

## Sheryl Kennedy: Dealing with uncertainty in the conduct of monetary policy

Remarks by Ms Sheryl Kennedy, Deputy Governor of the Bank of Canada, to the Montréal CFA Society, Montréal, 12 April 2007.

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Bonjour. It's great to be here to give you my best wishes as you begin preparations for the CFA Institute's sixtieth anniversary celebrations.

I want to speak to you today about dealing with uncertainty. I know you need to deal with uncertainty in your work as CFA charter holders. Uncertainty is also a fact of life for central bankers. To quote Alan Greenspan, "uncertainty is not just an important feature of the monetary policy landscape; it is the defining characteristic of that landscape."<sup>1</sup>

In my remarks today, I'll discuss the uncertainty inherent in monetary policy-making, and explain the strategies we at the Bank of Canada use to deal with that uncertainty. I should emphasize that the uncertainty I'll be speaking about relates to the models, indicators, and data we use to conduct monetary policy, *not* to what we call "risks" to the economic outlook – that is, possible outcomes around our "base-case" projection. To make my remarks concrete, I'll refer to how we estimate the potential output of the economy. But first, I think it would be useful to provide a brief sketch of what monetary policy aims to achieve.

### What monetary policy aims to achieve

The main goal of monetary policy is to help the country achieve strong, sustainable economic performance, and, in doing so, to contribute to rising living standards for Canadians. Experience has shown that the best way for a central bank to meet this goal, given the instruments at its disposal, is by keeping inflation low and stable. Low and stable inflation increases confidence in the future value of money, and allows for clear price signals. These benefits, in turn, help consumers, savers, and investors to make sounder economic decisions. The Bank of Canada has a clear inflation objective, and that is to keep the annual increase in the consumer price index as close as possible to 2 per cent. That objective, together with our transparent framework for how we go about achieving it, helps to anchor inflation expectations, and adds a significant amount of certainty to the economic and financial environment.

An important element of controlling inflation and promoting sustainable growth is keeping the economy operating in line with its production capacity. For the central bank, this means getting a good reading on this capacity, which we call the economy's *potential output*. Potential output is not directly measurable. And it changes over time with changes in productivity, the capital stock, and the composition of the labour force. So, as we try to keep demand in balance with the economy's capacity to produce at a sustainable pace, the Bank is dealing with variables that are both hard to measure and evolving.

When aggregate demand pushes the economy beyond its capacity limits, thus threatening to raise inflation above target, the Bank will – all things being equal – raise its policy interest rate. And, in symmetric fashion, when unused capacity puts downward pressure on inflation, threatening to push it below the target, the Bank will – all things being equal – lower the policy rate.

Of course, there's a lot packed into that phrase, "all things being equal."

One complication involves persistent movements in relative prices, which can affect inflation. For instance, a trend reduction in the prices of imported consumer goods puts direct downward pressure on inflation, since the prices of these goods are included in the consumer price index. This, in turn, provides scope for the economy to operate at a higher level than would otherwise be the case.

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<sup>1</sup> A. Greenspan. "Monetary Policy under Uncertainty." Remarks made at a symposium sponsored by the Federal Reserve Bank of Kansas City in Jackson Hole, Wyoming, August 2003. Available at: <http://www.federalreserve.gov/boarddocs/Speeches/2003/20030829/default.htm>.

A second complication is the time lag between a policy action and its effects. While a change in the policy rate can begin to affect output fairly quickly, it typically takes 18 to 24 months for the full effects to be felt on inflation, and that means that the Bank has to be forward looking and base its decisions on projections of *future* pressures on inflation. It also means that a large part of what we're doing as we deliberate on the appropriate interest rate setting is trying to look through the "noise" of the moment to get a sense of the underlying trends. We need to look through short-term, temporary volatility that will have disappeared by the time our actions have an effect on inflation.

A third and related complication arises when a shock hits the economy. Beyond the initial element of surprise, there can be uncertainty about the magnitude of the effects of the shock, about how the economy will be affected, and about how long the shock will last.

Try to imagine steering a ship. The ship's captain needs to regularly ascertain the ship's current location by means of various instruments and readings, scrutinize the charts to see whether there are any obstacles ahead, and then apply judgment to determine the best course to arrive safely at the destination. In like fashion, a central bank cannot directly see everything ahead, and so it must rely on models, data, and indicators, and then apply judgment to determine the best course for meeting the monetary policy objective. And the economy, like a large ship, takes time to respond to a change in course.

But unlike the precise instruments and readings available to the captain, our models, data, and indicators provide only approximate information. Models, data, and indicators are invaluable in informing monetary policy, but a good deal of uncertainty is inherent in them. By definition, models are simplifications of reality, and never entirely reflect the complexity of a dynamic economy. Our main indicators are derived from data, but the data we use are often subject to a good deal of revision. And for certain variables that are fundamental to conducting monetary policy – potential output is a good example – there are no direct measures at all. Our destination, however, remains clear: achieving the 2 per cent inflation target.

So, how do we at the Bank of Canada deal with the uncertainty inherent in the models, indicators, and data we use when conducting monetary policy?<sup>2</sup>

### **Responding to uncertainty**

As CFA charter holders, you'll be aware of Peter Bernstein's writings on risk. His advice is to treat uncertainty as a "friend" – "with care, consideration, and attention to consequences."<sup>3</sup> And that's the bottom line for the Bank of Canada, too. We treat uncertainty about our models and data – and the risks to the outlook as well – with care, consideration, and attention to consequences.

