Report on Competitiveness: Alberta 2013

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ALBERTA ECONOMIC DEVELOPMENT AUTHORITY

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Acknowledgements

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Message from the Chair

The Alberta Economic Development Authority is pleased to present the 2013 Report on Competitiveness.

This second edition reassesses Alberta's position on 70 benchmarked indicators relative to 14 jurisdictions in Canada, the United States, Europe, and Australia.

The report shows that overall, Alberta is doing well on the key factors that shape the business environment such as regulation, fiscal policy and the tax environment. Since 2010 however, innovation and real productivity growth has remained average and static.

Albertans should not presume that future prosperity is assured. Alberta's sustained prosperity is reliant on its competitiveness in the global market. Government, industry and indeed, individuals must work together to strengthen competitiveness. Investment in research and development, access to capital, and employment in high tech and knowledge industries are areas for increased attention.

Alberta's strengths remain in human capital and education, infrastructure, fiscal policy, and GDP. This year, nine new indicators also measure education attainment, construction GDP, infrastructure aging, and tech start-ups.

For both government and industry, this report is an important measurement and reporting tool that identifies key areas to focus on to sustain our province's prosperity.

Innovators, entrepreneurs and industry have a vital role in creating a competitive Alberta. As well, municipal, provincial and federal governments must take note of where improvements can be made.

The Alberta Economic Development Authority recognizes the value of this report in ensuring progress. Watching the competitiveness benchmark trends over time is invaluable for policy makers, investors, and global business.

As the province's economy is highly sensitive to international energy demand and economic cycles, Alberta's sustained prosperity is reliant on its competitive position in this dynamic global market.

Barry M. Heck
Chair

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Introduction and background

During the past 20 years, Alberta's economy has led Canada in average annual economic growth. Strong demand for Alberta's energy products, rising energy prices, and heavy investment in the oil sands have helped Alberta to achieve this enviable status.

*...**Alberta** cannot assume that future prosperity is assured. Government and industry must work together to enhance competitiveness...*

However, the Alberta economy is highly sensitive to global economic cycles and global energy demand. Therefore, the province cannot rest on its economic laurels and assume that future prosperity is assured. To achieve sustained prosperity in the long term, steps must be taken, and plans made, to build a highly competitive economy that can withstand the effects of external economic forces.

The Alberta Competitiveness Act of 2010 noted that "competitiveness is core to the Government of Alberta's plan to position Alberta for sustained property to provide a high quality of life for Albertans." This led to the formation the Alberta Competitiveness Council and the commissioning of the inaugural *Report on Competitiveness: Alberta 2010*.

Report on Competitiveness: Alberta 2013 is the second edition of this series, now released by the Alberta Economic Development Authority which has assumed the mandate of the former Competitiveness Council. This report was publicly released in Spring 2014, but reflects research and analysis completed in late 2012 and early 2013. This report benchmarks Alberta's competitiveness on an international scale and builds on the results of the inaugural report. It identifies areas of strength, highlights areas where opportunities for improvement may exist, and becomes a benchmark against which future progress can be measured.

Competitiveness and Alberta's competitiveness framework

"The fundamental source of long term prosperity is the productivity with which a nation (or province) can utilize its resources. Competitiveness is about creating the conditions under which companies and citizens can be most productive"

Michael Porter in Competitiveness Index: Where America Stands, US Council on Competitiveness, 2007

*...**Competitiveness** does not represent an objective in its own right. Rather, it is a means to achieving sustained prosperity, and a higher standard of living for Alberta...*

For an individual business, competitiveness is generally defined in terms of increasing sales, lowering costs and gaining market share. For the provincial economy as a whole, however, competitiveness has a much broader interpretation – creating the right conditions so that companies and people can grow and thrive, while protecting social values and ensuring responsible stewardship of the environment. Competitiveness does not represent an objective in its own right. The ultimate objective for Alberta should be to improve the standard of living of Albertans in a sustainable way, and competitiveness represents a means to this end.

For the purposes of this report, competitiveness is defined as "the condition created when government, industry and Albertans work together to pursue sustained prosperity".

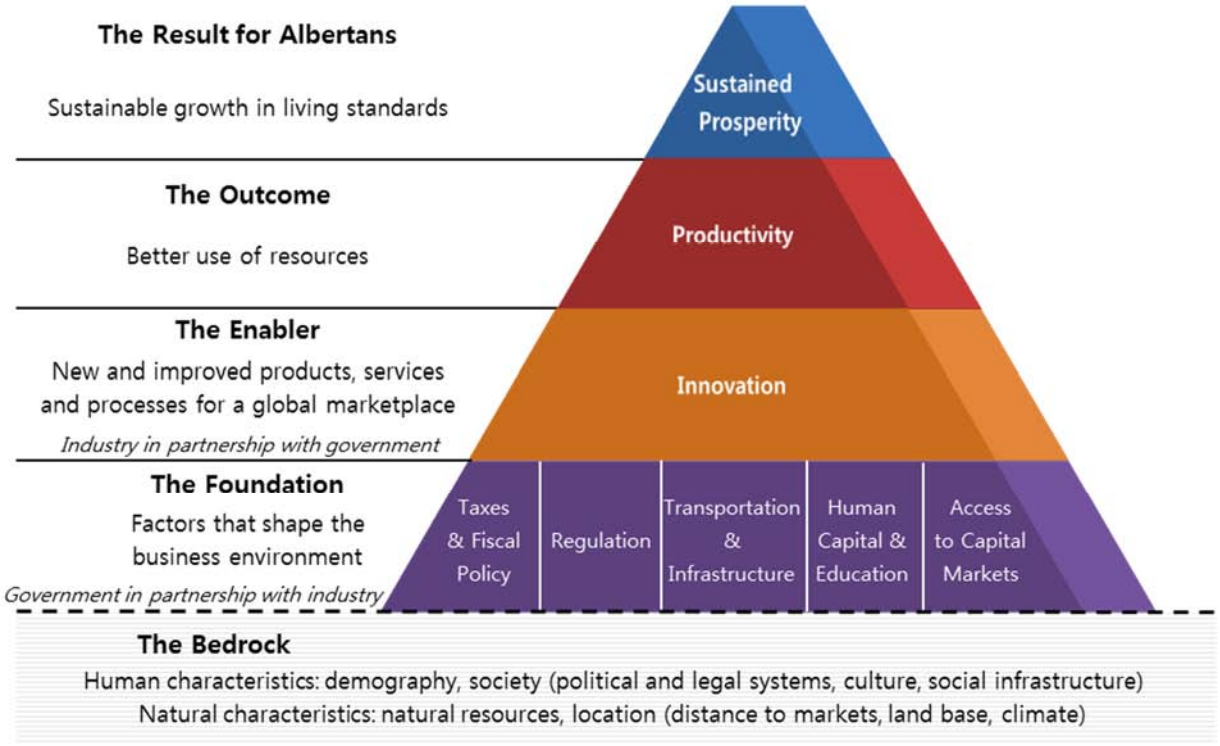
Alberta's economic prosperity can be best defined in terms of standard of living – the total level of income generated by the economy that is available for business re-investment, individual consumption and saving, and public spending on essential social services. Therefore, prosperity is best described as generating more income and a higher standard of living for Alberta – but this must be done in a way that can be maintained over generations.

...Higher living standards can be achieved by working more or by working smarter. Working more has limits, but there is no limit to the ability to work smarter...

There are two main avenues for pursuing a higher standard of living – either increasing labour effort (more people working more hours) or working smarter. While Albertans have long demonstrated their willingness and ability to work harder, this approach has obvious limits. The other option is to work smarter – to generate more income per hour, to be innovative, to increase productivity. The ability to improve productivity has no limit, provided that the economy is competitive, able to foster innovation, and able to adapt to change.

Therefore, improving productivity is the only true long term means to achieving and maintaining prosperity; and sustained prosperity, productivity, innovation, and competitiveness are all connected. A competitive economy is required to enable innovation to occur in industry, innovation drives gains in business productivity, and productivity gains are required to sustain prosperity. This relationship is illustrated in the Competitiveness Pyramid:

The Competitiveness Pyramid



In addition to the relationship between prosperity, productivity, and innovation, the Competitiveness Pyramid also identifies a range of factors that affect competitiveness and the likelihood of innovation. These factors, defined as the foundation, include taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets. It is through the elements of the foundation that government can work actively to develop a more competitive business environment, to encourage industry to become more innovative and productive. Finally, the Pyramid is built on a bedrock of factors that uniquely define Alberta. These include natural characteristics that do not change (natural resources and location) and human characteristics that can only change slowly in response to social or cultural change (demography and core social structures/values).

The Competitiveness Pyramid represents the model used in this report to assess the province's competitive performance.

Benchmarking Alberta's competitiveness

*...**Mobility** of both capital and labour means that Alberta's competitors are no longer restricted to neighbouring states and provinces – international comparisons are essential...*

With the bedrock under the Competitiveness Pyramid fixed, this report assesses Alberta's competitiveness by examining each aspect of the foundation, innovation, productivity, and sustained prosperity – benchmarking Alberta against a group of national and international peers. A total 14 jurisdictions have been chosen for comparison with Alberta:

- **Canada** – British Columbia, Saskatchewan, Manitoba, Ontario, and Quebec.
- **United States** – Colorado, Idaho, Minnesota, Oregon, Texas, and Washington State.
- **International** – Finland, Norway, and the state of Queensland, Australia.

These jurisdictions were selected on the basis of their relatively strong economic performance in recent years, as well as their size, location and/or structural similarities with Alberta. This report strives to provide comparisons for Alberta and all of the 14 other jurisdictions for every benchmark measure. However, comparable data are not always available for all locales, resulting in fewer jurisdictions (and/or national results) being compared for some measures.

A total of 70 individual benchmarking measures are examined in this report, with 4 to 12 measures used to assess each of the eight components of the Competitiveness Pyramid – sustained prosperity, productivity, innovation, and the five components that comprise the foundation. The measures chosen for comparison were selected based on three criteria – relevance for Alberta and its economy, the reliability of available data, and comparability to other jurisdictions.

Alberta's competitive performance

Alberta's performance in the benchmarking comparisons is generally very positive – a result that is not surprising given the strength and dynamic nature of the Alberta economy. The comparisons identify both areas of relative strength that need to be maintained and areas where Alberta performs less well – where actions by government and industry may have the potential to boost Alberta's competitiveness. In some instances strategic decisions will be required to ensure that initiatives designed to remedy an area of weaker performance do not detract from an existing competitive strength.

An overview summary of Alberta's performance for each level of the Competitiveness Pyramid is presented below:

Competitiveness benchmarking summary for Alberta

Indicator	# measures compared	change from 2010
Sustained Prosperity	10	⇨
Productivity	14	⇨
Innovation	14	⇨
The Foundation:		
Taxes & Fiscal Policy	4	⇩
Regulation	4	⇨
Transportation & Infrastructure	6	⇧
Human Capital & Education	13	⇨
Access to Capital Markets	5	⇨

Legend[1]

Excellent	(top quintile)
Good	(second quintile)
Average	(middle quintile)
Weak	(lower quintile)
Poor	(bottom quintile)

1: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

One aspect to note in these summary results is the apparent "prosperity paradox" – that Alberta has achieved a "Good" rating for sustained prosperity, even though its rating is "Average" for both productivity and innovation, the elements that support prosperity in the Competitiveness Pyramid. This result can be explained by higher resource prices in recent years bolstering Alberta's prosperity, without a need for high performance in productivity and innovation. Despite this, productivity and innovation remain vitally important, as they represent the elements that can support prosperity for Alberta during downward cycles in resource prices and as conventional resource production declines.

A similar table summarizing Alberta's results for all of the individual benchmarking measures can be found at the end of this executive summary. Among the 70 measures examined, Alberta achieves a rating of Excellent (top quintile) for 24 measures, Good (second quintile) for 20 measures, Average (middle quintile) for 7 measures, Weak (lower quintile) for 10 measures, and Poor (bottom quintile) for 9 measures. While these statistical results are important as a benchmark against which future performance can be assessed, equally as important is the ability to identify areas of relative strength and areas where Alberta lags its competitors in the benchmarking results. These are identified as follows:

- **Sustained prosperity** – To achieve sustained prosperity, economic, social, and environmental considerations must be balanced. Alberta has achieved a high level of gross domestic product (GDP) per capita, strong growth in personal income, low levels of long term unemployment (resulting in critical labour shortages in some years), and strong growth in a composite Index of Economic Well-being which encompasses social and environmental considerations. However, housing affordability has become a moderate issue in the province, and growth of real GDP per capita – after eliminating gains due to increasing energy prices – is relatively weak. It is this latter factor that is of greatest concern, as income growth from high energy prices has masked low growth in real economic output.

*...**Alberta's** real productivity growth has been low, allowing other jurisdictions to improve their competitive position relative to Alberta...*

- **Productivity** – Alberta's level of productivity – GDP per hour worked – is relatively strong, but this too has been influenced by higher energy prices in recent years as the value per unit of output has grown. After excluding the effect of higher resource prices, Alberta's real productivity growth has been comparatively weak – providing other jurisdictions an opportunity to improve their competitiveness relative to Alberta.

  Among Alberta's major sectors, agriculture and business services show good results both for productivity levels and growth rates. While Alberta's manufacturing sector has a high level of productivity, in recent years productivity growth in that sector has been lower than in most US states. For the mining, oil and gas sector, both the level and growth of productivity are below average among the locations compared, although improvement is expected in future years as major investments in oil sands development come to fruition.

- **Innovation** – Albertans have demonstrated a strong aptitude for entrepreneurship and for employment in natural and applied sciences. Business investments in equipment and industrial funding of university research and development (R&D) are also relatively strong in the province. Areas where Alberta's performance lags other jurisdictions include the level of overall investment in R&D by industry, and the levels of employment in high tech manufacturing and knowledge intensive service industries.

- **Taxes and fiscal policy** – Moderately low tax burdens for both corporations and individuals, along with a strong government financial position provided good results for Alberta, and no specific points of concern have been identified in this area. The priority is to maintain Alberta's current competitive position within an environment where other jurisdictions are seeking to improve their own standings in this area.

- **Regulation** – Good regulation is about more than just the number of regulations on the books. The quality of regulations and the regulatory development process are major areas of focus for Alberta. Among the limited measures of regulation compared in this report, Alberta's results are generally positive. The processing time for development permits in Calgary and the cost of development permits and business licenses in Edmonton were the two identifiable factors that weighed down Alberta's otherwise strong ratings in this area. Business regulation is an important topic and initiatives to improve the measurement of this factor in the future are under consideration.

- **Transportation and infrastructure** – Alberta achieved its strongest result in this area, ranking as "Excellent" relative to its peers. Alberta rated well for the age of, and investment in, public infrastructure as well as for the penetration of broadband internet. Alberta also fared moderately well for the service provided by its airports. Similar to regulation, transportation and infrastructure represents an important topic, but one that can be challenging to measure.
- **Human capital and education** – Alberta has benefited from its strong education system, with high school students scoring very well on international standardized testing. Albertans are also willing to apply their skills in the workplace, as demonstrated by high employment rates, high apprenticeship completion rates, and high rates of vocational and technical (non-degree) post-secondary education. While population aging remains an issue, Alberta is better positioned than its peers in terms of workforce age dynamics. The one measure for which Alberta ranks behind most other jurisdictions is its rate of university degree completion.
- **Access to capital markets** – Alberta has achieved a high level of foreign investment in its economy, bringing necessary capital to the province and demonstrating confidence in Alberta as an investment location. While not the subject of a specific measure, the presence of the TSX Venture Exchange headquarters in Calgary provides strong capabilities to raise public equity for venture-stage resource firms. Although access to capital markets for Alberta resource firms is strong, foreign investment in the province is heavily concentrated in the resource sector, and Alberta's non-resource sector lags in its ability to attract foreign investment. In addition, Alberta also fares poorly on access to venture capital in some sectors – a factor which may inhibit the growth of innovative new high tech businesses.

*...**Action** to improve weaknesses should be designed so as not to detract from existing advantages...*

This summary identifies measures where Alberta ranks behind many comparator jurisdictions. Whether or not these represent areas for improvement is a strategic decision for government and industry to consider in developing action plans based on this report. In some instances, taking action in these areas may be the preferred course of action. In other instances, working to remedy such issues may detract from an existing comparative advantage, or overall competitiveness may be better served by deploying resources to further strengthen existing advantages. These represent important considerations that the Alberta Economic Development Authority will address going forward.

A call to action

Prosperity, productivity, innovation, and competitiveness are interlinked in the modern global economy. Competitiveness paves the way for innovation, which is required to improve productivity. In turn, improving productivity is the only long term solution to achieving and maintaining sustained prosperity – irrespective of commodity price cycles.

To boost competitiveness, improve innovation, grow productivity, and sustain prosperity, action is required by both government and industry, working in partnership. The Alberta Economic Development Authority acts as an advisor to government, drawing on senior-level industry expertise to make policy recommendations to government to strengthen and diversify Alberta's economy. This report identifies possible areas of focus for these policy recommendations, after due consideration of other competitiveness initiatives already being pursued by Alberta firms and the Province.

This represents important work and the stakes are high – as the future prosperity of Alberta and Albertans will be determined by the actions of today.

Summary of competitiveness benchmarking indicator results for Alberta

Indicator	Alberta's Rank / Jurisdictions[1]	Change from 2010
Sustained Prosperity – Chapter 2		
GDP per capita	1 / 15	⇨
Growth in real GDP per capita	9 / 15	⇧
Personal income per capita, after tax	5 / 15	⇧
Growth in real personal disposable income	4 / 15	⇩
Housing affordability	6 / 13	⇧
Unemployment rate, latest year	4 / 15	⇨
Unemployment rate, five year average	2 / 15	⇧
Employment growth	2 / 15	⇨
Index of Economic Well-being	2 / 10	⇨
Human Development Index	3 / 10	*new*
Productivity – Chapter 3		
GDP per hour worked	6 / 15	⇩
Growth in real GDP per hour	13 / 15	⇩
GDP per hour worked, agriculture	1 / 6	⇧
GDP per hour worked, mining, oil and gas	1 / 6	⇧
GDP per hour worked, manufacturing	1 / 6	⇨
GDP per hour worked, construction	5 / 6	*new*
GDP per hour worked, business services	1 / 6	⇧
Labour productivity growth, agriculture	3 / 8	⇩
Labour productivity growth, mining, oil and gas	3 / 8	⇧
Labour productivity growth, manufacturing	10 / 14	⇩
Labour productivity growth, construction	14 / 14	*new*
Labour productivity growth, business services	9 / 14	⇩
Non-resource exports per capita	9 / 15	⇧
Non-resource exports growth	10 / 15	⇧
Innovation – Chapter 4		
Total R&D expenditures	14 / 15	⇨
Business R&D expenditures	13 / 15	⇨
Growth in total R&D expenditures	2 / 15	⇧
University patents received	9 / 13	⇩
Industrial share of research funding	2 / 12	⇨
Start-ups licensing university technology	9 / 12	*new*
Investment in machinery and equipment	9 / 10	⇩
Investment in ICT equipment and software	2 / 7	⇨
Multifactor productivity growth	5 / 6	*new*
Employment in high-tech manufacturing	13 / 14	⇨
Employment in knowledge-intensive services	13 / 14	⇨
Employment in natural and applied sciences	1 / 6	⇨
New business start-ups	2 / 12	⇩
High growth firms	3 / 6	⇩

Indicator	Alberta's Rank / Jurisdictions[1]	Change from 2010
The Foundation – Chapter 5		
Taxes & Fiscal Policy		
Marginal effective tax rate on capital investment	2 / 15	⇨
Top marginal personal income tax rate	3 / 15	⇨
Total tax burden	7 / 15	⇩
Government net financial assets	2 / 15	⇨
Regulation		
Time required to start a new business	7 / 10	⇩
Cost of procedures to start a new business	6 / 10	⇧
Property transfer costs	5 / 15	⇨
Total business cost index	5 / 13	⇨
Transportation & Infrastructure		
Age of public infrastructure, water and sewer	1 / 6	*new*
Age of public infrastructure, road and bridges	1 / 6	*new*
Government investment in infrastructure	1 / 10	⇧
Government spending on roads, bridges, transit	2 / 6	*new*
Airport passengers per capita	7 / 15	⇨
Households with broadband internet	3 / 15	⇩
Human Capital & Education		
High school math, reading and science skills	2 / 10	⇨
High school completion rate	7 / 15	⇧
Post-secondary education other than degrees	1 / 12	⇨
Bachelor degree completion rate	11 / 15	⇨
Graduate student rate	11 / 15	*new*
International graduate students	4 / 15	*new*
Apprenticeship completion rate	1 / 6	⇨
Ongoing formal or informal education	3 / 10	⇨
Employment rate	1 / 15	⇧
Change in employment rate	7 / 15	⇩
Net migration rate	6 / 15	⇧
Share of labour force aged 55+	2 / 15	⇧
Share of labour force aged <25	4 / 15	⇩
Access to Capital Markets		
Business sector foreign investment, total	1 / 6	⇨
Business sector foreign investment, non-resource	4 / 6	⇨
Available credit ratio	2 / 6	⇨
Venture capital investment	11 / 15	⇧
Number of venture capital deals	12 / 15	⇩

Legend[2]

Excellent	(top quintile)
Good	(second quintile)
Average	(middle quintile)
Weak	(lower quintile)
Poor	(bottom quintile)

1: The number of jurisdictions compared varies due to availability of data. Alberta's rank is shown relative to how many jurisdictions were compared for each measure.

2: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

1. Introduction

"Competitive economies are those that have in place factors driving the productivity enhancements on which their present and future prosperity is built"

World Economic Forum, The Global Competitiveness Report, 2009-2010

"Competitiveness is not about a low-cost labour force, the largest share of exports or even the fastest economic growth. It is about creating the conditions under which companies and citizens can be the most productive so that wages and return on investment can support an attractive standard of living"

Competitiveness Index: Where America Stands, US Council on Competitiveness, 2007

Background

*...**Alberta** has been able to build itself a highly prosperous economy; however, this does not mean that future prosperity is assured...*

Albertans, and the Alberta economy, have long been subject to the ups and downs of the global economy; but through the 2008-09 recession, and the years of recovery since then, Alberta continued to build a highly prosperous economy through the joint efforts of the Alberta Government, Alberta firms, and Albertans working together in partnership. However, this does not mean that future prosperity is assured.

The Alberta economy is highly sensitive to global energy demand and commodity prices. Therefore, the province cannot rest on its economic laurels and assume that future prosperity is assured. To achieve sustained prosperity in the long term, steps must be taken, and plans made, to build a highly competitive economy that can withstand the effects of external economic forces.

The Alberta Competitiveness Council developed an inaugural *Report on Competitiveness: Alberta 2010* to benchmark Alberta's economic competitiveness. *Report on Competitiveness: Alberta 2013* is the second edition of this series, now released by the Alberta Economic Development Authority which has assumed the mandate of the former Competitiveness Council. This report was publicly released in Spring 2014, but reflects research and analysis completed in late 2012 and early 2013. The report benchmarks the current state of Alberta's competitiveness on an international scale, building on the results of the inaugural edition. It identifies areas of strength, highlights areas where opportunities for improvement may exist, and becomes a benchmark against which future progress can be measured.

What is competitiveness?

*...**Competitiveness** is the condition created when government, industry and Albertans work together to pursue sustained prosperity...*

The definition of competitiveness varies depending upon its context. For an individual business, competitiveness will generally be expressed in terms of increasing sales, lowering costs, and gaining market share.

For the provincial economy as a whole, however, competitiveness has a much broader interpretation, and much greater significance for the future prosperity of all Albertans. At this level, competitiveness means the creation of the right conditions so that companies and individuals can grow and thrive economically, while reinforcing important social values and ensuring responsible stewardship of the environment.

Competitiveness does not represent an objective in its own right. The ultimate objective for Alberta should be to improve the standard of living of Albertans in a sustainable way, and competitiveness represents a means to this end.

Alberta's competitiveness framework

Alberta's economic prosperity can be best defined in terms of standard of living – the overall income generated by the economy. This income is available for business re-investment, individual consumption and saving, and public spending on essential social services. Therefore, prosperity is best described as generating more income and a higher standard of living for Albertans – but this must be done on a sustainable basis.

There are two main avenues for pursuing a higher standard of living – increasing labour effort or working smarter:

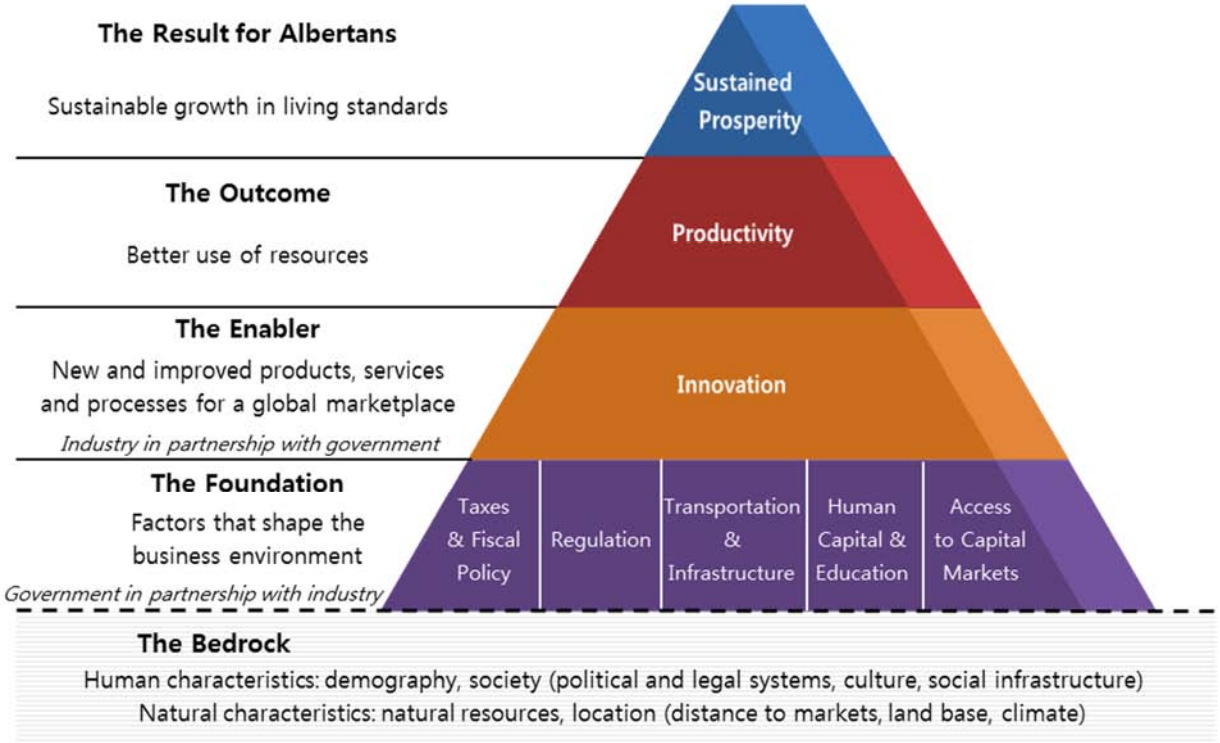
- Albertans can increase total economic income by increasing their total labour effort, either by growing the workforce or by increasing hours worked. While delaying retirement, increasing immigration, and/or working more hours per week can achieve this objective, obviously the capacity to continue working harder has its limits.
- The other option is to work smarter – to generate more output per hour worked. "Working smarter" equates to improving productivity, and the ability to improve productivity has no limit.

With an aging population and fewer future workers, Alberta's high standard of living cannot be sustained solely by relying on increased labour effort. To sustain growth in Alberta's living standards over time, productivity must grow. As leading competitiveness expert Michael Porter describes:

> *"True competitiveness….is measured by productivity. Productivity allows a nation to support high wages, a strong currency, and attractive returns to capital – and with them a high standard of living. Productivity is the goal."*

Therefore, sustained prosperity, productivity, and competitiveness are all connected: a competitive economy is required to enable productivity growth, and productivity growth is required to sustain prosperity. But competitiveness represents a complex topic, influenced by many factors. To provide a structure for assessing these issues, this report has adopted the following Competitiveness Pyramid:

The Competitiveness Pyramid



This competitiveness framework was first presented in the report *Alberta's Competitiveness – A Primer for Discussion* that was reviewed and accepted by government and industry at a June 2010 Competitiveness Forum. This pyramid framework is broadly consistent with a variety of different competitiveness frameworks developed by leading international economic agencies and academic institutions.

The importance of productivity to sustained prosperity has already been discussed. Key to improving productivity is innovation by industry – finding new ways of doing things better to generate more output per hour worked. Therefore, innovation represents the third layer of the Pyramid, helping to support productivity and prosperity.

No one single factor causes innovation to occur, but rather a variety of factors can help to increase the likelihood of innovation occurring in industry. The role of government here is to establish a competitive business environment by influencing taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets. These factors represent the foundation on which the Competitiveness Pyramid is based.

*...**Competitiveness Pyramid** represents the model used to assess the province's competitive performance...*

While government can work actively to develop a more attractive and competitive business environment as the foundation for competitiveness, once the foundation has been laid, industry has the lead role in generating jobs, innovation, productivity, and prosperity. Therefore, a strong partnership between industry and government can help to create the right mix of policies for Alberta to flourish.

