ECONOMIC COMMENTARY

Alberta's Manufacturing Industry is Recovering in 2017

October 10, 2017

Highlights:

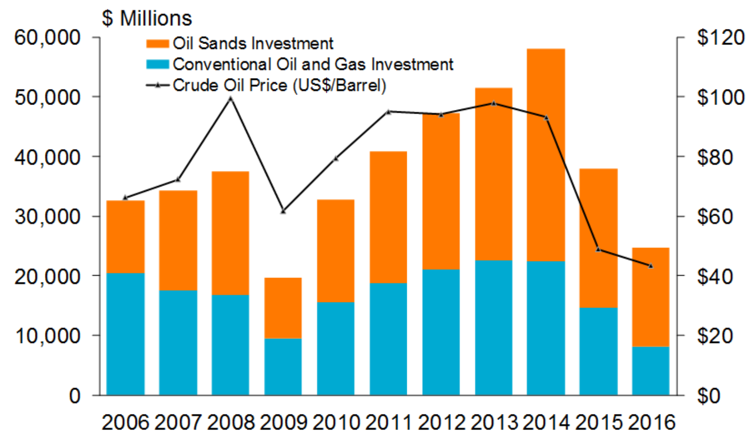
Alberta's manufacturing industry was in recession in 2015 and 2016 as a result of the dramatic drop in crude oil prices. Lower oil prices resulted in much lower selling prices of refinery products and caused oil and gas companies to drastically lower their capital spending which translated into reduced demand for machinery and equipment produced by Alberta's industrial machinery and fabricated metals sectors. As Alberta is emerging from its recession this year so is its manufacturing industry.

Alberta Government

Alberta's Recent Recession Heavily Impacted the Manufacturing Industry

The Alberta economy was in recession in 2015 and 2016 because of sharply lower crude oil prices which caused the Alberta economy to shrink by 3.6% in 2015 and by a further 3.8% in 2016. The manufacturing industry was especially hard hit by weak oil prices and saw its GDP fall by 5.6% in 2015 and by 7.6% in 2016, primarily because oil and gas companies reduced their capital spending programs as a result of the drop in oil prices. This especially affected producers of capital inputs such as machinery and fabricated metals. Lower oil prices also resulted in sharply lower prices for refinery products, such as diesel fuel and gasoline, that are produced in Alberta. Alberta has emerged from the recession and most private sector forecasters are predicting that Alberta will lead the nation in economic growth this year with a GDP increase of close to 4%. One of the reasons for this turn-around is rising oil and gas investment: in the second quarter of this year Canadian oil and gas investment rose 15% from the second quarter of 2016 (Alberta accounts for more than two-thirds of Canadian oil and gas investment). In this commentary we will examine how Alberta's manufacturing industry fared during the recent recession and how it is recovering from it this year.

Crude Oil Prices and Oil and Gas Investment



* Intentions
Source: Statistics Canada

GDP in the Manufacturing Industry Fell Sharply in 2015 and 2016

> GDP at basic prices (or by industry) measures an industry's unduplicated contribution to the overall economy by deducting the value of intermediate inputs that come from other industries from the value of its output (basically revenues or shipments). GDP is presented here in chained 2007 dollars. Percentage changes for GDP by industry are calculated using volume measures, that is, adjusted for price variations.

