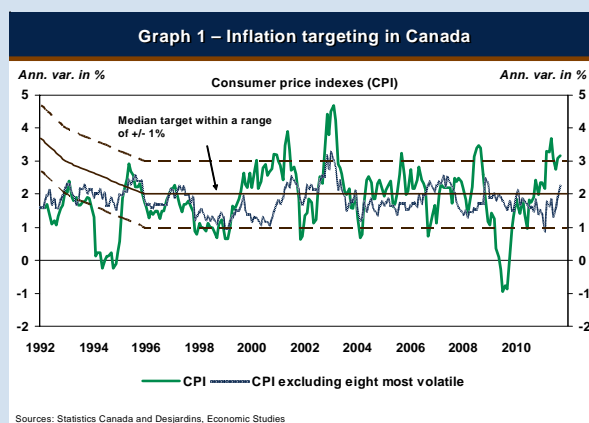


## Time for Canada to renew its 5-year inflation target Should we expect any changes?

Since 1991, the Bank of Canada (BoC) has had to set its monetary policy decisions based on an inflation target. For the first four years, the objective was to gradually reduce the inflation rate to 2%, a target that was reached much faster than originally expected. As of 1995, the BoC had to contain the annual change in the consumer price index (CPI) between 1 and 3% within a median target of 2% (graph 1). The Bank of Canada's mandate is reassessed on a regular basis. The Canadian government, together with the central bank, renewed the current target in 1998, 2001 and in 2006. A new decision must be made this November or by December, at the latest.

Although it is likely that the current mandate will again be renewed, various studies published by the BoC over the past years show that two other possibilities are being seriously considered. The first and relatively simple solution is to lower the inflation target. The second and more complex proposal calls for targeting price levels instead of price changes. This *Economic Viewpoint* revisits the usefulness of using inflation to set monetary policy and the reasons behind the 2% median target; it also presents the pros and cons of the two main avenues being considered by the BoC to replace its current target.



### WHY USE AN INFLATION TARGET?

Our experience in the 1970s and 1980s showed that high inflation is very costly for an economy and does not help reduce unemployment in any sustainable way. The consensus was that central banks should instead focus on ensuring low, stable and predictable inflation. Several central banks now base their monetary policy decisions on an inflation target. Canada, the euro zone, the United Kingdom, New Zealand, Australia and other countries have an official target for inflation; other countries, like the United States, seek to limit inflation without setting a specific target. In general, if the inflation rate is above its target, interest rates are increased to rein in the economy; conversely, when inflation is

running below the target, interest rates are cut to stimulate the economy.

There are many benefits to using a monetary policy that is based on an inflation target. Low, stable and predictable inflation allows consumers to better monitor prices on a variety of different products they can choose to consume. This allows consumers to make more insightful purchasing decisions, leading to a better allocation of resources and, by extension, a more efficient economy.

Low inflation protects the purchasing power of those whose incomes do not keep pace with rising prices; this is particu-

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larly true for seniors and others who receive government benefits or payments from private plans—these benefits and payments are not necessarily fully indexed to the cost of living.

Another advantage to targeting inflation is the lower cost of protecting from the uncertainty of future inflation. Interest rates over the medium and long term are generally lower in a credible inflation target regime, and both investment and consumption are better off as a result.

Lastly, a low, stable and predictable inflation rate is self-reinforcing since it influences inflation expectations. When businesses and individuals are confident that the inflation rate will be maintained at a stable level over the medium and long term, they do not react as quickly to short-term price fluctuations. Wage and price increases also tend to be steadier over time.

### SETTING THE TARGET AT 2%

Selecting a specific inflation target is not a simple thing to do. Several elements had to be taken into consideration in Canada before the median target of 2% was set. This rate was deemed neither too weak nor too high, based on what we knew then. Other central banks adopted this same target, but there are differences, both on the upside and on the downside. For example, the Reserve Bank of Australia preferred to set its inflation rate a little higher, within a target range of 2 to 3%, while the European Central Bank elected to aim for a lower inflation rate, but close to the 2% level (table 1).

