

Thirty years of inflation targeting in
New Zealand: The origins, evolution
and influence of a monetary policy
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**Thirty years of inflation targeting in New Zealand:
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Abstract

Nearly thirty years ago New Zealand ushered in a revolutionary approach to monetary policy. This was formalised by the Reserve Bank of New Zealand Act 1989 which specified price stability as the primary function of monetary policy and provided operational independence for New Zealand's central bank. This innovation spawned the spread of more central banks around the world with a mandate to prioritise inflation targeting. This paper explains the historical origins of the RBNZ Act, its design and the ideas that influenced its design. It reviews how the practice of inflation targeting and the choice of policy instruments have evolved. The paper includes a review of research evaluating the impact of inflation targeting in New Zealand and concludes with a discussion of contemporary issues including a proposal before the New Zealand Parliament to introduce significant changes to the Act which could have important implications for future monetary policy.

Key words: Monetary policy, inflation targeting, central bank governance, accountability, transparency, credibility, sustainability.

JEL classifications: E52: Monetary policy; E58: Central Banks and their policies; E61: Policy objectives, policy designs and consistency, policy coordination.

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1. Introduction

Nearly thirty years ago New Zealand introduced a revolutionary new approach to monetary policy. This approach specified price stability as the primary function of monetary policy and established operational independence for New Zealand's central bank. The foundation for this approach was the Reserve Bank of New Zealand (RBNZ) Act 1989 which became operative in February 1990. This approach and the success it achieved attracted global attention and spawned the spread of inflation targeting by central banks in other countries.

This new approach to monetary policy was prompted by several decades of high inflation, the social costs it inflicted, and the failure to achieve a sustained reduction in the rate of inflation. During the two decades prior to the introduction of the RBNZ Act 1989, inflation in New Zealand had persisted at rates well in-excess of the average for OECD countries long after many had successfully reduced inflation. Soon after the introduction of this Act New Zealand's inflation rate dropped below the average for OECD countries, and low inflation has been sustained.

This paper discusses the historical origins of the RBNZ Act 1989 and inflation targeting, the governance arrangements, the way monetary policy has evolved during the last thirty years, and it reviews evidence of the impact of monetary policy and inflation targeting in New Zealand. The paper is structured as follows.¹ Section 2 explains the historical origins of the RBNZ Act. The key legislative features of the Act are described in section 3 and the influences on the choice of these features are discussed in section 4. Policy Targets Agreements (PTAs), which act as a contract between the government and the RBNZ Governor, are an important feature of New Zealand's monetary policy framework. Section 5 reviews the development of these agreements and how they have changed with the introduction of secondary monetary policy objectives, the specification of inflation targets and the choice of price indexes. The Reserve Bank's choice of monetary policy instruments has also changed over time and this is discussed in section 6. Section 7 reviews empirical research on the impact of New Zealand's inflation targeting regime. Section 8 provides a discussion of contemporary issues and challenges, including a discussion of proposed legislative changes currently being considered by the New Zealand Parliament which could change the future conduct of monetary policy in New Zealand. Concluding comments are in section 9.

¹ The focus of this paper is monetary policy and inflation targeting. The RBNZ also has responsibilities for the efficiency and soundness of the financial system, along with the New Zealand Financial Markets Authority. This aspect is beyond the scope of this paper, although section 6.2 provides a brief overview of how the RBNZ has approached these responsibilities.

2. Historical background to the Reserve Bank of New Zealand Act 1989

Inflation targeting and the passing of the RBNZ Act 1989 were borne out of a history of New Zealand's vulnerability to global inflation, a long period of sustained rising inflation, and the persistent failure of a variety of anti-inflation policies to achieve sustained low inflation (see Grimes, 1996). The ability to achieve low inflation was also compromised by fiscal policy, particularly in the period leading up to the mid-1980s which was one factor influencing fiscal reform (see Buckle, 2018). Relative to the average for the OECD, inflation was higher in New Zealand prior to the first oil price shock in 1973, rose more during the 1970s, and fell less after the general shift by OECD countries to disinflationary policies in the first half of the 1980s (see Walsh, 1995, Table 1, p. 1181, and Figure 4 of this paper).

Prior to March 1985 New Zealand had for the most part maintained a fixed exchange rate. The domestic economy was characterised by high levels of import protection which reduced international competition in product markets, a highly unionised labour market and centralised wage setting procedures which resulted in rigid wage relativities, and a high degree of price and wage indexation (Whitwell, 1987). International price shocks, particularly import prices, were quickly transmitted through the domestic economy via a price-wage-price spiral. Consequently, New Zealand's inflation rate tended to follow that of its main international trading partner countries, but with occasional large deviations occurring in response to fiscal policy and exchange rate changes (Buckle, 1980).

Monetary policy was characterised by multiple objectives with no clear statement of priorities. The RBNZ Act (1964) required the Minister of Finance to direct monetary policy "... to the maintenance and promotion of economic and social welfare in New Zealand having regard to the desirability of promoting the highest degree of production, trade, and employment and of maintaining a stable internal price level." This contributed to a lack of transparency and accountability, and therefore created opportunities for governments to manipulate monetary policy and to direct it at any short-term problems confronting them, and to use monetary policy for political gain by inducing short-lived economic expansions leading up to elections. For example, estimates of the impact of budget policy on the monetary base show that government budget contributions became more volatile during the 1970s, with expansions occurring during the year leading up to a general election (Buckle & Snively, 1979).

Extensive financial regulations included compulsory reserve requirements on financial institutions that forced them to lend to government at below-market interest rates and directed banks to lend to favoured sectors. The result was extensive credit rationing with relatively low interest rates, while foreign exchange controls were intended to prevent capital outflows seeking higher returns from overseas investments. Grimes (1996, p. 251) described the consequence of this system as follows: "New Zealand had effectively been

running an inflation treadmill. Strong domestic inflation pressures, in large part driven by fiscal policy and an accommodating monetary policy, caused Government to devalue the exchange rate to maintain international competitiveness, but the devaluations then fed back into domestic inflationary pressures, so causing further devaluations and further inflation.”

During the early 1980s and prior to the wide-ranging economic reforms, pervasive price, wage and interest controls were used to try to stem inflation but their effect was temporary. In addition to the adverse price signalling and resource allocation effects, financial disintermediation, coupled with a deterioration in the effectiveness of controls on foreign exchange transactions and international capital flows continued to undermine the effectiveness and credibility of monetary policy.

The initial stage of monetary policy reform was part of a process of wide-ranging reforms initiated following a change of government in mid-1984.² The initial monetary policy reforms were embedded as part of financial reforms which included removal of all price regulations and controls of balance sheet structures, a commitment to contestability of financial markets, prudential supervision and liquidity management policies, and a search for non-distortionary instruments for monetary policy (Harper & Karacaoglu, 1987). The objectives of a new monetary policy framework were described by Tweedie (1986) as giving authorities effective control over domestic monetary conditions and ensuring that government intervention in monetary policy would be implemented in a way that did not impede the development of an efficient financial sector. Of significance for monetary policy was the decision to float the currency in March 1985 which, influenced by Friedman (1953), was considered a necessary precursor to domestic monetary control. Another feature was a move away from direct controls such as reserve ratio requirements and credit growth guidelines, toward market-based open market operations and periodic government stock tenders (Grimes, 1996).

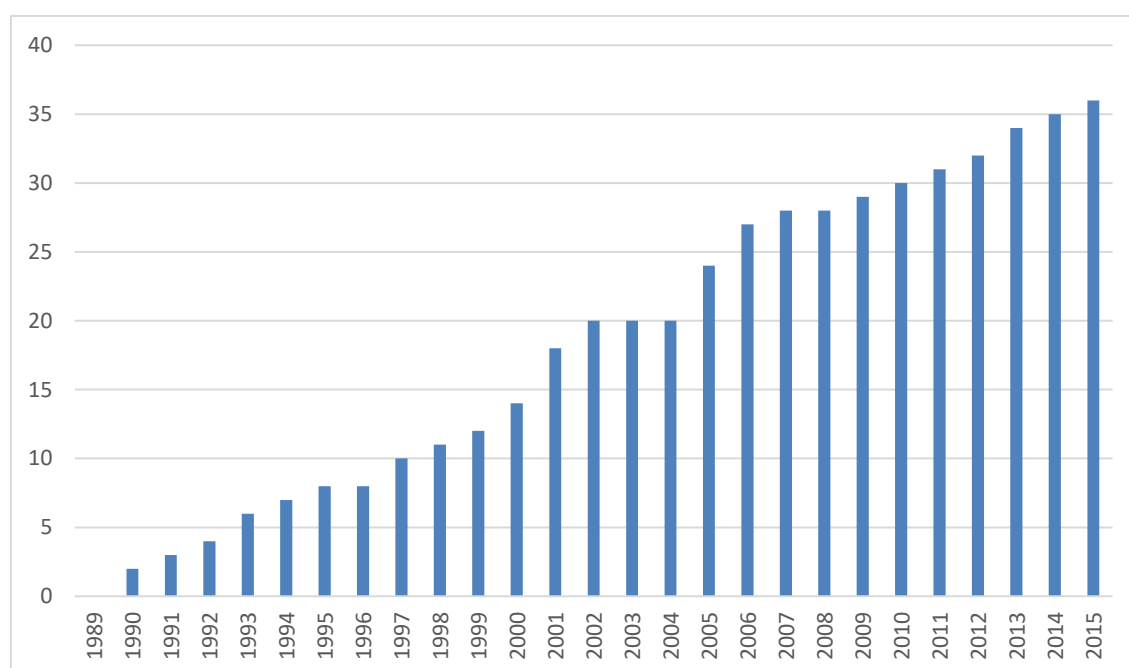
Despite these changes during the mid to late-1980s, there remained a concern that private expectations did not align with the government objective of achieving and sustaining low inflation. Private sector inflation expectations continued to persist at levels well in excess of the RBNZ's inflation forecasts, accentuating the potential costs of a monetary policy induced reduction in price inflation. Two factors were considered to be impeding progress. One was the multiple targets for monetary policy enshrined in legislation. The other concern was the lack of identification of a monetary policy instrument that provided a stable relationship with inflation. This identification proved difficult following the reform of financial markets which had resulted in significant financial re-intermediation. This meant it was not possible to establish clear patterns between growth of various

² For comprehensive explanations of the scope of the New Zealand economic reforms of the late 1980s and early 1990s see Bollard & Buckle, 1987; Silverstone, Bollard & Lattimore, 1996; Evans, *et. al.*, 1996; and OECD, 1999.

monetary aggregates and inflation (Wong & Grimes, 1992). The existence of multiple targets and the lack of a reliable policy instrument threatened the credibility of a regime that assigned monetary policy to target inflation.

The Reserve Bank was told by the new Minister of Finance to design a regime that could both reduce inflation to acceptable levels and withstand short-term political opportunism (Singleton, *et. al.*, 2006). The goal was to establish a regime that was more time-consistent, thereby lowering expected inflation and the costs of the disinflationary process and promoting sustained low inflation. The RBNZ Act 1989 was the outcome.

Figure 1: Growth in the number of countries adopting inflation targeting



Data sources: This chart shows the cumulative number of countries that have adopted inflation targeting since 1989. The data for this chart was derived from Table 2 in Schmidt-Hebbel & Carrasco (2016) and is supplemented by data from Table 2 in Samarina, Terpstra & De Haan (2014) who provide dates of the adoption of IT by Finland (1993) Spain (1994) and Slovakia (2005) and their abandonment on joining the EU in 1999, 1999, and 2009 respectively.

Other countries soon followed New Zealand's example to mandate inflation targeting as the priority for monetary policy. Canada and Chile followed the New Zealand initiative in 1991, the United Kingdom in 1992, and Australia in 1993³. By the late 1990s there was a consensus developing that the primary aim of monetary policy should be to control

³ McDermott & Williams (2018) note that several countries had earlier flirted with publishing inflation or price level targets. They point out that Italy, Greece and Portugal had single year targets for inflation during the early 1980s and Sweden had introduced price level targeting for a short period in the 1930s. However, none of these had developed the type of frameworks required for sustained inflation targeting that were developed by countries after 1989.

inflation (see Bernanke & Mishkin, 1997). Until the late 1990s the growth in formal inflation targeting was limited mainly to central banks in developed economies. Thereafter, the growth has come mainly from central banks in emerging economies.

Figure 1 shows the growth in the number of countries that have adopted inflation targeting since 1989. By 2015 there were 36 countries directing monetary policy toward inflation targeting (Schmidt-Hebbel & Carrasco, 2016). The initial growth came from developed economies of which 10 had adopted inflation targeting by 2001 and 11 by 2015. Since the late 1990s the highest adoption rate has been by emerging economies which increased from one country in 1998 to 25 in 2015. The only countries that have abandoned inflation targeting are Finland, Spain and the Slovak Republic which did so when they joined the European Union, having previously adopted inflation targeting. Bollard & Ng (2008, p. 7) suggest that the adoption of inflation targeting by both advanced and emerging economies is an indication that it is a monetary policy strategy that can handle a range of circumstances and shocks.

3. Key features of the Reserve Bank of New Zealand Act 1989

The RBNZ Act 1989 was designed to provide greater separation of the central bank operations from political influence, establish a single objective for monetary policy, and ensure accountability for the achievement of low inflation.⁴ It contained the following key features: (i) a clear (single) target; (ii) transparent policy objective setting, (iii) a requirement to publish specific targets, (iv) monetary policy operational independence for the Bank, and (v) accountability (Evans, *et. al.*, 1996, p. 1864). These features were designed to reinforce each other to create a framework that would establish monetary policy credibility by clarifying the purpose of monetary policy and enhancing transparency and accountability. These features were expected to overcome the time-inconsistency problem that was inherent in the previous multi-target framework and government direction of monetary policy.

The single target was specified in Section 8 of the Act as follows: "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." (RBNZ Act 1989). This removed any confusion about the objectives of monetary policy in order to enhance transparency. Transparent objective-setting was further strengthened by Section 12 of the Act which provided a mechanism for any government to override the

⁴ Independence of the Bank needs to be interpreted with care, as will be evident from this paper. It does not mean full autonomy nor full discretion about the goal of monetary policy nor a lack of accountability. Independence mainly applies to the choice and method of application of monetary policy instruments. The objectives of monetary policy are determined by legislation and by agreement between government and the Bank Governor currently via PTAs, and governance arrangements provide for monitoring of the Bank and Governor's performance. "Independence" in the context of the RBNZ Act 1989 aligns closely with Bernanke's (2017, pp. 29-36) four elements of central bank independence.

price stability objective (for a period of up to one year, renewable each year if necessary) and replace it with some other stated economic objective, but which must be done publicly through an Order in Council tabled in Parliament in advance. Grimes (1996, p. 258) explains that this provision was drafted for use primarily in times of emergency, although there is no constitutional impediment to its wider use. To date this provision has not been activated.

