Defining Price Stability: What Should We Aim For?

This article, which was prepared by Craig Ebert, discusses some of the issues involved in establishing a workable definition of price stability. It is based on an earlier paper prepared by David Rae, Michele Lloyd, and Andrew Fung, and provides an insight into some of the principal considerations involved in choosing the 0-2 percent inflation target contained in the Policy Targets Agreement.

Executive Summary

The Policy Targets Agreement (PTA) provides a workable definition of “stability in the general level of prices”. There are many issues involved in being specific about defining price stability.

A fundamental purpose of an explicit price stability target is to help establish credibility that the Bank will stabilise the general price level. Unfortunately, the types of targets which would appear to most enhance policy credibility usually limit policy flexibility. Policy flexibility allows certain one-off price ‘shocks’ to be accommodated, when offsetting these shocks could affect output and/or employment adversely in the short-term. On the other hand, a target which allows for a good deal of policy flexibility may compromise the credibility of the Bank’s commitment to stabilising the general price level.

This article considers a number of issues relating to the practical definition of price stability for policy purposes. First, there is a choice to be made between a price level target and an inflation rate target. The former may provide more policy credibility but is likely to constrain policy’s flexibility in dealing with price level shocks. Second, there is a choice between a short-term and long-term focus over which to achieve price stability. The current PTA targets the annual rate of CPI inflation. A longer time-frame for definition, for example a two year inflation average, is likely to provide more policy flexibility but may lead the public to discount the Bank’s credibility. Finally, the form or width of any inflation rate (or price level) band needs to be addressed. A wider band will probably allow for more monetary policy flexibility but may mean that the public has less faith in the Bank’s commitment to price stability.
Introduction

The Reserve Bank Act (1989) requires the Bank to direct monetary policy toward "achieving and maintaining stability in the general level of prices". The Policy Targets Agreement (PTA) provides a more specific definition of price stability for policy purposes. This article looks at some of the issues involved in being specific about what is meant by "price stability".

In establishing a working definition of "stability in the general level of prices", there are many things to consider. An important theme of this article is that there may be some conflict between a definition of price stability that gives policy substantial flexibility, and a definition that enhances policy credibility. Flexibility relates to the discretion that the Bank has in dealing with disturbances or "shocks" to the price level. This involves decisions about whether policy should react, and the time frame involved. For many reasons, it may not make sense for policy to react to every price shock, especially with a short-term focus. Credibility refers to the general public's belief in the Bank's commitment to stabilising the price level. It is important to consider public perception of current and expected price movements, as price expectations are important to many economic decisions and contracts. Generally, a more flexible target will allow the Bank more discretion but, at the same time, it may compromise the Bank's credibility.

The next section looks at the issue of whether the practical definition of price stability should be in terms of the price level or in terms of the rate of inflation. Then we consider the time period over which price stability should be defined. Finally, we look briefly at the current definition of price stability, and discuss some alternatives.

This article takes as given the fundamental objective of price stability. The current (sole) macroeconomic objective of price stability, set out in the Reserve Bank Act, reflects the conviction that the only sustainable contribution that monetary policy can make to good economic performance is to minimise the distortionary effects of inflation. The article does not discuss policy accountability, particularly the rewards and penalties associated with meeting or failing to meet the target. Nor does the article consider which price index policy should focus on.

Price Level Or Inflation Rate Target?

The first issue addressed in this article is whether price stability should be defined in terms of a specific price level target, or in terms of a particular target inflation rate (or a range for inflation). In comparing the two possibilities, it is convenient to interpret the issue as one between a constant price level and a zero inflation target. Although the two objectives are similar, they are not identical. The main difference is the way in which

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1 Shocks can be thought of as price movements outside a target. These will arise from factors outside the control of monetary policy, as well as monetary policy forecasting/adjustment/timing inaccuracies.