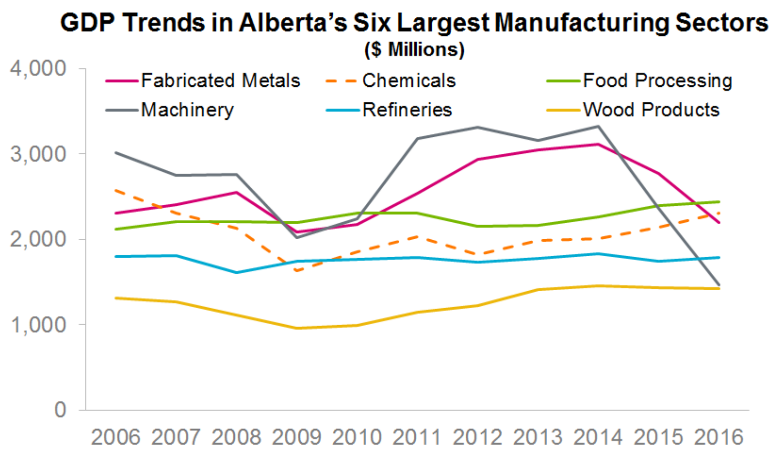
During the 2015/2016 recession, Alberta's manufacturing industry saw its output (GDP) fall 13%. Seventy-six per cent of the $1.4 billion drop in Alberta's manufacturing industry's GDP can be traced back to the sector that was manufacturing's largest sector on a GDP basis prior to the recession: machinery manufacturing. The machinery sector's GDP fell 56% during the recession mainly as a result of a 65% decline in the agricultural, construction and mining machinery sub-sector: more than 80% of that sub-sector's output is destined for the oil and gas fields. The fabricated metals sector accounted for 38% of the manufacturing GDP drop in 2015/2016 as that sector's output dropped 29%, in part because of a 59% decrease in the machine shops sub-sector. Other sectors with sizable GDP declines in 2015/2016: electronic products (down 32%); primary metals such as steel products (down 20%); non-metallic mineral products (down

15%); and plastics and rubber (down 10%). A number of manufacturing sectors still expanded during the recession: chemicals (up 15%); pulp and paper (up 13%); and food processing (up 8%).

The Canadian GDP by industry table with monthly GDP estimates suggests that the machinery sector is seeing a large rebound in output volumes in 2017 because of rising capital investment by the oil and gas sector. In the second quarter of 2017 GDP in Canada's machinery sector rose 22% from the same period of 2016, led by large increases in the agricultural, construction and mining machinery and other general-purpose machinery sub-sectors, both of which are major suppliers to the oil and gas sector. In the first quarter of 2017 machinery GDP rose 11%. Canada's fabricated metals sector has not seen much growth in GDP this year: GDP rose 4% between the second quarter of 2016 and the same period of 2017.

Manufacturing GDP Declined Between 2006 and 2016 because of the Recent Recession

Between 2006 and 2016 Alberta's manufacturing GDP declined by 12.6%[1], mainly because of the recent recession. The machinery sector accounted for almost two-thirds of the $2.4 billion decline in total manufacturing GDP during that 10-year period: GDP in the machinery sector fell 51% between 2006 and 2016. The chemical sector accounted for 11% of the overall decline (chemical sector GDP fell 11%) and the non-metallic mineral products sector, mainly cement and concrete products, for 10% (10-year decline of 21%). Among the sectors with at least $500 million in GDP the highest 10-year GDP growth was registered in the food processing sector (up 15%), followed by the plastics and rubber products sector (up 14%).



Source: Statistics Canada

Manufacturing Revenues Sharply Lower Because of the Machinery and Refineries Sectors

Alberta's manufacturing revenues (the value of sales) fell 13.9% to $68.5 billion in 2015 and by a further 8.6% in 2016 to $62.6 billion, a six-year low. The steep revenue declines in 2015 and 2016 were the result of declines in both volumes and prices. Total revenues fell 21% between 2014 and 2016, and according to the above GDP section manufacturing volumes dropped 13% during that period. Therefore, prices of manufactured goods fell an estimated 8% during the recession.

[1] All 10-year per cent changes in this commentary represent cumulative changes (from 2006 and 2016); they are not average annual changes. Therefore, a cumulative change of 12.6% between 2006 and 2016 translates into an average decline of about 1.3% per year.

Much lower crude oil prices led to sharply lower prices for refinery products such as gasoline and diesel. For the 10 years prior to 2016 the refined petroleum (refineries) sector was Alberta's largest manufacturing sector on a revenue basis but it fell to third place in 2016. About 58% of the $17 billion drop in overall manufacturing revenues between 2014 and 2016 can in fact be traced back to a 44% decline in refineries' revenues. Most of this revenue decline was the result of a more than 40% drop in prices as output in this sector fell only 2.5% between 2014 and 2016.

