RESERVE
BANK
OF NEW ZEALAND
TE PŪTEA MATUA

DP2015/04

Applying an Inflation Targeting Lens to Macroprudential Policy 'Institutions'

Güneş Kamber, Özer Karagedikli and
Christie Smith

June 2015

www.rbnz.govt.nz/research/discusspapers/

Discussion Paper Series

DP2015/04

Applying an Inflation Targeting Lens to Macroprudential Policy 'Institutions'[*]

Güneş Kamber, Özer Karagedikli and Christie Smith[†]

Abstract

We describe the origins of inflation targeting in New Zealand, and then use the four key attributes of inflation targeting – independence, the inflation target, transparency, and accountability – as an organizing device to analyze macroprudential policy 'institutions' – the rules, regulations and governance frameworks that implement macroprudential policies.

"Economic policy, like any real activity, has to reckon with many aspects originating from very different realms of life, and hence certainly not only economic view-points: institutional, juridical, technical in the widest sense of the word, and psychological. . . " Tinbergen (1952, p. 74)

1   Introduction

Inflation targeting has been an influential and durable monetary policy framework. It has been widely adopted, and the attributes of inflation targeting have been widely lauded for their contribution to price stability. Yet in recent years the global financial crisis and the sovereign debt crisis have challenged macroeconomic frameworks, providing substantial impetus to concerns about financial stability. In this paper we examine macroprudential policy frameworks through an inflation targeting lens, to understand whether the positive attributes of inflation targeting can and should inform macroprudential frameworks.

Despite an explosion of academic and policy research, macroprudential policies and the frameworks that govern their use are still in their infancy. In many respects, the current state of the art for macroprudential policy is similar to that which prevailed for monetary policy frameworks in the 1970s and early 1980s. There is considerable uncertainty about the objectives that should be pursued, about the intermediate targets that should guide policy, and the instruments that should be used to realize those objectives.

This paper has been prepared for the 25th anniversary of the Reserve Bank of New Zealand Act 1989. This act was a seminal milestone for inflation targeting as a monetary policy regime. We sketch the origins of inflation targeting in New Zealand and its four attributes: the explicit inflation objective; the independence of the monetary authority; the role of transparency to shape expectations; and the role of communication to ensure accountability.[1] These four attributes are important building blocks for monetary policy governance.

We then use these attributes as a device for thinking about the institutions that govern macroprudential policies. We do not explicitly focus on the development of macroprudential policies in New Zealand (details of which can be found in Rogers 2013 and Dunstan 2014). However, we do use elements of the institutional framework in New Zealand to motivate our

---

[1] See Bernanke and Mishkin (1997) and Bernanke et al (1999) for a general overview of inflation targeting.

more general observations about monetary and macroprudential frameworks. Our observations are inevitably influenced by the policy framework in New Zealand, but we expect that they will be more broadly applicable.

2 The historical backdrop

2.1 Origins of inflation targeting

The Reserve Bank of New Zealand implemented a fixed exchange rate system for around four decades from its inception in 1934. This regime began to break down in the 1970s in light of four developments: the collapse of the Bretton Woods system; the United Kingdom's entry into the European Economic Community (EEC);[2] large terms of trade movements;[3] and high domestic inflation, which eroded export competitiveness. The New Zealand dollar was revalued several times in the 1970s, fixed against the US dollar and then against a basket of currencies, and then a crawling peg exchange rate regime was adopted to offset inflation differentials between New Zealand and foreign countries. Finally, the exchange rate was floated in 1985.

During this period monetary policy supported wider government objectives. Section 8(2) of the 1973 Amendment to the Reserve Bank of New Zealand Act stated the following: "the monetary policy of the Government ... shall be directed to the maintenance and promotion of economic and social welfare in New Zealand, having regard to the desirability of promoting the highest level of production and trade and full employment, and of maintaining a stable internal price level." Inflation's low priority in this Act contrasts with an earlier statement made by Governor Low (1968) that "... there must be one over-riding consideration, namely keeping monetary policy still effective and avoiding any resurgence of inflation".[4]

Reserve Bank independence was non-existent. The Bank was "[w]ithin the limits of its powers, to give effect to the monetary policy of the Government as communicated in writing to the Bank". Section 5 of the RBNZ Amendment Act 1973 required the Reserve Bank to "ensure that the availability and

---

[2] The United Kingdom became subject to the EEC's Common Agricultural Policy, which constrained New Zealand's export access.

[3] Increases in New Zealand's commodity prices were subsequently followed by the OPEC oil price shocks.

[4] Inflation in 1967, just prior to Low's article, had peaked at just under 7 percent, increasing from around $\frac{1}{4}$ percent at the beginning of the 1960s.

conditions of credit provided by financial institutions are not inconsistent with the sovereign right of the Crown to control money and credit in the public interest" and to "advise the government on monetary policy, banking, credit and overseas exchange".

Post-war monetary policy in New Zealand cycled through sectoral constraints on credit allocation, constraints on credit growth, and various controls on interest rates (Quigley, 1992). Little use was made of interest rates to allocate resources (Low, 1968). Indeed, low interest rates were seen as beneficial for government borrowing and hence fiscal policy. Controls on trading banks led to disintermediation in favour of less regulated financial markets and intermediaries (Bayliss, 1968). Private and trustee savings banks and finance companies began to erode the importance of the trading banks, and even lawyers began to intermediate housing finance.[5]

The macroeconomic policies deployed by New Zealand during the 1970s – including exchange rate adjustments, capital controls, and incomes policies – failed to ensure domestic price stability.[6] Administrative control of wages were in place for nearly nine years between 1971 and 1984 (Boston, 1984, p. 8), and controls on prices were also deployed on various occasions. Despite these controls, headline inflation peaked in 1976, and again in 1980, at around 18 percent (see figure 1). Unemployment remained low, at less than 2 percent up until 1980,[7] but inflation and slow income growth remained major public issues.

Political discontent grew. In 1984 the ruling National Government called a snap election several months early, which they subsequently lost to the opposition Labour party. During the election there was considerable media speculation that an incoming Labour government would devalue the New Zealand dollar. Despite capital controls, the inflow of currency into foreign reserves dwindled as importers advanced foreign currency purchases and as exporters delayed the repatriation of foreign currency. In a messy transition from one government to the next the Reserve Bank had to close the foreign

---

[5] Solicitors' trust loans peaked at 18 percent of total household liabilities; see table C18 http://www.rbnz.govt.nz/statistics/discontinued/c18discontinued.xls.

[6] A 1974 Article XIV consultation by the International Monetary Fund noted that "incomes policy remains the main instrument for dealing with inflation." Nelson (2005) argues that Canada, Australia, and New Zealand continued to suffer high inflation into the 1980s because of non-monetary views of inflation.

[7] New Zealand unemployment in the 1970s was low by modern standards, but it was high relative to the average rate of 0.64 percent that prevailed in the 1960s. Contemporary estimates suggested that the unemployment rate in 1979 and 1980 was 3.9-4.1 percent (Deane, 1981).

exchange market as it effectively exhausted its stock of foreign reserves. The market closure was announced on Sunday 15 July 1984, a 20 percent devaluation was announced on 18 July, and the market reopened 19 July (RBNZ, 1986, pp. 199-200).

The election and subsequent foreign exchange crisis were a watershed event for monetary policy in New Zealand. The exchange rate crisis illustrated the operational vulnerability of a fixed exchange rate regime when a government or central bank has limited foreign reserves, even in the presence of capital controls. The variations in foreign exchange rate parities, swings in the terms of trade, and increasingly diverse trade relationships in the 1970s and 1980s also illustrated how difficult it could be to implement a 'fixed' exchange rate. Conversely, overseas experience suggested that price stability could be sustained by using monetary policy tools. The inflation outcomes in Germany and Switzerland showed that it was possible to maintain inflation at relatively low levels, while the Volcker disinflation in the United States and the Japanese disinflation of the 1970s also demonstrated that price stability could be restored by the use of conventional monetary policy instruments. (See Nelson 2007 for a discussion of disinflation in Japan.) Furthermore, Australia floated its dollar in December 1983, demonstrating that a small open economy could successfully implement a floating exchange rate regime.