The Act did not define the meaning of “stability in the general level of prices”. It required that on the appointment of a new Bank Governor (for a term of five years), the Governor and the Minister of Finance must agree on specific policy targets.⁵ Section 9 of the Act required these to be specified in a Policy Targets Agreement (PTA) which must be compatible with the Act and publicly released. The key components of the PTA, including the measure of prices, the inflation target range, duration of agreements, secondary objectives and how these have evolved since 1990 are discussed in section 5.

In the event of any Order in Council which modifies the primary function of monetary policy, a new PTA must be agreed and published. The conditions pertaining to the PTA were intended to protect against agreements substituting targets that are inconsistent with the Act or an Order in Council. The Governor of the Bank, rather than its Board of Directors, was made responsible for the achievement of the agreed targets specified in the PTA. Transparency was further enhanced by a requirement that the Governor must release a Monetary Policy Statement (MPS) at least every six months. The MPS was required to include a review of monetary policy during the preceding six months, a review of performance compared to the agreed target, and how the Bank intends to conduct monetary policy in the future. From the outset, Governor Brash published an MPS every three months and this practice has been adopted by all successive Governors. The reason is that a quarterly release matches the frequency of the publication of major economic data by Statistics New Zealand and anticipates interest in and analysis of these data by private commentators. MPSs and speeches by Governors became important policy communication instruments.

The Act specified a clear single policy target, but it did not specify the policy instruments that should be applied in pursuit of this target. The Reserve Bank has operational independence. Nevertheless, the Act did impose certain conditions that the Bank must satisfy when implementing monetary policy. These were specified in Section 10 of the Act which stated that “In formulating and implementing monetary policy the Bank shall (a) have regard to the efficiency and soundness of the financial system, and (b) consult with, and give advice to, the Government and such persons or organisations as the Bank

⁵ There have been five Governors appointed since the RBNZ Act 1989 was introduced: Dr Don Brash (1990 – 2002), Dr Alan Bollard (2002-2012), Graeme Wheeler (2012-2017), Adrian Orr (appointed in March 2018). Two Deputy Governors have been appointed Acting Governors: Dr Rod Carr in 2002 and Grant Spencer in 2017.

considers can assist it to achieve and maintain the economic objective of monetary policy.” (RBNZ Act 1989).

Operational independence and the conditions the Bank must satisfy when implementing monetary policy are important for several reasons. Monetary policy instruments can vary in their economic, social and distributional effects and hence the choice of instrument could be politically sensitive. Operational independence provides protection from political direction of the implementation of monetary policy. A second reason is that the preferred instrument will depend on the prevailing financial market conditions and the terms of the PTA. An informed choice of instrument requires research capability, a thorough understanding of financial markets, and knowledge of international best practice. Central Banks are typically well placed to satisfy these requirements and the conditions imposed by Section 10 of the Act provided a strong motivation for the Governor to promote the necessary research and knowledge creation, either internally or externally. As discussed in section 6 of this paper, the Bank’s preferred monetary policy instruments have changed over time as knowledge of the effectiveness of alternative instruments, based on international evidence and the bank’s own experience, has developed.

Accountability is further strengthened by Sections 52 to 63 of the Act which established a Board of Directors and required the Board to monitor and provide oversight on the Bank’s operations and policy decisions. The Board could recommend that the Minister of Finance remove the Governor due to inadequate performance. This part of the Act also required the Bank to have regard to any policy direction issued by the Minister in relation to government policies, and each year the Governor of the Bank frequently appears before the Finance and Expenditure Committee of Parliament.

The role and functioning of the Board has evolved over time. Following recommendations in a review by Svensson (2001), the Board meetings are chaired by a non-executive member of the Board (rather than the Governor as was previously the situation), and the non-executive members of the Board prepare an independent report each year setting out its assessment of the performance of the Bank in carrying out its functions. This is published as a separate statement in the RBNZ Annual Report (see for example, Quigley & Vautier, 2018). The Minister of Finance’s expectations of the Board’s monitoring role are conveyed to the Board by a “Letter of Expectations”. This letter specifies the requirement to assess the Bank’s performance across a range of functions, including monetary policy and the performance of the Bank in promoting the maintenance of a sound and efficient financial system. For example, after each of the Bank’s monetary policy decisions, the Board has access to all background papers considered during the decision-making processes throughout the year, and it conducts *ex post* reviews of this material and assesses how the Bank has responded to economic developments.

Although the New Zealand system has been described as implying the Governor is a “single decision maker”, the decision process is more nuanced than this term implies. Section 10 of the Act required the Bank to consult with persons or organisations it considers can assist it to achieve and maintain the economic objective of monetary policy. The Bank also developed a practice of holding its Board meetings in different parts of the country and meeting with members of the community. The Bank established an internal Official Cash Rate Advisory Group (OCRAG) to advise the Governor (see Bollard & Karagedikli, 2006, p.6). This Group also included two external advisors and its advice, although not published, was scrutinised in detail by the RBNZ Board after OCR decisions were made.

A Governing Committee within the Bank was established in 2013 to make major policy decisions. The establishment of this committee followed similar developments by the Bank of Canada, which also had a single decision maker model for monetary policy under its legislation. Wheeler (2014, pp. 10-11) explains that the committee comprised the four governors, it reviewed all major monetary and financial policy matters falling under the Bank’s responsibilities, including decisions on monetary policy, and is informed by several policy committees, each chaired by a governor. Nevertheless, the Governor retained a casting vote and sole decision-making power. McDermott & Williams (2018, p. 12) provide a detailed explanation of the process of consultation and decision making by the Bank and explain that “...Reserve Bank Governors have a long history of utilising advisory committees ..” and with respect to the process since 2013 they explain “While the Governor retains the right of veto on decisions, and continues to have statutory responsibility for policy, the Committee members work together to test ideas and build consensus around the monetary policy decision.....The flexibility of our approach to inflation targeting requires a great deal of judgement, and the use of a committee maximises the knowledge and experience of members individually and as a collective.”

The sections of the RBNZ Act 1989 pertaining to monetary policy have remained largely unchanged for twenty-nine years. Many of the features of the Act have influenced central bank governance arrangements in other countries, According to Mishkin & Savastano (2001), the features involving a strong commitment of a central bank to price stability, the public announcement of a numerical target for inflation, and a high degree of transparency and accountability have come to characterise inflation targeting regime’s globally.⁶ However, as discussed in section 8, a Bill was introduced to the New Zealand Parliament in 2018 proposing changes to the 1989 Act which if passed into legislation

⁶ Hall (2004) compares and evaluates central bank governance performance in four small, open economies which, at the time, had different monetary policy priorities. They included Hong Kong and Singapore which placed an emphasis on exchange rate stability, and Australia and New Zealand which were primarily inflation targeting countries. Appendix 1 in Snively, *et. al.* (2018) provides a summary of monetary policy legislative frameworks currently operating in Australia, Canada, Norway, Sweden, UK and USA.

will have implications for the monetary policy governance and decision-making processes in the future.

4. Influences on the design of the RBNZ Act 1989

The RBNZ Act 1989 was part of a broader suite of policy reforms introduced in New Zealand between the mid-1980s and mid-1990s that sought to make public sector organisations more accountable. This was to be achieved by specifying clearer objectives, by clarifying the responsibilities of those tasked with management of these organisations, and by improving reporting standards (see Evans, *et. al.*, 1996). These characteristics are evident in the RBNZ Act 1989, but the design of this Act was also influenced by international experiences with inflation policy and international developments in theories of policy design and monetary policy practice during the preceding decades.

Important were two fundamental principles pertaining to policy more generally that were developed by Tinbergen (1952) and by Mundell (1962). Tinbergen's principle suggests that to attain a given number of independent policy targets there must be at least an equal number of policy instruments. This means that if a central bank were charged with targeting inflation, and in addition output and other economic goals, but has only the interest rate as a policy instrument, it could be faced with conflicting goals especially, as discussed in section 5, in the presence of supply shocks. As Blinder (1998) explains, "... unless it has a single goal, the central bank is forced to strike a balance between competing objectives, that is, to face up to various trade-offs." This point is important in the context of monetary policy in New Zealand, particularly as inflation was reduced to lower rates during the 1990s and as secondary objectives started to assume more importance in the PTAs, and the regime moved toward a more "flexible" approach to inflation targeting.

The principle of effective market classification developed by Mundell proposes that policies should be paired with the objectives on which they have the most influence. If this principle is not followed, there will develop a tendency either for a cyclical approach to equilibrium or for instability. The principles developed by Tinbergen and Mundell challenged the merits of multiple targets for monetary policy as specified in the old Act and highlighted the importance of finding or designing institutional arrangements to ensure the effectiveness and appropriate assignment of policy instruments if New Zealand was to achieve and sustain a low rate of inflation.

Developments in monetary theory and particularly the ideas of Phelps (1968), Friedman (1968) and Lucas (1972), had influenced understanding of the short and long-run trade-offs for monetary policy, the crucial influence of expectations in determining those trade-offs as reflected by the expectations-augmented Phillips Curve, and the appropriate role for monetary policy. Practical experience was also influential. The effectiveness of the Volker experiment during the early 1980s in dramatically reversing the persistent high inflation rates in the USA and the role of the Bundesbank in sustaining low inflation in

post-war Germany were important experiences building a case that monetary policy could be used to target inflation.

The emerging research on the importance of policy credibility and the way institutional arrangements could affect policy credibility were also very influential. Again, both practical experience and theory highlighted these as important issues to address in the design of the Act. If monetary policy were assigned to reduce New Zealand's high inflation and to sustain low inflation, the cost of doing so and the ability to sustain this would be jeopardised if the policy goal were not credible.

This was a lesson from the experience of the USA Federal Reserve Board during the Volker disinflation experiment. The Federal Reserve Board's Open Market Committee (FOMC) was concerned that the reversal of monetary policy from one that had accommodated high inflation to one designed to reverse inflation would lack credibility following the years of rising inflation. The Volker experiment showed that monetary policy could achieve a significant reduction in inflation, but subsequent research has revealed that the output and employment costs of this policy were, as the FOMC expected, harmed by weak policy credibility (see Goodfriend & King, 2005).

The theoretical expression of this problem was anticipated by the concept of the time-inconsistency of optimal plans introduced by Kydland & Prescott (1977). The idea has wide applicability to decision-making generally and to public policy, and its relevance to monetary policy was quickly recognised (see for example Barro & Gordon, 1983; Backus & Driffill, 1985a, 1985b). The technical expression of this problem, as it applies to government policy, is described by Persson (1988, pp. 519-520) as follows: "*ex ante*, before some choices have been made by the private sector..., an optimal policy induces some response of private behaviour. But *ex post*, after the choices have been made, the response to policy may be very different from the *ex ante* response, which makes the government's *ex post* constraints different from the *ex ante* constraints."

In the context of monetary policy, this issue can be illustrated as follows. Following a history of low inflation, the public would typically expect low inflation to prevail. These expectations influence price and wage contracts. The duration of these contracts varies according to the types of markets; some may be set for several months and others for several years, and across the economy they will tend to overlap. A government that wants to increase output and employment could exploit this situation by manipulating monetary policy to cause an economic upswing (perhaps in the period leading up to an election). It could do this by creating easier credit conditions and lower interest rates. Lower interest rates and easier access to credit will increase investment demand, induce higher domestic prices for output, and in a small open economy cause higher domestic currency prices for tradeable goods via exchange rate depreciation, and induce lower real wage rates (due to the lags in the process of setting new wage contracts). This process of relative price

changes will generate higher demand for labour and output more generally, causing a business cycle upswing.

However, the monetary policy induced expansion will tend to be short-lived, especially if it forces the economy to grow beyond a sustainable rate. As price and wage contracts come up for renewal, the contracting parties take into consideration the higher growth in other prices and demand for the products and skills they are offering. Expectations of future inflation adapt accordingly, more prices and wage rates start to grow at a faster rate, and inflation rises which reinforces expectations of higher future inflation. Widespread price and wage adjustments will erode the initial monetary policy induced change in relative prices. Investment and employment plans start to re-adjust, demand and output growth start to decline bringing an end to the business cycle upswing. If the easier monetary policy conditions continue, the economy is left in a state where output and employment are growing at rates similar to that which prevailed before the easier monetary policy was introduced, but inflation will continue at the higher rate. The rate of inflation can only be reduced permanently by reversing the easier monetary conditions and causing a recession. This will continue until the economy re-adjusts to the new monetary conditions and output and employment growth have returned to their long-run sustainable growth rates. The easier monetary policy was time-inconsistent.

The problem of time-inconsistency of monetary policy in New Zealand under the old Act which imposed multiple targets and enabled monetary policy decisions to be made at the discretion of government was recognised and debated in New Zealand (see for example, Buckle, 1988). The issue of time-inconsistency and the importance of policy credibility had a significant bearing on the design of the RBNZ Act 1989 (see Grimes, 1996; and Evans, *et. al.*, 1996). The challenge was to design a policy framework that would ensure that people know the *ex ante* incentives and constraints of the monetary authority, and that these remain unchanged and are expected to remain unchanged, *ex post*. This required the design of an institutional device that would establish a credible commitment to sustained low inflation and would remove the dynamic inconsistency problem.

Just how to do this had been the subject of debate in the international literature in the context of the relative merits of rules versus discretion in public policy. Policy discretion can provide an advantage over a fixed policy rule in that it enables a government to adjust policy to changes in the structure of the economy and to the disturbances influencing it. But discretion suffers from the potential time-inconsistency problem. Rogoff (1985) proposed, in the context of the USA institutional arrangements, that a way through this dilemma in the context of monetary policy is to appoint a central bank chair with a greater distaste for inflation than society as a whole. It is difficult to see how this could be a realistic solution, at least in the New Zealand context where the central bank Governor is appointed by government and where, as was the case prior to 1990, governments determined monetary policy.

The approach adopted by New Zealand was to write into legislation a commitment to price stability, eliminate multiple targets (Section 8), and to appoint a Governor prepared to sign a contractual agreement that included an inflation target. This is a way to adopt the Rogoff-type solution, but through a contractual commitment to the policy goal, and where the Governor has discretion over the choice of policy instrument. The contractual obligations are specified in published Policy Targets Agreements which strengthened accountability and transparency. Therefore, the PTAs have been an important feature of the institutional architecture for monetary policy in New Zealand. The price stability objective and the contractual obligations specified in the PTA, coupled with the provision of operational independence for the Bank, were important building blocks introduced to overcome the problem of time-inconsistency that had been inherent under the old RBNZ Act.

Policy credibility also requires the Bank to have the technical means to manage price inflation. Floating the exchange rate in 1985 was a crucial step providing the potential for the Bank to influence domestic monetary conditions and inflation. The most effective monetary policy instrument was something the Bank had to learn during the early years of inflation targeting. Furthermore, there was always scope to change the legislation and move away from price stability as the primary goal of monetary policy, or to use the PTA to edge toward higher target inflation rates. Both these issues had the potential to undermine policy credibility and are discussed in sections 5 and 6.

