in that it does not have a general provincial sales tax as part of its revenues. In the U.S., there

37 For further information on the relative efficiency of different types of taxes please see: Clemens, Veldhuis, Palacios (2007).

38 For a thorough discussion of the economic incentives of different taxes please see: Palacios and Harischandra (2008).

39 Texas does, however, impose a fairly unique tax on businesses. For information on Texas' business tax please see http://taxfoundation.org/blog/texas-continues-nationwide-trend-away-gross-receipts-taxes, which includes links to other studies and commentaries.

Figure 16: Revenue composition at the provincial/state level for selected jurisdictions, 2011-12



Source: Provincial Government Public Accounts, 1999/00-2010/11; U.S. Department of Commerce, Census Bureau, 2014b.

are five states without a general sales tax—Alaska, Delaware, Montana, New Hampshire, and Oregon.[40] When Alberta is compared to other major energy producing jurisdictions in both Canada and the U.S. it reveals a greater reliance on both personal and corporate income taxes as a share of total revenue than these other jurisdictions. Given the distortionary nature and incentive effects of income taxes compared to consumption taxation, this tax structure does reduce Alberta's competitive advantage and economic efficiency.

The following highlights some of those key differences in greater detail.

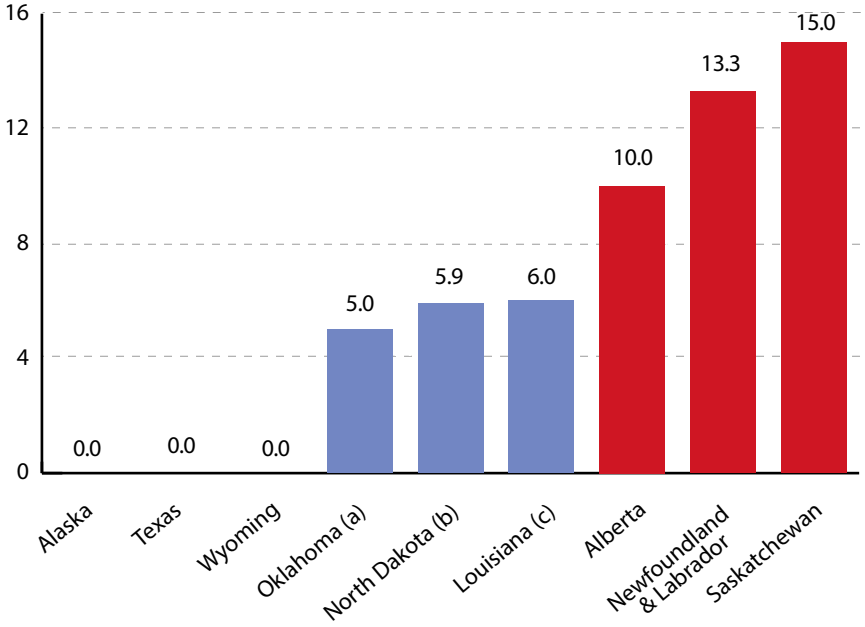
i) Personal income taxes

Another way to examine the reliance on personal income taxes for each of the jurisdictions is to measure the personal tax rates applied to income earners in the respective province or state. Figure 17a illustrates the top marginal tax rate applied in each of the jurisdictions. There are a couple insights easily gleaned from Figure 17a. First, Alaska, Texas, and Wyoming impose no personal income taxes. That is, these three states maintain a zero personal income tax at the state level.

Second, the three highest top personal income tax rates are for the three Canadian provinces: Alberta, Newfoundland & Labrador, and Saskatchewan.

40 Alberta does, however, derive revenues from specific consumption taxes as do U.S. states without a general sales tax. As well, in the United States there are sales taxes at the local level.

Figure 17a: Top provincial and state individual income tax rates (%), as of January 1, 2013



Notes:
a) 2012 tax information
(b) Bracket levels adjusted for inflation each year. Release dates for tax bracket inflation adjustments vary by state and may fall after the end of the applicable tax year.
(c) State allows some or all of federal income tax paid to be deducted from state taxable income. Colorado is excluded from Figure 12a because it imposes a tax based on federal taxes, which is similar to Canada's old tax-on-tax system. Specifically, Colorado assesses its personal income taxes as 4.63% of the federal taxable income.
Source: Canada Revenue Agency, 2014; Tax Foundation, (2014).

