BANK OF CANADA
BANQUE DU CANADA

Remarks by Lynn Patterson
Deputy Governor of the Bank of Canada
Edmonton Chamber of Commerce
Edmonton, Alberta
30 March 2016

Adjusting to the Fall in Commodity Prices: One Step at a Time

Introduction

Good afternoon. Thank you for inviting me here today.

It's a pleasure to be in Edmonton and speaking to the Chamber of Commerce.

When I accepted this invitation, it took me all of about 10 seconds to decide what my topic would be: the impact of lower commodity prices on Canada's economy, which is important to all of us.

As business leaders in Alberta, you know this better than most because you are experiencing it first-hand.

At the Bank we have committed a lot of resources to understanding the impact on the economy of the drop in prices, and so I thought it would be helpful to share some of our insights, from a macro perspective, into the adjustment we are facing.

Oil prices alone are down by well over 60 per cent since the highs we experienced in mid-2014. Given the supply dynamics that we are currently faced with, it is highly unlikely that we will see those levels again in the coming years.

While this price drop is affecting all Canadians, it is being felt most acutely here in Alberta and other oil-producing regions. We at the Bank are well aware of the toll this is taking on firms and the hardship it means for many individuals and families. Yet the message that I want to share with you today is that Canada's economy is diverse and dynamic enough to achieve, in time, a new balance of economic growth.

I would like to thank Rhys Mendes for his help in preparing this speech.

Not for publication before 30 March 2016
14:20 Eastern Time

While energy and other commodities will continue to play a very important role in the domestic economy, we don't expect that they will account for as large a share of our exports as they did in the recent past.[1]

I want to focus on three key questions that are top of mind for us at the Bank and, most likely, for many of you.

First, how do we assess the impact of this shock?

Second, how will the economy adapt and how long will it take?

And third, what will the economic landscape look like when it's done?

In answering these questions, I will highlight a simulation of the commodity price shock that we ran through one of our economic models to help us understand the implications for the economy. I will also describe in some detail the insights into the adjustment process that the model gave us.

Let me begin with some context.

Context: Impact of the Commodity Boom on Canada

A broad-based boom in global commodity markets began in the early 2000s. It was fuelled by growing demand from emerging-market economies. Canada was a big beneficiary of the rising prices. Our terms of trade—the price of our exports relative to that of our imports—improved substantially. So did our real gross domestic income (GDI), which is a measure of the purchasing power of income generated in Canada. The terms of trade directly boosted GDI by approximately 7 per cent between 2002 and 2013.[2] Rising commodity prices also boosted economic activity, particularly business investment, which generated job growth in the natural resource sector. In 2014, business investment in the oil and gas extraction sector peaked at almost $80 billion.

As commodity prices and Canada's terms of trade improved, the Canadian dollar strengthened. From a low of about 62 cents U.S. in 2002, the dollar rose to average around parity between 2010 and 2013. This increase was not merely coincidental. In addition to the improvement in our terms of trade, other factors, such as international interest rate differentials and safe haven flows, were at play. All of these elements influenced the level of the Canadian dollar.[3]

---

[1] As of 2015Q4, commodities accounted for 41 per cent of our exports, roughly one-third of which were energy products.

[2] Growth in real gross domestic income reflects both growth in real GDP and improvements in the terms of trade. Between 2002 and 2013, GDI increased by about 30 per cent. Of that increase, 7 percentage points are attributable to the *direct* effects of changes in our terms of trade. The remainder reflects growth in real GDP. Of course, higher commodity prices also contributed to GDP growth during this period. Thus, the improvement in the terms of trade *indirectly* raised GDI through this channel.

[3] The changes in our terms of trade fuelled the increase in demand for Canadian dollars through two channels in particular. Firms that sold their Canadian-produced commodities on world markets were paid in U.S. dollars, some of which they used to purchase Canadian dollars to pay for wages, dividends, inputs and capital expenditures. In addition, higher commodity prices increased foreign investor interest in the securities of Canadian firms, most of which are denominated in Canadian dollars. For a more detailed discussion, see S. S. Poloz, "Life After

In this environment, Canada's flexible exchange rate helped to prevent the economy from overheating. As the Canadian dollar appreciated, it became a headwind for some industries in the non-commodity export sector. This, in turn, reinforced incentives for capital and labour to shift to commodity-producing sectors and regions. Indeed, workers migrated in large numbers to regions of the country that were benefiting from job creation in the natural resource sector. The oil boom in Alberta provides the strongest example. Between 2002 and 2013, more than a quarter of a million people moved here from other provinces. We also saw the number of workers commuting to Alberta double during this period, rising to about 8 per cent of the province's workforce.