Below the Competitiveness Pyramid lies the bedrock – a collection of characteristics that uniquely define a jurisdiction. These include natural characteristics that do not change (natural resources and location) and human characteristics that can only change slowly in response to social or cultural change (demography and core social structures/values). These characteristics are generally considered to be fixed by policy makers, but do influence the approach taken in shaping Alberta's competitiveness foundation.

With the bedrock being effectively fixed over the short to medium term, this report assesses Alberta's competitiveness by considering and measuring each aspect of the foundation, innovation, productivity, and sustained prosperity, and benchmarking Alberta against a group of national and international peers.

Provincial versus sector level competitiveness

This report focuses on developing a thorough understanding of the competitive position of the Alberta economy as a whole, to guide policy advice that the Alberta Economic Development Authority provides to government, and to chart a path that will lead to sustained prosperity.

The competitiveness framework applied in this study is broadly applicable to the economy as a whole, but could also be readily applied to individual sectors within the economy. In general, when comparing the competitiveness of individual sectors, additional sector-specific "micro" drivers of productivity would need to be considered in addition to the "macro" level drivers examined in this report. Such additional competitiveness drivers for individual sectors may include (but not necessarily be limited to) factors related to unique demand conditions, the stage of cluster development in the industry, the degree of competition domestically and abroad, and specific factor inputs required by the industry.

This report focuses on the competitiveness of the entire economy, and cannot seek to present detailed assessments of individual industries. However, this report does present select information on major economic sectors in the Productivity chapter, which includes separate benchmarking of labour productivity in the natural resources, manufacturing, construction, and business services sectors.

Structure of the Alberta economy

Over the past 20 years, Alberta's economy has led Canada in average annual economic growth.

In 2012, Alberta's energy sector accounted for 23.3% of provincial GDP – down from the 30.8% share recorded in 2008, but still the most important industry sector by far.

Finance and real estate accounted for 13.6% of GDP in 2012, close to the 13.1% share recorded in 2008.

Construction accounted for 10.6% of GDP in 2012, up from its 8.3% share in 2009, and reflecting the construction industry's recovery from the recession that started in 2008.

Other key sectors, and their share of provincial GDP, are as illustrated in the pie chart.

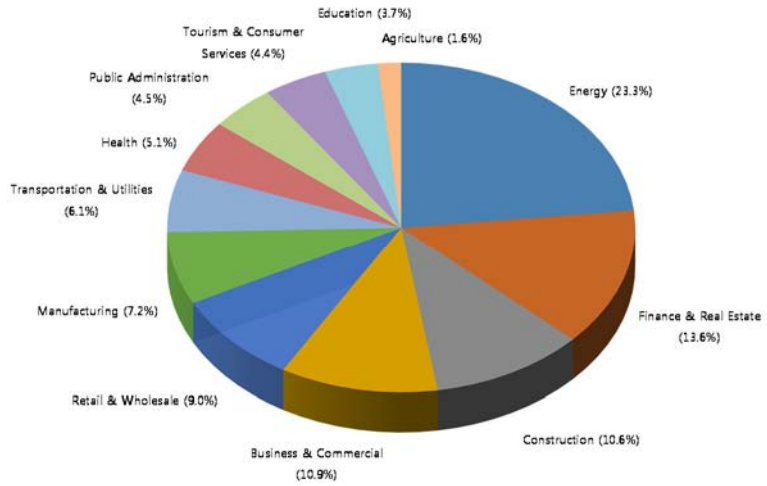
Alberta's economy is highly export oriented, with energy exports leading the way. Crude petroleum exports of $57 billion in 2012 were 86% higher than the $30.7 billion recorded in 2009.

Gas and gas liquids exports declined from $14.2 billion to $8.3 billion, reflecting softer prices associated with new extraction technologies and new shale gas projects coming into production across North America.

Petrochemicals exports increased from $5.4 billion to $6.6 billion between 2009 and 2012, and metals and machinery exports increased from $4.6 billion to $5.3 billion.

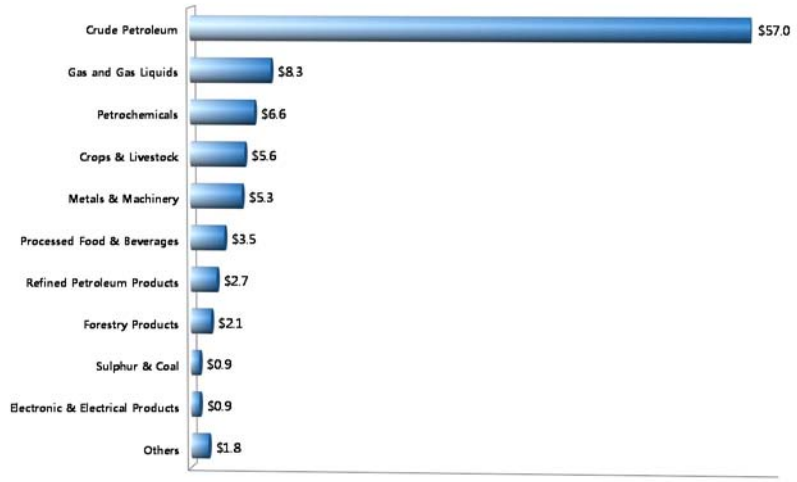
Most other export categories have experienced moderate growth in export values, ranging from 12% to 27% between 2009 and 2012.

Distribution of Alberta's GDP (2012)



Source: Alberta Enterprise and Advanced Education, Highlights of the Alberta Economy - February 2014 presentation

Alberta's major exports, 2012 ($ billions)



Notes: Export of services amount is an estimate. Source: *Highlights of the Alberta Economy, 2014*, Government of Alberta.

Competitiveness considerations for resource intensive economies

A highly relevant consideration for any form of economic measurement in resource intensive economies is the strong correlation between GDP, resource demand, and resource prices. As global demand for resources rises, so too do resource prices, causing GDP to climb even if output remains unchanged. Where possible, producers will respond to higher prices by increasing output, thus further raising GDP. With a higher price per barrel of oil, resource revenues grow relative to the hours worked, and this registers as gains in productivity in nominal terms (albeit not in real terms).

*...**It is critical** to take a long term view – to recognize that part of what is being recorded as "income" today is also a depletion of the province's natural wealth...*

However, as quickly as demand can build, so too can it reverse direction. When resource prices decline and production slows, GDP can decline precipitously.

This is not to suggest that the gains seen in boom years are somehow not "real". They are very real, and can be harnessed to help build a more competitive economy. Indeed, it is critical for resource intensive economies to take a long term view – to recognize that part of what is being recorded as "income" today is also a depletion of the province's natural wealth. Society must determine what share of this income should be directed to the development of human, physical, and technological capital – the capital that can sustain prosperity in the province as natural capital is depleted.

One further effect of this volatility in resource-related GDP is its effect on the measurement and assessment of performance for non-resource industries. When measured as a share of GDP, non-resource industries can appear to "shrink" during resource booms, simply because they become dwarfed by resource sector growth.

To counter this issue, it has been suggested that it would be useful to benchmark Alberta against its peers after excluding the "distortion" represented by the resource sector. While the direct impact of the resource sector can readily be identified, the tentacles of the resource sector run throughout the Alberta economy, into virtually every manufacturing, service, and government sector, and represent a multitude of workers, suppliers, service providers and regulators. Therefore, to try to "separate out" the resource sector from the "rest" of the Alberta economy becomes an impossible task. If everything connected to the resource sector was removed from the analysis, the resulting picture of Alberta would be entirely unrecognizable from the reality of what exists today.

To address these issues, this report has chosen to scale some measures relative to population, instead of GDP, so that broad economic measures become less prone to volatility in resource sector revenues. In addition, a special section on productivity in key sectors does help break down the "full economy" picture and provide a view of how the non-resource sectors of the Alberta economy are performing.

Benchmarking Alberta to its peers

In an increasingly global economy, which now experiences significant mobility in both capital and labour, Alberta's competitors are no longer restricted to neighbouring provinces and US states. Instead, Alberta now finds itself competing on a global stage to attract and retain investment and talent.

In order to accurately benchmark Alberta's competitiveness, international comparisons are now essential. This study utilizes both national and international benchmarks, which have been chosen on the basis of their relatively strong economic performance in recent years, as well as their size, locational and/or structural similarities with Alberta. In total, 14 jurisdictions in Canada, the United States, Europe, and Australia have been chosen for comparison with Alberta, representing the same 14 jurisdictions compared in the inaugural *Report on Competitiveness – Alberta 2010*. These jurisdictions are detailed in the following table, providing a brief snapshot of each jurisdiction.

Comparator Jurisdictions

	Jurisdiction	Abbreviation	Population (2011)	Resource sector % of total GDP (2011)	Urbanizaton: % of population in metro areas > 100,000 (2011)	Major Cities
	**Alberta**	**AB**	**3,779,353**	**22.3%**	**65.1%**	**Edmonton, Calgary**
Canada	British Columbia	BC	4,573,321	5.9%	68.6%	Vancouver, Victoria
	Saskatchewan	SK	1,057,884	24.9%	46.4%	Regina, Saskatoon
	Manitoba	MB	1,250,574	5.8%	61.0%	Winnipeg
	Ontario	ON	13,372,996	1.6%	82.3%	Toronto, Ottawa
	Quebec	QC	7,979,663	2.2%	64.8%	Montreal, Quebec City
	Colorado	CO	5,116,796	4.8%	86.6%	Denver, Col. Springs
United States	Idaho	ID	1,584,985	5.4%	66.5%	Boise
	Minnesota	MN	5,344,861	2.4%	76.2%	Minneapolis, Duluth
	Oregon	OR	3,871,859	1.3%	87.2%	Portland, Eugene
	Texas	TX	25,674,681	10.3%	88.2%	Dallas, Houston
	Washington	WA	6,830,038	1.6%	81.0%	Seattle, Spokane
	Norway	NOR	4,925,808	21.7%	34.7%	Oslo, Bergen
	Finland	FIN	5,381,237	3.4%	38.0%	Helsinki, Tampere
	Queensland	QLD	4,580,304	11.2%	79.5%	Brisbane, Gold Coast

This report strives to provide benchmark comparisons for Alberta to all of the other 14 jurisdictions for every measure. However, for some measures comparable data are not available for all jurisdictions, and the comparison is restricted to a subset of jurisdictions. In other instances, comparisons may reference national values for the United States or Australia, if relevant data are not available for specific states.

In order to benchmark Alberta's competitiveness relative to this group of jurisdictions, a total of 70 individual benchmarking measures are compared in this report – representing an increase of 10 measures over the inaugural 2010 analysis. Each of these measures relates to one of the eight components of the Competitiveness Pyramid – sustained prosperity, productivity, innovation, and the five components that comprise the foundation. The number of individual measures compared for each component of the Competitiveness Pyramid ranges from 4 to 14. The measures chosen for comparison were selected based on three criteria – relevance for Alberta and its economy, the reliability of available data, and the ability to compare to other jurisdictions.

Alberta's performance

An overview summary of Alberta's performance for each component of the Competitiveness Pyramid is presented in the following table. While the results for Alberta are generally positive, the table also identifies areas where Alberta performs less well.

Competitiveness benchmarking summary for Alberta

Indicator	# measures compared	change from 2010
Sustained Prosperity	10	⇨
Productivity	14	⇨
Innovation	14	⇨
The Foundation:		
Taxes & Fiscal Policy	4	⇩
Regulation	4	⇨
Transportation & Infrastructure	6	⇧
Human Capital & Education	13	⇨
Access to Capital Markets	5	⇨

Legend[1]

Excellent	(top quintile)
Good	(second quintile)
Average	(middle quintile)
Weak	(lower quintile)
Poor	(bottom quintile)

1: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

At the foundation level, four of the five indicators are rated as "Good" or "Excellent", while access to capital markets is rated "Average." Ratings are similar in 2013 as in 2010, except that transportation & infrastructure has improved from "Good" to "Excellent" due to high rankings for Alberta's infrastructure age and spending, and taxes & fiscal policy has weakened from "Excellent" to "Good" due to a drop in rankings for overall tax burden relative to GDP. At the higher levels of the competitiveness pyramid, innovation and productivity continue to be rated as "Average", while sustained prosperity continues to be rated as "Good."

Two important considerations need to be made in the context of these results:

- **The prosperity paradox** – Alberta has achieved a "Good" rating for sustained prosperity, even though its rating is "Average" for both productivity and innovation – the elements that support prosperity in the Competitiveness Pyramid. This result is achievable due to generally high resource prices in recent years. High resource prices bolster Alberta's prosperity, without need for high performance in productivity and innovation. Despite this, productivity and innovation are still vitally important, as they represent the elements that can support prosperity for Alberta during downward cycles in resource prices and as resource production declines.
- **Detailed results and potential action plans**– The detailed table on the following page identifies some areas where Alberta scores below many of its peers. Whether or not these represent areas for improvement is a strategic decision for government and industry to consider in developing action plans based on these results. In some instances, directly addressing these factors may be the correct course of action. In others, working to remedy such factors may detract from an existing comparative advantage, or overall competitiveness may be better served by deploying resources to further strengthen existing advantages.

The balance of this report presents detailed information on each of the indicators, and the benchmarking comparison results for Alberta.

Summary of competitiveness benchmarking indicator results for Alberta

Indicator	Alberta's Rank / Jurisdictions[1]	Change from 2010
Sustained Prosperity – Chapter 2		
GDP per capita	1 / 15	⇨
Growth in real GDP per capita	9 / 15	⇧
Personal income per capita, after tax	5 / 15	⇧
Growth in real personal disposable income	4 / 15	⇩
Housing affordability	6 / 13	⇧
Unemployment rate, latest year	4 / 15	⇨
Unemployment rate, five year average	2 / 15	⇧
Employment growth	2 / 15	⇨
Index of Economic Well-being	2 / 10	⇨
Human Development Index	3 / 10	*new*
Productivity – Chapter 3		
GDP per hour worked	6 / 15	⇩
Growth in real GDP per hour	13 / 15	⇩
GDP per hour worked, agriculture	1 / 6	⇧
GDP per hour worked, mining, oil and gas	1 / 6	⇧
GDP per hour worked, manufacturing	1 / 6	⇨
GDP per hour worked, construction	5 / 6	*new*
GDP per hour worked, business services	1 / 6	⇧
Labour productivity growth, agriculture	3 / 8	⇩
Labour productivity growth, mining, oil and gas	3 / 8	⇧
Labour productivity growth, manufacturing	10 / 14	⇩
Labour productivity growth, construction	14 / 14	*new*
Labour productivity growth, business services	9 / 14	⇩
Non-resource exports per capita	9 / 15	⇧
Non-resource exports growth	10 / 15	⇧
Innovation – Chapter 4		
Total R&D expenditures	14 / 15	⇨
Business R&D expenditures	13 / 15	⇨
Growth in total R&D expenditures	2 / 15	⇧
University patents received	9 / 13	⇩
Industrial share of research funding	2 / 12	⇨
Start-ups licensing university technology	9 / 12	*new*
Investment in machinery and equipment	9 / 10	⇩
Investment in ICT equipment and software	2 / 7	⇨
Multifactor productivity growth	5 / 6	*new*
Employment in high-tech manufacturing	13 / 14	⇨
Employment in knowledge-intensive services	13 / 14	⇨
Employment in natural and applied sciences	1 / 6	⇨
New business start-ups	2 / 12	⇩
High growth firms	3 / 6	⇩

Indicator	Alberta's Rank / Jurisdictions[1]	Change from 2010
The Foundation – Chapter 5		
Taxes & Fiscal Policy		
Marginal effective tax rate on capital investment	2 / 15	⇨
Top marginal personal income tax rate	3 / 15	⇨
Total tax burden	7 / 15	⇩
Government net financial assets	2 / 15	⇨
Regulation		
Time required to start a new business	7 / 10	⇩
Cost of procedures to start a new business	6 / 10	⇧
Property transfer costs	5 / 15	⇨
Total business cost index	5 / 13	⇨
Transportation & Infrastructure		
Age of public infrastructure, water and sewer	1 / 6	*new*
Age of public infrastructure, road and bridges	1 / 6	*new*
Government investment in infrastructure	1 / 10	⇧
Government spending on roads, bridges, transit	2 / 6	*new*
Airport passengers per capita	7 / 15	⇨
Households with broadband internet	3 / 15	⇩
Human Capital & Education		
High school math, reading and science skills	2 / 10	⇨
High school completion rate	7 / 15	⇧
Post-secondary education other than degrees	1 / 12	⇨
Bachelor degree completion rate	11 / 15	⇨
Graduate student rate	11 / 15	*new*
International graduate students	4 / 15	*new*
Apprenticeship completion rate	1 / 6	⇨
Ongoing formal or informal education	3 / 10	⇨
Employment rate	1 / 15	⇧
Change in employment rate	7 / 15	⇩
Net migration rate	6 / 15	⇧
Share of labour force aged 55+	2 / 15	⇧
Share of labour force aged <25	4 / 15	⇩
Access to Capital Markets		
Business sector foreign investment, total	1 / 6	⇨
Business sector foreign investment, non-resource	4 / 6	⇨
Available credit ratio	2 / 6	⇨
Venture capital investment	11 / 15	⇧
Number of venture capital deals	12 / 15	⇩

Legend[2]

Excellent	(top quintile)
Good	(second quintile)
Average	(middle quintile)
Weak	(lower quintile)
Poor	(bottom quintile)

1: The number of jurisdictions compared varies due to availability of data. Alberta's rank is shown relative to how many jurisdictions were compared for each measure.

2: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

2. Sustained prosperity

"Sustainable growth in living standards"

What it means

Sustained prosperity is defined as sustainable growth in living standards for a jurisdiction. In the broadest terms, economic prosperity reflects the income generated that is available to all citizens – gross domestic product (GDP). The income represented by GDP then flows to individuals for personal consumption and saving, to firms for re-investment in their businesses, or to government to fund the provision of public services.

While GDP represents an important measure of economic prosperity, to be truly competitive in a global economy it is important to take a broader view of prosperity. Sustained prosperity is about more than just dollars and cents. To achieve sustained prosperity, a balance is required between economic, social, and environmental considerations.

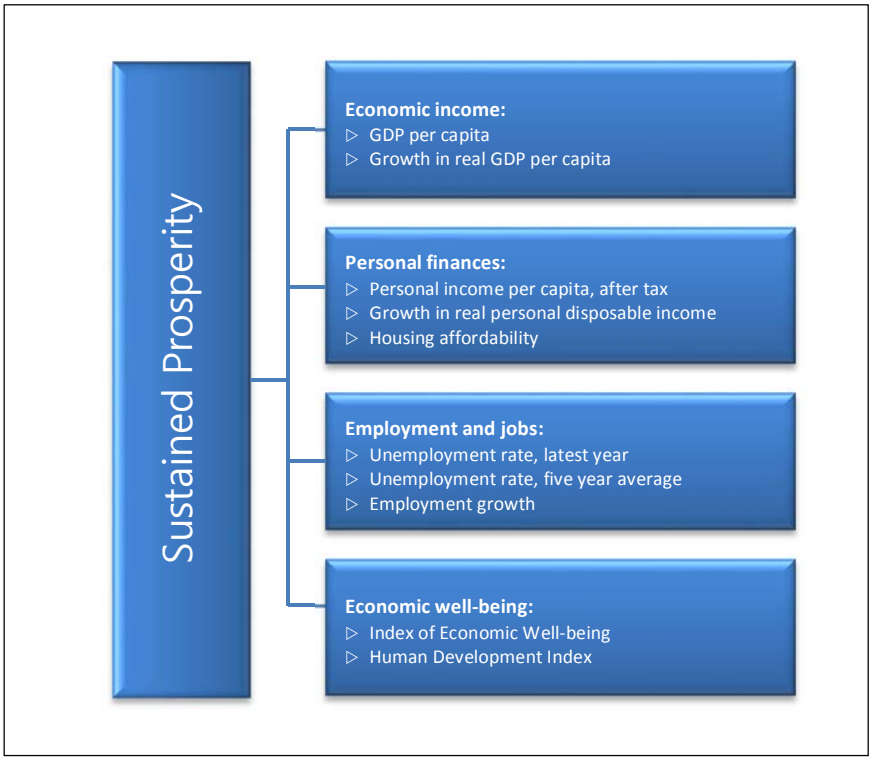
How it is measured

The globally accepted measure of a living standards is GDP per capita, reflecting the value of total economic output in a jurisdiction, divided by its population. As primary measures of economic income, this report examines both the level and the rate of growth of real GDP per capita.

Broader measures are needed to assess all aspects of sustained prosperity, and to ensure that macroeconomic gains are benefiting Albertans at a personal level.

The state of personal finances are examined, comparing both after-tax personal income and housing affordability. This report also examines the state of the job market, to consider whether jobs are available for all Albertans seeking work.

Finally, recognizing that sustained prosperity is a complex multi-dimensional topic, this comparison also includes an Index of Economic Well-being and the Human Development Index, both of which are composite measures assessing many different aspects of overall living standards.

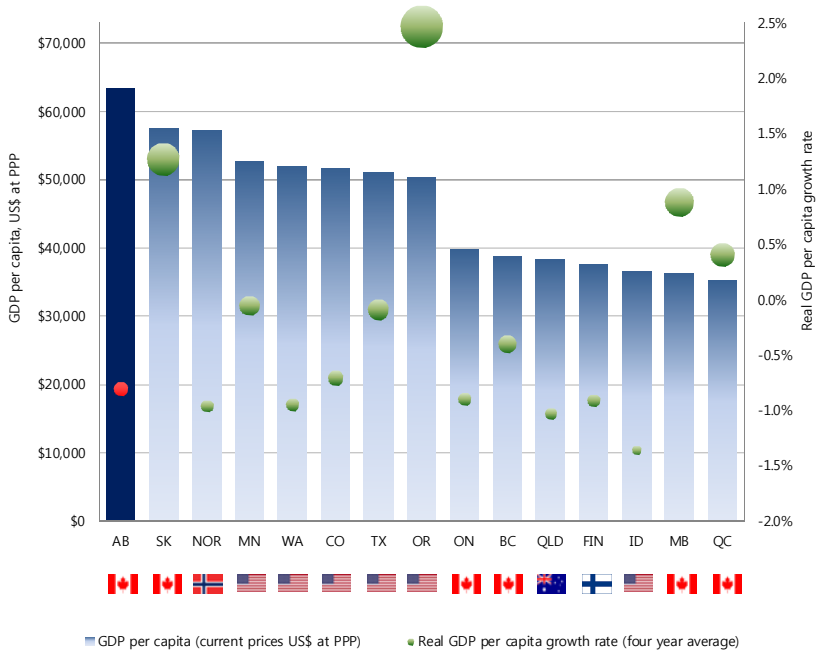


How Alberta performs

Economic income

- GDP per capita represents the internationally accepted measure of overall standards of living, and is the measure used in this report to assess macroeconomic income.
- When comparing the standard of living in international locations, it is important to recognize that a dollar of income can purchase relatively more goods or services – or has greater purchasing power – in some countries than in others. To facilitate international comparisons of GDP per capita, all GDP estimates are converted to a common currency (US dollars) using an exchange rate called the purchasing power parity (PPP). These exchange rates incorporate both foreign exchange trading rates plus purchasing power differences in each country, to reflect "value for money" oriented exchange rates between countries.
- Looking at the *level* of GDP per capita, in 2011 Alberta led all jurisdictions examined. GDP per capita in Alberta in 2011 was US$63,550 – a level of income that exceeded all OECD[1] nations other than Luxembourg.
- While Saskatchewan and Norway came close to Alberta's level of GDP per capita, relative to the other jurisdictions studied, Alberta's advantage ranges from a lead of nearly 20% over Minnesota, to a lead of more than 80% over Quebec.
- Although Alberta maintains a relatively high level of GDP per capita due to the strength of the resource sector, it is yet to return to the 2008 level of US$66,472.
- Strong resource revenues support high levels of GDP per capita in Alberta and other resource-intensive jurisdictions. However, this also represents a source of volatility – putting GDP gains at risk if oil or gas reserves, demand, or prices fall significantly in the future.

GDP per capita (2011) and Growth in real GDP per capita (2007-2011)

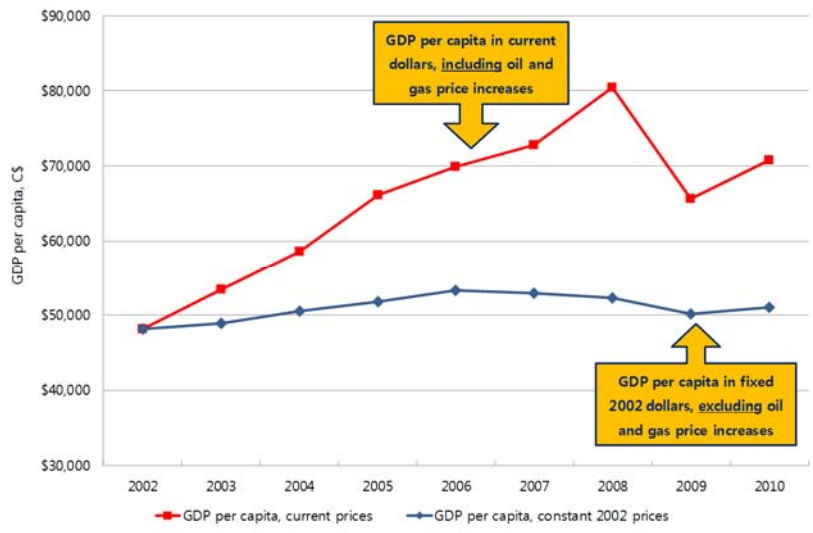


Notes: GDP per capita at current prices is in US$ at PPP. Real GDP per capita growth is based on GDP at 2007 price levels, in local currency. Sources: Statistics Canada CANSIM Tables 384-0038 (GDP) and 051-0001 (Population); US Bureau of Economic Analysis, *Regional Economic Accounts* and US Census FactFinder; Statistics Norway, subject 09-01, *Annual national accounts*; Table 09189; Statistics Finland PX WebStat Database, *National Accounts*; Eurostat: Population by sex, age group and citizenship; Queensland Treasury, *State Accounts*; Tables 1 and 11; Australian Bureau of Statistics Publication 3101.0 Table 4; OECD PPP exchange rates.

[1] Organisation for Economic Co-operation and Development.

- Growth in GDP per capita over time is compared in *real* terms. This removes the effects of inflation from the analysis to ensure that gains in income are not simply being eaten away by inflation, leaving the population no better off than before. Real GDP per capita measures growth in the volume of activity in the economy, irrespective of how prices have changed.
- Between 2007 and 2011 Alberta's real GDP shrank by an average of 0.8% per annum, partly due to the global recession in 2008-09. This represented the second weakest change in GDP per capita among the Canadian jurisdictions examined. Alberta was not the only jurisdiction to see a contraction in real GDP during the period under review, with all jurisdictions except Saskatchewan, Oregon, Manitoba and Quebec also recording negative growth between 2007 and 2011.
- One reason behind Alberta's real GDP contraction over this period was the higher level of effort required to tap new oil and gas supplies, whether involving enhanced extraction techniques for conventional oil or gas or the ongoing development of the oil sands deposits. While major new investments are being made in oil sands development, production from some of these developments has not yet come on stream in large volume.
- Alberta's track record in growing real GDP per capita can be seen in the chart on this page. The red line tracks Alberta's GDP per capita at current prices and reflects the full benefit of increased oil and gas prices over the years. This line shows generally strong growth, with the exception of the recessionary downturn in 2009. The blue line shows Alberta's performance in real terms – based on output – after removing the impact of rising oil and gas prices. Alberta's real GDP growth shows very little change over the years with 2010 being virtually unchanged from 2005.[2]
- Overall, Alberta's high level of GDP per capita is positive, but the lack of growth in real GDP per capita is a cause for concern.

The influence of oil and gas prices on Alberta's prosperity advantage



Notes: The difference between the current price and constant price GDP values represents price inflation on types of goods and services produced by the Alberta economy. This overall price inflation is very significantly influenced by rising oil and gas prices over the period from 2002 to 2008. Source:. CANSIM Table 384-0002, GDP, expenditure-based, provincial economic accounts.

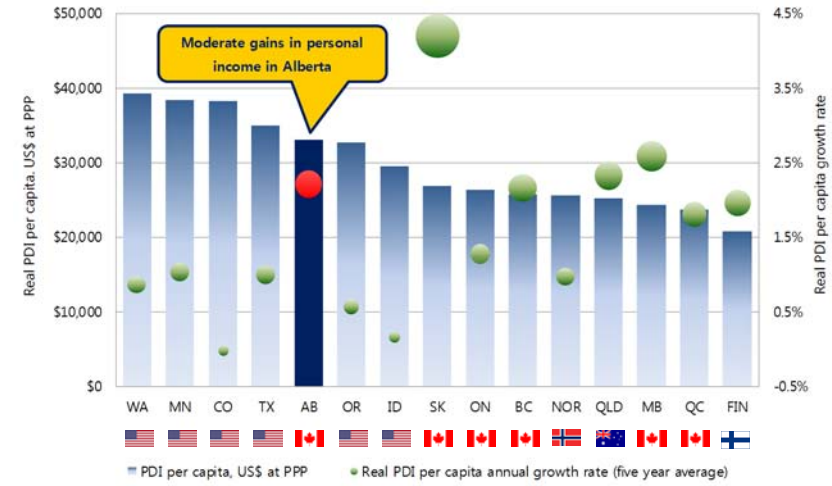
[2] Comparable data for 2011 are not available due to changes in Statistics Canada's methodology for estimating GDP.

