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The Meaning of "Data Dependence": An Economic Progress Report

Introduction

I am always happy to be here in St. John's, a unique corner of our country. Given the city's geography, its history and rich culture, those of you who get to call St. John's home are fortunate, indeed.

The idea of "home" is a preoccupation for us at the Bank of Canada. We have been working since the global recession almost a decade ago to bring the Canadian economy home. What I want to do today is give you a sense of how far the economy has come and how much further it has to go, and talk about some signs to watch for along the way.

The goal of our monetary policy is to keep inflation low, stable and predictable. Under the terms of the agreement between the Bank and the federal government, we aim for an annual rate of consumer price inflation of 2 per cent. Of course, unforeseen events can always push inflation up or down. So, our agreement sets out a target band of 1 to 3 per cent.

What do I mean by "home"? For us, home is at the intersection of full capacity and 2 per cent inflation. We expect that when the economy reaches full capacity, inflation will converge on the 2 per cent midpoint of the target band. That is why we are so preoccupied with the idea of home.

Our adjustments to interest rates affect economic activity, which affects the gap between the level of output and full capacity, which in turn affects inflation. However, there is an important consideration that sometimes gets lost: this process takes time. Any change in interest rates will not have its full impact on inflation for about a year and a half to two years. So, when we make our monetary policy decisions, we are less concerned about the latest inflation numbers—which are already a month old—than we are about where inflation will be in the future.

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Forecasting Inflation: Data, Sentiment and Intelligence

That brings us to the question of how to forecast future inflation. The place to start is with economic models. Models are indispensable for developing forecasts of inflation and the rest of the economy. However, no central banker would ever base a monetary policy decision solely on a projection from an economic model. Models provide us with a coherent starting point, but we need to apply real-world judgment before reaching a policy decision.

A lot of this judgment comes from conversations with people. Earlier this year, Deputy Governor Lynn Patterson spoke about how the Bank gleans intelligence from financial markets. Equally important are efforts to gauge business sentiment—sometimes called “soft data”—and to gather intelligence about the real economy from business leaders. We need to understand the view from both Main Street and Bay Street to help inform our outlook for growth and inflation. This is where our regional offices, staffed by people who routinely visit companies across the country, play a vital role.

One of the most important vehicles for these efforts is our *Business Outlook Survey* (BOS), which is celebrating its 20th anniversary this year. The informal process for these visits began when I was at the Bank in the early 1990s. In fact, the first time I visited St. John’s was to do some of those consultations. Through our surveys and conversations with business leaders, we regularly get clues about economic trends before they show up in the official economic statistics.

Let me illustrate. The roughly 50 per cent drop in oil prices during 2014 represented a cut of roughly $60 billion per year in export revenue for oil producers. Some of the impacts of this cut were immediately obvious and predictable. We knew oil-intensive regions would be hurt by the drop in income and that oil companies would reduce their spending. Certainly, the people of this city and province are aware of the pain caused by the oil price shock.

However, the BOS taken late in 2014, together with additional discussions we had with energy companies, revealed warning signs that went well beyond the decline in business investment. For example, companies in this region told us that they were being flooded by résumés of workers returning from Alberta. Service firms, such as hotel and trucking companies, told us about bookings being suddenly cancelled. Energy-service companies told us that previously signed contracts for construction and exploration work were being renegotiated, or even terminated.

So, well before the shock started to show up in the statistics, we could see that it would have a significant negative effect on the Canadian economy and the outlook for inflation. This was crucial to our decision to lower interest rates in January 2015. And, as companies cut their investment intentions further, we lowered interest rates again the following July.

To be clear, our economic models correctly predicted that the collapse in oil prices would be a serious blow. Specifically, our main policy model gave us invaluable insights into how the shock would affect the economy and how the subsequent adjustments would unfold. But the fact that everything we were hearing was supporting these insights increased our confidence that cutting rates was the right course of action.

Adjusting to Lower Oil Prices

Obviously, the drop in oil prices was a significant detour for the Canadian economy. We knew that the shock would trigger a complex series of adjustments and create significant hardship for many people.

Basically, our models projected that the economy would go through the reverse of its experience in 2010–14, when high oil prices led to strong increases in business investment and national income. Provinces where the energy sector is relatively more important, such as Newfoundland and Labrador, would feel these effects most acutely. This underscores one of the fundamental challenges for policy-makers, that economic shocks can have very different effects across Canada's regions.

