

The Monetary Policy Framework

Chapter 1: Introduction

Under section 8 of the Reserve Bank of New Zealand Act 1989 (the Act), the primary function of the Reserve Bank is to formulate and implement monetary policy directed to the objective of achieving and maintaining stability in the general level of prices. The Act provides the Reserve Bank operational independence in implementing monetary policy. However, the Reserve Bank must implement monetary policy directed towards the goal set out in a Policy Targets Agreement (PTA). This goal must be consistent with the price stability objective of the Act. The PTA is agreed between the Minister of Finance and the Governor of the Reserve Bank.

Consecutive PTAs have provided for a flexible inflation targeting approach, which is the norm for the implementation of inflation targeting frameworks globally. Under flexible inflation targeting the central bank aims to maintain price stability in the medium term but also puts weight on stabilising the real economy, and in particular stabilising employment and/or output around their trend level.¹ Flexible inflation targeting therefore requires the central bank to consider the short run impacts of monetary policy on the real economy and also recognises that monetary policy generally operates as the first line of defence in stabilising the real economy during an economic downturn. This approach recognises the importance of price stability in enabling long-run economic growth and therefore improving living standards but also recognises that large deviations of output from the economy's supply potential can also be costly to the economy in the long term.

The experience of the global financial crisis (GFC) that began in 2007 and the lethargic economic recovery post-GFC (with the resulting period of persistently low inflation and interest rates globally) has renewed debate on the tools of macroeconomic stabilisation policy. These debates include the role and effectiveness of flexible inflation targeting regimes in stabilising the economy following a large downturn, the scope for counter-cyclical fiscal policy, and the role and scope of macro-prudential policy.

These debates are in part motivated by the fact that central banks and financial regulators did not see the financial crisis coming. There is a renewed awareness that a low and stable rate of consumer price inflation, while important, is not sufficient to ensure macroeconomic stability and that financial sector risks can have large and prolonged impacts on macroeconomic stability.² A further motivation is that some

¹ Handbook of Monetary Economics, Volume 3B, Inflation Targeting, Lars EO Svensson 2011. OECD Economic Policy Paper, Strengthening Economic Resilience: Insights from the post-1071 record of severe recessions and financial crises, December 2016, No 20.

² See Stephen Grenville, Recent global developments in monetary policy and lessons for New Zealand, October 2016: <http://www.treasury.govt.nz/publications/informationreleases/monetarypolicy/mpw>

central banks have reached the effective lower bound (ELB)³ of interest rate policy and moved into the new operational procedures of quantitative easing and forward guidance to implement monetary policy over recent years. There is uncertainty as to how effective these measures will be in impacting on output and inflation in a particular instance. There is also uncertainty as to the secondary impacts of unconventional instruments, for example on financial markets in the longer term. This has renewed the debate as to the relative role of fiscal and monetary policy in stabilising output as interest rates become very low.

Finally, the recent extended period of low interest rates experienced globally has reduced the cost of borrowing for individuals and firms, contributing to rising indebtedness, increased risk taking and increases in asset prices.⁴ While low interest rates reduce the cost of borrowing in the short term, high levels of debt leave borrowers vulnerable to increases in interest rates or reductions in income in the future, creating financial stability risks. This set of circumstances has therefore highlighted the interaction of monetary policy settings and financial stability risks.

In this context, several countries have recently undertaken reviews of their monetary policy frameworks. Despite this, we are not aware of any country abandoning an established inflation targeting regime.⁵ However, some countries have made changes to their institutional arrangements to address the current challenges. There has also been widespread reform of financial stability frameworks, particularly to improve the ability of authorities to monitor and address systemic risks to the financial system.

While there is still scope to lower policy interest rates in New Zealand, many of the economic issues that are arising globally are relevant to New Zealand. For example, New Zealand has also experienced an extended period of low interest rates, low inflation and asset price inflation. The New Zealand Treasury undertook a programme of work in 2016 to better understand the operation of monetary policy in the current economic environment and to consider the case for alternative monetary policy frameworks. This work did not identify an alternative framework that would be likely to perform better for New Zealand. The key findings of this work are summarised in this document.⁶

³ Monetary policy is subject to an effective lower bound which international experience shows can be slightly less than zero. At this point lowering interest rates further is likely to result in households and firms shifting deposits into cash or other asset to avoid the negative interest rate penalty. This means monetary policy becomes increasingly less effective in easing monetary conditions as rates become more negative.

⁴ IMF Global Financial Stability Report October 2017.

⁵ Except for countries that joined the Euro.

⁶ This work was undertaken in 2016 but was updated in 2017.

Chapter 2: Institutional Framework and economic backdrop

Institutional framework

The Reserve Bank of New Zealand's responsibilities include both monetary and financial stability policy. In respect of its monetary policy functions, the 1989 Act requires that monetary policy be directed towards maintaining stability in the general level of prices. In formulating and implementing monetary policy the Act also requires the Reserve Bank to have regard to the efficiency and soundness of the financial system.

The Act, however, foresees that there may be economic circumstances under which the price stability objective is no longer appropriate for a period of time and therefore allows for the Government of the day to change the primary monetary policy objective to something other than price stability. This must be done in a transparent manner, allowing the Government to be held to account for its decision. A decision to change the objective of monetary policy must also be reviewed every year. The Act therefore recognises the right of the Government of the day to determine the macro-economic framework.

In order to set the specific target of monetary policy, section 9 of the Act requires that the Reserve Bank Governor and Minister of Finance agree on monetary policy targets and make these targets public in a Policy Targets Agreement (PTA). The PTA must be agreed whenever a new Governor is appointed (every 5 years), and may also be amended at other times. Consecutive PTAs have set the policy target in terms of an inflation target, although the Act is broad enough to allow alternative targets to be set. As a public document the PTA is important in providing transparency as to the target of monetary policy. The Reserve Bank has operational independence to conduct monetary policy to achieve the targets specified in the PTA.

The current PTA provides for a flexible inflation targeting regime, in which the primary objective is a medium term inflation target but the Bank must take account of other considerations in meeting this target. Its main features are:

- A target to keep future inflation outcomes between 1% and 3% on average over the medium term, with a focus on keeping future average inflation near the 2% target midpoint;
- The Bank must look through short term deviations in inflation that arise from shocks to prices or the economy and respond in a manner that is consistent with returning inflation to target in the medium term;
- Requirements as to transparency and communication when inflation deviates from target;

- A requirement that the Bank take account of the efficiency and soundness of the financial system and seek to avoid unnecessary instability in output, interest rates and the exchange rate in pursuing the price stability objective.

This monetary policy framework, based on a clear objective and operational independence to achieve that objective, allowed for the Government to make a credible commitment to long term price-stability as the objective of monetary policy. This framework was based on the theoretical work of Kydland and Prescott, according to which discretionary monetary policy has a bias towards inflation due to the ability of monetary policy to stimulate economic activity in the short term.⁷

To support the Bank's operational independence for monetary policy, the Act also provides mechanisms to promote the transparency of monetary policy through the requirements to issue Monetary Policy Statements. The Act also provides a comprehensive regime to hold the Bank, through the Governor as decision-maker, to account for monetary policy implementation. The main features of this regime are set out in Box 1.

In addition to its obligations to implement monetary policy, the Bank is also charged with undertaking prudential (and macro-prudential) regulation and supervision of banks and insurers and with advising on regulation of the non-bank regulatory sector. Under the Reserve Bank Act prudential regulation of banks is for the purposes of promoting the maintenance of a sound and efficient financial system or avoiding significant damage to the financial system from a bank failure. The Bank is also charged with monitoring the soundness of the financial system through financial stability reports.

⁷ See for example IMF Working Paper WP/15/132, Inflation-Forecast Targeting: Applying the Principal of Transparency p7.

Box 1: Summary of New Zealand's Monetary Policy Framework

Objective

- Set out in legislation. Section 8 of the RBNZ Act 1989 states: *The primary function of the Bank is to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices.*

Intermediate objective

- Specified in a Policy Targets Agreement (PTA) agreed between the Minister of Finance and the RBNZ Governor when the Governor is appointed.
- Each agreement to date has specified an inflation target for the Bank to meet. However, the Act does not require that the specific targets be set in relation to inflation or any other price variable.

Minister's Expectations

- Letter of Expectations to the Governor and to the Board.
- These letters provide the Governor and the Board with greater clarity about the Minister of Finance's specific expectations and interests in relation to relevant activities. These letters are usually sent annually and are formal documents (but are not legally binding).

Transparency

- PTA is a public document.
- Any change to the primary objective of monetary policy by the Minister must be gazetted.
- Monetary Policy Statement (MPS) provided by Bank four times a year (Act requires two times a year).
- Section 4(a) of the PTA requires the Bank to explain in the MPS why the annual rate of inflation is outside of the medium term target or is projected to be.
- Financial Stability Report released twice a year (financial stability).
- Reserve Bank's ongoing research programme - *Bulletin* articles; analytical notes.
- Corporate publications - Annual Reports, Statement of Intent; wider communications (eg, speeches and presentations).

