SPECIAL REPORT

TD Economics

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PUSH ME PULL ME: THE OUTLOOK FOR CANADIAN MANUFACTURING

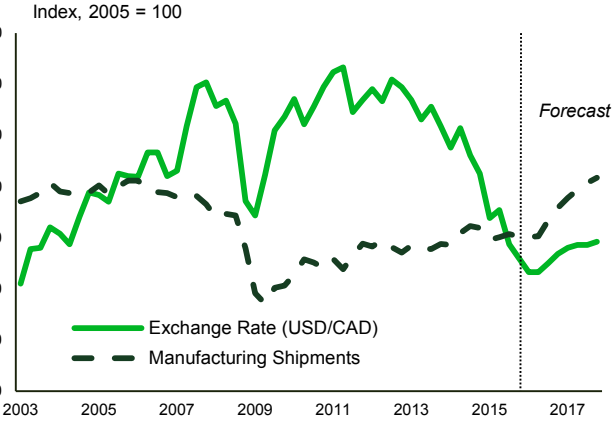
Highlights

- The decline in commodity prices and weakened Canadian dollar have resulted in an ongoing economic adjustment. Manufacturing is expected to play a larger role in economic growth, benefiting not only from the weak loonie, but also rising demand south of the border.
- Not all sectors will benefit equally. Based on our outlook for commodity prices, the exchange rate, and foreign demand, we expect a number of industries to outperform, including wood products, plastic and rubber products, and furniture.
- Chemical products and primary metals may also gain via supply chain effects, and based on historical performances.
- Some sectors are likely to underperform, notably petroleum products, textiles, and machinery and equipment. Relative industry performances will maintain a regional divide with B.C., Ontario, and Quebec expected to see relatively strong growth, versus Alberta and Saskatchewan.

In theory, most Canadian manufacturers should be celebrating recent economic developments – a weaker exchange rate, a U.S. economy that continues to expand, and reduced commodity prices should all support manufacturing output. In reality, the situation is much more complicated. Low oil prices may reduce input costs for firms producing plastic products, pulling growth higher, but at the same time petrochemical producers are likely to see profits pushed lower by falling prices. Similarly, a lower Canadian dollar should make manufactured goods more price-competitive in the export market, but the exchange rate impact also pushes up input prices, reducing the overall benefit for industries with a high import reliance in production. Because these push and pull factors vary by manufacturing sector, a more granular analysis is warranted.

To capture the nuances of differing industries, this report develops a ranking of likely manufacturing outperformance/underperformance at the sectoral level, based on estimated sensitivities to exchange rate movements, oil prices, and foreign activity. We then extend this analysis by looking at supply chain impacts to identify other industries that may benefit from second-round effects. Industry-level performance during similar episodes in the past is also considered. Finally, we examine the geographic concentration of out- and underperformer industries, mapping them into the regional outlook for the coming years. Doing so revealed a number of likely outperformer industries, including wood products, plastic and rubber products, and furniture manufacturing, among others. The regional distribution of these industries suggests that B.C., Ontario, and Quebec are likely to see the largest benefits.

CHART 1. MANUFACTURING HAS FAILED TO RE-ATTAIN PRE-CRISIS LEVELS



Source: Statistics Canada, TD Economics. Shipments data in nominal terms.

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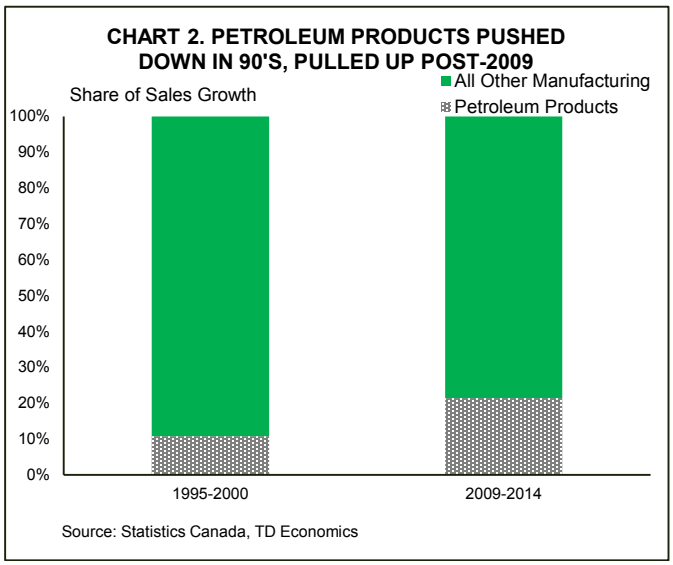


