PRICE-LEVEL TARGETING – A VIABLE ALTERNATIVE TO INFLATION TARGETING?

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Abstract: *The recent financial crisis that has led some central banks reaching the zero lower bound of their interest rate to use unconventional monetary policy instruments, has brought to the forefront the academic discussions on the shift from inflation targeting (IT) to price level targeting. This paper provides a comparative analysis on IT strategy and targeting the price level, assesses the implications and highlights the challenges of an eventual transition to a new monetary policy strategy. Balancing the advantages (mainly better anchored inflation expectations) and disadvantages (communication difficulties) generated by following a potential price-level targeting strategy and the necessary prerequisites for its functionality (predictive agents, fully familiar with the implications of such a strategy and with complete confidence in the monetary authority) has led us to the conclusion that there is no common acceptance that price level targeting strategy might replace the present IT framework.*

Keywords: price-level targeting, inflation targeting, inflation expectations, deflation, zero-lower-bound
JEL Classification: E31, E52

INTRODUCTION

The outbreak of the financial turmoil in 2007, the subsequent financial crisis and the collapse of economic activity led to the need of rethinking the monetary policy framework. This approach underlines a series of monetary policy principles unchanged under the international financial tensions, but also a number of elements to be reconfigured. Custom academic discussions on the global turmoil in terms of monetary policy strategies center on three potential modifications: setting a higher inflation target, monetary broadening and the shift from IT to price level targeting.

The present paper focuses on the third aspect mentioned, in order to identify the opportunity and feasibility of adopting a new monetary policy strategy, namely the price-level targeting, in the context of at least the temporarily abandonment of inflation targeting. Under an IT regime, after a shock hits the economy, the central bank (CB) acts to bring inflation back to the target level, regardless of the permanent effects of that shock on the price level. In contrast, a price level targeting strategy implies that the central bank would act to restore the price level to its initial value. This difference, although it might be considered minor, has complex implications to the formation of price expectations, and the leadership, credibility and communication of monetary policy.

Our paper, which aims to identify and analyze the potential impact of price-level targeting, is structured as follows. The first part illustrates the main ideas in the literature, the second part offers a comparative approach of the two monetary policy strategies, the third explains the consequences in terms of the new strategy benefits; the fourth part is presents the associated challenges and the fifth highlights the conclusions and future directions of analysis.

1. RELATED LITERATURE

The fact that currently no central bank applies price-level targeting points out the need to address its characteristics and implications based solely on theoretical analysis and especially on the models used by various researchers and scholars. The academic literature focused on the subject of price level targeting is broad enough, sharply in contrast to the lack of practical experience in the field.

A good criterion for analyses systematization is breaking them down into four horizons: 1) the period that includes the traditional argument, 2) the seminal work of Svensson (1999), 3) the research conducted in the context of reaching the zero lower bound of short-term nominal interest rates by Japan since the late 1990s; 4) the current academic discussions generated by the problematic dealing of various central banks with the zero-lower-bound as a consequence of the global crisis unfolding. For the present paper, mainly oriented on emphasizing the strengths and drawbacks of the potential application of price-level targeting it is extremely important to balance the theoretical and empirical approaches in terms of implications arising from the use of such a monetary policy strategy.

Thus, the first advantage of price targeting compared to the IT is the uncertainty limitation on the future long-term price level (Lebow, 1992; Fillion and Tetlow, 1994), which leads to a whole plethora of positive effects. Konieczny (1994) showed that a better predictability of price levels reduces future consumer costs, improving the role of prices in resource allocation, and thus lowers the risk of errors that could shape the consumption structure below the optimal. Ragan (1994) argued that enhanced price level estimation decreases the probability of default, thereby cutting down the costs of financial intermediation.

Meh et al. (2010) found that unlike in an IT strategy framework, inflation-induced arbitrary redistribution of wealth could be moderated by a third under a price level targeting regime. In addition, greater price certainty would lead to lower risk premium on long-term bonds and such a reduction in the cost of capital stimulates investments and a higher level of economic activity. Meh

et al. (2009) suggested that targeting the price level could favor a substantial growth in capital investment.

