Discussion 2

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Introduction

I would like to thank all of you and especially the presenters, discussants, and my fellow panellists for making this conference a great success. You have given us much food for thought that will guide our research leading to the renewal of our inflation target next year.

I will focus my remarks on two themes—one related to the target itself, and the other to the challenges encountered in meeting the target.

Unfinished Business

Over the past 15 years, we have witnessed a significant reduction in inflation rates around the world. That is no accident. It reflects a generalized commitment among central banks to low and stable inflation, in recognition of the harm that high and variable inflation inflicts on the economy and of the unique responsibility that monetary policy has to keep inflation under control.

Inflation targeting has been quite successful in anchoring expectations and in dampening economic fluctuations, largely because of the transparency of communications that the framework encourages. In particular, the stabilizing properties of inflation targeting have not been limited to demand shocks (Blanchard's "divine coincidence"), but have extended to supply shocks as well. With inflation expectations well anchored, supply shocks have a one-off price-level effect; they no longer produce a trade-off between the output gap and trend or future inflation.

When it comes to communications, the Bank of Canada has not been reluctant to speak openly about the stabilizing properties of inflation control for output and to provide estimates of the output gap. The Bank has also made it clear, however, that a wide range of uncertainty exists around any estimate of the output gap and that the behaviour of inflation provides the ultimate gauge for estimating potential output.

The success of inflation targeting should encourage us to give serious consideration to making further progress towards price stability. The credibility acquired under the current regime should alleviate concerns about the potential transition costs associated with private sector learning.

At the time of the last renewal of the inflation target in May 2001, the Bank carefully examined the arguments for both a higher and a lower target. We concluded that sound theoretical arguments could be made to support a reduction in the target rate of inflation, but that it had thus far proven difficult to quantify the longer-term benefits of such a change.

Since then, the search-theoretic models developed by Shouyong Shi, Randall Wright, and others have increasingly been used to quantify the welfare gains from lower inflation under a variety of institutional set-ups. Kevin Moran takes a slightly different approach, focusing on a more conventional dynamic general-equilibrium (DGE) model, where inflation distorts decision rules for consumption, work, and investment plans, owing to a distinction between cash and credit consumer goods. The challenge for central bankers is to determine which set-up comes closest to the real world and, more importantly, to communicate the results in a way that can be understood by the public and that is convincing to the government.

One important benefit of lower inflation stems from the more efficient operation of the price system. As pointed out by Christopher Ragan, the only way to quantify this benefit is to build a computable DGE model with multiple sectors and relative prices. The model presented by Eva Ortega and Nooman Rebei is a good first step in that direction. The fact that the simulation results are puzzling—that, for example, targeting non-traded inflation dramatically increases the variance of total output though nonetheless resulting in large welfare gains—shows that we still have some work ahead of us.

As Ragan pointed out yesterday, long-run price certainty is too important an issue for us to dismiss price-level targeting without carefully considering its costs and benefits.

When the Bank first proposed studying price-level targeting at its 1993 conference, this was widely regarded as more of a curiosity than a real alternative for monetary policy. The lack of interest for price-level targeting

reflected the belief that it would induce more variability in inflation, output, and nominal interest rates. Since that time, price-level targeting has been gaining currency as a viable alternative. And I am delighted to see that Frederic Mishkin (one of the most pragmatic authorities on inflation targeting) is starting to warm to the idea of a price-level target.

Studies have found that when agents are forward looking and monetary policy is credible, price-level targeting can yield lower variability in inflation, output, and interest rates. The reason for this is simple. When an increase in demand raises the price level above target, the anticipation that prices will return to target will in itself raise the real interest rate and help curb demand, thus requiring a smaller reaction from nominal interest rates. The reverse holds for a contractionary shock. This gives monetary policy greater room to manoeuvre without hitting the zero bound on nominal interest rates.

In the case of supply shocks, however, the trade-off between output and price stabilization—which had disappeared under credible inflation targeting—may re-emerge under price-level targeting. The adjustment to a relative price shock—a one-off increase in oil prices, for example—would require a reduction in other prices. To assess the welfare and macroeconomic consequences of such adjustment under price-level stability, we need to develop richer multi-good models with heterogeneous degrees of price stickiness and cross-price elasticities of demand.

Policy Design

The second theme of my remarks is the design of policy. The Governor touched on several issues last night.

