The Debate on Alternatives for Monetary Policy in Australia

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1.   Introduction

Debate on the monetary-policy framework can be viewed as taking place at two distinct levels. At one level, there is debate about the appropriate choice of policy system from a range of conceptually distinct alternatives such as inflation targets, nominal-income targets, money targets, fixed exchange rates, and various more radical schemes. The other level of debate is that occurring within some broadly accepted system, concerning the system's detailed parameters and design features – in the case of inflation targeting, this covers issues like the time-frame, the design of pre-commitment mechanisms and the scope to be allowed for business-cycle stabilisation within the policy framework.

In the Australian context, debate has occurred at both these levels, broadly reflecting the character of the international literature. Some critics of monetary policy in Australia have advocated moving to radically different systems of one sort or another, including a currency board (Hanke, Porter and Schuler 1992), monetary-base control (McTaggart and Rogers 1990; Makin 1993), a commodity standard (Evans and Dowd 1992) or a target for M1 (Weber 1994). McKibbin (1996) looked at a variety of alternatives for Australia, including nominal-income targeting. Various other proposals could be viewed as being more accepting of the current framework, but arguing for some significant changes of emphasis within it. For example, Stemp (1996) argued for an exclusive inflation focus with tighter pre-commitment to the target, while Pitchford (1996) and McDonald (1997) have effectively argued for a shift in the opposite direction to allow an increased focus on output stabilisation.

The title of a recent contribution by Stanley Fischer (1995) – *The Unending Search for Monetary Salvation* – nicely captures the tone of much of this area of debate. One gets the sense from many of the participants in the debate that an ideal system is thought to exist, if only it could be found or if only policy-makers would adopt it. But, as Fischer indicates, the search for an ideal system is unending, and what is actually required is a choice between realistic alternatives. The purpose of the present paper is to review the debate on alternative monetary-policy systems as it applies to Australia. The argument is primarily directed at the broader of the two levels of analysis – the choice of system – and leaves issues of detailed design features of an inflation target to other contributions to this conference. In covering these issues, the paper aims to give a general rationale for the type of policy system that we currently have, and to show where our system is placed in the menu of theoretical and practical alternatives.

2. Monetary-policy Systems

I use the term 'monetary-policy system' to mean some coherent framework for making monetary-policy decisions and for explaining them to the public. A useful way to classify possible systems is according to the instrument or operational objective emphasised by the policy-maker. There would seem to be four broad theoretical possibilities in this regard:

- quantity-setting systems, based on the control or targeting of a monetary aggregate;
- final-targeting systems, where an interest-rate instrument is used in the direct targeting of final objectives;
- exchange-rate or commodity standards; and
- *laissez-faire* approaches to the monetary standard.

Before discussing in detail the criteria for choosing among the different policy approaches, it will be useful to examine more precisely what they entail and in what sense the differences are important in practice. Clearly, there is potential for overlaps and hybrids among some of these approaches, particularly between the first two.

2.1 Rate setting or quantity setting?

In principle, domestically focused monetary policy is conducted at the operational level using either an interest-rate or a quantity instrument. The usual textbook assumption is that policy is conducted by quantity setting: that is, by setting some variable m either on an exogenous growth path or adjusting it systematically in response to shocks to other variables. This immediately raises the question of whether this m can be controlled. To the extent that this question is addressed in the literature, two types of approach seem possible. One is to focus consideration on the monetary base which, if not controllable already, can by assumption be made so by appropriate institutional changes. The other route is to introduce the concept of money as an intermediate target, under which some other policy instrument (in practice, the short-term nominal interest rate, i) is adjusted with the aim of keeping the chosen monetary aggregate close to the targeted path. The distinction is between rules of the following forms:

$$m_t = m_t^T \qquad \text{(quantity rule)}$$

$$i_t = \gamma(m_t - m_t^T) \qquad \text{(monetary target)}$$

where m^T is the target path and γ represents the responsiveness of policy to a deviation from target.

There are few, if any, cases of policy being conducted on the basis of strict monetary-base control as defined above. The cases most frequently cited are those of Swiss monetary-base targeting in the period since 1980, the Bundesbank's Central Bank Money target (1974 to 1988) and the Federal Reserve's period of targeting non-borrowed reserves of the banking system (1979 to 1981). In none of these cases, however, was the monetary-base variable kept strictly to a pre-determined path. In a review of these policy approaches, Goodhart (1995) concluded that the role of the monetary base in practice

was more like that of an intermediate target, being used by policy-makers as a signal rather than as a policy instrument.[1] Intermediate targeting systems more generally, using the broader monetary aggregates, were, of course, common to many other countries (including Australia) in the 1970s and 1980s, and such a system still plays an important part in the public explanation of policy in Germany.