Again, consider the captain of a ship. Like the captain, we need to know first where we are *now*. That means knowing, among other factors affecting inflation, the current level of output relative to potential. To do this, we first run our models for potential output with the most recent data and revisions, which brings us up to date on recent history. But we also look at a range of other data and indicators before coming up with a judgment about our current situation. Then we have to determine what lies *ahead*, which means that we try to determine the growth of potential output going forward, as well as the future growth rate of the economy and the trend for inflation. We use judgment to decide on a course of action, keeping in mind that the "ship" of the economy responds slowly to a change in the policy interest rate, and that there could be headwinds or tailwinds to deal with. And because we get monthly data on inflation and output, we can correct our course, if necessary, on subsequent policy interest rate announcement dates.

Let me expand on this. In conducting monetary policy, the Bank uses three main strategies to reduce uncertainty.

First, we *use a variety of models* to produce economic projections and to examine alternative assumptions about key variables. The use of multiple models helps to provide comprehensive

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<sup>2</sup> For further details on uncertainty in the conduct of monetary policy, see P. Jenkins and D. Longworth. 2002. "Monetary Policy and Uncertainty." *Bank of Canada Review* (Summer 2002). Available at: [http://www.bankofcanada.ca/en/review/2002/longworth\\_e.pdf](http://www.bankofcanada.ca/en/review/2002/longworth_e.pdf).

<sup>3</sup> P.L. Bernstein. 2006. "Risk: The Hottest Four-Letter Word in Financial Markets." In *Global Perspectives on Investment Management: Learning from the Leaders*, 221, edited by R.N. Sullivan and J.J. Diermeier. Charlottesville, VA: CFA Institute.

information and analysis, and helps to guard against policy errors that could result from relying on a single economic model. The models we use range from single-equation indicator models to multi-equation reduced-form models to dynamic stochastic general-equilibrium models, such as our newest model of the Canadian economy, ToTEM.<sup>4</sup>

The second strategy we use to reduce uncertainty is to *bring together a variety of information and indicators* before we make an interest rate decision. These include both quantitative and qualitative measures covering international and domestic economic developments, the regional business outlook, monetary and credit conditions, and the views and expectations of financial market participants. As we sift through this information, we try to look through the noise and discern fundamental trends. We look carefully at both corroborating and non-corroborating evidence.

Finally, we *apply judgment*. The Bank of Canada does this by means of a committee that debates the issues and comes to a decision. Interestingly, research suggests that the composition of a committee and the structure of a meeting can affect the quality of decision making, both in central banking<sup>5</sup> and elsewhere. The Bank's committee is called the Governing Council. It consists of the Governor, the Senior Deputy Governor, and four Deputy Governors. The Governing Council is advised by staff and by a Monetary Policy Review Committee, which looks at the evidence and the projections, and raises issues. Open discussion and debate are encouraged. Decisions benefit from the exchange of differing views among members – what James Surowiecki calls the "wisdom of crowds."<sup>6</sup> These differing views arise largely from different weightings of various aspects of the analysis presented by Bank staff. The Bank's clear goal – meeting the inflation target – helps to focus the deliberations. And with decisions made every six to eight weeks, there are frequent opportunities to take new soundings and adjust course.

A good example of how we apply these strategies is the way we estimate potential output. Potential output is important in understanding inflation dynamics over time, but, as I said earlier, it cannot be measured directly. We're not sure that our models fully capture potential output, especially when the economy is undergoing significant structural change. To add to the challenge, some of the data used in these models are frequently revised.

So, in addition to the readings we get from our models, we also consider a number of alternative indicators of pressure on capacity. These indicators include the rate of capacity utilization, measures of labour shortages, building vacancy rates, reports from our quarterly regional surveys of firms, and the recent behaviour of inflation relative to expectations. Of course we also consider more direct influences on inflation such as import prices, cost pressures such as wages relative to productivity, and inflation expectations.

I should also mention that we meet, on a regular basis, with a wide variety of business people to discuss their investment and hiring intentions, their costs and their pricing decisions, and any constraints they may be facing. The information we obtain from these meetings helps us to interpret the numbers and better informs our judgment.

Of course, the strategies I have mentioned complement one another. Taken together, they help the Bank to arrive at a comprehensive and balanced view of developments in the Canadian economy, the outlook for inflation, and the appropriate monetary policy action to keep inflation on target over the medium term.

## Conclusion

Let me conclude. In my remarks today, I've described how the Bank of Canada deals with the uncertainty that underlies the conduct of monetary policy. The task of monetary policy is, and is sure to remain, a challenging one, given the limits of understanding something as complex and dynamic as the modern, globally integrated economy.

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<sup>4</sup> See the *Bank of Canada Review* (Autumn 2006) for several articles on models used by the Bank. Available at: [http://www.bankofcanada.ca/en/review/rev\\_autumn2006.html](http://www.bankofcanada.ca/en/review/rev_autumn2006.html).

<sup>5</sup> See, for example, P. Maier. 2007. "Monetary Policy Committees in Action: Is There Room for Improvement?" Available at: <http://www.bankofcanada.ca/en/res/wp/2007/wp07-6.html>.

<sup>6</sup> J. Surowiecki. 2004. *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*. Toronto: Doubleday.

While dealing with uncertainty is a challenge for all central bankers, Canadians no longer have to worry about one form of uncertainty that plagued us in the 1970s and early 1980s: that of high and variable inflation. Canadians can be certain that the Bank of Canada will continue to direct its policy actions at meeting the 2 per cent inflation-control target, and thus contribute to the sustainable growth of the Canadian economy.

Uncertainty may indeed be the "defining characteristic" of monetary policy, but our clear inflation target, and our success in meeting it, give us solid ground on which to stand.