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**Inflation targeting in an open economy:
Strict or flexible inflation targeting?**

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I would like to start by thanking Victoria University and the Reserve Bank of New Zealand for the invitation to come to New Zealand as a Professorial Fellow in monetary economics. I have had a wonderful time here, have been received in a very friendly way, and have had many interesting and informative discussions with people at the University and the Reserve Bank. I have also been provided with a very productive research environment.

Since my main field of interest is monetary economics and monetary policy, it is especially interesting to come to New Zealand. As you know, New Zealand was the first country in the world to introduce an explicit target for inflation, after the Reserve Bank Act was passed in 1989. The Act also introduced an entirely new institutional framework for monetary policy. The key features of this framework are:

- (1) a clear mandate for the Reserve Bank to pursue price stability, as specified in the Policy Target Agreements;
- (2) operational independence of the Reserve Bank; and
- (3) public accountability of the Reserve Bank.

The monetary reforms in New Zealand and the explicit inflation target have so impressed the world that they have become contagious. During the 1990s several other countries, namely Canada, Britain, Sweden, Finland, Australia and Spain, have followed the New Zealand example and also introduced explicit inflation targets. In Europe there has also been a wave of institutional reform of monetary policy, giving central banks a clear mandate to pursue price stability, considerable operational independence and, in several cases, increased accountability. It is therefore no surprise that Windy Wellington has become something of a Mecca for monetary economists.

One of the pleasant obligations as a Professorial Fellow is to give tonight's public lecture. I will talk about inflation targeting in an open economy and, in particular, about the choice between what I would describe as "strict" and "flexible" inflation targeting.

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I Inflation targeting in an open economy

All countries with explicit inflation targets happen to be very open economies, with few, if any, restrictions on trade and capital mobility. What is special about monetary policy in an open economy? Two things, namely that:

- (1) there is an exchange rate channel for the transmission of monetary policy, which comes in addition to the other transmission channels; and
- (2) the economy is subject to foreign shocks as well as domestic ones.

Let me elaborate on the transmission channels a bit. Monetary policy actions are transmitted to the economy through several different channels. The most important are:

- (1) the aggregate demand channel through interest rate changes;
- (2) the expectations channel; and
- (3) the exchange rate channel.

Consider a situation when monetary policy becomes firmer, for instance by an increase in interest rates. The increase in interest rates makes it more expensive to borrow, and causes a reduction in spending on consumption and investment, that is, a fall of aggregate demand. This fall in aggregate demand eventually reduces inflation. This is the aggregate demand channel through interest rate changes.

Suppose a firmer monetary policy leads to lower inflation expectations. Lower inflation expectations in turn eventually lead to lower wage increases and lower price inflation. This is the expectations channel. If inflation expectations are initially above the inflation target, lower inflation expectations mean higher credibility of the inflation target. This is one reason why inflation-targeting central banks talk about credibility so much.

Suppose a firmer monetary policy leads to an appreciation of the exchange rate. This means that imports become cheaper in New Zealand dollars. Since part of the goods and services in the CPI (the Consumer Price Index) are imports, CPI inflation falls. This is the so-called *direct* exchange rate channel. It may be the channel that New Zealanders are most familiar with. In addition, an appreciation of the exchange rate also makes New Zealand goods more expensive relative to foreign goods. This reduces the foreign demand for New Zealand exports, and shifts some domestic demand from New Zealand goods to imported goods. In both cases aggregate demand for New Zealand goods falls, and eventually inflation falls further. This is sometimes called the *indirect* exchange rate channel.

So much for the transmission channels. In spite of these transmission channels, or maybe because of their diversity, the fact is that the Reserve Bank, as every central bank, has very imperfect control over inflation. This imperfect control is a major problem with inflation targeting. Fortunately, it has a solution. But first the problem. Inflation control is imperfect for several reasons:

First, there are lags between the monetary policy action and the effect on inflation, and these lags vary between the different channels, and they are sometimes long. Second, inflation is affected by many other things than monetary policy, for instance, fiscal policy and various domestic and foreign shocks, including changes in inflation expectations. Some of these shocks occur during the period intervening between monetary policy action and the effect on

inflation. Third, there is considerable uncertainty about the workings of the economy, about the details of the transmission mechanism, about the current state of the economy, and about the nature of the shocks that are hitting the economy. Given all these complications, one sometimes wonders how central banks can control inflation at all.