Setting the stage: the broad outlook for manufacturing

Canadian manufacturing output fell markedly during the 2009 recession, and has recovered only gradually since then. With average growth of just 0.5% per quarter, manufacturing output remains about 10% below its pre-crisis peak (reached in 2005; Chart 1).

Undoubtedly part of this underperformance was due to movements in the Canadian dollar, which was roughly 17% above its 2005 average in the 2009-2013 period. This had the effect of both reducing Canadian manufacturers price competitiveness for export oriented firms, while also reducing the price of imported goods, creating competitiveness issues within the domestic market.

Leading the Canadian dollar higher over this time were rising oil prices, which created further pressure for manufacturers via rising input costs, a particularly pressing issue for those firms that rely on plastic feedstocks, such as plastic and rubber product producers and transportation equipment producers, notably automotive parts suppliers. Finally, a third headwind existed in the somewhat gradual recovery in the U.S. economy, further constraining demand for those firms with significant export exposure.

Two important points should be kept in mind: First, the effects of these headwinds were not the same for all manufacturers. Petrochemical manufacturers likely benefited from higher oil prices, while weakness in U.S. demand may not have made any meaningful difference for manufacturers focused only on the domestic market. Petrochemical producers also show how these factors can change through time - accounting for 10% of sales growth in the late 1990s, but more than 20% post-2009 (Chart 2), with price effects undoubtedly playing a major role. Second, these factors have now reversed. The Canadian dollar has depreciated significantly against its U.S. counterpart since 2014, and is forecast to appreciate only modestly in the coming years (Chart 1). Similarly, oil prices are expected to recover, but to levels well below 2011 to 2013 prices. Finally, U.S. demand is likely to sustain strength as healthy labour markets translate into increased spending power (Chart 3).

For these reasons, the outlook for manufacturing in Canada appears to have improved. However, just as the drag on manufacturing was uneven during the post-recession period, the outlook is likely to vary by sector in the coming years. The next section quantifies how these impacts are likely to affect different manufacturing industries.

First pass: determining sectoral outperformers

To provide a more fulsome outlook for manufacturing sales, we examine the outlook for 19 major manufacturing industries. Within each industry, we estimate a model of manufacturing sales that includes oil prices in Canadian dollars, a broad measure of the exchange rate, and a measure of foreign activity.[1] Based on the normalized coefficients resulting from these estimates, we construct an index that captures the expected reaction of manufacturing sales by industry to the three factors.[2] Stronger relationships with the exchange rate and foreign activity result in a higher index, whereas higher estimated impacts of oil prices on sales subtract from the index, consistent with our 2016/2017 outlook.

Based on this analysis, a number of industries are likely to outperform in the coming years. Both wood product and