Besides the obvious positive effects of accentuated price stability, reduced uncertainty generates strong anchored price expectations; thus, the price level targeting strategy manifests as a true automatic stabilizer (Haldane and Salmon, 1995; Fisher, 1994; Mishkin, 2011). The stabilization of inflation expectations increases the short-term macroeconomic stability (Svensson, 1999; Berentsen and Waller, 2009; For Resende et al., 2010). Enhanced compromise between output and inflation volatility result of price-level targeting is also emphasized by Clarida et al. (1999).

Another positive effect associated to price level targeting feature of automatic stabilizer, of great interest in the present context, is the limitation of cases frequency related to zero-lower-bound issues, i.e. an easier exit from the liquidity trap (Berg and Jonung, 1999; Svensson, 2001, 2010; Eggertson and Woodford, 2003; Mishkin, 2006, 2011; Coibion et al., 2010). Moreover, a better anchoring of inflation expectations due to the new monetary policy strategy implies a greater flexibility in addressing financial stability (Carney, 2009).

However, the potential benefits of targeting the price level are conditioned to a number of mandatory prerequisites. The emergence of these advantages depends on the anticipatory nature of agents' decisions (forward-looking) (Steinsson, 2003; Ball et al., 2005; Vestini, 2006; Amano et al., 2011). If the economy includes both types of agents, forward-looking and backward-looking, the highest social welfare can be achieved under certain conditions, by combining price-level targeting with inflation targeting into the so-called *hybrid targeting* that involves the central bank's loss function to be defined in terms of both inflation and price level volatility (Batini and Yates, 2003; Cecchetti and Kim, 2005).

At the same time, the implied benefits of price-level targeting require a full agents' understanding of its functioning (Bank of Canada, 2011). Therefore, the process of learning plays a key role (Gaspar et al., 2007). The full credibility of the central bank's commitment ends the series of preconditions necessary to achieve the benefits of a potential use of price level targeting. Only a credible CB will be able to firmly anchor inflation expectations to provide the outcomes of price-level targeting as automatic stabilization mechanism (Cate et al., 2009, Masson and Shukayev, 2011; Kryvstov et al., 2008).

The major weakness of the new strategy compared to inflation targeting is the complicated communication of monetary policy, both of the target itself and the current decision-making process (Kahn, 2009; Ambler, 2009; Mishkin, 2011). Another impediment in the implementation of price-

level targeting is considered to be the strong exposure to time inconsistency problem (Jeanne and Svensson, 2007; Evans, 2010; Masson and Shukayev, 2011). In addition, another challenge to a potential new strategy would be determined by the increased volatility of relative price shocks, respectively higher output volatility (Fillion and Tetlow, 1994; Black et al., 1997; Svensson, 1999 s) and/or a growth in inflation volatility (Haldane and Salmon, 1995; Coletti et al., 2008; Murchison, 2010).

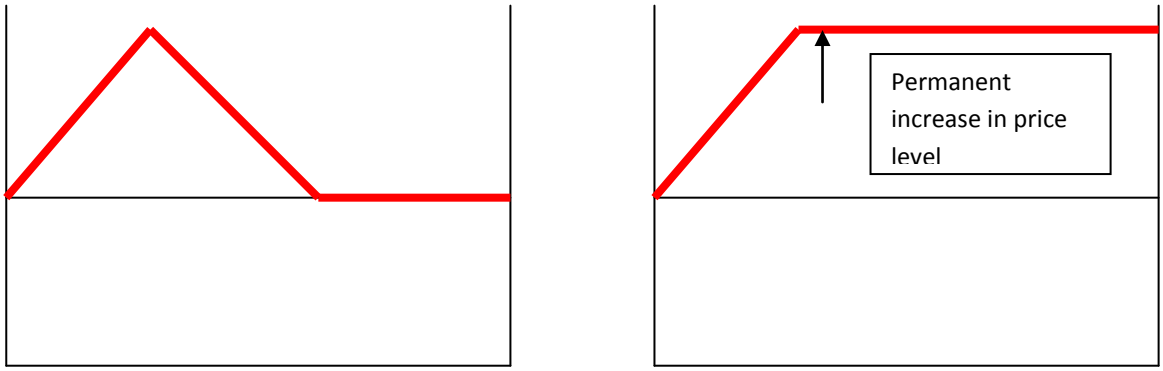
Also, another obvious disadvantage of a possible shift from inflation targeting to price level targeting concerns the lack of practical experience in the use of such a monetary policy strategy (Bohm et al., 2011).