Given this imperfect control over inflation, what is the best thing for the Reserve Bank to do? Because of the lags between policy actions and their eventual impact on inflation, monetary policy will be more effective if it is forward-looking rather than backward-looking. Indeed, the Reserve Bank's inflation projections for the next 1-2 years become crucial. The best the Bank can do is to set monetary policy conditions such that the inflation projections, that follow from those monetary policy conditions and from other relevant information about the economy, meet the inflation target at an appropriate horizon. Thus, if the inflation projection is above the target, monetary policy has to become tighter, and vice versa.

Let me be a bit more explicit here. New Zealand has a target range for inflation, currently 0–3 percent per year. In order to maximise the probability that inflation stays with this range, it is best to aim for the midpoint of the range, 1.5 percent per year. From now on, when I say inflation *target* it should be understood that I mean the *midpoint* of the target range.

Let me get back to the Bank's inflation projection. The fact is (and this idea may be new to some of you), that the inflation projection becomes a so-called intermediate target. A good intermediate target is such that, if you aim for it, it helps you to achieve the ultimate target. The best the Bank can do is to adjust monetary policy conditions such that the corresponding inflation *projection*, the *intermediate* target variable, is on target at an appropriate horizon. This is the best way to make the *ultimate* target, *actual* inflation, fulfil the target. Of course, ex post, when time has advanced and we find ourselves at that horizon, actual inflation will deviate from the projection, and hence from the target. That is unavoidable, because of the uncertainty inherent in the situation, and because shocks occur in the period intervening between monetary policy action and the effect on inflation. Nevertheless, this way the deviations are on average the smallest.

Thus, the best solution to the problem of the imperfect control of inflation is to regard the inflation projection as an intermediate target, and adjust monetary policy conditions accordingly. Of course, good inflation projections require a lot of skill. That is one reason why Governor Brash has hired a number of good economists to help him with these projections.

Of course, the inflation projections take into account everything the Bank knows about the transmission channels of monetary policy. I mentioned the direct exchange rate channel above. The direct exchange rate channel is a bit special in that the lag between exchange rate movement and effect on the CPI is by all accounts shorter than for the other channels, because import prices normally react with a relatively short lag. Therefore, in an open economy, there is potentially a possibility for a central bank to target CPI inflation more narrowly and strictly, at a shorter horizon, by relying more on the direct exchange rate channel, than what is possible in a closed economy.

II Strict or flexible inflation targeting?

This brings me to the general issue of the choice between strict and flexible inflation targeting. Let me first specify what I mean by this. Strict inflation targeting is when the central bank is only concerned about keeping inflation as close to a *given* inflation target as possible, and nothing else. Flexible inflation targeting is when the central bank is to some extent also concerned about other things, for instance, the stability of interest rates, exchange rates, output and employment.

Note that I said a *given* inflation target above. The *level* of the target is not the focus here. The countries that implement inflation targeting have all chosen inflation targets (either a point target or the midpoint of the target range) varying from 1.5 percent per year in New Zealand to 2 percent per year in Canada, Sweden and Finland and to 2.5 percent per year in Britain and Australia. For a given bandwidth, I don't think the difference between a midpoint of 1.5 or 2.5 matters much. For instance, I don't think there was any good reason to raise the midpoint of the target range in New Zealand from 1 to 1.5 percent per year in the last Policy Target Agreement. There is no evidence that a 2.5 percent inflation target brings better performance of the economy, or that a 1 or 1.5 percent inflation target brings worse performance. There is a bit of controversy in the monetary policy literature over whether it is good or bad to go all the way down to zero from the above levels, but let me not get into that discussion here. There is substantial evidence that considerably higher inflation harms long-run growth.

So, here we are talking about whether keeping inflation close to the given inflation target is the only thing that matters for the central bank, or whether there are other things that matter as well. So, in considering the choice between strict and flexible inflation targeting, let me start with strict inflation targeting. What does it imply? Suppose a shock has made inflation rise to a level above the target (the midpoint of the target range). What should the Bank do? Well, if keeping inflation as close to the target as possible is the only thing that concerns the Bank, it should obviously do everything it can do get inflation back to target as soon as possible. This, by all accounts, requires very vigorous and activist policy, with dramatic interest rate and exchange rate changes. Since the direct exchange rate channel has the shortest lag among the transmission channels, it implies vigorously moving the exchange rate, in order to use the direct impact of the exchange rate on import prices to get the CPI right.