Assessing the Magnitude of the Shock

I'm sure many of you felt the benefits of higher commodity prices. You likely witnessed changes in your neighbourhoods and city. But, by late 2014, you may have begun to feel a cold wind blowing.

With the significant decline in commodity prices, the economy was faced with a material shock.

Let me turn to my first question: how we assess a shock such as this.

The Bank uses a variety of analytical tools and sources of economic intelligence to better understand and assess the impact of shocks like this one. Some of our tools, such as our *Business Outlook Survey*, help us identify near-term impacts, including changes in business investment. Others help us look at a longer horizon.

The recent oil price drop merited particular attention, not only because of the size and speed of the decline, but also because of the relative importance of oil production and investment. As oil prices began to fall, we closely monitored announcements of capital expenditures. We also analyzed the impact of past oil price shocks on investment and we talked with firms in the energy sector to understand how they were responding to the price decline. The picture that emerged was of a sizable contraction of investment in the oil and gas sector in the near term.[4] And so in January 2015, and again in July, concerned about the impact of lower oil prices and the risks to inflation, and to facilitate the economy's adjustment to its new circumstances, we lowered our policy rate.

For insights into the longer horizon, we ran a simulation of the shock in our workhorse model, the Terms-of-Trade Economic Model (ToTEM).[5] A paper that we released with our January *Monetary Policy Report* has all the details.[6] ToTEM is designed to capture the impact of terms-of-trade shocks, which is a necessity

---

Liftoff: Divergence and U.S. Monetary Policy Normalization" (speech to the Mayor's Breakfast Series, Ottawa, 7 January 2016).

[4] Indeed, around $28 billion in oil and gas sector investments, or over 35 per cent, evaporated in 2015.

[5] The simulation looked at the adjustment process over a 5-year period, unlike our forecasts, whose typical projection horizon is 18 to 24 months.

[6] J. Champagne, N. Perevalov, H. Pioro, D. Brouillette and A. Agopsowicz, "The Complex Adjustment of the Canadian Economy to Lower Commodity Prices," Staff Analytical Note 2016-1, Bank of Canada, 2016.

for analyzing an economy such as Canada's that is so heavily engaged in international trade.[7]

ToTEM is fed data on everything from consumer spending to household wealth, labour markets, wages, imports and exports, long- and short-term interest rates, business investment and government spending. The model helps us understand how these components interact in response to shocks. It also allows us to explore the linkages between the commodity and non-commodity sectors, as well as how the exchange rate and monetary policy facilitate adjustment to shocks.

The ToTEM simulation provided insight into how a fall in commodity prices would affect the broader economy. The shock is complex because it sets in motion several, seemingly non-synchronous forces: on the one hand, it indicated that our resource sector would shrink and we would earn less income from the rest of the world; on the other hand, the non-resource sector would gradually begin to expand. At the same time, the Canadian dollar would depreciate.

A front-loaded restructuring of the resource sector

By convention, we assumed for the simulation that commodity prices would remain roughly where they were at the time (the third quarter of 2015), when West Texas Intermediate was trading at about US$46 per barrel, almost 60 per cent below its peak in June 2014.[8]

Our simulation suggested that, by the end of 2015, the commodity price decline would cause GDP to be 1 per cent lower than it otherwise would have been.

And that's what happened. As investment fell, firms cut their workforces. You all likely have friends, neighbours or colleagues who were affected by the cuts. By December of last year, about 30,000 jobs had been lost in the mining, oil and gas extraction sectors in Alberta, Saskatchewan, and Newfoundland and Labrador, a decline of almost 20 per cent from the employment peak in 2014. But supply-chain linkages and spillovers to other sectors meant that the losses were much broader: almost 70,000 jobs disappeared in these provinces.

Regional divergences also emerged. While employment in these energy-producing provinces fell, it grew in the rest of Canada. As a result, unemployment rates rose by roughly 2 to 3 percentage points in the three provinces while remaining flat or declining in British Columbia, Ontario and Quebec.

The employment decline in the resource sector also had an outsized impact on national aggregate earnings. Not only do these jobs pay well, they also tend to call for longer work days and, therefore, a greater number of hours worked. For example, in 2014, average hourly earnings and average hours worked in the resource sector were, respectively, about 40 per cent and 25 per cent higher

---

[7] P. Fenton and S. Murchison, "ToTEM: The Bank of Canada's New Projection and Policy-Analysis Model," *Bank of Canada Review* (Autumn 2006): 5–18; and J. Dorich, M. Johnston, R. Mendes, S. Murchison and Y. Zhang, "ToTEM II: An Updated Version of the Bank of Canada's Quarterly Projection Model," Technical Report No. 100, Bank of Canada, October 2013.