After the July 1984 election the Labour Government committed to fund the fiscal deficit by issuing public debt to the private sector (Deane, 1986). Once the NZ dollar was floated in March 1985, the Reserve Bank finally gained control over its liabilities, enabling it to pursue domestic monetary policy objectives. Financial markets were substantially deregulated in 1984, with controls on interests rates and capital flows being removed (Evans et al, 1996). In the wake of the devaluation of the New Zealand dollar and the removal of a wage and price freeze, inflation jumped up once again, reaching 15 percent in 1985.[8] Restoring price stability became the pre-eminent policy objective assigned to monetary policy.[9]

---

[8] A 10 percent value added tax (GST) was introduced in 1986, further worsening the measured level of inflation.

[9] New Zealand's reform period is described in some detail by Evans et al (1996) and Silverstone et al (1996). Singleton et al (2006) provide a history of the Reserve Bank of New Zealand from 1973 onwards.

2.2 Inflation targeting

In 1989 the Reserve Bank of New Zealand Act was passed by parliament, coming into force on 1 February 1990.[10] Sections 8, 9, 13, and 15 of the Act provide the four key inflation-targeting properties that have come to be synonymous with an inflation targeting regime – the explicit price stability objective, independence, transparency, and accountability.

Section 8 of the Act states that 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." Section 9 provides for policy targets agreements (PTAs), which have been used to articulate explicit inflation targets. Section 13 provides for the Bank's independence in meeting these objectives, except as otherwise provided for in the Act.

The announced objective was intended to influence private sector expectations. As Buiter and Miller (1983) discuss, monetarists in the 1980s suggested that the real consequences of disinflation could be modest if the disinflation was well understood and incorporated into expectations. In practice, disinflations in the United States and United Kingdom in the early 1980s were accompanied by large recessions. New Zealand surveys of business inflation expectations in March 1987 and 1988 were in double digits whilst inflation outcomes were 7.4 and 4.1 percent respectively (Evans et al, 1996, p. 1864). With this backdrop it became obvious to New Zealand policymakers that it was important to correct the disconnect between expected and actual inflation. In the late 1980s the Bank published a series of indicative inflation ranges to facilitate the transition towards the 0-2 percent range that had been announced in the first PTA.[11]

Section 15 of the 1989 Act ensures transparency by requiring the Bank to provide policy statements that specify the policies that are being implemented, outline how policies might be formulated and implemented over the next 5 years, and review policies implemented in previous periods. These monetary policy statements need to be tabled at the next Reserve Bank Board meeting, published in the Gazette, and laid before the House of Representatives, providing a key accountability mechanism for the Reserve Bank.

The transparency embedded in the Reserve Bank Act was intended to 'future-

---

[10] The material in this section is based on the Act as originally passed into law.

[11] http://www.rbnz.govt.nz/monetary_policy/about_monetary_policy/0096846.html.

proof' the monetary policy framework against misuse by political representatives (Singleton et al, 2006). In the 1970s and early 1980s Reserve Bank Governors and Treasury officials provided advice to Minister of Finance Muldoon that was often ignored, yet the advice (and its rejection) did not necessarily enter the public domain. Under the Official Secrets Act 1951, which prevailed through until 1982, releasing official information without authorization was a criminal offence.

The transparency of the Reserve Bank Act was part of a broad change in the philosophy pertaining to public information. The Official Information Act 1982, enshrined in law "the principle that [official] information shall be made available unless there is good reason for withholding it."[12] In part, the Official Information Act was intended to promote the accountability of ministers and public officials. This attitudinal shift with respect to official information was also mirrored in other pieces of legislation, such as the Public Finance Act 1989, which provides parliamentary scrutiny of government expenditure and the management of public assets and liabilities.

2.3   Observations

As we conclude this brief description of inflation targeting in New Zealand, we highlight some key points from this historical experience. First, the Reserve Bank of New Zealand was made independent because there was genuine concern that monetary policy implemented by self-interested politicians would lead to poor macroeconomic outcomes. Second, the focus on inflation in New Zealand reflected theoretical developments, foreign monetary policy experience, and the elevated levels of inflation that occurred in New Zealand in the 1970s and 1980s. Double digit levels of inflation were not conducive to the efficient functioning of markets and they had distributional consequences that were politically unpopular. It was also hoped that a specific target would directly influence inflation expectations and price setting behaviour.

Third, much greater transparency was required of the Bank in accordance with the philosophy underlying the Official Information Act. Accountability was not simply to be addressed with respect to the Board of the Reserve Bank or the Minister of Finance, but with financial market participants, academics, the media, and the general public.

---

[12] In the United States the Freedom of Information Act was signed into law in 1966. Australia introduced a Freedom of Information Act in 1982 applying to institutions at the Federal level. The United Kingdom introduced a Freedom of Information Act in 2000.

Fourth, as the single decision-maker the governor had, and continues to have, considerable latitude to use policies to achieve the objectives set down in the Act and in the Policy Targets Agreement. In the 1970s and 1980s, there was considerable *uncertainty* as to what those objectives should be and as to what instruments should be used to pursue objectives. A policy rule was not delegated to the governor or Reserve Bank because it was not known what rule should best be applied.

We now turn to macroprudential policy, discussing in turn independence, objectives, transparency and accountability.

3   Macroprudential policies

In the wake of the great recession and the global financial crisis, central bankers have become less complacent about the resilience of their financial systems. As a result, new institutions and policies have been developed in an effort to reduce the frequency and severity of financial crises. Renewed concerns for financial stability have prompted a number of countries to deploy 'macroprudential' policies to foster macroeconomic and financial stability.

In New Zealand's case, the legislation underpinning recent macroprudential policies has the same pedigree as inflation targeting. Section 10 of the Reserve Bank Act 1989 requires the Bank to "have regard to the soundness and efficiency of the financial system" in formulating monetary policy.[13] Section 68 of the Act provides the same soundness and efficiency motivation for the deployment of prudential policies.[14] This soundness and efficiency mandate has always been interpreted in a macroprudential vein given its 'systemic' focus.[15]

In the remainder of this article we examine the institutional arrangements that govern macroprudential policies in light of the four inflation targeting attributes identified earlier. Our discussion focuses on 'macroprudential'

---

[13] The style of the Reserve Bank of New Zealand Act 1964, which underpinned the 1973 Amendment, was rather different. Section 34 of the 1964 Act gave the Reserve Bank a wide degree of latitude to direct trading banks in relation to advances, discounts, investments, and interest rates. The Reserve Bank could also inspect the books and accounts of the trading banks if, among other reasons, it was "desirable in the public interest that an inspection be made".

[14] The 1989 version of the Act oriented New Zealand's prudential supervision towards registered banks.

[15] The Act simultaneously introduced 'statutory management', providing the Bank with substantial powers to resolve bank failures.

policies, but our remarks could equally be applied to prudential policies. As noted in the introduction, the focus is not on the specifics of particular instruments or policies, rather the aim is to provide a fairly high level perspective relating macroprudential policy frameworks to the four inflation targeting attributes. We begin by discussion independence.

3.1   Macroprudential independence

A large number of studies have examined the effect of central bank independence, resulting in a fairly positive consensus. Most studies find that central bank independence is unrelated to output or employment volatility, but that it is negatively correlated with average levels of inflation.[16]

Given that independence is favourably regarded for monetary policy, it is natural to consider whether 'independence' would also be desirable for macroprudential policy. One of the foremost questions is whether a single authority should govern both macroprudential and monetary policies, or whether two separate organizations should be tasked with the two branches of policy. In principle, macroprudential policy decisions could be determined by the central bank, by some other independent authority, or by political authorities. Here we focus on the 'institutional location' of macroprudential decision-making and the independence of the decision-maker. We take for granted that political authorities will determine the objectives assigned to macroprudential policymakers. As Reis (2013) notes for central banks, "basic democratic principles suggest that society should give it a clear set of goals."