In terms of adjustments, we anticipated that lower oil prices would mean not only a decline in the energy sector, but also a pickup in growth in the non-energy sector. We expected exports to be boosted by a lower Canadian dollar. And, as exporting companies reached their capacity limits, we expected to see business investment increase. Stronger exports and investment would complement household spending, and growth would become more broadly-based and self-sustaining.

Certainly, adjustment in the energy sector has been painful. Beyond cuts to investment spending, oil companies restructured operations and laid off workers. Employment in the resource sector fell by roughly 50,000 jobs from the beginning of 2015 to the middle of last year. Despite this, companies boosted production and exports of crude oil as earlier investments were completed and as they found greater efficiencies. And, since oil is priced in US dollars, the decline of the Canadian dollar also helped cushion the impact of the shock. The increased output and weaker currency helped to offset almost half of the $60 billion decline in revenue from oil shipments, boosting exports by about $25 billion.

That said, Canada's other exports took longer to recover than we anticipated. Exporting companies had taken a significant hit both during and after the global financial crisis. Many disappeared, to be replaced over time by new firms exporting new goods and services. As a consequence, the composition of Canada's exports has also changed since the crisis. Exports of services in categories such as technical, travel, financial and management services, have taken the lead, while some traditional goods, such as motor vehicles and parts, have seen their shares decline. By mid-2016, non-energy exports had fully recouped their previous drop, and today, total exports are almost 10 per cent above their pre-crisis peak.

Monetary policy has played a key role in this adjustment. We estimate that if we had not lowered our policy rate in 2015, the economy would be roughly 2 per cent smaller today—a difference of almost $50 billion—and there would be about 120,000 fewer jobs. Government fiscal stimulus measures also contributed importantly to growth, and this has meant a better mix of monetary and fiscal policy. Without this fiscal stimulus, interest rates would have had to have been even lower than they were. All things being equal, this would have meant even more household debt and an increased longer-term vulnerability for the economy.

As we look ahead, we project that business investment will be a key driver of economic growth. Business investment has also been slower to materialize than we expected, but it has been strong across the board over the first half of this year. Further, in our most recent BOS, our regional staff found that companies were more focused on expanding capacity than they were previously. Indeed, businesses across an increasing range of sectors say they expect sales growth to improve further, and hiring intentions have reached a record high.

Given all this evidence, we could see by the beginning of summer that the economy's adjustments to lower oil prices were essentially complete. To be clear, the impact of the shock was still visible in energy-intensive areas of the country. But this was being offset at the macro level by greater strength in other areas.

So, in July, and again earlier this month, we raised our key policy interest rate. Between those two rate hikes we saw a long string of stronger-than-expected economic data, culminating in the GDP report at the end of August that showed an annual growth rate in the second quarter of 4.5 per cent. As we noted in our most recent interest rate announcement, this pace is unlikely to be sustained, and recent data point clearly to a moderation in the second half of the year. Still, the expansion is becoming more broadly-based and self-sustaining, and it is important to remember that it is the level of output relative to potential that drives inflation, not the growth rate. We are in the process of developing an updated forecast for growth and inflation, and it will be published in next month's *Monetary Policy Report* (MPR).

Risk Management

Despite the recent news about economic growth, the story of inflation in Canada over the past few years has been dominated by downside risks. Indeed, for most of the past five years, inflation has been in the bottom half of the target band. Bearing in mind the long lags between economic activity and inflation, much of this low inflation has been due to slow economic growth in the past. More recently, it has also reflected temporary factors such as weakness in food and electricity prices. In fact, inflation has been surprisingly soft recently in much of the developed world, not just Canada. I will have more to say about this in a few minutes.

Since inflation has been so consistently in the lower half of the target band, our risk-management approach to monetary policy led us to pay greater attention to forces pushing inflation down. This is because when inflation is already low, a negative shock to the outlook for inflation has more significant policy consequences than a surprise on the upside. Throughout, we wanted to be sure our policy would be sufficiently stimulative to get the economy home.

As the expansion continues, we will continue to manage the evolving risks to the inflation outlook. The temporary factors that have been holding inflation down should dissipate in the months ahead, although recent exchange rate developments could affect this timing. In our July projection, we forecast that inflation would reach close to 2 per cent by the middle of next year. Since that projection, the Bank's measures of core inflation have edged higher, as expected. We expect the downward pressure on inflation to shift to upward

pressure as economic slack is used up. Indeed, our models forecast a very slight overshoot of our 2 per cent target in 2019—a product of our model's dynamics.