Quantity setting can be contrasted, in principle, with rate setting, where short-term interest rates are adjusted to achieve a systematic influence on final objective variables – usually some combination of prices and output. This definition encompasses a range of theoretical possibilities, including inflation targets and nominal-income targets, and would also seem capable of describing more pragmatic policies in countries where numerical objectives are not formally specified.[2] Three stylised rules in this class might be written as follows:

$$i_t = \bar{r} + \pi_t + \gamma(\pi_t - \pi_t^T) \qquad\qquad\qquad \text{(inflation)}$$

$$i_t = \bar{r} + \pi_t + \gamma(\Delta py_t - \Delta py_t^T) \qquad\qquad\qquad \text{(nominal income)}$$

$$i_t = \bar{r} + \pi_t + \gamma_1(\pi_t - \pi_t^T) + \gamma_2(y_t - \tilde{y}_t) \qquad\qquad\qquad \text{(Taylor rule}^3\text{)}$$

where i represents the nominal interest rate, π the inflation rate, py nominal income, $(y–\tilde{y})$ the output gap, and the superscript T a target value.

The common feature of these rules is that interest rates respond systematically to deviations of prices and output from 'normal' paths, where these are expressed in terms of inflation targets combined with some notion of potential output. Such rules can alternatively be expressed in terms of expectations of these variables based on currently available information, which would seem a reasonable representation of the way many central banks currently describe the conduct of their policies.

There is some empirical evidence to support the realism of this general class of simple rate-setting rules; for example Taylor (1993), in an empirical study of US monetary policy, found that his rule gave quite an accurate explanation of the federal funds rate over the period since 1987. Obviously a range of more complex rules in the rate-setting category is also possible, many of which are studied in detail in applied work such as that of McKibbin (1996) and Bryant, Hooper and Mann (1993), as well as by de Brouwer and O'Regan (1997). An important feature sometimes added to empirical rules of this form is an interest-rate smoothing term designed to limit instrument variability (Lowe and Ellis 1997).

Goodhart (1989) notes that there is a basic duality in theory between any rate-setting rule of the type described above and a corresponding quantity-setting rule. The point can be illustrated by combining a standard money-demand function with some assumed policy response under a quantity-setting framework:

$$m - p \; = \; \alpha y \; - \; \delta i \; + \; \beta x + u \qquad\qquad\qquad \text{(money demand)}$$

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1. For a detailed discussion of policy in Switzerland and Germany, see Laubach and Posen (1997).

2. Some of these targeting policies have also been proposed in frameworks that assume a quantity instrument; for example, McCallum (1988) and Feldstein and Stock (1994).

3. As proposed by Taylor (1993).

$$m = ay + bp \qquad \text{(money supply)}$$

where x is some vector of pre-determined variables. This quantity-setting policy implies an equivalent interest-rate reaction function of the form

$$i = (\frac{\alpha - a}{\delta})y + (\frac{1-b}{\delta})p + \frac{\beta}{\delta}x + \frac{1}{\delta}u$$

which allows money to be eliminated from the system.[4]

Notwithstanding this theoretical equivalence, the two approaches can be viewed as quite different in practical terms where policy-makers are looking for relatively simple robust principles for conducting and explaining policy. In general, simple interest-rate rules imply complicated quantity rules, and *vice versa,* so there are potentially large differences in the way the two approaches would be operationalised and explained to the public. I return to this point in a later section.

2.2   Price-level determinacy

A point of controversy in the literature has been the question of price-level determinacy under a rate-setting policy system. Sargent and Wallace (1975) made the claim, repeated by Sargent (1979, p. 362), that 'there is no interest rate rule that is associated with a determinate price level'. This proposition has an important commonsense element but, as subsequent literature has shown, is also subject to an important limitation. The commonsense element in the simplest case is clear: under a fixed interest-rate rule, inflation shocks reduce the real interest rate and are therefore self-reinforcing, so the rule is unstable; and under rational expectations, this instability collapses to indeterminacy in the short run. The same conclusion extends to any exogenous rate-setting policy or to any policy that links the interest rate only to real variables.

The important limitation to this principle is provided by McCallum (1981, 1986), who showed that price-level determinacy is ensured in any rate-setting policy rule specified to have a stabilising effect on the price level or on some other nominal variable.[5] This condition is generally satisfied by reaction functions that move interest rates in response to deviations of the price level or the inflation rate from some targeted path. Blinder (1996) provides a useful summary of this conclusion, stating that the nominal anchor under such a rule is the central bank's commitment to raise interest rates when the inflation rate is too high.

The general claim that rate-setting systems are always indeterminate must therefore be seen as fallacious. But, with some exceptions (Ball 1997), there has been some reluctance in the academic literature to study policy in terms of an interest-rate instrument, notwithstanding the fact that many central banks now present their policy decisions to the public in rate-setting terms. Large parts of the literature, including much of the literature on time consistency and inflation targeting, bypass the question of the

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4.   In a full system, money cannot be eliminated if the stock of money is an argument in another equation, for example through real-balance effects. But the point remains that policy can be fully defined by an interest-rate reaction function.