A number of authors have suggested that macroprudential policymaking should reside in central banks. For example, Nier et al (2011b) argue that it is beneficial to take advantage of the expertise of the central bank, and Lim et al (2013) suggest that central bank involvement improves the timeliness of macroprudential policy responses. Blinder (2010) and Duff (2014) note that financial stability and price stability objectives are closely interlinked, and therefore that the central bank will be highly motivated to ensure financial stability. Conversely, Willem Buiter notes that monetary and macroprudential objectives may diverge and that concerns about price stability may

---

[16] See Bade and Parkin (1988), Cukierman (1992), Cukierman et al (1992), Alesina and Summers (1993), Eijffinger and de Haan (1996), Berger et al (2000), Crowe and Meade (2008), Klomp and de Haan (2010), Arnone and Romelli (2013), and Parkin (2013), among others.

contaminate macroprudential policy, and vice-versa.[17] Svensson (this volume) provides an example of this problem, arguing that macroprudential concerns adversely affected monetary policy decision-making in Sweden. Relatedly, there are concerns that poor macroprudential policy performance might damage a central bank's reputation, tainting its monetary policy independence (Čihák, 2010; Smets, 2014). Blinder (2010), on the other hand, advances the contra possibility that handling a financial crisis effectively may enhance a central bank's reputation.

Berger and Kißmer (2013) argue that an independent central bank tasked with an inflation objective may pay too little attention to financial stability concerns. Another problem with embedding macroprudential policies in central banks is that it increase the influence and power of central bank officials in determining macroeconomic outcomes; we discuss this further in section 3.4. A further tension associated with the consolidation of power in a single institution is that it increases the possibility of groupthink. Spreading policymaking power across institutions may complicate coordination and communication, but it may also foster greater diversity in views, providing healthy checks and balances on the implementation of policy.

Naturally, agency relationships with an independent policymaker also have potential costs. If it is difficult to distinguish experts, one may inadvertently get stuck with an in-expert decision-maker, resulting in poor outcomes for a period of time. On the negative side, appointing an independent agent also exposes one to the possibility of moral hazard. The agent may pursue policies that advance their own conception of welfare, which may differ from that of the general public or the appointment board.

Since macroprudential policies are designed to reduce the frequency of crises or their negative consequences, such policies may also have implications for the fiscal costs of resolving such crises. Consequently, treasuries and finance ministries have a legitimate interest in the deployment of these policies. Of course, assigning responsibility for macroprudential policies to political authorities may induce 'political business cycles'. Furthermore, like monetary policy, it is possible for macroprudential policies (such as liquidity requirements) to be misused by political authorities to solve traditional financing problems.

In principle, a Minister of Finance could use monetary or macroprudential authorities as expert advisers, whilst retaining decision-making powers, as

---

[17] See   http://blogs.ft.com/maverecon/2009/10/the-proposed-european-systemic-risk-board-is-overweight-central-bankers/.

per fiscal policy. Such a framework deals with the expertness advantage of agency noted above, with macro-policy coordination issues, and provides a decision-maker with a clear mandate to resolve unforeseen contingencies. Yet having one agent (the policymaker) advise another agent (the minister) may still be problematic for the ultimate principal (the general public). As noted in section 2.1, an 'expert-advises' framework prevailed under the Reserve Bank of New Zealand Amendment Act 1973. That experience illustrates that an expert-adviser framework can still result in poor decisions.

As the discussion above makes clear, monetary policy, macroprudential policies, and fiscal policies form an interlocking whole, and given the interdependence of these policies some degree of coordination is required. Tinbergen (1952) is often invoked to suggest that we need as many 'instruments' as we have 'target variables', and there is often a presumption that individual instruments can be assigned to specific objectives (see for example Smets 2014). Yet Tinbergen (p. 29) actually argues that one can only assign a single specific instrument to a single specific target in special circumstances, "...the values of the instrument variables are dependent, generally speaking, on all the targets set and cannot be considered in isolation". Tinbergen (p. 29) goes on to describe a situation where the structure of the economy is 'consecutive', which we might now term recursive. Then, a single instrument may be directed to a single target, taking into account other instruments that are higher up the recursive ordering. In general, however, the structure of the economy need not necessarily support such an ordering. These interdependency issues relate to non-separabilities in the objective, which arise in many economic contexts.[18]

Meade (1984) makes the point that fiscal and monetary policies should be coordinated, and Smets (2014, pp. 265-6) notes that macroprudential and monetary policies should be coordinated because of their interdependencies. From a game theoretic perspective, policies could be decentralized, but a no-cooperative solution will generally be inferior to one that involves cooperation, since a cooperative solution could always choose the same mix of strategies as a non-cooperative equilibrium.

The extent to which coordination is important depends on the magnitude of the externality effects that one branch of policy has on the other. At the moment, the materiality of these effects is not well understood. There is, however, some indication that they may be substantial. For example, there

---

[18] In the control literature on multiple-input-multiple-output systems an analogous distinction is made between 'decoupled or noninteracting' systems, where a single control affects a single output, and coupled systems where all controls affect all outputs.

is an ongoing debate about the risk-taking channel of monetary policy and the impact that stimulatory monetary policy has had on the riskiness of private portfolios. Housing prices, construction activity and consumption positively co-vary, and macroeconomic activity and inflationary pressures may be materially affected by macroprudential policies if such policies can indeed affect asset prices and credit growth.

Although policies may be interdependent, the institutions that govern them may still have a semblance of independence. For example, fiscal and monetary authorities in inflation targeting countries generally have independent lines of accountability and ostensibly separate objectives. Yet in practice monetary authorities take into account fiscal plans, and fiscal authorities understand and internalize the interest rate consequences of fiscal plans, sometimes asking monetary authorities for explicit information about those consequences. Likewise, macroprudential plans have implications for business cycles and hence monetary policy and these consequences should be internalized in setting policy.

While it is clear from an abstract perspective that coordination between different policy branches is generally required, other considerations may also be important. Currie and Levine (1985, ch.6) discuss a situation in which simple policy rules assigned to specific targets may be beneficial if private individuals need to infer public policies using least squares learning. The complexity of policy rules, and their susceptibility to model mis-specification, may thus provide sufficient grounds for considering simple, assigned rules. Nevertheless, it is not obvious why an information asymmetry would persist with respect to the policy rule, and why the asymmetry could not be resolved through central bank communication. One possibility is that there is some essential uncertainty about the rule that should be followed – uncertainty shared by everyone – rather than an information asymmetry about the rule.

Kydland and Prescott (1977) famously explore what happens when policy-maker incentives are not aligned with private individuals' incentives. The root of the problem in Kydland and Prescott's paper is an imperfection that causes the socially optimal outcome to diverge from the 'natural' outcome that is arrived at under flexible prices. Because policymaker and private incentives diverge, they face inherent incentives to behave non-cooperatively. Assigning policy to an independent policymaker – choosing a conservative agent or assigning a different objective to the policymaking agent – is one way of offsetting the market imperfection.

Macroprudential policies may suffer from the same misalignment of poli-cymaker and private agent incentives. Definitions of financial instability

routinely reference situations where market failures or externalities distort financial intermediation (see for example Ferguson 2003), implying the same discord between altruistic policymaker and private sector objectives, which may prove problematic if policymakers cannot pre-commit to a given policy.

If one is concerned about the ill effects of discretionary policy – i.e. the incentive to surprise private sector agents, taking advantage of predetermined expectations – it is natural to want to specify a policy rule. In the absence of bounded rationality contracting parties can establish rules or contracts that deal with every feasible contingency. In practice it may be extremely difficult to identify reasonable state-contingent policies. Specifying state-contingent rules or contracts for macroprudential policy appears to be especially problematic. For example, Taylor (2013) suggests that temporary counter-cyclical capital buffers should be set aside in favour of "permanent and appropriate capital and subordinated debt ratios". Likewise, Stefan Gerlach, Deputy Governor of the Central Bank of Ireland, questions the feasibility of employing macroprudential instruments in a time-varying manner.[19]

Before we conclude this independence section, we briefly describe the New Zealand situation with respect to macroprudential independence. On 13 May 2013 the Minister of Finance and the Governor of the Reserve Bank of New Zealand signed a Memorandum of Understanding (MoU) outlining macroprudential policy and operating guidelines.[20] The MoU specifies the objectives, the instruments, and certain consultation expectations between the Bank and the Minister of Finance. The inclusion of the latter two elements differentiates it from the policy targets agreement for monetary policy, since the PTA only specifies the targets or objectives of policy, not the instruments.

