

Economic Spotlight

Measuring GDP and employment diversification in Alberta

With its large energy sector, Alberta has a more concentrated industrial structure in terms of value-added production, relative to most other provinces. However, this has significant positive spill-over impacts across other industries. In fact, Alberta has one of the most diversified labour markets in the country, relative to other provinces. This spotlight measures GDP and employment diversification¹ in Alberta using a common measure of industry concentration.

¹ For an in-depth discussion on measuring diversification in Canada, see [Tombe and Mansell \(2016\)](#)

Economic activity more concentrated in Alberta

Often diversification is examined simply by looking at industry shares, but a more comprehensive measure is the Herfindahl-Hirschman Index (HHI). For more detail about the HHI, see the call-out box on the right side of this page. Using the HHI metric of market concentration and applying it to nominal gross domestic product (GDP) by industry, the Alberta economy is more concentrated compared to most provinces, but in line with other resource-based provinces.

Averaging over the last five years (2016-2020), Alberta has the fourth-highest (or fourth most concentrated) HHI in Canada, comparable to Prince Edward Island and Saskatchewan, but significantly lower than Newfoundland & Labrador, the most concentrated economy in the country (Chart 1).

The energy sector is a key driver of economic activity in Alberta and across Canada. The provincial economy, however, has

become less concentrated over time. While the reduction in oil prices since 2014 has lowered the nominal GDP contribution of the energy sector, increased activity across other sectors has also contributed to a less concentrated and more diversified provincial economy. The share of mining, quarrying, oil & gas extraction in Alberta's nominal GDP declined from 32% in 2008 to 19% in 2019, while GDP grew 19% over the same period. As a result, HHI decreased from 0.138 in 2008 to 0.085 in 2019, supported by an increase in activity in non-energy sectors. In 2020, Alberta's HHI fell further due to the significant impact of the COVID-19 pandemic on oil prices and demand.

Measuring economic diversification

Diversification is a concept that can be measured and analyzed over a range of macroeconomic indicators: nominal GDP, investment, exports, employment, etc. For this analysis, we have chosen a commonly used metric of market concentration, the Herfindahl-Hirschman Index (HHI), to measure economic diversification:

$$HHI = \sum_{i=1}^N S_i^2,$$

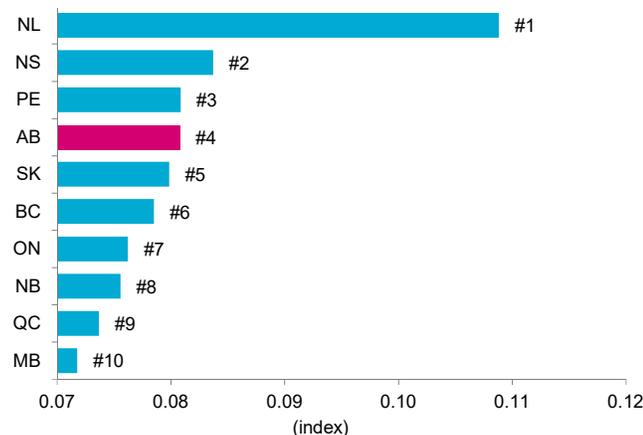
where S_i is the share of sector i and N is the number of sectors.

HHI ranges from $1/N$ to 1, where 1 implies a fully concentrated market. Lower HHI means low market concentration and, as a result, a more diversified economy.

For example, if there are four sectors in a labour market and the share of each is 25%. The labour market HHI is calculated as $(0.25)^2 + (0.25)^2 + (0.25)^2 + (0.25)^2 = 0.25$ and implies a diversified market. However, if the share of one of these sectors is 70% and the other three sectors are 10% each, the HHI increases to 0.52, suggesting a more concentrated market.

CHART 1. GDP CONCENTRATION HIGHER IN ALBERTA

Calculated HHI using nominal GDP by industry, 2016-20 average



Sources: Statistics Canada, Haver Analytics and Alberta Treasury Board and Finance calculations; # refers to the provincial rank for HHI applied to nominal GDP.