Personal finances

Personal income after tax

- While Alberta has the highest level of GDP per capita among the 15 comparison jurisdictions, the same cannot be said when looking at personal income per capita after tax.
- Alberta ranks fifth on this measure, placing behind all US states except Oregon and Idaho. However, Alberta is the clear leader among Canadian jurisdictions, with net personal income in Alberta (US$33,107) being 23.5% higher than in Saskatchewan and 39.6% higher than in Quebec.
- Lower tax rates partially explain the strong performance of US states in this comparison of after-tax personal income. US states generally benefit from lower personal tax rates, leaving a higher proportion of take-home pay.

Personal income per capita, after tax (2010) and real growth (2005-10)



Notes: Personal income after tax represents disposable income before payment of personal social security contributions. Sources: Statistics Canada CANSIM Tables 384-0013 and 384-00123; US Bureau of Economic Analysis, *Regional Economic Accounts*, *State Annual Personal Income*, Table SA51-53; Statistics Norway, *Annual National Accounts*, Table 6 ; Statistics Finland PX Web Databases, *Income distribution statistics–Household's income by socio-economic group;* Australian Bureau of Statistics, 5204.0, Table 37.

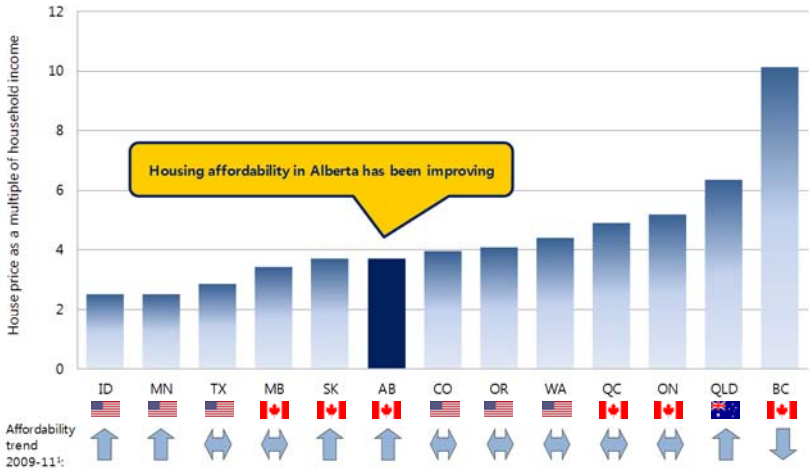
- After tax income alone does not present a truly fair comparison between Canadian and US jurisdictions. These numbers do not factor in social security payments – which can be substantially higher in the US than the equivalent CPP and EI contributions in Canada. In addition, the private medical system in the US results in substantial healthcare costs for US households, when many of the equivalent costs in Canada is covered through the tax system. According to the Centre for the Study of Living Standards[3], in 2009 Albertans spent 4.3% of after tax income on healthcare (just above the Canadian average of 4.1%), while Americans spent 11.3% of net income on healthcare.
- A further consideration as to the difference between Alberta's first place rank for GDP per capita and fifth place for personal income per capita relates to the structure of the economy. Alberta's economy benefits from a very high level of foreign investment in productive capacity. One consequence of this for Alberta is that a greater share of total economic income leaves the province as returns to foreign investors.
- On a positive note, growth in real personal income has outpaced growth in GDP per capita, meaning that Albertans have been able to take home a relatively larger share of the total economic pie. Unlike the decline in GDP per capita experienced between 2007 and 2011, personal disposable income grew by an average of 2.2% per annum during the same period. However, Alberta's personal disposable income growth rate has slowed down compared to the 2003-2008 period, when it averaged 4.3% annually.

[3] Index of Economic Well-being database, Table 5.

Housing affordability

- For many Albertans, housing affordability is a vitally important issue – possibly more important than their level of earned income. Housing affordability is also related to both domestic and international immigration – immigrants are attracted to areas where housing is affordable, yet a high level of migration can drive up housing prices.
- Housing affordability has been an issue of concern in Alberta – and in many Canadian cities – as house prices climbed faster than incomes for a number of years during the 2000's. However, house prices have moderated in Alberta and some other jurisdictions between 2009-2011, leading to improvements in housing affordability.
- In 2011 Alberta ranked 6th among 13 jurisdictions for housing affordability, with median house prices being 3.7 times median annual household income (before tax). This represents an improvement over both 2009, when median house prices were 4.4 times median household income, and over 2007 when house prices peaked at 4.6 times income. (Results for Alberta represent the average of Calgary and Edmonton, with houses in Calgary costing 3.9 times household income in 2011, as compared to 3.5 times income in Edmonton.)
- Saskatchewan is the only Canadian province other than Alberta to have seen improvements in housing affordability between 2009-2011. In Manitoba, Quebec and Ontario, the ratios of house prices to household income remained relatively stable during this comparison period. Among all 13 locations compared, from 2009 to 2011 housing affordability deteriorated in only one jurisdiction – British Columbia. In Vancouver and Victoria, average house prices reached 10.1 times income in 2011.
- In the United States, following the correction in house prices in the aftermath of the 2005-6 housing bubble, the trends in affordability have stabilized in most of US jurisdictions. Between 2009 and 2011 further improvements in affordability were seen in Idaho and Minnesota, while in the other states housing affordability remained relatively stable.

Housing affordability (2011) and trend[1] (2009-2011)



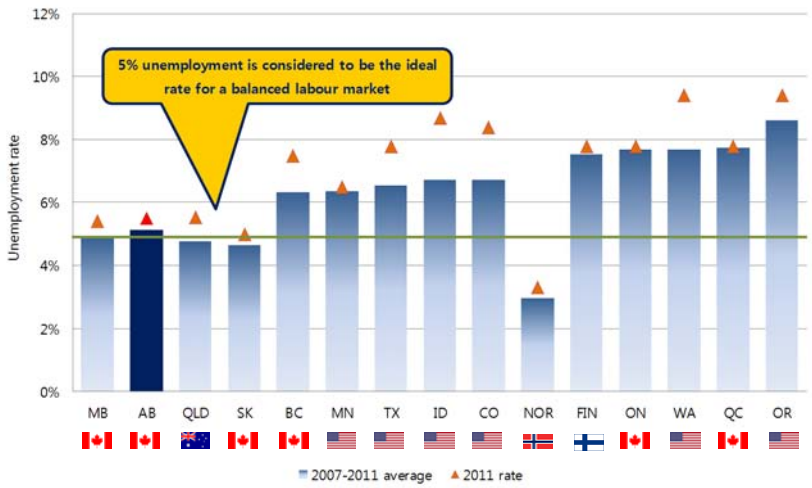
Notes: Housing affordability is measured by comparing median house prices as a multiple of median annual household income (before tax). When house price as a multiple of income rises, housing affordability declines. (1) Affordability trend represents the direction of movement for housing affordability between 2009 and 2011, which is the inverse of the movement in the charted house price / income multiple. For example, between 2009 and 2011 house prices as a multiple of income in Idaho have decreased from 3.0 to 2.5, thus representing an increase in housing affordability in Idaho. (2) Results generally represent the population-weighted average results for the two largest cities per jurisdiction included in the source study. Specifically, results for each jurisdiction represent the following cities: Idaho, Boise; Minnesota, Minneapolis and Duluth; Texas, Dallas and Houston; Manitoba, Winnipeg; Saskatchewan, Regina and Saskatoon; Alberta, Calgary and Edmonton; Colorado, Denver and Colorado Springs; Oregon, Portland and Salem; Washington State, Seattle and Spokane; Quebec, Montreal and Quebec City; Ontario; Toronto and Ottawa; Queensland, Brisbane and Gold Coast; British Columbia, Vancouver and Victoria. Data for Finland and Norway are not available. Source: Demographia, *Annual International Housing Affordability Survey,* 2012 (reporting 2011 data).

Employment and jobs

Unemployment rates

- Irrespective of aggregate GDP and income statistics, providing meaningful employment for Albertans is a core aspect of achieving sustained prosperity.
- It is also important to maintain a balanced labour market – where unemployment is neither too high, nor too low. In Alberta, if the unemployment rate drops below a balanced level of 5%[4], then labour shortages can occur, negatively impacting competitiveness and jeopardizing long term employment prospects for all workers. Therefore, for measures of unemployment, the jurisdictions have been ranked not based on their actual rate of unemployment, but rather by the differential in their unemployment rates (in absolute terms) above or below Alberta's 5% balanced rate.

Unemployment rate (2011 and 2007-2011 average)



Notes: The order of jurisdictions in this chart is based on their deviation, in absolute terms, from an unemployment rate of 5%, which is treated as representing Alberta's ideal balanced labour market that works in the best interests of both employees and employers.
Sources: Statistics Canada, *Labour force survey estimates*, Table 282-0002; US Bureau of Labor Statistics, *Local Area Unemployment Statistics*; Eurostat, *Unemployment rates by gender*, Australian Bureau of Statistics, *6202 Labour Force, Australia*, as reported by the Queensland Office of Economic and Statistical Research. Ideal unemployment rate for Alberta of 5% is from *Building and Educating Tomorrow's Workforce, Alberta's 10 Year Strategy*, Government of Alberta, 2006.

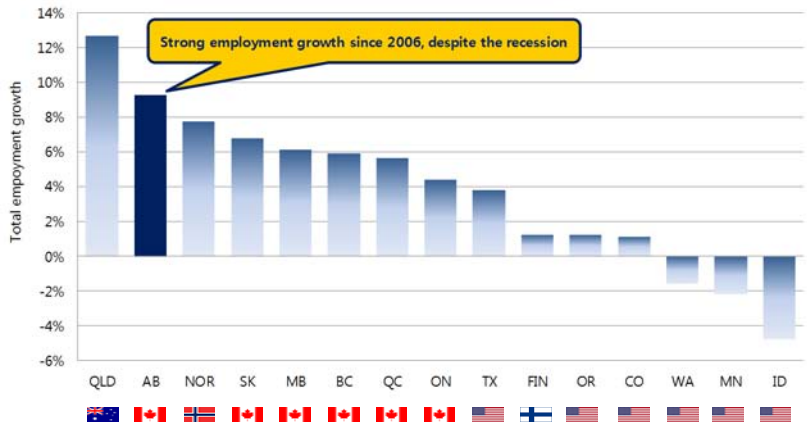
- From 2007-2011, Alberta was ranked second, just behind Manitoba, for unemployment during this period. On average, the unemployment rate in Alberta in this period was 5.1%, very close to the target balanced rate of 5%. By contrast, Norway had the lowest unemployment rate among the fifteen jurisdictions in this period, at 3.0%, but it ranks in the tenth place because of the distance from the "ideal" unemployment rate of 5%. Of the 13 jurisdictions ranked behind Alberta (with unemployment further away from 5%), three had unemployment rates below 5% and 10 had unemployment rates above 5%.
- After seeing unemployment spike from 3.5% in 2007 to 6.6% in 2009, by 2011 Alberta's unemployment rate had dropped back to 5.5%. Based on this measure, in 2011 Alberta ranks 3rd among the 15 jurisdictions, with only Saskatchewan and Manitoba ranking closer to the target unemployment rate of 5%. In 2011, a total of 11 jurisdictions recorded unemployment rates higher than in Alberta, with last-ranked Oregon and Washington State both having unemployment rates of 9.4%.

[4] *Building and Educating Tomorrow's Workforce, Alberta's 10 Year Strategy*, Government of Alberta, 2006.

Employment growth

- While unemployment rates measure those out of work at certain points in time, unemployment rates are also influenced by the ebbs and flows of people entering and leaving the workforce, whether due to aging, migration, studying, work opportunities, or lifestyle choices.
- Therefore, the measures of unemployment shown on the prior page are supplemented with this measure of employment growth, which reflects the overall ability of the economy to generate new jobs for Albertans.
- Alberta has seen strong employment growth since 2006, despite the intervening recession, and Alberta ranks second among the 15 jurisdictions for employment growth from 2006 to 2011 – behind only Queensland, where employment grew by almost 13% in 5 years.
- Among the Canadian provinces, employment growth from 2006 to 2011 ranged from 9.3% in Alberta, followed by 6.8% in Saskatchewan, to a low of 4.4% in Ontario.
- Employment growth in all Canadian provinces outpaced all US states compared in this period, with 3.8% employment growth in Texas being the leader (by far) among the US states. Washington State, Minnesota and Idaho all saw decreases in total employment from 2006 to 2011.

Employment growth (2006-2011)



Sources: Statistics Canada, *Labour force survey estimates*, Table 282-0002; US Bureau of Labor Statistics, *Local Area Unemployment Statistics*; Eurostat, *Employment by sex, age groups and nationality*; Australian Bureau of Statistics, *6202 Labour Force, Australia*, Table 12.

Economic well-being

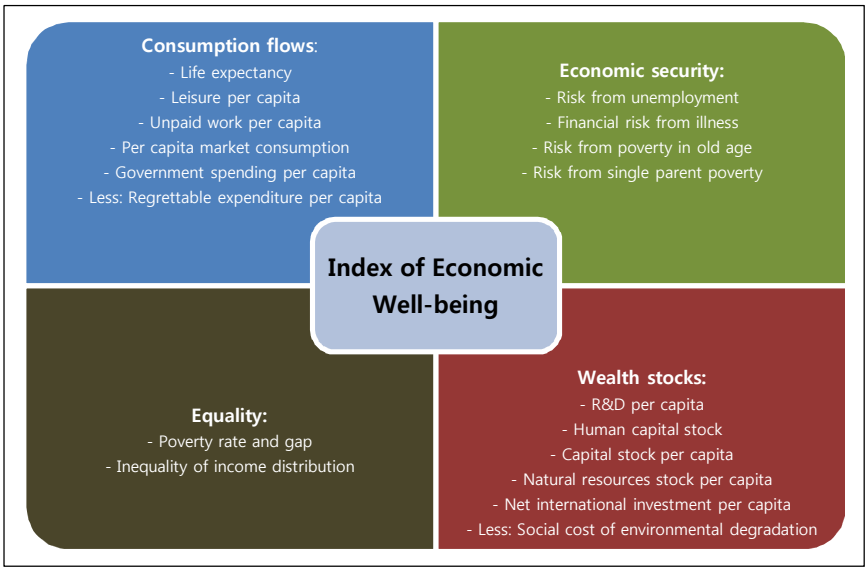
The Index of Economic Well-being

- The Index of Economic Well-being was first developed in 1998 by the Centre for the Study of Living Standards, based on the work of Dalhousie University economist Dr. Lars Osberg. The index comprises four domains of economic well-being, as illustrated in the diagram. Each of these domains – consumption, economic security, equality, and wealth – in turn includes a range of specific measures that are scored and aggregated to determine the Index of Economic Well-being.

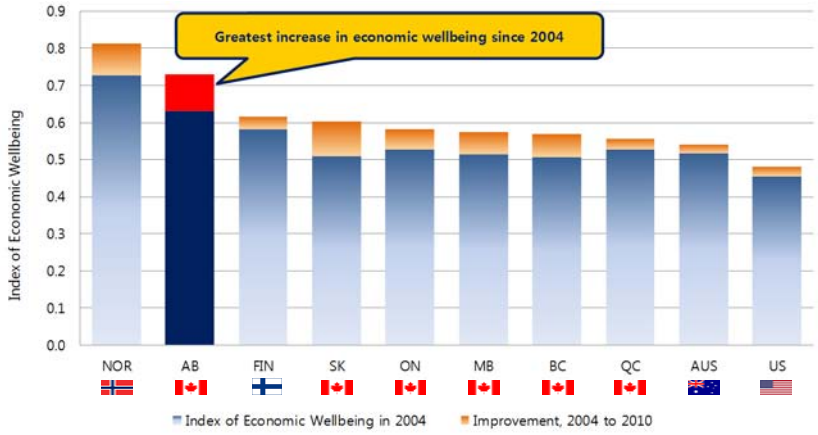
- The Index of Economic Well-being is intended to provide a much broader view of well-being than can be reflected in purely economic measures related to GDP or personal income. Using the Index of Economic Well-being allows a variety of social and environmental measures – from the poverty rate to greenhouse gas emissions – to be incorporated implicitly into the results of the analysis.

- Alberta ranked second among the 10 jurisdictions compared for this index in both 2004 and 2010. Alberta also experienced the greatest increase in economic well-being between 2004 and 2010, partially closing the lead that Norway holds for this measure. However, while the Index of Economic Well-being consistently improved in Norway between 2004 and 2010, strong growth in Alberta from 2004 to 2008 was followed by a sharp decline in 2009 and then a partial rebound in 2010.

- Overall, Alberta's positive performance on this index correlates with the strong standings seen for Alberta on a wide range of specific economic and competitiveness measures assessed in this report.



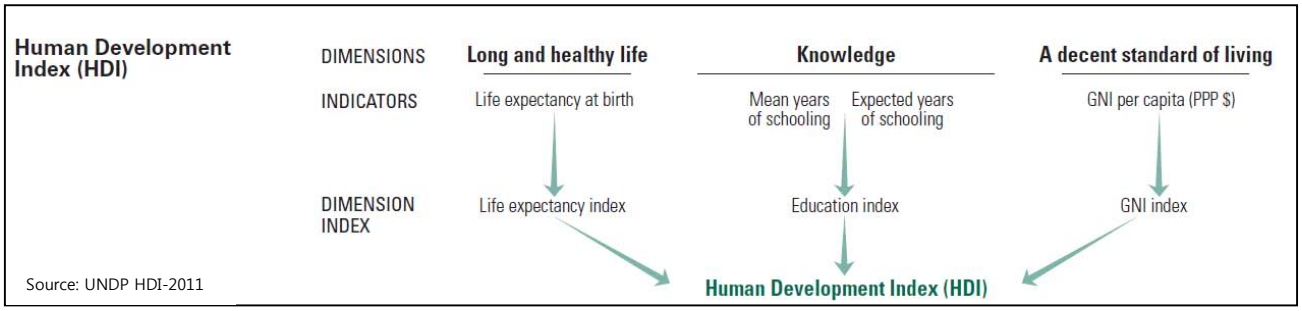
Index of Economic Well-being (2004 and 2010)



Notes: Results are not available for individual US states or Queensland. Sources: Centre for Study of Living Standards, *Index of Economic Well-being Database 2011, Table 11.*

Human Development Index

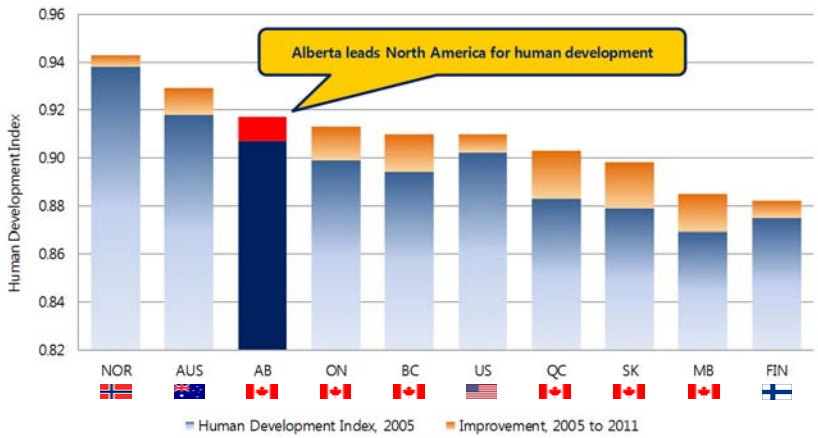
- The Human Development Index (HDI) is a measure developed by the United Nations Development Program to provide a broader perspective on human development, beyond standard income based measures. HDI offers a high-level comparison of general socio-economic development between jurisdictions. As illustrated in the following diagram, the HDI is broadly based on four key indicators of life expectancy, average years of education, expected years of education, and income per capita.



Source: UNDP HDI-2011

- While the UN develops annual HDI scores for all countries, in May 2012 the Centre for the Study of Living Standards released a study that provides HDI estimates for each of the Canadian provinces that are consistent with the UN's national calculation for Canada.
- In 2011, Alberta had the third highest HDI ranking among the 10 jurisdictions compared, behind only Norway and Australia.
- Alberta currently enjoys the highest HDI ranking among the six Canadian provinces compared. However, since 2005 the other provinces have all improved their HDI scores at a faster rate than Alberta – reducing Alberta's lead on this measure.

Human Development Index (2005 and 2011)



Notes: Results are not available for individual US states or Queensland. Sources: Centre for Study of Living Standards, *The Human Development Index in Canada: Estimates for the Canadian Provinces and Territories, 2000-2011*; UN Development Program, *International Human Development Indicators.*

The importance of environmental outcomes

Albertans define sustained prosperity to include healthy ecosystems and a healthy environment. Therefore, overall quality of life is based upon responsible development that meets the economic, environmental, and social goals of Albertans. Given this societal context, industries are increasingly reflecting the importance of responsible environmental stewardship in their business models.

While many of the indicators in this report reflect economic variables, complementary work is underway to take into account the cumulative effects of development within Alberta and the environmental performance of industry.

This is important to competitiveness from many perspectives:

- There is a shared objective of maintaining and enhancing quality of life for Albertans.
- There is a shared understanding that economic prosperity and environmental protection/quality are mutually supportive objectives. Strong environmental performance is reflective of technological innovation and effective management.
- Alberta's environmental quality is a competitive advantage in attracting human capital to this province.
- Alberta's demonstrated environmental outcomes, along with the performance and continuous improvement of industry in Alberta, contribute to meeting the sustainability expectations of export customers.

3. Productivity

"Better use of resources"

What it means

Productivity is defined as better use of resources in productive activities; the ability to create more value through the use of all forms of resources – renewable and non-renewable natural resources, human resources, land, and capital. The more value that can be created through using a given measure of resources, the more productive the economy is.

Productivity is frequently misunderstood and in the workplace. Employees worry that "improving productivity" is code for having to work longer and harder, while the company reduces the number of workers. This is not the case, as productivity gains are achieved by working smarter – finding new ways to produce more value from the same level of effort.

As illustrated in the diagram, growth in GDP can be generated by a wide range of factors. These include:

- Increasing labour input – engaging more workers and/or having existing employees work longer hours.
- Increasing labour quality – improving education and skills in the workforce.
- Increasing capital productivity, either by increasing equipment used in production, or by enhancing the mix of equipment used.
- Employing technological change, organizational change, process improvements, or other new ideas to increase efficiency – a concept known as "multifactor productivity".

Adapted from the productivity framework used by the Centre for Study of Living Standards.

While all of these factors work to increase overall GDP growth, individual factors can be very difficult to measure and value in isolation. Therefore, GDP growth is often measured in terms of two major components – labour input and labour productivity. Labour input can be readily measured as the total hours worked, while labour productivity encompasses all the other factors that govern how much value a worker can create for every hour worked.

To generate and sustain increases in the standard of living, improving labour productivity is key – to create more value per hour worked, rather than relying on more people to work more hours. Sustainable growth in GDP – and sustained prosperity – must result from working smarter rather than harder, and labour productivity is what makes this happen.

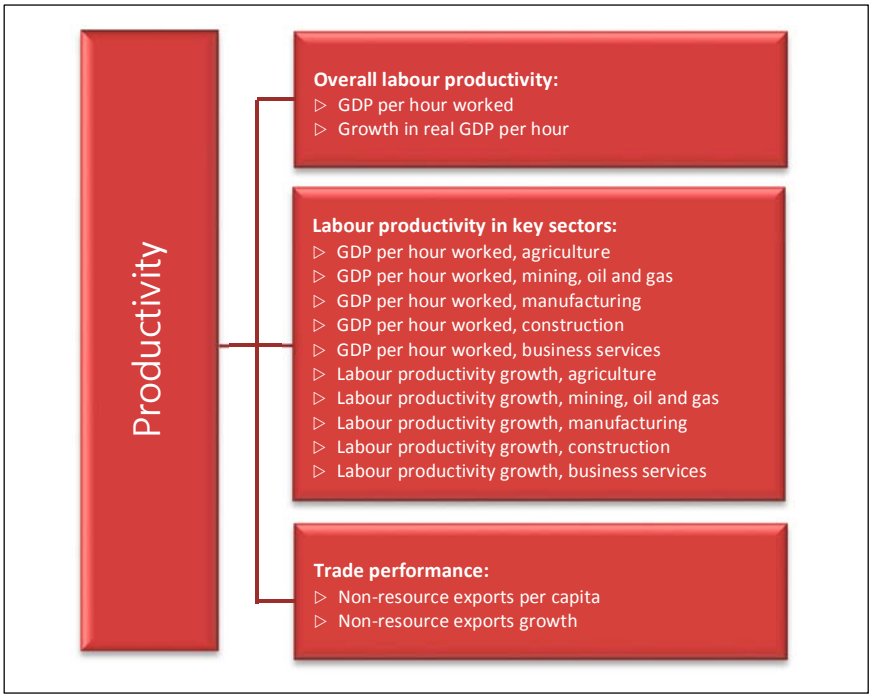
How it is measured

Labour productivity is measured as the total value of GDP, divided by the number of hours worked by all workers in the economy. This reflects the new economic value created by each hour of work.

To measure productivity, the overall level of labour productivity can be examined for the entire economy – and this report includes such a measure. However, this macro view can mask significant differences between sectors of the economy, and therefore it is also important to consider productivity performance by sector.

Another way to consider productivity is to look at international trade performance. A high level of exports is evidence of a competitive and productive economy, as international buyers are choosing to source their goods and materials from Alberta, rather than other possible global suppliers.

Reflecting these possible approaches, this report examines a total of 14 measures of productivity, as shown in the diagram.



The level of productivity (GDP per hour worked) and growth of productivity (growth in real GDP per hour) are both examined for the economy as a whole, and for five defined economic sectors – agriculture; mining, oil and gas; manufacturing; construction; and business services.

For international comparisons, GDP per hour worked is converted into US dollars, based on the purchasing power parity (PPP) of each nation's currency.

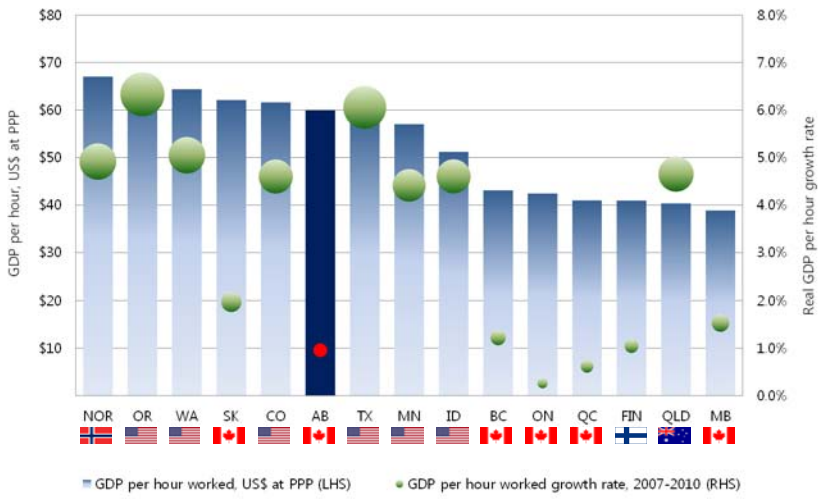
The 12 measures related to GDP are rounded out with two measures of trade performance – the level and growth rate of exports per capita. Due to the predominance of resource exports in the Alberta economy, and the limited choices the world has for where it can source oil and gas, this report focuses on *non-resource* exports per capita as a better measure of the types of goods that foreign buyers may choose to purchase from Alberta, or from other international sources.

How Alberta performs

Overall labour productivity

- Labour productivity represents the single most important factor in maintaining and enhancing long term prosperity. The only other option to increase prosperity is to continually work more hours – which may generate more income, but not higher levels of well-being. Therefore, productivity is the key to improving well-being.
- In terms of current *levels* of labour productivity, Alberta ranked 6th among the 15 jurisdictions in 2011, down from 2nd in 2008. The top resource-exporting economies – Norway, Alberta and Saskatchewan – all saw GDP per hour worked decline in 2011 compared to pre-recession peaks in 2008. In Alberta, GDP per hour dropped from US$60.28 in 2008 to $59.93 in 2011.

GDP per hour worked (2011) and Growth in real GDP per hour (2007-2011)



Notes: GDP (basic prices) per hour worked at current prices is in US$ at PPP. Real GDP per capita growth is based on GDP at 2007 price levels, in local currency. Queensland numbers are based on assumption that average annual hours worked per employee in Queensland is equal to the national average. Sources: Statistics Canada CANSIM Tables 384-0037 (GDP) and 383-0009 (Hours); US Bureau of Economic Analysis, *Regional Economic Accounts* (GDP) and Bureau of Labor Statistics, *Current Employment Statistics* (Hours); Statistics Norway, subject 09-01, *Annual national accounts*, Tables 09170 (GDP) and 09174 (Hours); Statistics Finland PX WebStat Database, *National Accounts* (GDP and Hours),; Queensland Treasury, *State Accounts*, Table 11 (GDP) and Australian Bureau of Statistics Publication 6202.0 Tables 12 and 19 (Hours); OECD PPP exchange rates.