**Table 1 - Inflation targets in advanced countries**

Countries and monetary zones	Inflation targets
Canada	2% +/- 1%
Euro zone	< 2%
United Kingdom	2%
Sweden	2%
Norway	2.5%
Switzerland	< 2%
Iceland	2.5% +/- 1.5%
South Korea	3% +/- 1%
Australia	2 to 3%
New Zealand	1 to 3%

Sources: Various central banks and Desjardins, Economic Studies

The difficulty of measuring inflation accurately, downward nominal wage rigidity and the lower bound of interest rates<sup>1</sup> all argue against setting the inflation target too low. Studies done by the Bank of Canada have shown that the Canadian

CPI usually overstates annual price advances by about 0.6%.<sup>2</sup> This bias in the numbers stems mainly from changes in consumption habits that are not captured by the CPI's benchmark consumption basket. This basket is only revised every four years. In the interim, consumers can therefore make significant adjustments to their consumption by opting for less expensive goods and services. A poor accounting of product quality and the growing market share of discount stores can also skew the inflation calculation.

With regard to the downward nominal wage rigidity, some economists believe that workers are more inclined to accept lower real wages when nominal wages are stable or continue to rise. The difference between changes in real salaries and nominal salaries is inflation. With an inflation rate of 2%, real wages decline as soon as nominal wage growth falls below 2%. This type of adjustment sometimes occurs when the unemployment rate is high and the economy is not running at full capacity. Once these types of adjustments are done, the economy usually swings back to full capacity more quickly, which is why it is so important to not hinder these adjustments by aiming for an inflation rate seen to be too low.

The issue of the lower bound is even more restrictive in the choice of an inflation target. The inability of central banks to lower their key rates to below zero can prevent them from providing enough economic stimulus. Some flexibility can be seen however when the problem is examined from the perspective of real interest rates, which are in fact, the nominal interest rates minus expected inflation. Higher inflation expectations weaken real interest rates and can even push them into negative territory. When governments set an inflation target, inflation expectations tend to converge toward the target. Selecting a higher target therefore increases the monetary authorities' leeway to cut real interest rates and stimulate the economy should the need arise. In Canada, the median 2% target technically gives the BoC free rein to drop real interest rates as low as -2%.

In contrast, there are arguments against setting an inflation target deemed too high. Experience tends to show that higher inflation makes it more volatile and harder to predict. In such situations, it becomes difficult for central banks to accurately anchor inflation expectations, which, by extension, erodes the advantages of an inflation target. Higher inflation would therefore generate fewer gains in terms of production and employment. Given this drawback, it is better to preserve the

<sup>1</sup> Central banks cannot lower their interest rates below 0%. In practice, this limit can even be slightly above 0% to make sure the interbank market is running smoothly.

<sup>2</sup> James ROSSITER, "Measurement Bias in the Canadian Consumer Price Index," Working paper, 2005-39, Bank of Canada, December 2005; Allan CRAWFORD, "Measurement biases in the Canadian CPI: An update," *Bank of Canada Review*, spring 1998, p. 39-54.

maximum money value by favouring a lower inflation target. A median inflation target of 2% appeared to be the midpoint in Canada. A range of +/- 1% gives the BoC some manoeuvrability in setting its monetary policy since it no longer has to react as soon as inflation shifts away from its median target.

### WHY CHANGE A WINNING FORMULA?

The BoC has managed to stick to its inflation target for the past 20 years, and Canada's economy has reaped the benefits. This does not mean, however, that things cannot be improved. The international economic and financial context is evolving and new economic theories and practices are emerging, pushing the BoC to occasionally review its methods with the federal government's approval.