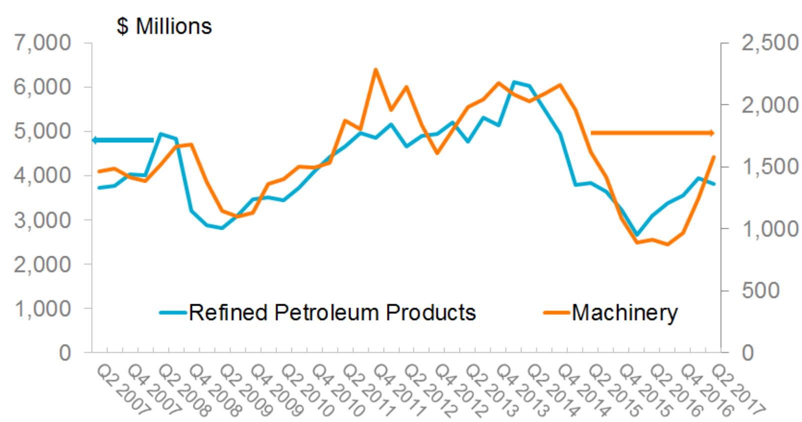
The machinery sector, which was the fourth largest manufacturing sector until 2016 when it fell to sixth place, accounted for 28% of the overall manufacturing decline in 2015/2016 as its revenues declined by 57% to $3.6 billion in 2016 from $8.4 billion in 2014. This decline was almost entirely the result of lower volumes as GDP declined by 56% between 2014 and 2016. Machinery's large revenue drop was mainly the result of a 74% decline in its mining and oil and gas field machinery sub-sector, which accounted for at least one-half of machinery revenues prior to the recession.

Manufacturing revenues have started to recover in 2017: they rose 16% during the first six months of 2017 from the same period of 2016. All major manufacturing sectors registered year-over-year sales gains with the exception of fabricated metals which saw its sales drop 2% in the first half of 2017 from the same period of 2016. Strong growth was registered in the following sectors:

- Machinery – up 61% (sales of pumps and compressors rose 137%);
- Petroleum refineries – up 37%;
- Pulp and paper – up 19%;
- Chemicals – up 15% (sales reached a nine-year high in the second quarter of 2017);
- Wood products – up 10% (sales reached a record high in the second quarter of 2017); and
- Plastics and rubber – up 7%.

While the machinery and refined petroleum sectors were the largest contributors to the decline in manufacturing revenues during the previous two years, this year they are also the main drivers behind manufacturing's rebound. Between the first half of 2016 and the same period of 2017 total sales of manufactured products rose $4.8 billion to $29.8 billion. Petroleum refineries accounted for 42% of the overall increase in manufacturing sales as their sales have risen $2.0 billion so far this year. Machinery sales rose $1.1 billion and this sector therefore accounted for 22% of the overall increase.

Refinery Products and Machinery Drive Manufacturing Sales

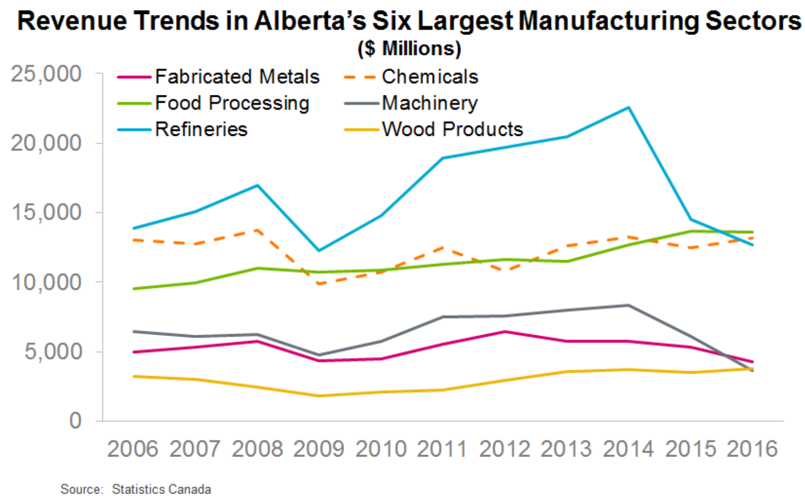


Source: Statistics Canada

Ten-Year Trends in Manufacturing Sales Revenues

Between 2006 and 2014 Alberta's manufacturing revenues (the value of sales) grew by 22% to $79.6 billion. As a result of the 2015/2016 recession, manufacturing revenues fell 3.9% between 2006 and 2016. The 10-year decrease of 3.9% in the value of revenues was the result of lower volumes as prices rose about 9% during that period.