3 An alternative could be to compare a positive inflation rate target with an equivalent upward sloping price level target. This could be extended to include inflation rate bands and price level margins for error.
policy reacts to (positive or negative) price level shocks. A constant price level target would require a return to the original price level at some future point. A zero inflation rate target would require only that prices be stabilised at the new level. If price shocks are biased either upwards or downwards then this will lead to different long-run price level paths for the price level and inflation rate targets. Ultimately, the choice between the two boils down to the issue of whether or not monetary policy should act to reverse or ‘correct’ one-off shocks to the general price level. The answer hinges on whether the more demanding requirements of a price level target will generate important long-term gains in credibility and economic efficiency.

**A Constant Price Level Target?**

A constant price level target has an appealing simplicity. Holding the price level constant -assuming this is feasible- makes planning easier (more certain) and minimises the need for indexation. Price signals will be clearer as any adjustments will reflect relative price movements. When the overall price level changes, it is more difficult to distinguish relative price movements from general price level movements.

Although a price level target is less flexible than an inflation rate target, the former may have an important advantage in terms of policy credibility. As discussed later in the article, a zero inflation rate target may allow an upward drift in the price level. A price level target would avoid such an upward bias and therefore should provide more credibility that the price level would be stable in the long run.

Whatever the advantages, there are also a number of drawbacks in having a price level target. If the measurement biases in whatever price index we use are significant, then we may not want it to hover forever around a fixed level. There is theoretical and empirical support for the notion that price indices may overstate the true cost of living. This bias stems from several different sources. A *substitution bias* arises if consumers substitute from relatively expensive goods and towards relatively cheap ones. Most price indices use fixed weights and so do not pick this up. An *outlet substitution bias* results from a failure to adjust the weights applied to each shop as consumers switch to new (probably cheaper) outlets. A *new product bias* again stems from the fixed weight methods of price indices. A bias will result from consumers switching to new (probably cheaper) products which are not weighted in the price index. There may also be a *product quality bias*. If the quality of goods is improving, then prices will be overstating the underlying cost.

The size of such biases has not been the subject of extensive research. Statistics New Zealand appears to be more thorough than many foreign statistical bureaus in trying to account for these biases. However, to the extent that price indices have an upward bias, a constant price level target would, over time, be associated with a ‘true’ price deflation. A way of accommodating any bias would be to have a price level target with an upward slope of, say, one percent per year.

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*Because of the way inflation is usually measured, i.e. annual percentage changes in the price level, a one-off shock is likely to keep inflation away from its (zero) target for a number of quarters. However, it would be only during the period of the shock that prices were actually changing. The public perception of this difference between headline and underlying inflation may have important consequences for price expectations.*

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Choosing a price level target makes the choice of price index important since different price indices can follow significantly different paths such that they drift apart over time.\textsuperscript{5}

Further drawbacks stem from fact that a price level target is less flexible. This means that policy has less room for discretion about which price shocks to offset, and over what sort of time frame. This point is best discussed in the context of the benefits of a zero inflation rate target. The main point is that it may be better to accommodate some price shocks, and this is incompatible with a strict price level target.

\textbf{A Zero Inflation Rate Target?}

A zero inflation target differs from a price level target in that there is a possibility that, under the former, the price level can drift in the long term. This allows for more discretion in dealing with price shocks, i.e. not all of them need to be ‘corrected’.\textsuperscript{6} This in turn means that potential costs of deflation can be avoided, when a (positive) shock is viewed as one-off and/or unlikely to alter inflation expectations. This is where the public’s perception of price shocks becomes important. Problems arise if one-off price shocks (e.g. the effects of an increase in the rate of GST) are misperceived as ongoing. This will cause people to increase their inflation expectations in the case of a positive shock. Such misperceptions would lead the one-off shock to have ongoing inflation effects. To prevent such ongoing or ‘second-round’ effects, some monetary tightening would be necessary. This tightening would be likely to affect output and employment adversely over the short run. However, if one-off price shocks are correctly perceived to have only a temporary influence on inflation, then inflation expectations will not change. In this case there would be no credibility gains from reversing price level shocks. This suggests that an inflation rate target would be preferred in cases where there would be nothing to gain, and some real costs incurred, in reversing the price level shock.