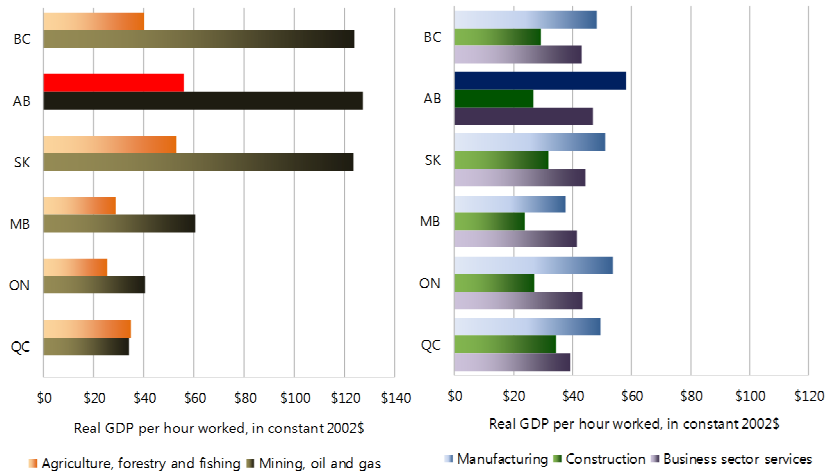
- Alberta continues to have an advantage over most other Canadian provinces for this measure, although its lead has narrowed between 2008 and 2011. The top ranked province for labour productivity is Saskatchewan, which had GDP per hour of US$62.11 in 2011.
- The *rate* of productivity growth has been slow in Alberta in recent years, with Alberta ranking 13th for this measure. From 2007 to 2011, Alberta's real GDP per hour grew at an average rate of 1.0% per annum, as compared to 6.3% in Oregon and 6.1 % in Texas.
- Changes in the nature and composition of Alberta's energy output certainly influence the province's productivity growth rates. Production of conventional oil and gas – which had traditionally been highly productive – declined through the early 2000's as some deposits exhausted their reserves. While conventional oil and gas production has rebounded somewhat in recent years, this is due to enhanced extraction techniques (including fracking for shale gas) that are more labour and capital intensive than traditional extraction techniques.
- Substantial capital development in the oil sands has also lowered Alberta's labour productivity. Large numbers of employee hours and capital dollars have been dedicated to the construction of major oil sands projects, which only now are starting to generate substantial levels of output. In the years ahead, productivity in the oil sands is expected to improve, as more projects expand their production. Due to the complex nature of the extraction process, the oil sands cannot be expected to experience the same level of labour productivity seen historically in conventional oil extraction.
- These circumstances of the oil and gas industry are expected to continue to affect Alberta's labour productivity in the years ahead, making the achievement of productivity gains in other sectors of the provincial economy all the more important to maintaining total labour productivity.

Productivity in key sectors

Productivity levels

- Separate results are presented here for five major economic sectors – agriculture; mining, oil and gas; manufacturing; construction; and business sector services.
- Due to international differences in data definitions, the level of labour productivity within specific sectors can only be compared reliably within a single country. Therefore, productivity levels (value added per hour worked) are compared only for Alberta and the five other Canadian provinces chosen for comparison.
- Overall, the level of productivity in Alberta in 2011 exceeded that of all other provinces in all sectors compared, except construction. In the construction sector, Alberta ranks fifth among the six provinces, ahead of Manitoba.

GDP per hour worked, by major sector (2011)



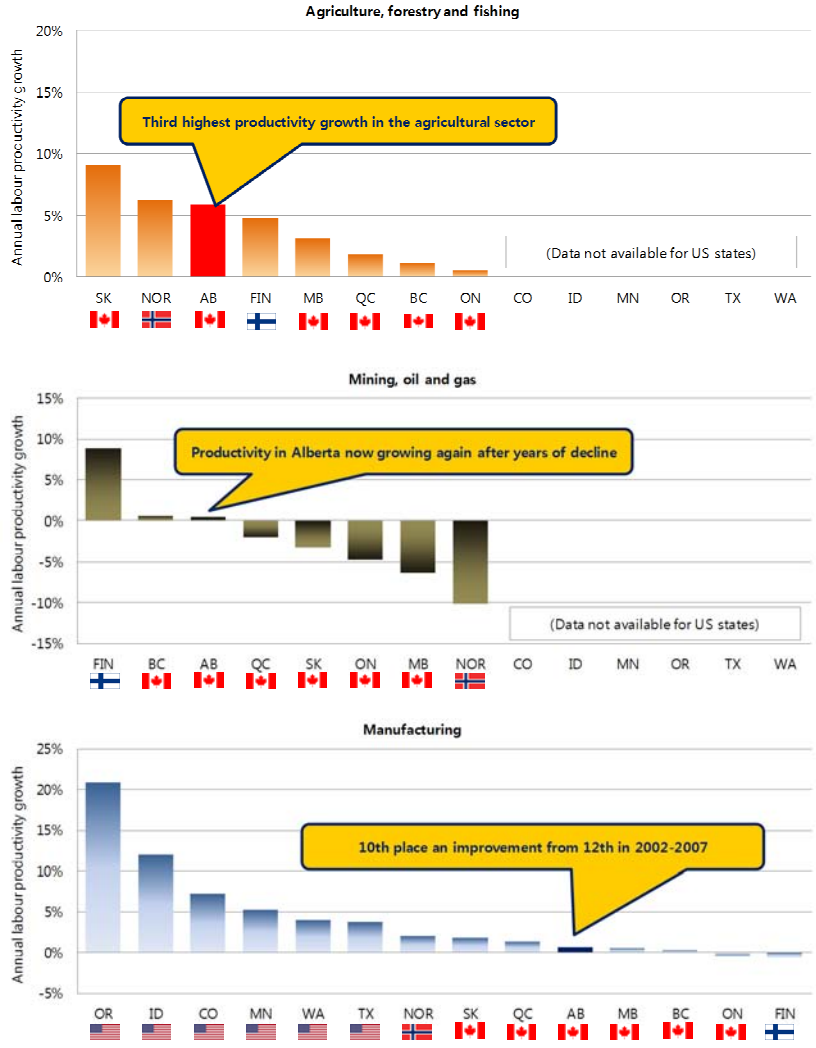
Notes: GDP per hour worked represents 2011 labour productivity, but for comparison purposes is expressed in constant 2002 Canadian dollars. Business sector services include all service industry classifications from utilities, transportation, and trade, to other services (excluding public administration, healthcare, and education). Source: Statistics Canada CANSIM Tables 379-0025 (GDP) and 383-0009 (Hours).

- For agriculture, Alberta established itself as a leader in agricultural productivity among Canadian provinces in the mid-2000s, and continues to lead this sector in 2011.
- For mining, oil and gas, Alberta, Saskatchewan and British Columbia have been consistently ranked among the three most productive provinces since at least 2002. Saskatchewan held the lead in this sector until 2008, while Alberta was the top ranked province in 2009 and 2011, and British Columbia fared best in 2010.
- For manufacturing Alberta's productivity is the highest among the six Canadian provinces, leading second-ranked Ontario by almost 9%.
- For construction, Alberta's fifth place ranking for productivity in the construction sector in 2011 is not surprising, given the complexity of large-scale, custom-built industrial developments in Alberta's oil and gas industry.
- The services sector measure includes all forms of private sector services – from utilities, trade, and transportation, through to "other services" – but excludes the health and education sectors, which are dominated by publicly provided services. Utilizing this approach to measure the services sector, Alberta's lead over second-ranked Saskatchewan is almost 6%.

Productivity growth

- While the *absolute level* of labour productivity per sector can only be compared reliably within a given country because of different measurement approaches among countries, it is possible to compare the *rate of growth* of labour productivity by sector among international locations.
- For agriculture, from 2006 to 2011, Alberta ranks third among eight jurisdictions[5] for productivity growth in the agricultural sector, with average annual productivity growth of 5.8%. Alberta led all jurisdictions for productivity growth in this sector between 2002 and 2007.
- For mining, oil and gas, Alberta's productivity grew at an average rate of 0.4% between 2006 and 2011, ranking Alberta third among eight jurisdictions[1]. This represents a significant improvement for Alberta, which saw its productivity in this sector decline by an average of 6.7% per annum between 2002 and 2007. (The rebound in conventional oil production, combined with more oil sands projects coming online may explain this improved productivity growth rate for Alberta.)
- In manufacturing, Alberta ranked 10th among 14 jurisdictions for productivity growth from 2006 to 2011, with average growth of 0.7% per annum. While Alberta's growth rate in this sector has slowed from the 2.3% annual growth seen in 2002-2007, many other jurisdictions have also seen lower productivity growth since 2006, and Alberta's ranking for this measure has improved from 12th in 2007 to 10th in 2011.

Labour productivity growth (2006-2011 annual average)

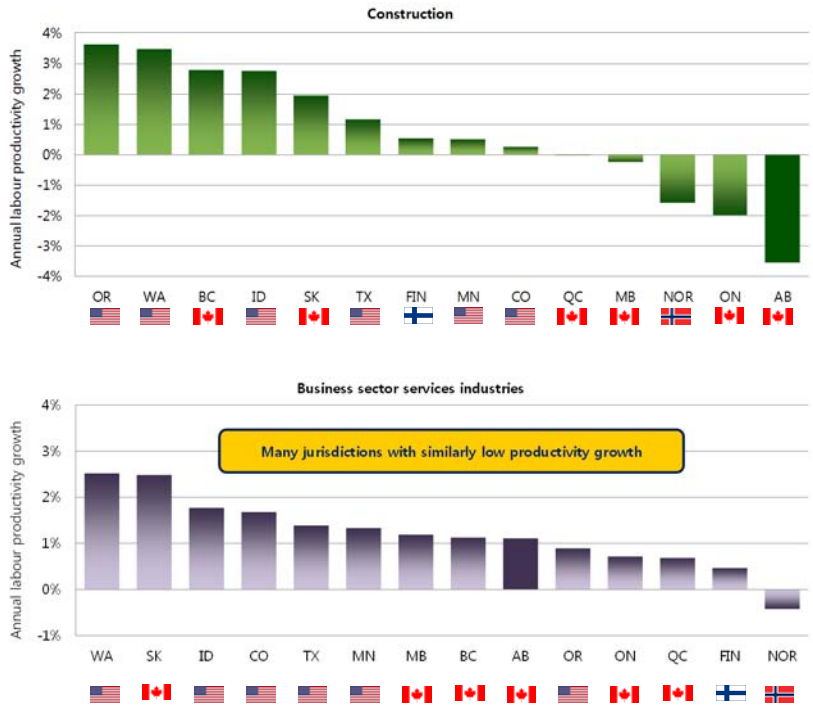


Notes: GDP growth is calculated based on real GDP per hour worked in national currency. Data are not available for Queensland or for the US for the two primary resource sectors. Sources: Statistics Canada CANSIM Tables 379-0025 (GDP) and 383-0009 (Hours).; US Bureau of Economic Analysis, Regional Economic Accounts (GDP) and Bureau of Labor Statistics, Current Employment Statistics (Hours); Statistics Norway, subject 09-01, Tables 09170 (GDP) and 09174 (Hours);; Statistics Finland PX WebStat Database, National Accounts (GDP and Hours).

[5] No compatible data is available for the United States or Queensland.

- In the construction sector, Alberta ranks last among the 14 jurisdictions for labour productivity growth between 2006 and 2011, with an average decline of 3.6% per annum. The large, complex, "one of" engineering construction projects undertaken in Alberta during that period may have contributed to the drop in productivity, along with the major inflow of new workers into this sector, especially in the boom years 2006-2008, as new workers take time to "come up to speed".
- In the business services sector, Alberta ranked 9th among 14 jurisdictions for labour productivity growth between 2006 and 2011, with average annual growth of 1.1%. In this sector, productivity growth rate differentials are small, with five jurisdictions reporting growth rates of 1.1% to 1.4% while productivity growth rates in the leading jurisdictions – Washington State and Saskatchewan – were just 2.5%.

Labour productivity average annual growth (2006-2011)

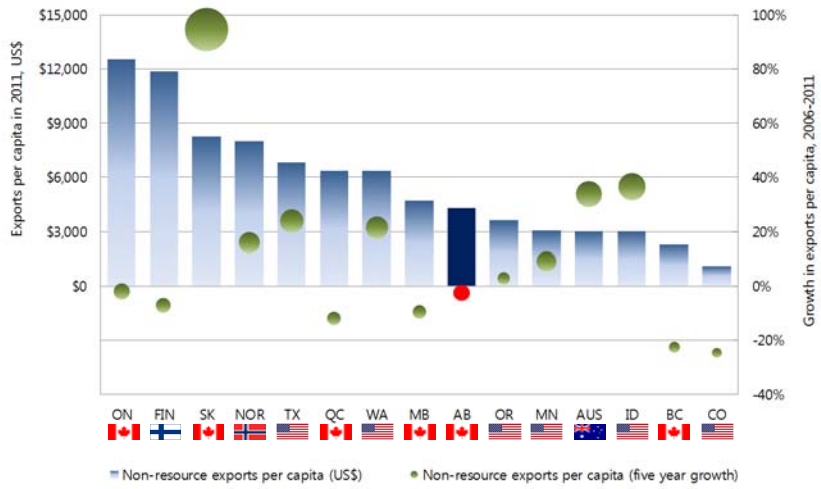


Notes: GDP growth is calculated based on real GDP per hour worked in national currency. Data are not available for Queensland. Business sector services include all service industry classifications from utilities, transportation, and trade, to other services (excluding public administration, healthcare and education). Sources: Statistics Canada CANSIM Tables 379-0025 (GDP) and 383-0009 (Hours); US Bureau of Economic Analysis, Regional Economic Accounts (GDP) and Bureau of Labor Statistics, Current Employment Statistics (Hours); Statistics Norway, subject 09-01, Tables 09170 (GDP) and 09174 (Hours);; Statistics Finland PX WebStat Database, National Accounts (GDP and Hours).

Global trade performance

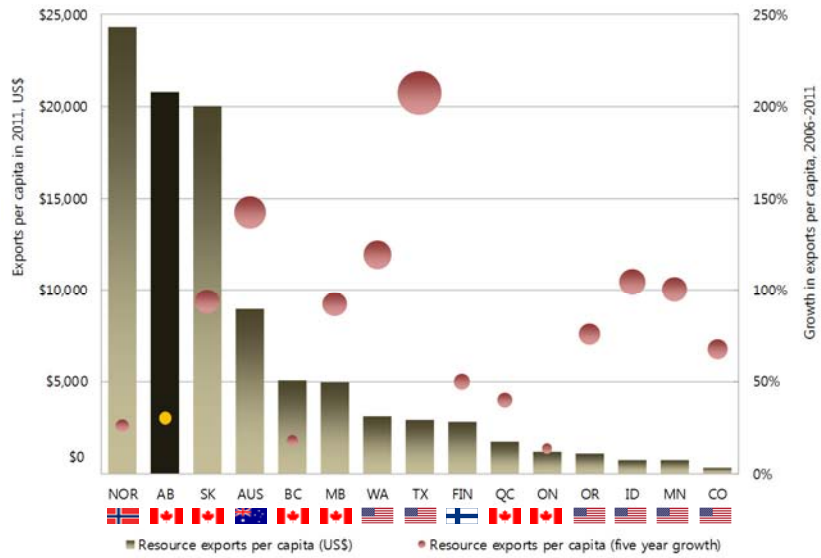
- Global trade performance reflects Alberta's productivity by measuring the ability of Alberta companies to compete on the world stage, and to attract international buyers for their products. This is particularly relevant for non-resource exports, as such exports are not tied to local natural resources and foreign buyers may choose to purchase such goods either from Alberta or from other international sources.
- Alberta ranked 9th among the 15 jurisdictions for non-resource exports per capita in 2011, consistent with its ranking in 2009. The value of Alberta's non-resource exports per capita has increased by 34% since 2009, but is still below the pre-recession peak of 2008.
- In this measure, Alberta lags other resource-intensive economies. Norway, Alberta, and Saskatchewan are the leading jurisdictions for per-capita *resource* exports, yet Norway and Saskatchewan both rank well ahead of Alberta for *non-resource* exports per capita.
- Between 2006 and 2011, Alberta's *non-resource* exports per capita declined by 2.5%, ranking Alberta 10th on this measure. Alberta was one of seven jurisdictions that saw a decline in non-resource export levels over that period.
- Resource exports per capita are not used as a benchmark measure in this analysis, but are presented in the lower chart for informational purposes. For resource exports, Alberta ranks 2nd among the 15 jurisdictions for the value of resource exports – behind only Norway, and just ahead of Saskatchewan – but ranks 12th among the jurisdictions for growth in resource exports between 2006 and 2011, ahead of Norway.

Non-resource exports per capita (2011) and growth (2006-2011)



Notes: Non-resource exports include all significantly processed manufactured products, but excludes food products and lightly-processed wood, oil, and mineral products (SITC codes 00-34 and HS equivalents). Values are FOB, and converted to US$ at annual average exchange rates. Sources: MMK Consulting Inc. based on trade data from Industry Canada, *Trade Data Online*; US Census Bureau, *US Trade Data Online*; Statistics Norway Statbank, Table 06766; Finnish Board of Customs, *Uljas Foreign Trade Statistics*; Table SITC rev4; Australia Bureau of Statistics, Catalogue 5368.0, Table 12a.

Resource exports per capita (2011) and growth (2006-2011)



Notes: Resource exports include all food products and lightly-processed wood, oil, and mineral products (SITC codes 00-34 and HS equivalents). Values are FOB, and converted to US$ at annual average exchange rates. Sources: MMK Consulting Inc. based on trade data from Industry Canada, *Trade Data Online*; US Census Bureau, *US Trade Data Online*; Statistics Norway Statbank, Table 06766; Finnish Board of Customs, *Uljas Foreign Trade Statistics*; Table SITC rev4; Australia Bureau of Statistics, Catalogue 5368.0, Table 12a.

4. Innovation

"New and improved products, services and processes for a global marketplace"

What it means

The term "innovation" is defined by the Conference Board of Canada as "the extraction of economic and social value from knowledge." Within this broad definition, innovation can include the creation of new and improved products, services, and processes. Innovation is a key driver of productivity growth in the modern knowledge-driven economy.

Innovation is frequently discussed in the context of new ideas; but true innovation goes far beyond ideas. Ideas must have value – be capable of delivering new products or services that markets demand, or be capable of improving the way existing products and services are designed, manufactured, and/or delivered. This is the true spark of innovation.

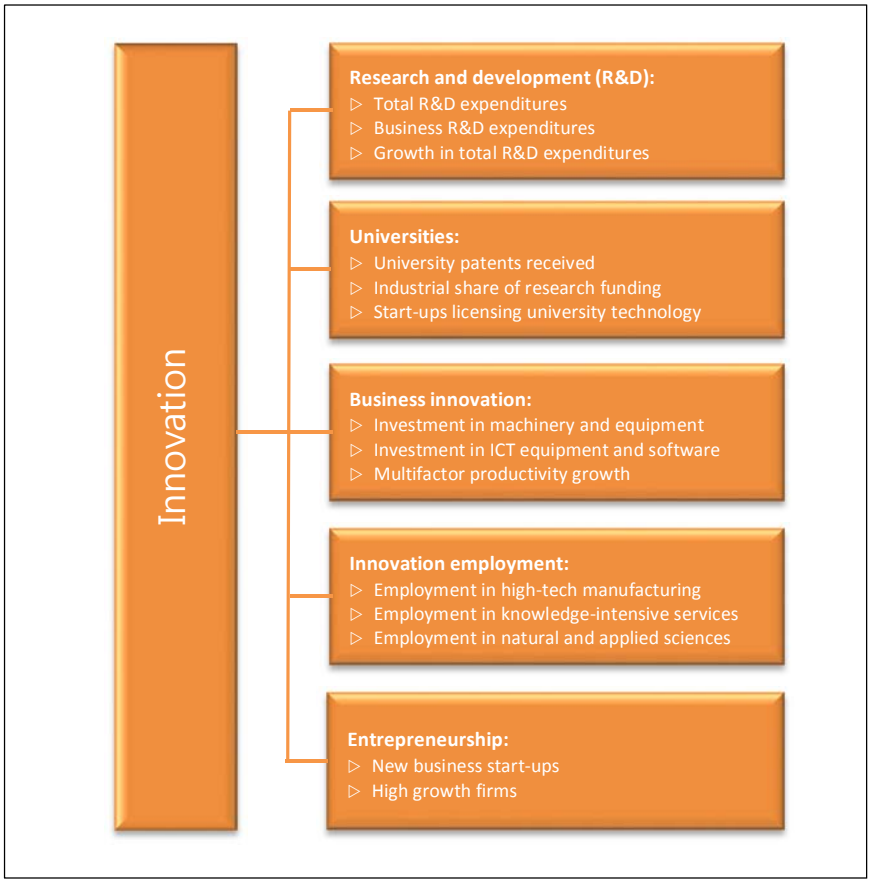
Innovation is primarily driven by industry, but with support from government. The potential sources of innovation are virtually unlimited. Whether a graduate student conducting original research, a team working on commercialization of a new technology, a manufacturer installing major new machinery, an entrepreneur introducing a new service to the market, or a production worker trying a new approach to solving an old problem – all of these represent potential sources of innovation.

How it is measured

Because innovation is a broadly defined concept it is not possible to encompass all aspects of innovation within a few measures. Accordingly the following analysis is based on 14 separate measures that are indicative of various aspects of innovation and of Alberta's competitiveness in innovation.

Within the Competitiveness Pyramid framework used in this report, the training and education of workers form part of the Human Capital/Education component of the Foundation. So, while education is an important contributor to innovation, the measures selected for comparison in this section focus on the innovation process and innovation outcomes.

This report examines 14 measures of innovation, as detailed in the diagram.



These measures are grouped into five themes – R&D, universities, business innovation, innovation employment, and entrepreneurship.

Expenditures on R&D represent a key aspect of innovation. New ideas are more likely to be found if effort and funding are dedicated to R&D. This study measures the levels of both total (gross) expenditure on R&D, and R&D expenditures made specifically by business. In addition to the relative *level* of R&D spending (expressed as a percentage of GDP), it is also important to measure the *growth* of actual R&D spending over time.

Research universities represent an important component of the innovation process. Strong connections between university research and industry are vital to knowledge transfer, application and commercialization. This report compares three different measures of innovative success of universities – the number of US patents earned, the willingness of businesses to invest in university R&D, and the number of start-up enterprises licensing technology from universities.

The business sector represents another vital source of innovation. Investments in innovative technologies, such as machinery and equipment, and also information and communications technology (ICT), strongly influence business innovation. This report measures business investments in these two categories of innovative technologies. This report also measures multifactor productivity growth – an overarching, macro-level measure of innovation in the private sector.

Having skilled employees working in jobs focused on innovation is the fourth main theme for assessing innovation. Within this theme, this report measures the percentage of workers employed in high tech manufacturing industries, knowledge intensive service industries, or working in jobs that relate to science and technology. This last measure is particularly important as many jobs that relate to science and technology can occur in industries that would not generally be considered "high tech", including the oil and gas extraction industry.

The final theme for measuring innovation relates to entrepreneurship. Innovation requires a willingness to take risks and try new ideas, and thus represents a natural fit for new business start-ups. The rationale for starting a new business often includes a desire to commercialize a new process, product, service, or idea. This report assesses the state of entrepreneurship by measuring the number of new business start-ups, and the number of firms achieving rapid job growth.

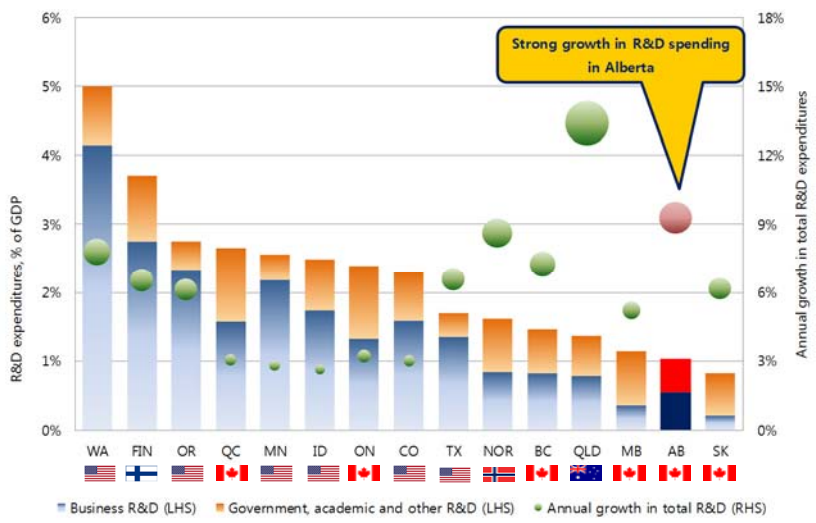
How Alberta performs

Research and development

- R&D is an important platform for innovation - representing a planned, systematic search for new knowledge, whether at the conceptual (research) or applied (development) stage of the innovation process. R&D is conducted by universities, business, and non-profit research institutes, with partnerships and consortia among these groups often used to pool R&D resources and talent.
- Three measures are used to assess R&D performance in each jurisdiction:
  - Total (gross) expenditures on R&D, as a percentage of GDP – representing the total intensity of R&D in the economy, and including the value of all R&D performed by business, government, academia, and non-profits.
  - Business expenditures on R&D, as a percentage of GDP – representing the intensity of R&D undertaken by only the business sector.
  - Average annual growth in total R&D expenditures over five years – representing R&D spending trends.
- While these three measures of R&D activity are critically important, it is equally important to recognize their limitations. These standard international measures reflect "formalized" R&D – specific programs of R&D undertaken in research labs, in prototype plants, and the like. What these measures cannot capture is the "informal" R&D that occurs every day on the shop floors of manufacturing firms, in the cubicles of ICT firms, and in the workplace sites of construction and resource firms.

- In terms of R&D intensity, Alberta lags behind most jurisdictions, ranking 14th for its total R&D intensity and 13th for its business R&D intensity in 2008 (the latest available data). Only Saskatchewan ranks behind Alberta in terms of total R&D intensity, while Manitoba also ranks behind Alberta for business R&D intensity. These rankings are unchanged from 2007.
- In first-ranked Washington State, not only is the total intensity of R&D much higher than in other jurisdictions, but the level of business R&D investment is also significantly higher, with business R&D accounting for over 80% of total R&D. Minnesota, Oregon, and Texas have similarly high business shares of total R&D. Meanwhile, business R&D accounts for less than 60% of total R&D in all of the Canadian provinces compared.

R&D expenditures, percent of GDP (2008) and growth (2003-2008)



Sources: Statistics Canada, CANSIM Table 358-0001; US National Science Foundation, *Science & Engineering Indicators 2012*, Table 8-39; Nordic Institute for Studies in Innovation, Research and Education, *R&D Statistics for Norway*; Statistics Finland PX-Web Stat Database, *Science, Technology and Information Society*; Australian Bureau of Statistics Catalogue 8112.0, Table 7.

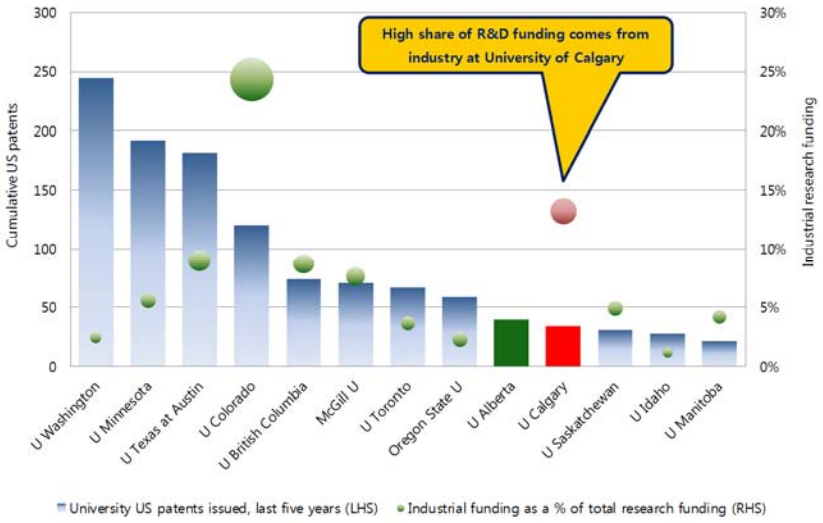
- Government expenditures on R&D range from 0.4% to 1.1% of GDP across all jurisdictions, with Alberta at the low end of this range. Quebec, Ontario and Finland have the highest intensity of government R&D among the 15 jurisdictions, at 1.0% of GDP or more.
- The major resource economies in the comparison – Alberta, Saskatchewan, Norway, Texas, and Queensland – all trail in the ranking of R&D expenditures as a percentage of GDP.
- While Alberta has a low overall *level* of R&D investment, between 2003 and 2008 Alberta saw a high rate of *growth* in R&D spending, with average annual growth of 9.3%. This ranks Alberta second among the 15 jurisdictions for R&D growth, with only Queensland exceeding Alberta on this measure.

Universities

Patents received and industrial research funding

- Research universities represent an important source of innovation, due to their high levels of formalized basic and applied R&D.
- The first measure used here to assess the innovative performance of universities is the cumulative number of US patents received by each university from 2006 to 2010. This measure identifies research results that the universities have been able to patent.
- The universities of Alberta and Calgary rank 9th and 10th among 13 universities for US patents received. This represents a drop in ranking for the Albertan universities since 2008, with Oregon State University having moved ahead of both Alberta and Calgary, while University of Toronto has also surpassed the University of Alberta. While both Albertan universities had high patent rates in the early 2000's, their patent rates have dropped since 2006.