This may succeed in stabilising CPI inflation around the inflation target. However, it most likely leads to considerable variability of exchange rates and interest rates, as well as of output, employment and probably the domestic component of inflation as well. This is, for instance, indicated by some of my own research, which was presented at a recent workshop at the Reserve Bank.

In practice, no inflation-targeting central bank behaves this way. Instead, they simply avoid causing this instability to other variables than the CPI, by adopting a more gradualist approach. They do not attempt to take inflation back to target as fast as possible. Instead, they take it back gradually, and aim for the inflation target further into the future. In terms of the inflation projections I mentioned previously, they set monetary conditions such that the inflation projection hits the inflation target at a longer horizon than the shortest possible, say a horizon of 6-8 quarters rather than 2-3. Thus, in this sense, all real-world inflation-targeting central banks have made the choice to pursue flexible rather than strict inflation targeting.

I believe there are several good reasons for this choice. First, we have the possibility that too activist a policy, especially whip-sawing the interest rate or the exchange rate, may be counter-productive and lead to the so-called “instrument-instability problem”. That is, increasingly larger changes in the interest rate and the exchange rate are required, which in the end may destabilise inflation rather than stabilise it, not to speak of what this then may have done to the rest of the economy.

Second, there is considerable uncertainty about the workings of the economy and about the parameters of the transmission mechanism for monetary policy. There is a classic result in the theory of economic policy under uncertainty, due to the American economist Brainard in 1967: If there is uncertainty about the parameters of the model, the policy instrument should be moved with caution, and generally adjusted less than if there were no such uncertainty. This implies a more gradualist policy.

Third, there is inherent uncertainty about the current state of the economy and about the nature of the shocks that are hitting the economy. Therefore, the central bank often has to wait for more information before it can fully assess the situation and the appropriate policy response. The result of such waiting will also tend to be a more gradualist policy.

Fourth, if there are frequent and large reversals in monetary policy, it is likely that public understanding of monetary policy, and the predictability and credibility of monetary policy, will suffer. For instance, it may be rather difficult for the central bank to explain to the public that a large reversal is due to new information rather than previous mistakes, or mounting despair in the bank.

Fifth, for some shocks, but only some, there is a conflict between variability of output and employment on one hand and variability of inflation on the other. For instance, consider a world oil price increase for an oil-importing country. This is an example of a negative so-called supply shock. It will increase inflation and reduce output and employment. A firm monetary policy response to return inflation quickly back to target would then add to the fall in output and employment. A more gradual approach would bring inflation back to the target at a slower rate, and result in a cushioning of the decline in output and employment.

Similarly, a shock to the domestic component of the CPI can be met with a relatively quick appreciation of the nominal exchange rate in order to stabilise CPI inflation. However, this increases the variability of the both the nominal and the real exchange rate. A more gradual approach means that it takes longer for CPI inflation to get back to target, but real exchange rate variability becomes lower.

Thus, some concern about the stability of output, employment or the real exchange rate is a reason for hitting the inflation target at a longer horizon. It is important to note, however, with regard to these real variables, that any concern here is about their *variability* and not their average *levels*. It is not in the power of monetary policy to affect the long-run average levels of real variables. In the past, a lot of bad things have come from attempting to achieve permanent increases in growth or external competitiveness, or a permanent fall in unemployment, with the help of monetary policy. It is simply counter-productive to use monetary policy for such purposes. Instead, other policies have to be found. For instance, in order to permanently reduce unemployment, the best policy may be to make the labour market more flexible.