Among the 10 largest sectors (with at least $1 billion in revenues) the highest 10-year growth on a revenue basis was registered in food processing (up 43%), followed by wood products such as lumber (up 17%). Most sectors had lower revenues in 2016 than in 2006 due to the recession, for instance revenues in the machinery sector dropped by 44% between 2006 and 2016, by 45% in primary metals (such as steel products) and by 14% in fabricated metals.

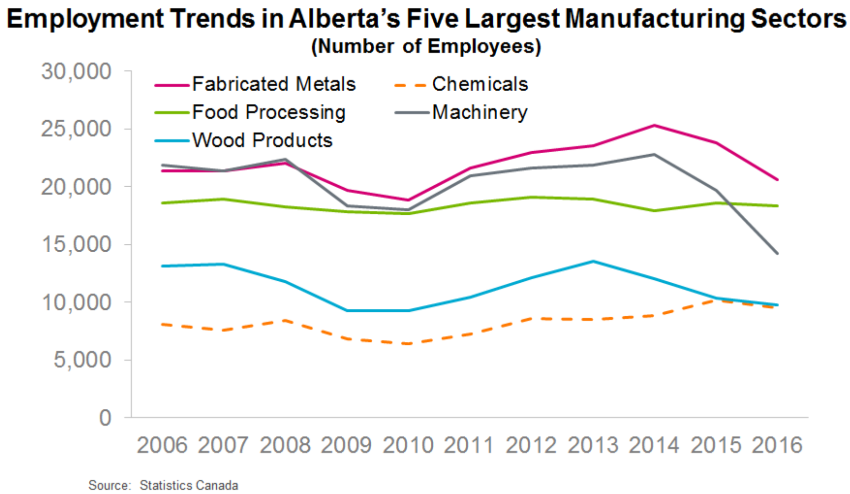


The food processing sector is now Alberta's largest manufacturing sector. Among the 10 largest manufacturing sectors, food processing registered the largest 10-year gain with revenues growing by 43% between 2006 and 2016 to $13.6 billion as both prices and volumes increased during that period. The two largest sub-sectors, meat products and grains and oilseed milling (mainly canola products such as canola oil), grew strongly by 38% and 94%, respectively.

The chemicals sector, Alberta's number two manufacturing sector in 2016, saw its revenues rise 1% between 2006 and 2016 to $13.2 billion as a result of a 12% increase in prices. In the largest sub-sector, basic chemicals (mainly petrochemicals), revenues fell 29% during that 10-year period to $5.0 billion, while revenues in the second largest sector, synthetic resins and fibres (such as polyethylene), rose 41% to $4.8 billion.

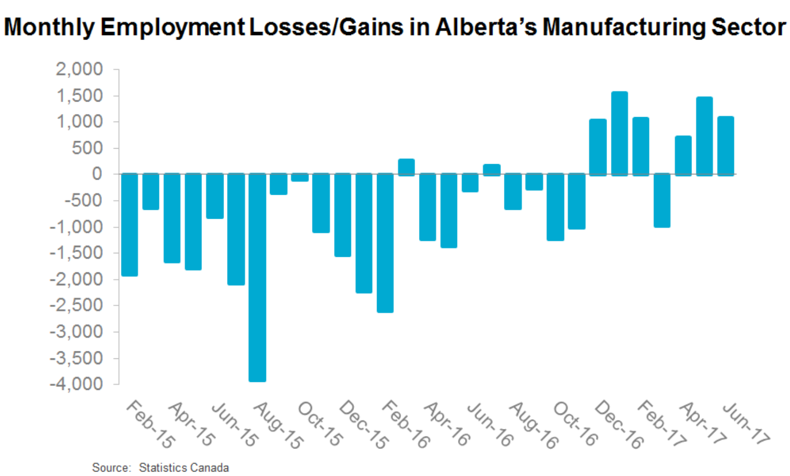
Why do the rankings differ when using revenues rather than GDP? The problem with using revenues as the main yardstick for ranking sectors is that in some sectors, such as petroleum refining, very little processing takes places and most of the value of the output can be traced back to the value of the inputs (e.g. crude oil in the case of refineries). The petroleum refining sector employs relatively few workers and this translates into a much lower contribution to GDP than in the machinery sector.