Accountability

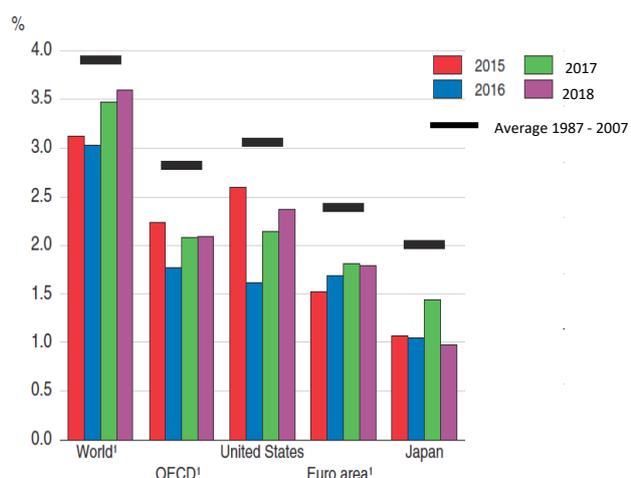
- Governor can be removed from office (on advice of the Minister) if he/she does not adequately ensure that the PTA is met.
- Performance of the Bank is monitored by the Board. Board's formal role is to keep under constant review the performance of the Bank/Governor in discharging all of its functions including in meeting the PTA. Section 53(a), requires the Board to prepare an Annual Report on the performance of the Bank.
- Scrutiny by Parliament (Finance and Expenditure Select Committee). Each MPS and Annual Report is referred to a parliamentary committee for review, and the Governor is called to appear before the committee.
- Scrutiny by financial markets, the media and the public, including through Official Information Act requests.

Economic Backdrop

International context

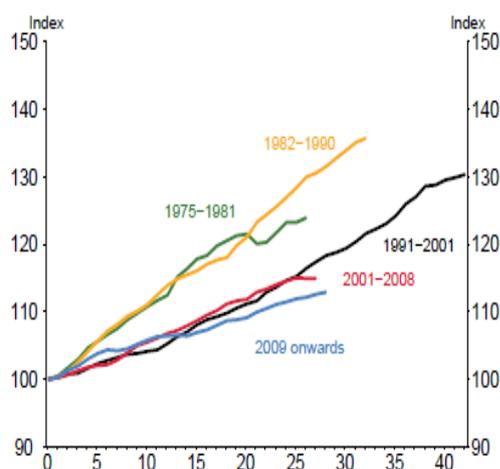
As a small open economy, international developments have a large influence on New Zealand’s economic conditions. Globally, economic growth has been weaker in advanced economies in the post-GFC period than in past recoveries (figure 2) and growth in real GDP remains below past norms in many countries (figure 1). Although some of the low growth can be explained by structural factors such as low productivity growth, 10 years on from the GFC there continues to be excess capacity in several economies as measured by either the output gap or measures of labour utilisation.⁸

Figure 1: Real GDP Growth (2015-2018 vs 1987-2007)⁹



Source OECD Economic outlook 2017

Figure 2: Real GDP growth in OECD¹⁰



Source: OECD, RBNZ estimates

Given the prolonged weak economic environment, central banks’ policy rates have been low for an extended period of time (figure 3) and even negative in some cases. For some advanced countries, monetary policy reached the effective lower bound on interest rates (ELB) and monetary policy has been implemented through the new operational techniques of quantitative easing and forward guidance. The result has been a prolonged period in which monetary policy has been extremely accommodative and interest rates have been exceptionally low (figure 3).¹¹ Despite this, inflation has been at historically low levels in many countries for a sustained period of time (figure 4).¹² Globally, core inflation is expected to edge up slowly over coming years as economic slack declines in advanced economies.

⁸ IMF World Economic Outlook, October 2017; OECD: <http://stats.oecd.org/Index.aspx?QueryId=51655>.

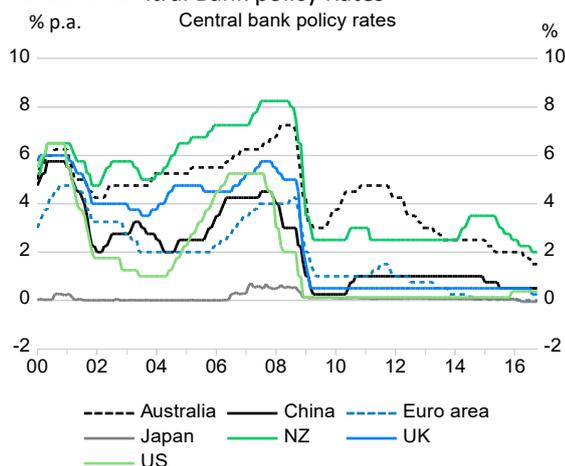
⁹ OECD Economic Outlook, Volume 2017 Issue 1 page 12. Green box is 2017, purple 2018 forecast. Horizontal lines show the average annual growth rate of GDP in the period 1987-2007.

¹⁰ Rebecca Williams, Characterising the Current Economic Expansion: 2009 to present day, Reserve Bank Bulletin Vol. 80. No. 3. June 2017. OECD expansions correspond to periods following global recessions as identified by the IMF (2009), while also including the Dot-Com crash of 2001 that coincided with mild recessions in many advanced economies.

¹¹ OECD economic outlook Volume 2016 Issue 1.

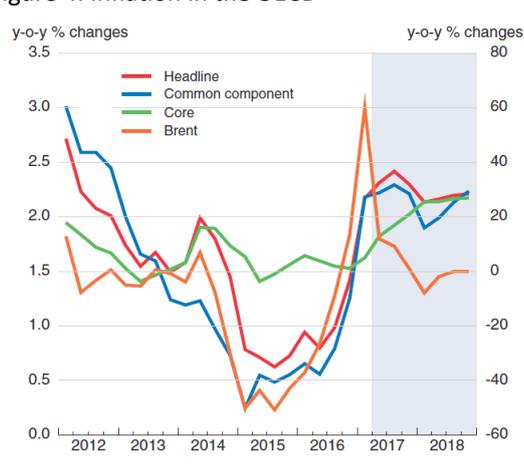
¹² OECD economic outlook Volume 2016 Issue 1.

Figure 3: Central Bank policy Rates



Source Haver

Figure 4: Inflation in the OECD



OECD Economic Outlook

This period of low growth and low inflation has given rise to debates as to whether macroeconomic stabilisation frameworks, including both fiscal and monetary policy, need to be strengthened in order to see a quicker return of output and employment to average levels. Further, there is concern that the extended period of low interest rates has led to the build-up of financial risks through increased risk taking, debt accumulation and rapid rises in asset prices.¹³ Whilst expansion in borrowing is one of the channels through which monetary policy operates to support economic growth, high levels of debt create vulnerabilities should interest rates rise rapidly in the future.

Another feature of the international environment has been the fall in the neutral interest rate (the interest rate where monetary policy is neither stimulatory nor expansionary).¹⁴ As monetary policy rates are set relative to the neutral rate, a fall in the neutral rate of interest (for a given inflation target) implies monetary policy makers have less scope to address deep economic slowdowns through the traditional means of cutting short-term interest rates than in the past.¹⁵ Kiley and Roberts (2017) for example, show that for the US the lower neutral rate implies that the use of conventional approaches to monetary policy could lead to policy rates being constrained by the zero lower bound as much as one-third of the time, with adverse effects on the Fed's ability to hit its 2 percent inflation target or to keep output near potential.¹⁶ The potential for ELB episodes has generated debate not only on the role of unconventional monetary policy but also the role of fiscal policy in stabilisation at the ELB and whether alternative monetary policy frameworks or a higher inflation target could reduce the risks of the ELB episodes.

¹³ IMF Global Financial Stability Report October 2017.

¹⁴ Laubach and Williams estimate that the neutral rate has fallen around 400 basis points since the 1980s. It is not clear if the fall is permanent but at least it appears to be a prolonged feature of the environment.

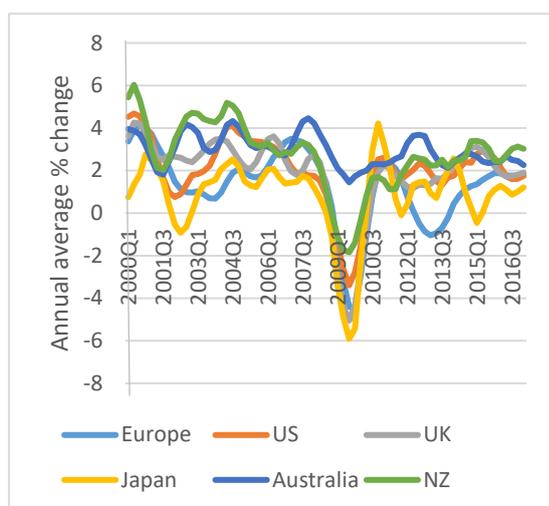
¹⁵ Bernanke Monetary Policy in a New Era, Brookings (2017).

¹⁶ Kiley and Roberts, Monetary Policy in a Low Interest Rate World, Brookings Papers on Economic Activity, Washington DC, Spring 2017.

New Zealand context

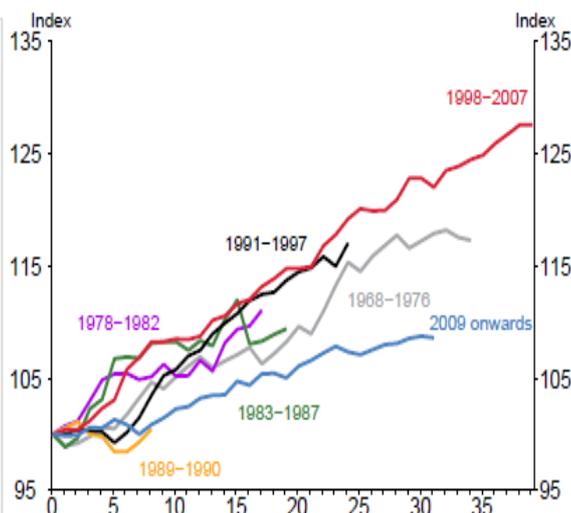
Economic growth in New Zealand has been relatively strong in the post-GFC period compared to some international peers (figure 5), although more so on an aggregate basis than a GDP per capita basis (reflecting high inward migration over recent years). However, as with the global economy, the recovery in economic growth following the GFC has been slower than in past economic recoveries on both a real GDP basis and on a real GDP per capita basis (figure 6).¹⁷

Figure 5: Annual Average % change in GDP



Source: Haver

Figure 6: Real per capita GDP over NZ business cycles



Source: Statistics New Zealand, RBNZ estimates

Following the adoption of inflation targeting in New Zealand in 1989, New Zealand has experienced a period of relatively low and stable inflation (figure 7, 8). While the mid-2000s saw a period of inflation at the top of the band, as with the global environment, inflation in New Zealand has been low over recent years (figure 8). Headline inflation was below the 2% target mid-point when it was formalised in 2012 and remained below this point until 2017. Headline inflation was also below the bottom of the target band (1%) from the final quarter of 2014 until the final quarter of 2016 despite the OCR reaching a historical low of 1.75%. Inflation has increased from its low point recently and is expected to return to the mid-point of the target in the medium term. Looking over a longer period of time, the post-2002 average inflation rate is around 2.2%, therefore averaging close to target over the long term.