Nature of the energy sector inflates its economic contribution

The energy sector makes a large economic contribution to the Alberta economy, with energy investment and exports dwarfing those in any other industry. The oil and gas industry is highly capital-intensive in nature. The average cost of an oil & gas extraction or pipeline project in Alberta is over \$1.5 billion, as opposed to less than \$500 million for a new project in other industries.² As a result, Alberta has historically attracted high levels of capital investment. Between 2000 and 2019, business investment in Alberta has doubled, higher than the investment growth experienced by Ontario, the country's auto capital.

Subsequently, energy exports out of the province have grown in line with rising oil demand in the United States, its largest export market. Alberta's energy products constitute the majority (roughly 70%) of its total goods exports, and its value has risen by more than 200% in the last 23 years, making Alberta the biggest net exporter in the country. In comparison, Ontario, Quebec and British Columbia - the three largest provincial economies - are net importers.

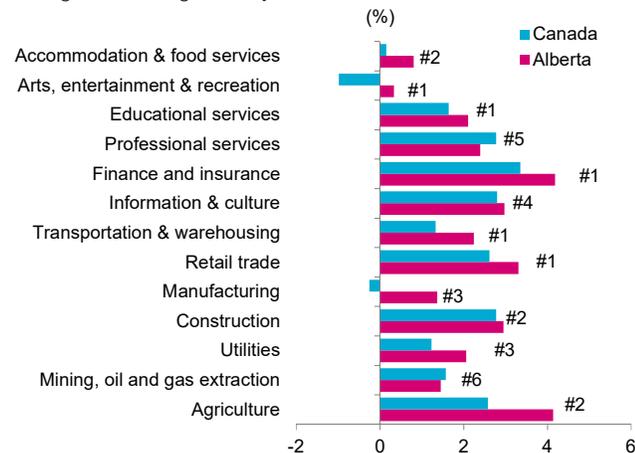
Spin-offs from energy

Higher activity in Alberta's energy sector has strengthened economic activity across both goods and services. Among goods sectors, machinery manufacturing has become more competitive over the past few decades. Between 2000 and 2020, Alberta's exports of industrial machinery, equipment & parts grew at an average of 8.6%, over five times the average growth for the rest of Canada.

² Calculated from the [Alberta Major Projects](#) database.

CHART 2. ALBERTA A GDP GROWTH LEADER ACROSS A WIDE RANGE OF NON-ENERGY INDUSTRIES

Average real GDP growth by select industries, 2000-20



Sources: Statistics Canada, Haver Analytics and Alberta Treasury Board and Finance calculations; # refers to Alberta's rank among all provinces.

Additionally, a wide range of service industries in Alberta grew faster than in the rest of Canada. Over the last two decades, real GDP growth for retail trade, finance & insurance, arts & recreation and educational services in Alberta have outpaced any other province in Canada (Chart 2).

Alberta has a relatively diversified labour market

Despite having a more concentrated GDP, Alberta continues to have one of the most diversified labour markets in the country (Chart 3). This is owing to the nature of the energy sector, which is not as labour-intensive as, for example, the manufacturing sector. Alberta's employment concentration is below that in Ontario, Canada's manufacturing hub or any other province in the country. Less than 6% of Albertans were employed in its mining, oil and gas extraction industry in 2020, as opposed to Ontario, where almost 11% of its workforce was employed in manufacturing.

CHART 3. LABOUR MARKET IN ALBERTA REMAINS DIVERSIFIED OVER TIME

Calculated HHI using employment by industry, 2016-20 average (index)



Sources: Statistics Canada, Haver Analytics and Alberta Treasury Board and Finance calculations; * Due to lack of data availability, 2017 and 2018 HHI have been removed from the five-year average for PE

Also, energy investment creates significant indirect employment across other industries. A \$1 billion investment in Alberta's oil and gas industry creates more than 1,500 indirect jobs across other industries.³ Alberta has outpaced the national average for employment growth in wholesale trade, retail trade, information, culture & recreation and finance & insurance, among other sectors, over the last two decades.

³ Calculated using Statistics Canada's Input-Output tables.

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