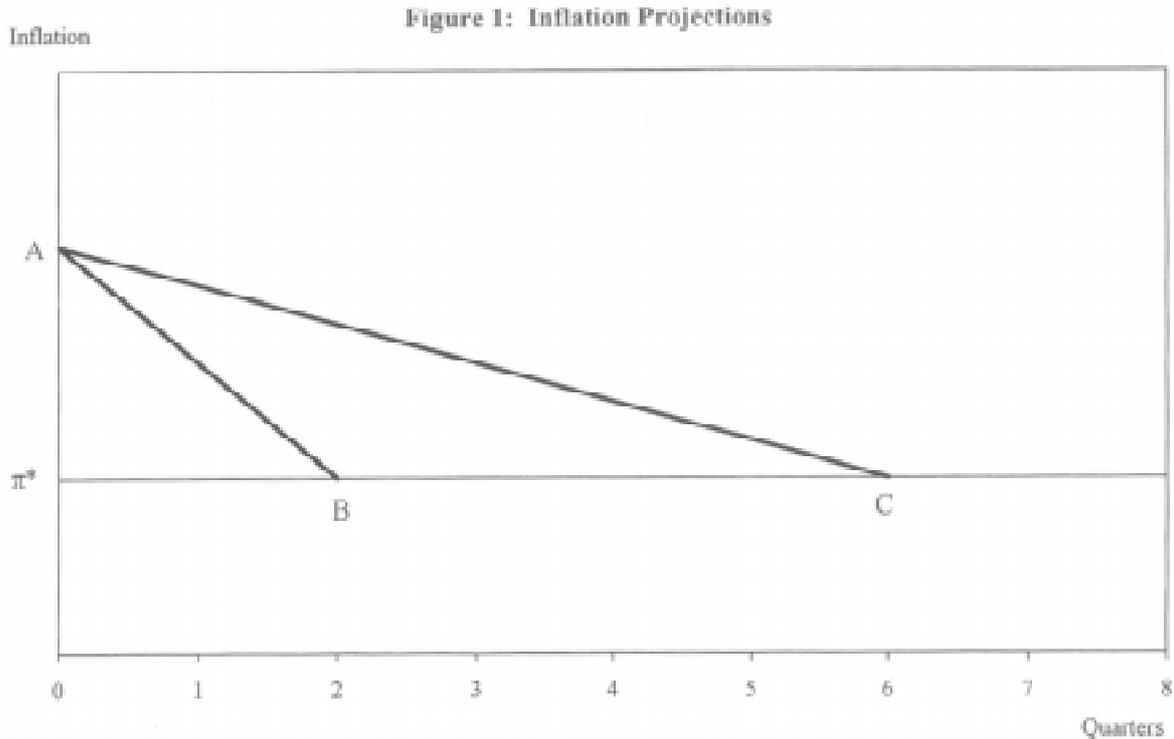
Also, please note that I said that the conflict between the variability of inflation and real variables only arises for some shocks and not for others. Actually, for most shocks there is no conflict, and stabilising inflation also means stabilising output and employment. This is the case for demand shocks, which in most countries probably are the most common shocks. A shock to aggregate demand increases both output, employment and inflation. Then stabilising inflation means stabilising output and employment. In particular, unchecked demand shocks can cause the economy to be overheated, in which case demand outstrips capacity and inflation seriously takes off. After an overheated boom often comes a severe bust, with a dramatic fall in output and employment. The best way to prevent the bust is to moderate the previous boom and prevent the overheating. This is done automatically under inflation targeting, since preventing inflation from rising also prevents the overheating. Similarly, negative demand shocks cause recessions and make inflation fall below the inflation target. Then easing monetary policy to get inflation back to target at the same time moderates the recession.

Similarly, since the exchange rate enters via import prices in the CPI, under normal circumstances, stabilising the CPI also automatically means stabilising the exchange rate and countering exchange rate shocks. My own research indicates that it is only when the CPI is targeted at a very short horizon that the exchange rate channel ends up causing excess variability in the exchange rate.

One of the worst things that can happen to an economy seems to be an unanticipated prolonged deflation. Then the real value of nominal liabilities in the economy may increase above the value of assets, causing widespread bankruptcies and considerable disturbances and instability. Having an inflation target is probably the best guarantee there is against such a development.

One final note about automatic stabilisation of real variables under inflation targeting. Inflation targeting has better potential than other kinds of monetary policy to stabilise inflation expectations. Fluctuating inflation expectations are an important source of instability in the economy, so stabilising inflation expectations is an important contribution to stability in the economy.

Let me get back to the choice between strict and flexible inflation targeting. I have listed several reasons for why central banks would choose flexible inflation targeting. The weight central banks put on the different reasons may vary somewhat from country to country. Whether the weights differ is difficult to know, because all the reasons lead to similar behaviour: targeting inflation at a longer horizon than the minimum feasible. Thus, observing this behaviour doesn't tell us whether a particular bank puts more weight on one particular reason than on another. And perhaps it doesn't matter that much what the true reasons are.