The objective outlined in the MoU for macro-prudential policy, is motivated by the soundness objective in the Reserve Bank Act, described above in section 2.2. This objective is finessed to say that the aim of the policy "is to increase resilience of the domestic financial system and counter instability in the domestic financial system arising from credit, asset price or liquidity shocks."

The MoU lists four instruments that the Reserve Bank has access to, and notes that development of additional macro-prudential instruments is to be undertaken in consultation with the New Zealand Treasury, reflecting the Treasury's role in advising the Government on risks to the Crown's balance

---

[19] http://www.bis.org/review/r130920d.pdf.

[20] MoUs are relationship documents that typically fall short of having the legal status of binding contracts.

sheet. The instruments are intended to apply to registered banks, and the Bank is to advise the Minister of any expansion of these powers to non-banks (eg to non-bank deposit takers, which are now also regulated by the Reserve Bank). The Memorandum does not prescribe how macroprudential policy instruments may be used.

In statute the Reserve Bank retains instrument independence with respect to macroprudential policies, and the Memorandum also clearly states that decisions on macro-prudential interventions will be taken by the Governor. However, as stated in the memorandum, the Governor has agreed to consult with the Minister of Finance and the Treasury when a macro-prudential intervention is under consideration, and must inform these two parties prior to making a decision or deploying a macro-prudential instrument. The 'independence' of macroprudential decision-making in New Zealand is thus different to that of monetary policy, given that prior consultation could modify or influence decisions.

Ultimately, the New Zealand Minister of Finance has access to provisions within the Reserve Bank Act that enable him or her to direct the Bank. Section 68B of the current version of the Act requires the Bank to 'have regard' to directions about government policy in relation to the Bank's prudential powers.[21] The New Zealand Minister of Finance's ability to direct the Reserve Bank contrasts with the situation in Sweden, where no public authority may determine how the Riksbank shall decide matters of monetary policy.[22]

We believe that many institutional arrangements can be devised to successfully deploy macroprudential policies. For small countries like New Zealand, incorporating macroprudential policy decision-making within the central bank seems a reasonable approach, given pre-existing expertise and the overlap in responsibilities. Here we have also highlighted that macroprudential policy has spillovers for both monetary and fiscal policy, and it therefore makes sense to coordinate macroprudential policies with monetary and fiscal policies.

---

[21] Section 12 of the Reserve Bank Act provides the Governor General with wide powers to direct the Reserve Bank to formulate *monetary policy* for different economic objectives. Such directions must be made on the advice of the Minister of Finance.(As the Queen's representative, the Governor-General has largely a ceremonial role, and is expected to follow the advice of elected ministers.) These powers must be implemented through an Order in Council, which has to be published in the New Zealand Gazette and presented to the House of Representatives.

[22] English translation of an op-ed article by Lars E.O. Svensson published in Dagens Nyheter, 28 May, 2014, `http://larseosvensson.se/2014/05/28/improve-the-democratic-control-of-the-riksbank/#more-2095`.

3.2 Macroprudential objectives

Almost by definition, inflation targeting central banks specify explicit numerical targets for inflation. Such targets could be considered 'cheap talk' designed to influence private sector price-setting (see Farrell and Rabin 1996 for a discussion of cheap talk). Announcing an inflation target may help reveal information about the choices that policymakers will make and thus influence the strategic choices of private agents. For example, an inflation target, if believed, may facilitate a less costly transition towards an equilibrium (though targets do not seem to make much difference to the costs of disinflation in practice).

There is widespread agreement that macroprudential authorities should also have a clear mandate,[23] yet for macroprudential policy there is no measurable counterpart to the inflation target. Given the lack of accepted norms about how to use macroprudential policies, broad macroprudential objectives provide little guidance as to what policies will be implemented, when, and in response to what. 'Talk' about macroprudential objectives lacks specificity and is generally uninformative about chosen macroprudential policies. The missing detail about policies and objectives needs to be in-filled with other forms of communication – speeches, financial stability reports, and so forth.

Although having a clear macroprudential mandate remains important for accountability purposes, there continues to be a lack of unanimity about how to specify that mandate. Perhaps most importantly, the 'financial stability objective' of macroprudential policy is not directly observable.

We do not wish to exaggerate the clarity of the inflation targets provided for monetary policy. There has of course been ongoing debate about the price index that should be used to measure inflation, the horizon, the appropriateness of 'caveats' and exclusions, not to mention sectoral issues relate to price stickiness. (On the latter issue see Mahadeva and Sterne 2000, Aoki 2001, Mankiw and Reis 2003 and Woodford 2003).

Conceptually, financial stability and inflation targeting are both intermediate objectives. While inflation is often treated as a macro objective in its own right, Woodford (2003) makes clear that it is a metric for measuring distortions

---

[23] For example, the European Systemic Risk Board notes "The tasks and powers of the macro-prudential authority should be clearly defined." (10), p. 2. `http://www.esrb.europa.eu/pub/pdf/ESRB_Recommendation_on_National_Macroprudential_Mandates.pdf?87d545ebc9fe76b76b6c545b6bad218c`. Similarly, the IMF suggests that explicit objectives help to "guide decision-making and enhance accountability". `http://www.imf.org/external/np/pp/eng/2013/061713.pdf`.

that arise in response to sticky prices, and thus a metric for evaluating the extent to which resources are misallocated across firms that have adjusted their prices recently and those firms that have not. Identifying a financial stability metric that approximates distortions in financial intermediation would be desirable, but no single metric has yet been identified.

Theoretical research has endeavoured to be more specific about the measurement of distortions that affect welfare. For example, Carlstrom et al (2010) introduce agency costs into a dynamic stochastic general equilibrium model, and derive a welfare function that contains a 'risk premium' in addition to the more standard output and inflation arguments (see also De Paoli and Paustian 2013). Such metrics have not yet been adopted explicitly by policymakers. While there are a number of observed variables that are related to financial stability – asset prices, leverage, credit spreads – there is no consensus about which variable should be of primary interest. The lack of primacy perhaps reflects the fact that there are multiple distortions that may affect financial stability, from agent myopia to information asymmetries to moral hazard, and there is no consensus as to which distortions are most costly.

To sum up, we do not yet have a single numeric objective for macroprudential policy. We do not know which distortions are most important and we do not have a single observed variable to represent those distortions. Research is ongoing to understand how policies affect policymakers' feasible choice sets, but this research is still at an early stage. The objectives as currently expressed for policy purposes provide little guidance as to how macroprudential policies will ultimately be implemented.

3.3 Transparency

In this section we focus on macroprudential policy efforts to strategically influence private agents, first arcing back to discuss the monetary transparency literature. Central bank transparency is intended to shape private expectations, contributing to the transmission of policies through to the interest rates and asset prices that influence private behaviour.

Inflation reports or monetary policy statements have become one of the most important vehicles of central bank communication. These reports discuss the current state of the economy and current policies. Many inflation reports or monetary policy statements also contain a great deal of information about the future evolution of the economy, and future monetary policy actions. For example, the Riksbank, Norges Bank, and the Reserve Bank of New

Zealand all report their expected future interest rate paths, and the former two central banks routinely report fan charts to illustrate uncertainty about future outcomes.

Central bank transparency has come under increasing academic scrutiny – influenced at least in part by the development of inflation targeting. A substantial literature quantifies transparency and evaluates its impact on macroeconomic outcomes.[24] The literature on transparency has tended to focus on the impact of informational asymmetries between the central bank and private agents. Model of transparency then need to distinguish: the source of private central bank information (whether it is about the state of the economy or the preferences of the central bank); the distribution of private information about the state of the economy; and the quality of the 'signal' from the central bank to private agents.

There is an extensive literature that supports increased central bank transparency. However, the *optimal* level of transparency is determined as the outcome of two competing considerations. On the one hand, providing clear and timely information may help central bank's achieve their objectives, by making it less costly to disinflate. Yet on the other hand, increased transparency may increase economic volatility if public pronouncements displace private information. Economic agents' decisions may then be contaminated by noise in public communication.[25] In a similar vein, Walsh (2007) develops a theoretical model that shows transparency may help to augment diverse private information sets, but that the desirability of transparency depends on whether supply or demand shocks predominate.