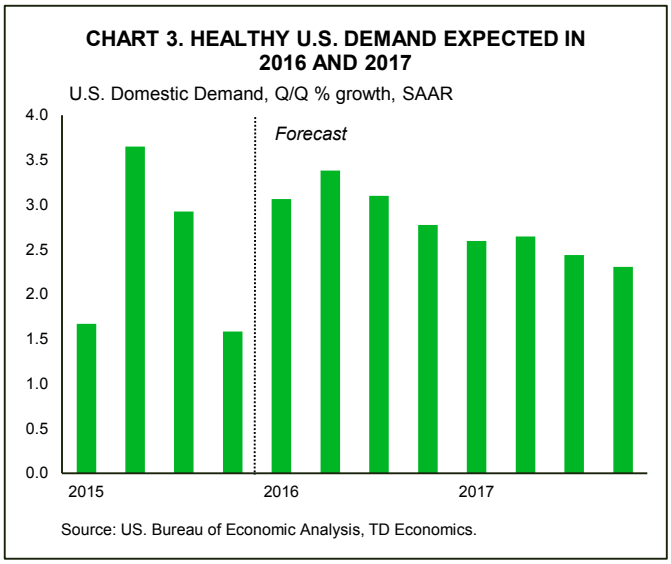


Table 1. Industry Rankings	
Rank	Industry
Outperformers	
1	Wood Products
2	Plastic and Rubber Products
3	Furniture
4	Printed Materials
5	Fabricated Metals
6	Paper Products
Modest Performers	
7	Textile Mills
8	Chemicals
9	Transportation Equipment
10	Non-Metallic Minerals
11	Clothing
12	Leather Goods
13	Electrical Equipment
Underperformers	
14	Miscellaneous
15	Machinery and Equipment
16	Food
17	Primary Metal Products
18	Textile Products
19	Petroleum Products

Source: TD Economics

plastic and rubber product manufacturing score extremely high in our ranking, with stronger relationships found for the exchange rate and foreign activity, and a negative relationship with oil prices. The production of furniture and fabricated metals both benefit from a very strong estimated relationship to foreign activity, while printed materials performs well across all three categories.

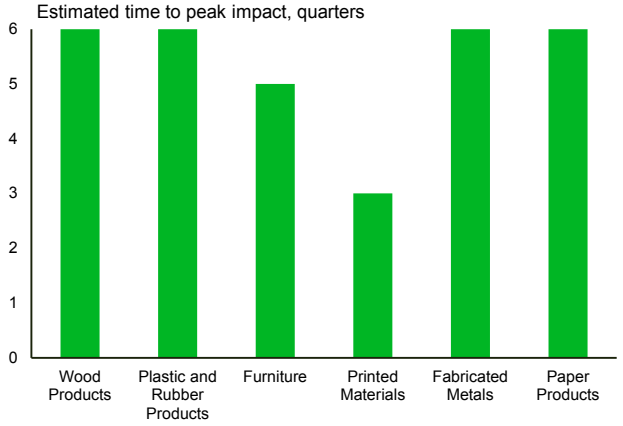
A number of industries fall in the middle of the pack for various reasons. For instance, we find that chemical manufacturing has a relatively strong relationship with foreign activity, and tends to rise when oil prices are weak, but the industry also tends to see falling sales when the exchange rate is weak – likely due to a high reliance on imported inputs to the production process. In a similar vein, non-metallic mineral products tend to sell better when foreign activity is strong, but also tend to do well when oil prices are high, reducing their overall score.

While this analysis is forward looking, the identified industries have already begun to outperform in 2016, with strong sales growth of wood products, plastic and rubber products and furniture in the latter part of the year, reconfirming our analysis.

Finally, there are a number of industries that we identify as likely to underperform. Unsurprisingly, petrochemical products fall at the bottom of the ranking, but both machinery manufacturing and primary metal products are also near the bottom of the list. In both cases we found a relatively strong inverse relationship with the exchange rate, and in the case of primary metals, a strong relationship with oil prices.

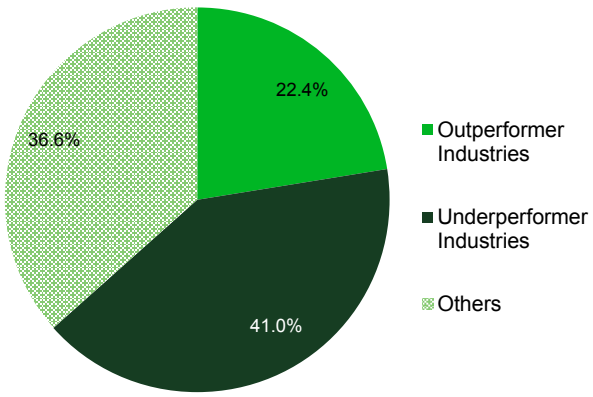
Beyond the ranking, our analysis provides some further insight into the likely performance of manufacturing sectors. In line with our past research,[3] among the top ranked manufacturing industries, the relationship with the exchange rate tends to be quite lagged – by as much as six quarters (Chart 4). This implies that the biggest impacts of past exchange rate movements likely have not been seen yet. Even with the sales acceleration that has been seen in many of the identified sectors, significant gains from past currency movements