A significant factor driving low inflation over recent years has been low tradables inflation, which has been negative for a sustained period. Low tradables inflation is due to factors such as: a fall in oil prices over 2014-2015, weaker than expected global growth and inflation and a high New Zealand dollar due to relatively more accommodative monetary policy overseas. However, non-tradables inflation has also

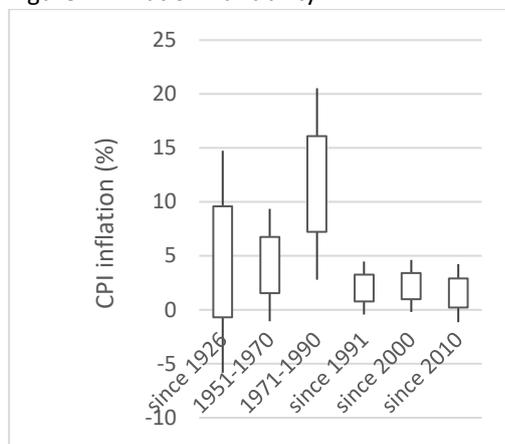
¹⁷ Rebecca Williams, Characterising the Current Economic Expansion: 2009 to present day, Reserve Bank Bulletin Vol. 80. No. 3. June 2017.

been low compared to historic averages. Some of the reasons for this include: a fall in New Zealand export commodity prices (largely due to a fall in dairy prices) resulting in a weakening in expenditure, increases in participation in the labour force and unexpectedly high migration reducing supply constraints, a decline in short term inflation expectations as a result of persistent low inflation, and sector specific factors.¹⁸

Over the last business cycle it appears that the neutral interest rate has fallen in New Zealand, as it has globally. The Reserve Bank has estimated that the neutral interest rate has fallen since the GFC, with the mean (nominal) estimate just below 4 percent in 2017.¹⁹ A lower neutral rate (for a given inflation target) implies that monetary policy interest rates will need to be lower than in the past to stimulate demand in a downturn and are therefore more likely to reach the ELB. However, unlike some countries severely affected by the GFC and subsequent sovereign debt crisis, New Zealand currently still has room to cut official interest rates.

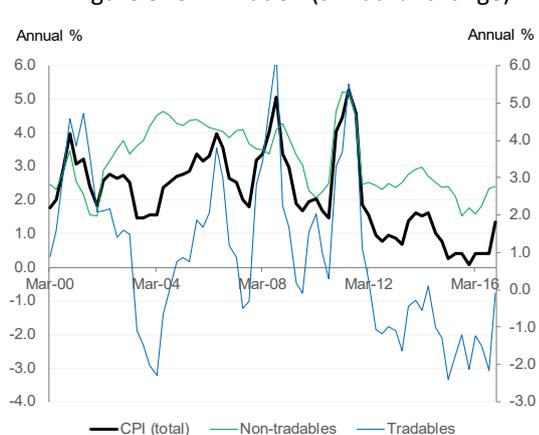
Low short term rates and accommodative monetary policy overseas have resulted in mortgage rates being at historical lows. Combined with high net migration and a slow housing supply response, this has resulted in high house price inflation particularly in Auckland. Low interest rates have also been associated with an increase in household debt, although low interest rates have moderated the impact on household debt servicing costs. High levels of household debt pose a risk to households' ability to pay should interest rates rise rapidly in the future or there be a shock to incomes.

Figure 7: Inflation Variability²⁰



Source Statistics New Zealand, the Treasury

Figure 8: CPI inflation (annual % change)



Source Statistics New Zealand, the Treasury

¹⁸ John McDermott, Understanding Low Inflation in New Zealand, October 2016:

¹⁹ Rebecca Williams, Characterising the Current Economic Expansion: 2009 to present day, Reserve Bank Bulletin Vol. 80. No. 3. June 2017.

²⁰ Note: the box shows +/- 1 standard deviation from mean CPI inflation in the given period. The line shows +/- 2 standard deviations from mean CPI inflation.

Chapter 3: Macroeconomic Policy Objectives

Macroeconomic stability

Government policy interventions can be assessed against their ability to improve the living standards of New Zealanders. A stable macroeconomic environment contributes to living standards by improving incomes over the long term, both by setting the scene for more efficient decisions and by reducing the likelihood of large negative reductions in income. A stable macroeconomic environment also improves living standards by improving equity by reducing arbitrary redistributions of income.

Key elements of a stable macroeconomic environment (internal stability) are: real output is at or close to capacity (output stability), the inflation rate is low and non-accelerating (price stability), and a sound and efficient financial sector (financial stability). External stability also requires that the current account balance can be sustained by capital flows on terms comparable with the growth prospects of the economy - that is, it requires that a country can continue to finance its external debt. Below we discuss how the key elements of internal stability improve living standards.

Price stability

Price stability, meaning low and stable inflation, is important to maintain high levels of long run economic growth. This means that through maintaining low and stable inflation monetary policy can improve income levels in the long term. High and variable inflation increases uncertainty throughout the economy, which may dis-incentivise investment, undermine the role of prices in signalling relative price changes and distort intertemporal decisions with respect to labour supply and consumption. High and variable inflation therefore harms economic growth by resulting in an inefficient allocation of resources in the economy. In an empirical study Motley (1994) estimates that an increase in the inflation rate by 1 percentage point would reduce long run productivity growth by 0.06 percentage points per year in developed countries. Hence an increase in inflation from 2% to 12% (similar to the rates in the 1970s) would lower productivity growth by 0.6 percentage points.²¹ There is, however, likely to be a threshold under which inflation does not harm growth, and small positive amounts of inflation may improve growth by helping the economy to adjust in the face of nominal rigidities. A positive inflation rate also reduces the likelihood that monetary policy may reach the ELB. Estimates of the level at which inflation may start to harm growth vary. Khan and Senhadji estimate the threshold above which inflation has a negative impact on growth for industrial economies to be between 1-3%.²² Hammond considers that the consensus seems to be that above a threshold of around 3-4% inflation imposes welfare

²¹ Taylor The Inflation/Output Variability Trade-off revisited p34

²² Threshold Effects in the relationship between Inflation and Growth IMF WP WP/00/110

costs, while plausible gains from reducing inflation below 2% are unlikely to outweigh the benefits of a positive target.²³

Financial stability

Financial stability is also important to maintain income levels and income growth over time. Reinhart and Rogoff for example show that financial crises (in the form of systemic banking failures) can give rise to large negative shocks to real per capita GDP, and that it can take several years for real per capita GDP to return to pre-crisis levels.²⁴ This may result in a loss of wealth for individuals or a prolonged period of high unemployment, that can significantly impact on the welfare of those affected. A prerequisite for financial stability is that the financial system as a whole is sufficiently resilient to ensure that the core services of payments, credit supply and risk transfer and pooling can be sustained in the face of large shocks. This would require both that financial entities are not likely to fail in the event of a reasonable range of large shocks but also that financial entities can continue lending and providing risk transfer in the event of a large shock.²⁵

Output stability

There is evidence that high levels of output volatility are correlated with lower levels of average output in the long run, with large recessions (i.e. large negative deviations) being particularly costly.²⁶ High levels of output volatility may lead to greater uncertainty-induced planning errors by firms, or discourage investment thereby resulting in lower capital accumulation. Sustained periods of below potential output may also lead to hysteresis (the current rate of unemployment negatively affecting the future) as those that become unemployed in a recession, or unable to enter the work force, may see their skills decline making them less employable in the future. In this way recessions may disproportionately disadvantage those at the lower end of the income distribution, leading to equity issues.

Domestic monetary policy versus fixed exchange rates

One of the main choices a country makes in its macroeconomic policy framework is the choice of monetary, capital account and exchange rate policies. The monetary policy

²³ Centre for Central Banking Studies Handbook no 29, State of the art of inflation targeting -2012. Gill Hammond.

²⁴ Recovery from Financial Crisis: Evidence from 100 cycles *American Economic Review: Papers & Proceedings* 2014, 104(5): 50–55

²⁵ Hanson, Kashyap and Stein, A Macro-prudential Approach to Financial Regulation, *Journal of Economic Perspectives*, vol 25 No 1 Winter 2011.

²⁶ Guy Debelle, Inflation Targeting and Output Stabilisation, Research Discussion Paper, June 1999, Reserve Bank of Australia: https://web.stanford.edu/~johntayl/Papers/inf_target_out_stab.pdf. Ramey and Ramey, Cross Country Evidence on the Link between Volatility and Growth, *The American Economic Review*, Vol. 85, No. 5 (Dec., 1995), pp. 1138-1151 (1995).

'trilemma' states that, at any one time, it is possible to have only two of the following three things:

- a fixed exchange rate;
- control over domestic monetary policy; and
- free cross-border capital movement.

In practice this means that there are trade-offs between these potential objectives and more of one will come at the cost of another. For example, putting greater weight on reducing volatility in the level of the nominal exchange rate will come at the cost of a loss of control over domestic monetary policy and increased volatility in output and inflation.²⁷

As a small open economy reliant on external debt, (reasonably) free cross-border capital movement is important to sustained growth and economic development by ensuring funding is available for investment needs. Therefore the relevant choice for New Zealand is between the level of control over domestic monetary conditions, and domestic prices, and the exchange rate.