A zero inflation target also has the advantage that the choice of price index becomes less important. Although different price indices may not generally move together, inflation rates of different indices tend to converge in the long term.

With a zero inflation rate target, a balance of positive and negative price shocks will help minimise any price level drift away from some base. However, there are reasons why price level drift might be biased upwards. First, there is the common argument that prices rise more easily than they fall. Many studies have looked at the behaviour of wages, import prices (when the exchange rate changes), and domestic prices. Evidence that either price levels or inflation rates rise more easily than they fall, however, is inconclusive.

Secondly, there may be a potential conflict between targeting price level stability and being a lender of last resort. The reason is that the Bank, in its role as guardian of the financial sector, has a strong incentive to offset deflationary shocks which may threaten financial stability. Other things equal, it does not have as strong an incentive to offset

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\textsuperscript{5} In technical terms, the price indices do not cointegrate.

\textsuperscript{6} After some time, past shocks will become irrelevant, whereas with a price level target ‘nothing is forgotten’.

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positive shocks. This could generate an inflationary bias in the Bank’s behaviour, but fortunately, the circumstances in which such bias might occur are very rare.

Finally, political pressure may lead to an upward bias. The issue here is whether monetary policy will be expected to be equally ruthless in offsetting positive and negative shocks. If the risk of political pressure is judged to be important then we should consider whether different targets may insulate monetary policy from at least some of this interference. What is more important than our own perception is the public’s view (and the view of the financial markets). If they see a significant probability of a government using its right to override the price stability target from time to time, this will raise inflation expectations and make price stability harder to keep. It is unclear, however, whether a price level rule would avoid this potential problem.

One benefit of an upward drift in the price level, which may be more likely with a zero inflation target, is that it will tend to counteract the type of price index measurement bias described in the previous section. That is, an upward creeping price level may leave the ‘true’ cost of living close to unchanged.

Overall, the economic implications of a slight upward drift in the price level are not clear. Simulation work by David Lebow et al. suggests that, as expected, the drift which comes with a zero inflation target leads to greater price level uncertainty than does a strict price level target. However, they also find that this difference may not be large in practice. Also, the degree of price level drift may be so small that it does not affect economic decisions (the U.S. Federal Reserve’s criterion for price stability). If so, many of the costs of inflation would fall to zero because people would be behaving as if the price level were constant. The overriding consideration is, again, the way in which expectations are shaped by the policy regime.

**Short Term Or Long Term Price Stability Focus?**

As discussed in the introduction, any choice of price stability target needs to be mindful of the potential conflict between flexibility and credibility. This applies to the choice of time horizon as much as it does to the other criteria. This section starts by looking at the difficulties and benefits of a ‘short’ term focus on price stability. This represents one end of the time horizon scale. From this point it is generally a matter of substituting flexibility for credibility in moving toward a ‘longer’ time horizon. For the purposes of exposition, it is easier to discuss timing issues with reference to an exact price level target (i.e. one without margins for error). However, most of the arguments apply with equal force to a zero inflation target.

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7 See Toma (1992). Note that this is also an argument in favour of a price level rather than zero inflation target. The reason is that after a negative shock, under a price level target the Bank is obliged to ease policy to push the price level back up. This should also cure the financial stability problem. Under a zero inflation target the Bank is required to hold the price level at this new lower level. Of course, all this depends on the timeframe in question.

8 Lebow et al. (1990)
Difficulties of a Short-term Focus

It is worth recalling the motivation for monetary policy targeting price stability. The basic reason is a belief that inflation has costs and that, apart from being able to reduce these costs, monetary policy cannot systematically affect output in the long run. However, most economists believe that monetary policy has real effects in the short run.