CHART 4. EXCHANGE RATE MOVEMENTS GENERALLY TAKE TIME TO IMPACT MANUFACTURING SALES



Source: TD Economics

CHART 5. UNDERPERFORMER INDUSTRIES ARE LARGEST SHARE OF MANUFACTURING OUTPUT



Source: TD Economics

Table 2: Inputs for Top Preforming Industries		
Industry	**Inputs**	**Share**
Wood Product Manufacturing		
	Wood Product Manufacturing	59.9%
	Chemical Manufacturing	8.9%
	Plastics & Rubber Manufacturing	5.5%
	Fabricated Metals Manufacturing	5.4%
Plastics & Rubber Manufacturing		
	Chemical Manufacturing	58.9%
	Plastics & Rubber Manufacturing	21.8%
	Miscellaneous Manufacturing	9.1%
	Primary Metals Manufacturing	2.6%
Furniture Manufacturing		
	Wood Product Manufacturing	29.4%
	Plastics & Rubber Manufacturing	14.6%
	Primary Metals Manufacturing	12.1%
Printing and Related Support Activities		
	Paper Product Manufacturing	60.2%
	Chemical Manufacturing	16.5%
	Printing and Related Support Activities	5.5%
Fabricated Metals Manufacturing		
	Primary Metals Manufacturing	55.8%
	Fabricated Metals Manufacturing	23.0%
	Chemical Manufacturing	3.3%
Paper Product Manufacturing		
	Paper Product Manufacturing	46.0%
	Wood Product Manufacturing	18.0%
	Chemical Manufacturing	12.2%
	Primary Metals Manufacturing	4.0%
Source: Statistics Canada 2010 Input- Output Tables		

should nevertheless continue to make themselves felt in 2016, continuing into 2017.

By conducting the analysis on a by-industry basis, the size of the various industries can be taken into account in the context of the outlook for manufacturing as a whole. The six industries that we identified as likely to outperform represent just 22% of 2015 manufacturing output, whereas the bottom six industries in our analysis (the 'underperformer' industries) made up more than 40% of manufacturing sales (Chart 5). This implies that although we do expect manufacturing sales to pick up this year and next, growth expectations must be tempered given the relative output shares of the sub-sectors.

Round two: determining potential second-order impacts

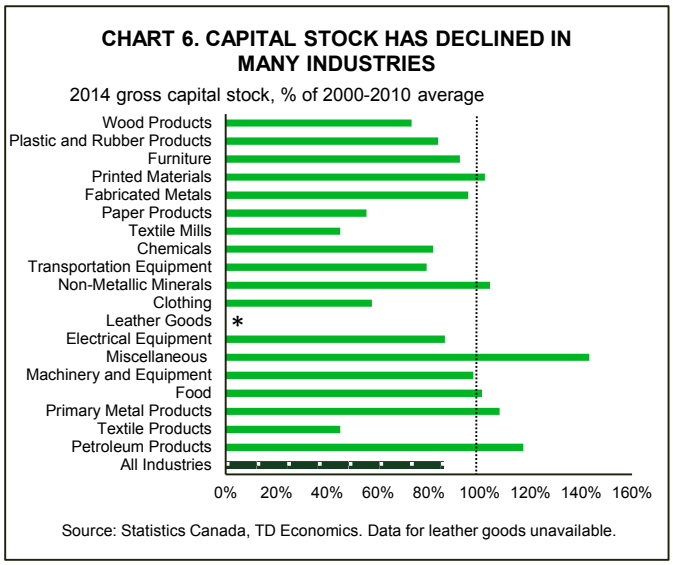
Domestic re-orientation: supply-chain impacts

With the depreciation of the Canadian dollar and a healthy U.S. demand outlook we expect to see some re-orientation of supply chains in the manufacturing sector to take advantage of the domestic market. To gain a sense of supply chain orientation, we use the Statistics Canada Input-Output tables, which show the between-industry linkages in the supply chain. This gives us insight as to which industries are key components of our top performers, as outlined in Table 2. Two industries previously identified by our regression analysis as likely underperformers may fare better than expected due to these reallocation affects.