University patents received (2006-2010) and Industrial share of research funding (2008-2010)



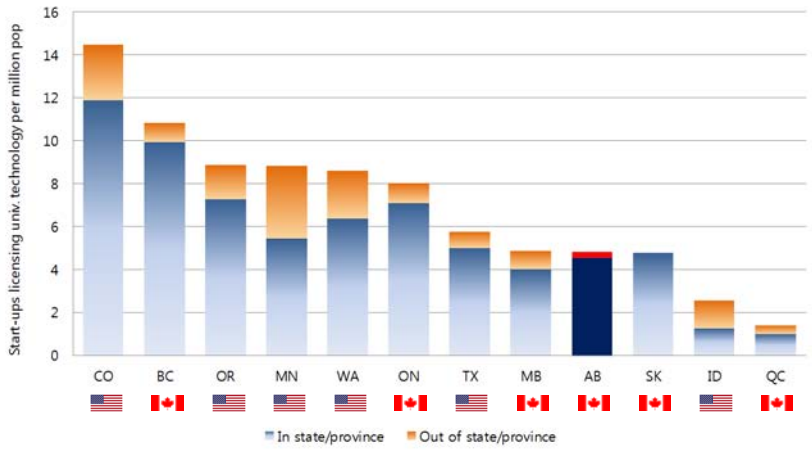
Notes:. In all jurisdictions other than Alberta, the single largest publicly-funded university is shown. Recent, reliable data on industrial share of research funding are not available for University of Alberta. Values shown for University of Texas at Austin (UTXA) are specific to that campus for 2006 to 2008. In 2009 and 2010 UTX only reported consolidated data for all campuses. In those years, UTXA values are estimated based on the UTXA share of UTX system-wide values for specific each measure from 2005 to 2008. Source: Association of University Technology Managers, Licensing Surveys Database.

- The leading universities for patents received, Washington and Minnesota, have close connections with major local technology clusters – ICT in Seattle and medical technology in Minneapolis. These connections likely influence the high numbers of patents received by these schools.
- The second measure used to compare universities is the share of total research funding that comes from industry. This measure identifies the partnership between the university and industry in their research activities, and the confidence industry has in the university's research capabilities.
- The University of Calgary continues to rank second behind the University of Colorado for the share of R&D funding that comes from industry, based on the annual average rate in the period from 2008 to 2010. The annual average share of R&D funding from industry for the University of Calgary increased to 13.2% in this period, from 10.3% in the period 2006-2008. (Data for this measure are not available for the University of Alberta.)
- Patentable inventions developed at universities only represent part of the innovation story. There are also patentable inventions developed in the private sector, and just as importantly, innovative process improvements by firms that boost innovation and productivity, but which do not result in patents.

Start-ups licensing university technology

- The third measure used to compare universities is the rate of start-up firms licensing university technology, per million population.
- As this measure is expressed per capita, this measure has been presented on a "jurisdiction" basis rather than using the same "institution" basis as for patents.
- Universities license technology to a wide range of organizations, from large corporations, to small start-up firms, to non-profit entities. Technology licenses issued to start-up firms is a strong indicator that innovations have commercial potential, reflecting the quality of innovations being generated by universities. While licensing of technologies to start-up firms can be risky, it is often one of the most effective ways for technologies to transfer from universities to the wider society.

Start-ups licensing university technology, last five years per million population, 2006 to 2010



Notes: Start-up licenses are aggregated for all reporting institutions in each jurisdiction. Source: Association of University Technology Managers, Licensing Surveys Database.

- Alberta ranks 9th among the 12 US and Canadian jurisdictions for the number of start-ups licensing university technology (per million population) in the period from 2006 to 2010.
- Together with Saskatchewan and Quebec, Alberta is the only jurisdiction where the rate of licensing has decreased in 2006-2010, as compared to 2002-2006. This decrease in licensing activity for Albertan universities correlates with the decrease in innovation patents in recent years, as noted previously.
- While jurisdictions are ranked based on their total rate of start-ups, the chart also shows the breakout between start-ups located in state/province and out of state/province. This aspect has not been rated as a measure, because there are both positive and negative aspects of having a high number of out of state/province start-ups. On the one hand, a large number of out of state/province start-ups reflects favourably on the quality of the R&D at an institution and its ability to attract interest from national and international firms. On the other hand, out of state/province start-ups mean that less of the economic impact of technology commercialization is being captured in the local jurisdiction, with employment and income instead accruing in another jurisdiction. Alberta's ratio of out-of-province licensing, relative to in-province licensing, is small in relation to most jurisdictions (other than Saskatchewan and BC).

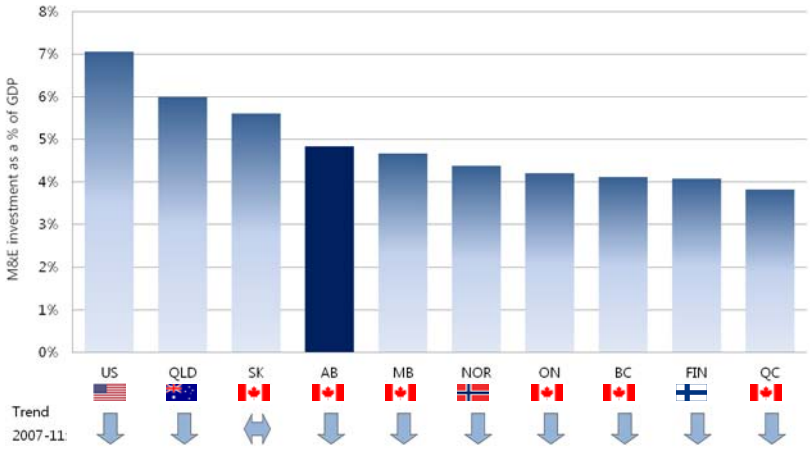
Business innovation

- Business investments in innovative technologies, including machinery and equipment, and information and communications technology, strongly influence innovation in firms. Multifactor productivity growth provides a macro measure of innovation in the private sector.

Investment in machinery and equipment

- In 2011, Alberta ranked 4th among the 10 jurisdictions compared for business investment in machinery and equipment, as percentage of GDP.
- Alberta's high level of investment in machinery and equipment reflects the nature of the capital intensive oil and gas sector of the provincial economy.
- Business investment in machinery and equipment as percentage of GDP has been generally stable in Alberta in the 2004-2011 period, although such investment did trend downward between 2007 and 2011, reflecting the effects of the recession in that period.
- Saskatchewan's ranking has improved on this measure to 3rd place from 7th. Saskatchewan is the only jurisdiction where business investment in machinery and equipment, as percentage of GDP, has not been trending down in recent years.

Investment in machinery and equipment, percent of GDP (2011)

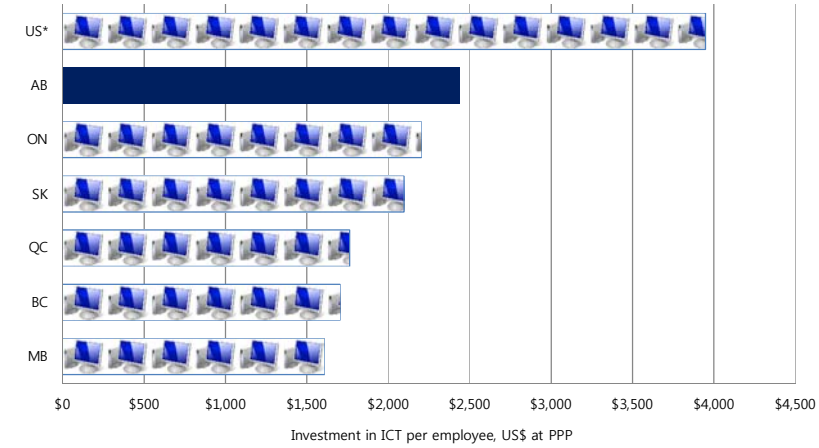


Notes: Results are not available for individual US states. Software is included in the definition of machinery and equipment in both Canada and the United States, but in other countries software is excluded from machinery and equipment. Sources: Statistics Canada, CANSIM Table 384-0038; US Bureau of Economic Analysis, *National Economic Accounts: Fixed Asset Tables*, Table 2.7; Statistics Norway Table 09181; Statistics Finland PX Web Databases, *National Accounts, Gross Capital formation by sector*, Australian Bureau of Statistics, Catalogue 5220.0, Table 4.

Investment in information and communication technologies

- Comparable data on the per-employee value of business and government ICT investments are only available for the Canadian provinces and the US national average, so the comparison for this measure is restricted to seven jurisdictions.
- Within Canada, Alberta led the six provinces compared for investments in ICT per employee in 2011.
- While the result for Alberta is generally favourable within the Canadian context, investment in ICT by Canadian firms lags well behind the investment by US firms.
- Possible reasons for this lower average level of ICT investment by Canadian firms include Canada's smaller share of employment in the ICT-intensive cultural and information industries, and Canada's larger share of employment in small and medium enterprises (which typically spend less on ICT than larger firms)[6].
- If ICT investments were compared as a percentage of total business investment, instead of per employee, then Alberta would rank last among the jurisdictions – likely due to the relatively low percentage of overall capital investment represented by ICT within Alberta's highly capital intensive energy sector.

Investment in ICT equipment and software, per employee (2011)



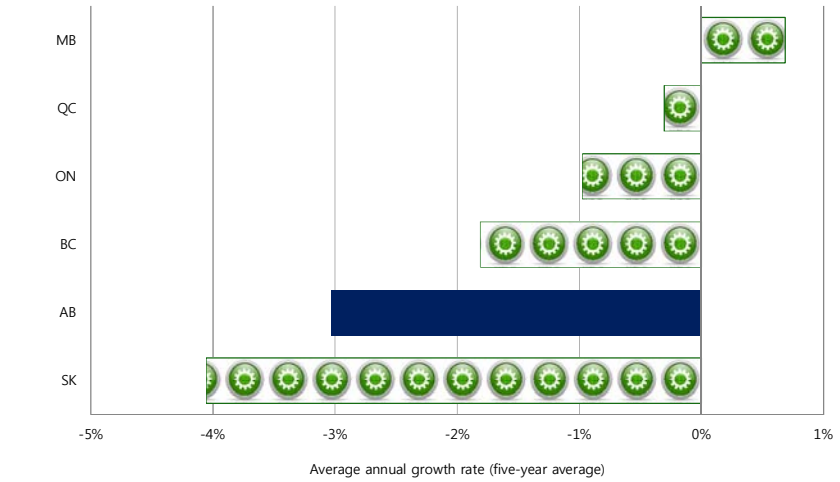
Notes: ICT investment includes non-residential (business and government) capital investments in computers, telecommunications equipment, and software. (*) US data represents private sector, non-residential only, divided by private sector workforce. (Government investment and public sector workers are excluded.) This distinction is not expected to result in a material difference in data comparability. The significant differential in ICT investment per worker between the US and Canada has also been confirmed in more detailed analysis developed by the Centre for Study of Living Standards (ICT Data Base, 2008 Charts and Tables, Tables S1). Sources: Statistics Canada CANSIM Tables 031-0004 (investment) and 282-0002 (employment); US Bureau of Economic Analysis, *National Accounts*, Fixed Asset Table 2.7 (investment); US Bureau of Labor Statistics, Employment *Hours & Earnings - National* (employment); OECD (PPP exchange rate).

[6] *What Explains the Canada-US ICT Investment Intensity Gap?,* Centre for the Study of Living Standards, 2005

Multifactor productivity growth

- Multifactor productivity (MFP) is the portion of labour productivity that results from factors other than capital investment and skilled labour, and thus represents a measure of technological change.
- Changes in MFP reflect innovation advancements, capturing the effects of process improvements, the adoption of new technologies, and improved production and management techniques in the business sector.
- Research by the OECD has shown that linkages exist between MFP and overall living standards.
- Comparable data for multifactor productivity growth are only available for the Canadian provinces, so the comparison for this measure is restricted to six jurisdictions.

Multifactor productivity growth, market sector (2005-2010)



Sources: Unpublished Statistics Canada estimates with growth estimates calculated by the Centre for Study of Living Standards.

- MFP is a difficult factor to estimate, and MFP estimates can be quite volatile from jurisdiction to jurisdiction and from year to year. For this reason, this comparison measure reflects five year average growth in MFP, rather than a point-in-time comparison or a one-year change.
- Despite the strong performance for Alberta in the preceding measures of business investments in innovative technology, Alberta ranks fifth among six jurisdictions for MFP growth – even after allowing for the generally poor performance of most Canadian provinces for this measure. Alberta's MFP declined by an average of 3.0% per annum between 2005 and 2010, placing Alberta ahead of only Saskatchewan. Among the provinces compared, only Manitoba saw MFP gains over the comparison period, with average annual growth of 0.7% per annum.
- This poor performance on MFP contributes to Alberta's relatively low growth rates for labour productivity – as gains in labour and capital are being offset by negative MFP.
- MFP gains can potentially be made in any sector of the economy, and it is a high priority for Alberta and Albertan businesses to improve their approaches to innovation with combinations of labour and capital that maximize productivity growth.

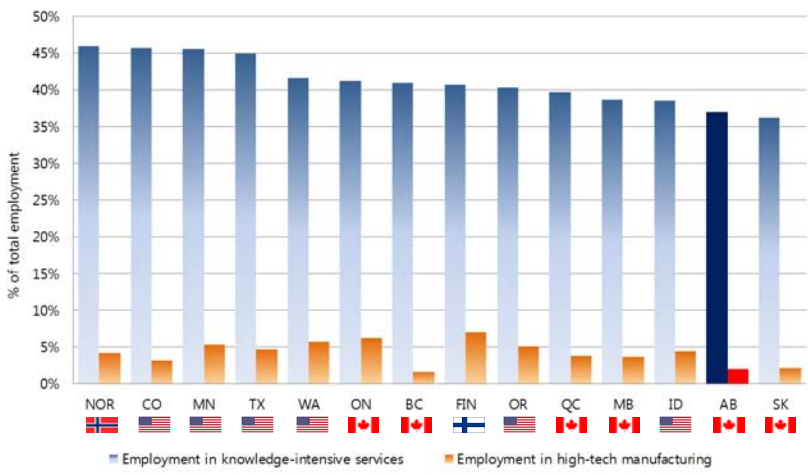
Innovation employment

- Innovation cannot occur without educated people working in innovation-orientated industry sectors. Within the Competitiveness Pyramid framework, education forms part of the Human Capital and Education component of the Foundation. In relation to innovation, this section examines the industries and occupations that are particularly innovation orientated.

High-tech manufacturing and knowledge-intensive services

- The Organisation for Economic Co-operation and Development (OECD) tracks employment for innovation orientated insudtry sectors such as high tech manufacturing and knowledge intensive services.
- High-tech manufacturing includes a variety of industries which are generally characterized by higher-tech products, such as computer, medical, and aerospace equipment.
- Knowledge-intensive services include a wide range of services characterized by higher levels of required knowledge, such as R&D, computer services, healthcare, education, and professional/ technical services. Many of these service industries also represent tradable services – services that can be exported to foreign purchasers.

Employment in high-tech manufacturing and knowledge-intensive services, percent of total employment (2007)



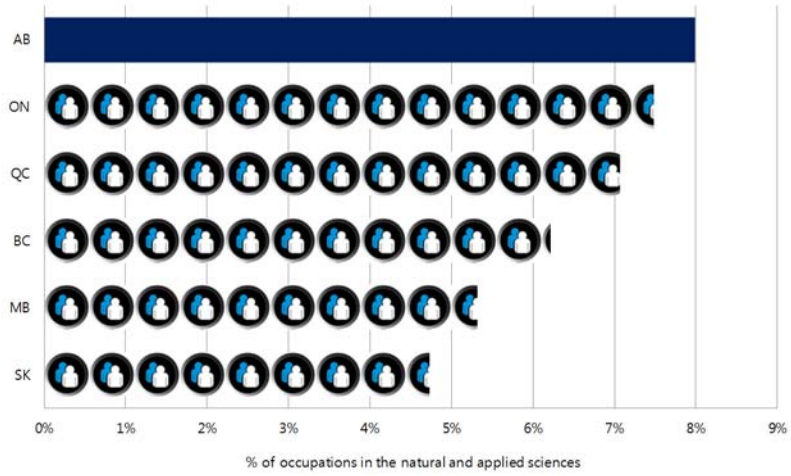
Notes: Knowledge-intensive services (KIS) and high-tech manufacturing (HTM) are defined based on International Standard Industrial Codes (ISIC) as follows. HTM includes manufacture of pharmaceuticals (2423); office machinery and computers (30); radio, TV and communications equipment (32); medical, precision and optical instruments (33), and aircraft/spacecraft (353). KIS includes water/air transport (61-62); post/telecommunications (64); financial intermediation (65-67), real estate activities (70); renting of machinery and equipment (71); computer-related activities (72); research and development (73); other business activities (74); education (80); health and social work (85); and recreational, cultural, and sporting activities (92). Data are not available for Queensland or Australia. Source: OECD *Innovation Indicators Dataset*.

- Due to high levels of employment in Alberta's resources sector, Alberta fares relatively poorly on these measures. However, while Alberta has the second lowest level of employment in knowledge-intensive services, Norway leads on this measure. Indeed, Alberta's low level of employment in these industries may be of concern, given that a range of key services supporting the resource sector are included within the definition of knowledge-intensive services.
- For high-tech manufacturing, Alberta also has the second lowest percentage of employment in these industries, ahead only of British Columbia.
- It should be noted that these results reflect 2007 data which are now dated and are unchanged from the 2010 *Alberta Report on Competitiveness*. The OECD has not yet released any new data for this measure, although new data are expected to become available for future editions of this benchmark analysis.

Employment in natural and applied sciences

- The previous section focuses on employment in industry sectors which are generally considered to be innovative, without regard to the actual occupations of each employees within the sector.
- This section examines innovation employment from the opposite direction, looking at employees working in jobs that relate to science and technology, regardless of industry sector. This measure recognizes that many science and technology jobs exist in industries that are not usually considered to be "high tech".
- Both of these measures provide valid, but different, viewpoints on the innovative potential of the workforce.
- Employment in natural and applied sciences represents a measurement concept only reported within Canada, so for this measure comparisons are limited to the six Canadian provinces.
- Alberta fares very well in this comparison, due to high levels of employment in engineering and science in the resources sector (e.g., geology, chemistry, etc.).

Employment in natural and applied science (and related) occupations, percent of total occupations (2011)



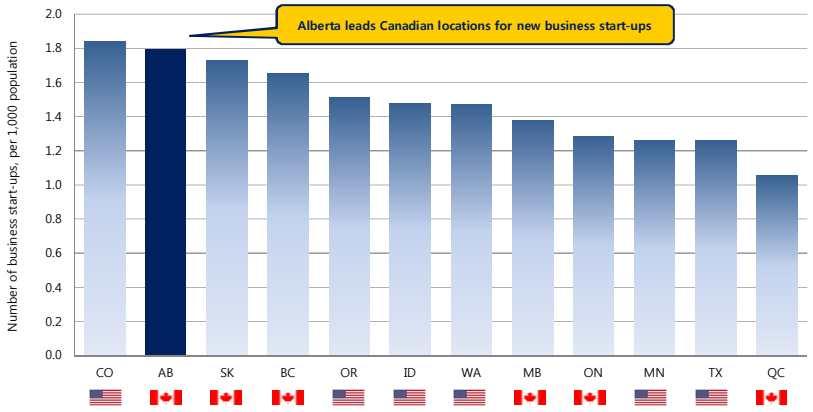
Source: Statistics Canada, *Labour force survey estimates by National Occupational Classification for Statistics*, Table 282-0009.

Entrepreneurship

Business start-ups

- New businesses are often founded on the basis of a great new idea, service, or product. For this reason, business start-ups are measured as one indicator of innovation.
- Alberta ranked 2nd among 12 provinces and states for new business start-up in 2010. The rate of new business start-ups in Alberta was more than 60% higher than that seen in the last-ranked jurisdiction, Quebec.
- Alberta has ranked in the top three for the Canadian and US locations for start-ups each year since 2005 – reflecting the spirit of independence and entrepreneurship on which Alberta prides itself.

New business start-ups, per 1,000 population (2010)

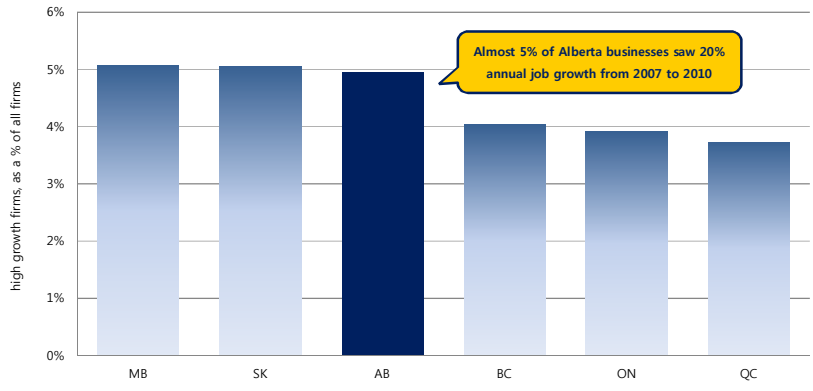


Notes: Comparable data not available for overseas jurisdictions. 2010 represents most recent data released to date by both Canada and US, but more recent data will be released in the future. Sources: Statistics Canada, LEAP Database, custom extract for Alberta.; US Census Bureau, *Business Dynamics Statistics, Firm Age by Firm Size by State.*

High growth firms

- Another important part of the process of innovation, is the success of the business venture. Firms are more likely to succeed and grow if they have an innovative advantage over their competitors, and the most innovative firms are most likely to experience rapid growth.
- High growth firms have been identified as firms experiencing job growth of more than 20% per annum for three straight years. Many such businesses would represent small and medium businesses, for the simple reason that large percentage increases in employment become harder to sustain as companies grow.
- Alberta is effectively tied with Manitoba and Saskatchewan on this measure, with 5% of firms classified as high growth.

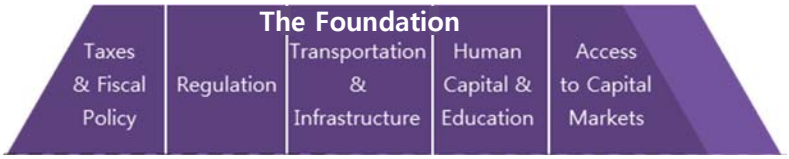
High growth firms (>20% job growth for 3 straight years, 2010)



Notes: Results represent the percentage of all firms that experienced employment growth in excess of 20% in each of 2008, 2009, and 2010. Data not available for Australia, US, Norway or Finland.. Sources: Statistics Canada, LEAP Database, custom extract.

5. Foundation

"Factors that shape the business environment"



What it means

The foundation of the Competitiveness Pyramid is defined by the factors that shape the business environment. These are the building blocks of the economy that drive future innovation and productivity. They include taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets.

Government has a lead role in shaping and improving the foundation, but industry also has a role in helping to develop key aspects of the foundation, including technology infrastructure and business financing mechanisms.

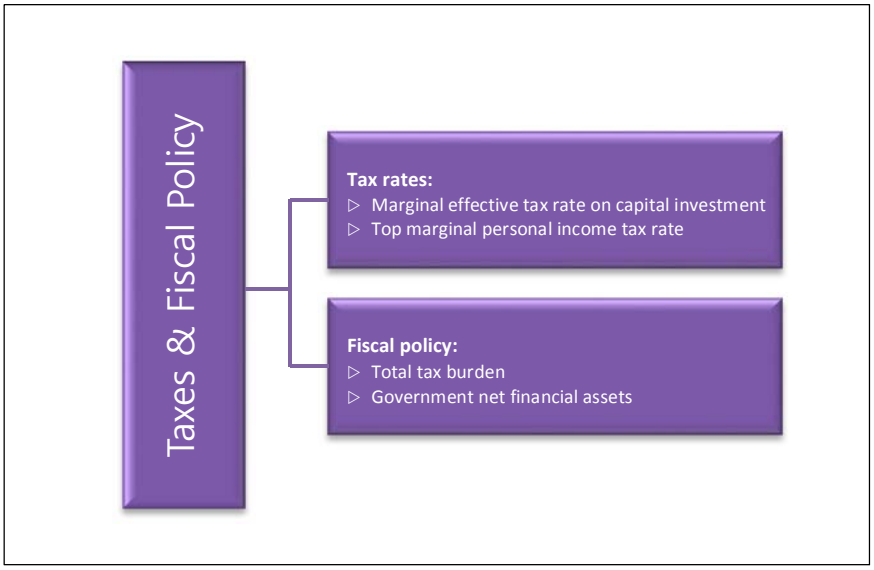
Developing a robust foundation does not ensure sustained prosperity; however, if the foundation is weak, achieving sustained prosperity becomes a far more challenging task.

Taxes and fiscal policy

How it is measured

High taxes can limit investment and wealth creation, and choices made through fiscal policies can result in situations where high taxes become unavoidable. Therefore, this report measures these two important topics together.

Taxes play a significant role in shaping day-to-day economic decisions of both business and individuals. From companies choosing to relocate to another jurisdiction due to an adverse tax structure, to an individual opening an RRSP or Tax Free Savings Account, tax policies affect decision making in profound ways.



As shown in the diagram above, this study uses two measures to compare taxes, looking at the marginal effective tax rate for businesses, and the top marginal income tax rate for individuals.

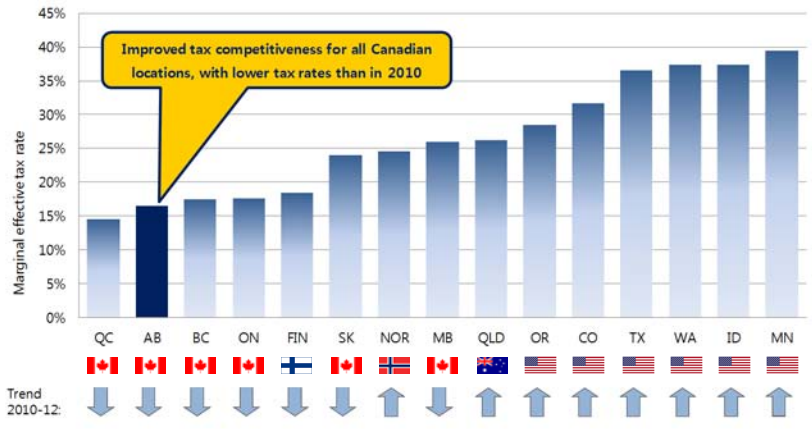
Fiscal policy can signal future economic stability, and future tax levels. To compare the fiscal policy of jurisdictions, this study looks at the current government tax burden (total tax revenue as a share of GDP), and the government's net savings or indebtedness (net financial assets).

How Alberta performs – taxes

Business taxes

- Competition for new business investments is fierce, and having a competitive tax environment can make a difference in a jurisdiction's ability to attract such investments.
- Business taxes are compared using the Marginal Effective Tax Rate (METR) on capital, a calculation that is inclusive of corporate income tax, gross receipts tax, capital tax, and sales tax. METR is calculated as the annualized value of the taxes paid by large and medium sized corporations on their profits and capital inputs, expressed as the share of these taxes in the pre-tax rate of return to capital.

Marginal effective tax rate on capital investment (2012)



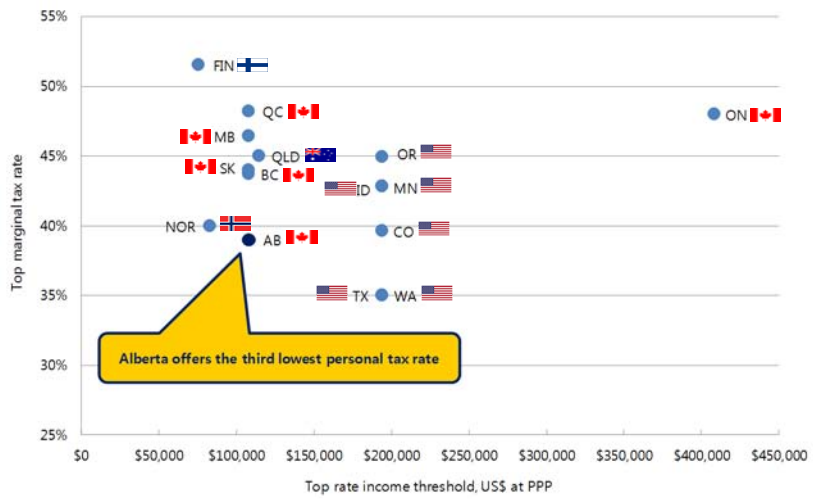
Source: *Marginal Effective Tax Rate on Capital Investment: Alberta in Comparison with 14 Other Jurisdictions in Canada and Abroad*, Duanjie Chen and Jack Mintz, University of Calgary School of Public Policy, 2012.

- Alberta scores strongly on this measure, with the second lowest METR among all jurisdictions, behind only Quebec. Quebec's lead is the result of a 5% investment tax credit offered for manufacturing and processing assets in that province.
- Alberta's low METR reflects its low corporate income tax rate, and the fact that it does not levy other taxes that impact business, such as capital, payroll, and sales taxes.
- Since 2010, all Canadian provinces have seen a reduction in METR. The federal corporate income tax rate reduction from 18% in 2010 to 15% in 2012 assisted all provinces, while provincial tax reductions in BC and Ontario (income tax), and in Manitoba and Quebec (capital taxes) further assist those jurisdictions.
- The distinction between Alberta and all US states is significant. Oregon, the highest-ranked US state, ranks 10th among the 15 jurisdictions, with a METR of 28.5%, as compared to Alberta at 16.5%. METR has increased in all US states in the last two years, with the expiry of "recovery" bonus depreciation entitlements a partial cause of the increase. METR has also increased in Norway and Queensland in the last two years, while decreasing in Finland.