The empirical evidence in favour of transparency is supportive, though not unambiguously compelling. Using cross-country evidence, Demertzis and Hughes Hallett (2007) suggest that greater transparency reduces inflation volatility, but increases output volatility. Ehrmann et al (2012) find that central bank transparency reduces costly forecast disagreement amongst private sector forecasters. In their review of the literature on central bank communication, Blinder et al (2008) conclude that communication can be a powerful tool to help monetary authorities achieve their objectives. For New Zealand, Moessner and Nelson (2008) find evidence that the Reserve Bank's forecasts of its policy rate influence market prices.[26] Moreover, they

---

[24] See Geraats (2002), Eijffinger and Geraats (2006), Dincer and Eichengreen (2007), Demertzis and Hughes Hallett (2007), Siklos (2011), and Dincer and Eichengreen (2014).

[25] See Morris and Shin (2002), Svensson (2006), and Geraats (2007).

[26] Similar evidence is found by Ferrero and Secchi (2009).

find no evidence that market participants place un-due weight on policy rate guidance and they suggest that market participants understand the uncertainty and conditionality of these forecasts. Looking at New Zealand and Norway, Rudebusch and Williams (2008) reach the same conclusion.

Communication about macroprudential policies has become increasingly important as financial stability concerns have increased in prominence. Macroprudential policy frameworks have appropriated the same transparency mechanisms underlying monetary policy. Financial stability Reports (FSRs) report on the risks that might perturb the stability of the financial system, on the state of the economy (broadly defined), and they discuss the use of macroprudential policies to support stability. The discussion of policy may contain *ex post* evaluations of policies that have been implemented, and *ex ante* descriptions of policies that may be deployed in future. Born et al (2014) show that FSRs do indeed have a material impact. They investigate a dataset of more than 1,000 financial stability reports and speeches for the period 1996-2009 and find that FSRs affect stock market returns and reduce market volatility.

Transparency about macroprudential policies may have important payoffs by moderating the risk-taking behaviour of private individuals. Yet being transparent about the tactics of macroprudential policymaking can be difficult as there is not necessarily a clear mapping from the state of the economy through to actual policy choices. These challenges exist for monetary policy but seem even more acute for macroprudential policies. The difficulties arise because of the proliferation of macroprudential instruments and the lack of well-accepted rules governing their behaviour.

Macroprudential policies also impact the propagation of the monetary transmission mechanism (Claessens et al, 2013; Agénor and da Silva, 2014). If private agents are to develop a clear idea of how macroprudential (and monetary) policies will be implemented then they must learn about policymakers' preferences and about policymakers' understanding of the tradeoffs involved, which will be governed by the underlying constraints imposed by policy transmission mechanisms.

Monetary policy communication is very clear about the timing and likely menu of policy actions.[27] Interest rate decisions are generally made at regular intervals and movements are typically made in 25 or 50 basis point increments or decrements. At this point, there is much greater ambiguity about how and when macroprudential policies might be implemented and adjusted. There is

---

[27] Unconventional policy actions may be considered an exception to this statement.

of course variation across countries. For example, the Reserve Bank of New Zealand does not have a preannounced schedule for macroprudential policy announcements, though FSRs are biannual. Elsewhere, the Financial Policy Committee of the Bank of England meets roughly quarterly at preannounced dates, and Norges Bank provides advice on countercyclical capital buffers in conjunction with the Executive Board meetings that determine interest rates.

FSRs are heavily based on intermediate targets such as asset prices, measures of credit, or measures of the price of risk, and these quantities are associated with capital or asset portfolio decisions, which are inherently forward-looking. However, Čihák et al (2012) find that FSRs tend to focus on the current levels of financial stability indicators and the current state of the economy, with relatively less forward-looking information. If policymakers wish to use macroprudential policies to influence asset prices, and if macroprudential policies have some effect on asset prices, then macroprudential policymakers should also look to forecast and reveal future macroprudential policies, since even future policy actions are relevant to current asst prices. Helping private agents to understand the evolution of future policy and future macroeconomic developments should be a central feature of macroprudential communication.

3.4   Accountability

In this section we discuss accountability, with reference to both monetary and macroprudential policies. Accountability has been a central element of inflation targeting regimes, in part reflecting the growing independence of central banks (Cukierman, 2008). To be held to account, policymakers must have clear objectives and a clear delineation of their policymaking powers.

With respect to monetary policy, different inflation targeting countries have adopted different accountability mechanisms to explain and assess policy actions. These accountability mechanisms are typically multi-layered. Central banks' primary accountability relationships are with independent boards and with governments, but they may also be required to consult with or inform political authorities more broadly. As public institutions, all central banks are subject to the legislated preferences of the government (Goodhart, 1994), and administrative law considerations may subject central banks to judicial review. Therefore all central banks are ultimately subject to mechanisms that ensure democratic accountability.

Accountability mechanisms include the provision of information and the incentives provided for performance of duties. When duties are not performed

satisfactorily, sanctions may be applied to the monetary authority – perhaps as embodied by the governor. These sanctions vary from country to country, with some jurisdictions sacrificing *de jure* accountability in favour of greater decision-making independence.

Using theoretical models, Persson and Tabellini (1993) and Walsh (1995) examine the incentives that can be provided to individual central bankers to ensure optimal monetary behaviour. Walsh, for example, finds that if the monetary policy agent only cares about their own pecuniary incentives then the optimal contract may be some kind of inflation rule contingent on supply shocks.[28] Further, Walsh (1995) establishes that the optimal commitment policy can be sustained by a dismissal policy based on the measured rate of inflation, with the central bank governor being fired if inflation exceeds a critical inflation rate determined by the government. In principle, the Reserve Bank of New Zealand Act 1989 provides mechanisms and a number of grounds for the Governor's dismissal,[29] but in practice these provisions have never been deployed. Most central bank legislation allows for the dismissal of officials only in cases of serious misconduct or incapacity, and rarely because of poor performance (BIS, 2009).

Much of the incentive for good performance by central bank policymakers come from the reputational costs that ensue if the central bank fails to meet its obligations. These informal accountability mechanisms complement *de jure* accountability. Robert Reynders, formerly a director of the National Bank of Belgium, has suggested that *de facto* accountability can exert a much sharper constraint than the *de jure* accountability".[30] Since outcomes depend on both policy actions and other shocks, accountability mechanisms tend to evaluate decision-making based on the information and advice that was available *ex ante. De jure* sanctions may then be difficult to enforce, given that many plausible policy actions can be justified *ex ante* particularly since policies must take into account tail risks that may not even arise *ex post*.

One dimension of accountability that has changed substantially in the last thirty years is the provision of information to the general public. This

---

[28] In the initial stages of inflation targeting in New Zealand it was suggested that the Governor of the time, Don Brash, had explicit pecuniary incentives to achieve good inflation outcomes. Nowadays, explicit pecuniary incentives receive little attention. In countries with decision-making committees it may be hard to devise pecuniary incentives to maximize performance.

[29] As Reddell (2006) notes, the Act does not allow the Governor to be dismissed simply for failing to meet the policy targets. The criteria in the Act refer explicitly to the performance of the Bank and the Governor in pursuit of those targets.

[30] See Reynders' comment on Briault et al (1997).

transparency has increased the accountability of central banks by providing the press, academic experts, financial markets, and a wider spectrum of parliamentary representatives with information that can be used to assess the quality of monetary policy decision-making. While it is widely accepted that monetary policy is best placed in the hands of expert central bankers rather than in the hands of politicians,[31] ensuring accountability to the general public remains important to legitimize the decision-making undertaken by central bank policymakers.

There is as yet no single 'best practice' institutional framework to ensure macroprudential accountability.[32] To a large extent, the accountability mechanisms first instituted for monetary policy have been copied and applied to macroprudential policy. In the New Zealand case, for example, the Reserve Bank Board and the Minister of Finance oversee both monetary and macroprudential decision-making.[33] Biannual Financial Stability Reports have also been instituted to complement quarterly Monetary Policy Statements.