The first is chemical manufacturing. As a primary input to all of our outperformers, there is no doubt that chemical products play an important role in manufacturing in Canada. In 2015, Canadians imported almost $50 billion of chemical products, with about 60% these coming from our neighbour south of the border. Currently, chemical imports satisfy just over 80% of domestic demand, almost double the levels of the 1990s. As supply chain reallocation toward domestic markets begin to take effect, we should see an increase in domestic demand for these goods with potential substitution away from more expensive U.S. imports taking hold. Capacity utilization rates are well below historic levels, and Canada has a reputation as one of the world's top chemical manufacturers.[4] This, coupled with a favorable manufacturing environment, means we should see an increase in production. Capital stock levels are currently below their long run average however, which may mean limited capacity in the short-run.

The second industry that has been identified as likely to benefit from second order effects is primary metals manufacturing. As a primary input to many of our top performing industries it is expected that as these industries begin to re-orient their supply-chains to take advantage of the domestic market, primary metals should receive a boost.

In 2015, imported primary metal manufactured goods totalled over $20 billion with over half of these products coming from the United States. These imports satisfy about 61% of domestic demand, above the historical average (51%). As the lagged effects identified in our earlier analysis begin to take effect and our 'winning' industries begin to ramp up production, we should begin to see a reversion towards more traditional levels. If history is any indication, as



discussed in the following section, the current environment is favourable for the primary metals sector. With capacity utilization rates well below historic levels and existing infrastructure in place, the conditions are in place for this industry to meet increased domestic demand.

A re-orientation of supply chains does not occur overnight. Multi-year contracts, product mismatches, and simple logistics all mean that it will likely take some time for manufacturers to adjust their supply chains to benefit from changes in cost structures. As a result, while these sectors are likely to gain from growth in other manufacturing industries, it make take some time for this benefit to pass through, likely not materially impacting these sectors until perhaps 2017.

Potential for increased investment

The extent to which capital is being utilized varies by industry – within wood product manufacturing, capacity usage is at a record high 98.6%, suggesting little scope to expand output barring additional investment. In contrast, while utilization has been steadily increasing in the plastic and rubber products industry, it remains well below historic norms. In addition, the most recent data suggests that in many industries, including those identified as likely to outperform, capital stock levels remain well below historic levels (Chart 6).[5]

The implications of the decline in capital stock are mixed. In the near term, limited physical capital may result in capacity constraints being reached more quickly, reducing the growth of output. Over the medium term, however, strong sales growth and limited capacity create a strong incentive for firms to increase investment, helping further boost Canadian growth. This takes time to occur. As noted by Bank of Canada Governor Stephen Poloz in a recent speech, it can take several years for a re-orientation of the economy to occur.[6] Indeed, our medium-term outlook includes an uptick in non-oil and gas investment via this 2nd round channel, however most of the gains are not expected to occur until late 2017, continuing into 2018.[7]

Round three: what does history tell us?

As a further test of our results, we can look back to a similar period in history that was also marked by weak domestic growth, a soft currency and relatively modest oil prices: the mid-to late 1990s.[8] Examining the path of manufacturing between 1995 and 2000, five industries stand out as outperformers – petroleum and coal, plastics and rubber products, electrical equipment, transportation equipment, and furniture manufacturing. Many of these industries were already identified as likely outperformers in our initial analysis; however, history suggests electrical equipment manufacturing may perform more strongly than its initial ranking might imply. As a result of structural shifts in the market for and production of petroleum products, notably the development of shale gas deposits within the U.S., we maintain our view that petroleum product manufacturing is likely to underperform in the coming years.