New Zealand's choice prioritises control over domestic monetary conditions and therefore domestic prices and output stability. This is recognised in the objective of monetary policy in the Act – price stability- and in the PTA which provides for a flexible inflation targeting regime. The PTA, however, does require the Bank to take account of exchange rate volatility and hence does allow the Bank to adjust the speed at which it returns inflation to target in order to take account of exchange rate impacts.

This choice of control over domestic monetary conditions reflects the benefits that arise from price and output stability, discussed above. It also reflects that fixing the nominal exchange rate does not give a country control over the real exchange rate (which is what is important for international competitiveness) as it will have less control over inflation. The lack of international competitiveness arising from high inflation was one of the reasons for the specification of a price stability target when the Act was passed in 1989.²⁸ Further, a flexible exchange rate has benefited New Zealand by assisting adjustment in the face of income shocks, although with different impacts on different sectors of the economy. For example, the exchange rate tends to depreciate in the face of negative income shocks or reductions in the terms of trade stimulating exports and encouraging substitution away from imports and towards domestically produced goods. Any loss of exchange rate flexibility would require economic adjustments to occur through domestic prices and wages. In countries with fixed exchange rates this has at times meant painful downward adjustment in prices and wages to restore competitiveness in the face of negative shocks.

²⁷ West (2003) "Monetary policy and volatility of real exchange rate in New Zealand" Reserve Bank Discussion Paper Series, 2003/09.

²⁸ Hansard 1989, speech by David Cagill.

Chapter 4: Alternative frameworks: price and output stabilisation

Different macroeconomic policy frameworks have different impacts on the stability of prices, output and interest and exchange rates.

Monetary policy settings impact on the rate of inflation but also in the short run monetary policy directly impacts on the level of output and employment. For example, a reduction in the short term interest rate will encourage borrowing and spending and therefore stimulate economic activity and reduce unemployment. In the long run, however, prices and wages adjust to monetary policy settings and therefore a government cannot permanently increase output and employment through accommodative monetary policy.²⁹ However, monetary policy may indirectly impact on long-run levels of output/income through reducing volatility in both inflation and output which, as discussed in chapter 3, can impact on the average level of output in the long run. Given this, the channel through which monetary policy improves living standards through impacting on the real economy (i.e. influencing variables other than nominal variables) is through stabilising output and employment around their potential or 'sustainable' levels.³⁰ Monetary policy frameworks generally put weight on both inflation and output stabilisation.

The objectives of price and output stabilisation are generally complementary for monetary policy. The 'divine coincidence' refers to the property of monetary policy that policy directed towards price stability will also generally stabilise actual output around potential output.³¹ For example, when demand for the economy's goods and services exceeds the capacity of the economy to supply those goods and services, there will be pressures on resources and inflation will tend to result. Monetary policy directed at reducing inflation will also tend to reduce demand and stabilise output around potential.³² New Zealand evidence shows that between 1989 and 2001 inflation targeting tended to have a countercyclical impact on New Zealand growth cycles, typically reducing output and inflation variability around their trend levels.³³

²⁹ This is often expressed by the idea that the long run Phillips curve (i.e. inflation/unemployment trade-off) is vertical.

³⁰ See for example Svensson, Lars (2001) "Independent Review of the Operation of Monetary Policy in New Zealand: Report to the Minister of Finance".

³¹ Blanchard (2006) <http://economics.mit.edu/files/742>. In the new Keynesian framework without real wage rigidities this is a strong result that holds in the presence of a supply shocks, such as a rise in oil prices, as both actual and potential output decrease in response to this shock. In this framework the optimal response to a shock such as an oil price shock is to stabilise inflation.

³² Mankiw (2005) – shows this property also holds for productivity shocks in the new Keynesian framework as, while prices are effected by productivity shocks, both actual and potential output adjust.

³³ Robert A Buckle, Kunhong Kim and Nathan McLellan; "The impact of monetary policy on New Zealand business cycles and inflation variability", Treasury Working Paper June 2003 03/09.

However, there are a number of reasons why the divine coincidence does not hold perfectly – for example due to the presence of real wage rigidities in the economy.³⁴ In the presence of real wage rigidities, workers may take time to accept the real wage adjustment that is needed to adjust to a negative shock to the economy such as an oil price shock or supply shock that implies a loss of income to the economy but also raises prices. This means that in the event of a supply or cost-push shock, targeting inflation will not necessarily also stabilise output around potential and may exacerbate the fall in output from a negative shock. Strict inflation targeting will therefore not result in an optimal response to a supply or cost-push shock which is, rather, to tolerate a higher period of inflation for a period of time. This avoids compounding the reduction in income from the shock and can assist with the real wage adjustment. How long higher inflation should be tolerated depends on the degree of real rigidities. This means that central banks need to make judgements as to how to weigh-up the short run effects of monetary policy on output and the goal of maintaining price stability. Different frameworks provide different approaches to weigh up these factors. We discuss alternative frameworks below.

Flexible Inflation Targeting

Flexible inflation targeting central banks not only aim at stabilising inflation around the inflation target but also put some weight on stabilising the real economy; for instance explicitly or implicitly stabilising a measure of resource utilisation such as the output gap or unemployment.³⁵ The IMF (2015) argue that “under a flexible inflation forecast targeting regime the central bank has a dual mandate (either explicit or implicit) and recognises that there is a short-run trade-off between inflation and output”.³⁶ This approach to monetary policy recognises that whilst monetary policy is focused on price stability in the longer term, decision makers should consider the short run impacts of monetary policy on the real economy and also that monetary policy plays an important role in cushioning the impact of economic shocks and, in inflation targeting countries, is generally viewed as the first line of defence in stabilising the real economy during an economic downturn.³⁷

Globally, inflation targeting today is practiced through flexible inflation targeting. In a recent survey of inflation targeting central banks, all central banks, in making monetary policy decisions, either implicitly or explicitly took account of the impact of monetary

³⁴ Blanchard and Gali (2007) “Real Wage rigidities and the New Keynesian Model” Journal of Money Credit and Banking - show that the divine coincidence does not hold in the new Keynesian framework in the presence of real wage rigidities.

³⁵ Svensson (ibid)

³⁶ IMF Working Paper WP/15/132: Inflation-Forecast Targeting: Applying the Principal of Transparency, K Clinton, C Freedman, M Juillard, O Kamenik, D Laxton and Hou Wang.

³⁷ OECD Policy Paper December 2016 No 20, Strengthening Economic Resilience: Insights from the post-1970 record of severe recessions and financial crises.

policy on output and employment in the short term although there are a variety of ways that this consideration is included in the mandate of the central bank.³⁸

A flexible inflation targeting framework requires a) a precise numerical target (or band) for inflation in the medium term, and b) a response to economic shocks in the short term. The medium term inflation target provides an anchor on which the private sector can form its expectations about future inflation.³⁹ This anchoring of inflation expectations, which is a measure of central bank credibility, means that monetary policy needs to do less work than otherwise to achieve the inflation target, given inflation expectations are a major driver of inflation outcomes. However, credibility is not free and needs to be earned through the central bank consistency achieving inflation control.

Whilst in the face of economic contractions (expansions) inflation and output will generally both decline (increase), a flexible inflation targeting framework recognises that at times there may be events that create inflation without impacting on output in the same direction, or that reduce output at the same time. The medium term nature of the inflation target and recognition of the need to manage fluctuations in the real economy allows the central bank to take a more gradual and moderate approach to monetary policy than if there was a strict focus on inflation in these cases. For example in the face of a temporary increase in inflation that has a negative impact on output such as a cost-push shock (e.g. oil price hike), it allows the central bank to tolerate deviations of inflation from the target for a period of time in order to avoid exacerbating the impact of the shock on output and employment.

In terms of macroeconomic performance Roger (2010) provides evidence that inflation targeting countries saw significant reductions in the rate of inflation following adoption of inflation targeting and generally performed relatively better in terms of improvements in inflation outcomes and the level and variability of growth rates than non-inflation targeting countries in the period up to 2009.⁴⁰ Empirical evidence also suggests that easy monetary policy during “normal” downturns leads to faster recoveries.

However, there are limits to the ability of monetary policy to provide counter-cyclical output and employment stabilisation in a downturn. Monetary policy is less effective at stabilising output in a financial crisis when private sector balance sheets and monetary policy transmission channels are impaired; the GFC provides an example of how frozen credit markets and weak balance sheets can weaken the transmission of monetary policy. Conventional monetary policy is also subject to the effective lower bound on interest rates. Whilst several advanced country central banks implemented

³⁸ Wadworth, An International Comparison of Inflation Targeting Frameworks, Reserve Bank Bulletin, Vol 80, No 8 August 2017.

³⁹ Centre for Central Banking Studies Handbook Bank of England - No 29 State of the art in inflation targeting Gill Hammond

⁴⁰ Scott Roger Inflation Targeting Turns 20 Finance and Development March 2010

unconventional monetary policy measures when they reached the ELB following the GFC, the impact of these measures on returning output to potential output and raising inflation are less certain, and may be more case specific, than is the case for conventional policy. Given this countries may need to consider concerted action by monetary and fiscal policy to stabilise the economy in a deep recession.⁴¹

NGDP Targeting

There has been renewed interest in the concept of nominal GDP targeting since the GFC. A nominal GDP target is an alternative way to balance the objectives of price and output stabilisation; it requires the central bank to target a combination of the trend in real activity and an inflation (or price) target.⁴² It also represents a shift in the bundle of prices under consideration as price weights are based on their share of output/activity rather than consumption as with inflation targeting.