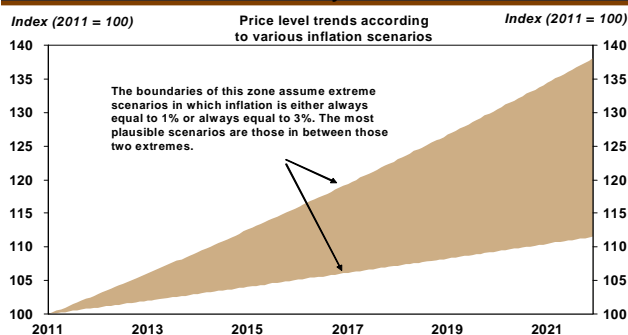
In 2006, the BoC launched a research program to study the potential benefits and costs of lowering the inflation target or switching to a price-level target regime. Several related studies have been published by BoC researchers over the past few years.<sup>3</sup> Even if some points still need to be clarified, the conclusions drawn from these studies tend to show that Canada's economy would benefit from a cut to the inflation target and that, under certain conditions, targeting price levels would be more advantageous than targeting the inflation rate (i.e. annual price growth).

Both options have common goals: preserving the money's value and reducing the costs related to the uncertainty of price movements over the long term. This would have the potential to reduce long-term market interest rates and help economic growth. The current regime allows inflation to temporarily shift away from its target within a range of +/- 1%. This opens the door to a vast number of price movements and keeps a measure of uncertainty afloat over the long term (graph 2). Lowering the inflation target and reducing the range to between 1 and 2% would substantially reduce this uncertainty (graph 3), while a target based solely on price levels would greatly minimize it.

The main difference with having a price-level target is that we systematically wipe out past deviations once we get back to the target, while these deviations can accumulate in a regime that targets inflation (see box 1 on page 4 for an example using numbers). To get an equivalent result in a target inflation regime, each period of above-target inflation would have to be voluntarily offset by a period of below-target inflation, which is not a mandate requirement. In fact, in an

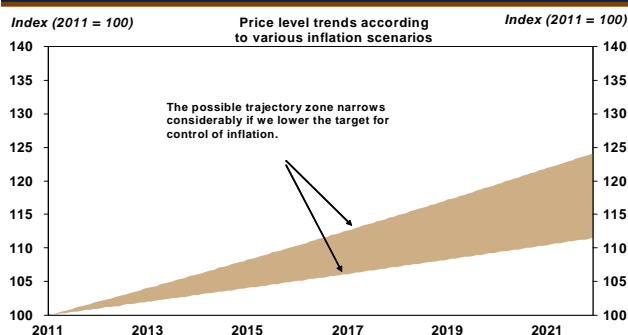
<sup>3</sup> Several of these studies are available on the BoC Web site; however, for an initial report on this research, consult the *Bank of Canada Review*, spring 2009.

**Graph 2 – Zone of possible price-level trajectories if annual inflation is able to vary between 1 and 3%**



Source: Desjardins, Economic Studies

**Graph 3 – Zone of possible price-level trajectories if annual inflation varies between 1 and 2%**



Source: Desjardins, Economic Studies

inflation targeting regime, simply getting back to the target after a period of above-target inflation is enough.

### LOWERING THE INFLATION TARGET: WOULD THE LOWER BOUND BE LESS RESTRICTIVE?

In terms of targeting inflation, price measurement bias and the problem of wage rigidity are reason enough to maintain an inflation rate above 0%. However, the knowledge acquired from the most recent financial crisis suggests that the lower bound could be less problematic than originally believed, a situation that would lower the need to set a target inflation rate at 2%. A 1% target would reduce the costs tied to future price advances and could be enough to manage CPI measurement deviations and wage rigidity.

Several advanced countries had to cut their key interest rates to floor levels when the crisis exploded in 2008 (graph 4 on page 5). At that point, the central banks knew they had to implement a range of non-traditional tools to stimulate the economy and combat disinflation pressures.

These measures led to an expansion of central banks' balance sheets (graph 5 on page 5). Some banks responded to

**Box 1**

**Divergence in the price trajectory between an inflation targeting regime and a price-level targeting regime**

The following example shows how an inflation targeting regime can build up deviations and increase long-term uncertainty about price trends.

Let's compare pricing trends in an inflation targeting regime with those that exist in a price-level targeting regime. We assume that the target inflation rate is 2%, and the target path for price levels rises by 2% per year.