In between are three of the four U.S. states, Oklahoma, North Dakota, and Louisiana, which all have lower top personal income tax rates than any of the Canadian provinces including Alberta.[41]

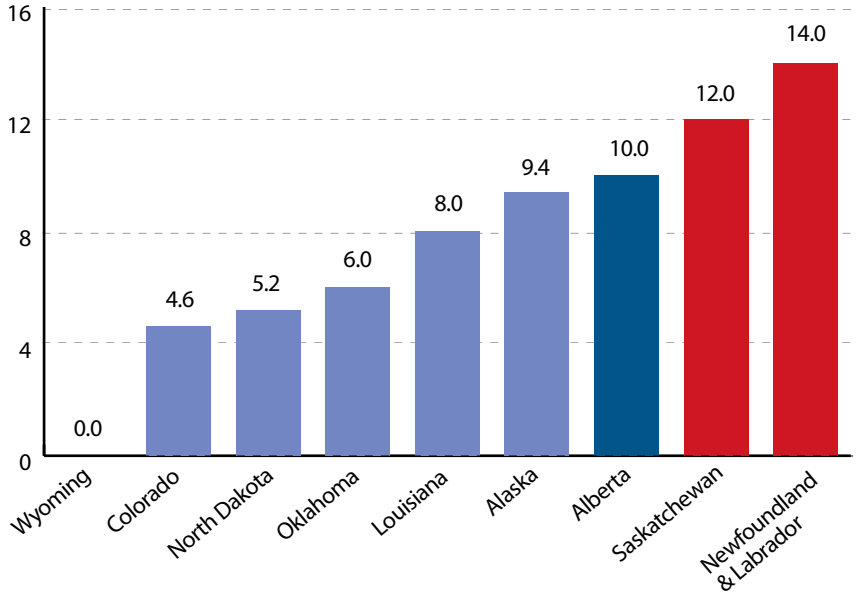
ii) Corporate income taxes

Figure 17b shows a similar ranking as Figure 17a except done for the general corporate income tax rates applicable in each of the jurisdictions. Wyoming is the only jurisdiction not to impose corporate income taxes. Colorado, North Dakota, and Oklahoma all impose relatively low corporate income tax rates.[42]

41 Colorado is excluded from Figure 12a because it imposes a tax based on federal taxes, which is similar to Canada's old tax-on-tax system. Specifically, Colorado assesses its personal income taxes as 4.63% of the federal taxable income.

42 It is worth noting that the U.S. has a comparatively high corporate income tax rate at the federal level, which impairs state-level competition internationally. See http://taxfoundation.org/blog/us-has-highest-corporate-income-tax-rate-oecd for further information.

Figure 17b: General corporate income tax rates (%), as of January 1, 2013



Notes: Texas does not have a corporate income tax but does have a gross receipts tax with rates not strictly comparable to corporate income tax rates. See Table 21 in the Tax Foundation report for more information.
Source: Canada Revenue Agency, 2014; Tax Foundation, (2014).

Alberta's 10% corporate income tax rate ranks it seventh of the nine jurisdictions ranked.[43] Like personal income taxes, the highest corporate income tax rates are all present in Canadian provinces.[44]

iii) Sales or consumption taxes

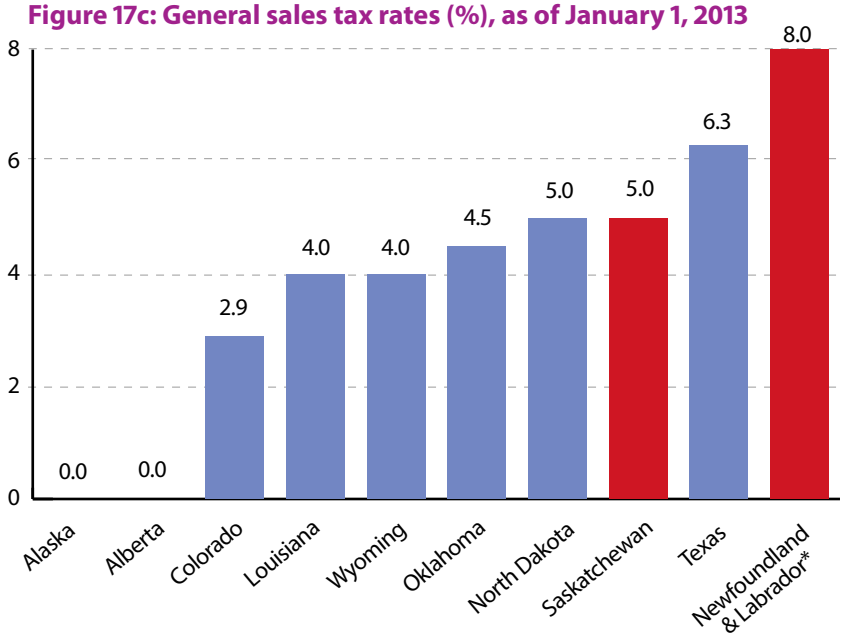
Finally, with respect to sales taxes (see Figure 17c), Alberta again appears at one end of the spectrum in comparison to other energy producing provinces and states. In this case, Alberta is one of only two energy producing provinces and states with no general sales tax; Alaska is the other jurisdiction. The average sales tax rate for the eight jurisdictions with a sales tax is 5.0%.