Payroll Employment also on the Rise this Year



According to the Survey of Employment, Payrolls and Hours[2], payroll employment in the manufacturing industry fell by 11.1% or by 14,628 employees in 2016 after a loss of 5,641 workers in 2015. The largest losses in 2015/2016 were registered in the machinery sector which lost 8,548 jobs in those two years, primarily due to a drop of 5,492 in the agricultural, construction and mining machinery sub-sector (most of these jobs are related to machinery destined for the oil and gas fields). Other sectors with large employment losses in 2015/2016 were fabricated metals (a loss of 4,786 jobs), wood products (down 2,245), pulp and paper (down 947) and primary metals (down 790).

Employment in the manufacturing sector bottomed out in November 2016 and has risen since then: between November 2016 and June 2017 manufacturing employment increased by nearly 6,000 from 113,649 in November 2016 to 119,552 in June, the highest employment level since January 2016. The manufacturing industry had lost 26,900 jobs between December 2014 and November 2016. The food processing sector has had the largest job gains: payroll employment increased by about 2,700 or 15% between November 2016 and June 2017. Almost half of these job gains can be attributed to the meat products sub-sector. The machinery sector gained almost 1,800 jobs during that period because of strong gains in the agricultural, construction and mining machinery (mainly oil and gas field machinery) and ventilation, heating, air-conditioning and commercial refrigeration equipment sub-sectors. Other sectors with strong job gains in 2017 include: wood products;



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[2] For the employment measure the monthly establishment based *Survey of Employment, Payrolls and Hours* (SEPH) is a reliable source of employment by industry estimates because it is a business census of non-farm payroll employees. Since it is a company based survey it excludes self-employment, but this is not a major problem for the manufacturing industry as self-employment accounts for less than 3% of total employment.

beverages; chemicals (large gains in the pesticides, fertilizers and other agricultural chemicals sub-sector); and non-metallic mineral products (most gains are in the cement/concrete sub-sector).

Payroll employment in the manufacturing industry fell by 15% between 2006 and 2016 to 117,080. The largest sector on an employment basis in 2016 is fabricated metals with 20,587 employees followed by food processing (18,309), machinery (14,246), wood products (9,768) and chemicals (9,549). For the employment measure petroleum refineries only rank seventh with 5,785 employees.

Exports of Manufactured Goods Sharply Lower in 2015 and 2016

Nearly one-third of Alberta's manufacturing sales are destined for international markets. The export intensity ratios (export sales as a share of total sales) are in excess of 40% in these sectors: pulp and paper (about 80%); chemicals; electronics; electrical equipment; and primary metals. The lowest export intensities were recorded for the non-metallic mineral products, refineries, fabricated metals, plastics and rubber, and furniture sectors, all of which export less than one-fifth of their sales.

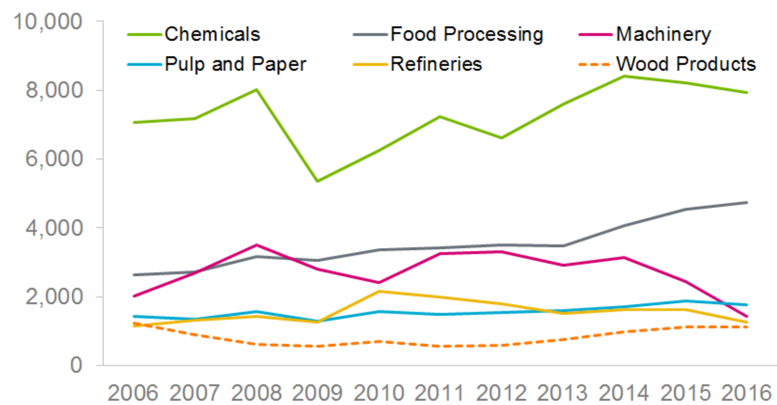
In 2016, exports of manufactured goods fell 9.3% to $21.6 billion because of lower prices as manufacturing export volumes fell by less than 1%. In 2015, the value of these exports had fallen 1.7%.