The inflation rate varies over the business cycle\(^9\), and the question of whether monetary policy should try to offset this is a complicated one. A key question here is *what drives the business cycle?* If it is because of the institutional set-up of the economy (long-term nominal contracts, prices being sticky either up or down, and so on) then it could be argued that trying to cure what is essentially a microeconomic problem with a fairly blunt macroeconomic tool may make the economy worse off.

However, if the reason why the economy has business cycles is because people’s price expectations are slow to adjust, then a *credible* policy which aims for short-run price stability may actually cure the problem. The issue is complex and a complete discussion of it would end up looking like a survey of macroeconomics. At the risk of being overly simplistic, it seems the ‘institutional’ explanations of short-run economic behaviour have struggled, and sluggish expectations may be better at explaining the swings in inflation over the cycle. We do not know enough about what causes business cycles to be confident that we could or should try to offset them. But it is clear that the more unstable is the price level in the short-term, the greater is the problem of generating credibility of price stability over the longer-term.

The *feasibility* of short-term price stabilisation is also an issue. It depends heavily on the lags with which monetary policy operates, the impact of various inflationary pressures, and the accuracy of the Bank’s forecasts.

After a monetary loosening, the inflationary effects appear to hit the New Zealand economy sooner than the real effects. Model simulations suggest that the impact on inflation of a policy loosening is concentrated in the first two years. In practice, the lag will depend on the state of the economy, on how quickly expectations and contracts adapt to the policy change, and on the Bank’s operating approach (the exchange rate is a comparatively direct and quick policy instrument).

Econometric and simulation work at the Bank gives some idea of how sensitive the inflation rate is to various shocks. Swings of the terms of trade of plus or minus 10 percent are not uncommon, with the occasional much larger blip. Swings of this size can be expected to boost CPI inflation by 1 to 1.5 percent. A 5 percent nominal exchange rate depreciation can push inflation up by around 1.5 percent. A 3 percent nominal wage shock (with productivity unchanged) can boost inflation by 1 to 2 percent after one year. These results suggest that the inflation rate is quite sensitive to a variety of common shocks.

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\(^9\) Inflation could also be subject to seasonal fluctuations.
This is not a problem if the swings can be accurately forecast (or if they can be offset reasonably quickly). Good forecasting may be able to give sufficient warning to enable the Bank to set monetary policy to offset the ‘shocks’ when they are forecast. Recognising the existence of forecast inaccuracies, frequent shocks, and policy lags, it is questionable whether monetary policy could reasonably be expected to stabilise prices over the short run.

Even if short-term price stabilisation were feasible, what are the costs of a tight price level target with a short-term focus? If a shock hits which pushes inflation above the target, we would have to deflate to bring the price level back down. Deflating quickly, in order to meet the short-term price target, may cause a recession. This is a key reason for taking a medium-term approach, at least in response to major shocks. This is clearly a problem under a price level target, and may be a problem under a zero inflation target if price expectations are mainly backward-looking. The reason is that after a positive price level shock, inflation expectations may follow the blip upwards. If so, bringing the inflation rate back down will lead to temporary but still painful losses of output and employment. The difference between the two targets is that, under an inflation target, the Bank would need to tighten to bring the inflation rate back down to zero; under a price level target, the tightening would need to be longer and/or firmer to induce a period of declining prices.

**Benefits of a Short-term Focus**

The main benefit of attempting to stabilise inflation, even in the short term, is that it may serve to enhance the credibility of monetary policy.

It is likely to be easier for the public to monitor the Bank’s adherence to a short-run target than to a long-run target. If the price level drifts away from a target then, with a long-run target, the Bank may claim, legitimately or otherwise, that this was caused by an unavoidable shock, or that it is not a cause for concern because it will be corrected in due course. In practice it may be difficult to tell whether the Bank’s excuse is genuine. If so, the public may interpret deviations of the price level from the long-term target as a softening of resolve rather than as simply the accommodation of a shock. As a consequence, inflation expectations may rise. But if the Bank runs a ‘trust us, we know what we are doing’ line, will there be public acceptance, or will there remain a residual skepticism? If this is judged to be a problem then the Bank may benefit from a target specified over a shorter time horizon which the public can more easily monitor.