In summary, based on this comparison it is clear that Alberta has an opportunity to improve its mix of taxes by shifting away from income taxes, both personal and corporate, and introducing a sales tax. In doing so, Alberta would not only bring its mix of taxes more in line with competing energy producing provinces and states but would also improve the efficiency of its tax system. This latter point is worth understanding in greater depth: By shifting

43 Texas does not have a corporate income tax but does have a gross receipts tax with rates not strictly comparable to corporate income tax rates. See http://taxfoundation.org/article/state-corporate-income-tax-rates for further information.

44 For an excellent discussion of national business taxes as well as an analysis of provincial business taxes in Canada please see Chen and Mintz (2013).

Figure 17c: General sales tax rates (%), as of January 1, 2013



Notes: *Newfoundland & Labrador has a harmonized provincial value-added sales tax with the federal GST.
Source: Canada Revenue Agency, 2014; Tax Foundation, (2014).

to consumption taxes, Alberta would improve incentives for work effort, savings, investment, and entrepreneurship, which would improve the overall functioning and performance of the Alberta economy.

Critically, however, any shift towards a consumption tax must be done in a revenue neutral way. In other words, introduction of a sales tax should be done by completely offsetting any new revenues through reductions in personal and corporate income taxes. Such a reform would have no effect on the budget balance since no new revenues would be received. The same level of revenues would be expected only in different forms.[45]

Conclusions—Government fiscal performance

Alberta enjoyed large surpluses as a share of spending pre-recession in 2008-09 but moved to large deficits as a share of spending post-recession. Specifically, Alberta went from an average surplus of 20.6% of provincial spending between 2000-01 and 2007-08 to an average deficit of 4.2% of provincial spending between 2008-09 and 2012-13. Alberta, as well as Newfoundland & Labrador, experienced improvement in their fiscal balances in 2011-12 but backtracked in 2012-13 with larger deficits. Specifically, Alberta's deficit in 2011-12 was just 0.1% of total spending but increased markedly to 6.9% of provincial spending in 2012-13.

45 See Bazel and Mintz (2013) for a recent proposal and Simpson (2013) for a discussion.

Alberta's fiscal balance has not rebounded as strongly as the other energy-producing jurisdictions. Several U.S. states enjoy large surpluses while Alberta's most recent comparative statistics indicate a fairly large deficit. The presence of deficits while other energy-producing jurisdictions are in surplus coupled with the general strength of the Alberta economy as highlighted in the first section of this paper should give cause for concern about the general state of Alberta's government finances.

The surplus/deficit per capita statistics presented highlight Alberta's continuing reliance on resource revenues compared to other energy-producing jurisdictions. When resource revenues are removed, Alberta moves from having the fourth highest average surplus (per capita) over the 2000-2011 period to having the second largest average per capita deficit. Specifically, Alberta goes from an average per person surplus of $763 when resource revenues are included to an average per person deficit of $1,626 when resource revenues are excluded. It seems clear from the surplus/deficit analysis that Alberta as well as Newfoundland & Labrador, Saskatchewan, Alaska, and Wyoming have a disproportionate reliance on resource revenues compared to other energy-producing jurisdictions.

It is also worth reiterating the source of the deficits observed in Alberta. Since 2005-06, the provincial government in Alberta has increased program spending by $22.1 billion more than needed to account for inflation and population growth. Had the government of Alberta simply maintained the real value of per person spending in the province, it would have recorded successive balanced budgets. It is this marked increase in real per capita spending that has caused deficits over the last number of years rather than any particular dearth of revenues.

In terms of gross debt as a share of the economy, which measures only the value of the stock of debt in a jurisdiction, ignoring the presence of any financial assets held by government, Alberta ranks ninth of the ten jurisdictions with a gross debt-to-GDP ratio of 11.7%.