Personal taxes

- Personal tax rates, and especially the top marginal rate paid by high income earners, are important because of the influence they have on the ability to attract top-notch management, engineering, and R&D personnel to live and work in a jurisdiction.
- The top marginal tax rate of 39% in Alberta ranks behind only those US states that do not impose personal income tax – Texas and Washington State – where the US federal rate of 35% represents the top marginal rate. However, those US states do have heavier tax burdens in other areas, including sales taxes, that compensate for the lack of personal income taxes.
- The top tax rate in Alberta is at least 4.7 percentage points lower than in the other Canadian provinces compared, and 9.22 percentage points lower than in Quebec. This advantage is largely due to Alberta's low single-rate personal income tax system (10%), as compared to the multi-rate systems used in other provinces that result in higher top marginal tax rates.
- Finland has the highest top marginal tax rate, at 51.5%. This rate gradually dropped from 55% in 2003 to 51% in 2010, but increased again to 51.5% in 2012. As well as having the highest tax rate, Finland also has the lowest income threshold above which the top marginal rate first takes effect.
- Both Ontario's tax rate and income threshold have increased in 2012 due to Ontario's introduction of a wealth surtax on very high income taxpayers.

Top marginal personal income tax rate (2012) and Corresponding income threshold (2012)



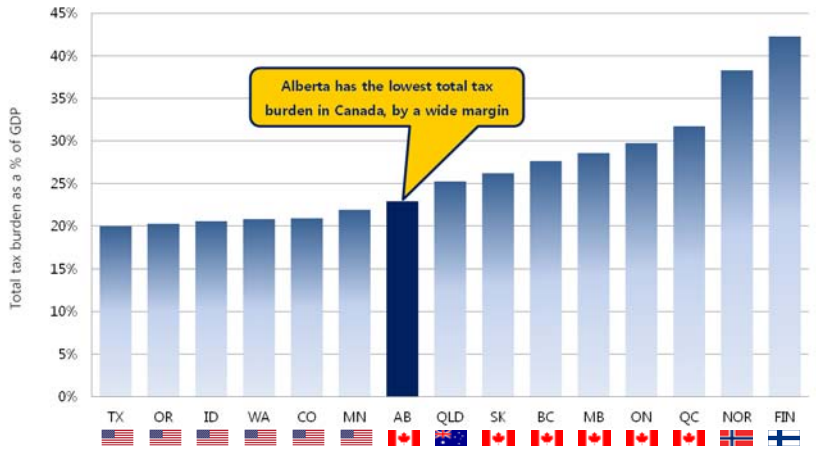
Notes: Income thresholds are converted to US$ at PPP exchange rates. US income thresholds represent thresholds for married persons filing separate returns. Thresholds are higher for single tax filers. In all countries, medical levies, social security, and similar additional specific-purpose levies are not included. Sources:; KPMG Canada, *Tax Facts*; US Tax Foundation, Federal and *State Tax Rates Tables;* PriceWaterhouseCoopers, *Worldwide Tax Summaries;* OECD PPP exchange rates.

How Alberta performs – fiscal policy

Current taxation revenue

- Taking a broader view of taxes within the context of overall fiscal policy, total tax burden looks at the cost of all taxes imposed by all levels of government, relative to GDP. This measure helps to compare jurisdictions, regardless of how they structure or label their various taxes.
- For this measure of total burden, including federal, provincial/state, and local taxes, Alberta ranks 7th among the 15 jurisdictions, down from 4th in 2010. While Alberta reduced its total tax burden from 23.5% of GDP in 2008 to 22.9% in 2010, all of US jurisdictions have seen their tax burdens decrease faster, resulting in Idaho, Washington State and Minnesota all moving ahead of Alberta in the rankings for this measure.

Total tax burden, percent of GDP (2010)



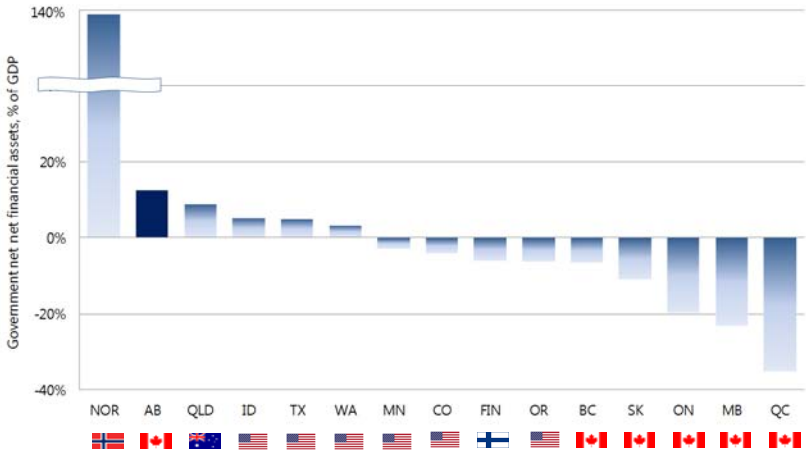
Notes: Calculation includes taxation at all levels of government: federal, provincial/state, and local for calendar year 2010. Where fiscal years don't align with the calendar year, tax revenues were apportioned equally by month. Federal tax collections are apportioned by province/state based on relative shares of total GDP. Tax burden includes all forms of taxes and social security contributions, but excludes resource royalties (or other special taxes on resource profits) and gambling revenues. Sources: Alberta Treasury Board & Finance calculations based on data from the Public Accounts of Canada; Provincial Public Accounts; CANSIM Table 384-0002; Régie des rentes du Québec, Annual Reports; Annual Report of the Canada Pension Plan; US Census Bureau, State Government Tax Collections and State and Local Government Finances; Bureau of Economic Analysis, Regional Economic Accounts; Internal Revenue Service Data Book; Statistics Finland, Tax and tax-like payments; Statistics Norway Statbank, Subject: 12 Public finances, Tables: 07486 and 07487; and Australian Bureau of Statistics Catalogue 5506.0 Tables 1 and 4, 5220.0 Table 1, and 5512.0 Table 333.

- This measure is a complex one to interpret, as decreases in some US states may not really reflect an improvement in competitiveness, but rather may reflect high unemployment rates, low tax collections, and governments struggling to maintain public services in the face of fiscal shortfalls and services cuts.
- Alberta performs very well among the Canadian provinces, all of which provide generally similar levels of public services, including universal public healthcare. While the US states all have lower total tax burdens than the Canadian provinces, they also provide a different level of services and US businesses face substantial additional expenses for private healthcare costs.
- Some tax burden studies only consider the senior levels of government, but the inclusion of local government is essential to a fair comparison, particularly when comparing Canadian and US jurisdictions. In Alberta, the municipal tax burden accounts for 1.6% of GDP (of a total of 22.9%), but in four of the six US states compared (CO, OR, TX, and WA) the municipal tax burden is at least 3% of GDP.

Government net savings or indebtedness

- "Net debt", or net financial assets (financial assets minus liabilities) represents the current balance of savings – positive or negative – for each jurisdiction.
- With net financial assets in the bank, governments have greater ability to weather short term fiscal storms, and to make strategic investments to enhance competitiveness.
- Alberta ranked second on this measure in 2008, with positive net financial assets, including the Alberta Heritage Savings Trust Fund, that are the result of both the province's significant natural resource endowment and its strict fiscal policy of avoiding debt financing.
- All jurisdictions place far behind Norway, which has accumulated public savings that exceed annual GDP. However, in the tax measures above, Norway consistently placed behind Alberta. This is indicative of a higher tax burden on current citizens which then allows the government to save a larger share of resource revenues for the future.
- Jurisdictions below the line have a " net debt" position – and Alberta is the only Canadian jurisdiction not in this situation. In addition, three of the six US states compared were in a net debt position as at 2008.
- It should be noted that these results reflect 2008 data which are now dated and are unchanged from the 2010 Alberta Report on Competitiveness. Statistics Canada has not yet released any new data for this measure, although new data are expected to become available for future editions of this benchmark analysis.

Government net financial assets, percent of GDP (2008)



Notes: Represents financial assets – liabilities. Pension plan assets are excluded, either based on accounting classification (Canada, Australia), or by exclusion of data (United States, Finland). All jurisdictions represent the consolidated position for the central government only (provincial, state, or national, as relevant), excluding local government. Data reporting for Norway between central government and social security funds shows the social security funds accounts at zero. It is unclear whether Norway's social security funds are co-merged with central government funds, whether the social security program is outside the government reporting entity, or whether central government accounts included unfunded social security liabilities, if any. This issue could work to diminish the lead shown for Norway in this chart, but regardless of this issue, Norway's financial asset position would be expected to far exceed all other jurisdictions. Sources: Statistics Canada Table 385-0014; U.S. Census Bureau *State Government Finances*; The Pew Center on the States, *The Trillion Dollar Gap: Underfunded State Retirement Systems and the Road to Reform*, February 2010; Australian Bureau of Statistics Publication 5512.0 Table 233; Statistics Norway, statistics subject 12-01: Government assets and liabilities, Table 2; Statistics Finland, General government financial accounts, Appendix table 1.

Regulation

How it is measured

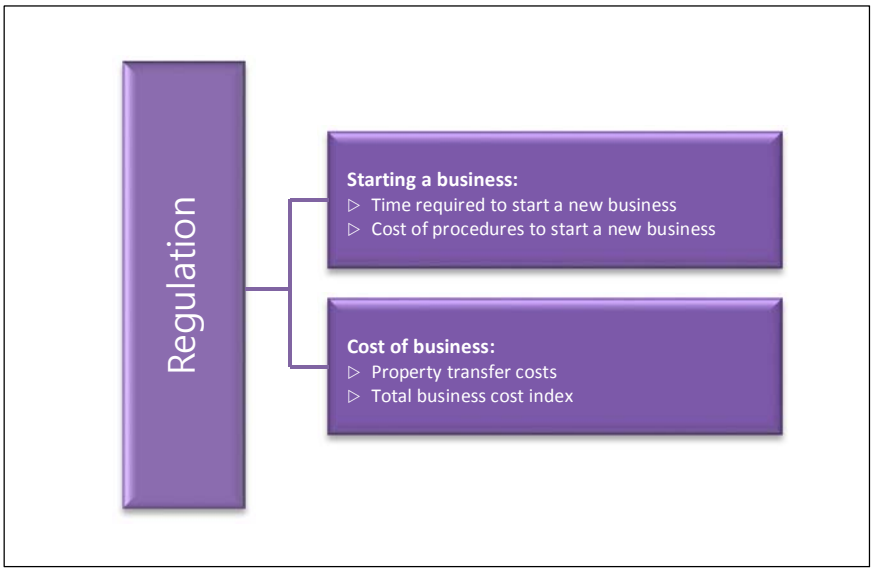
The regulatory environment cannot be measured as readily as other elements of competitiveness.

Good regulation is about more than just the number of regulations in a given jurisdiction. In fact, quality of regulations and the regulatory development process has become a major focus for both the Government of Alberta and international regulatory reform experts.

Based on specific initiatives under development by the Alberta Regulatory Review Secretariat, future editions of this benchmark report may be able to incorporate more comprehensive measures of the regulatory environment. In the interim, this report includes four measures that demonstrate specific elements of the impact and cost of regulation on business.

The time required to form a new company and the mandatory cost of required procedures to start a new enterprise represent two direct measures of how business regulations impact upon business start-up. These factors impact both major corporations that need to incorporate a new subsidiary or joint venture, or small entrepreneurs who are starting their own business.

Business regulations also impact the cost of doing business. This report assesses two business cost measures. The first is the cost of transferring a property, as transfer fees and taxes can have a significant impact on such a transaction. The second measure is more general, looking at the total cost of doing business in each jurisdiction.



How Alberta performs – starting a business

Time required to start a business

- Regulation, permitting, and licensing can all represent hindrances to the start-up of a new business entity – whether a small entrepreneur trying to get their own business up and running, or a large corporation that needs to move quickly to establish a new corporate entity.
- The World Bank *Doing Business* project compares the ease of starting a business in countries around the world, considering the time, cost, and procedures required to get a new company up and running. In that international comparison, in 2012 Canada ranks 3rd among 183 countries for the ease of starting a business.
- This report compares international results from the *Doing Business* report, to comparable results developed for each of the Canadian provinces, reflecting relevant provincial incorporation and municipal licensing requirements.

Time required to start a new business (2012)

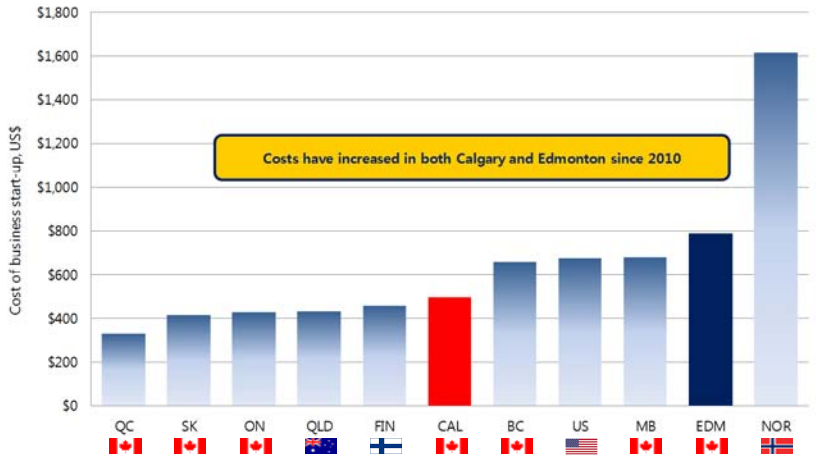
Notes: Results represent the elapsed time required to complete all incorporation, business licensing, building occupancy, tax registration, and/or workers' compensation registration requirements prior to commencing operations for a new general business office in an existing office building in the largest city in each jurisdiction. Results allow for ability for procedures to be completed concurrently. Results are not available for individual US states. Sources: Australia, Finland, Norway, and United States: World Bank, *Doing Business Report 2012*. Comparable results for Canadian locations were developed using the World Bank methodology and data from BizPal, provincial corporate registries, approved private registration service providers (where applicable), city development and licensing departments, Canada Revenue Agency, provincial tax agencies, and provincial workers' compensation agencies.

- The results of this analysis vary by city, due to local licensing and permitting requirements. While results for other jurisdictions reflect the single major business centre in each jurisdiction, within Alberta results are presented separately for Edmonton and Calgary.
- Based on the average of the time required to start a business in both Calgary and Edmonton, Alberta ranks 7th in 2012, as compared to 5th in 2010. Quebec and British Columbia have both streamlined their incorporation systems since 2010, causing British Columbia to move ahead of Alberta. Meanwhile, an apparent increase in the processing time for local permits of 3 days in Edmonton and 1 day in Calgary has caused Alberta's average timeline to drop behind that of Norway.
- These changes highlight the fact that regulatory processes such as this can be influenced by both structural process improvements and also changes in timing due to differing workloads at the relevant agencies.

Cost of starting a business

- When looking at the cost of starting a new business, the results for Calgary and Edmonton are reversed from those for the time required to start a business.
- Based on the average of the costs incurred to start a business in both Calgary and Edmonton, Alberta ranks 6th in 2012, an improvement over its 7th place ranking in 2010, even though the cost of starting a business has risen in both Calgary and Edmonton since 2010.
- The improved ranking for Alberta is due to the cost of starting a business having more than doubled in the US between 2010 and 2012, based on World Bank data which reflects New York City. Therefore, starting a business in the US now ranks as more expensive than the average of the two Alberta cities.
- Quebec, Ontario, Manitoba and Norway recorded decreases in incorporation costs between 2010 and 2012.
- This analysis only reflects the fees associated with required start-up procedures. The analysis does not include the value of time spent by company employees or professional advisors on the various procedures.

Cost of procedures to start a new business (US$, 2012)



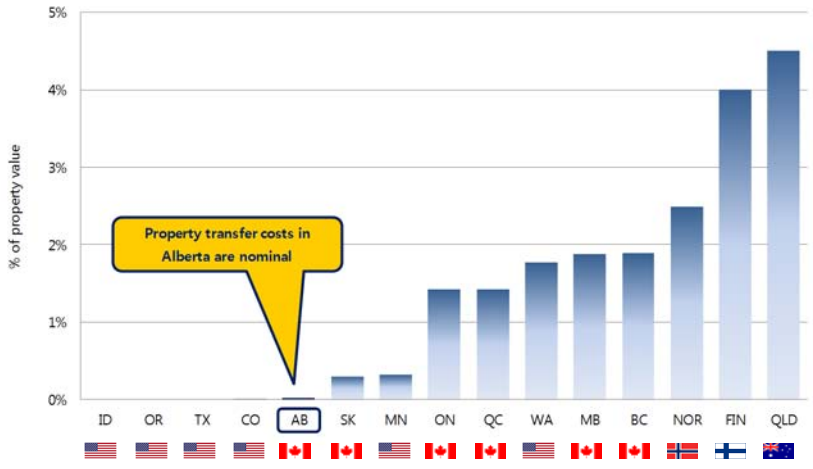
Notes: Results represent the cost of all required fees (including rush fees, where relevant) to complete incorporation, business licensing, building occupancy, tax registration, and/or workers' compensation registration requirements prior to commencing operations for a new general business office in an existing office building in the largest city in each jurisdiction. Results only include out-of-pocket costs, and do not include the cost of company employee time spent on each procedure. Results are not available for individual US states. Sources: Australia, Finland, Norway, and United States: World Bank, *Doing Business Report 2012*. Comparable results for Canadian locations were developed using the World Bank methodology and data from BizPal, provincial corporate registries, approved private registration service providers (where applicable), city development and licensing departments, Canada Revenue Agency, provincial tax agencies, and provincial workers' compensation agencies.

How Alberta performs – cost of business

Property transfer costs

- When purchasing real estate, either for personal use or for a business operation, property transfer fees and taxes can have a significant impact on the final cost of the transaction. These fees or taxes often end up being hidden – capitalized in the cost of the property rather than explicitly viewed as an additional expense.
- Based upon the cost of transferring a property valued at US$2 million, Alberta ranks 5th among 15 jurisdictions for regulatory costs associated with the transfer.
- Property transfer costs in Alberta represent just 0.02% of the property value. The only jurisdictions that rank ahead of Alberta on this measure are three US states where no material property transfer costs apply – Idaho, Oregon, and Texas; and also Colorado, where the transfer cost is just 0.01%.
- These five jurisdictions stand in contrast to all others compared. In Saskatchewan and Minnesota transfer rates are approximately 0.3% – 15 times higher than in Alberta. Transfer costs in all other jurisdictions exceed 1.4% of the property value, while transfer costs in Finland and Queensland exceed 4.0% of the property value – 200 times higher than in Alberta.
- Several jurisdictions have decreased their property transfer taxes since 2009, but these changes are marginal and have not altered the rankings of jurisdictions between 2009 and 2011.

Property transfer costs, percent of value on a US$2 million property (2011)

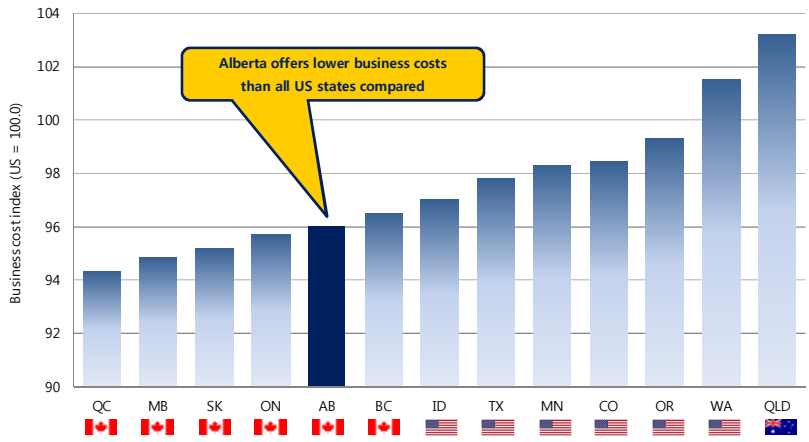


Notes: Includes all material transfer fees, taxes, and stamp duties. Sources: KPMG *Competitive Alternatives 2012*, World Bank *Doing Business 2012*.

Total business cost

- Offering a business climate in which businesses can operate with a reasonable level of business costs represents an important aspect of competitiveness.
- Business costs also implicitly reflect the results of many types of regulatory activity. From provincial regulation of labour standards, transportation, and utilities; to municipal land use policies; to tax rates and regulations at all levels of government; many forms of regulation ultimately end up impacting the overall cost of business in a jurisdiction.
- According to KPMG's international business location study, *Competitive Alternatives 2012,* business costs in Alberta are competitive with the United States. Alberta reports a business cost index of 96.0, representing business costs 4.0% below the United States baseline.

Total business cost index, United States = 100.0 (2012)



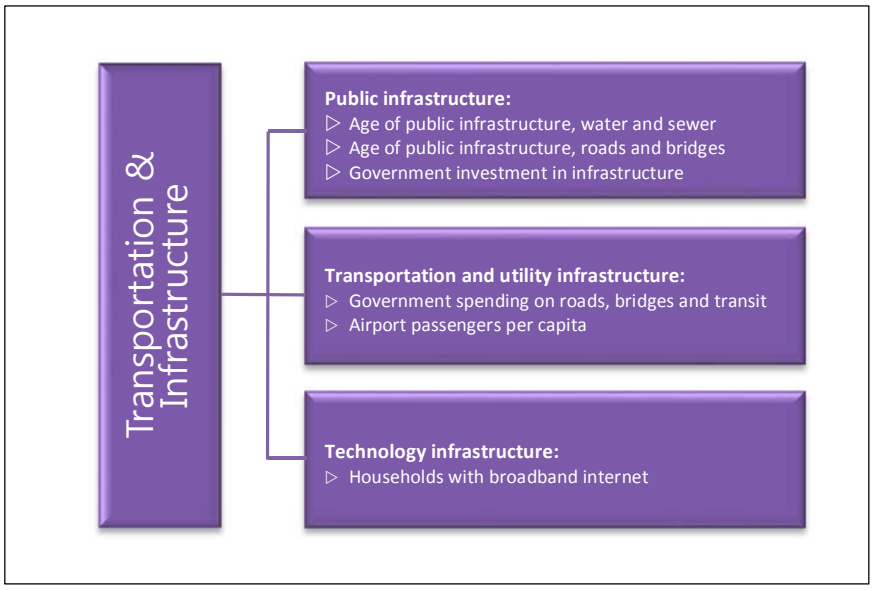
Notes: Business cost index expresses total business costs, including taxes, in percentage terms relative to the United States baseline of 100.0. The US baseline represents the average of business costs in the four largest US business centers: Chicago, Dallas, Los Angeles, and New York City. Results for each jurisdiction represent a single major metropolitan area, as follows: Manitoba, Winnipeg; Saskatchewan, Saskatoon; Quebec, Montreal; British Columbia, Vancouver; Alberta, Edmonton; Ontario; Toronto; Idaho, Boise; Queensland, Brisbane; Texas, Houston; Oregon, Portland; Minnesota, Minneapolis; Colorado, Denver; Washington State, Seattle. Data for Finland and Norway are not available. Source: KPMG, *Competitive Alternatives 2012.*

- For the US states compared, Idaho's business cost index is 97.0 (3.0% below the US baseline), while in Texas costs total 97.8 (2.2% below the baseline). Costs in each of the other four US states compared are within 1.7% of the US baseline.
- Within Canada, business costs in Alberta (Edmonton) are lower than British Columbia (Vancouver), but higher than in each of the other provinces compared. Quebec and Manitoba have the lowest business costs, with a business cost index of 94.3 for Quebec, and 94.8 for Manitoba. This result is due to Alberta's strong economy during the mid-2000's, which led to higher increases in business costs – especially labour, electricity, and facility costs – than seen in other provinces. These three cost factors have tended to be strongly cyclical in Alberta, rising rapidly in boom cycles due to labour shortages, high demand for electricity, and strong real estate markets, but then stabilizing or moderating during slower economic cycles.
- It is important to note that higher business costs particularly hurt competitiveness when they are not offset by higher levels of productivity. Alberta's higher business costs, coupled with its low rate of productivity growth, is thus a cause for concern.

Transportation and infrastructure

How it is measured

Infrastructure in an advanced economy can be measured in many dimensions, as summarized in the diagram, and described in the following paragraphs.



Public infrastructure represents the backbone of the province and its communities, and includes water and sewer pipes, wastewater treatment facilities, bridges, overpasses, public transit, highways, and roads. To measure the quality of such infrastructure, this report compares both the average age of infrastructure (by type of infrastructure), as well as new dollars invested by government.

Transportation and utility infrastructure represent a mix of public and private infrastructure. Roads, highways, and public transit infrastructure are generally publicly owned and are included in the measures of public infrastructure, listed above. Transport and utility infrastructure that are privately owned and operated (or possibly semi-publicly by Crown corporations) can include ports, airports, pipelines, electrical transmission lines and railways. This report includes two measures in this area, one examining total government spending (capital and operating) on roads, bridges, and public transit, and a second measure related to airports in each jurisdiction. This section also contains a more general review of other aspects of transportation and utility infrastructure.

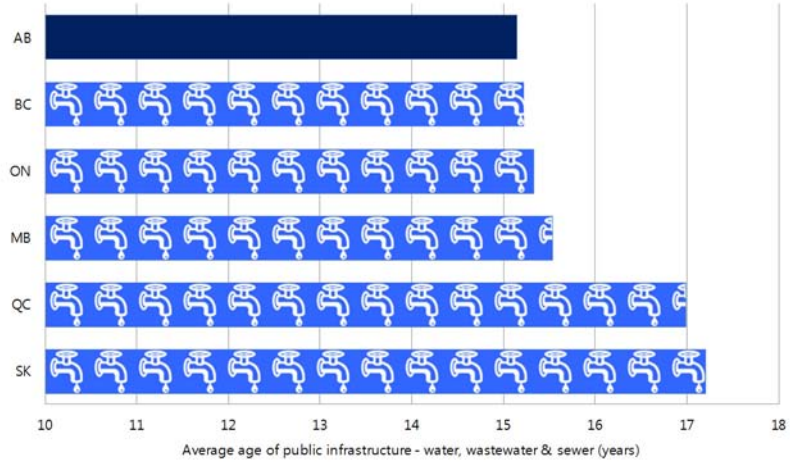
Technological infrastructure plays an important role in supporting the modern economy. This report measures the penetration of broadband internet in each jurisdiction.

How Alberta performs – public infrastructure

Age of public infrastructure

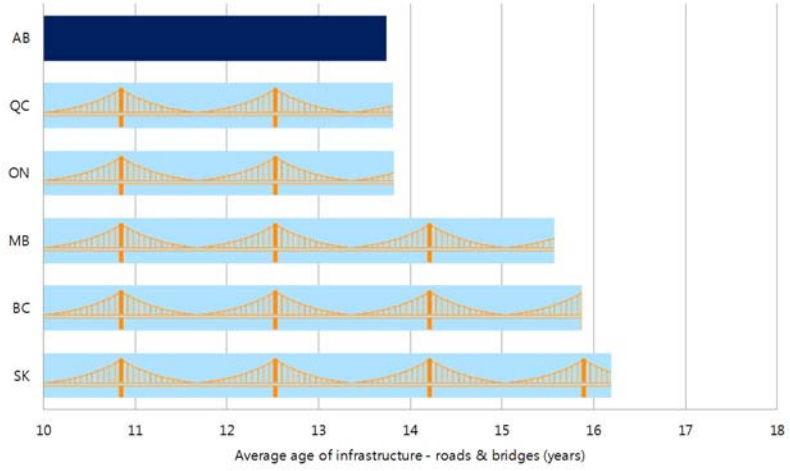
- Building and maintaining public infrastructure is a major role for all levels of government. Continual reinvestment in infrastructure to keep the stock of infrastructure relatively young is an important strategy for avoiding deferred maintenance issues.
- Comparable data on the age of infrastructure are only available within Canada, so these comparisons are restricted to the six Canadian provinces.
- Two major categories of public infrastructure are compared: sanitary infrastructure (water, wastewater and sewer) and transportation networks (roads, highways, and bridges).
- Sanitary infrastructure is crucial for public health and general well-being. At 15.1 years, Alberta leads all other Canadian provinces for the lowest average age of water, wastewater and sewer infrastructure.
- An efficient transportation network is crucial to the movement of both goods and people, thus supporting economic growth and productivity. Alberta leads all other provinces in terms of the average age of its roads and bridges, at 13.7 years. Quebec ranks second on this measure.