However, having a target which the public finds hard to monitor will not *necessarily* lead to less policy credibility. If our basic policy credibility is already intact, the public will expect us to be just as often above as below the target. The independence and accountability mechanisms should convince the public that we have no incentive to create a surprise burst of inflation.

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10 ‘Backward-looking’ means that price expectations are formed on the basis of what has happened to prices. ‘Forward-looking’ expectations are based on predicted future prices.

11 The theoretical development of these ideas is contained in Backus and Driffield (1985).
There are two complications with this argument. First, we are still trying to build our reputation as inflation beaters - we do not yet have full credibility. An easy-to-monitor target may help. And secondly, will we be just as likely to be above as below the target?

It should be noted that it is difficult to demonstrate the beneficial role of credibility. Three strands of evidence suggest that credibility has made little if any impact on the economy in the past. The first group of studies looks at individual disinflations and asks whether some have been more credible than others, and whether the more credible ones have led to lower costs of disinflation. The bulk of the evidence is negative.\textsuperscript{12} A second group of papers look at the inflation process itself, and find that it has been remarkably stable over the 1980s. This suggests that credibility has not changed the process which drives inflation.\textsuperscript{13} The third strand of evidence is the large number of studies which find that inflation expectations are mainly backward-looking,\textsuperscript{14} and some theoretical studies which argue that this is just what should be expected.\textsuperscript{15} Backward-looking expectations imply that policy will be judged by what it actually delivers rather than by what it promises to deliver. The difficulty in finding clear evidence of credibility effects, however, may say more about the power of the tests than about the importance of credibility. Certainly, the bulk of current macroeconomic theory regards credibility as a vital issue in determining the output consequences of monetary policy.

\textbf{Moving Toward a Longer Term Focus}

Generally, in moving toward a longer horizon, the benefits stem from the avoidance of the short-term difficulties discussed above. If the costs of holding to a tight target in the short-term are considerable, then a longer period over which to adjust may be desirable.

At the same time, however, a longer focus may also harm credibility. A long time horizon may make monitoring by the public more difficult. A concern is that a longer-term focus does not pin down intentions, and hence expectations, very well.

A longer focus of price stability definition may also undermine the Bank’s ability to impose some discipline on the government’s fiscal policy, because conflicts will be less immediate and less obvious.

A longer focus may increase the Bank’s susceptibility to political pressures. There will always be times when the needs of monetary policy and the government’s aims clash, either because of genuine concerns about the short-run consequences for the real economy of monetary policy action, or because of political considerations. At times it may be hard to defend a tight or non-accommodating monetary policy if our goal is fairly far into the future; the criticism can always be levelled at the Bank that it should ease up ‘for a while’ and could do so without jeopardising its long-run aims. A less accommodating short-term target may make the Bank less vulnerable to this sort of pressure.

\textsuperscript{12} See Friedman (1988); Gordon (1985); Blanchard (1984); and Romer and Romer (1989).

\textsuperscript{13} For example, Gordon (1985); Poret (1990); Fortin (1991). For a host of other references and a more thorough discussion see Corfield and Rae (1992).


\textsuperscript{15} Friedman (1979); Ball (1991).
Target Ranges

Given the size and frequency of shocks, it is probably undesirable (for the reasons discussed) that monetary policy should aim to keep measured CPI inflation to a tight short-term target. Nor is it likely that such a strict target could be met. An obvious alternative - one embedded in the Policy Targets Agreement - is to allow for a range of outcomes around a midpoint target inflation rate. The PTA requires the Bank to target CPI inflation within a 0-2 percent band at all times. Even with this degree of flexibility, there are circumstances where shocks may lead to a breach of the target. The significance of such breaches depends on whether the target is perceived to be an actual or underlying inflation target, on how often we miss the target, and on whether we are more often above it than below. These issues, and alternative target specifications, are discussed next.