Measures of gross debt, however, only examine one side of a province or state's financial accounts: their indebtedness. A more regularly used measure of indebtedness is net debt, which takes account of financial assets. Alberta's net debt position has declined from a net asset position of $31.5 billion in 2007-08 to a net asset position of $12.1 billion in 2012-13. In other words, Alberta has depleted its asset or rainy day accounts by $19.4 billion since 2007-08 through deficit spending and capital expenditures. At the same time, Saskatchewan was able to reduce its net debt by $2.2 billion and Newfoundland & Labrador reduced their net debt by $1.6 billion.

Alberta's Heritage Fund, which forms part of its assets, is unique in Canada and it is the third largest in terms of value among the jurisdictions reviewed. However, fund value per capita is one-twentieth the value

of Alaska's, one-third the value of Wyoming's, and less than half the value of New Mexico's. Also, at 24%, Alberta's fund has seen the slowest growth of the six funds in existence between 2000-01 and 2012-13. New Mexico's grew by one-third, Alaska's by three-quarters and Wyoming's has more than tripled.

In terms of the size of government of the energy-producing jurisdictions, Alberta maintains the fourth highest level of per capita spending but the third smallest government sector as a share of the economy. This contradictory conclusion is rooted in the per capita income of the province compared to other jurisdictions. Alberta's high comparative income level allows for a smaller share of the economy to be spent in the government sector but translates into a fairly high level of per capita dollar spending.

Government spending is funded by taxes and Alberta has an opportunity to improve its tax mix in a revenue neutral manner (meaning no reduction in revenues) by shifting away from personal and corporate income taxes towards a sales tax. Critically, three of the jurisdictions included in this analysis have no personal income taxes (Alaska, Texas, and Wyoming) and Wyoming and Texas also impose no corporate income tax. In addition, Alberta's tax rates vis-à-vis the U.S. states that do maintain personal and/or corporate income taxes tends to be higher. By reforming the tax system to rely more on consumption taxes and less on income taxes, Alberta would not only bring its mix of taxes more in line with competing energy producing provinces and states but would also improve the efficiency of its tax system.

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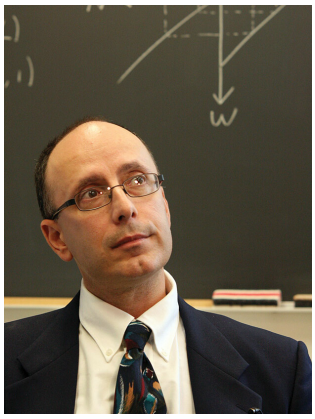
About the authors



Livio Di Matteo

Livio Di Matteo is a Professor of Economics at Lakehead University in Thunder Bay, Ontario, where he conducts research and teaching 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 (http://www.EvidenceNetwork.ca), and is a contributor to the Worthwhile Canadian Initiative, an economics blog. He has been listed in Canadian Who's Who since 1995 and holds a Ph.D. from McMaster University, an M.A. from the University of Western Ontario, and a B.A. from Lakehead University.

Jason Clemens

Jason Clemens is the Fraser Institute's Executive Vice-President. He held a number of positions with the Fraser Institute between 1996 and 2008, including Director of Research Quality, Director of Budgeting and Strategic Planning, and Director of Fiscal Studies. He most recently worked with the Ottawa-based Macdonald-Laurier Institute (MLI) as Director of Research and held a similar position with the San Francisco-based Pacific Research Institute for over three years. Mr. Clemens has an Honours Bachelors Degree of Commerce and a Masters Degree in Business Administration from the University of Windsor as well as a Post-Baccalaureate Degree in Economics from Simon Fraser University. He has published over 70 major studies on a wide range of topics, including taxation, government spending, labour market regulation, banking, welfare reform, health care, productivity, and entrepreneurship.

He has published nearly 300 shorter articles, which have appeared in such newspapers as the *Wall Street Journal, Investors' Business Daily, Washington Post, Globe and Mail, National Post,* and a host of other US, Canadian, and international newspapers. In 2012, the Governor General of Canada on behalf of Her Majesty the Queen, presented Mr. Clemens with the Queen Elizabeth II Diamond Jubilee Medal in recognition of his contributions to the country.

Joel Emes

Joel Emes is a Fraser Institute Senior Fellow. He is a former senior advisor to British Columbia's provincial government. He previously served as a senior analyst, then as executive director (2009 to 2011), at the BC Progress Board. Prior to that, Joel was a senior research economist at the Fraser Institute, where he initiated and led several flagship projects in the areas of tax freedom and government performance, spending, debt, and unfunded liabilities. Joel holds a B.A. and an M.A. in economics from Simon Fraser University.

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