5. Policy Targets Agreements and the evolution toward flexible inflation targeting

One of the features of the development of inflation targeting in New Zealand is the adoption of increased flexibility in the practice of monetary policy. McDermott & Williams (2018, p. 6) describe this process as follows: “As the Bank established its credibility in achieving its inflation target, we could allow some volatility in realised inflation in order to offset some volatility elsewhere in the economy. In practice, this means that interest rates have generally been adjusted more slowly. And in this sense, the Bank has increasingly paid regard to the wider economy despite having a consistent overall objective of price stability specified in the Act.” In his review of the operation of monetary policy in New Zealand after a decade of inflation targeting, Svensson (2001) suggested that the move toward more flexible inflation targeting was consistent with the way best international practice had developed. This gradual change in the practice of monetary policy is reflected in the contents of the PTAs. Nevertheless, ‘price stability’ has remained the paramount goal, as reflected in the comments by Bollard & Ng (2008, p. 6) who remarked that “a monetary policy that loses sight of the importance of price stability will probably contribute to large economic cycles as inflation gets out of hand and then needs to be reined in with an economic crunch.”

This section traces the changes in the specification of PTAs and the evolution toward a more flexible approach to inflation targeting. Section 5.1 provides some structure to the discussion by reviewing some insights from developments in modern monetary theory that have influenced the application of monetary policy. This is followed by a discussion of the contractual nature of PTAs, the introduction of policy objectives in addition to price stability, changes in inflation targets, and the choice of price indices.

5.1 Inflation targeting and policy trade-offs

A useful framework is provided by Clarida, *et. al.*, (1999) who use a simple macroeconomic model to demonstrate a set of results that have influenced contemporary practice of monetary policy. The model has the following features. There are temporary nominal price rigidities and people are forward looking and their spending and production decisions are based on expectations of future income, prices, monetary policy, etc., as well as current values. The central bank policy instrument is short-term interest rates. The bank's objective is to minimise a weighted sum of deviations of inflation from a target rate and deviations of aggregate output from its long-run growth path (which is independent of monetary policy and determined by forces such as the state of technology and productivity growth). Inflation is determined by expectations of future inflation, demand and costs shocks (such as an increase in the price of imported oil or changes in excise taxes). The task of monetary policy is to choose a path for the interest rate in order to influence inflation and output in a way that maximises the objective function. Assuming there is a commitment by the central bank to these objectives, the model generates several important results.

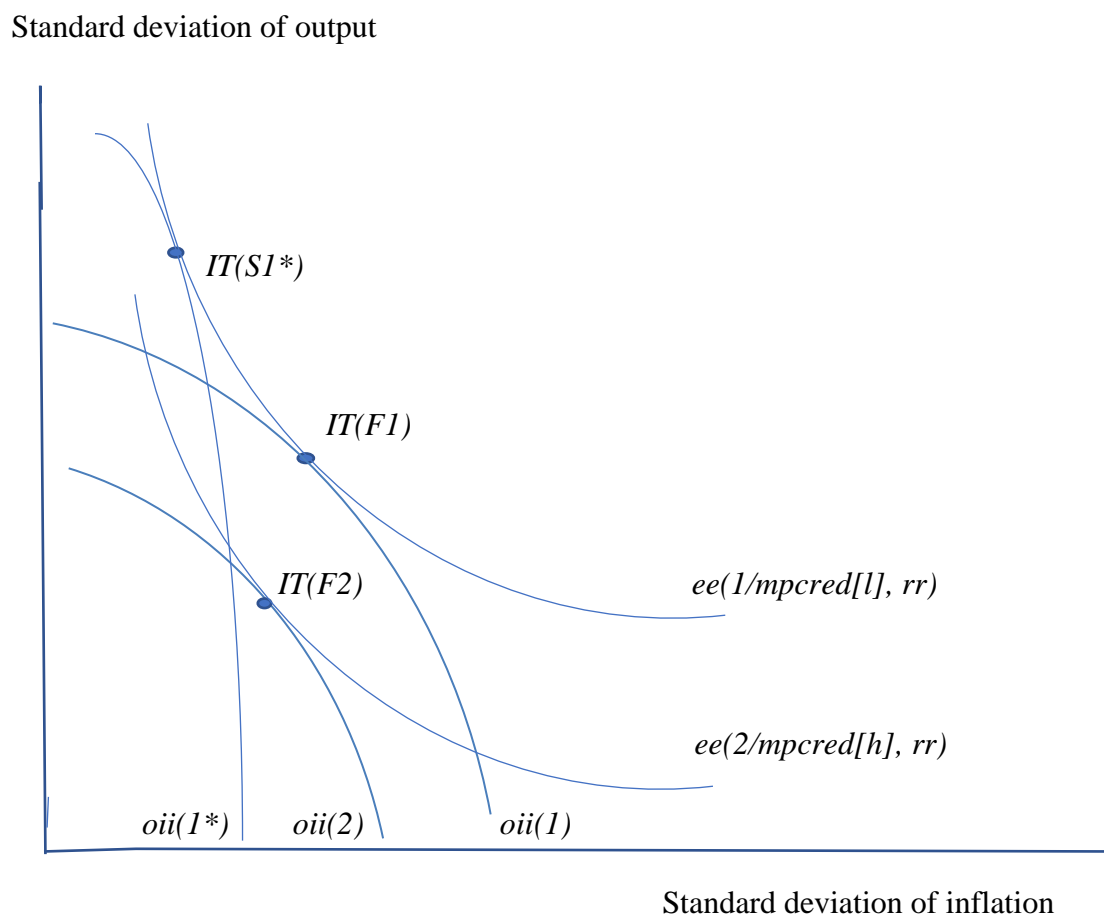
One important result is that in the presence of cost push inflation, or supply-side shocks to prices, there exists a short run trade-off between inflation and output volatility, a result originally developed by Taylor (1979).⁷ Although supply shocks (e.g., an increase in the price of oil used in production) impact both demand and supply, real rigidities such as slow adjustment of relative prices and wages, slow rates of substitution of factors of production, and the time taken to innovate and find alternative production processes will generate this trade-off (see for example Blanchard & Gali, 2007; Alves, 2014; Kim, 2016).⁸ These rigidities will determine how cost shocks impact on output growth and price-wage dynamics. The properties of this trade-off are therefore state dependent. These types of rigidities help explain why the large increases in the relative price of oil (a supply shock) during the 1970s contributed to a long period of persistent high inflation and

⁷ Walsh (1998) provides a succinct description of this trade-off and how it relates to the earlier idea of a short-run Phillips-curve trade-off between inflation and output. It is clearly one of the key relationships that underpins the RBNZ approach to inflation targeting and the application of monetary policy (see Bollard & Karagedikli, 2006, Figure 4, p. 14).

⁸ Grimes (2014a) shows that targeting nominal GDP rather than inflation does not avoid this trade-off.

recession (stagflation) in many countries that were dependent on imported oil for production.

Figure 2: Inflation and output volatility efficiency frontiers and inflation targeting regimes



Note: ee depicts a monetary policy efficiency frontier (Taylor curve) for a given set of real rigidities and level of policy credibility. $ee(2/mpcred[h], rr)$ depicts an efficiency frontier where monetary policy credibility is high; $ee(1/mpcred[l], rr)$ depicts an efficiency frontier where monetary policy credibility is low, and rr depicts the state of real rigidities. $oii(1)$, $oii(2)$, and $oii(1^*)$ depict alternative government indifference curves. $oii(1)$ and $oii(2)$ represent the same preferences over inflation and output volatility; $oii(1^*)$ illustrates an indifference curve where the government has a relatively higher preference for low inflation volatility compared to the other two indifference curves.

This trade-off can be depicted by a convex relationship between inflation volatility and output volatility, referred to as the monetary policy efficiency frontier. This is illustrated by the curve $ee(1)$ in Figure 2. Points above this efficiency frontier are sub-optimal and points below are not feasible. The nature of real rigidities is likely to vary between economies and therefore the nature of the volatility trade-off will also vary between countries. The position of the efficiency frontier is also influenced by the credibility of monetary policy as explained below. This point and the fact an efficiency frontier is

dependent on real rigidities, is denoted by labelling the efficiency frontiers as follows: $ee(1/mpcred[l], rr)$, where $[l]$ denotes low credibility and $ee(2/mpcred[h], rr)$, where $[h]$ denotes high credibility. The preferred positioning of the economy on these frontiers will depend on the government's or central bank's preferences (relative weights) over minimising inflation and output deviations from their targets.

Figure 2 can be developed further to combine the efficiency frontier with indifference curves to illustrate the combination of inflation and output volatility that will maximise social welfare (or well-being). The indifference curve $oii(1)$ represents a set of points along which government (or the central bank) is indifferent. It reflects the idea that if inflation volatility increases, it needs to be offset by increasingly lower output volatility to maintain the same level of welfare. Indifference curves closer to the origin, such as $oii(2)$, represent higher welfare. Given the technological limits of monetary policy represented by the efficiency frontier $ee(1)$, the welfare maximising point for monetary policy is to locate along the efficiency frontier at the point $IT(F1)$.

Figure 2 can be further extended to provide an interpretation of the difference between "strict" and "flexible" inflation targeting. Suppose the relevant efficiency frontier is $ee(1)$ and the indifference curve for a government with a high preference for reducing inflation volatility relative to output volatility is represented by the curve $oii(1^*)$. In that situation monetary policy should position the economy at the point $IT(S1^*)$. Compared to the optimal position for a government with preferences represented by the indifference curve $oii(1)$, the pursuit of "strict" inflation targeting at $IT(S1^*)$ increases the volatility of output compared to the position $IT(F1)$. The difference between strict and flexible inflation targeting, for a given efficiency frontier, can therefore be interpreted as representing a difference in government preferences over inflation and output volatility.

As noted earlier, the position of the efficiency frontier ee is state dependent. It will shift if there are changes to the way cost shocks impact on the economy, including the way they impact inflation and output dynamics. It will therefore be influenced by policy credibility and the way policy credibility influences price and wage dynamics. Suppose government introduces a monetary policy governance arrangement that enhances monetary policy credibility such that, in contrast to the state prevailing for the frontier $ee(1)$, expectations of low inflation are embedded in price and wage dynamics and cost shocks do not pass through into inflation with the same intensity. The relevant efficiency frontier changes. For given cost shocks there will be a smaller impact on inflation volatility. This is represented by the efficiency frontier $ee(2/mpcred[h], rr)$, which lies below $ee(1)$. This 'technology' change enables government to achieve an indifference curve closer to the origin which represents higher social welfare. For the new efficiency frontier $ee(2)$, the optimal point to position monetary policy is along the indifference curve $oii(2)$ at the technically feasible point $IT(F2)$. This illustrates another interpretation of the difference between strict and flexible inflation targeting. It may arise from an

improvement in policy credibility which leads to a shift in the monetary policy efficiency frontier (ee) and the feasibility of a simultaneous reduction in output and inflation volatility without a change in government preferences.

At the time the RBNZ Act 1989 was introduced, New Zealand was also undertaking a range of other reforms. Changes in trade policy and the later introduction of more competition in the labour market, including the Employments Contract Act 1994, had changed the characteristics of price and wage dynamics (see Morrison, 1996; Evans, *et. al.*, 1996; Silverstone, *et. al.*, 1996).⁹ These reforms are also likely to have reduced the severity of real rigidities in product and labour markets and therefore also influenced the position of the efficiency frontier. In that way, other product and labour market reforms will have complemented the reform of monetary policy and the redesign of monetary policy governance in the pursuit of inflation targeting.¹⁰

Figure 2 demonstrates several important points. One is that the pursuit of monetary policy credibility (and microeconomic reforms to labour and product markets that reduce real rigidities) can increase social welfare by enabling monetary policy to achieve simultaneously lower inflation and lower output volatility, for given preferences. The second related point is that observed changes in inflation targeting from “strict” to “flexible” inflation targeting may be the result of: (i) a shift in the efficiency frontier, as represented by the shift from $ee(1)$ to $ee(2)$, for a given set of preferences; or (ii) a shift in government preferences which attach a greater weight to reducing output volatility relative to inflation volatility, as represented by the differences between the indifference curves $oii(1^*)$ and $oii(1)$ where the latter attaches a higher preference (weight) to reducing output volatility; and (iii) it can arise from a combination of both these two factors.

There is a corollary. Just as enhanced monetary policy credibility can change the technology of monetary policy and improve the trade-off between inflation and output volatility, the reverse can occur. If monetary policy credibility is lost, the process can reverse; the efficiency frontier will, for a given set of factors influencing real rigidities, shift out (say, from $ee(2)$ to $ee(1)$) and the trade-off will deteriorate. For example, a change in policy preferences that increases the emphasis on reducing output volatility relative to inflation volatility and which undermines the credibility of monetary policy credibility to target low inflation could cause the efficiency frontier to drift out again, worsen the trade-off, and risk a return to expectations of higher inflation and sustained higher inflation.

⁹ See footnote 1 for other references that discuss these reforms.

¹⁰ See also Bollard & Karagedikli (2006, pp.15-17) and references therein for a discussion of other influences contributing to lower inflation and changes to inflation dynamics in New Zealand's during the 1990s and 2000s and which could contribute to shifting the efficiency frontier.

Several other important results can be gleaned from this basic framework. Figure 2 helps demonstrate an insight from Clarida *et. al.*, which is that extreme (or “strict”) inflation targeting would only be optimal in either the absence of cost shocks or if there is no concern for output deviations from its long-run growth path. For example, if government had a preference function like that depicted by the indifference curve $oii(I^*)$ (or a vertical indifference curve), the optimal point to locate the economy is $IT(SI^*)$ when the efficiency frontier is $ee(I)$, which implies relatively high output volatility.

Other important insights mentioned by Clarida *et. al.*, but which are not apparent from Figure 2, are the following. The optimal policy requires the central bank to aim for convergence of inflation to its target over time. Another relates to demand shocks. When the economy experiences demand shocks, the optimal monetary policy response is to adjust the interest rate to offset demand shocks (i.e., keep demand close to the output growth path). A different monetary response is required in the presence of shocks to potential output (for example, a rise in trend productivity growth). In this situation, monetary policy should accommodate this shock by adjusting interest rates to encourage demand to move with and match the change in potential output growth.