2. COMPARATIVE ANALYSIS OF THE TWO MONETARY STRATEGIES FUNCTIONING

The contrast between the IT and price level targeting occurs due to the different impact of their application on inflation and price level.

Figure 1 - Time evolution of inflation and price levels under an inflation targeting regime

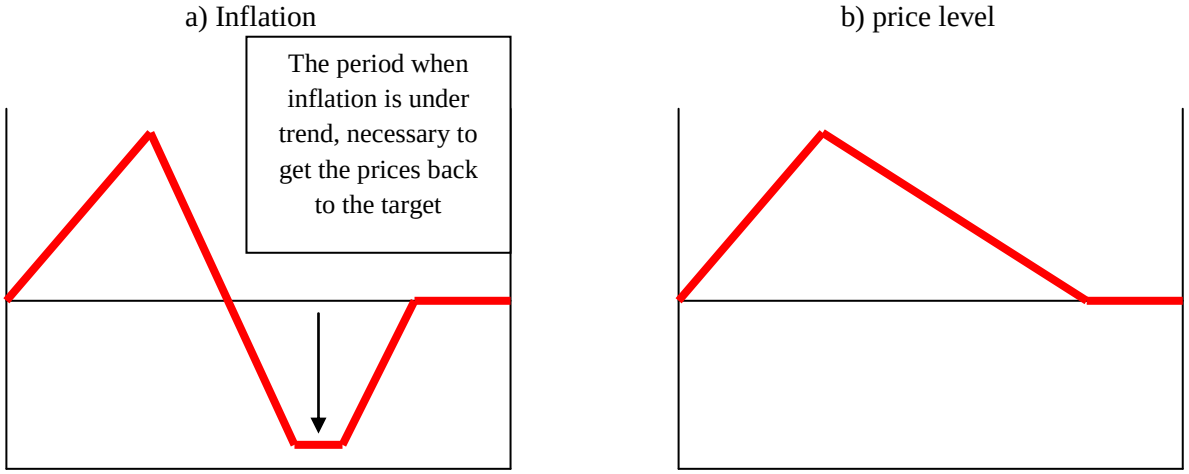
a) inflation b) price level



Source: Bank of Canada, „Renewal of the Inflation-Control Target", p.15, http://www.bankofcanada.ca/wp-content/uploads/2011/11/background_nov11.pdf

Under an IT framework, the emergence of a temporary shock which leads to an inflation rise would make the central bank to pursue a restrictive monetary policy, of increasing the nominal short-term interest rates to bring inflation down to the target. In this case, in the absence of other additional shocks, inflation growth will be only temporary; the indicator would return and remain at its initial value. But while inflation is only temporary, the corresponding increase in price level would be permanent, displaying a *base drift*, as shown in Figure 1.

Figure 2 - Time evolution of inflation and price level under a price-level targeting strategy



Source: Bank of Canada, „Renewal of the Inflation-Control Target", p.15, http://www.bankofcanada.ca/wp-content/uploads/2011/11/background_nov11.pdf

Instead, under a price-level targeting regime, the manifestation of a temporary shock that increases inflation, thus implying a price growth, the central bank would seek to promote a restrictive monetary policy, but with a more pronounced degree of tightness to get inflation below the trend, bringing the price level back to the determined value. In this way the base drift is removed, as demonstrated by Figure 2. The CB does not aim to correct inflation to follow the trend, but to make the price level go back to the target.