Proponents note that it is a way to address dual mandates of inflation stability (long run) and support short term output stability.⁴³ According to Sumner (2011) a focus on nominal GDP would have led central banks around the world to respond more rapidly and aggressively to the GFC as real GDP and therefore nominal GDP growth fell earlier than CPI inflation. He also argues that while not eliminating the problem, nominal GDP targeting is less likely to result in asset bubbles as it would impose more monetary restraint when output growth is above normal.

In their 2015 *NZIER Insight* NZIER note that nominal GDP targeting is better able to respond to supply shocks so that when, for example, "... a drought, hits the economy, output falls and inflation is flat so no change in interest rates is required under inflation targeting. Under nominal income targeting, interest rates are lowered to offset the fall in output."⁴⁴ McKibbin (2015) also promotes the advantages of nominal income targeting in the face of supply shocks and uses the example of a fall in productivity growth (a negative supply shock).⁴⁵ Falling productivity would cause both a rise in input costs and a fall in output. McKibbin notes that an inflation targeting central bank would tighten monetary policy as input costs rose but in doing so would reduce real GDP in the economy. Thus monetary policy based on inflation targeting would lead to a worse outcome for the real economy than caused by the shock alone.

⁴¹ OECD December 2016 No 20 (ibid).

⁴² As with flexible inflation targeting the aim is also to stabilise output around potential output not to increase the level of potential output. In this paper we discuss a NGDP targeting regime based on an inflation target, as opposed to a price level target.

⁴³ See Frankel, Jeffrey, "The death of inflation targeting", www.voxeu.org, 19 June 2012, or Sumner, Scott, "The Case for NGDP Targeting – Lessons from the Great Recession", www.adamsmith.org, 2011 for accessible discussions.

⁴⁴ Leung, Christina, and Lees, Kirden, "Time to reassess inflation targeting", NZIER Insight 57-2015

⁴⁵ <https://www.brookings.edu/opinions/central-banks-must-target-growth-not-inflation/>

A second reason McKibbin supports nominal GDP targeting is related to high or rising levels of debt relative to incomes. He notes that “fiscal policies will ultimately need to tighten to bring down the level of debt in many countries, [therefore] it is also important that the rate of nominal GDP growth is maintained. Falling debt levels combined with falling nominal GDP growth means that the ratio of nominal debt to GDP may rise, even as countries attempt to get their fiscal deficits under control.”

There are however a number of weaknesses of nominal GDP targeting. First, there are practical considerations which would make a numerical nominal GDP target hard to implement. This includes that GDP data is not as timely as CPI data and is subject to revision and that nominal GDP targeting requires estimation of the trend in real GDP which is not known with precision. In New Zealand, large shifts in the terms of trade would mean that the evolution of GDP deflator inflation (the base for nominal GDP targeting) could deviate quite considerably from CPI inflation (which is closer to people’s experience of inflation), and swings in GDP growth associated with population growth may make the target volatile. In aggregate these factors are likely to complicate communication and could result in errors in implementation.

Second, some of the benefits of nominal GDP targeting over inflation targeting are relative to a strict inflation targeting regime. Many of the purported benefits are able to be attained under flexible inflation targeting that takes account of both price and output stability. For example, New Zealand’s monetary policy regime proved sufficiently flexible to enable considerable easing of interest rates in response to the GFC even though at that time inflation remained elevated, suggesting that the argument for a more rapid easing of monetary policy under nominal GDP targeting may not be that pertinent to New Zealand. New Zealand’s inflation targeting regime also allows the Reserve Bank to look through short term shocks to inflation and therefore provides a mechanism to manage supply shocks that have a temporary impact on inflation. Depending on how it is implemented, nominal GDP targeting could be a less flexible approach than flexible inflation targeting, which would give rise to the risk of perverse results in some cases.

Third, with a particular nominal GDP target there would be many different combinations of real growth and inflation consistent with the target, but with different levels of desirability. For example, 4 percent real growth and 1 percent inflation is likely to be deemed more desirable than 1 percent real growth and 4 percent inflation even though both would be consistent with meeting a 5 percent nominal GDP target.

Overall, there is likely to be limited benefit from nominal GDP targeting over flexible inflation targeting and some risks arising from complications in implementation, de-linking of the inflation target and people’s experience with inflation, and risk of errors from the mis-calculation of variables. It is also notable that no other country has moved to nominal GDP targeting, including in countries with more stable population growth, more persistent output gaps, and in which terms of trade swings may be less material.

Price level path targeting (PLT)

A relevant question for the achievement of price stability is whether the focus should be on inflation or some path of the price level (usually specified with a time trend). The main difference between inflation targeting and PLT is how deviations from the target are treated and responded to. With inflation targeting the target rate of inflation remains the same even if inflation has been higher/lower than target. The central bank is able to “look through” temporary fluctuations in inflation and does not need to make up fluctuations in inflation with a reversal in the future. With PLT a period of below target inflation results in an explicit attempt to achieve a period of higher inflation to make up the initial deviation and *vice versa*. Both PLT and inflation targeting can be practiced flexibly; that is the central bank can take output and employment considerations into account with the speed of return to target dependent on the state of the real economy.

The Bank of Canada (2011) discusses two theoretical benefits from PLT, both which have the potential to improve welfare.⁴⁶ First, PLT provides more certainty about future prices and as a result a more certain environment for saving and investment. Second PLT may result in expectations “leaning” against shocks and thus mitigate the impact of shocks more than inflation targeting. For example, when an economy is hit with a negative shock which would result in lower inflation a PLT central bank will be committed to a period of above target inflation. Because firms and households know this, the original negative impact on prices will not be as large and inflation expectations will be higher than under inflation targeting, encouraging greater spending in the short term. In this way PLT may result in lower volatility in inflation, output and employment as compared to inflation targeting.

PLT in theory may also ease some of the constraints of the ELB. The Bank of Canada (2011) argue that the automatic stabilising property of PLT that arises through the impact on expectations may make encounters with the ELB less frequent and easier to get out of. This is because a period of low inflation, as a result of the ELB, would be expected to be followed by a period of high inflation. This should increase inflation expectations and therefore, given the ELB constraint, reduce real interest rates therefore resulting in a further monetary easing. Similarly, Bernanke argues that if monetary policy is constrained by the ELB, monetary policy may be tighter than it otherwise would for a period. He argues the optimal response is to follow a period of below target inflation with a period of above target inflation as occurs under price level targeting (termed “low for longer”).⁴⁷

However, these theoretical benefits of PLT depend on assumptions about how inflation expectations are formed. Households and firms must understand that their medium-term inflation expectations should rise (fall) when actual inflation falls (rises), in order to

⁴⁶ Bank of Canada, “Renewal of the Inflation-Control Target”, November 2011

⁴⁷ Monetary Policy in a New Era, Ben Bernanke, Brookings Institution (2017).

produce the automatic stabilization benefits of PLT. It is not clear that individuals would react this way and if expectations do not move in this manner, PLT could be destabilizing relative to inflation targeting.⁴⁸

Further, a significant downside of PLT is how the framework would respond to supply shocks. Bernanke points out that under PLT, “the central bank cannot “look through” supply shocks that temporarily drive up inflation, but must commit to tightening policy in order to reverse the effects of the shock on the price level. This reversal could be gradual and responsive to real side conditions, but it would nevertheless imply a possibly painful tightening even as the supply shock depresses employment and output.⁴⁹ If the commitment to reverse supply shocks by engineering a period of below-target inflation and employment, when employment is already depressed, is not credible and therefore expectations do not adjust in this manner, efforts to offset positive inflation shocks may be costly in terms of output and employment. Hence PLT may not always be consistent with achieving price stability and full employment.

Communication may also be more difficult under PLT as the inflation rate being targeted in any one year by the central bank will change. These communication difficulties are compounded when there are exogenous price shocks, such as large increases in oil prices, where a central bank may either need to generate offsetting price movements or explain what new level of prices are being targeted if it is deemed appropriate to look through such movements.

Given these downsides of PLT, Bernanke proposed that PLT only be adopted around ELB episodes.⁵⁰ This would be implemented by the central bank stating that, once rates hit the ELB, a necessary condition for raising rates would be that average inflation since the date at which the policy rate first hit the ELB be at least 2% (in effect this is a form of forward guidance). Hence a period of low inflation would be followed by a period of above target inflation. This would provide a way for the central bank to commit to a period of “low for long” and may give rise to greater monetary accommodation through lowering longer term rates. Bernanke considers that this approach could be folded into existing inflation-targeting regimes, which would minimise the need to make changes to the policy framework and communications practices.

Product price targeting

Product price targeting is a variant on inflation targeting proposed by Professor Jeffrey Frankel for countries where terms of trade volatility causes macroeconomic instability.⁵¹ Rather than focusing on the CPI (i.e. the consumption basket), the focus is on a basket of goods produced in a country, including exports (i.e. the production basket).

⁴⁸ Bank of Canada (ibid)

⁴⁹ Bernanke (ibid)

⁵⁰ Bernanke (ibid)

⁵¹ Frankel, Jeffrey (2012), “Product Price Targeting – A New Improved Way of Inflation Targeting”, *Macroeconomic Review*, April

Product price targeting is considered to have more desirable properties in the face of terms-of-trade shocks when compared to relatively strict forms of inflation targeting. If the terms-of-trade shock is a fall in the export price of a major commodity exported by the country, these output-based indices suggest that monetary policy should ease and therefore allow the currency to depreciate. If, on the other hand, the terms-of-trade shock is a rise in the price of imported oil for example, there is no pressure to tighten monetary policy (as imported goods do not enter the product bundle).