These insights have sometimes been interpreted as implying that in the presence of demand or productivity shocks, inflation targeting does not necessarily result in a trade-off between inflation volatility and output volatility. However, this does not necessarily follow. There can be sectoral differences arising from demand or productivity shocks and which can vary with the type of shock. For example, a frequent source of demand shocks in New Zealand are agricultural commodity prices changes. In response to an increase in pastoral product prices the nominal exchange rate will appreciate (Chen & Rogoff, 2003; Buckle, *et al.*, 2007) and, coupled with any monetary policy induced interest rate increases, will ameliorate some of the impact on agriculture sector incomes and spending. But increases in the exchange rate and interest rates also impact other sectors, including those that have not experienced increases in demand (see Karagedikli, *et. al.*, 2013). The ability of these sectors to adjust is affected by real rigidities. Consequently, changes in monetary policy in response to demand-side or supply-side shocks (whether reducing or enhancing productivity) have frequently provoked criticism of monetary policy and inflation targeting.¹¹

¹¹ These differential sector effects are similar to “Dutch disease” effects that arise when, in response to a “boom” in demand in one sector, relative prices change, and resources shift to the “booming sector” (see Corden & Neary, 1982). In the context of monetary policy and inflation targeting, the situation described in the text is akin to Corden’s (1997) “by-product distortions”. Although applied in the context of international trade policy, an implication that applies to any policy assignment decision is that it is important to understand these by-product effects. The optimal choice of policy instrument can change if these side-effects are sufficiently costly. Corden’s approach to the assignment of instruments in the trade policy context is represented by an “hierarchy of policy instruments” which acknowledges that secondary distortions from each instrument (when it is used to hit its primary target) may also be

The crucial point to arise from this approach to analysing the optimal response of monetary policy is that an important task of monetary policy is to distinguish the sources of shocks to the economy. Cost shocks, demand shocks and productivity shocks require different responses, and the optimal response depends on the characteristics of the economy, such as the nature of relative price rigidities and rates of substitution in response to relative price shocks. The optimal monetary response is both shock dependent and state dependent. However, identifying the character of shocks, particularly changes to productivity, understanding the sectoral implications of shocks, and understanding the nature of rigidities are difficult tasks and therefore the practice of monetary policy and inflation targeting is inevitably conducted with some uncertainty.

The following discussion reviews the evolution of PTAs in the context of the above characterisation of optimal monetary policy responses to various economic circumstances. The successive PTAs reflect a change toward a more flexible approach to inflation targeting. They help illuminate change in government preferences, although as several of the RBNZ papers suggest, they may also reflect recognition by governments and the Bank that economic conditions had changed (through improvements in monetary policy credibility and stronger expectations of sustained low inflation for example) that have made simultaneously targeting lower inflation and output volatility more feasible.

5.2 PTAs as a contract between the government and the RBNZ Governor

The Policy Targets Agreements (PTAs) required by Section 9 of the Act are an agreement signed between the Minister of Finance and the Governor. This arrangement was influenced by the approach adopted to reform the wider public sector at the time, which gave public sector managers the authority to manage and made them directly accountable. (see Reddell, 1999; Scott, 2001).

The first PTA was signed on 2 March 1990, shortly after the 1989 Act came into force. Since then, there have been twelve further PTAs either as a result of the appointment of a new Governor, a change of government or Minister of Finance, or an agreed change in the parameters following changing circumstances (RBNZ, 2018). Many of the changes have been relatively minor in nature, but there have been some significant changes which over time have resulted in variations to all parameters of the agreements. These have included the introduction of secondary objectives, changes to the numerical values of the ceiling, floor and mid-point of the inflation target band, changes to the measure of inflation, and changes to the timeframe over which the inflation target is to be met (RBNZ, 2000a). The reasons for these changes are discussed in detail by Grimes (1996, p. 261), RBNZ (2007), and Lewis & McDermott (2016, pp. 344-347).

important. In the context of Mundell's (1962) assignment principle this would mean that the optimal selection and assignment of policy instruments would change.

Section 41(1) of the Act explicitly assigns responsibility for achieving the targets set out in the PTA. It states that: "It is the duty of the Governor to ensure that the Bank carries out the functions imposed on it by this Act." Section 49 titled "Removal of the Governor from office" makes clear that failure to achieve the policy targets can lead to the removal of the Governor. Walsh (1995) evaluates whether the contract implicit in the Act is in some sense optimal, using the principal-agent approach to central bank design. He focuses in particular on two features of the Act. He argues that the optimal commitment policy can be sustained by a dismissal policy based on the measured rate of inflation. This requires the government to establish a critical inflation rate and dismiss the Governor whenever actual inflation exceeds this critical rate. Walsh (1995, p. 1188) argues that the critical rate should be a function of aggregate supply disturbances and measurement error in the observed inflation rate, but it should be independent of aggregate demand shocks. He concludes that "This is exactly what the Policy Target Agreements required by the Reserve Bank Act do. The Reserve Bank Act of 1989 seems to mimic quite well the firing rule designed to sustain the socially optimal commitment policy."

As the Clarida, *et al.*, framework suggests, and Figure 2 implies, the presence of supply shocks does not necessarily render inflation targeting suboptimal. Under certain preference settings an optimal policy may be one of 'strict' inflation targeting that minimises inflation volatility, although at the cost of higher output volatility. But optimality would require monetary policy to be more 'flexible' if output volatility is also a concern. Nevertheless, Walsh's (1995, p. 1188) suggestion that two important qualifications are in order would seem to be valid: "First, a dismissal policy based on the measured rate of inflation will sustain the socially optimal policy if and only if the central banker cares about holding office and shares society's preferences with respect to output and inflation fluctuations. Second, the optimal dismissal policy must be renegotiation proof." The PTAs can be viewed as a contract designed to ensure an appointed Governor conducts monetary policy consistent with the first condition (i.e., consistent with the preferences of society or at least the government).

From 1990 until 1996 the PTAs included a statement similar to the following that appeared in the 1996 PTA: "The policy targets are established on the understanding that the monetary policy instruments available to the Bank are adequate to achieve the objective. The Governor shall inform the Minister if he considers that any changes in the availability or effectiveness of these policy instruments impair the conduct of monetary policy. The Minister and the Governor may then set new policy targets." (RBNZ, 2018a). Statements to this effect were dropped from the 1997 and all subsequent PTAs. To date, no PTA has been renegotiated other than when there has been a change of government or on the completion of a Governor's term which is either renewed or a new Governor is appointed.

5.3 Policy Targets Agreements and secondary objectives

The introduction of secondary objectives, notably with respect to the treatment of supply shocks and in more recent years requirements pertaining to the volatility of real economic variables and interest rates and exchange rates, has been a feature of successive PTAs. Lewis & McDermott (2016) suggest this reflects the desire for the inflation targeting regime to be more flexible and, as illustrated by Figure 2, this trend could be due to opportunities arising from a shift in the efficiency frontier, from changes in government preferences, or a combination of these influences.

The increasing number of secondary objectives may also be a consequence of political pressure on governments arising from the consequences of Corden type “by-product distortions” of monetary policy. The inclusion of secondary objectives in PTAs may also be an opportunity for governments to signal to the public that they care about these “distortions”. However, they have been included without necessarily ensuring, as required by the Tinbergen principle, that the Bank has enough effective instruments to simultaneously target inflation and the growing list of secondary objectives. The increased propensity for including secondary objectives may also be a response to the relatively benign inflation conditions over the last two decades, and perhaps an assumption that the risks of high inflation are now sufficiently low to warrant reducing the priority attached to low inflation.

Although price stability was made the "primary function" of monetary policy, from the outset and until 2018 PTAs explicitly recognized that inflation targets may need to be changed in the face of supply-side shocks. The first PTA signed in March 1990 stated that “These targets may also be varied at any time by agreement between the Governor and the Minister” as a result of the following types of shocks to the price index: material changes to indirect tax rates including the GST, a significant change in either export prices or import prices, crisis situations such as a natural disaster or a major disease-induced fall in livestock numbers expected to influence significantly the price level. The following statement in the December 1999 PTA is typical of the type of statement included in all PTAs from 1990 until 2017: “There is a range of events that can have a significant temporary impact on inflation as measured by the CPI, and mask the underlying trend in prices which is the proper focus of monetary policy. These events may even lead to inflation outcomes outside the target range. Such disturbances include, for example, shifts in the aggregate price level because of exceptional movements in the prices of commodities traded in world markets, changes in indirect taxes, significant government policy changes that directly affect prices, or a natural disaster affecting a major part of the economy.” (RBNZ, 2018a).

The inclusion of this type of statement allowed the Governor and the Bank to “look through” the impact of unusual shifts in the price level and prompted Walsh (1995, p.

1182) to conclude that the inclusion of these provisions meant that “the Act has produced something more sophisticated than pure inflation targeting.” They imply that the government was expecting the Bank to give some weight to output volatility as well as to inflation volatility. For example, in a strict inflation targeting mode a rise in import prices would require an immediate tightening of monetary policy to maintain price inflation on or near the target rate. The consequence would be that monetary policy would accentuate the contractionary impact of the rise in import prices on real output, thereby increasing output volatility.¹²

The December 1999 PTA (signed by Governor Brash who also signed the previous PTAs) went further: “In pursuing its price stability objective, the Bank shall implement monetary policy in a sustainable, consistent and transparent manner and shall avoid unnecessary instability in output, interest rates and the exchange rate”. Comments by Hunt (2004) and Bollard & Karagedikli (2006) suggest the Bank was already considering the behaviour of macroeconomic conditions when deciding on monetary policy.

That the Bank was already taking into consideration wider economic conditions is not surprising since the contemporary and expected future path of output, or the output gap, and employment will influence future wage and price behaviour. Nevertheless, ‘changing economic circumstances’ was interpreted as providing more scope for flexibility. Governor Bollard (2002), who signed the 2002 PTA, suggested that the scope for more flexibility had been achieved as a result of inflation declining during the preceding decade. Svensson (1997) makes a similar observation and emphasises the importance of improved policy credibility in enabling greater scope for a more flexible approach to take evolving economic circumstances into account. These explanations are consistent with a shift in the efficiency frontier from $ee(1)$ to $ee(2)$ illustrated in Figure 2. It implies that more emphasis could be placed on reducing output volatility without necessarily creating higher inflation volatility. Whether this should be labelled as a more flexible approach to inflation targeting or simply a move to a new optimal point is a moot point.

An interesting feature of the 2002 PTA was that it couched the inflation target explicitly in terms of the future rate of inflation with the requirement that the “policy target shall be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term.” Bollard (2002, p. 44) interpreted this statement as implying that “monetary policy should be forward-looking and avoid getting distracted by transitory fluctuations to the inflation rate.” The justification given was that after low inflation had been achieved and expectations had adapted to the low inflation environment, people are

¹² Note, the contractionary effects on domestic output and incomes as a result of an increase in import prices arises from the presence of real rigidities, either slow adjustment of relative prices and/or slow rates of substitution. In circumstances where imports (such as oil) are inputs to domestic production processes, a slow rate of substitution to alternative production inputs in response to a rise in import prices is equivalent to a fall in productivity. See for example Findlay & Rodriguez (1977).

less likely to view price fluctuations as the start of a resurgence of inflation. This interpretation is consistent with an inward shift of the efficiency frontier due to improved credibility. The forward-looking approach to inflation targeting is also consistent with one of the conditions identified by Clarida, *et al.*, that optimal policy requires the central bank to aim for convergence of inflation to its target over time.

The December 1999 and subsequent PTAs introduced restrictions on the behaviour of interest rates and exchange rates which Lewis & McDermott (2016) note is not usual international practice. This type of restriction imposes a constraint on policy since interest rates and exchange rates are important primary channels by which monetary policy impinges on inflation in a small open economy. These restrictions imply that, contrary to the original intention of the Act, there may arise circumstances when the Bank does not have full operational discretion. Moreover, as Grimes explains (2014b, p. 54) a floating exchange rate is “a canary in the coal mine”; it is a symptom of what is happening elsewhere in the economy. The exchange rate will be volatile when underlying determinants are volatile, such as volatile commodity prices (see Chen & Rogoff, 2003; Buckle, *et al.*, 2007).¹³ Therefore, imposing restrictions on interest rates or the exchange rate would normally transfer the impact of shocks to other variables. To illustrate, West (2003) has estimated that the cost of assigning New Zealand interest rate policy to smooth the real exchange rate. His results show that a reduction in real exchange rate volatility of 25 per cent would be accompanied by increases in output volatility of 10 to 15 per cent, inflation volatility of 0 to 15 per cent and interest rate volatility of 15 to 40 per cent.

Nevertheless, to ameliorate this conflict government approved in March 2004 a scheme that would enable the Bank to directly intervene in the foreign exchange market to influence the level of the exchange rate. Eckhold & Hunt (2005) explain that this scheme allowed the Bank, subject to publicly disclosed criteria agreed with the Minister of Finance, to use its discretion to intervene at the extremes of the exchange rate cycle.¹⁴ The intention of the scheme was to intervene when the exchange rate was ‘under’ or ‘over-shooting’. That is, intervention was expected to occur at extreme points in the exchange rate cycle and when it was deviating significantly beyond levels that could be explained by longer-term or “fundamental” determinants and it was not to compromise the price stability objective.¹⁵ This additional instrument provided another device that the Bank could use to signal it viewed the exchange rate movement as unjustifiably volatile, although it has rarely been used. During this period the Bank was actively exploring the

¹³ Buckle, *et al.* (2007) show that the exchange rate tends to act as a buffer and after controlling for the impact of the effects of government demand, changes in climatic conditions, and international commodity, business cycle and financial shocks, the residual effects of the exchange rate in inducing further volatility of New Zealand’s GDP were trivial during the period of floating until the early 2000s.

¹⁴ This scheme is distinct from the use of foreign reserves by the Bank for intervention in the foreign exchange market to preserve the functioning of the market in times of a foreign exchange crisis.

¹⁵ Munro (2004) provides a discussion of what the RBNZ considered at that time to be the principal determinants of movements in the New Zealand exchange rate.

feasibility of other instruments that might enable it to influence domestic interest rates and inflation while minimising additional volatility in the exchange rate.

The emphasis on a flexible approach to inflation targeting and a stronger eye on real economic activity has been taken a step further in the March 2018 PTA signed by Governor Orr. Although explicit reference to specific types of supply shocks has been dropped for the first time, it has included an additional secondary objective which is to avoid “unnecessary” instability in employment and an explicit statement requiring the Bank to pursue “flexible inflation targeting”. The current PTA states “The Bank will implement a flexible inflation targeting regime. In particular the Bank shall, in pursuing the policy target: have regard to the efficiency and soundness of the financial system; seek to avoid unnecessary instability in output, employment, interest rates, and the exchange rate; and respond to events whose impact on inflation is expected to be temporary in a manner consistent with meeting the medium-term target.” (RBNZ, 2018a). What is more, in addition to price stability the Governor is now required to ensure the Bank contributes to “supporting maximum sustainable employment within the economy.” This is discussed further in Section 8.

5.4 Policy Targets Agreements and inflation targets

More flexible inflation targeting can also be achieved by the way the inflation target is specified. The first numerical target was introduced in the first PTA signed in March 1990. It recognised that New Zealand had for some years been experiencing high inflation and it allowed a period of transition by requiring the Bank to implement monetary policy with the intention of achieving price stability by the end of 1992. An annual inflation rate in the range of 0 to 2 per cent was to represent price stability, and inflation was to be kept within that range from the end of 1992 until the conclusion of the Governor's term of office which was 31 August 1993. The statement also required that monetary conditions at the end of the Governor's term should be consistent with sustaining price stability thereafter.

When the first target was introduced, the PTA specified a transitional period for the Bank to bring inflation down to its target and indicated that the Bank should implement monetary policy to achieve a steady reduction in the annual rate of inflation until December 1992. Lewis & McDermott (2017, p. 345) explain that the first Monetary Policy Statement (MPS), issued in April 1990 specified the following transition targets for the reduction of inflation: 3 to 5 per cent inflation for the year to December 1990; 1.5 to 3.5 for the year to December 1991; and 0 to 2 per cent for the year to December 1992.