The existence of a base drift under an inflation targeting strategy creates uncertainty about the future price level, (the central bank does not consider a reversal in the evolution of prices). In other words, under an IT framework, inflation deviations generate permanent effects on the price level and the successive accumulation of such violations would lead to price levels far from the expected path. Conversely, in the case of a price level targeting strategy, the central bank would consider neutralizing the shocks effects on the price levels, thus limiting uncertainty at all horizons.

3. THE EVALUATION OF POSITIVE IMPLICATIONS OF PRICE-LEVEL TARGETING

Research conducted on various models show that the major advantage of the transition from IT to price level targeting is the increase of economic welfare. The new strategy would enhance this trend based on its ability to provide greater certainty about the long-term price level and on its features of truly automatic stabilizer. The latter leads to other two positive effects, namely the increase of short-term macroeconomic stability and the avoidance/limitation of zero lower bound of

nominal short-term interest rate problems and as such, to the economy removal from the deflation trap.

At the first level, the reduced uncertainty about future price levels contributes to achieving higher growth rates due to superior results in terms of relative prices improved transparency, less arbitrary redistribution of income and wealth, diminished risk premia with a positive impact on the capital cost, avoiding the defalcation of resources from production to cover unnecessary operations against rising prices.

Of course, the IT strategy has led to price stability, as the experience of adopting states clearly demonstrates it; however, it is estimated that the use of price level targeting would enable a further strong reduction of long-term prices uncertainty.

Moreover, the capacity of price level targeting strategy to provide greater certainty would lead to a better anchoring of inflation expectations, particularly important when flexibility is needed to address the financial stability. Well anchored expectations would allow an increase of short-term nominal interest rate in order to prevent the formation of asset prices bubbles, without compromising the fundamental central bank's objective of ensuring and maintaining the price stability.

In fact, inflation expectations have a vital role, enhancing the nature of the new framework as automatic stabilizer, the second tier that supports the benefits of such a monetary policy strategy. And this is because the implementation of price level targeting requires the CB to ensure that periods with above trend inflation are followed by periods when inflation is below trend (and vice versa). The anticipation of this inflation dynamic may lead firms to behave in a stabilizing manner under a price level targeting strategy. For example, if at a certain moment, the price level is above the target, firms and households will expect a future level of inflation below the trend.

These anticipations will operate through two channels. The first one is represented by the way firms pricing discourage them to raise prices in response to the initial shock, as expectations of future lower inflation would attenuate the impulse of increasing the current raise. The second channel is the real interest rate changes. Expectations of lower inflation in the future will raise the real interest rate which will affect consumption decisions, household and businesses savings and investments. Both channels will require, to lower inflation, small adjustments of output values.

Thus, the identified stabilizing, auto-correction character of price level targeting determines a level of employment, output, interest rates and inflation less volatile compared to the figures under an IT regime. The explanation is that in an IT framework the estimations do not play a vital role as

agents have no reason to expect that periods of over trend inflation will be followed by under target inflation.

At the same time, the stabilizing nature of price level targeting strategy could lead to a decrease in the frequency of possible confrontation with situations of zero lower bound than under an IT regime, and the automated evolution of expectations specific to price-level targeting should result in a smooth exit from a deflationary situation, something of great interest today, when many CB of developed countries are faced with the zero-lower-bound issues.

Thus, the more prices fall below target, the more central banks will have to stimulate the economy to offset the price level decrease under the target. In this case, one would image inflation expectations to rise and real interest rates to fall, thereby facilitating the exit from the liquidity trap.

4. CHALLENGES FOR THE MONETARY POLICY IN THE CONTEXT OF PRICE-LEVEL TARGETING

The positive implications resulting from the potential application of a strategy targeting the price level are, however, strongly counterbalanced by a number of obvious difficulties associated with its implementation. We underline the communication difficulties, much stronger than in the case of an IT regime, a possible exacerbation of monetary policy time inconsistency problem, external shocks of relative prices, and the lack of practical experience in the effective adoption of the new framework.

On the other hand, the successful application of price level targeting, as demonstrated by various econometric models is based on a number of preconditions: it requires that agents pro-actively form their expectations (forward-looking), they are fully familiar with the strategy implications and also have a high degree of confidence in the monetary authority. If these conditions are not met in full (in fact a very likely situation in the real world), the net benefits of price level targeting mentioned in the previous section will be smaller or even completely canceled.