Look at Figure 1. It shows time, measured in quarters, on the horizontal axis, and inflation on the vertical axis. The inflation target (the midpoint of the target range) is denoted by π^* , and corresponds to 1.5 percent per year for New Zealand. Suppose a shock has caused inflation to exceed the target at point A. Then, strict inflation targeting implies that the central bank adjusts monetary conditions such that the inflation projection hits the target at the shortest possible horizon at point B, after 2 quarters, say. Flexible inflation targeting means that monetary conditions are set less tight, so that the inflation projection hits the inflation target at a longer horizon at point C, after 6 quarters, say.

Then the question arises: Is the Reserve Bank of New Zealand similar to other inflation-targeting central banks in pursuing flexible rather than strict inflation targeting, in spite of its reputation among some observers to be the strictest of the inflation targeters? Is there any evidence of a gradualist approach by the Reserve Bank? Well, let us look at the latest *Monetary Policy Statement* of June 1997. There, in his “Summary and policy assessment” Governor Brash says (page 3):

Against this background, a more pronounced easing in the stance of monetary policy now would need to be followed by quite an aggressive tightening in 1998 to prevent a rapid escalation of inflation in 1999. *Such a roller coaster ride in monetary conditions would do more harm than good* [emphasis added].

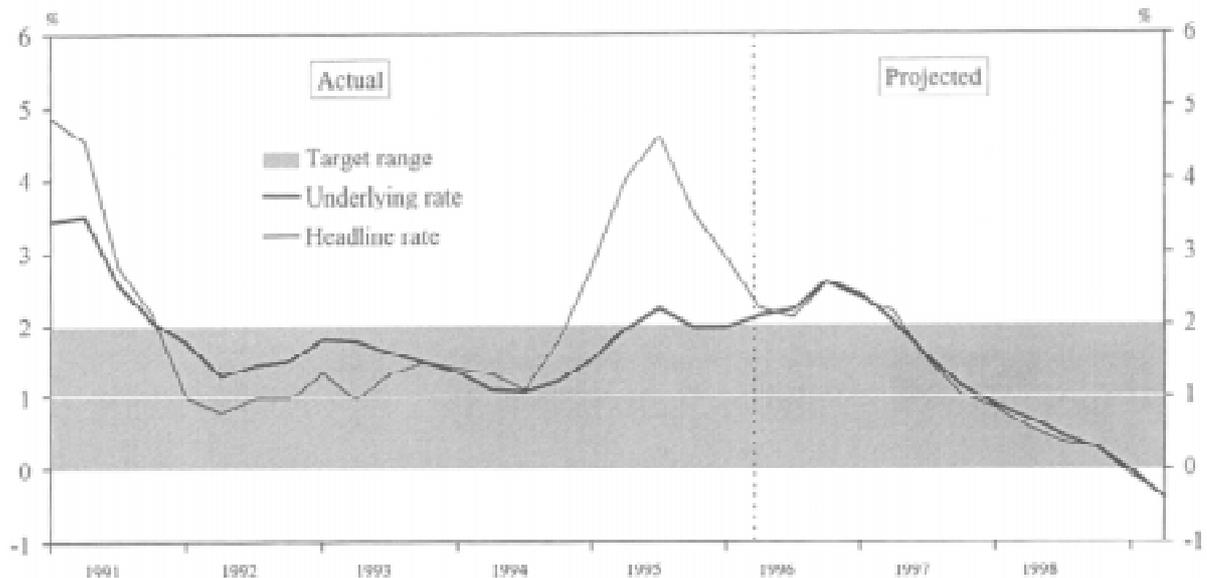
If we go back to a speech by Governor Brash in Christchurch on January 23, 1997, he said:

Indeed, irrespective of where the mid-point of the target range is, there may be some advantage in having a slightly wider inflation target than the original 0-2 percent target. A number of observers have suggested that a target with a width of only 2 percentage points requires *an excessive degree of activism* [emphasis added] on the part of the central bank, and that a slightly wider band, whatever its mid-point, would be sensible.

In the *Briefing on the Reserve Bank of New Zealand*, issued in October 1996, it is stated that in the early years of inflation targeting the policy horizon was fairly short, around 6-12 months. Then the briefing says (pages\38-39):

Indeed, it is possible that in some situations actions aimed at maintaining price stability in the short term *could prove destabilising* [emphasis added] to activity and inflation in the medium term. In recent years the Bank's policy horizon *has lengthened further into the future* [emphasis added], driven partly by experience and partly by firmer empirical evidence on the impact of policy on inflation beyond the one year horizon.