The target band remained at 0 to 2 per cent until a new PTA was signed in December 1996, which widened the band to 0 to 3 per cent. This range prevailed until the September 2002 PTA which lifted the lower bound and narrowed the range to 1 to 3 per cent. Simultaneously, the 2002 PTA increased flexibility by stating that “the policy target shall

be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term.” (RBNZ, 2018a). In September 2012, reference to the mid-point of the target band was added to the PTA. It required the Bank to maintain “a focus on keeping future average inflation near the 2 percent target midpoint.” (RBNZ, 2018a). Kendall & Ng (2013) explain that this clause was intended to anchor inflation expectations at 2 per cent and to signal that when inflation approaches the upper or lower bound it will more likely cause a policy reaction.

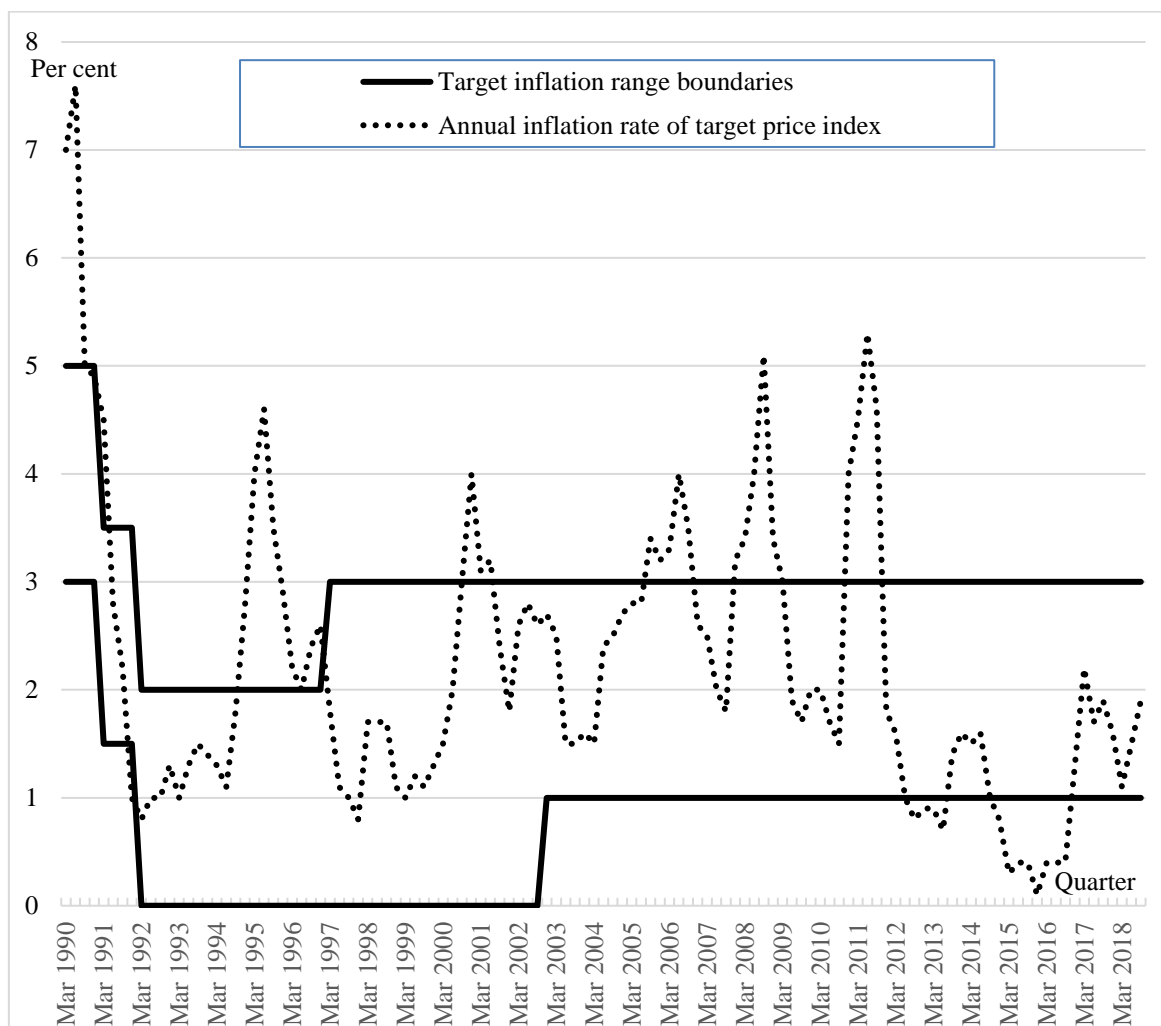
Figure 3 shows the inflation target bands that were agreed in successive PTAs, which were specified as annual rates of inflation. Although recognised as not being ideal (for reasons discussed in section 5.5), the price indices used to monitor performance were the All Groups Consumers’ Price Index (CPI) from 1990 until December 1997 and the CPIX (CPI excluding credit services) from then until December 1999. Since 1999 the CPI has been the target index and has been prepared on a conceptual basis more suitable for measuring inflation for the purposes of the RBNZ Act.

Figure 3 shows that inflation declined rapidly after the introduction of the Act and by December 1991 had moved to within the 0 to 2 per cent medium term target; more rapidly than expected when the first PTA was agreed. Thereafter the trend rate remained within the respective target bands until early 2012, apart from the occasional large spike arising from supply-side shocks. From 2012 until the end of 2016 inflation fluctuated around the 1 per cent lower bound with two periods of persistence below this point. Since then the average rate has returned to within the target band.

The deviations of inflation outside the target range since 1989 have been due primarily to the type of supply-side shocks specifically mentioned in PTAs. Monetary Policy Statements (MPS) covering the recent periods when inflation was persistently below the lower bound suggest that the global decline in oil prices that occurred from mid-2014 to early 2016 contributed to the Bank under-estimating the decline in inflation. This period provoked criticism of the Bank and concern that monetary policy was unduly tight. However, it is difficult for the public to be able to assess the adequacy of the Bank’s performance in these types of circumstances. The factors discussed prior to when monetary policy decisions are made and how they are taken into consideration are not published, although the “key policy judgements” are explained in the quarterly MPSs.¹⁶ Also, PTAs explicitly recognise there will be circumstances when inflation will vary around the medium term trend and allow some scope for deviations from influences such as “exceptional movements in the prices of commodities traded in world markets...” (see 2012 PTA, RBNZ, 2018a).

¹⁶ Monetary Policy Statements are available from this site: <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Monetary%20policy%20statements/2018/mpsfeb18.pdf>

Figure 3: New Zealand inflation and inflation targets: 1990 to 2018



Data sources: Inflation data are from the RBNZ Statistics database sourced from <https://www.rbnz.govt.nz/statistics>. Inflation target bands are taken from the PTAs (RBNZ, 2018a) and Lewis & McDermott (2017). The target inflation index is the Statistics New Zealand All Groups Consumers' Price Index (CPI) from March 1990 to Dec. 1997 and March 2000 to Sept. 2018. The price index for the period March 1998 to December 1999 is the Statistics New Zealand CPIX (CPI excluding credit services).

Alternative arguments have been advanced concerning the choice of target bands. Some have argued that having unrealistic inflation target bands can have adverse political implications for the sustainability of an inflation targeting regime (Granville, 2013). Others take the view that increases in inflation target bands risk generating inflation creep (Buiter, 2010). Another argument relates to the uncertainty caused by changes in inflation targets and bands. Orphanides & Williams (2005) have demonstrated that uncertainty about inflation targets has the potential to worsen macroeconomic performance.

Inflation expectations and inflation dynamics in New Zealand are influenced by changes in inflation target bands. Lewis & McDermott (2017) show that increases to the inflation target band have been promptly reflected in increased inflation expectations with no significant gain to growth in real economic activity. Furthermore, Karagedikli & McDermott (2017) show that inflation expectations have a significant influence on the inflation process and sustained low inflation expectations are critical to maintaining New Zealand's sustained low inflation. The importance of inflation expectations to price and wage dynamics coupled with their sensitivity to the target rate and range suggest that future decisions about the inflation target range need to take account of the implications for monetary policy credibility and the cost of reversing high inflation once it sets in. To date inflation creep has been avoided despite increased flexibility and the introduction of more secondary objectives into the PTA.

5.5 Policy Targets Agreements and the choice of price index

The choice of price index used to measure inflation is also an important issue for the integrity and credibility of inflation targeting. Section 8 of the Act requires the Bank to direct monetary policy towards the stabilisation of the "general level of prices". As Bollard (2002, p. 42) explains, maintaining price stability does not mean keeping the price of every item stable. To promote clear price signals and guide resource allocation decisions, individual prices and relative prices should be able to change in response to conditions in their respective markets. Moreover, maintaining a stable general level of prices helps to clarify the significance of individual price changes. The Bank's task is to allow relative price changes to occur while setting monetary policy to ensure second-round inflationary effects and inflation expectations do not increase. This requires an appropriate specification of a general price index.

In early 1990 there did not exist an independently constructed consumers' price index that was derived on a conceptually appropriate basis for the Bank's inflation targeting role. The "All Groups Consumers Price Index" (CPI) prepared by Statistics New Zealand (SNZ) was at that time not entirely suitable because of the way it included prices and servicing costs of investment-related expenditures, notably housing. In contrast to the usual practice amongst OECD countries, the New Zealand CPI included components for both the purchase price of dwellings and the cost of mortgage finance. By including mortgage interest rates in the CPI, the target price index could react to changes in the Bank's primary monetary policy instrument in a perverse way. Attempts to reduce inflation via increases in interest rates could cause the CPI measure of inflation to rise initially.

This problem was dealt with in the early PTAs by stating that for practical purposes the CPI will be the measure of inflation used in setting the targets, but the Bank should monitor price movements as measured by a range of price indices. The Bank was also

required to prepare and publish an alternative measure of consumer prices based on an internationally comparable approach, one that replaced the expenditure-based measure of housing costs with a measure based on an imputed housing rental cost (RBNZ, 2018a). This was denoted as the housing-adjusted (consumer) price index, or HAPI (RBNZ, 2018a, December 1990 PTA). Another index prepared by the Bank was a measure called “underlying inflation” which Lewis & McDermott, (2016, p. 345) explain “deducted [from the CPI] interest rates and sometimes deducted other items, such as significant changes in the terms of trade, significant change in indirect tax rates (such as the Goods and Services Tax) and significant price level changes arising from changes to government or local authority levies.” In practice this index became the basis for determining monetary policy and hence CPI inflation as derived by SNZ could be outside the inflation band, yet policy could be consistent with meeting the forecast underlying inflation target.

Although the HAPI was required to be verifiable by reputable external sources, this solution was not ideal because it involved the organisation being monitored (the RBNZ) deriving its own price index (the HAPI). Eventually this potential conflict of interest was resolved when SNZ prepared an alternative Consumers Price Index that excluded credit services (CPIX). The CPIX was specified in the December 1997 PTA as the basis for measuring inflation for the purpose of the Act. Eventually SNZ changed the conceptual basis of the CPI to one that did not include mortgage interest rates and since the December 1999 PTA the All Groups Consumers Price Index (CPI), as published by SNZ, has been the basis for measuring inflation for the purposes of the RBNZ Act.

While the issue of independent measurement of the target price index can and has been resolved, there are well known biases in the measurement of composite product price indexes such as the CPI. These biases arise because the appropriate basket of goods and services that should be used to determine the CPI is constantly changing. It changes for several reasons, including the effects of product substitution by consumers arising from relative price changes, the introduction of new products, and changes in product quality. Sherwin (2000) explains that the expectation of a measurement bias was a factor influencing the mid-point of the range (0 to 2 percent) set for the period 1992 to 1996. Gibson & Scobie (2010) estimated that bias in the measurement of the New Zealand CPI as a cost of living index was approximately 1.4 per cent per year between 1984 to 2001, and the size of this bias had been gradually declining during that period. This estimate suggests the increase in the target inflation range in September 2002 to 1 to 3 percent places the mid-point above the average bias for the period 1984 to 2001, particularly if, as Gibson and Scobie suggest, it has been declining. Another possible reason for setting the lower bound of the inflation band above zero is to minimise the probability of creating persistent disinflation as has occurred in some countries.

6. The search for suitable policy instruments

The ability to achieve monetary policy credibility also depends critically on the technical ability of the Bank to influence monetary conditions and in turn, future inflation and output volatility, with enough precision. The choice of preferred monetary policy instrument is another area in which the Bank has had to learn from experience and adapt. Operational independence coupled with the conditions imposed by Section 10 of the Act provided a strong motivation for successive Governors to promote research to identify monetary policy instruments that are the most efficient at achieving price stability and which enhance the efficiency and soundness of the financial system. This section traces the evolution of the Bank's choice of monetary policy instruments during the inflation targeting regime.

6.1 The evolution of monetary policy instruments

Prior to the introduction of the Act, and immediately after the deregulation of financial markets in the mid to late 1980s, the Bank was struggling to identify a monetary policy instrument that provided a stable relationship with inflation. Deregulation and the ensuing re-intermediation process as funds from previously less regulated sectors flowed back to the banking sector, disrupted the information value of historical relationships between different variables and therefore their reliability as guides for policy. As Grimes (1996) and Evans *et. al.* (1996) observe, the re-intermediation process contributed to rapid growth in traditional monetary aggregates despite attempts to tighten monetary conditions. These informational uncertainties made policy implementation difficult during the reform period, resulting in high volatility of monetary aggregates. Eventually the Bank moved away from emphasising monetary aggregates in a search for alternative monetary policy instruments that provided more effective leverage over inflation.

The Bank was grappling with these problems and searching for suitable monetary policy instruments before the new RBNZ Act was introduced. The first major change to monetary policy implementation was the introduction in 1986 of another quantity-based system via the management of a target supply of Settlement Cash Balances (SCBs). SCBs are commercial bank deposits held with the RBNZ used for the daily settlement of payments. Following the deregulation of financial markets and as was the case with several countries, New Zealand no longer had statutory reserve requirements for banks. Accordingly, the demand for reserves was a demand for settlement cash balances. If inflation forecasts warranted a change in monetary conditions, the Bank would try to steer interest rates by changing the supply of or influencing the demand for SCBs. The Bank used open market operations to target a constant nominal stock of SCBs. This process was supplemented by two price mechanisms. The Bank paid interest on settlement cash and charged a discount rate on loans. In order to influence interest rates, the Bank could

change the level of settlement cash balances, the overnight rates it charged commercial banks, or the discount rate.