Price level targeting communication implies a significant communication challenge. Unlike the IT regime, where communication is direct and focused on the inflation target, price level targeting communication is more difficult. In the first place, the difficulty arises when the central bank targets un upward trajectory of the price level, which translates into the impossibility to present a single number; the target would be in constant motion and thus more difficult to explain to the audience than an inflation target maintained at a constant level. This communication drawback could be diminished if the target price would not incorporate the trend (for instance, an inflation

target of 0% which would compensate previous deviations), whereas CB could engage in meeting a comprehensible objective, to maintain prices constant over time. Secondly, for some economic agents and their decision-making process, the inflation rate may be more important than prices, especially if they have a long experience under an IT regime.

The solution to this problem is that the new strategy to maintain communication on inflation and the inflation target (preferably an average inflation target for a longer period of time with a monetary policy geared to target the average inflation). This option would require a change in communication (for example, the Reserve Bank of Australia uses as target the average inflation over the business cycle, while the Reserve Bank of New Zealand targets the medium-term average inflation), but even in this case communication would be much more difficult than in an IT framework. It is the situation of projections description (the central bank's reaction function should be defined in terms of inflation target or in terms of price level target?) or when assessing the target performance (which deviation is more relevant-price-level fluctuation from target or inflation variation from target?).

Thirdly, another communication problem arises from the fact that price level targeting might make the public believe that the central bank puts too much emphasis on past economic developments and too little emphasis on forecasting future developments. The backward-looking feature of price level targeting *versus* inflation targeting might raise issues related to agents' formation of inflation expectations. These are just three major communication drawbacks for the potential application of price level targeting, but considering its associated benefits, central banks should investigate, even if only theoretically, how to efficiently communicate the target to the public.

A second challenge to price level targeting is time-inconsistency problem, a basic theoretical aspect, in the forefront of the new monetary policy paradigm in the late '70s which led to the crystallization of the IT framework. Conducted in a flexible way, the IT strategy does not face this weakness. The same is not true for price level targeting, which may face this problem as follows. Considering the example of a price level targeting strategy at a given time, following a shock, the price level is above the target, which requires the central bank to commit to a future inflation below the long term average. This has a positive effect on inflation expectations and lowers the costs to absorb the shock.

However, once the shock disappears and inflation (not prices level) reappears at its optimal long-term level for the CB, and the whole economy is tempted not to comply with CB announced policies (of not compensating the positive shocks prices by pushing inflation below its long-term

average, since this would harm domestic product), prices will not return to the established path. In other words, in real life it may happen that both the public and professionals to consider short-term gains more attractive. In this context, the central bank would be under strong pressure to violate the principle of time consistency. Finally, the CB would not resist public pressure and give up its efforts to restore the price level target. One possible way to avoid the time inconsistency problem is to use price level targeting only in certain situations, for example, in the case of a liquidity trap accompanied by a double-digit unemployment.

A third problem of the potential implementation of price-level occurs in the event of external shocks in relative prices, very common especially to small open economies. To offset the shocks, the new strategy should produce relative changes of other prices to counter the negative impact. For example, a significant increase in oil prices would make necessary a relative drop of other components in the considered index price to restore the desired trend. To the extent that these other prices prove to be rigid, the adjustment could lead to a higher volatility of output, inflation and interest rates than under an IT regime.

The solution would come again from the expectations stabilizing feature, as the increased volatility of relative price shocks can be fully offset by the movement of stabilizing expectations, specific to price level targeting.

A fourth disadvantage of a possible shift from IT to price level targeting is the lack of practical experience in the use of such a monetary policy strategy. The experience of Sweden, with its monetary policy from the 1930s, often labeled as the only case of price level targeting, does not help a lot because of its short duration and vague implementation elements. All positive and negative implications of price level targeting drawn from the application of different econometric models are based on questionable assumptions and, therefore, remain far too simple to represent a real economy. Therefore, the results returned imply a high uncertainty degree.