Figure 2: Consumer price inflation
(annual percentage change)



Finally, let us look at Figure 2. This shows the Reserve Bank's inflation projection in the *Monetary Policy Statement* of June 1996. The projection was done with data through the first quarter of 1996, the vertical dashed line. As you may recall, this was a difficult time for the Bank and Governor Brash, with inflation projected to exceed the upper edge of the target range for several quarters. The projection did not reach the target range until three quarters later, in the March quarter 1997, and the projection did not reach the midpoint of the target until after 6-7 quarters. With an extreme further tightening of monetary policy, the Bank probably would have been able to make the projection reach the target range a bit earlier, and definitely reach the midpoint of the target range earlier. Instead, the Governor chose to keep monetary conditions at their existing (relatively firm) level, and to accept that the inflation target would be met at a longer horizon than the shortest possible.

In addition, the caveats in the Policy Target Agreement can be interpreted as allowing flexible inflation targeting. For instance, one of the specified caveats is a significant change in the terms of trade, which if caused by an oil price increase is an example of a negative supply shock, as I mentioned above. If such a supply shock occurs, a breach of the target is excused. Thus, the Bank need not do its utmost to prevent the breach, only make sure that the breach is temporary. This can be interpreted as gradually getting inflation back to target.

Although this evidence is not completely conclusive, I believe it strongly indicates that the Reserve Bank of New Zealand is not targeting inflation at the shortest horizon possible, and is not following the most activist policy. Instead, it pursues flexible inflation targeting, like the rest of the inflation-targeting central banks. Perhaps some of you are surprised to learn that the Reserve Bank is more flexible than you were aware of.

Before I conclude, one final point about flexible inflation targeting. It is obvious that there is a limit to how much flexibility is appropriate. If central banks go too far down the road of flexibility, that is, if the horizon they are aiming for is too long, or the rate at which they bring inflation back to target is too slow, reasonable doubts about the commitment to the inflation target may arise. Then the credibility of the inflation target may suffer, and inflation expectations may fail to be stabilised around the inflation target. For this reason, a central bank in the introductory phase of inflation targeting may find it appropriate to pursue a somewhat stricter approach, in order to more clearly demonstrate the commitment to the inflation target and to build credibility more quickly. This may be especially appropriate, if the initial phase also involves a program of disinflation. At a later stage, when the bank has demonstrated this commitment, and credibility has been established to a reasonable degree, there may be more scope for flexibility without endangering credibility.

III Conclusion

Let me conclude: I started by talking about the transmission channels for monetary policy in an open economy. Although inflation control is always imperfect, in an open economy the direct exchange rate channel potentially allows a more narrow and strict control over inflation than in closed economies. I then noted that, given the imperfect control of inflation, the best the central bank can do is to set monetary policy conditions such that the inflation projection at an appropriate horizon hits the inflation target (the midpoint of the target range). This way, the inflation projection becomes an intermediate target.

I then went on to discuss the choice between strict and flexible inflation targeting, which in practice boils down to whether inflation should be targeted at the shortest possible horizon or a somewhat longer horizon. I argued that, in practice, central banks, including the Reserve Bank of New Zealand, actually all pursue flexible inflation targeting. Flexible inflation targeting shows up in less policy activism, gradualism in returning the inflation back to target, and in aiming at the inflation target at a somewhat longer horizon. There are very good reasons for doing so. The consequences for the economy of strict inflation targeting are simply undesirable.

Finally, I argued that there is a limit to what degree of flexibility is appropriate. Too much flexibility may cause the public to doubt the bank's commitment to the inflation target, thereby reducing the credibility of the inflation target and failing to stabilise inflation expectations.

Why is current inflation targeting often described by many observers as very strict, or even too strict? I think current inflation targeting may appear strict only in comparison with previous decades of sloppy, unstable and generally very bad monetary policy. But a closer look reveals that current inflation targeting is in fact quite flexible. Furthermore, flexible inflation targeting can succeed in stabilising both inflation and other variables. There are

considerable automatic stabilisation mechanisms in inflation targeting, for instance, the stabilisation of demand shocks, inflation expectations, and exchange rates.