In this way, competition between commercial banks for settlement cash would influence interest rates. Inflation management therefore involved indirectly influencing interest rates, and in turn the trade-weighted exchange rate, in order to bring inflation within the desired inflation target range. Svensson (1997) explains that a distinctive feature of inflation-targeting regimes is they involve a forward-looking decision-making process known as ‘inflation-forecast targeting’. This involves using policy instruments to bring the central bank’s inflation forecast in line with its inflation target. The basis for the RBNZ’s policy decisions were inflation forecasts for the subsequent two to three years. However, because of the suite of economic reforms, inflation forecasting also posed new challenges for the Bank during the late 1980s and early 1990s. Therefore, considerable weight was attached to influencing the trade-weighted exchange rate because of its quick influence on consumer prices via changes in the domestic price of traded goods. Although the operating target was settlement cash balances, the exchange rate was viewed as the intermediate target to influence inflation. The Bank did not have independent targets for interest or exchange rates, other than the combination deemed consistent with keeping inflation within the target band. This small open-economy approach involved calibrating the operating target (settlement cash balances) to influence the intermediate target (exchange rate) in order to achieve the ultimate target, a forecast inflation rate. (see Grimes & Wong, 1994).

This system proved to be inadequate for several reasons. One reason was that financial market participants found it difficult to identify a predictable relationship between changes in the stance of monetary policy and changes in short-term market interest rates. A procedure of regular monetary policy announcements commenting on whether market interest rates and the exchange rate were at levels commensurate with achieving price stability was introduced to supplement the liquidity channel. The RBNZ (2000b, paragraph 11) described the situation as follows: “The ability to change the cash target as required gave us all the leverage we needed to influence financial markets. But although we had a powerful lever, and a gradually emerging inflation target, there was no direct or reliable connection between the two, without additional guidance to condition financial market responses. This additional guidance – ‘signalling’ as it came to be known – turned out to be very powerful. Relying on the threat (explicit or implicit) to adjust the cash target if necessary, signalling became the centrepiece of monetary policy implementation for the next 10 years until the introduction of the Official Cash rate in 1999. Largely as a result, the cash target itself was adjusted only rarely – typically only when all else had been tried.”

Guthrie & Wright (2000) tested the effectiveness of the Bank’s signalling strategy, or “open mouth operations” as they called it. They demonstrated that the Bank was indeed

able to influence market interest rates without necessarily any liquidity or open market operations taking place. This was a practice applied by several other countries with apparently similar effects (Borio, 1997). The RBNZ statements could come in one of several forms. It could use the three-monthly MPSs to announce the desired path of inflation and interest rates, conditional on the information available at that time. Subsequently, it could make additional statements if the preferred level of interest rates moved sufficiently far away from the previously announced rate or if new information indicated a different preferred rate. To be effective, these “open mouth operations” relied on the Bank having a credible method to influence interest rates. Guthrie & Wright found that these statements by the Bank caused changes to interest rates across all maturities that could not be explained by open market operations.

Nevertheless, during the early 1990s the Bank was still finding it difficult to establish reliable relationships between interest rates and inflation. It continued to rely on a check-list of indicators to monitor monetary conditions to guide policy. Interest rates and the exchange rate were by the mid-1990s the main indicators in this check-list and were viewed as the main channels by which monetary policy would influence the real economy and inflation. In December 1996, the Bank publicly stated that between projection dates it would be seeking conditions consistent with the interest rates and exchange rates underlying those projections. Eventually this became formalised in a Monetary Conditions Index (MCI) which served as the operating guide for monetary policy. The MCI involved a formal trade-off between the exchange rate and the 90-day interest rates, where the weights attached to these components reflected the Bank’s view of their relative impact on inflation. However, the use of the MCI as a guide to policy and as a signal to financial markets proved to be inappropriate and was used for only eighteen months from June 1997 to March 1999 before it was replaced by the introduction of the Official Cash Rate.¹⁷

¹⁷ The MCI was introduced prior to a major demand shock arising from the Asian Financial Crisis and supply shocks arising from successive severe droughts that impacted pastoral production in New Zealand. The nominal exchange rate fell as would be expected, which increased the value of the MCI. But although a fall in domestic interest rates would be required to help moderate the fall in domestic economic activity, financial markets believed that an increase in interest rates was required to maintain the MCI at its target level. In their evaluation of the impact of inflation targeting on output and inflation volatility, Buckle, *et. al.*, (2003) found that, even when controlling for the impact of these shocks, monetary policy during the MCI period was much less effective in reducing inflation and output volatility than it had been prior to its introduction and after it was abandoned. Engelbrecht & Loomes (2002) found that, contrary to its stated intentions, the MCI regime failed to improve the Bank’s communication of its monetary policy stance to financial markets. The Bank has acknowledged that the way it implemented monetary policy in this period accentuated output and interest rate volatility (RBNZ, 2000b).

Throughout the period of the operation of the SCB system the volatility of short-term interest rates in New Zealand was high by international standards.¹⁸ The high volatility in the exchange rate further complicated the system and the effectiveness of the MCI as a guide for monetary policy. It was abandoned when it was realised it was too difficult to determine appropriate bands for the MCI, and its use was generating increased responsiveness between the exchange rate and interest rates and higher interest rate volatility (RBNZ, 2000a). Furthermore, the functioning of the open market operations system was becoming compromised by a declining volume of outstanding Treasury Debt instruments, which served as collateral in open-market operations and the Bank's increasing reliance on foreign exchange swaps to affect liquidity conditions.

The lesson from the experience with the MCI, and from the earlier period of financial market re-intermediation and the open market operations and the SCB system, is that when designing monetary policy governance arrangements, it is important that policy instruments are not prescribed by legislation. Economic and financial markets evolve and therefore the most appropriate policy instrument can change over time. If an instrument ultimately proves to be unsuitable, the Bank must be able to move quickly to design and introduce a suitable alternative instrument.

In February 1999 the Bank made another change to its choice of policy instruments and adopted the simpler and internationally more conventional Official Cash Rate (OCR) system. Under this system, interest rates on the Bank's standing facilities determine the overnight interest rates over which borrowing and lending rates between the commercial banks will normally range. The OCR enables the Bank to control overnight interest rates and influence interest rates along the yield curve without involving large open market operations. The OCR is the mid-point for the overnight cash rate in the interbank lending market. In this system the Bank offers to lend at a margin above the announced OCR and agrees to accept deposits at a margin below the OCR. These two rates set the limits of the corridor within which the overnight cash rate fluctuates.¹⁹

The OCR is therefore the instrument for operating the Bank's standing facilities system and it acts as a signal for the current stance of monetary policy. It is the benchmark for short-term interest rates in New Zealand. Open market operations have become less important as the Bank endeavours to improve the operational efficiency of the OCR system. The Bank has described the system as one which allows it to achieve what it was trying to do under the previous regime but without the combination of the quantity-based

¹⁸ After a few years SCBs were supplemented by Reserve Bank Bills and the Bank targeted the combined aggregate referred to as "primary liquidity", which was still a quantity based instrument.

¹⁹ An explanation of the OCR system and prevailing overnight cash rates is available from this site: <https://www.rbnz.govt.nz/education/for-teachers-and-students/the-official-cash-rate-in-action>

system and signalling statements, and in a way that is less likely to be misinterpreted (RBNZ, 2000b).

In their evaluation of the impact of the OCR on the behaviour and predictability of New Zealand interest rates, Guender & Wu (2012) concluded that the system has the advantage that it is transparent, efficient and easy to understand; it sends a clear signal to the market about the desired level of interest rates at the short end of the maturity spectrum of the yield curve; and it allows expectations about the future course of monetary policy to affect current interest rates. They show that the introduction of the OCR regime affected the predictability of short-term interest rates and the extent to which these interest rates conformed to the predictions of the expectations hypothesis. The predictive content of the term spread improved markedly following the switch from a quantity-based (SCB) to a price-based (OCR) operating procedure. The OCR system has made it easier for financial market participants to understand the day-to-day conduct of monetary policy and market interest rates have become more predictable. The OCR system combined with the quarterly MPS is the system of monetary policy implementation that has prevailed from 1999 to this day.

Following the outbreak of the GFC several countries found it necessary to reduce their policy interest rates to zero or close to zero. This limited the scope for the use of conventional interest rate policies to provide further stimulus to their economies and prompted the develop of alternative monetary policy instruments. These alternative instruments have included negative policy interest rates, forward guidance, targeted term lending to the banking sector, large-scale asset purchases (or ‘quantitative easing’), purchasing foreign assets, and policy sequencing (Bernanke, 2017, pp. 4-19).

Although estimates of the New Zealand neutral policy interest rate (the rate considered neither expansionary or contractionary) suggest that it has steadily declined since the GFC (Richardson & Williams, 2015), to date the Bank has been able to continue to use the OCR as its primary policy instrument coupled with communication that has included signalling about the future path of the OCR (a form of ‘forward guidance’), and has not resorted to the use of alternative policy instruments.²⁰ The RBNZ Act does not restrict the Bank in its choice of policy instruments. The Bank has therefore undertaken due diligence assessing the feasibility of adopting alternative policy instruments in the event the OCR rate approaches zero and requires supplementing with alternative policy instruments (see Drought, *et. al.*, 2018). Some of these alternative policy options, if adopted, might involve changes in the degree of operational independence for the Bank

²⁰ However new liquidity facilities, such as residential mortgage-backed securities (RMBS), were introduced during the GFC to provide liquidity to commercial banks for financial stability purposes. See: <https://www.rbnz.govt.nz/news/2008/05/reserve-bank-update-on-liquidity-measures>

if they require coordination with fiscal authorities or are constrained by PTAs, such as the conditions relating to interest rates and the exchange rate.

6.2 Prudential policy adaptation

The focus of this paper is on monetary policy and not prudential policy which warrants more space than can be afforded here. Nevertheless, financial stability requirements are an important part of the RBNZ Act and it is therefore appropriate to comment in general on how the Bank's approach to this responsibility has developed. Policy developments in this area can be categorised as either (i) micro-prudential, which are designed to protect the financial stability of individual institutions and tend to give attention to capital requirements; and (ii) macro-prudential, which are designed to protect system-wide financial stability. Developments in this sphere of policy are a further example of the importance of not closely prescribing policy by legislation and enabling the design of prudential policy to evolve as circumstances change and knowledge develops.

The initial approach by the RBNZ to prudential policy during the 1990s was to rely on market discipline and self-disclosure. But as Wheeler (2014, p. 12) points out, many central banks and financial regulatory authorities have turned to macro-prudential policies to reduce risks to financial stability and to complement monetary policy and inflation targeting. This type of development has been evident in New Zealand and in RBNZ policy.²¹ With a change in Governor in 2002, the prudential supervision department was re-established, and an emphasis was placed on ensuring the health of the financial system, clarifying rules of behaviour and monitoring. Local incorporation was part of this process, introduced to prevent surrendering financial system regulation to overseas regulatory authorities, particularly the Australian Prudential Regulation Authority (APRA).²²

This change in prudential policy did not involve a change to the Act, but there was a change in the interpretation of the responsibilities of the Bank. The Bank wanted to ensure that New Zealand took responsibility for the New Zealand financial system. The motivation was to ensure the system was sound and the Bank was able ameliorate risks of contagion or domino effects of individual bank failures. There was also a concern that the New Zealand deposit holders in those banks would not necessarily be treated in the same way as deposit holders resident in the home country of the banks. The role of the Bank was to set the rules for the way financial institutions, including the large Australian-based banks, operated within New Zealand. The way in which the New Zealand financial

²¹ See Grimes (2014c, 2014d) for a discussion of prudential policies and developments in the New Zealand context.

²² APRA is an independent statutory authority that supervises Australian financial institutions, including the Australian-based banks that operate in New Zealand and which hold a large share of the market for banking services in New Zealand.

system managed to negotiate its way through the global financial crises is perhaps testimony to the value of this change in prudential policy. For instance, the RBNZ took a relatively more conservative approach to defining what they accepted as commercial bank capital. The Bank tended to accept equity but was particularly cautious in viewing other financial instruments as forms of capital. The type of financial assets that became toxic overseas were discouraged by the RBNZ, even if not formally banned.

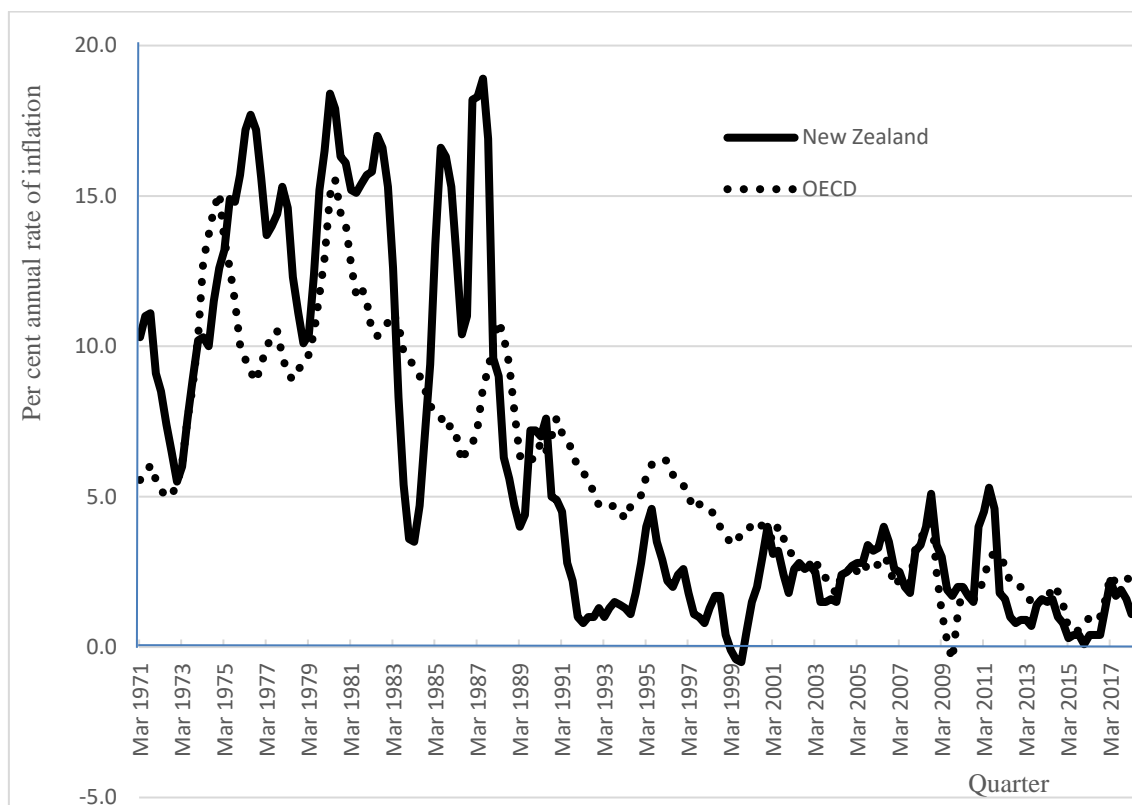
The post-GFC phase involved further adaptation. This included the provision of signals of liquidity distortions and risks and an emphasis on macro-prudential issues. The motivation was again financial system-wide stability. The focus shifted from the structure of the liabilities to the composition of commercial bank assets. The RBNZ had observed that by earlier pinning down the liabilities side of the commercial bank balance sheets, these banks had responded by increasing risk on the assets side of their balance sheets, in order to maintain adequate returns on their assets. As an example of the Bank's response, loan-to-value ratios were applied to bank lending for housing.²³ These loan-to-value ratios were introduced to mitigate the increased risks to the financial system and to society more generally, of the growth of house mortgage lending during the period 2013 to 2016.