Age of public infrastructure, water, wastewater & sewer (2010)



Source: Statistics Canada custom tabulation: Average age of public infrastructure by province and type of infrastructure

Age of public infrastructure, roads and bridges (2010)



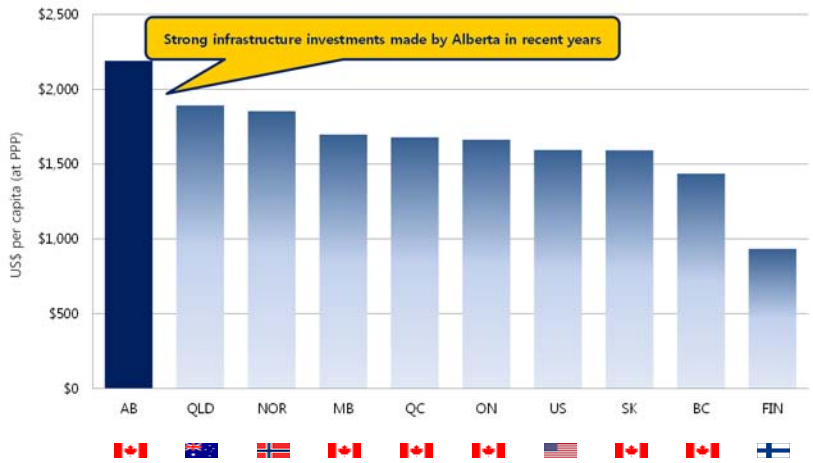
Source: Statistics Canada custom tabulation: Average age of public infrastructure by province and type of infrastructure

- Alberta's relatively young infrastructure stock is consistent with the rapid growth seen by the province in recent decades. Since 2000, the Government of Alberta has placed significant emphasis on upgrading the province's infrastructure as the demands of economic growth have required better, safer, and newer infrastructure. This investment will pay dividends in multiple ways, contributing to quality of life for individual Albertans, as well as facilitating business.
- While age of infrastructure is a key competitiveness measure, the functionality, condition, and adequacy of infrastructure in meeting the needs of the local economy are also important indicators of infrastructure competitiveness. Comparative measures for such indicators are currently not available across jurisdictions.

Government investment in infrastructure

- Government investment in infrastructure is essential to ensure that public infrastructure is suitably maintained and enhanced to meet the growing needs of the economy.
- Comparable data on new government infrastructure investments are available for all study locations, except for the six US states. National data for the United States are used in this comparison, reported per capita.
- Alberta ranks first among the 10 jurisdiction compared, well ahead of all other national and provincial jurisdictions. Per capita investment in Manitoba, the second-ranked Canadian province, is 23% less than in Alberta
- This high level of government investment in infrastructure correlates with the young age of Alberta's capital stock, as presented on the previous page.

Government investment in infrastructure, US$ per capita at PPP (2007-2011)



Notes: Data represents government gross fixed capital formation in infrastructure. Data unavailable for US states. Sources: Statistics Canada CANSIM Table 384-0002; Queensland Treasury, State Accounts, Table 11; Statistics Finland PX Web Stat Database, National Accounts, Gross Fixed Capital Formation of industries; Statistics Norway, statistics subject 09-01, Annual national accounts, Table 1.

How Alberta performs – transportation and utility infrastructure

Important aspects of transportation and utility infrastructure include ports, railways, pipelines, electrical transmission lines, roads and highways, public transit systems, and airports.

Ports and railways

- Alberta is served by Canada's two national railways operating over 6,900 km of main-line track within the province. Canadian Pacific Railway and Canadian National provide direct single line access for Alberta's goods to major market gateways on Canada's West and East coasts, the Midwest US and the US Gulf Coasts.
- Rail accounts for approximately 23% of Alberta's exports representing $23 billion, while 35% or $7 billion of imports were handled via rail.
- Railways are especially important for the movement of bulk commodity goods in the agricultural, forestry, mining, and chemicals industries. The transportation of petroleum on rail has increased significantly over the past 3 years and this trend is expected to continue as rail serves as a vehicle for crude oil market diversification. Comparisons of railway effectiveness and cost are specific to the commodity being moved, the origin, and the destination. Hence, measurement and analysis of railway issues need to be addressed on a sector-specific basis.
- Rail is the dominant mode of transportation for the shipment of resource products and containers off the west coast of Canada – where export volumes from Western Canada are forecast to double by 2020.

Utilities

- Natural gas and electricity infrastructure and utilities can have a significant impact on business cost competitiveness.
- As a major producer of natural gas in North America, Alberta has an abundant gas supply and very competitive natural gas rates for industry.
- Alberta's electricity system is owned and operated by a mix of investor and municipally owned companies. Alberta experienced a significant increase in electricity costs between 2003 and 2008 due to strong growth in demand. A rise in gas prices during that period also led to higher prices for electricity, as 40% of Alberta's electricity is derived from natural gas-fired generation. Since the fall of 2009, electricity prices in Alberta have moderated, to become more competitive with jurisdictions across Canada and the United States.

Pipelines

- Pipelines represent an important component of Alberta's infrastructure competitiveness. In 2011, Alberta's oil and gas exports – the vast majority of which are shipped by pipeline – totalled $63.4 billion and represented 68% of the total value of Alberta's exports.
- Between 2003 and 2010, industry invested close to $11 billion in pipeline projects in Alberta. Another $5 billion is expected to be invested in 2011 and 2012.
- Alberta needs increased oil and natural gas pipeline capacity to access new markets. Securing tidewater access is vital to diversifying markets and securing global prices for energy products.
- Over the next five years, Canadian Energy Pipeline Association (CEPA) members propose to spend more than $22 billion on pipeline projects. This would include expanding and extending existing networks and new pipeline infrastructure to access Asian, Gulf Coast and eastern Canadian oil markets. Several natural gas pipeline projects to the west coast are also under consideration.
- There are various pipeline projects before regulators, under construction and under active consideration to connect growing oil sands crude to markets: west to the British Columbia coast to access Asian and potentially California markets; south to the large United States Gulf Coast refining market; and east to Ontario, Quebec, New Brunswick, the U.S. northeast and Atlantic tidewater markets.
- Pipelines are generally the safest and most economical means of transporting crude oil, but can take many years to be certificated and built. In the short-term, crude oil transport by rail will increase due to the ability to add rail capacity relatively quickly as needed and utilizing existing rail infrastructure.
- The rapid development of shale gas supply in the eastern United States has negatively impacted traditional Western Canadian Sedimentary Basin (WCSB) markets in eastern Canada and the northeastern United States. This has significantly reduced flows on pipelines traditionally delivering western Canadian natural gas to these markets. Conversion of some TransCanada pipeline capacity from natural gas to oil service is being considered.
- New markets for WCSB natural gas will require the development of liquefied natural gas (LNG) facilities at Kitimat and Prince Rupert, British Columbia. The LNG will be transported by LNG carriers to Asian markets. New natural gas pipelines from the WCSB to the BC coast will be required to serve the LNG facilities. There could be significant LNG exports from Canada by late in the decade. In other jurisdictions, the existence of, and need for pipelines varies greatly among jurisdictions. Given this situation, no effective comparison measure exists for pipelines.

Roads, bridges and public transit

- Since 2003, Alberta has sharply increased investment in transportation infrastructure to reduce traffic congestion and improve trucking efficiency.
- Major road projects recently completed or under development include ring roads around Calgary and Edmonton, and twinning sections of Highway 63 to Fort McMurray.
- Public transit systems also help to facilitate the overall transportation network in major urban centres. By reducing private passenger vehicle trips, transit systems help to ease congestion and allow more road capacity for commercial vehicles.

Government spending on roads, bridges and transit, per capita (2009-2011)

Note: Includes total capital and operating expenditures by both provincial and local governments.

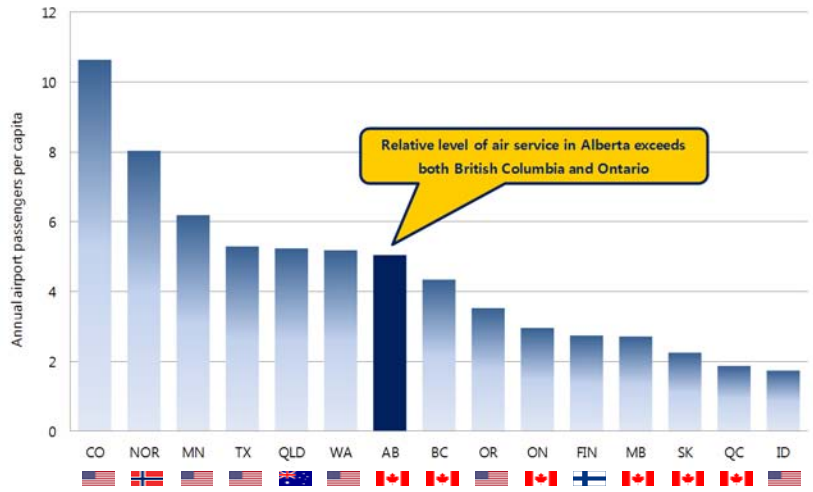
Source: Transport Canada, *Transportation in Canada 2011 Addendum*, Table G7

- The per-capita measure presented here examines total spending on roads, highways, bridges and public transit by governments – allowing for both provincial and local expenditures on capital and operations (including repairs and maintenance). This measure provides a more complete picture of government funding for road and transit networks than looking at infrastructure capital investments alone.
- Alberta's provincial and local governments spent an average of $832 per capita on roads, bridges and transit annually in the 2009-2011 period, just $7 per capita less than the leader, Quebec. Alberta's level of spending per capita was more than 35% higher than in Ontario.
- This high rate of total government spending on roads, bridges, and transit in Alberta includes the high level of capital expenditures on infrastructure noted previously, and correlates with the relatively young age of this type of infrastructure in Alberta.

Airports

- Airport infrastructure assets have become increasingly important in the era of globalized trade and higher international flows of skilled knowledge-economy workers. For many companies, airport proximity and services represent an important site selection consideration.
- Airports and air services for each jurisdiction are compared by measuring total annual passengers counts for airports with more than one million annual passengers. These passenger counts are then scaled per capita to indicate the range and frequency of air service available in each location, relative to population demand.
- Alberta ranks 7th among 15 jurisdictions on this measure, but with only a slim difference between Alberta and fourth-ranked Texas. Rankings for 2011 remain unchanged from 2009.
- Based on this relative measure of air services, Alberta ranks ahead of all Canadian provinces, including Ontario and British Columbia – home to Canada's two major international gateway airports. Calgary's position as a major hub for WestJet helps boost both Alberta's air service options and its ranking on this measure.
- Colorado holds a large lead on this measure because of Denver International Airport's role as a major national and international hub for United Airlines. Similarly, Norway represents a major hub for air travel within the Scandinavian countries.

Airport passengers per capita (2011)

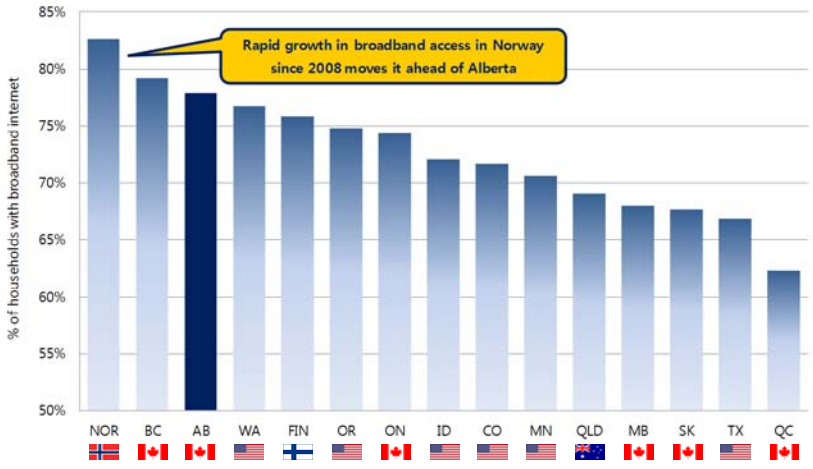


Notes: Passengers per capita represent total annual airport passenger counts for each airport recording more than one million passengers per year in each jurisdiction, divided by the population of the jurisdiction. Sources: Passenger counts: Airports Council International North America, Brisbane Airport, Cairns Airport, Finavia, Avinor. Population estimates by state/province/country: national statistical agencies.

How Alberta performs – technology infrastructure

- Technology infrastructure plays an increasingly important role in the modern economy. While there are many important aspects of technological infrastructure, a widely distributed, high quality, broadband internet service has become essential to meeting the data needs of the modern economy.
- This report compares the penetration of broadband internet into households in each jurisdiction, including both wired and wireless high speed data connections.
- Household uptake of these services is broadly reflective of the quality and affordability of such services – both factors that also benefit businesses and reflect the relative stage of advancement of ICT infrastructure in each jurisdiction. This measure also reflects how ingrained use of the internet and ICT has become in everyday life – in other words, how "tech savvy" the population is.
- Alberta ranks 3rd among 15 jurisdictions for broadband internet access by households, behind only Norway and British Columbia.
- Broadband internet penetration jumped significantly in Norway between 2008 and 2010, with broadband access increasing from 73.0% to 82.6% of all households in just two years – moving Norway ahead of both Alberta and British Columbia. Over the same period, the corresponding increase in Alberta was more modest, from 76.0% to 77.9% of households.

Households with broadband internet access, percent of total (2010)



Sources: Statistics Canada, *Survey of Household Spending;* US National Telecommunications and Information Administration, *Current Population Survey Internet Use*, Table 6; OECD ICT database; Australian Bureau of Statistics Catalogue 8146.0, Table 2.

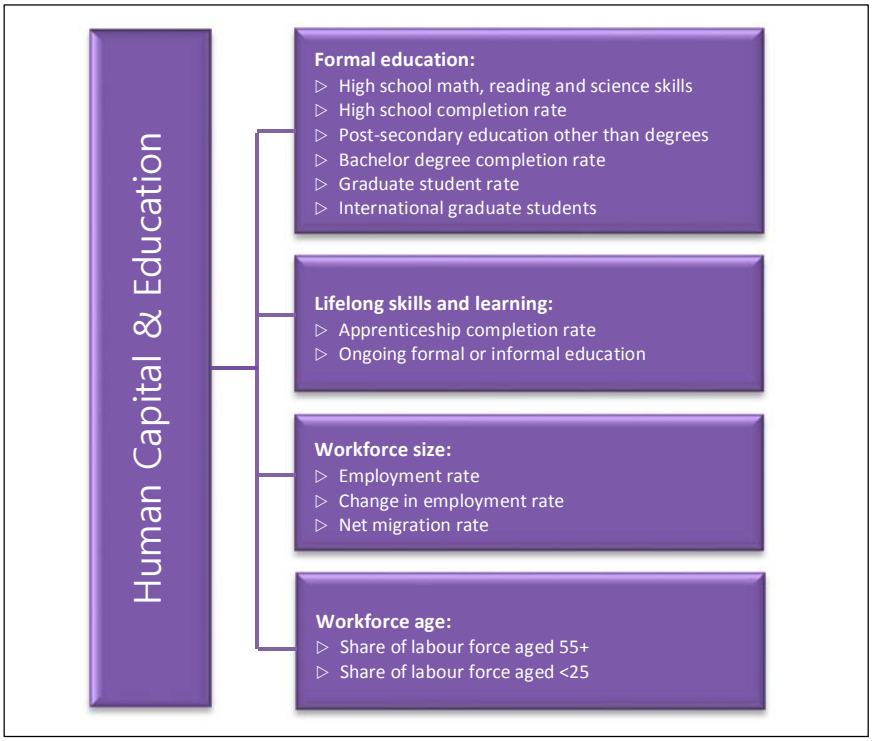
Human capital and education

Human capital and education encompasses the collective value of the knowledge, skills, and competencies of Albertans. Ensuring that there is a sufficient quantity of workers with the skills required in the economy is fundamental to increasing productivity and innovation.

Human capital and education are intrinsically linked with innovation. In this report, this Human Capital and Education component of the Foundation deals with education and workforce development, while the Innovation level of the Competitiveness Pyramid focuses on the innovative outcomes from a highly educated and highly skilled workforce.

How it is measured

The education and development of human capital – the people who live and work in the economy – represents a complex, but important, topic for every economy.



This report compares a total of 13 measures related to human capital and education, as illustrated in the diagram. These 13 measures cover four important themes – formal education, lifelong skills and learning, workforce size, and the age profile of the workforce.

Formal education is the stage where core skills and knowledge are developed in the population, and thus in the workforce. The quality of education is measured at the high school level using an international assessment of key math, reading, and science skills among high school students, and at the university level by comparing the numbers of international students attracted to study as graduate students at local universities. Levels of education are measured by comparing the relative rates for completion of high school, completion of post-secondary education other than bachelor degrees, completion of bachelor degrees (or higher), and the rate of students undertaking graduate studies.

While formal education establishes core skills and knowledge, workplace skills development and lifelong learning are also important to building and maintaining human capital. These lifelong skills and learning are measured based on apprenticeship completion rates and adult participation in ongoing education.

In addition to education, the size of the workforce is another important aspect of human capital. In this regard, this report measures the employment rate, recent changes in the employment rate, and net migration to the province.

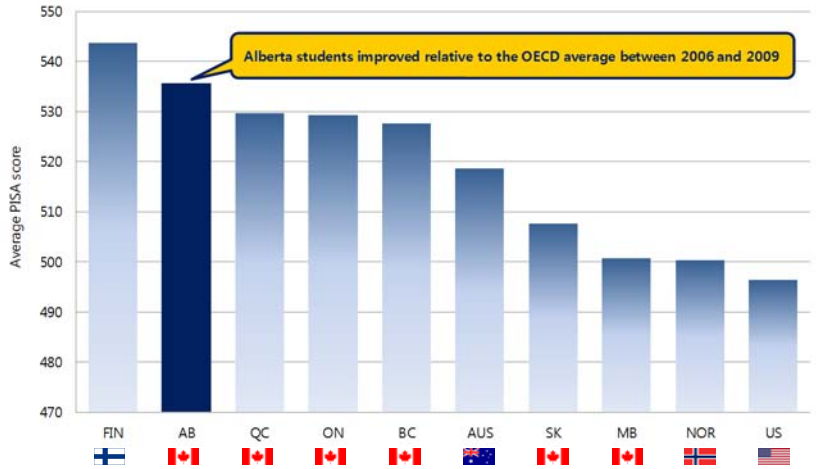
The final theme in this section is workforce age, an important issue in all advanced economies. To measure workforce age dynamics, this report compares the share of workers aged 55+ in the labour force, and the share of workers aged under 25.

How Alberta performs – education

High school skills

- The Program for International Student Assessment (PISA) is a worldwide evaluation of scholastic performance among 15 year old students. PISA assesses scholastic achievement in three key areas: mathematics, reading, and science. Standardized international PISA testing first took place in 2000, and is repeated every three years.
- This program is coordinated by the OECD, with a view to improving educational policies and outcomes. The OECD publishes PISA test results on a national basis, and on a regional basis in a number of countries, including Canada.
- Consistent with its 2006 results, Alberta ranked 2nd among 10 jurisdictions in the 2009 PISA test results. Alberta students ranked 2nd for both reading and science skills (behind Finland), and 3rd for math skills (behind Quebec and Finland).
- This high score for Alberta reflects favourably on the future workforce of the province, with highly skilled students moving out of the high school system and into university, college, and/or the workforce.
- Alberta 2009 PISA score is 7.9% above the OECD average, up from 7.6% above the OECD average in 2006.

High school math, reading and science skills, test scores among 15 year olds (2009)

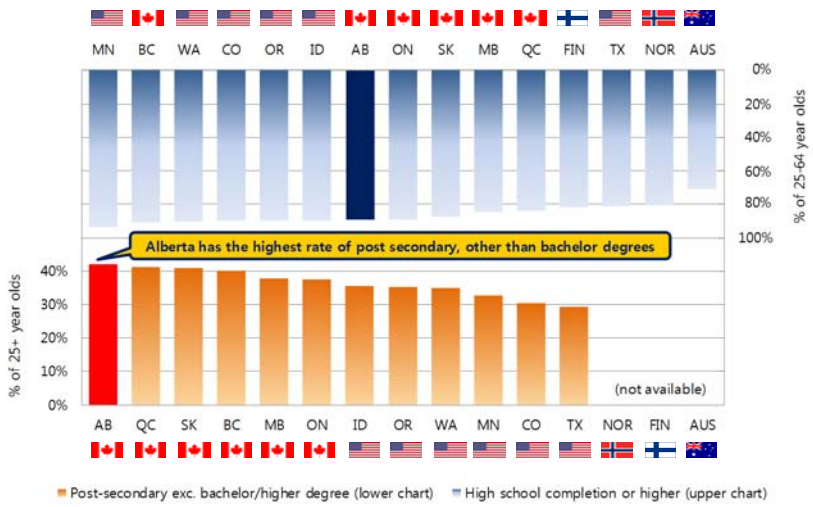


Notes: Results are not available for individual US states. Reading scores were not reported for the United States in 2006, so the US result represents the average of scores for mathematics and science only. This variation is not expected to influence results and most countries show similar scores for all three skill areas (variations of less than 20 points on a scale where the OECD average score equals 500 points). Sources: OECD Program for International Student Assessment.

Education attainment

- Completion of formal education – high school and/or post-secondary – is a core objective of the education system.
- Comparing jurisdictions based on their high school completion rates (upper half of the chart), Alberta ranks 7th – behind five of the six US states but ahead of all Canadian provinces except BC.
- The high school completion rate in Alberta in 2009 was 89.3%, up slightly from 88.6% in 2008. Alberta's current 7th place ranking is an improvement compared with its previous 8th rank, with Alberta's high school completion rate having surpassed that of Ontario.
- Resource sector job opportunities are often cited as a cause of young Albertans leaving school early without finishing high schoool. However, Alberta's rate of high school completion exceeds those of Saskatchewan, Manitoba, and Quebec.

High school completion rate (2009) and Post-secondary education other than bachelor/higher degrees (2010)



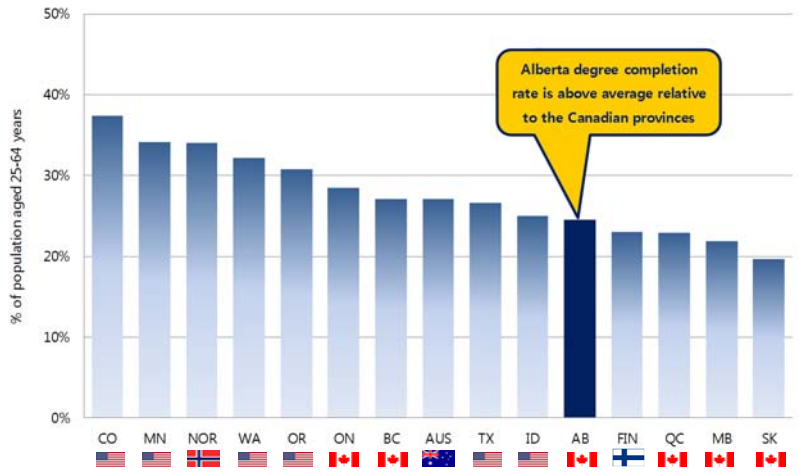
Notes: High school completion is measured as a percentage of the population aged 25-64 years, while post-secondary education is measured as a percentage of the population aged 25+ years. Post-secondary education other than bachelor/higher degrees includes all forms of post-secondary education from completion of some training, through to completion of certificates, diplomas and associate degrees. Comparable data are not available for Australia, Finland, and Norway. Sources: Statistics Canada, CANSIM Table 282-004; US Census Bureau, *American Community Survey, 1- Year Estimates;* OECD, *Education at a Glance 2011*, Table A1.2.

- The next step up the education ladder from high school is post-secondary education. To broadly capture a measure of individuals who have upgraded their skills and knowledge beyond the high school level, but not to the level of university completion, the lower half of the chart compares those individuals who have completed anything from "some post-secondary coursework" through to completion of vocational certificates, diplomas, and associate degrees.
- Alberta leads among the 12 US and Canadian jurisdictions that can be compared for this measure. While this measure encompasses many different forms of education and training, the positive result generally reflects the strength of Alberta's workforce in terms of technical and vocational education.

Education attainment (continued)

- The final level of education attainment measured here is the completion of a bachelor degree (sometimes referred to as the "university completion rate"). This measure captures all individuals who have completed a bachelor degree, including those who continued on to masters and/or doctoral degrees.
- Alberta ranks 11th among the 15 locations compared (unchanged from 2008), but ranks 3rd among the six Canadian provinces, with a degree completion rate above the Canadian average.
- Many jurisdictions are seeing rapid upgrades in the education levels of their workforce. In 2009, both British Columbia and Australia overtook Texas on this measure, with both jurisdictions seeing an increase of about 1% in their bachelor degree completion rate. These two jurisdictions both moved from having 22% of 25-64 year olds holding bachelor degrees in 2004 to 27% in 2009 – a rapid increase considering that the 25-64 age group comprises the vast majority of the adult population (all 25-64 year olds). Alberta comes close to matching this increase, with its bachelor degree completion rate having risen from 20.1% in 2004 to 24.5% in 2009.
- Considering educational attainment overall, Alberta fares relatively well within the Canadian context, and particularly well for non-degree post-secondary education. However, Alberta does lag the comparator US states for both high school and bachelor degree completion.

Bachelor degree completion rate (2009)

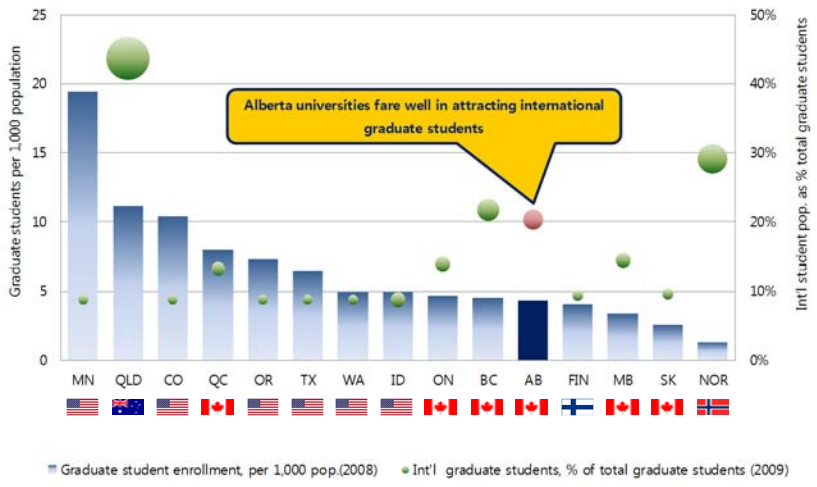


Notes: Bachelor degree completion includes all individuals who have ever completed a bachelor degree, including those who continued on to masters and/or doctoral degrees. Sources: Statistics Canada, CANSIM Table 282-004; US Census Bureau, *American Community Survey, 1- Year Estimates;* OECD, *Education at a Glance 2011*, Table A1.3.

Graduate studies

- Holders of advanced degrees are a key indicator of competitiveness in modern, knowledge-based economies, with individuals developing their knowledge, work skills, and critical thinking skills beyond the foundational level provided by an undergraduate education.
- Graduate students represent a benefit to economic competitiveness in two ways. During their studies, they are engaged in cutting edge research to develop new knowledge and to apply new knowledge in innovative ways. Upon completion of their degrees, they graduate with advanced degrees and knowledge desired by employers both in industry and the public sector. Therefore, the number of graduate students in a jurisdiction reflects the future pipeline of highly skilled people.

Graduate student rate (2008) and International graduate students, percent of graduate students (2009)



Sources: Statistics Canada CANSIM Table 477-0019; US Department of Education, National Center for Education Statistics, *Integrated Postsecondary Education Data System (IPEDS)*, Table 224; Eurostat Table educ_enrl1tl; Australian Department of Education, Employment and Workplace Relations, *Selected Higher Education Statistics Publication, Full Year Data*, Table 5.

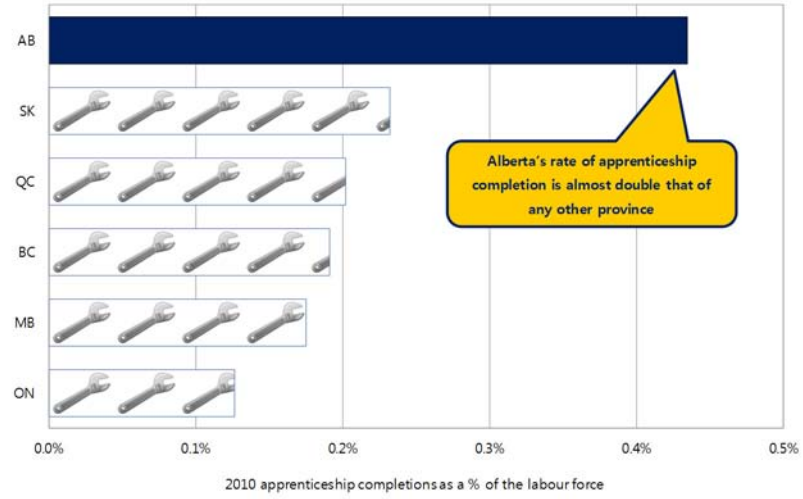
- Alberta ranks 11th among the 15 jurisdictions for the number of graduate students enrolled in its universities in 2008, measured per 1,000 population. This ranking is consistent with Alberta's bachelor degree completion rate.
- The ability to attract international graduate students reflects on the quality of universities in a jurisdiction, as international graduate students are motivated to seek out high quality schools for their studies. The presence of international students also adds to the diversity of thought and approach seen in graduate schools and, to the extent that some international students stay on as residents after graduation, helps build global economic linkages.
- In this regard, Alberta universities are very successful, with Alberta ranking 4th among 15 jurisdictions for the share of international students among all graduate students. In 2009, one in five graduate students studying in Alberta was an international student. While this places Alberta narrowly behind British Columbia and well behind Queensland and Norway on this measure, this rate of international enrollment in graduate studies in Alberta is more than double the rates seen at universities in the six US states, Finland and Saskatchewan.