There are, however, several reasons why even stricter accountability mechanisms might be needed for macroprudential policies. First, as a general principle, more extensive powers require greater effort to ensure accountability. Central banks that have been assigned additional responsibility for macroprudential policies should therefore be subject to stronger accountability mechanisms to discipline the implementation of these policies. Second, macroprudential policymakers may be susceptible to regulatory capture, since their policies are likely to affect financial institutions – a well-resourced special interest group. Barth et al (2012) suggest that regulatory capture is of substantive importance in the sphere of finance. Third, although even monetary policy has distributional effects (Fischer, 2014), the redistributive consequences of macroprudential policies may be even more substantial or more self-evident (Haldane, 2013). These policies can directly constrain private behavior and may dictate the allocation of resources within society. Moreover, as noted earlier, macroprudential policies may also have public finance consequences (Goodfriend, 2012). Arguably, unelected officials should not determine such redistribution alone.

Baxter (2011) suggests a variety of mechanisms to try to ameliorate the

---

[31] See Donald Kohn's testimony before the House Committee on Financial Services, February 11, 2014, `http://www.brookings.edu/research/testimony/2014/02/11-monetary-policy-state-of-the-economy-kohn`, and Romer and Romer (1997).

[32] See Nier et al (2011a) for a discussion of the institutional arrangements for macroprudential policy deployed by different countries.

[33] The New Zealand Treasury provides additional scrutiny.

negative consequence of regulatory capture. One suggestion is to foster 'creative turbulence', to challenge the frameworks and policies that are being deployed. The high degree of transparency that is a hallmark of inflation targeting regimes should help to scrutinize and challenge the frameworks put in place for macroprudential policies.[34]

Another approach to moderate regulatory capture is to accept that vested interests will be promoted, but to seek to achieve balance between competing interests, ensuring that no single group has a disproportionate impact on outcomes. One suggestion to balance competing interests is to promote public interest groups to advocate in favour of under-represented constituencies. In the United States the Consumer Financial Protection Bureau, established under the Dodd-Frank Act in 2010, might be regarded as one such entity. In a related vein, Barth et al (2012) suggest that 'sentinels' should be created to provide oversight of financial regulators. Arguably, the Board of the Reserve Bank of New Zealand and the 'Independent Evaluation Unit' recently established at the Bank of England are examples of such.

In New Zealand, substantial effort has been made to break the monopoly of information – if not the monopoly on expertise. Both Monetary Policy Statements and Financial Stability Reports are referred to the House of Representatives, and the Governor testifies to, and answers questions from, the Finance and Expenditure Committee (FEC), a sub-committee of parliament. The FEC may obtain third party advice to examine these policy documents, in addition to the oversight provided by the Reserve Bank's Board. Bean (1999) argues that to be effective parliamentary committees need to be well-resourced to perform these supervisory functions effectively.[35]

The likelihood of regulatory capture may also be ameliorated in other ways. In New Zealand, for example, the Reserve Bank must consult with persons or the representatives of persons affected by regulations imposed on deposit-takers (under section 157E of the Reserve Bank Act). This consultation is open to the general public as a whole. Such consultation broadens the realm of viewpoints to which the Reserve Bank is subject.[36] It is interesting to note that there is no counterpart to this consultation in the implementation

---

[34] Multi-agency frameworks that seek to maintain financial stability and committee structures may also contribute diverse points of view. Naturally there is a delicate balancing act between diverse and robust debate and obstructive practices that thwart the effective implementation of policy. It seems likely that all institutional frameworks may successfully negotiate this balance or, conversely, fail to do so.

[35] Similar arguments are also made in Barth et al (2012).

[36] It is worth noting that while the Reserve Bank must consult, failure to do so does not affect the validity of regulations made under section 157E.

of monetary policy. While consultation about macroprudential policy is advantageous on accountability grounds, it impedes very rapid changes to policy.

In principle, much of the decision-making in macroprudential policy could be devolved back to political authorities. Such a move could be justified by the fact that prudential (and implicitly macroprudential) decisions may have substantial fiscal implications if a large financial institution is provided liquidity support or, in a worst case scenario, bailed out. Reallocating macroprudential policy to political authorities would then subject it to accountability through the electoral cycle. However, devolving macroprudential decisions to political authorities makes them both 'worker and overseer', yielding a potentially contradictory mix of incentives for transparency to the general public. An alternative approach to foster democratic accountability would be to elect either the central bank governor or decision-making committee members, possibly to long and/or staggered terms. This approach could be used to 'extract' monetary/macroprudential issues from the bundled good that individual political parties 'sell' in parliamentary elections (see Besley and Coate 2003 for related discussion). Parliamentary authorities and/or a separate board could then be used to provide oversight of these elected officials.

The extension of accountability mechanisms to macroprudential policies seems entirely desirable on generic grounds, but it is hard to discount the difficulty of holding macroprudential policymakers to account. There is not so much an information asymmetry between policymakers and the general public, as an information deficit. Policymakers and public alike do not know exactly how these policies translate through into macroeconomic and macroprudential outcomes. There is uncertainty about the objectives of macroprudential policies, and there is uncertainty about the effects of such policies. Ingves (2011) suggests that accountability must then focus on the correct application of processes rather than outcomes, though this conclusion is dissatisfying and rather at odds with the outcome-focus of inflation targeting. These accountability problems exist irrespective of whether macroprudential policy is implemented by a central bank, a financial stability authority, or indeed a political authority.

Uncertainty about macroprudential policies mirrors the monetary policy uncertainty that existed following the breakdown of the Bretton Woods system of fixed exchange rates. As then, the implementation of policy is likely to evolve through time as policymakers develop practical experience using new instruments. We remain convinced that transparent communication to the general public remains a significant element in ensuring accountability.

4 Conclusion

In this article we use the four attributes of inflation targeting – independence, transparency, accountability and the explicit inflation objective – to help frame debate about the institutions used to govern macroprudential policies. Overall, we argue that these attributes are important for effective macroprudential frameworks. There are, however, some points of difference.

First, the merits of independence are not as clear for macroprudential policy. One reason to appoint an independent policymaker is to take advantage of 'expertness'. However, this advantage must be balanced against the possibility that the policymaker may pursue tradeoffs at odds with the mandate provided by government and the public at large. The scope for such tradeoffs is exacerbated if outcomes are not directly observable or if outcomes are not self-evidently related to the policies that have been implemented. These problems seem more substantial for macroprudential policy than for monetary policy.

We have also argued that macroprudential policies are interdependent and cannot be pursued entirely 'independently'. Monetary and macroprudential policies are unified by their connection to social welfare, and policies should be implemented to optimize their marginal contribution to this overarching notion of welfare. In principle, policies must be coordinated if they are to be set optimally, but whether the interdependencies are material remains uncertain. Of course, macroprudential and monetary policy could be coordinated even if they were housed in separate institutions.

There is a strong case for monetary authorities to be independent and/or for other constraints that prevent political authorities from monetizing budget deficits (since political authorities may have little regard to the inflationary consequences of doing so). While political authorities could use macroprudential policies indirectly to stimulate the economy and therefore increase tax revenue, it may be more difficult to use macroprudential policies to deal with such funding issues. Thus, the case for appointing an agent to run macroprudential policy independently of political authorities is arguably somewhat weaker.

The second observation we make is that financial stability objectives and intermediate targets should be made more explicit. Policymaking involves strategic interaction between policymakers and private agents, and is an exercise in influencing the behaviour and expectations of private agents. While announcing objectives can foster coordination in strategic games, we

do not see that financial stability objectives, as commonly expressed, provide enough guidance about the macroprudential policies that will be implemented in future.

Our third observation is that macroprudential policymakers need to consciously address their communication of future policy actions. As advocates for transparency, we suggest that the institutions of policymaking should explicitly address when policy decisions will be announced and/or implemented, and greater attention should be paid to the menu of macroprudential policies. Macroprudential policies governed by principled rules-based behaviour would make clear what policies will be pursued and how they will be adjusted through time, but much work needs to be done before operational, state-contingent macroprudential rules can be identified.

Our fourth observation is that applying the accountability mechanisms of inflation targeting to macroprudential policies has been a desirable development, though these mechanisms should be strengthened further. We remain convinced that transparent communication to the general public remains a significant element in ensuring accountability.

Lastly, while the accountability institutions for macroprudential and monetary policies are well developed, oversight and accountability are materially constrained by the quality of current analytical frameworks. Such uncertainty makes it difficult to provide objective assessments of macroprudential policies. Looking forward, we must fully expect that macroprudential policies will evolve as views solidify about the most important distortions and the most important macroprudential mechanisms. Institutional frameworks should be flexible enough to accommodate such changes.