7. The impact of central bank operational independence and inflation targeting

Proponents of central bank governance that provides operational independence and mandates inflation targeting as the primary goal of monetary policy consider it to be a strategy that improves macroeconomic outcomes. Eliminating the time-inconsistency problem of monetary policy and improving transparency and accountability is expected to reduce inflation volatility, anchor inflation expectations, and protect the credibility of a central bank in the presence of short-term deviations from the inflation target. It is expected to improve the short-run inflation-output volatility trade-off enabling output to be stabilized with reduced inflation volatility.

New Zealand's inflation rate fell sharply after the implementation of the RBNZ Act 1989 and the adoption of inflation targeting, shown by Figure 4. This was a major turnaround in New Zealand's inflation performance. During the preceding two decades inflation in New Zealand typically exceeded the average inflation rate of other developed countries. When the OECD countries started to successfully reduce inflation after stagflation during the 1970s, New Zealand continued to experience high inflation. This persisted until the early 1990s, except for the temporary effect of a two-year price and wage freeze introduced in 1982. Since 1990 New Zealand has achieved sustained low inflation and moreover, has rarely exceeded the average inflation rate for the OECD.

²³ Armstrong, *et. al.*, (2018) provide a description of the LVR scheme that was applied by the Bank in three stages between 2013 and 2016, and they evaluate the impact on house price inflation in different regions of the country.

Figure 4: New Zealand and OECD inflation: 1971 to 2018

Note: This Figure shows year-on-year annual percentage changes in the Consumers' price indexes (CPI) for New Zealand and the OECD, at quarterly intervals. Data sources: New Zealand CPI data are from the RBNZ. The OECD data are the OECD's weighted average inflation rate for OECD member countries.

An evaluation of the impact of inflation targeting in New Zealand requires comparing actual outcomes with a counterfactual estimate of what would have occurred if inflation targeting had not been adopted. There is no completely satisfactory method for determining this counterfactual. Further complicating any empirical assessment of the impact of inflation targeting is the fact that inflation targeting was widely adopted by developed economies during the "Great Moderation" of the 1990s, a period of low and more stable inflation combined with steady economic growth, and not all countries which experienced this environment adopted inflation targeting. Nevertheless, there are two types of evidence that can help guide judgement of the impact of inflation targeting in New Zealand. These include comparisons between the outcomes of countries with similar characteristics that did and those that did not adopt inflation targeting, and studies of the behaviour of relevant macroeconomic variables in New Zealand since adoption of inflation targeting.

With respect to the international experience, countries that adopted inflation targeting (IT) generally saw their inflation decline (see Walsh, 2009, Table 1, p. 203). However, the international literature has not reached a consensus on whether the outcomes for IT

countries are demonstrably better than those achieved by countries that have different monetary policy regimes. Samarina, *et. al.*, (2014) suggest the reasons for the conflicting results are that studies use different country samples, time periods, inflation targeting adoption dates and research methodologies. After attempting to control for these differences, they conclude that distinguishing countries by economic development is crucial. No significant differential effect for IT adoption is found for advanced economies, whereas for emerging and developing countries their results indicate a significant additional beneficial effect on inflation by countries that adopted IT.²⁴

One important criticism of early studies examining whether inflation targeting in developed countries experienced a larger decrease in inflation than non-IT countries is that they ignored the possibility of an endogeneity bias; that is, countries struggling with high inflation may be more likely to adopt IT (Ball & Sheridan, 2005). Controlling for this regression-to-the-mean effect appears to be significant with some studies finding that the adoption of inflation targeting has a significant but only small effect on subsequent inflation (Ball, 2010) or no significant impact (Mishkin & Schmidt-Hebbel, 2007; Willard, 2012). Studies that compare countries that had similar initial conditions also show varying results with some finding no significant effect in advanced countries (Lin & Ye, 2007; de Mendonca & de Guimarães de Souza, 2012) and others finding an effect using a larger and more diverse sample of countries (Vega & Winkelried, 2005).

The significant influence of initial conditions on the determination of the choice of a monetary policy regime amongst advanced countries (including New Zealand) suggests that those that adopted IT needed a mechanism to bring inflation down. The initial inflation rates can be viewed as a proxy for the prior institutional arrangements. But they may not be adequate to capture the differences in initial institutional arrangements and hence the impact of substituting them for an IT regime. Further, institutional arrangements vary across non-IT countries, some of which have been effective at reducing inflation, such as the Federal Reserve system in the USA. Furthermore, even amongst inflation targeting countries, there can be differences in the characteristics of those regimes, including differences in the number of targets, the monetary policy decision making bodies, and the degree of transparency. That is, the IT regime designed by New Zealand may be one of several alternative regimes that could have delivered lower inflation.

Another probable reason why there is little discernible difference between the inflation outcomes of developed countries that are declared as IT and those not declared as IT is that there may now be little difference between these regimes. One of the weaknesses of the empirical studies comparing the outcomes of IT and non-IT countries is the tendency to assume there is a clear distinction. Walsh (2009, p. 196) has observed that even among

²⁴ See Kuttner (2004) and Battini, *et. al.* (2005) for discussions of the benefits to emerging countries of adopting an inflation targeting monetary policy regime.

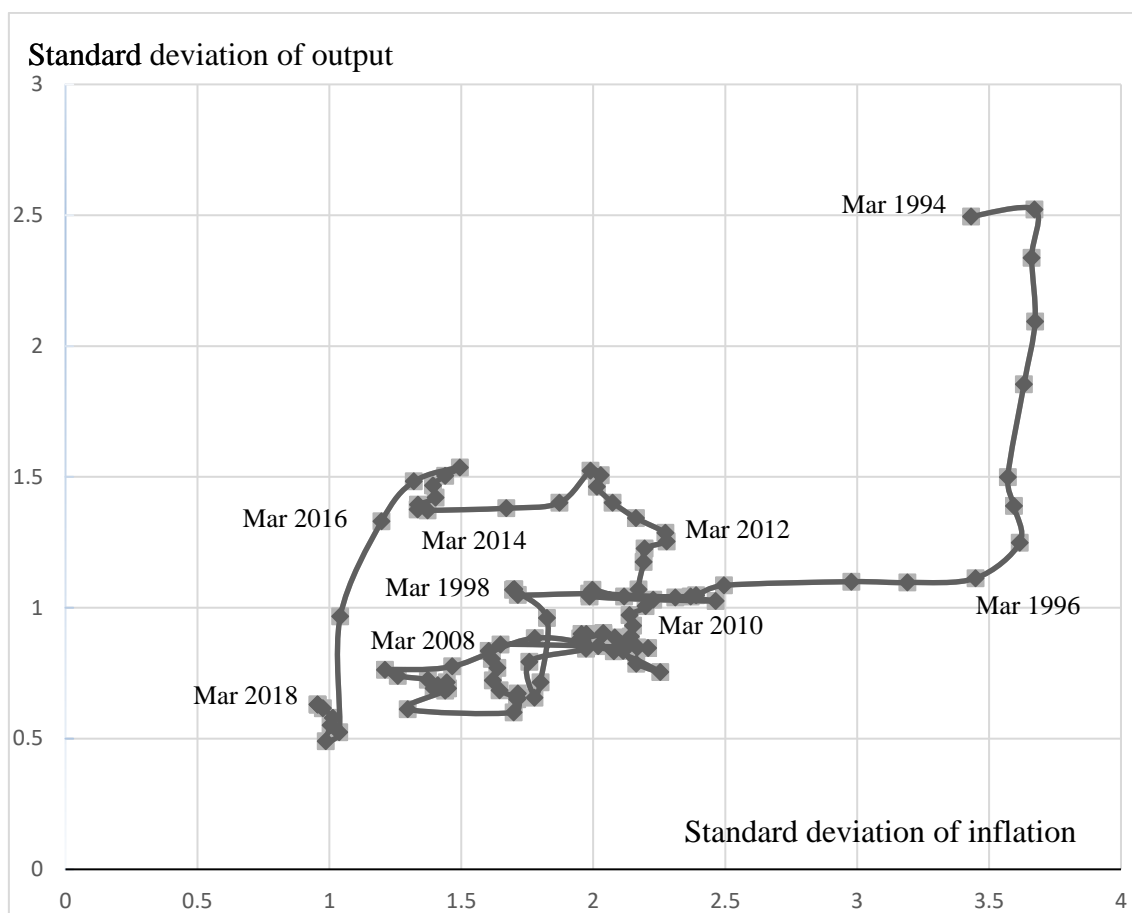
central banks that do not consider themselves to be targeting inflation, many of the policy innovations associated with inflation-targeting are now common and transparency has spread from IT to so-called non-IT central banks. He further comments: “virtually all of them [non-IT central banks] follow policies that could be described as inflation targeting” (p. 219).

While differences in the inflation and output volatility outcomes for IT and non-IT countries are difficult to identify, no country that has adopted an inflation targeting regime has abandoned it, apart from those that subsequently joined the European Union and its monetary system (Finland and Spain in 1999 and Slovakia in 2009). This suggests that governments in these countries consider inflation targeting is feasible and brings benefits. Having invested in the change of institutional arrangements required to establish inflation targeting, governments in these countries appear to have judged that there is little obvious benefit in reverting to a different arrangement. They may also have made the judgement that the durability of a monetary policy regime is important and longer-lived regimes produce better inflation outcomes than young regimes, as suggested by Mihov & Rose (2008).

There is evidence showing that the behaviour of macroeconomic variables in New Zealand since the adoption of IT is consistent with the predictions of the time-inconsistency literature, and like that of other inflation targeting countries. The results summarised here are drawn from research using different methods and different time-spans since the adoption of IT in New Zealand. The results pertain to the New Zealand inflation targeting regime and do not necessarily imply that an alternative regime focussed on building central bank credibility and targeting low inflation would not necessarily deliver similar results.

A comparison by Grimes (2014a) of outcomes for declared and non-declared IT countries in the OECD including New Zealand shows that since adoption of IT, inflation persistence and output persistence in New Zealand have declined implying that inflation and output volatility have declined. He also shows this has been associated with an increase in real GDP growth. Figure 5 shows the standard deviations of New Zealand CPI inflation and real GDP growth since the introduction of the RBNZ Act 1989 and inflation targeting. Each data point represents the combination of 5-year moving averages of inflation and output volatility at quarterly intervals commencing with the 5-years period from June 1989 to March 1994 until the 5-year period ending in March 2018. It therefore represents the equivalent output/inflation volatility space illustrated in Figure 2 but with the actual outcomes for New Zealand during the last twenty-nine years. Except for a few observations that make-up the first three quarterly data points all the observations are drawn from data since the introduction of inflation targeting and the RBNZ Act 1989. Figure 5 reveals a very clear and unambiguous pattern which is a clear long-run decline in the combination of New Zealand’s output and inflation volatility.

Figure 5: New Zealand inflation and output volatility since adoption of inflation targeting.



Note: Figure 5 shows the 5-year moving average of New Zealand's annual CPI inflation and real GDP growth at quarterly intervals. For instance, the point M:1994 is the 5-year moving average for the annual growth from June 1989 to March 1994. Data sources: The CPI data are from the RBNZ and GDP data are from the Federal Reserve Economic Database: <https://fred.stlouisfed.org/series/NAEXKP01NZQ189S#0>.

The results shown in Figure 5 (and those reported from Grimes, 2014a) are consistent with a reduction in the costs to output volatility associated with inflation targeting. However, the results in Figure 5 and those reported by Grimes do not control for other potential influences on inflation and output volatility. But they are consistent with research that has endeavoured to do that. Using a structural vector-autoregressive model developed to identify the impact of a range of influences on New Zealand business cycles and inflation for the period 1983 to 2001, Buckle, *et. al.*, (2003) conclude that since the adoption of IT and the governance arrangements embodied in the RBNZ Act 1989, monetary policy has tended to reduce the volatility of inflation and real GDP. They show that prior to the introduction of the 1989 Act and explicit inflation targeting, monetary policy tended to accentuate inflation and real output volatility, but after its introduction this pattern was reversed. However, there are differences in the performance of monetary policy during the inflation targeting period. From 1990 to 1995, monetary policy

contributed to a fall in inflation and output volatility. But during the late 1990s when the MCI was being applied, monetary policy was less effective at reducing inflation and output volatility for reasons discussed in section 6.1.

The fact the rate of inflation and inflation volatility have declined with a simultaneous decline in output volatility as shown in Figure 5, is consistent with enhanced monetary policy credibility. According to this argument, once lower inflation expectations are achieved, shocks that move inflation away from target can be brought back to target with less cost in terms of output volatility. This outcome is also consistent with the findings of Fischer & Orr (1994) and Hutchison & Walsh (1998) who provide evidence of improved monetary policy credibility during the early years of inflation targeting in New Zealand. These results are consistent with the idea that the efficiency frontier such as $ee(1)$ has shifted to the left in Figure 2 to a lower frontier like $ee(2)$, enabling the Bank to pursue a more flexible approach to inflation targeting as discussed in section 5.

More recent research on the behaviour of New Zealand inflation expectations also suggests improved policy credibility. Fischer & Orr (1999) found that inflation expectations followed the sharp decline in inflation after the adoption of the RBNZ Act 1989. They concluded it was the path of inflation itself that influenced the reduction in inflation expectations rather than the change in institutional arrangements ushered in by the new Act. But subsequent research benefitting from many more years of low inflation and inflation targeting, suggests that expectations are sensitive to changes in monetary policy parameters. Lewis & McDermott (2017) have shown that increases to the inflation target range are promptly reflected in increased inflation expectations (with no significant gain to growth in real economic activity). Further, Karagedikli & McDermott (2017) demonstrate that inflation expectations are critical to the inflation process itself and to maintaining New Zealand's sustained low inflation.

Research on the behaviour of New Zealand interest rates is also illuminating. Berument & Froyen (2015) found that the response of long-term interest rates in New Zealand and Australia to changes in the monetary policy instrument has diminished since the adoption of inflation targeting. Vector autoregressive models of interest rates estimated for both countries reveal significant shifts in their coefficients pre- and post-adoption of inflation targeting. The responses of longer-term interest rates to innovations in the New Zealand and Australian monetary policy interest rates declined following the introduction of inflation targeting, a finding consistent with long-term inflation expectations being more firmly anchored under inflation targeting.

8. Contemporary issues and challenges

The RBNZ Act 1989 ushered in a radical new approach to monetary policy governance emphasising accountability, transparency, operational independence and inflation targeting as the primary goal for monetary policy. Empirical research discussed in section

7 suggests that in general, the expected benefits for policy efficiency, inflation, expectations and policy credibility have been realised and New Zealand has benefitted from simultaneous reductions in inflation and output volatility. The regime appears to have played a significant role in promoting a more stable New Zealand economy, in concert with other economic reforms. A former Chair of the RBNZ Board of Directors concluded “... a key advantageous property of inflation targeting is, in my view, its rejection of a diffused or dual mandate. Any central bank faced with a dual inflation/real sector mandate is unable to commit to achieving price stability. the ability to commit to low inflation leads to better real sector outcomes. This is the key insight of the time inconsistency literature.” (Grimes, 2014a, p. 22).