Hypothetical scenario:

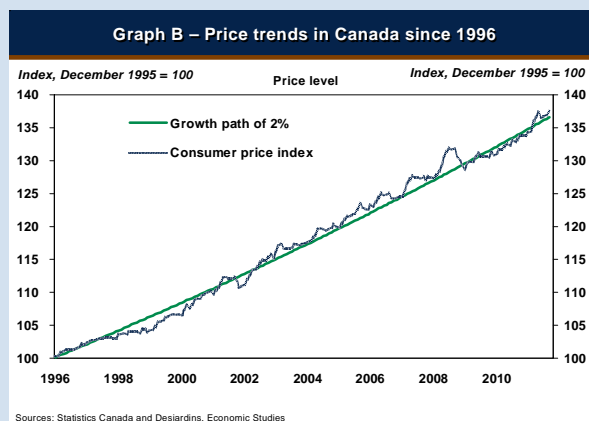
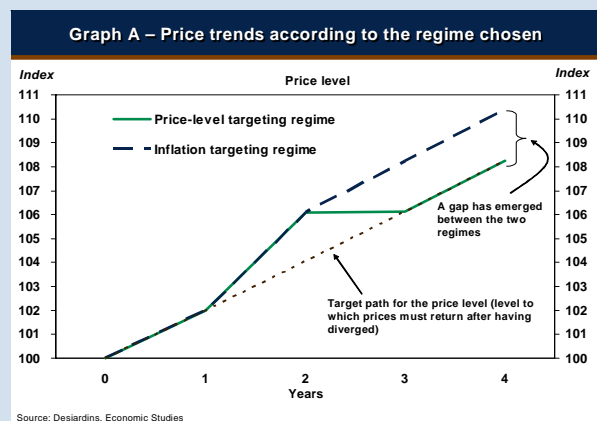
- In the first year, inflation stands at 2%.
- In the second year, inflation rises to 4%.
- In the third year, under an inflation targeting regime, the central bank brings the inflation rate back to its 2% target.

A central bank using a price-level targeting regime would have to bring the price level back down to its target path. This could result in a 0% inflation rate if we assume that the deviation of the second year is completely corrected during the third year (we could also imagine scenarios in which the deviation would be corrected over more than one year).

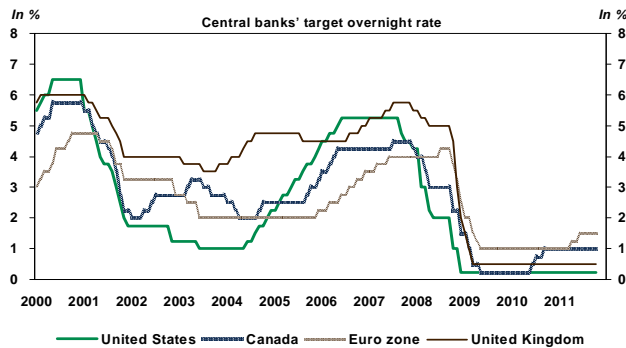
- In the fourth year, inflation is at 2%.

Graph A shows us that, under an inflation targeting regime, the deviation that occurred in the second year is never rectified; this takes us along a different price growth path than that called for by the price-level targeting regime. Consequently, the uncertainty about future price trends is greater in an inflation targeting regime.

In practice, these deviations can sometimes cancel each other out, since they are not always headed in the same direction. Graph B shows the evolution of Canada's consumer price index since 1996 versus price growth of 2%. We can see that despite the lack of an official price-level target, the CPI has not shifted too far from the target that could have been set at the time. However, the past provides no guarantee of the future. A series of one-way shocks could potentially occur and push the price index off that path significantly and sustainably.

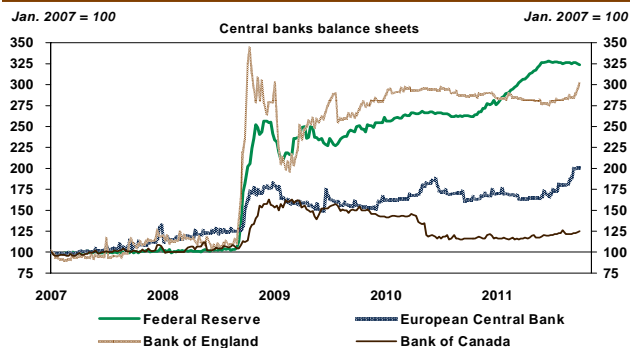


**Graph 4 – Many central banks reached their lower bound after the financial crisis of 2008**



Sources: Datastream and Desjardins, Economic Studies

**Graph 5 – Unable to lower their interest rates, the central banks fell back on other tools**



Sources: Bank of Canada, Bank of England, European Central Bank, Federal Reserve and Desjardins, Economic Studies