- The current system: an annual 0-2 target, with caveats

The range of circumstances in which the Bank may 'legitimately' miss the 0-2 inflation target is broad but by no means definitive. For example, any shock must be 'significant' before we can invoke it as a legitimate reason for missing the 0-2 percent inflation target, but no definition is given of what is classed as significant. The current Policy Targets Agreement also lists the 'principal' shocks to be considered, which gives the Bank scope to include more as required. There may also be disagreements about the impact of a shock.

Thus there are many possible reasons for missing the 0-2 percent target. This makes it difficult for the public to monitor us, although if the monitoring is principally done by the Bank's Board on behalf of the government or by the government directly, then they will have more time and more ability to assess the merit of the case.

Irrespective of the government's view, it is debatable whether financial markets and the public would accept the reasons for breaches at face value, or whether our credibility would be marked down.

- A longer time horizon: a moving average inflation rate

We could consider keeping a three or five year (or longer) moving average of inflation within some band. The chief advantage of this approach is that a moving average smooths the series and so reduces the impact of any shock (a 5 percent annual inflation shock will push up a 5 year moving average inflation rate by only 1 percent). Thus it reduces the chances of leaving the band. The drawback is that if we do leave the band we will stay outside it for much longer. This may greatly undermine credibility if we have to re-use the same explanation five years in a row to explain why we are outside our band. Alternatively, we would have to go to the bottom of the band for a while to return the moving average to within the band. In this sense, a moving average inflation rate target can work in a similar way to a price level target.

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A moving average is a rather extreme version of a backward-looking target, as it gives equal weight to all inflation outcomes within the period and zero weight to events outside it. What may make more sense is to have declining weights on inflation the further back you look, such as geometrically declining weights. But this makes the target complicated.

- **A wider band**

  A wider band has the advantage that we will be more likely to stay within it, but the disadvantage is that it may harm our credibility. Having a target like 0 to 4 is likely to result in average inflation higher than any reasonable definition of price stability, but how would a target like -1 to +3 be viewed by the public? Too wide a band has the disadvantage of not being able to pin down expectations sufficiently, in which case people are likely to devote resources to estimating how much inflation will vary within its band. This reintroduces once again the costs of inflation which the policy is trying to cure.

- **A ‘graded’ band**

  A fixed bandwidth is also a rather extreme version of a band, as it gives equal weight to all outcomes within the band (zero penalty) and high weight to all outcomes outside the band (a high penalty). An alternative is to have an ‘open’ band, and the Bank could be graded on the basis of how far from its measure of price stability inflation currently is. There are several variants on this theme. We could be graded (A to E) according to how close to the target we are; our performance could be measured by the sum of squared deviations from target; or we could have a point target and be expected to explain why we are more than, for example, one percent from the target. Each of these alternatives suffers from the disadvantage of having an uncertain yardstick against which to measure performance.

**Concluding Remarks**

Having accepted the need for price stability, it is then a matter of establishing an operational definition. This article has looked at some of the dimensions of choice such as; whether to have a price level or inflation rate target; whether a price stability definition should have a short-term or long-term focus; and the width or form of a target band.

Ideally, a price stability definition should serve to enhance the credibility of the Bank’s commitment to stabilise prices. It should also be flexible enough to accommodate the type of price shocks which would otherwise be costly to offset. Unfortunately, it is the general case that targets which help credibility usually constrain flexibility, and vice versa.
The current formulation of the PTA represents a compromise between these competing aims. On the one hand, the PTA specifies a fairly narrow target range for inflation (although this is not as restrictive as a point target), and a comparatively short-term horizon over which it is to be maintained. Both elements limit the Bank’s room for manoeuvre in dealing with shocks. However, it is argued that this is appropriate, given New Zealand’s low starting point in terms of policy credibility (reflecting New Zealand’s track record of inflation). On the other hand, specifying the target in terms of an inflation rate rather than a price level, and the allowance in the PTA for certain price shocks to be ignored for policy purposes, both increase the flexibility of policy.

References