How Alberta performs – lifelong skills and learning

Apprenticeship completion rate

- For a competitive economy, the ability of workers to take theoretical knowledge and apply it on the job is vital. Apprenticeship programs link education to direct job skills, and on this measure Alberta rates particularly well.
- Measured as a percentage of the workforce, Alberta's rate of apprenticeship completion in 2010 was almost double that of second-ranked Saskatchewan, and more than three times the apprenticeship completion rate in Ontario – a province that historically would have been expected to generate high numbers of apprenticeships given the significance of the skilled manufacturing sector.
- Alberta's significant resource sectors provide a strong incentive to follow a trades career path out of school, making this strength in Alberta's technical workforce development especially important. The high rate of apprenticeship completions in Alberta indicates the responsiveness of training opportunities to the needs of the provincial economy.

Apprenticeship completion rate, percent of labour force (2010)

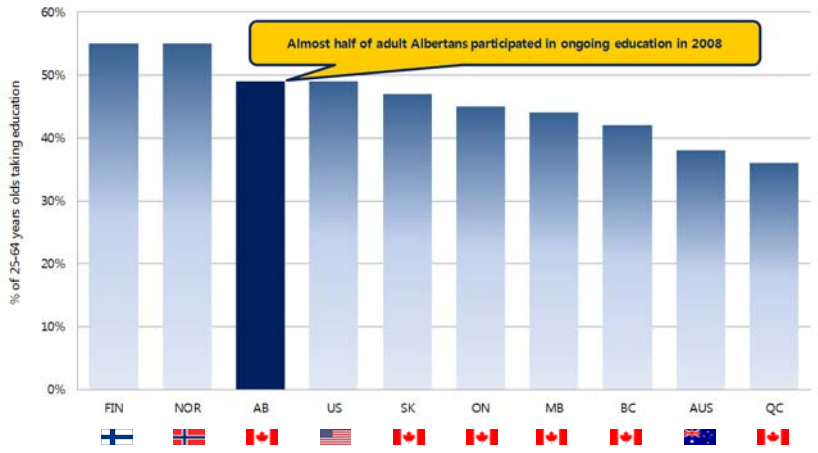


Sources: Statistics Canada CANSIM Tables 477-0054 (apprenticeship completions) and 282-0002 (labour force).

Lifelong learning

- In today's knowledge-driven global economy, lifelong learning has become a factor of critical importance, both for economic competitiveness and personal career development.
- Lifelong learning can take place either through formal education, such as adults returning to university to earn a higher degree, informally in the workplace, or through knowledge sharing in business networks.
- Alberta's rate of participation in lifelong learning activities in 2008, at 49%, matched the US average and exceeded every other Canadian province. Results for the other Canadian provinces range from 47% in Saskatchewan to 36% in Quebec.
- Finland and Norway exhibited a stronger commitment to lifelong learning, with both countries reporting 55% of 25-64 year olds participating in some form of ongoing education in 2007.
- Australia ranks relatively poorly on this measure, with only 38% of adults participating in ongoing education.
- It should be noted that these results reflect dated 2008 data and are unchanged from the 2010 *Alberta Report on Competitiveness*. Statistics Canada and the OECD have not yet released new data for this measure, although new data are expected to become available for future editions of this benchmark analysis.

Ongoing formal or informal education among 25-64 years olds (2007-08)



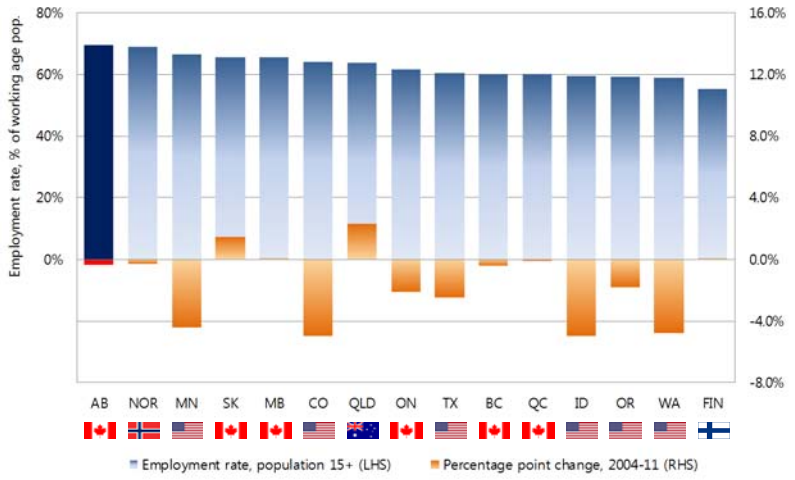
Notes: Data for Canadian provinces are 2008, all other jurisdictions are 2007. Data for Queensland represents the Australian average. Data not available for individual US states. Sources: OECD, *Education at a Glance 2010*, Indicator A5, Table A5.1b; Statistics Canada, *Education Indicators in Canada, An International Perspective, 2010*, Catalogue no. 81-604-X Table: C.3.1.

How Alberta performs – workforce size

Employment rate

- The employment rate is a key measure of workforce dynamic, reflecting the percentage of the adult population that is actively employed. While the employment rate is influenced by short term unemployment rates, in the long term employment rates are reflective of labour force vibrancy – assessing whether adults are motivated to be part of the workforce and be actively employed. A strong employment rate also acts as a magnet to help attract talent from other jurisdictions.
- For this analysis, the employment rate has been measured based on total employment as a percentage of the population aged 15+ (16+ in the US). This measure also includes seniors (65+), recognizing that employment among this group is likely to become increasingly significant in the future.

Employment rate (2011) and Change in employment rate (2004-2011)



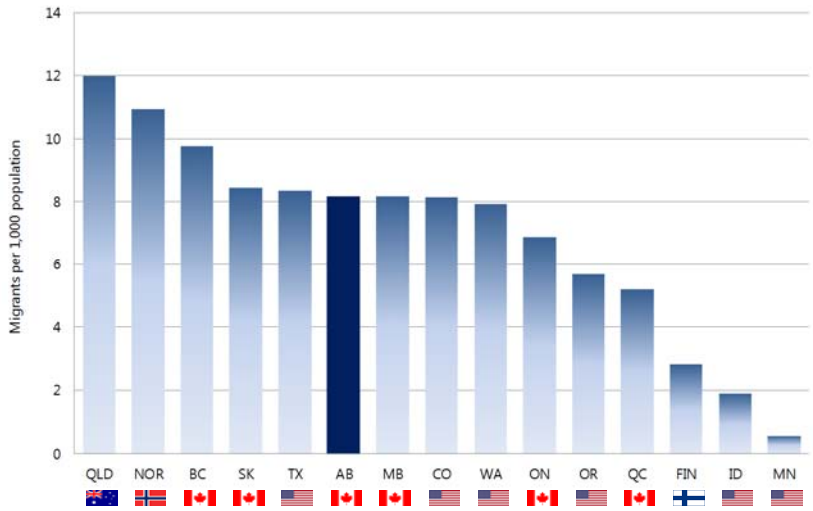
Notes: Employment rate for US states is measured as a percentage of the population aged 16+, as compared to 15+ in all other jurisdictions. This has a marginal positive effect on US numbers, due to the low percentage of 15 year olds who are working in all other countries. Sources: Statistics Canada, Labour force survey estimates, Table 282-0002; Bureau of Labour Statistics, Annual average state-wide data, Employment status of the civilian non-institutional population in states; Eurostat, Employment rates by age; Australian Bureau of Statistics, Publication 6202.0 Labour Force Australia, Table 12.

- In 2011, Alberta ranked 1st among the 15 jurisdictions for its employment rate, with 69.7% of the population aged 15+ actively employed – reflecting Alberta's long tradition of representing a hard-working society. A dip in Norway's employment rate, from 70.4% in 2009 to 69.0% in 2011, has resulted in Alberta moving up from 2nd place in the prior edition of this report.
- Over the longer term, the employment rate has remained relatively stable in Alberta between 2004 and 2011, decreasing by just 0.3 percentage points. In comparison, Minnesota, Washington State, Colorado, and Idaho have seen decreases in their employment rates since 2004 of between 4.4% and 5.0%.
- Only two jurisdictions have seen any significant increase in their long term employment rates – Queensland and Saskatchewan. Alberta is one of six jurisdictions where the employment rate has changed by less than 0.5% since 2004.
- Alberta's stable employment rate is partially explained by Alberta's high rate of employment, as it becomes much harder to generate any increases in employment as natural limits on labour participation are reached. Alberta's high employment rate illustrates the importance of Alberta not relying on more people working more hours to sustain future prosperity, but instead working to improve labour productivity.

Net migration

- Because of Canada's low natural population growth, the ability to attract and retain immigrants, along with the ability to increase labour force productivity, are of key importance for competitiveness and future sustained prosperity.
- This measure compares net migration for each jurisdiction (immigration net of emigration). It presents international migration for Finland and Norway, and international plus domestic migration for the states and provinces in Australia, Canada, and the US. (International labour mobility within Europe provides Finland and Norway with the equivalent to domestic migration within Canadian, Australian, and US states and provinces.)
- Alberta ranks 6th among the 15 jurisdictions for its rate of net migration over the last three years – attracting 8.19 net migrants per 1,000 population. Within the same three year time period, Queensland attracted 50% more migrants than Alberta, at 12 net migrants per 1,000 population. British Columbia attracted 9.75 net migrants per 1,000 population.
- Decreases in migration for all US states resulted in an improvement in Alberta's ranking for this measure – moving up to 6th place from 10th in the previous study. This improved ranking saw Alberta move ahead of Colorado, Washington State, Oregon, and Idaho.

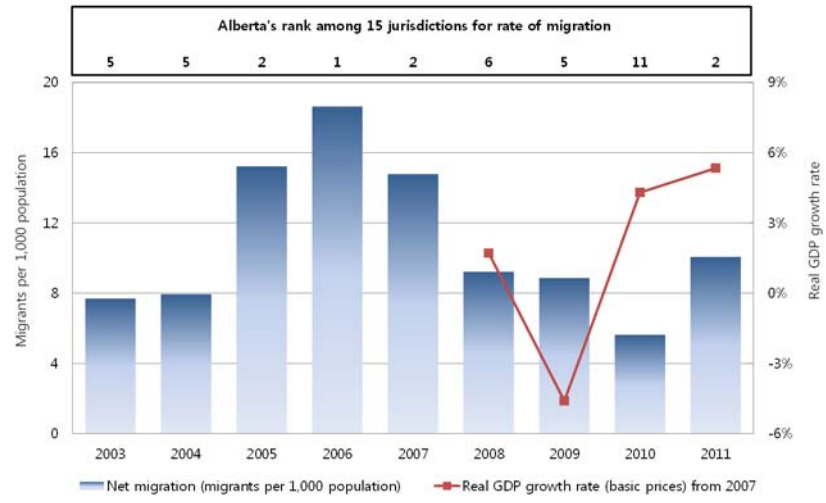
Net migration rate, per 1,000 population (2009-11)



Sources for migration statistics: Statistics Canada, CANSIM Table 051-0004; US Census Bureau, Population Division, Table 5. *Estimates of the Components of Resident Population Change for the United States, Regions, States, and Puerto Rico*; Statistics Norway StatBank, Subject: 02 Population, Table: 05426; Statistics Finland PX Web Databases, Population, Migration, *Immigration and emigration by age, gender and area;* Australian Bureau of Statistics, Catalogue 3101.0 Table 2, as reported by Queensland Office of Economic and Statistical Research. Population: National statistical agencies.

- For US jurisdictions, domestic migration generally represents the primary source of migrants, whereas for all Canadian jurisdictions, international migrants significantly outnumber domestic migrants.
- Alberta's rate of net migration is highly responsive to the provincial and national economic situation. As the chart demonstrates, there has been a direct correlation between Alberta's rate of economic growth and its rate of net migration in recent years. When the provincial economy was booming in 2005-2007, Alberta had the top or second highest rate of net migration among the 15 jurisdictions. Alberta's ranking dropped as low as 11th in 2010, a year after the 2009 recession, before returning to 2nd place in 2011 as Alberta's economy rebounded well from the recession and faster economic growth in 2010 encouraged immigration through demand for additional labour.

Trend in Alberta's net migration (2004 to 2011)



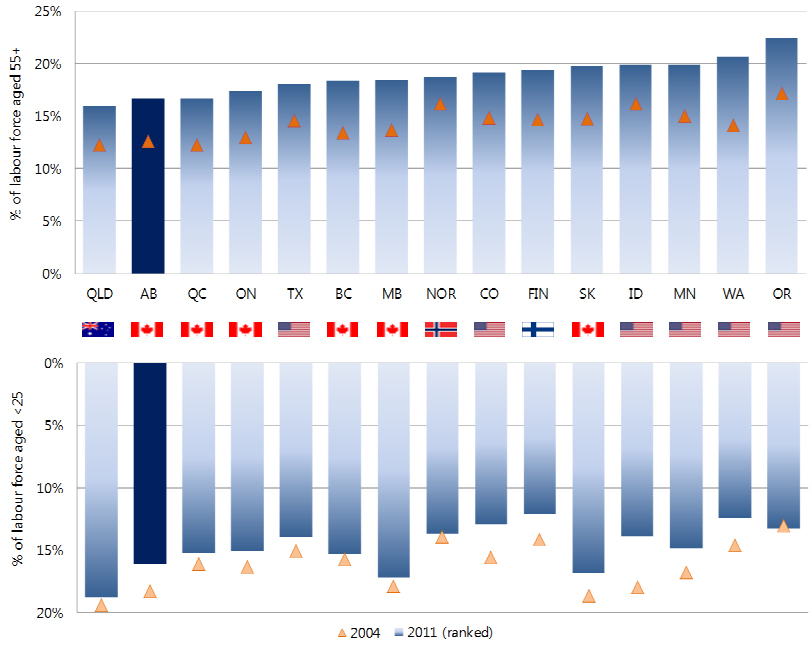
Sources: Statistics Canada, CANSIM Tables 051-0004 (migration) and 379-0030 (real GDP). GDP data prior to 2007 not comparable.

- Although immigration flows are working in Alberta's favour, increased numbers of immigrants may not meet labour demands unless these immigrants possess the required skills and land in Alberta at the right time. In addition, demographic trends in all developed countries are likely to significantly increase global competition for skilled labour.
- While international immigration is an important source of workforce growth for Alberta, interprovincial migrations are also a significant factor. Interprovincial migration into Alberta peaked during 2006 with a net gain of 45,795 residents, followed by a dramatic decline with Alberta experiencing a some instances of net interprovincial outflow. The number of net interprovincial migrants has recovered in 2011 to 13,660; however, a future rebound in Alberta's economy may not necessarily correspond with a rebound in net interprovincial migration if economic conditions also improve in other provinces.
- The data presented here on immigration flows only includes new permanent residents in each jurisdiction. In addition to migration of permanent residents, Alberta also makes significant use of temporary foreign workers to help balance shortages of both general labour and specific skills.
- In 2011, 25,568 temporary foreign workers were destined to Alberta, representing 13% of the national total. Among the foreign workers arriving in Alberta in 2011, the top 20 occupational groups included food service counter attendants and food preparers; professional occupations in business services to management; babysitters, nannies and parent's helpers; general farm workers; truck drivers; mechanical engineers; university professors; construction managers; and civil engineers – reflecting the diversity of needs that this program can fill.

How Alberta performs – workforce age

- To assess the issue of workforce demographics, this analysis compares the relative share of the workforce in 2004 and 2011 for two key sections of the labour force – older workers and younger workers.
- Workers aged 55+ represent those employees who are approaching the end of their careers.. As shown in the upper portion of this chart, Alberta had the second *lowest* share of workers aged 55+ in 2011, with 16.7% of its workforce in this age group. In this regard Alberta ranks behind only Queensland.
- While the share of older workers in Alberta increased from 12.6% of the workforce in 2004 to 16.7% in 2011, all other jurisdictions also saw their relative share of older workers rise over that time period. Alberta had the fifth slowest rate of increase, at 4.1 percentage points between 2004 and 2011, as compared to the 6.5 point increase in Washington State, which saw the largest growth in older workers during this period.
- Workers aged under 25 represent those employees starting out in their careers. In 2011, Alberta had the fourth *highest* share of workers aged <25 among the 15 jurisdictions, with 16.1% of its workforce aged under 25 – ranking behind only Queensland, Manitoba and Saskatchewan.
- Between 2004 and 2011, all locations saw the relative share of younger workers in the workforce decline, except Oregon where the share of younger workers increased marginally.

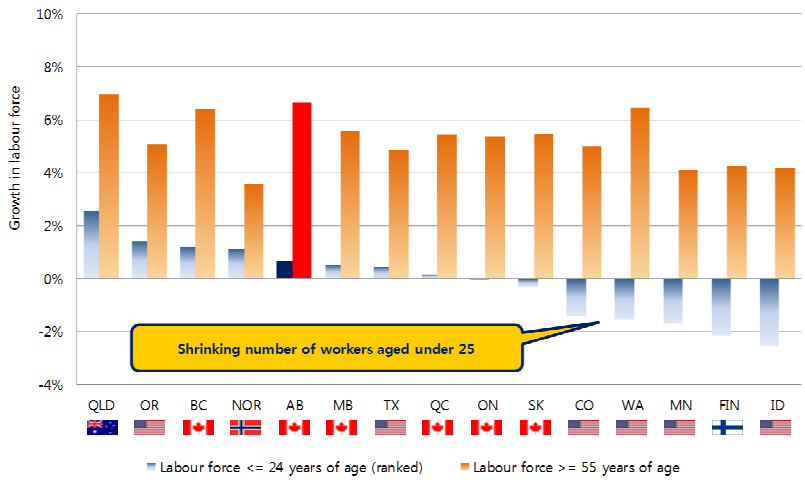
Share of labour force aged 55+ and <25 (2004 and 2011)



Notes: Labour force aged <25 represents 15-24 year olds in all locations except for the US states, for which it represents 16-24 year olds. Sources: Statistics Canada, CANSIM Table 282-0002; US Bureau of Labour Statistics, *Local Area Unemployment Statistics, Data Tables*; Eurostat data table lfsa_pganws: *Population by sex, age groups, nationality and labour status;* Queensland derived from Derived from Australian Bureau of Statistics Publication 6202.0 Table 12, and SuperTable ST GM1: *Gross Flows by State, Age, Sex, Table 1.*

- Alberta, like nearly all jurisdictions, saw its *share of workers* aged under 25 years decline between 2004 and 2011. However, Alberta still saw an increase in the *total number* of younger workers, thanks to the province's labour force growth over that period. Alberta had the 5th highest rate of growth in its number of young workers, with only Queensland, Oregon, British Columbia, and Norway experiencing greater gains of young workers.
- Alberta saw the second highest rate of growth in its *number* of older workers between 2004 and 2011, even though it ranks second among jurisdictions for its relatively low *share* of older workers.
- Of particular interest is the difference in results by country. Finland and four of the six US states compared saw declines in their absolute numbers of young workers between 2004 and 2011, as did Saskatchewan. Meanwhile, Queensland, Norway, and all Canadian provinces except Saskatchewan saw an increase in their number of young workers. These results may be due in part to younger workers in the United States either going back to school, or giving up looking for work as result of weak labour market conditions in the US.
- Overall, Alberta has a relatively young labour force, helped in part by strong immigration. While an aging population remains an issue for Alberta, the province is generally better positioned than comparator jurisdictions in terms of workforce age demographics.

Growth of labour force aged 55+ and <25 (2004 and 2011)



Notes: Labour force aged <25 represents 15-24 year olds in all locations except for the US states, for which it represents 16-24 year olds. Sources: Statistics Canada, CANSIM Table 282-0002; US Bureau of Labour Statistics, *Local Area Unemployment Statistics, Data Tables*; Eurostat data table lfsa_pganws: *Population by sex, age groups, nationality and labour status;* Queensland derived from Derived from Australian Bureau of Statistics Publication 6202.0 Table 12, and SuperTable ST GM1: *Gross Flows by State, Age, Sex, Table 1.*

Access to capital markets

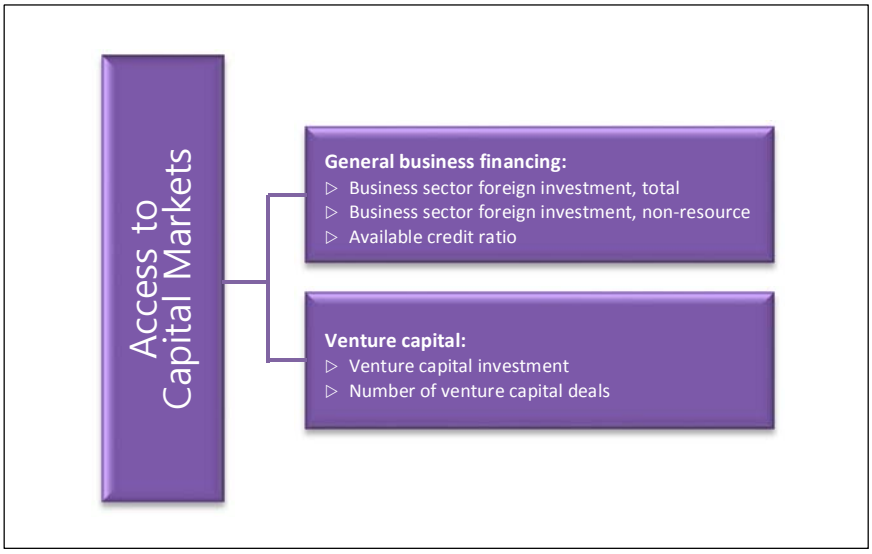
How it is measured

Access to capital represents a vital issue for businesses of all sizes. From start-up entrepreneurs seeking seed capital to major corporations looking to finance mega-projects, access to capital influences the ability of the economy to prosper at every level.

As illustrated in the diagram, this report includes five measures for access to capital, under two broad themes.

The general business financing theme measures the degree of foreign investment in the economy – both in total, and specific to the resources sector. In addition, this theme also compares the availability of authorized credit – a measure of the extent to which existing businesses have unused credit facilities in place that could potentially be used to finance expansion projects.

The venture capital theme measures both the value of venture capital investments made in a year, expressed as a percentage of GDP, and the number of venture capital deals made, expressed relative to population.

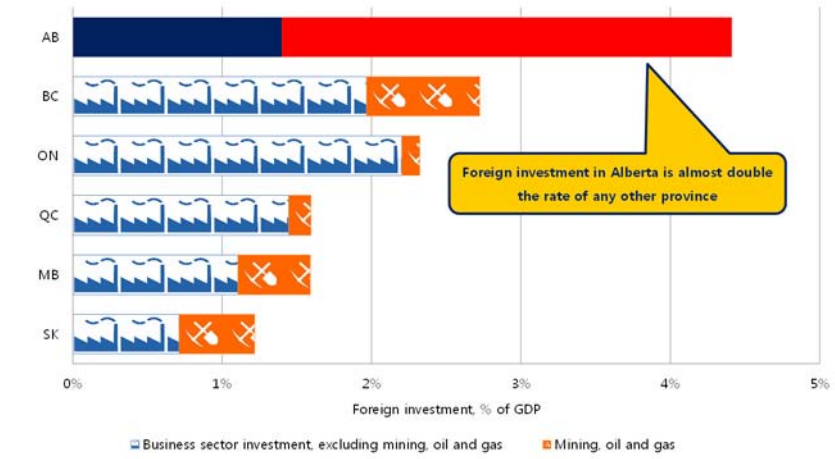


How Alberta performs – general business financing

Foreign capital investment as percentage of GDP

- This measure shows the relative attractiveness of jurisdictions for major foreign investments in productive assets. It includes investments in projects by subsidiaries of foreign companies, but excludes foreign investments in mergers, acquisitions, or other "paper" investments.
- While foreign investment in Alberta in 2010-2011 accounted for 4.4% of GDP, a smaller share of GDP than the 5.8% recorded in 2008-2009, Alberta continues to lead all other provinces on this measure.
- 68% of foreign investment in Alberta in 2010-2011 was in the mining, oil and gas industries – a slight decrease from 73% in 2008-2009.
- The extent of Alberta's lead has diminished however, as second-ranked BC saw only a marginal drop in foreign investment, from 2.8% of GDP in 2008-2009 to 2.7% in 2010-2011.
- Foreign investment in other sectors (other than mining, oil and gas industries) in Alberta has remained steady at 1.4% of GDP in 2009-2010 and 2010-2011. Alberta continues to rank 4th among six provinces on this measure.

Business sector foreign investment, total and non-resource, percent of GDP (2010-2011)

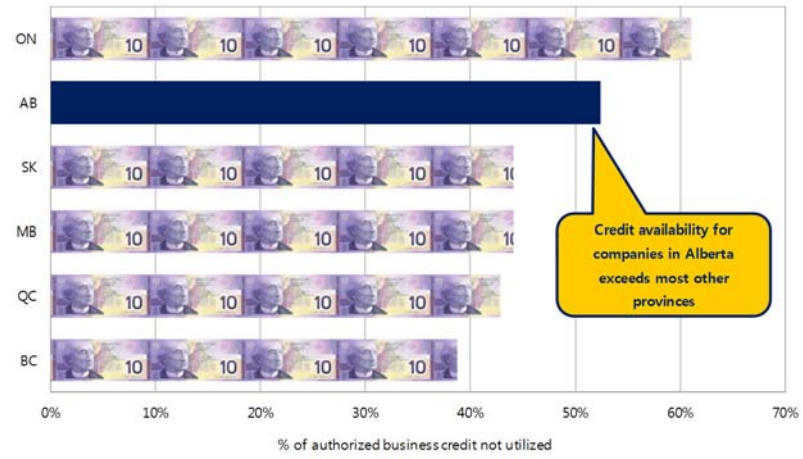


Notes: Business sector foreign investment includes investment by foreign firms and foreign-owned Canadian subsidiaries in structures, machinery, and equipment. Business sector includes all sectors of the economy except education, healthcare, public administration, and residential dwellings. Source: Statistics Canada 61-232-X, *Foreign & Domestic Investment in Canada.*

Available credit ratio

- Credit availability is measured as the percentage of authorized loans that businesses have not drawn upon. This available credit provides flexibility to companies in managing their operations, as they have pre-authorized credit they can draw upon quickly if required.
- Alberta ranks second, behind Ontario, for the percentage of authorized commercial debt currently available to companies in Canada. This gives companies in Alberta greater financing flexibility than in most other provinces.
- The high credit availability in Ontario is possibly attributable to authorized credit being held by corporate head offices in Toronto.
- While Alberta's 2nd place ranking is unchanged from the previous report, the availability of credit to businesses in Alberta has improved. The percentage of authorized commercial debt available to companies in Alberta has increased from 48.0% in 2008 to 52.4% in 2010. Other Canadian provinces have achieved more modest improvements in the same period, allowing Alberta to gain in relation to the other provinces.

Available credit ratio (2010)

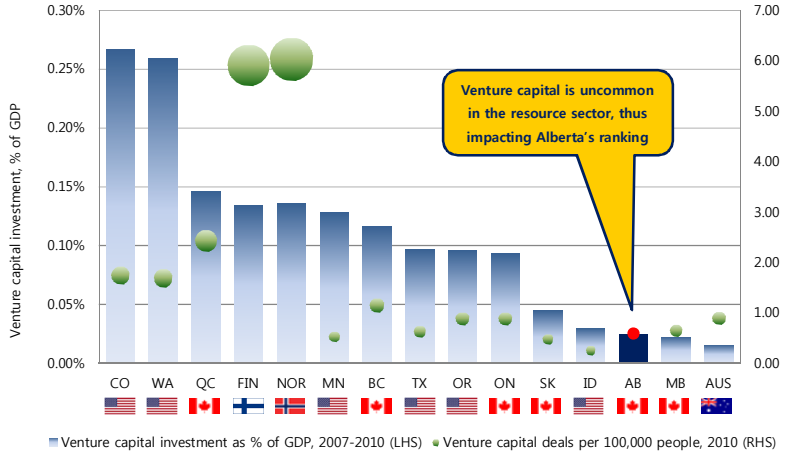


Source: Statistics Canada, *Survey of Suppliers of Business Financing.*

How Alberta performs – venture capital

- Venture capital plays a critical role in supporting the development of innovative companies, helping to bridge the gap between early individual investors and an initial public offering.
- The first measure of venture capital invested is the value of new investments that have been made, relative to GDP. This measure is based on a four year average, using data from 2007 to 2010.
- Based on this measure, Alberta ranks 13th among 15 jurisdictions, ahead of Manitoba and Australia.
- The second measure of venture capital investment is the number of venture capital deals per 100,000 population. For Alberta, this measure has increased slightly from 0.54 in 2009 to 0.59 in 2010. Alberta's ranking among the 15 jurisdictions has declined slightly from 11th to 12th place from the previous report.
- These measures reflect the nature of different industries in each jurisdiction. Venture capital plays a significant role in the development of high tech start-ups, as commonly seen in the leading high tech jurisdictions such as Washington, Colorado, and Quebec. By way of contrast, resource oriented start-ups are generally more reliant on traditional debt and equity markets, even for early stage capital.

Venture capital investment, percent of GDP (2007-2010) and Number of venture capital deals, per 100,000 population (2010)



Notes: Date represents venture capital only, and does not include private equity. Data is not available for number of deals in Finland and Norway. Sources: .Canadian Venture Capital & Private Equity Association, *Annual Statistics Review*, Table 4; PricewaterhouseCoopers/National Venture Capital Association, *MoneyTree Report*; Eurostat Table htec_vci_stage2, Venture capital investments by type of investment stage; Australian Private Equity & Venture Capital Association, *Yearbook 2011 Data*, Table 3.

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