short-term credit conditions while others were able to cut longer term interest rates. The central banks also adapted their statements to influence market interest rates over a longer horizon and quell uncertainty. We only have to think of the BoC and the commitment it made in spring 2009 to leave its key rate at 0.25% for more than a year. The Federal Reserve recently adopted part of this formula by announcing that it had no intention of increasing its key rates until, at least, the summer of 2013.

Up until now, all of these measures have proved somewhat effective in influencing the economy and financial markets. A reduction in the inflation target and the capacity to cut real interest rates could therefore be partially offset by these latest innovations. However, we may still have to wait a few years before researchers validate the effectiveness of these measures and they gain wider consensus. The global economy's sluggish recovery could be enough to raise a few doubts.

#### TARGETING PRICE LEVELS SEEMS MORE OPTIMAL

One interesting aspect of the price targeting concept is that it almost eliminates the problem of the lower bound. In theory,

price targeting introduces short-term fluctuations in inflation expectations, modifying real interest rates without having to change nominal rates. And while rates are currently trending near their lower bound, real interest rates could potentially continue to fall (see box 2 on page 6 for more on this).

The same thing would be difficult to achieve in a target inflation regime. We could however, consider a hybrid regime where the inflation target would change over time. At close to the zero mark, the BoC could exceptionally target higher inflation, which would further lower the real interest rate and stimulate the economy. The problem with this approach is that the BoC risks compromising its credibility since it continually has to reconsider and justify its target, and anchoring long-term inflation expectations would be that much more difficult.

Another advantage to price level target vs. targeted inflation is that movements in real interest rates triggered by changes in inflation expectations act as an automatic stabilizer. Key interest rates would not have been adjusted as often in this type of regime, since real rates would partially self-adjust. In theory, this means there would be fewer chances of reaching the lower bound.

#### FINANCIAL STABILITY: LOOKING FOR FLEXIBILITY

Since the last financial crisis, the concept of financial stability is being raised more often by central bankers. Besides, the BoC defends the macroprudential approach, whose first aim is to ensure the stability of financial markets by instituting better regulations. Interventions that target problem sectors can also be considered as well as using non-traditional monetary tools, such as injecting liquidities into the banking system to reduce financial strains.

And yet in some situations, the traditional monetary policy tool—key interest rates— may need to be called on for support. But since this tool is already used to fulfill the inflation target mandate, the risk of a conflict is very real. For example, a situation could arise where the central bank's main mandate would call for an interest rate increase, but the financial stability part of the equation would require the status quo, or even a cut to key rates.

A price-level targeting regime could provide some of the flexibility needed to pursue more than one objective at a time. This regime allows prices to deviate from their short-term target without threatening the monetary authorities' credibility and running the risk of unanchoring long-term inflation expectations. During a 2009 speech in Jackson Hole, Wyoming, BoC Governor Mark Carney showed that he was open to this idea.

**Box 2**

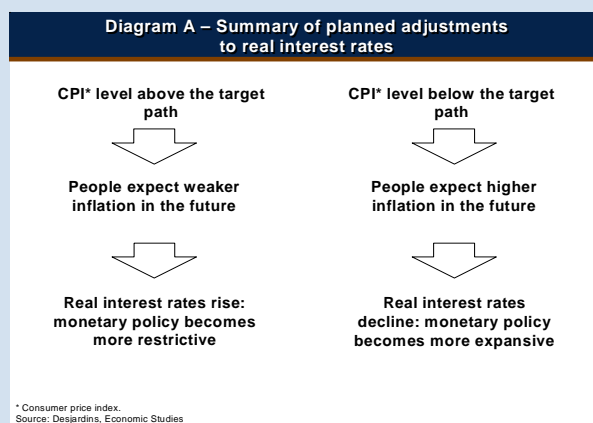
**Price-level targeting would introduce short-term fluctuations in inflation expectations**

To see how real interest rates would move in a price-level targeting regime, we must understand how short-term inflation expectations would change over time.