The appropriate path for interest rates in this situation is very difficult to know, because there are a number of important unknowns around the inflation outlook. These unknowns are unusual, as they are mostly the product of the unusual nature of the situation we find ourselves in—the legacy of the global financial crisis, the protracted period of slow economic growth and extremely low interest rates, and so on. Accordingly, we need to keep updating our understanding of the economy in real time. That is why we say that the outlook for inflation, and therefore monetary policy, is particularly data dependent right now.

The Meaning of Data Dependence

What does it mean, in practical terms, to say that monetary policy is "data dependent"? After all, central banks always depend on data to measure their economy's progress relative to expectations.

What I mean in this context is that in a period of heightened uncertainty about how the economy is evolving and the implications for inflation, we need to pay very close attention to *all* the information we receive, including data, sentiment indicators and intelligence, and make continuous inferences about not just how the economy is evolving, but how its behaviour may be changing.

Let me give you four examples of the issues we will be monitoring.

The first, and most important, is the evolution of **economic capacity**. I said that our version of "home" is at the intersection of full capacity and 2 per cent inflation. But full capacity can be a moving target. This is because when companies increase investment, they augment their capacity to produce through some combination of raising their productivity and increasing their workforce. This is a welcome development because, as the economy approaches full capacity, investment spending can have the effect of pushing out those capacity limits, giving the economy more room to grow in a non-inflationary way. In short, this is something worth encouraging. To some extent, this happens at this point in every economic cycle, but the protracted cycle we have been through makes this issue particularly relevant this time around.

A second issue is the question of **inflation and technology**. Some economists have cited technology as contributing to the weakness in global inflation. The digital economy may be allowing goods and services to be produced and delivered more efficiently, helping to keep prices down. We may also be seeing stronger competition through e-commerce, which affects how retailers set prices.

It is worth emphasizing that this type of disinflation increases everybody's purchasing power and therefore is also a positive development. The Bank would want to estimate the impact of technological developments on trend inflation and, assuming the impact was temporary, see through it, provided that inflation expectations remained well anchored. There is a lot more work to be done to understand both the size and persistence of these effects.

A third issue is **wage growth**, which has been slower than would be expected in an economy that is approaching full output. Hourly wages increased at an annual pace of 1.7 per cent in the second quarter, and growth has been subdued for

months, although there were signs of an increase in the latest monthly employment report. The slow growth is likely due in part to employment shifting from higher-paying jobs in the oil sector to lower-paying jobs elsewhere. How long this effect will continue is not clear, and other phenomena may be at work. Again, we must work hard to understand the data, and the underlying shifts in behaviour they may be pointing to.

The fourth issue is **elevated household debt**. There is reason to think that interest rate increases may have more of an impact on the economy and inflation than they did in the past. Further, we do not yet know the full extent of the economy's reaction to various macroprudential measures aimed at imbalances in the housing market. So, the Bank will be looking closely to see how the economy's adjustment to changes in interest rates may differ from that in previous economic cycles.

This is not an exhaustive list. There are also many external risks and uncertainties around our outlook, including geopolitical developments and the rise of protectionist sentiment in some parts of the world. The evolution of the neutral rate of interest is also a topic of significant debate in the profession. We have been talking about these uncertainties for some time.

In such an environment, we simply cannot rely mechanically on economic models. This does not mean we are abandoning our models. It does mean we need to use them with plenty of judgment, informed by data, sentiment indicators and intelligence, as we go through the delicate process of bringing inflation sustainably to target. We will continue to watch all the data closely, as well as developments in financial markets, in terms of their impact on the outlook for inflation. We recognize that the economy may act differently than in previous cycles. We will not be mechanical in our approach to monetary policy.

Let me quickly make one final point. Among the financial market developments that we watch closely are movements in longer-term interest rates and the exchange rate. Changes in interest rates naturally lead to movements in the Canadian dollar. However, currencies can move for many other reasons, including external factors, and these movements can affect our inflation outlook, depending on their cause, size and persistence.

Conclusion

It is time to conclude. I hope I have given you an appreciation of just how far the economy has come on its way home. And although we are confident that the economy has made significant progress, we cannot be certain of exactly how far there is left to go.

The economic progress we have seen tells us that the moves we took to ease policy in 2015 were the right thing to do. At a minimum, that additional stimulus is no longer needed. But there is no predetermined path for interest rates from here. Monetary policy will be particularly data dependent in these circumstances and, as always, we could still be surprised in either direction. We will continue to feel our way cautiously as we get closer to home, fostering economic growth and keeping our inflation target front and centre.