[8] In fact, our research shows that this simple "no change" assumption is generally about as good as those produced by sophisticated models or futures markets. However, we believe that, over the medium term, there are upside risks to this assumption.

than the national average. Our simulation suggests that the commodity price shock will cause aggregate earnings to be almost 2 per cent lower than they otherwise would have been by the middle of this year.

Broader income and wealth effects

The retrenchment in the commodity sector is the first and most visible step in the adjustment process. Over time, the losses in income and wealth associated with the price decline will spread across the country.

As I mentioned earlier, our terms of trade improved substantially in the 10-year period before commodity prices began to fall. We have now lost about half of those gains. Measured at annual rates, this represents a loss of more than $60 billion in national income, or about $1,800 for every Canadian.

This drag on household spending was initially small, because the restructuring in the commodity sector has been fairly concentrated and the monetary stimulus from the Bank's interest rate cuts last year helped support the broader economy. But the impact of lower real incomes is gradually building. We expect it to become the dominant source of drag on the economy by 2017. As their wealth and incomes decline, households will likely restrain their spending and we will see lower, but still positive, consumption growth.

How Is the Economy Adapting?

Now that I have given you some numbers around the impact of the oil price shock on the Canadian economy, let's turn to my second question: how long and what form the adjustment will take.

It is difficult for us to be precise about the timing of the underlying shifts in the economy. But our best guess is that the full adjustment will take longer than two years, our normal forecast horizon. Having said that, we have a few clues that can help us to frame the timeline.

First, in examining labour markets, we see an interesting development that suggests we may be adjusting to the economic shift more quickly than we have historically.

In the past, regional shocks would have led to a persistent divergence in employment rates across provinces. Between 1976 and 1997, the average difference between employment rates in any one province and the national rate was 5.5 percentage points. This was much higher than the corresponding gap in the United States.

But the gap in Canada has now shrunk to U.S. levels, below 4 percentage points, as we explain in a staff analytical note posted on our website today.[9] While this is just one indicator of labour mobility, the convergence suggests that Canadians have become more willing to move to where the jobs are. That may mean that regional labour markets will adjust more quickly to the decline in commodity prices. Indeed, we are already seeing shifts in migration patterns. Net

---

[9] D. Amirault and N. Rai, "Canadian Labour Market Dispersion: Mind the (Shrinking) Gap," Staff Analytical Note 2016-3, Bank of Canada, 2016.

interprovincial migration to Alberta reversed in the fourth quarter of 2015. At the same time, over the past two quarters, Ontario registered the largest inflow of interprovincial migrants since 2002.

In addition, the flow of workers who were commuting from their homes in other provinces to Alberta has fallen sharply.[10]

A second clue is the close but imperfect link between our terms of trade and the value of our currency. It is no surprise that the value of the Canadian dollar has fallen along with commodity prices. Since late 2011, when some commodity prices first began slipping, the Canadian dollar has lost almost one-third of its value. While many factors influence the exchange rate, its depreciation, which will certainly hurt some businesses, is a necessary part of the adjustment process.

The weaker dollar acts as a buffer for Canada's exporters. It offsets part of the drop in U.S.-dollar commodity prices, softening the blow to the Canadian-dollar revenues of commodity exporters. Similarly, the depreciation boosts the Canadian-dollar revenues of non-commodity exporters that price their goods in U.S. dollars.[11]

The weaker dollar also makes Canada's exports more competitive. We are already seeing some evidence of this increased competitiveness. In particular, export categories sensitive to the exchange rate have performed better than average. These categories include building materials, furniture, industrial machinery and equipment, and pharmaceuticals. The service sector also benefits. Tourism is surging: the number of foreigners travelling to Canada jumped 11 per cent in January compared with the same month last year. Film and television production is also enjoying a revival across the country—*The Revenant* was filmed here in Alberta. And in Vancouver more than 350 productions were shot last year, a record that surpassed 2014 by 40 per cent.[12]

Estimates from ToTEM and other models suggest that it typically takes up to two years for the full effect of exchange rate movements to be felt. Since the loonie fell by roughly 15 per cent against the U.S. dollar in 2015, more gains are coming to the non-commodity sector, consistent with the notion of a two-track economy. What we are witnessing is a reallocation of productive resources to the non-commodity sector.