In concrete terms, a price-level target is a predetermined path for price growth. The BoC could choose a path in which the annual growth of the CPI is 2%. Long-term inflation expectations would tend towards that rate, but the short-term expectations would vary according to how far the CPI strayed from the target path. If prices rose faster than expected, economic agents would anticipate weaker price growth in order to meet the target path. Conversely, if prices rose more slowly than anticipated, stronger price growth would be expected. Then, in a situation where the economy was struggling and prices fell below the target path, short-term inflation expectations would increase and real interest rates would fall. In an extreme scenario of deflation, inflation expectations would grow even more, and real interest rates would tumble even farther.

The reverse reasoning would apply if the price level were above the target path. People would then expect weaker inflation, which would push real interest rates up. Diagram A sums up the changes in expectations and real interest rates, according to the situation.

This mechanism relies on several assumptions, including a high degree of credibility on the part of the central bank, and people forming rational expectations (based on all the information available and on a good understanding of price-level targeting).



“If these macroprudential tools prove insufficient to achieve financial stability, monetary policy faces a difficult trade-off between flexibility and credibility. As a consequence, authorities may wish to adjust the monetary policy objective to have the credible flexibility required to achieve both targets. Price-level targeting offers one potential avenue for consideration<sup>4</sup>.”

**AN IMPERFECT SOLUTION**

A price-level target offers many enticing benefits, but difficulties could still arise in applying it. It should be noted that this policy has yet to be adopted by any central bank in the world, so to analyze its effectiveness we must mainly rely on theoretical models.

<sup>4</sup> Mark CARNEY, “Some Considerations on Using Monetary Policy to Stabilize Economic Activity,” speech given at a symposium organized by the Federal Reserve Bank of Kansas City in Jackson Hole, Wyoming, on August 22, 2009.

The cornerstone of a price-level target is the trend in short-term expectations. If people’s expectations do not change over time as theoretically expected, the superiority of price targeting declines rapidly. In reality, individuals’ expectations do not necessarily take fully into account all the information that is available. For example, some people might estimate future inflation based on that which has just been observed. In this situation, declining inflation would trigger a drop in inflation expectations, and thus an increase in real interest rates. Economic activity would be held in check, and prices would not return to their target path.

To validate the effectiveness of price targeting, BoC researchers have started to use experimental economics<sup>5</sup> to study how people behave and adapt their expectations under dif-

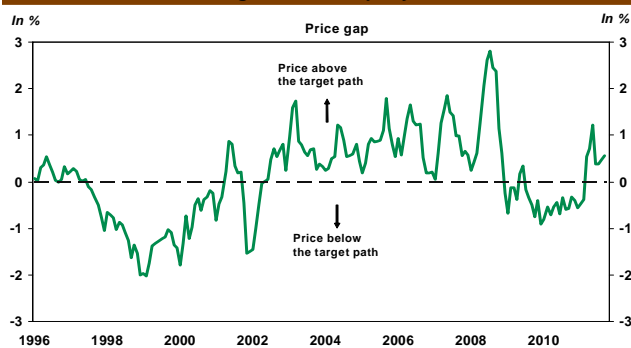
<sup>5</sup> Experimental economics consists in experimenting with individual and/or collective economic behaviours in a controlled environment, and analyzing the results using statistical methods.

ferent monetary policy regimes. A research report published this past summer by the BoC shows that people had only a sketchy understanding of the implications of price-level targeting<sup>6</sup>. Due to the manner in which the subjects of the experiment formed their expectations, it was not possible to derive full benefit from a price-level targeting policy. Admittedly, the authors of the study mentioned that, in the experiment that was carried out, the introduction of a regime based on price levels was explained only once. In reality, a central bank would certainly adopt a more detailed communication strategy to explain how a price targeting regime works, and to remind the public of the implications thereof.