References

Agénor, P-R and L A P da Silva (2014), "Macroprudential regulation and the monetary transmission mechanism," *Journal of Financial Stability*, 13, 44–63.

Alesina, A and L H Summers (1993), "Central bank independence and macroeconomic performance: Some comparative evidence," *Journal of Money, Credit and Banking*, 25, 151–62.

Aoki, K (2001), "Optimal monetary policy response to relative price changes," *Journal of Monetary Economics*, 48(1), 55–80.

Arnone, M and D Romelli (2013), "Dynamic central bank independence indices and inflation rate: A new empirical exploration," *Journal of Financial Stability*, 9(3), 385–398.

Bade, R and M Parkin (1988), "Central bank laws and monetary policy," *University of Western Ontario, Mimeo*, URL `http://economics.uwo.ca/faculty/parkin/CentralBankLaws.pdf`.

Barth, J R, G C Jr, and R Levine (2012), *Guardians of Finance*, The MIT Press, Cambridge, Mass.

Baxter, L G (2011), ""Capture" in financial regulation: Can we channel it toward the common good?" *Cornell Journal of Law and Public Policy*, 21, 175–200.

Bayliss, L C (1968), "Monetary policy in New Zealand," *New Zealand Economic Papers*, 2(1), 81–101.

Bean, C (1999), "Australasian monetary policy: A comparative perspective," *Australian Economic Review*, 32(1), 64–73.

Berger, H, J de Haan, and S C Eijffinger (2000), "Central bank independence: An update of theory and evidence," *Center for Economic Studies (CES), CESifo Working Paper*, 255.

Berger, W and F Kißmer (2013), "Central bank independence and financial stability: A tale of perfect harmony?" *European Journal of Political Economy*, 31(0), 109–118, URL `http://www.sciencedirect.com/science/article/pii/S017626801300030X`.

Bernanke, B S, T Laubach, F S Mishkin, and A S Posen (1999), *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, Princeton, NJ.

Bernanke, B S and F S Mishkin (1997), "Inflation targeting: A new framework for monetary policy?" *Journal of Economic Perspectives*, 11(2), 97–116.

Besley, T and S Coate (2003), "Elected versus appointed regulators: Theory and evidence," *Journal of the European Economic Association*, 1(5), 1176–1206, URL `http://ideas.repec.org/a/tpr/jeurec/v1y2003i5p1176-1206.html`.

BIS (2009), "Issues in the governance of central banks," *Bank for International Settlements, Mimeo*, URL `http://www.bis.org/publ/othp04.pdf`.

Blinder, A S (2010), "How central should the central bank be?" *Journal of*

Economic Literature, 48(1), 123–133, URL `http://ideas.repec.org/a/aea/jeclit/v48y2010i1p123-133.html`.

Blinder, A S, M Ehrmann, M Fratzscher, J D Haan, and D-J Jansen (2008), "Central bank communication and monetary policy: A survey of theory and evidence," *Journal of Economic Literature*, 46(4), 910–45.

Born, B, M Ehrmann, and M Fratzscher (2014), "Central bank communication on financial stability," *Economic Journal*, 124(577), 701–734.

Boston, J (1984), *Incomes Policy in New Zealand: 1968-1984*, Institute of Policy Studies, Victoria University of Wellington, Wellington, NZ.

Briault, C, A Haldane, and M King (1997), "Independence and accountability," in *Towards More Effective Monetary Policy*, ed I Kuroda, 299–326, Macmillan Press Ltd, Basingstoke.

Buiter, W H and M H Miller (1983), "Changing the rules: Economic consequences of the Thatcher regime," *Brookings Papers on Economic Activity*, 1983(2), 305–365.

Carlstrom, C T, T S Fuerst, and M Paustian (2010), "Optimal monetary policy in a model with agency costs," *Journal of Money, Credit and Banking*, 42(s1), 37–70, URL `http://ideas.repec.org/a/mcb/jmoncb/v42y2010is1p37-70.html`.

Čihák, M (2010), "Price stability, financial stability, and central bank independence," in *Central Banking After the Crisis*, Oesterreichische National-Bank, Vienna, URL `http://www.oenb.at/en/Publications/Economics/Economics-Conference/2010/Economics-Conference-2010.html`.

Čihák, M, M S Muñoz, S T Sharifuddin, and K Tintchev (2012), "Financial stability reports: What are they good for?" *International Monetary Fund, Working Paper*, WP/12/1.

Claessens, S, K Habermeier, E Nier, H Kang, T Mancini-Griffoli, and F Valencia (2013), "The interaction of monetary and macroprudential policies," *International Monetary Fund, Policy Paper*.

Crowe, C and E E Meade (2008), "Central bank independence and transparency: Evolution and effectiveness," *European Journal of Political Economy*, 24(4), 763–777, URL `http://ideas.repec.org/a/eee/poleco/v24y2008i4p763-777.html`.

Cukierman, A (1992), *Central Bank Strategy, Credibility, and Independence:*

Theory and Evidence, vol 1 of *MIT Press Books*, The MIT Press, URL `http://ideas.repec.org/b/mtp/titles/0262031981.html`.

Cukierman, A (2008), "Central bank independence and monetary policy-making institutions – Past, present and future," *European Journal of Political Economy*, 24(4), 722–736, URL `http://www.sciencedirect.com/science/article/pii/S0176268008000566`.

Cukierman, A, S B Webb, and B Neyapti (1992), "Measuring the independence of central banks and its effect on policy outcomes," *World Bank Economic Review*, 6(3), 353–98, URL `http://ideas.repec.org/a/oup/wbecrv/v6y1992i3p353-98.html`.

Currie, D and P Levine (1985), "Macroeconomic policy design in an interdependent world," in *International Economic Policy Coordination*, eds W H Buiter and R C Marston, book 6, 228–273, Cambridge University Press, Cambridge, URL `http://www.nber.org/chapters/c4136`.

De Paoli, B and M Paustian (2013), "Coordinating monetary and macroprudential policies," *Federal Reserve Bank of New York, Staff Reports*, 653, URL `http://ideas.repec.org/p/fip/fednsr/653.html`.

Deane, R S (1981), "An overview of balance of payments policy," in *External Economic Structure and Policy*, eds R S Deane, P W E Nicholl, and M J Walsh, 15–27, Reserve Bank of New Zealand, Wellington.

Deane, R S (1986), "Financial sector policy reform," in *Financial Policy Reform*, 11–29, Reserve Bank of New Zealand, Wellington.

Demertzis, M and A Hughes Hallett (2007), "Central bank transparency in theory and practice," *Journal of Macroeconomics*, 29(1), 760–789.

Dincer, N N and B Eichengreen (2007), "Central bank transparency: Where, why, and with what effects?" *National Bureau of Economic Research, NBER Working Papers*, 13003.

Dincer, N N and B Eichengreen (2014), "Central bank transparency and independence: Updates and new measures," *International Journal of Central Banking*, 10(1), 189–259.

Duff, A W (2014), "Central bank independence and macroprudential policy: A critical look at the U.S. financial stability framework," *Berkeley Business Law Journal*, 11(4), 182–220.

Dunstan, A (2014), "Interactions between monetary and macro-prudential

policies," *Reserve Bank of New Zealand Bulletin*, 77(2), 15–25, URL `http://ideas.repec.org/a/nzb/nzbbul/jun201402.html`.

Ehrmann, M, S Eijffinger, and M Fratzscher (2012), "The role of central bank transparency for guiding private sector forecasts," *Scandinavian Journal of Economics*, 114(3), 1018–1052, URL `http://ideas.repec.org/a/bla/scandj/v114y2012i3p1018-1052.html`.

Eijffinger, S C and J de Haan (1996), "The political economy of central-bank independence," *International Economics Section, Department of Economics Princeton University,, Princeton Studies in International Economics*, 19, URL `http://ideas.repec.org/p/fth/prinfi/19.html`.

Eijffinger, S C and P M Geraats (2006), "How transparent are central banks?" *European Journal of Political Economy*, 22(1), 1–21, URL `http://ideas.repec.org/a/eee/poleco/v22y2006i1p1-21.html`.

Evans, L, A Grimes, B Wilkinson, and D Teece (1996), "Economic reform in New Zealand 1984-95: The pursuit of efficiency," *Journal of Economic Literature*, 34(4), 1856–1902.