On an export basis the chemicals sector is by far Alberta's largest manufacturing sector with $7.9 billion in exports in 2016, accounting for about one-third of exports of manufactured goods. The next largest sector is processed foods, accounting for about one-fifth of manufacturing exports, followed by pulp and paper, machinery, and petroleum refineries. Exports of chemicals fell 5.7% in 2015/2016 on lower prices: exports of acyclic hydrocarbons declined from $762 million in 2014 to $276 million in 2016. The machinery sector saw its export value decline by 55% during those two years to a 12-year low of $1.4 billion as its three largest sub-sectors, oil and gas field machinery, pumps and compressors, and other industrial machinery, all declined by about two-thirds. Exports of processed foods rose 17% between 2014 and 2016 as a result of a 104% increase in exports of canola oil. Lower crude oil prices led to a more than 50% decline in export prices for refinery products, such as gasoline and diesel, but export volumes in this sector rose at least 40%.

Exports of manufactured goods are recovering this year: the value of manufacturing exports increased by 17% between the first half of 2016 and the first half of 2017 to $12.4 billion. The largest 12 manufacturing sectors all have higher export sales in 2017 than in 2016, led by strong gains in the wood products and petroleum refineries sectors of 59% and 54%, respectively. Wood product exports rose 59% between the first half of 2016 and the first half of 2017, mainly because of an 87% jump in lumber exports. Exports of refined petroleum exports have increased 54% so far this year because of a 114% jump in heavy fuel oils such as diesel fuel. Exports of chemical products have increased 8% in 2017: exports of Alberta's top commodity, ethylene polymers such as polyethylene, rose 9%; of ethylene glycol 23%; and of styrene 80%. The machinery sector has seen its exports increase 23% so far in 2017: the pumps and compressors sub-sector rose 54%; and oil and gas field machinery 32%. Exports of processed foods are 20% higher in the first half of this year compared to the same period of 2016, driven higher by a 95% gain for canola oil and a 68% gain for canola oil-cake and meal.

After declining sharply during the 2009 recession exports of manufactured goods recovered strongly through 2014 and by then they had exceeded the 2006 export value by 18%. Although such exports did not decline as sharply during the recent recession as during the 2009 recession they still fell by 11% between 2014 and 2016.

Trends in the Largest Manufacturing Sectors on an Export Basis
($ Millions)



Source: Statistics Canada

The 10-year increase of 5.7% in manufacturing export sales was entirely the result of higher prices as volumes decreased during that period. Among the six sectors with at least $1 billion in exports the highest 10-year growth on an export basis was registered in processed foods (up 80%), followed by pulp and paper (up 24%), chemicals (up 12%), and petroleum refineries (up 10%). However, exports of machinery and wood products[3] fell 30% and 11%, respectively.

Summary

Lower crude oil prices had a severe impact on Alberta's manufacturing sector in 2015/2016. This impact was two-fold: 1) lower input prices caused much lower selling prices of refinery products and of a number of chemicals; 2) oil and gas companies drastically lowered their capital spending which translated into reduced demand for machinery and equipment produced by Alberta's industrial machinery and fabricated metals sectors. As a result, GDP in the manufacturing sector fell by 5.6% in 2015 and by a further 7.6% in 2016. Employment, revenues and exports were also much lower during the recession. All current indicators suggest that the manufacturing sector is recovering this year as the values of shipments and exports were much higher in the first half of this year than in the first half of 2016. Although slower to recover the number payroll employees in the manufacturing sector has recently started to show some improvement. The sectors that were most impacted in 2015 and 2016 by the recession were the machinery and refined petroleum sectors, although a number of other sectors such as fabricated and primary metals and non-metallic mineral products were also affected by lower capital spending. The same two sectors, machinery and refined petroleum, are also contributing the most to the manufacturing industry's increase in sales this year. The food processing and wood products sectors have also contributed to the industry's improved performance.

Note: monthly statistics for the manufacturing industry and many other economic indicators can be found on the Alberta Economic Dashboard at http://economicdashboard.alberta.ca

[3] The 10-year decrease of 11% for wood product exports was the result of very high exports to the US in 2006 which was the last year of the US residential housing boom.