In a similar vein to our supply chain analysis, we also examine what industries appeared to have benefited from the expansion of manufacturing sales in the late 1990s period. In this case, we consider two criteria as indicating that an industry was benefiting from supply chain impacts: first, that growth during the period outpaced the longer run trend for

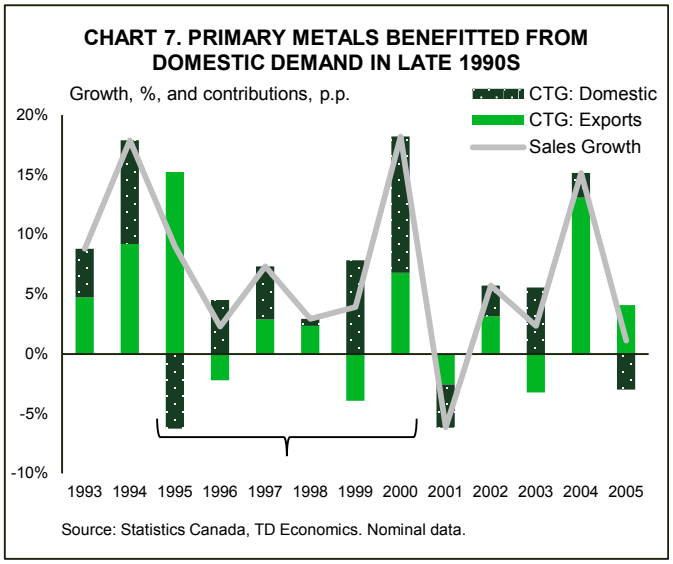


Table 3. Industry Rankings, Including Second-Round Effects	
Rank	**Industry**
Outperformers	
1	Wood Products
2	Plastic and Rubber Products
3	Furniture
4	Printed Materials
5	Fabricated Metals
6	Paper Products
Modest Performers	
7	*** Primary Metal Products
8	*** Electrical Equipment
9	*** Chemicals
10	Textile Mills
11	Transportation Equipment
12	Non-Metallic Minerals
13	Clothing
14	Leather Goods
Underperformers	
15	Miscellaneous
16	Machinery and Equipment
17	Food
18	Textile Products
19	Petroleum Products

Source: TD Economics
*** - Identified as likely to benefit from second-round effects

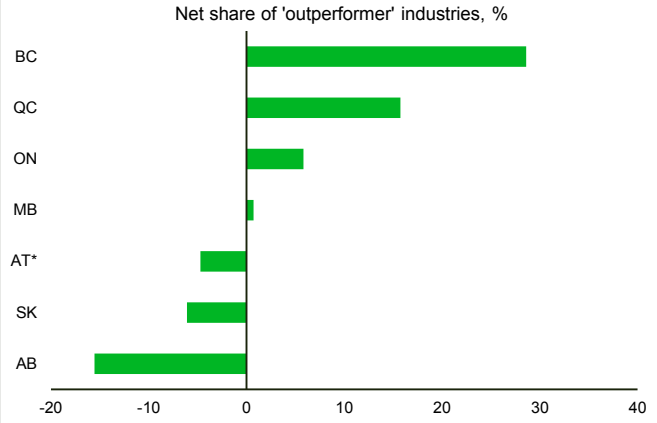
the industry; and second, that a majority of that sales growth came from domestic demand. This analysis suggests that primary metal product manufacturing should be added to the list of potential outperformers (Chart 7). This supports the results of our supply chain analysis, further suggesting that our initial ranking may have been too harsh on this industry.

Round four: mapping the regional implications

Our analysis has identified six industries as likely to outperform. In addition to these industries, electrical equipment and primary metals products may also turn in strong performances based on their behaviour in past periods. We also identify a number of industries as likely to underperform, including machinery and equipment, textile, and petroleum product manufacturing. A revised industry ordering is shown in Table 3.

Manufacturing is generally quite dispersed across Canada, with most major industries having at least some presence in every province. Clearly though, some regions have higher concentrations of certain industries than others. The predicted over/under-performance of the different manufacturing industries will thus have a direct impact on the likely economic performance by province in 2016/2017.