Frankel argues that the product price targeting approach is most appropriate for developing economies dependent on international capital flows that can quickly disappear in times of crisis. This, coupled with New Zealand's flexible inflation targeting approach, means the approach is less likely to be suited to New Zealand. Another important aspect is that although products such as dairy products make up a relatively large share of New Zealand's exports, they make up a much smaller share of New Zealanders consumption bundle and therefore a product price index may not align with the general price expectations of New Zealand households.

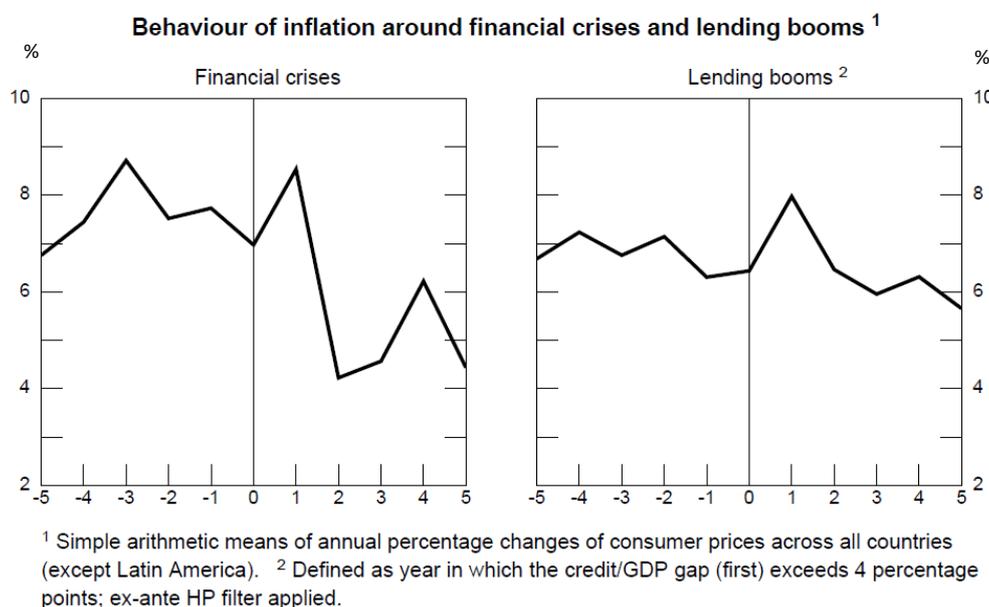
Chapter 5: Monetary policy and financial stability

Links between monetary policy and financial stability

Section 10 of the Reserve Bank Act requires that the Reserve Bank have regard to the efficiency and soundness of the financial system in implementing monetary policy. This is repeated in the current PTA. It is therefore important to understand the links between monetary policy and financial stability.

High and variable inflation is likely to undermine financial stability.⁵² This is because unexpected inflation will impact on the real value of debt, resulting in borrowing and lending decisions being at a different real value than anticipated and therefore resulting in an inefficient allocation of resources. However the converse, low and stable inflation, does not protect against the build-up of financial vulnerabilities in the financial system. Borio and Lowe (2002) measure the evolution of inflation in the years prior to and after financial crises, for crises prior to the GFC. They show that while inflation falls immediately after the crisis there is no evidence that inflation picks up systemically either in the years prior to the crisis or as lending booms are developing (figure 9).⁵³ Low inflation, whilst important for macro-economic stability, is therefore not a sufficient indicator for overall macro-economic stability.⁵⁴

Figure 9



Source: Borio and Lowe (2002)

⁵² Borio and Lowe (2002) Asset prices, financial and monetary stability: exploring the nexus BIS working paper No 114 p18.

⁵³ Borio and Lowe 2002 (ibid) Page 19

⁵⁴ IMF (2015) Monetary Policy and Financial stability p20 show that inflation in advanced economies picked up marginally prior to the GFC (deviating from target slightly over 1% on average). The estimate of the average output gap in 2007 was for a closed output gap. However a re-estimate in 2015 taking account of a broader set of information shows output above potential.

The interaction of monetary policy and financial stability is complex.⁵⁵ Monetary policy operates through a number of transmission channels (Box 2) but, at its simplest, changes in short term interest rates lead to changes in other prices in the economy (such as exchange rates and asset prices) and together this results in changes in the willingness of individuals to consume or invest, thereby impacting on aggregate demand and ultimately inflation. Commercial banks are the transmission channel of monetary policy to the economy; it is by changing the price of saving and borrowing that monetary policy has an impact on the economy and this occurs in part through influencing the amount of debt (leverage) individuals and firms are willing to take on and the level of financial risk-taking. The impact of monetary policy on leverage is an intended outcome of monetary policy and is the mechanism through which growth and output are stabilised. However, this has implications for financial stability.

Box 2

Transmission channels for monetary policy (from Cecchetti (2016)):

- Interest rates: lower interest rates reduce the cost of investment, making more projects profitable.
- Exchange rates: lower interest rates reduce the attractiveness of domestic assets, depressing the value of the currency and increasing net exports.
- Asset prices: lower interest rates lead to higher stock prices and real estate values, which, through collateral value and household wealth effects, fuel an increase in both business investment and household consumption.
- Bank lending: an easing of monetary policy raises the level of bank reserves, increasing the supply of funds.
- Firms' balance sheets: lower interest rates raise firms' profits, increasing their net worth and reducing the problems of adverse selection and moral hazard.
- Household net worth: lower interest rates raise individual borrowers' net worth, improving their creditworthiness and allowing them to increase their borrowing.

The way that monetary policy impacts on financial stability differs in the short and long term.⁵⁶ In the short term a policy easing may reduce financial stress by increasing firm profitability, asset values and net worth, and reducing servicing costs and thereby lowering the probability of default on loans. Cecchetti shows, for example, that in the short term a policy easing reduces distance to default for financial firms, a measure of

⁵⁵ See Cecchetti Monetary, Prudential and Fiscal Policy, how much co-ordination is needed, October 2016. <http://www.treasury.govt.nz/publications/informationreleases/monetarypolicy/mpw>

⁵⁶ See Cecchetti (ibid) p17 and IMF (2015) Monetary Policy and Financial Stability.

firm level vulnerability.⁵⁷ A policy tightening has the opposite impact and may weaken financial stability in the short term: Borio and Lowe (2002) cite evidence that shows that a significant tightening of monetary policy could increase defaults and the probability of a financial crisis. However, they consider that it is not the decline in inflation from the tightening which causes risks to the financial system but the decline in asset prices and unwinding of financial imbalances that largely explains the onset of crisis.

In the longer term agents will adjust their balance sheets to the changes in interest rates reversing the short-run impacts. Cecchetti provides evidence that a prolonged period of low interest rates results in an increase in leverage (debt:equity), as well as an increase in other measures of firm level vulnerability, for banks and non-banks each quarter that a monetary policy easing persists.⁵⁸ IMF (2015) cite evidence that the real debt level decreases following a 100 basis point monetary policy tightening by between 0.3-2% after 4-16 quarters and the decline in real estate prices from a tightening of this magnitude is in the order of 2% over 10-16 quarters (the opposite could be expected for an easing).⁵⁹ Cecchetti concludes that when interest rates remain low for several years, the result is an increase in leverage that will almost surely reduce the resilience of the system.⁶⁰

The way that a prolonged monetary policy easing impacts on financial stability is through changes in the value of financial variables, such as increases in debt levels (credit growth) and asset prices that occur with an easing. However, the link between changes in credit and asset price growth and significant future macro-economic disturbances is not clear cut. There is empirical evidence that faster growth in credit and asset prices, particularly when considered together, are correlated with an increased probability of a future banking crisis or a future period of low economic growth due to deleveraging (appendix 1). However, not all periods of above average credit growth will lead to a financial crisis and in some cases a period of above average credit growth will be beneficial to economic growth, for example if the credit growth is driven by a productivity boom.⁶¹ Further, macro indicators will only ever tell part of the story. Structural (non-cyclical) factors, such as lending standards and the form and level of bank funding, will also be important to crisis risk. For example, Shin argues that it is not credit-growth per se that should be of concern, but credit growth which is funded through increasing non-core liabilities (liabilities other than debt and equity) and accordingly leverage. Structural factors can lead to a crisis even absent the macro factors such as high leverage.

⁵⁷Cecchetti (ibid) p16

⁵⁸ Leverage as measured as (liabilities + market capitalisation)/market capitalisation) increases after a prolonged monetary policy easing – however leverage measured as regulatory capital/assets will be constrained by prudential regulation.

⁵⁹ IMF (2015) Monetary Policy and Financial Stability: debt is generally measured as household debt.

⁶⁰ Cecchetti (ibid) p17

⁶¹ IMF (2015) (ibid) p28

What does this imply for the role of monetary policy in financial stability?

The depth of the GFC and the slow recovery following has reminded us that the negative consequences of financial crises can be severe and prolonged. This underlines the importance of having appropriate policy settings to mitigate the risk of another severe financial crisis and gives rise to a question of how monetary policy should take account of the soundness of the financial system.

A first point to make is that only a subset of financial stability risks are interest rate sensitive, in particular the amount of leverage/debt and asset price growth, and hence can be impacted by monetary policy. Other risks to financial stability, such as those arising from financial market infrastructure, poor governance, large exposures and concentration risk or credit and lending standards cannot be influenced by monetary policy but can be influenced by prudential (financial) policy.⁶²

A second point to make is that prudential (financial) policy can mitigate the risks to the financial system from interest rate sensitive vulnerabilities by building resilience and mitigating vulnerabilities. Capital requirements, for example, reduce financial institution leverage and seek to ensure that financial entities have sufficient loss absorption capacity so as not to fail in the face of a reasonable range of possible losses. IMF (2015) argue that prudential policies (such as capital requirements) materially improve systemic resilience.⁶³ There is debate however over the extent to which prudential policy should be set on a 'through the cycle' basis, as opposed to varying over time in response to credit cycles or shifts in sectorial risks, in order to improve systemic resilience.