The New Zealand monetary policy regime has been subjected to several formal enquiries, including by Svensson (2001), and by Parliamentary Select Committee enquiries (see RBNZ, 2007).²⁵ The Bank has benefited from the insights of regular IMF and OECD country reviews and regular visiting international scholars under the Professorial Fellowship in Monetary and Financial Economics (RBNZ, 2018b). Prior to the global financial crisis, the Bank and The Treasury hosted a forum inviting overseas specialists to review the New Zealand monetary and fiscal regimes (Buckle & Drew, 2006). The broad conclusions pertaining to monetary policy were that New Zealand’s framework was sound and among the tasks assigned to monetary policy, inflation targeting should have priority. Cecchetti (2018) concluded in a post-GFC review of the most efficient assignment of monetary, fiscal, and prudential policies, that the pre-crisis consensus largely holds; monetary policy should retain its focus on price stability.

Nevertheless, the New Zealand regime and IT regimes in other countries have provoked a range of opinions. During the height of the global financial crisis a leading international scholar of inflation targeting concluded that “inflation targeting has improved macroeconomic performance among developing economies. Importantly, inflation targeting has not been associated with greater real economic instability among either developed or developing economics.” (Walsh, 2009, p. 195). A contrary view was expressed by Stiglitz (2008) who commented “Today, inflation targeting is being put to the test – and it will almost certainly fail” (cited in Walsh, 2009, p. 196). Frankel (2012) announced, some four years after the outbreak of the GFC, that the international financial crisis was the death of inflation targeting.

Although it appears that no additional countries have adopted formal inflation targeting since the GFC (Jahan, 2017), no country abandoned formal IT and many of the innovations introduced by IT have been adopted by central banks that are not declared as formally targeting inflation. The priorities for monetary policy, the merits of continuing to target low inflation, and the degree of operational independence of central banks are

²⁵ Refer to Grimes (2001) for a summary of the Svensson Review and the initial response by the RBNZ.

nevertheless issues that continue to be questioned in the aftermath of the GFC and the long period of low inflation. Sustained low inflation has also brought political and technical challenges to central bank governance arrangements and inflation targeting regimes (see the discussion in Bernanke, 2017).

These challenges have also been evident in New Zealand. Perhaps the greatest risks are short memories and that too much will be expected of monetary policy. As described in previous sections, the practice of monetary policy and inflation targeting in New Zealand has steadily evolved in response to changing circumstances, improvements in the technology of monetary policy, and changing government expectations and goals. The RBNZ has been criticised frequently for the behaviour of interest rates, exchange rates, asset prices and housing prices. Some of this criticism has influenced the evolution of PTAs. The reactions to exchange rate movements is an example.

The New Zealand exchange rate is particularly sensitive to international commodity prices and international interest rates (Chen & Rogoff, 2003; Munro, 2004; Buckle, *et al.*, 2007), and the differential sectoral effects of short-term variations in the nominal exchange rate have exposed the Bank to criticism and pressure to smooth fluctuations in the nominal exchange rate.²⁶ These and other concerns, and perhaps also the desire for political signalling, have influenced the inclusion of an increasing number of secondary objectives in PTAs (see RBNZ, 2018a). But there are costs associated with adding more objectives, particularly if monetary policy is not the most efficient instrument to assign to those additional objectives or if the Bank does not have adequate additional instruments.

Adaptation of the inflation targeting regime has until 2018 taken place without significant changes to the Act. However, the current Labour-led government announced in November 2017 another review of the RBNZ Act 1989 that is taking place in two phases (Robertson, 2017). The first phase involves adding an employment objective, implementing a formal committee process for monetary policy decisions, and providing more flexibility for government to influence the priorities for monetary policy. The second phase will review the financial policy provisions that provide the legislative basis for prudential regulation and supervision and the broader governance arrangements (The Treasury, 2018a). The issues pertaining to the first phase of the Review were reviewed in a Regulatory Impact Statement prepared by the Treasury (2018b) which is leading the Review process supported by an advisory panel which has also made recommendations (Snively, *et al.*, 2018).

²⁶ Nevertheless, the New Zealand real effective exchange rate does not seem to have been exceptionally volatile in recent decades, and countries with alternative types of exchange rate regimes, such as Hong Kong and Singapore, and other commodity currencies such as Australia and Canada, appear to have experienced higher volatility (see Grimes, 2014b, section 3.5, pp. 45-48).

Proposals pertaining to the first phase of the Review were announced with the introduction of the Reserve Bank of New Zealand (Monetary Policy) Amendment Bill in July 2018. They include modifying the Act to (i) add supporting maximum sustainable employment alongside price stability as an objective of monetary policy; (ii) changing the procedures that enable government to influence monetary policy priorities; and (iii) requiring that monetary policy decisions be made by a Monetary Policy Committee (MPC) that is to include a minority of external members, and a non-voting representative from the Treasury to attend as an observer. It is proposed that members of the MPC will be appointed by the Minister of Finance following a nomination of the Reserve Bank Board, with the Reserve Bank Governor and Deputy Chief Executive being members, by virtue of their positions in the Bank. The Bill emphasised that the Reserve Bank will retain operational independence.

The additional employment goal has already been written into the current PTA signed by Governor Orr in March 2018. It states, “The conduct of monetary policy will maintain a stable general level of prices, and contribute to supporting maximum sustainable employment within the economy.” (RBNZ, 2018a). The significance of this proposal depends on the definition of sustainable employment and how it is interpreted. If it were to be interpreted as requiring the Bank to contribute to maximising sustainable employment growth, it would violate the assignment principle and would be a departure from the conventional approach to monetary policy described by Clarida, *et. al.* Long-run sustainable employment and output are influenced by factors outside the purview of central banks, such as education policy, skills acquisition, the functioning of labour markets, regulations, innovation and productivity. This point is recognised by Snively, *et. al.*, (2018, p. 4) who recommended the emphasis should be on “assisting in stabilising economic activity and employment.” The wording of the Amendment Bill indicates recognition that monetary policy’s comparative advantage is price stability and implies that this proposal is intended to ensure that, in addition to price stability, the Bank should minimise employment volatility rather than try to determine its potential level and trend growth.

One of the reasons given for including this additional goal is that several other central banks include employment stabilisation alongside price stability as the goals of monetary policy (Treasury, 2018b). However, for some countries, such as Australia and the USA, this feature pre-dates modern approaches to monetary theory and policy and the introduction of inflation targeting.²⁷ Treasury acknowledges that the RBNZ’s evolution to a more flexible approach to inflation targeting has been consistent with giving more weight to minimising output and employment volatility. Moreover, as argued in section 5.1, improving policy credibility shifts the monetary policy efficiency toward the origin

²⁷ Appendix 1, pp. 33-39 in Snively, *et.al.* (2018) contains a description of the goals of monetary policy for a selection of developed economies and the dates they were established.

in output and inflation volatility space, and the evidence provided in Figure 5 suggests the trade-offs have been successively reduced over time. If the proposal to include employment stabilisation as an additional goal of monetary policy is intended to formally require the Bank to maintain a “flexible” approach to inflation targeting, McDermott & Williams (2018, pp. 13-14) suggest this legislative variation may not result in a significant change in practice. This is not immediately obvious. In their analysis of the properties of New Zealand business cycles, Hall & McDermott (2016) reveal that standard deviations for employment cycles have been considerably higher than for real GDP. They also reveal that the relationship between output and employment cycles varies, and that peaks in employment cycles have variously led, lagged or been contemporaneous with real GDP peaks.

Regarding the MPC proposal, the Treasury recognised the consultative processes already established by the Reserve Bank (and described in section 3) but argued that formalising a committee decision process would align the RBNZ with several other central banks. Snively, *et. al.*, (2018, p. 5) suggest that “The benefits of committee decision-making arise from ensuring that a diversity of perspectives is included in the decision-making process, and from moderating the influence of extreme views that may be held by individuals.” The Treasury report also argues that independent external members are more likely to feel unconstrained in challenging the views of internal Bank members of the committee and analysis of monetary and economic conditions tabled by Bank staff. Other arguments advanced for legislating an MPC process are that it will ensure that a formal committee process prevails in the future, or at least the decision-making process is one that is determined by elected governments rather than the Governor. A similar point was made by Svensson (2001) in his comments on the merits of a committee-based decision process. Wheeler (2014, p. 10) on the other hand observed that there is no evidence of the performance of the RBNZ, or other central banks where the Governor is formally accountable for policy decisions, being any weaker or more volatile than that of central banks where accountability rests with a committee, and the evidence was presented by Treasury or the advisory panel.

The Amendment Bill proposes that the Governor be the chair of the MPC and that the MPC take decisions by consensus where possible and publish records of meetings that outline differences when they exist and the balance of votes where consensus is not reached. This requirement would appear to enhance transparency. The responsibilities of the MPC on the other hand would appear to imply a significant departure from the contractual arrangement between government and the Governor that has prevailed since 1989 and the role of PTAs because the Governor would not seem to have the same decision. The implications for the contractual relationship between the Governor and government were raised by Reddell (2018) and the RBNZ (2017). Snively, *et. al.* (2018) recognise that this change will disrupt the principal-agent relationship that has previously existed and recommend the governance structure and the responsibilities of the Reserve

Bank Board should be reviewed accordingly. Amongst the recommendations are that the Board continue to act as a monitoring agent, but that its role be modified to include monitoring of the performance of the MPC and its members, including monitoring the performance of the Governor whose responsibilities will have changed.

Clause 8 of the Amendment Bill proposes to eliminate policy targets fixed by agreement between the Minister and the Governor. The explanatory note states that “Instead, the Minister must, after having regard to remit advice given by the Bank, issue a remit for the MPC. Rather than setting policy targets, this remit will set out operational objectives for carrying out the function of formulating monetary policy. For example, it may set targets: provide a framework for weighting the economic objectives:....”. This proposal is foreshadowed in Snively, *et. al.*, (2018, p. 8) in their discussion of proposed changes to the setting of operational objectives for monetary policy and seems to imply an enhancement of the discretionary power of the Minister of Finance.

It remains to be seen whether Parliament will adopt the potentially significant changes to monetary policy governance proposed in the Amendment Bill, and the implications they would have for monetary policy practice and inflation targeting in New Zealand. There seem to be several possible scenarios. The addition of an employment objective might be viewed as simply formalising current monetary policy practice and may not represent a change in government preferences over inflation and employment volatility. The changes may be more signalling than an intention to change practice and outcomes.

Alternatively, the proposal may represent a significant change in government preferences for lower employment volatility compared to inflation volatility and an intention to enable the government to have greater monetary policy discretion. In the context of Figure 2, this type of change in government preferences can be depicted by an indifference curve that is flatter than $oii(2)$ and is tangential to the efficiency frontier $ee(2)$ further to the right of $IT(F2)$. That is, an indifference curve that attaches a higher priority to minimising output (or employment) volatility compared to the other indifference curves shown in Figure 2. Under this scenario, inflation volatility would be likely to increase for given shocks, which may have implications for inflation expectations, trend inflation, and the ability of the Bank to maintain inflation within the current target band. If this was the outcome, could it lead to pressure in the future to renegotiate an increase to the upper bound of the inflation target range? Could it result in diminished credibility of New Zealand’s inflation targeting regime and in turn, a shift in the efficiency frontier back toward $ee(1)$ and an inferior inflation and output (or employment) volatility trade-off? Could this dynamic reverse the virtuous cycle of reduced inflation, improved monetary policy credibility, and reduced inflation and output volatility that has characterised the last thirty years? Or has policy credibility and inflation expectations become sufficiently entrenched to enable even greater flexibility to inflation targeting? These should be some of the questions the legislators consider as they debate the merits of the Amendment Bill.

9. Conclusion

Nearly thirty years have passed since the RBNZ Act 1989 ushered in a revolutionary new approach to monetary policy. This new approach succeeded where previous methods used to try to reduce and control inflation had failed. This radical new approach has delivered sustained low inflation and fostered a more stable macroeconomy for New Zealand. The success of this experiment in New Zealand motivated changes in central banking practice globally and a new generation has grown up with sustained low inflation and with many central banks around the world specifying low inflation as the main goal of monetary policy.

The identification and implementation of this institutional solution is a triumph for economic research and for policy-makers who were prepared to invest in building knowledge of the insights from relevant research and understanding the experiences of other countries grappling with high inflation during the 1970s and 1960s and the heavy social costs it rendered. It is a solution that has been highly effective and influential. But at the same time, those involved with stewardship of the application of this innovation have adapted the practice of monetary policy as circumstances have changed.

This adaptation has involved improvements to the design of monetary policy instruments. The Bank has moved from an emphasis on quantity-based instruments to the current price-based Official Cash Rate instrument supported by policy statements. There has also been a movement toward a more flexible approach to inflation targeting. The early period was characterised by a strong focus on reducing inflation. As policy credibility improved and inflation and inflation expectations declined, the Bank had scope to apply a more flexible approach that enabled more emphasis on reducing output volatility without sacrificing the long-term inflation goal. This shift to greater flexibility has also been the result of changing government priorities and changes in the expectations of monetary policy as reflected in the content of Policy Targets Agreements that successively added more secondary objectives including avoiding “unnecessary” volatility in output, employment, interest rates and the exchange rate. The addition of secondary objectives brings risks to policy effectiveness and credibility. As this paper has argued, enhanced monetary policy credibility (which the evidence suggests has accompanied inflation targeting) will enable a central bank to adopt a more flexible approach to inflation targeting.

New Zealand is going through another phase of reviewing its monetary policy framework. The suite of proposed amendments to the RBNZ Act include adding employment as an additional policy priority along-side price stability, changing the decision-making process, and creating a process that could enable government to have more discretion over monetary policy decisions. The precise nature of the changes to New Zealand’s monetary policy framework will remain uncertain until the actual changes to the Act are

determined by Parliament. If passed into law, these proposals would be the first significant changes to the RBNZ Act since it was introduced in 1989.

How the suite of proposed legislative changes, if passed into law, will impact on monetary policy practice and inflation targeting in New Zealand is uncertain. It could be interpreted as simply formalising the more flexible approach to inflation targeting that has emerged during the last thirty years and which has been made feasible in part by the reduction in inflation and inflation expectations and enhanced monetary policy credibility. Or should the proposals be interpreted as a move back toward the monetary policy framework that prevailed before 1989 with multiple targets and more discretionary policy? Will these proposals enhance the scope for opportunism and time-inconsistent monetary policy that characterised monetary policy prior to the 1990s, and undermine policy credibility and the significant gains achieved since 1989? Or can New Zealand take comfort in the practices and experiences of other countries that embrace inflation targeting but have dual objectives for monetary policy? Only the future will provide the answers, and they will likely come when the country faces significant supply-side or demand-side pressures that have been a feature of New Zealand's past.

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