CHART 8. SOME PROVINCES MORE EXPOSED TO OUTPERFORMERS THAN OTHERS



Source: Statistics Canada, TD Economics. AT: Newfoundland and Labrador, Nova Scotia, New Brunswick, and Prince Edward Island

Examining the regional composition of industry, and weighting by industry size, we calculate the share of outperformer industries in each province, net of underperformer industries (Chart 8).[9] Three provinces stand out as having a particularly favourable composition – B.C., Quebec, and Ontario. British Columbia performs particularly well on this measure with significant wood and paper products industries, and a relatively small share of underperformer industries; virtually no petroleum products are manufactured in the province. The more diversified manufacturing base in Quebec and Ontario result in a smaller, but on net, a positive share of outperformer industries, as plastics and rubber producers, fabricated metal, and chemical manufacturers are well represented in these provinces.

Beyond these outperformer industies, Ontario and Quebec both benefit from sizeable transportation equipment manufacturing sectors. Within Ontario, the sector skews towards automotive production. While auto assemblers may not see any immediate gains due to the cross-border integration of supply chains, parts suppliers are likely to benefit from lower input costs, and as well as potential supply chain re-alignment with time. For Quebec, transportation equipment production is more oriented towards aerospace, and has a much more uncertain outlook given the product-driven nature of the industry. That said, the sector still stands to gain from price competitiveness and improving foreign demand.

In contrast, Alberta stands out due to its high share of petroleum product manufacturers, as well as a high concentration of machinery and equipment producers. It should be noted that Alberta also has the highest relative concentration of fabricated metal and chemical producers, but the size of

the petroleum products sector outweighs these pockets of potential strength. On balance, the regional distribution of expected over and under-performing industries is consistent with our outlook for provincial growth.[10] British Columbia, Ontario and Quebec are all forecast to see above-average growth, while Alberta and Saskatchewan are likely to be laggards over the near-term.

Bottom line

The outlook for Canadian manufacturers is somewhat upbeat, but as in all things, there are likely to be both outperformers and underperformers within the sector. Our analysis suggests that there are several industries that are poised to do well in the current environment, notably wood products, plastic and rubber products, and furniture manufacturers. Additional industries may gain from the reorientation of supply chains to favour domestic sources, with chemical product and primary metal manufacturers likely to benefit. However, this reorientation will take time, and so it will take longer for growth to feed through to these industries. Primary metal manufacturing also outperformed during similar historic periods, reinforcing the positive outlook for this sector.

Caution is warranted when considering the aggregate manufacturing outlook however, as our outperformer industries represent only about 22% of current manufacturing output, although this share rises to more than 35% when chemical and primary metal products are included.

Just as the outlook by manufacturing industry varies, so too do the implications for regional growth. B.C., Ontario, and Quebec all appear well placed to gain from the outperformer industries. In contrast, Alberta and Saskatchewan have high concentrations of industries identified as likely underperformers, which weigh down their outlooks.

The evolution of manufacturing is likely to occur in three phases - initially, growth will be led by outperformer industries. This growth will translate into more industries with time via supply chain re-orientation. Finally, we expect sales growth to translate into increased investment, although this phase will likely not occur for some time. Clearly, manufacturing will be key determinant of Canadian economic growth over the coming years.

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End Notes

1. We also include a price index as we are using nominal sales data. Including this index helps us strip out the impact of price increases, but does not have a meaningful interpretation for the sector outlook. As a result, we exclude it from further discussion.
2. We allow the lag structure to vary by industry, and by regressor.
3. See Failure To Launch: Canadian Exports and Structural Headwinds.
4. See Department of Foreign Affairs, Trade and Development - Chemicals and Plastics, Canada's competitive advantage
5. Although gross capital stock is an admittedly crude measure, the trend is nevertheless informative.
6. See http://www.bankofcanada.ca/2016/01/life-after-liftoff-divergence-u-s-monetary/
7. See our December 2015 Quarterly Economic Forecast.
8. Due to data constraints, we are unable to consider the mid-1980s period, the other logical comparator.
9. As a result of data suppression at the industry-by-province level, for a number of provinces we have inferred manufacturing output. As we are considering overall shares (rather than trends at the provincial level by industry), this does not materially affect our results.
10. See our January 2016 Provincial Economic Forecast.

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