Clearly, it is easier to understand and to communicate an inflation target than a price-level target. The inflation target remains the same from one year to the next, while the target price level would have to rise. In September, the numerical value of the Canadian CPI was 120.6. In a price targeting regime, the target for next year would be a CPI of 123; a target of 125.5 for 2013, and so on. Those numbers are less explicit than an inflation rate.

On the other hand, calculating and publishing deviations from the price target could prove easier to communicate and understand. The BoC could even use an operating band if it deemed it necessary. Graph 6 shows what a price deviation from a target path might look like. In a price-level targeting regime, we would not want to see prices straying from the target for too long. Accordingly, the BoC would be inclined to lower its rates if the deviation were in negative territory (prices below the target); conversely, it would be prepared to raise its rates if the deviation were in positive territory (prices above the target).

**Graph 6 – Deviation of Canada's CPI from a stable path for growth of 2% per year**



\* Consumer price index.  
Sources: Statistics Canada and Desjardins, Economic Studies

<sup>6</sup> Robert AMANO, Jim ENGLE-WARNICK, and Malik SHUKAYEV, "Price level Targeting and Inflation Expectations: Experimental Evidence," Working paper 2011-18, Bank of Canada, September 2011.

Other technical aspects would also have to be considered if a price-level target were to be adopted, such as the treatment of indirect taxes (mostly made up of consumption taxes). In an inflation target regime, a tax increase translates to a temporary increase in inflation, and the central bank wouldn't need to adjust its monetary policy as a result, since the inflation rate would fall back to its target on its own once the effect has passed. This is not the case with price levels however, which shift away from the initial target over the long term. The monetary policy would then be adjusted to correct the gap created, which could have an unnecessary adverse effect on the economy. Rather than intervening, the BoC could, from the start, base its target on a price index that excludes the effect of indirect taxes. That said, wiping out perfectly the effect of these taxes is no easy task. The BoC could also choose to readjust its target each time the federal or provincial governments amend their indirect taxes, but this would only create more uncertainty. This type of issue could be a serious obstacle to the application of a price level target.

#### **CONCLUSION: THE BOC WILL PROBABLY PREFER TO WAIT A FEW MORE YEARS**

The options for replacing the 2% inflation target and the associated operating band of +/- 1% offer some interesting advantages, in particular for reducing uncertainty about future price trends. Lowering the inflation target would be a relatively simple option to implement, but the lack of certainty as to a central bank's ability to manage the lower bound could lead the BoC to hesitate a while longer.

Price-level targeting seems more promising, in particular because it eliminates the problem of the lower bound, but also because it acts as an automatic stabilizer and facilitates a macroprudential approach to ensuring financial stability. However, the BoC would certainly want to carry out further research with experimental economics before it would be thoroughly convinced of the superiority of price-level targeting. Putting price-level targeting into practice would entail obstacles and would require a high degree of credibility on the part of the central bank. The communication component would have to be analyzed more carefully.

In view of the troubled economy and the numerous concerns around the globe, this would not be a good time to implement, explain and communicate a new target. Moreover, while Canada's inflation rate currently stands at over 3%, the effective introduction of a price target could trigger a decline in short-term inflation expectations and an increase in real interest rates. Such an outcome would not be desirable, especially since the tone of the BoC's latest press release was gloomy, and closed the door to monetary tightening for several more quarters.

This would also be a bad time to target a lower inflation rate. To preserve its credibility, the BoC would probably be obliged to raise its key interest rates faster, a situation that could hinder the economic recovery.

Having said that, the BoC could still open the door to a near-term change in its mandate if it accepted to renew its inflation target of 2% +/- 1% for a shorter period than previously. Two or three years from now, the economy will probably be more stable and less fraught with worries; meanwhile, new studies may confirm or invalidate the effectiveness of an alternative regime. Another option would be for the BoC to use more flexibility without changing its median target; for example, the price stability mandate could focus more on the fact that the 2% target applies to the medium and long terms, but that wider deviations could be tolerated in the short term. The fact remains that, to preserve the benefits that an inflation target provides, the BoC will have to maintain its credibility and make sure that long-term inflation expectations remain firmly anchored. Time will tell...

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