Prudential (financial) policy is therefore the primary tool to achieve financial stability. However, in what way should monetary policy take account of the soundness of the financial system? The answer to this question depends in part on the extent to which the setting of monetary policy is or is not complementary to financial stability.

The setting of monetary policy to achieve an inflation target will often be complementary with financial stability, as financial vulnerabilities will often be building at the same time as the economy is expanding and inflation rising.⁶⁴ However, this will not always be the case. In the current economic environment, for example, inflation pressures are weak leading to a prolonged period of low interest rates, which is one factor in supporting credit growth and asset price increases. Hence, there can be periods when the optimal choice for monetary policy (focused on inflation and output variability) is not complementary with financial stability. This conclusion is supported by work of the BIS calculating the financial cycle based on credit and asset price growth. It shows that the business cycle and financial cycle have different periodicity and

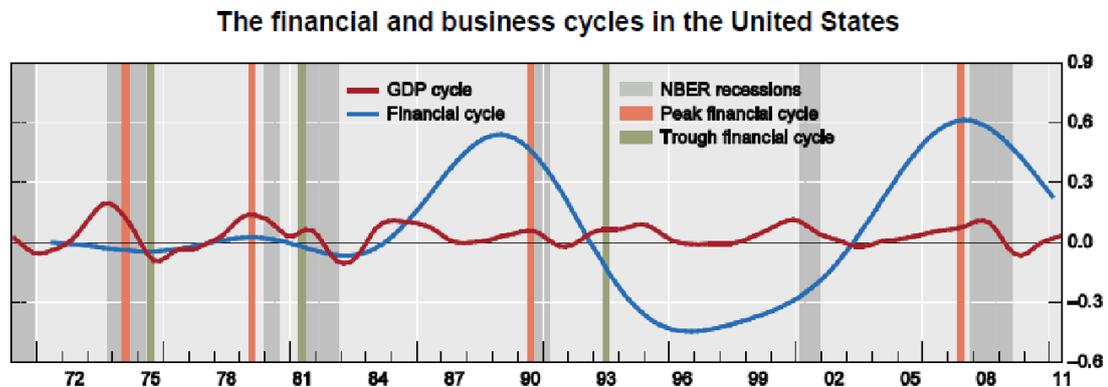
⁶² Bank of Canada renewal of the Inflation Control target: <http://www.bankofcanada.ca/core-functions/monetary-policy/>

⁶³ IMF (2015) Monetary Policy and Financial Stability

⁶⁴ IMF (2015) Monetary Policy and Financial Stability

amplitude. The implication of this is that there is no ‘divine coincidence’ when it comes to simultaneously achieving price/output stability and financial stability.

Figure 10



Orange and green bars indicate peaks and troughs of the financial cycle measured by the combined behaviour of the component series (credit, the credit to GDP ratio and house prices) using the turning-point method. The blue line traces the financial cycle measured as the average of the medium-term cycle in the component series using frequency-based filters. The red line traces the GDP cycle identified by the traditional shorter-term frequency filter used to measure the business cycle.

Source: Drehmann et al (2012).

This means that if monetary policy reacted to credit and asset price cycles, in addition to its traditional objectives, there would be a cost in terms of not meeting the inflation target; in real terms this cost is the lost output (i.e. lower incomes for individuals) and higher unemployment that would result from holding interest rates higher than necessary to achieve inflation/output stability. In recent years there has been much analytical work undertaken looking at the costs and benefits of setting the monetary policy interest rate higher than justified to hit the inflation target, or lengthening the policy horizon, in order to reduce credit and asset price cycles, known as ‘leaning against the wind’. The benefits of leaning against the wind are measured as the reduction in the risk of a financial crisis (from lower debt levels), whereas the costs are measured in terms of lost employment and output as a result of tighter monetary policy. Leaning against the wind may also have costs in undermining the credibility of the inflation target, which can reduce the effectiveness of monetary policy in meeting the inflation target. Our interpretation of the literature (summarised in appendix 1) is that on balance in most circumstances the costs of using monetary policy to actively lean against the credit and asset price cycle generally outweigh the benefits (which potentially may be better achieved with other mechanisms) and therefore the risks arising from the financial cycle do not provide a justification to change the primary purpose of monetary policy.⁶⁵ In most cases prudential policy will be more effective at addressing the risks of the financial cycle.

⁶⁵ Cecchetti (2016) reaches the same conclusion “This increasing body of evidence leads to the conclusion that using monetary policy to directly combat incipient financial stability risks is unlikely to meet the cost benefit test” page 16.

That said it may still be the case that leaning may have net benefits, such as when the risks of financial instability are elevated or where prudential regulation does not capture a significant part of the financial system or is otherwise inadequate.⁶⁶ Further, outside of the debate on leaning against the wind, monetary policy makers need to take account of the risk that a significant tightening of monetary policy may impact on financial stability. Hence it is important that monetary policy makers take account of financial stability and there may be circumstances when it is appropriate to adjust the horizon over which inflation is returned to target to take account of financial stability risks, however we do not consider financial stability should be a primary objective of monetary policy.

Note that even if prudential policy is the primary tool to address risks arising from the financial cycle, time varying prudential and monetary policy cannot operate completely independently. This is because both monetary and macro-prudential policy impact on the price and availability of credit (i.e. interest rates) for individuals and businesses. Co-ordination between the policies can occur with little cost when both policies are set by the same institution, as is the case in New Zealand.

⁶⁶ This second case does not apply in New Zealand, as the prudential regime captures the vast majority of financial entities.

Appendix 1: Costs and benefits of using monetary policy to address financial cycles

There has been a long standing debate as to the role of monetary policy in financial stability and in particular whether monetary policy should seek to smooth financial cycles, including reducing the build-up and growth of credit in the economy (lean),⁶⁷ or should only have a role in cleaning up after a financial downturn by supporting demand during an economic recovery (clean).

Prior to the global financial crisis, the consensus was generally in favour of clean. However, the experience of the global financial crisis demonstrated the possibility for financial stability risks to increase even in the presence of small output gaps and low inflation. Further, the cost of waiting to “clean up” after the event was greater than previously thought and the effectiveness of monetary policy was less than expected.⁶⁸ This has led to reconsideration of the role of monetary policy in financial cycles.⁶⁹

This appendix considers the benefits and costs of leaning and how financial stability concerns have been incorporated into inflation targeting frameworks.

Benefits of “leaning”

There is a consensus that ‘leaning’ can provide some economic benefits, including reduced risk and severity of an economic or financial crisis. Some suggest that there are benefits from leaning which cannot be achieved through other tools alone (such as prudential and macro prudential policy) because of the ability of monetary policy to ‘get in all the cracks’.⁷⁰ While prudential policies only affect regulated entities, monetary policy affects the broader economic and financial system. However, in the New Zealand context, non-bank financial intermediation is only a small part of the financial system so this has not been a significant concern.

Recent literature, discussed below, has made attempts to quantify the benefits of leaning.⁷¹ These are typically small because of both the infrequency of financial crises and the limited ability of interest rates to have long term impacts on household debt levels (or other financial imbalances).⁷² Leaning may have additional benefits by

⁶⁷ This is the most common approach taken among the literature. The term is occasionally used to refer to monetary policy responses to asset price growth, or the use of monetary policy for financial stability purposes, but this is less commonly discussed.

⁶⁸ Grenville, Recent Global Developments in Monetary Policy and Lessons for New Zealand, 2016

⁶⁹ Dunstan, Ashley (2014) The interaction between monetary and macro-prudential policy, Reserve Bank of New Zealand: Bulletin, Vol. 77, No. 2, June 2014

⁷⁰ Stein, Jeremy C. (2013), “Overheating in Credit Markets: Origins, Measurement, and Policy Responses”, remarks at the “Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter” research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri, February 7, 2013

⁷¹ e.g. Svensson 2016, Gorea, Kryvtsov and Takamura 2016

⁷² Gorea, Kryvtsov, and Takamura 2016

reducing the burden on any single policy instrument to control financial imbalances and therefore improve stability, although the relationship between monetary policy and prudential and macroprudential policy remains an area of ongoing research.

Costs of “leaning”

The costs of leaning are due to the short run increase in unemployment and lower growth (in the absence of a crisis) from higher interest rates than are required to achieve the inflation target. Leaning may also exacerbate the labour market implications of a crisis should one occur. By creating a weaker starting point for employment and output crises may be more severe and long lasting.

There is also some resistance to leaning due to practical concerns, such as the difficulty of identifying financial bubbles in real time (particularly early in the cycle when policy action is likely to be more effective). It is also the case that leaning involves the use of one policy instrument for two targets, which can be difficult when the two targets imply contradictory policy action it can also complicate communications around how the tools are being used and why.

There is a growing literature comparing costs of leaning to its benefits. Recent studies find that, in general, the costs of leaning outweigh the benefits.⁷³ The next section explores some of the underlying parameters and assumptions in these studies.

Underlying assumptions and parameters

One of the primary assumptions that drives the conclusion that there are not net benefits from leaning is that monetary policy is “neutral” in the long-run. This implies that monetary policy does not permanently alter debt levels or the growth rate of debt (although it can have short-term impacts). When this assumption is made, leaning is unlikely to ever yield a net benefit. This is because, if monetary policy is neutral, then the period of lower growth in debt will be followed by a period of higher growth as debt ‘catches up’. This means that the probability of a crisis is not reduced but simply shifted through time, yet the costs of higher unemployment are still incurred in the near term.