Farrell, J and M Rabin (1996), "Cheap talk," *Journal of Economic Perspectives*, 10(3), 103–118, URL `http://ideas.repec.org/a/aea/jecper/v10y1996i3p103-18.html`.

Ferguson, R (2003), "Panel discussion," in *The Transformation of the European Financial System*, eds V Gaspar, P Hartmann, and O Sleijpen, 316–320, European Central Bank, Frankfurt am Main, URL `http://www.ecb.europa.eu/pub/pdf/other/transformationeuropeanfinancialsystemen.pdf`.

Ferrero, G and A Secchi (2009), "The announcement of monetary policy intentions," *Bank of Italy, Economic Research and International Relations Area, Temi di discussione (Economic working papers)*, 720, URL `http://ideas.repec.org/p/bdi/wptemi/td_720_09.html`.

Fischer, S (2014), "Macroprudential Policy in Action: Israel," in *What Have We Learned? Macroeconomic Policy After the Crisis*, vol 1 of *MIT Press Book Chapters*, chap 7, 87–98, The MIT Press.

Geraats, P M (2002), "Central bank transparency," *Economic Journal*, 112(483), 532–565, URL `http://ideas.repec.org/a/ecj/econjl/v112y2002i483p532-565.html`.

Geraats, P M (2007), "The mystique of central bank speak," *International*

Journal of Central Banking, 3(1), 37–80, URL `http://ideas.repec.org/a/ecj/econjl/v112y2002i483p532-565.html`.

Goodfriend, M (2012), "The elusive promise of independent central banking," *Institute for Monetary and Economic Studies, Bank of Japan, IMES Discussion Paper Series*, 12-E-09.

Goodhart, C (1994), "Central bank independence," in *Central Bank Independence and Accountability: Open Issues and Institutional Reforms*, Proceedings of a Conference held at Bocconi University, 4 March 1994.

Haldane, A (2013), "Macroprudential policies – when and how to use them," *Bank of England, Mimeo*, paper presented at the Rethinking Macro Policy II: First Steps and Early Lessons Conference.

Ingves, S (2011), "Central bank governance and financial stability: A report by a study group," *Bank for International Settlements*.

Klomp, J and J de Haan (2010), "Inflation and central bank independence: A meta-regression analysis," *Journal of Economic Surveys*, 24(4), 593–621.

Kydland, F E and E C Prescott (1977), "Rules rather than discretion: The inconsistency of optimal plans," *Journal of Political Economy*, 85, 473–491.

Lim, C H, I Krznar, F Lipinsky, A Otani, and X Wu (2013), "The macroprudential framework: Policy responsiveness and institutional arrangements," *International Monetary Fund, IMF Working Papers*, 13/166, URL `http://ideas.repec.org/p/imf/imfwpa/13-166.html`.

Low, A R (1968), "Monetary policy–A New Zealand review," *New Zealand Economic Papers*, 2(2), 5–14.

Mahadeva, L and G Sterne, eds (2000), *Monetary Policy Frameworks in a Global Context*, Routledge, London.

Mankiw, N G and R Reis (2003), "What measure of inflation should a central bank target?" *Journal of the European Economic Association*, 1(5), 1058–1086.

Meade, J (1984), "International co-operation in macro-economic policies," *Commission of the European Communities, Economic Papers*, 28.

Moessner, R and W Nelson (2008), "Central bank policy rate guidance and financial market functioning," *Bank for International Settlements, BIS Working Papers*, 246, URL `http://ideas.repec.org/p/bis/biswps/246.html`.

Morris, S and H S Shin (2002), "Social value of public information," *American Economic Review*, 92(5), 1521–1534.

Nelson, E (2005), "Monetary policy neglect and the great inflation in Canada, Australia, and New Zealand," *International Journal of Central Banking*, 1(1), 133–179, URL `http://ideas.repec.org/a/ijc/ijcjou/y2005q2a4.html`.

Nelson, E (2007), "The great inflation and early disinflation in Japan and Germany," *International Journal of Central Banking*, 3(4), 23–76.

Nier, E W, J Osiński, L I Jácome, and P Madrid (2011a), "Institutional models for macroprudential policy," *International Monetary Fund, Staff Discussion Note*, SDN/11/18.

Nier, E W, J Osiński, L I Jácome, and P Madrid (2011b), "Towards effective macroprudential policy frameworks: An assessment of stylized institutions," *International Monetary Fund, Working Paper*, WP/11/250.

Parkin, M (2013), "The effects of central bank independence and inflation targeting on macroeconomic performance: Evidence from natural experiments," *University of Western Ontario, Economic Policy Research Institute, University of Western Ontario, Economic Policy Research Institute Working Papers*, 20133, URL `http://ideas.repec.org/p/uwo/epuwoc/20133.html`.

Persson, T and G Tabellini (1993), "Designing institutions for monetary stability," *Carnegie-Rochester Conference Series on Public Policy*, 39(1), 53–84, URL `http://ideas.repec.org/a/eee/crcspp/v39y1993ip53-84.html`.

Quigley, N C (1992), "Monetary policy and the New Zealand system: An historical perspective," in *Monetary Policy and the New Zealand Financial System*, 205–231, Reserve Bank of New Zealand, Wellington, 3rd edn.

RBNZ (1986), *Financial Policy Reform*, Reserve Bank of New Zealand, Wellington, NZ.

Reddell, M (2006), "Monetary policy accountability and monitoring," *Reserve Bank of New Zealand, Mimeo*, URL `http://www.rbnz.govt.nz/monetary_policy/about_monetary_policy/2851362.pdf`.

Reis, R (2013), "Central bank design," *Journal of Economic Perspectives*, 27(4), 17–44.

Rogers, L (2013), "A new approach to macro-prudential policy for New Zealand," *Reserve Bank of New Zealand Bulletin*, 76(3), 12–22, URL `http://ideas.repec.org/a/nzb/nzbbul/sep201303.html`.

Romer, C D and D H Romer (1997), "Institutions for monetary stability," in *Reducing Inflation: Motivation and Strategy*, eds C D Romer and D H Romer, 307–329, Chicago University Press, Chicago.

Rudebusch, G D and J C Williams (2008), "Revealing the secrets of the temple: The value of publishing central bank interest rate projections," in *Asset prices and monetary policy*, ed J Y Campbell, 247–289, University of Chicago Press.

Siklos, P (2011), "Central bank transparency: Another look," *Applied Economics Letters*, 18(10), 929–933, URL `http://ideas.repec.org/a/taf/apeclt/v18y2011i10p929-933.html`.

Silverstone, B, A Bollard, and R Lattimore (1996), *A Study of Economic Reform: The Case of New Zealand*, Elsevier, Amsterdam.

Singleton, J, A Grimes, G Hawke, and F Holmes (2006), *Innovation + Independence: The Reserve Bank of New Zealand 1973-2002*, Auckland University Press, Auckland, NZ.

Smets, F (2014), "Financial stability and monetary policy: How closely interlinked?" *International Journal of Central Banking*, 10(2), 263–300, URL `http://ideas.repec.org/a/ijc/ijcjou/y2014q2a11.html`.

Svensson, L E (2015), "Forward guidance," *International Journal of Central Banking*, forthcoming.

Svensson, L E O (2006), "Social value of public information: Comment: Morris and Shin (2002) is actually pro-transparency," *American Economic Review*, 96(1), 448–452.

Taylor, J B (2013), "Simple rules for financial stability," Dinner Keynote Address at the Financial Markets Conference "Maintaining Financial Stability: Holding a Tiger by the Tail", Federal Reserve Bank of Atlanta, URL `http://www.stanford.edu/~johntayl/Taylor%20Keynote%20-%20Atlanta%20Fed%204-9-13.pdf`.

Tinbergen, J (1952), *On the Theory of Economic Policy*, Elsevier, Amsterdam.

Walsh, C E (1995), "Optimal contracts for central bankers," *American Economic Review*, 85, 150–167.

Walsh, C E (2007), "Optimal economic transparency," *International Journal of Central Banking*, 3(1), 5–36.

Woodford, M (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press, Princeton, NJ.

Figures

Figure 1: Headline inflation (yoy)