And, of course, the resource sector is not standing still. We expect to see new efficiencies, further innovation and shifts in investments. For example, here in Alberta's industrial heartland, there are ongoing investments in upgrading and

---

[10] In 2015, many of these commuting interprovincial workers returned to their home province. Chartered aircraft passenger traffic at Fort McMurray International Airport, a proxy for this trend, fell by half between 2014 and 2015.
[11] S. S. Poloz, 7 January 2016.
[12] http://mayorofvancouver.ca/news/2015-record-year-television-and-film-vancouver

processing that will help diversify the mix of products from your natural resources.

What Will the Landscape Look Like After the Adjustment?

Now, let me turn to the last question I posed at the outset: what the economic landscape is likely to look like after these adjustments have worked their way through.

Again, although we can't be precise about the timing, we expect that, several years from now, the Canadian economy will have found a new balance. Our simulation suggests that the share of the commodity sector in the economy will decline toward its pre-boom level. By 2020, the sector could account for roughly 40 per cent of exports, compared with about 50 per cent in 2014. Similarly, the sector's share of business investment could fall to 40 per cent, compared with 56 per cent in 2014.

Lower commodity prices will lower incomes and are likely to lower the economy's potential output. This is the result of a number of factors, primarily the drop in investment in the resource sector, but also the rise in the price of imported capital, which negatively affects investment in all industries. With less investment, the country's stock of capital will be smaller than it otherwise would have been, lowering the economy's productive capacity.[13]

The extent to which potential GDP is permanently lower will depend on how much capacity is rebuilt in the non-commodity sector. As well, low oil prices could spur companies to innovate and achieve greater efficiencies in their production cycles. We are studying these questions now and will update our estimate of potential output in our April *Monetary Policy Report*.

Assumptions and Assessments

While our modelling exercise laid out a plausible longer-term scenario for the economy, it is subject to many assumptions. Three are worth noting: (i) the magnitude—whether we have accurately assessed the extent of the declines in business investment; (ii) the timing—both with respect to the pickup of non-commodity exports and the reallocation of labour; and (iii) our assumption of flat oil prices.

Let me say a few words about our oil price assumption.

In the near term, the risks to oil prices appear to be balanced. While elevated inventories still represent the main downside risk, we now have an upside risk in the form of a faster-than-expected decline in U.S. oil production.

---

[13] The reallocation of labour across sectors will also have an impact on potential. The *level* of labour productivity in the commodity sector is higher than the average for the rest of the economy. So, in the near term, the reallocation of labour away from the commodity sector will be a drag on productivity growth. However, the non-commodity sectors of the economy have tended to have a higher rate of labour productivity *growth*. Thus, in the longer run, the reallocation may support productivity growth.

In contrast, over the medium term, the risks remain tilted to the upside. The significant reductions in oil investment since late 2014 could leave future increases in global demand unmet, putting upward pressure on prices and drawing investment back into the sector. The level of prices that would balance the oil market in the medium term is still highly uncertain, particularly since technical improvements and other efficiency gains by oil-producing firms have lowered their costs of production.

Moreover, as we highlighted in the January *Monetary Policy Report*, low oil prices make it more likely that adverse threshold effects on economic activity may occur. If prices fell to such a low level that firms struggled to cover their ongoing costs, consolidation could accelerate, resulting in more-pronounced declines in production and weighing on the broader economy by hurting demand and confidence.

Conclusion

Let me conclude.

Our simulation of the commodity price shock is just one example of how we assess the various factors influencing the Canadian economy. Examining the shock in isolation enhances our understanding of its potential influence on our outlook for inflation. We consider this type of analysis, together with many other inputs, when we set monetary policy. As we note in our *Monetary Policy Report*s, we conduct a rich analysis around our projections and identify risks to the inflation outlook. This analysis acts as the foundation for Governing Council to assess and exercise its judgment about the appropriate stance for monetary policy.

Earlier this month, we left our policy rate unchanged at 0.5 per cent, since the economy was evolving broadly in line with our expectations and projections set out in January—about 1.5 per cent GDP growth in 2016 and 2.5 per cent in 2017. In our April *Monetary Policy Report*, we will update this forecast and take into account the fiscal measures that were announced last week.

We are mindful that the changes to our economy that are under way are, and have been, difficult, particularly here in Alberta. Adjustments to large negative shocks take time. Although painful for many, the shifts are signs of a dynamic economy.

We are fortunate that Canada’s wealth is based on a broad set of natural and human resources and that the growth of our economy is powered by a wide range of industries. To make the most of our opportunities as a trading nation, we need to let the adjustment process unfold as effectively as possible. It won’t be easy and it will take time.

For the Bank, the best contribution we can make is to set policy that will help keep inflation low, stable and predictable, so that Canadians can plan and invest with confidence. And as business and community leaders, you can help by being proactive and innovative in your respective fields.