However, if this assumption is not made then an increase in interest rates implies that debt is reduced to a permanently lower path. In such a situation there may be a net benefit from leaning in certain cases, although this is still dependent on the underlying parameters. The main underlying parameters that impact on model estimates of the benefits of leaning are the estimated relationship between:

- interest rates and debt growth;

⁷³ Three papers are explored in some depth in this note: Svensson (2016), Gorea, Kryvtsov, and Takamura (2016), and Habermeier et. al., (2015)

- debt or debt growth (or asset prices) and the probability of a crisis.⁷⁴

The literature uses a wide range of estimates for the impact of a change in interest rates on debt levels or on debt growth. Svensson, Gorea, Kryvtsov, and Takamura for example find a 100 basis point increase in interest rates has an effect ranging in size from a 0.04 percent decrease in debt levels to a 1 percent decrease⁷⁵. IMF (2015) cite evidence that the real debt level decreases following a 100 basis point monetary policy tightening by between 0.3-2% after 4-16 quarters and the decline in real estate prices from an easing of this magnitude is in the order of 2% over 10-16 quarters.

There are a number of studies on the relationship between the probability of a crisis and debt or debt growth. Svensson suggests that a 5 percent reduction in debt for four years reduces the probability of a financial crisis by about 0.3 percentage points. Borio and Lowe⁷⁶ cite the finding of Eichengreen and Arteta (2000) that a 1 percentage point increase in the rate of growth of domestic credit increases the probability of a banking crisis in the following year by 0.056%. They show that a credit gap of 4% over a 1 year period correctly predicts crises in 79% of cases, but also predicts 24% false positives.⁷⁷ Dell’Ariccia note that 1 in three credit booms is followed by a banking crisis but additionally 3 in 5 booms is followed by a period of below trend growth during the six year period following the end of the boom. In all Dell’Ariccia states that in the aftermath of a credit boom something goes wrong two out of three times and that credit booms are a good predictor of “credit-less recoveries”, that is economic recoveries that happen in the absence of credit growth and which are generally characterised by average growth being substantially lower than otherwise.⁷⁸ Putting these estimates together Habermeier in his model assumes that an increase in interest rates by 100 basis points will reduce the probability of a crisis by between 0.04 and 0.3 percentage points.⁷⁹

However, the interactions between interest rates and crisis risk are complex and results from models differ over the projection horizon. Some models describe the probability of a crisis increasing at some point following a rise in interest rates.⁸⁰ In the near-term, higher rates can increase the debt financing burden. This can increase the likelihood of default and therefore raises the probability of a financial crisis. Over the medium-term, agents adjust to the higher rates and debt is reduced, lowering servicing costs and reducing the relevant financial imbalances that posed the initial threat. Later the

⁷⁴ In many cases the same parameters are used due to consensus by researchers in this area. Both Svensson and the Habermeier et. al. use estimates from Schularick and Taylor (2012) at different times. Schularick and Taylor base their estimates on a comprehensive panel data set of 14 developed countries.

⁷⁵ These estimates are drawn from a range of models from both Svensson (2016), and Gorea, Kryvtsov, and Takamura (2015).

⁷⁶ Borio and Lowe (2002)

⁷⁷ Combining credit and asset prices significantly reduced the false positives.

⁷⁸ Policies for macro-financial stability: How to deal with credit booms. IMF (2012) page 11-12.

⁷⁹ in the Habermeier et. al. (2015) model

⁸⁰ Svensson and Gorea, Kryvtsov, and Takamura

probability of a crisis can increase due to the lower debt levels growing faster to 'catch up' to baseline (if monetary policy is considered neutral for debt levels in the long term).

Given these assumptions and underlying parameters, none of the recent literature finds that leaning provides net benefits in any baseline models. In Gorea, Kryvtsov, and Takamura sensitivity analysis and robustness checks, which include removing the assumption of monetary neutrality, changing the impact of interest rates on debt, increasing the length and severity of a crisis and increasing the probability of a crisis did not result in finding a case in which leaning might be justified.

However, some academics have found situations where leaning might be beneficial particularly where risks are highly elevated. Habermeier et al found minor benefits of leaning when the lower probability of a crisis from leaning is at the highest level suggested by the literature (0.3 percentage points compared to the average baseline assumption of 0.02 percentage points) and the potential crisis is of a magnitude in which unemployment increases by 7 percent for six to eight years. Svensson found that the impact of lower debt on the probability of a financial crisis would need to be about six times larger than current empirical estimates to provide net benefits.⁸¹ Even in this case, only a small amount of leaning would be justified.

The circumstances under which leaning might be appropriate

Why then does anyone argue in favour of leaning? If baseline estimates show no net benefits and sensitivity analysis suggests extreme assumptions need to be made to justify even a small level of leaning, what is the drive behind this argument? Most advocating in favour do not ground their arguments in technical models but rather rely on qualitative benefits. As mentioned earlier, Jeremy Stein suggests leaning should be kept on the table because monetary policy "gets in all the cracks", however this argument is weak in New Zealand where prudential policy is comprehensive.⁸² Jamie Caruana argues that when macroprudential and monetary policy work in opposite directions they are each less effective and require more significant movement of the respective tools, which can have distortionary effects.⁸³

While these arguments are purely qualitative, there is some emerging research, with more complex dynamics, heterogeneous agents and financial distortions, that may support these arguments.⁸⁴ These models are able to show some benefit from leaning due to reductions in financial distortions and inefficiencies. However, it is crucial to note

⁸¹ Svensson (2016)

⁸² Stein, Jeremy C. (2013), "Overheating in Credit Markets: Origins, Measurement, and Policy Responses", remarks at the "Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter" research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri, February 7, 2013

⁸³ Caruana, Jaime (2014), Redesigning the central bank for financial stability responsibilities, Speech on the occasion of the 135th Anniversary Conference of the Bulgarian National Bank, 6 June 2014

⁸⁴ Cúrdia and Woodford 2010, Leduc and Natal 2015, Gambacorta and Signoretti 2013, for example

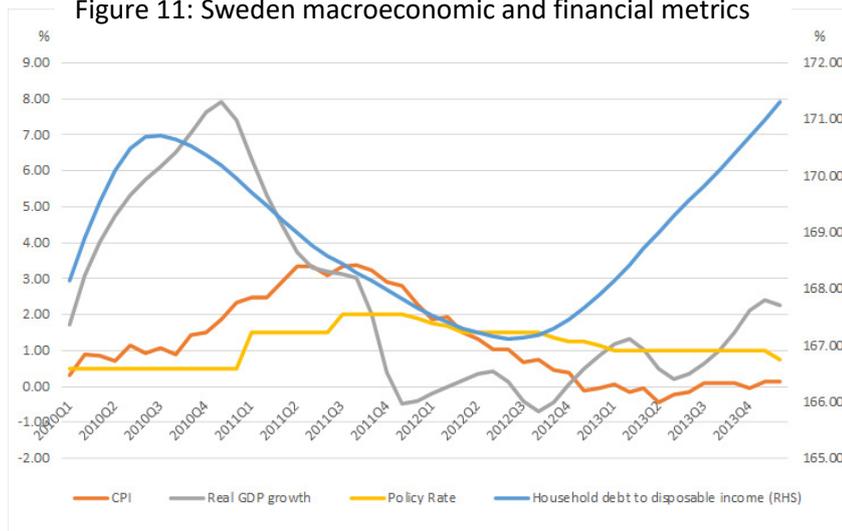
that any benefits are state dependent (that is, a central bank must understand the source of shock) and are dwarfed by the benefits from instead using a suitable macroprudential tool. For example, Gambacorta and Signoretti find that it is optimal for monetary policy to lean against the wind following a supply shock if monetary policy is also concerned with output stabilisation. Another model which includes a feedback loop (between asset prices and credit growth) finds that leaning is optimal where no macroprudential tool is available. These models currently remain stylised and further developments and results may come as the literature in this area expands.⁸⁵

Most who have expressed a view on when leaning might be appropriate have taken a more moderate position. Janet Yellen acknowledged the difficulty of using monetary policy to influence financial stability, while simultaneously recognising the ability of monetary policy to '[get] in all the cracks'.⁸⁶ The IMF have also recently emphasised that monetary policy should not be ruled out as a tool but rather keep the door open as this is an area of ongoing research.⁸⁷

Box 3 - The Swedish experience

In 2011, the Riksbank began increasing interest rates in part to ease the rapid debt growth and rising asset prices. Ex-post there is debate over the effectiveness of this policy action, including whether this was 'leaning'. When implemented, real GDP growth was 6.3 percent, and CPI inflation was 2.5 percent. Policymakers increased policy rates by 150 basis points over 18 months. This was followed by a sharp decline in real GDP growth and accompanying weak inflation outcomes. By the end of 2012, real GDP growth was negative and it was clear that the attempt to address high household debt-to-income ratios using monetary policy had damaging implications for both the real economy and the ability of the Riksbank to achieve its inflation target.

Figure 11: Sweden macroeconomic and financial metrics



In response the Riksbank implemented a gradual but continual lowering of interest rates over the following four years by a total of 250 basis points. Household debt-to-disposable income ratios are now well above the levels that leaning initially sought to avoid. It would appear that leaning resulted in a weak real economy and sometimes deflationary price level movements without meaningfully addressing longer-term trends in household debt accumulation.

⁸⁵ Leduc and Natal 2015

⁸⁶ Yellen 2014

⁸⁷ Habermeir et al 2015

Overall, it appears that the case for using monetary policy as a tool for addressing financial stability concerns is limited. A targeted prudential or macroprudential policy is likely to be most effective. However, even in the absence of such a tool, it is not clear that the cost of higher unemployment and slower growth outweigh the reduced probability of a financial crisis. Furthermore, unless the balance sheets of borrowers are sufficiently resilient, the debt servicing impacts of leaning could actually increase the probability of a financial crisis in the short-term.

However, research in this area is still developing and real world examples are limited, therefore, it seems premature to completely rule out this option. For the time being it would seem that the door should be left tentatively open to the possibility of leaning with a high hurdle set to justify its use.