Fifth, the success of such a strategy critically relies on a set of assumptions: forward-looking agents' decisions, a strong understanding of its functioning and full confidence in the monetary commitment of the monetary authority. Thus, if in the models identified in the literature, the assumption that agents make decisions in a proactive manner is relaxed, eliminating the stabilizing effect of expectations that prices will systematically return to the target, the advantages of this potential new strategy against an IT regime rapidly diminish.

However, for the price level targeting to produce the expected beneficial effects it is highly necessary that agents completely understanding its mechanism.

Households and firms should see that medium-term inflation expectations increase (decrease) when current inflation decreases (increases) in order to generate the specific advantages of price level targeting strategy automatic stabilization. If their expectations do not follow this path, the price level targeting could prove to be destabilizing compared to the IT regime. Closely related to the need for a full agents' familiarization with the new strategy implications, as a essential precondition for the success of price level targeting, one of the challenges is determined by the length of time during the agents learn about its functioning mechanism, given that the benefits would be drastically reduced if the learning process is too slow.

Obtaining the comparative advantages also involves the credibility of the central bank's commitment to fully compensate for past deviations from the price targeted trajectory. If agents doubt the willingness of the CB to limit the output by tightening monetary policy in order to reverse the trend of rising prices, expectations will not move enough to provide the automatic stabilization feature benefits of price level targeting strategy. In this context, the IT framework could prove more appropriate than the new strategy.

CONCLUSIONS

The fact that the recent financial crisis has highlighted the idea that the problem of zero lower bound monetary policy interest rate may be more serious than previously thought, has brought to the forefront of discussion the potential shift from IT to price level targeting, at least temporarily, until the disappearance of deflation threat.

While applying an IT strategy has reduced uncertainty and costs associated to high and volatile inflation, the adoption of a price level targeting regime would make the long-term price uncertainty reduction even stronger. Under the current IT framework, the monetary policy focuses on achieving the inflation target on an anticipatory basis, ignoring previous deviations between actual and targeted inflation, and to the extent that these variations accumulate, the expected price level becomes more uncertain.

Price level targeting, as an alternative strategy, could limit this uncertainty because the monetary policy would try to compensate for past violations in order to restore the price level to its predetermined trajectory. Thus, while the IT approach is *bygones is bygones*, the price level targeting approach is "dependent on the past" (history dependent). This difference, although it may be considered minor, has complex implications for the leadership, credibility and communication of

monetary policy and price expectations formation, a better expectations anchoring on their future level, as the core of the price level targeting strategy.

The theoretical and empirical analysis has led to the identification of its benefits against the IT regime, and to the uncertainty reduction on long-term price level leading to better anchored inflation expectations. Expectations firmly anchored enable the automatic stabilizer manifestation of price level targeting, with two favorable results: greater short-term macroeconomic stability and therefore improved trade-off between inflation and domestic product and limited likelihood of zero lower bound of short-term nominal interest rate occurrence and respectively, the smooth exit out of this situation.

However, all these potential benefits are sensitive to assumptions, emerging only if a set of hypotheses are fully respected: predictive agents, familiar with the strategy' implications and confidence in the willingness and ability of the monetary authority to meet its commitments. If any of these assumptions are changed, the advantages of price level targeting versus those of IT become less clear.

Apart from the mandatory prerequisites to be met for the potential application of price level targeting strategy to generate the expected benefits, it also faces a number of challenges related to the increased difficulty of public communication, high exposure to the problem of time inconsistency, and volatility due to relative prices shocks. In addition, there is the lack of practical experience in the use of such a monetary policy strategy, which is not currently used by any central bank, so that conclusions about its potential implications were drawn based on various simulation models using questionable assumptions, and therefore too simple to represent a real economy.

Bridging together the associated benefits and challenges leads to the idea that, in the real world, under normal circumstances, we could make a fully covered statement on the price level targeting strategy superiority over the IT regime. If the economy felt into the liquidity trap, potential benefits may predominate and therefore we propose as future research direction, the analysis of price level targeting strategy behavior in the context of deflation risk zero lower bound of short-term nominal interest rate.

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