One is: How should we react to asset-price movements?

Using a model that allows for a financial accelerator in the propagation mechanism, Robert Tetlow suggests that monetary policy should react as much to stock-price changes as to inflation in goods and services prices. Given the high volatility of stock prices, that strikes me as giving them considerable weight. But Tetlow concludes that the gain from reacting to stock-price movements is marginal and that "a policy of pure inflation-forecast targeting does a reasonable and robust job," at least most of the time.

Now, *reacting to outcomes* is not the same as *targeting outcomes*. There is little disagreement in central banking circles about the case for monetary policy to react to asset-price developments in order to keep inflation on target. The question being debated is whether we should allow for a longer horizon to meet the inflation target when hit with a "non-fundamental"

asset-price shock, i.e., let inflation fall below target over the normal policy horizon to prevent a greater fall later when the bubble bursts.

While Tetlow does not directly address that question, his Figure 3 provides a suggestive answer. Under his proposed "optimal" reaction function, inflation is lower initially than under a pure inflation-forecast-based rule, but does not fall below target. It would be instructive to compare this outcome from an *instrument rule* with that from a *targeting rule*.

Given our limited ability to forecast economic developments much beyond 18 months and to foretell when a stock bubble will burst, the suggestion to trade off achievement of the inflation target over a 6- to 8-quarter horizon for a potential better outcome later strikes me as somewhat imprudent. I can see extending the risk analysis beyond the policy horizon, as suggested by Philip Lowe, but I find it difficult to conceive of a shock that would justify extending the policy horizon. This matter clearly merits more research.

A more vexing issue is the vanishing exchange rate pass-through. Why aren't exchange rate variations showing up in prices? Who absorbs them? And how do they affect the economy?

Steven Globerman and Paul Storer point to growing intrafirm and intra-industry trade as a source of reduced pass-through, given that exchange rate fluctuations have offsetting effects on the revenues and costs of firms. That factor could also explain the increased variability of exchange rates that puzzles the authors: larger variations are needed to achieve the required reallocation of resources if some sectors are insulated from exchange rate movements. That increased variability would then be part of the equilibrating process, not something for monetary policy to resist.

On the other hand, we also observe lower pass-through of other cost increases, such as energy and raw materials, and more variability of relative prices now that inflation is under control. Is there a link? This is another question that a richer multi-sector DGE model might be able to answer.

The last issue I want to address is reduced inflation persistence. An important breakthrough in the New Keynesian Phillips curve (NKPC) literature is the acknowledgement, following Kozicki and Tinsley (2003), of the roles played by central bank behaviour and by private agents' learning in the determination of inflation persistence. Ironically, while that work may have resolved the puzzle of excessive inflation persistence relative to the "forcing" variable, it has created a new puzzle: Robert Amano and Stephen Murchison now find much lower persistence of detrended inflation than real marginal costs. This raises questions about the assumptions that underlie the construction of the marginal-cost variable.

The more important question from the point of view of monetary policy, however, is: Have we become victims of our own success? With inflation close to a white-noise variable, what information does it provide about the output gap or future inflation? Both Armour (2006), for Canada, and Heath, Roberts, and Bulman (2004), for Australia, have found a dramatic deterioration in the ability of various measures of core inflation to predict future inflation. Thankfully, the paper by Amano and Murchison shows a ray of hope, in that their NKPC can outperform other popular models for forecasting inflation. However, given the somewhat arbitrary manipulations involved in extracting estimates of the so-called "deep" parameters, I would tend to agree with Sharon Kozicki that it may be premature to conclude that we have good models of inflation.

More importantly, while the NKPC framework may be a fruitful line of research, it doesn't provide a full explanation of inflation dynamics, for it focuses on the adjustment of prices to marginal costs but neglects the central Phillips curve relationship between demand pressure and wage increases. I was pleased that Bergljot Bjørnson Barkbu and Nicoletta Batini acknowledged this.

Conclusion

More research is needed on several key issues: (i) consideration of a lower inflation target or a price-level target; (ii) multi-good dynamic stochastic general-equilibrium models; and (iii) how we should run policy.

As we conduct research on these and other important questions, our knowledge will advance. This leads to my final point, which is the importance of periodic reassessments of the inflation-target agreement between the Bank of Canada and the Government of Canada in light of evolving information and research.

References

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