5.   See also Edey (1990), Taylor (1993), Fuhrer and Moore (1995) for discussion of this result.

policy instrument altogether by assuming that the instrument is the inflation rate, set directly by the central bank (Svensson 1995; Walsh 1995). Others retain a framework that explicitly assumes direct control of a quantity instrument: for example, McCallum (1988), who assumes monetary-base control, and Feldstein and Stock (1994), who assume an M2 instrument, both in the context of an intermediate target for nominal income. Still others regard instrument-setting as an essentially technical detail, and focus only on the choice of targets. These sorts of approaches do seem to neglect an important aspect of practical policy design.

2.3   Targets with and without base drift

A further aspect of target setting is the decision on whether to allow 'base drift': that is, whether or not the policy should aim to correct accumulated deviations from the target. This issue applies to any targeting regime, but is most frequently raised with respect to inflation targets, where the distinction is between an inflation-rate and a price-level target. Base drift, as occurs under a standard inflation-rate target, clearly increases the long-run variability of the targeted variable, but is usually argued to reduce short-run variability.[6] The point can be illustrated by considering the two forms of targeting below, where both are subject to a given degree of control uncertainty:

$$p_t = p_t^T + u_t \qquad\qquad\qquad \text{(control error)}$$

$$\pi_t = p_t - p_{t-1}. \qquad\qquad\qquad \text{(definition of inflation)}$$

Under a price-level target,

$$p_t^T = p_o + \lambda t$$

where λ is the permitted rate of inflation. This implies

$$\text{var}(p_t) = \sigma_u^2$$

$$\text{var}(\pi_t) = 2\sigma_u^2.$$

The corresponding inflation target is

$$p_t^T = p_{t-1} + \lambda, \text{ which implies}$$

$$\text{var}(p_{t+k}) = k\sigma_u^2$$

$$\text{var}(\pi_t) = \sigma_u^2.$$

The pure inflation target in this example thus produces a smaller variance of the inflation rate itself, but results in an infinite unconditional variance of the price level: uncertainty about the future price level increases as the forecast horizon lengthens. The relative desirability of these stylised systems thus depends partly on the extent to which longer-run price-level certainty is desired in its own right, as well as on other considerations

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6.   Svensson (1995) provides a counterexample.

such as the output cost of achieving price-level corrections that might periodically be required under a levels target.

Usual practice in targeting regimes has been to allow a high degree of base drift, with targets generally specified in rates of change rather than levels. Although the issue has been widely discussed in the academic literature, designers of inflation-targeting systems have paid little attention in practice to the issue of limiting base drift, perhaps implicitly accepting arguments that there is no net benefit to doing so. The only clear case of a drift-free target seems to have been the Swedish price-level target of the 1930s, when policy over a number of years was aimed at keeping the level of the CPI constant. This period was something of a special case and, according to Jonung (1992), the policy was designed to prevent deflation associated with the onset of the depression.

2.4   Fixed exchange rates and commodity standards

The main alternative to an internal policy anchor of the sorts set out above is an external anchor such as a fixed exchange rate or commodity standard. Exchange-rate-oriented policy systems vary considerably in the degree of practical exchange-rate flexibility permitted, from European-style systems with fluctuation bands and adjustable parities at one end of the spectrum to currency boards at the other. The general observation can be made that, the more flexible the exchange-rate pegging mechanism, the more closely the system is likely to resemble one of the domestic targeting arrangements described above. The current Israeli system offers an interesting example of an intermediate system where an adjustable exchange-rate band is operated in conjunction with an inflation objective and is effectively viewed as a means of achieving that objective (Ben-Bassat 1995).

In recent years, there has been some revival of interest in currency boards as a distinct monetary-policy alternative. Currency boards were common in early colonial monetary systems and currently operate in several countries, including Hong Kong, Argentina and some eastern European countries. There was a brief flurry of advocacy of a currency-board arrangement for Australia a number of years ago.[7] In essence, a currency board involves a fixed exchange rate where the board is required to hold reserves of the anchor currency at least equal to the domestic monetary base, the intention being that convertibility between the domestic and foreign currencies could thus be guaranteed. Market operations in such a system are strictly limited to exchanging currency on demand at the official exchange rate, so the system eliminates any scope for independent policy action. The proposal thus has a natural appeal to economists opposed to central bank discretion, and those supporting it in Australia did so on principle rather than with a case for linking to any particular currency in mind.[8]

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7.   Currency boards were put forward in the Australian debate by Hartley and Porter (1988), Hanke, Porter and Schuler (1992) and Walters (1992). For detailed exposition and analysis of currency boards, see Schwartz (1993).

8.   None of the papers cited above in respect of Australia address the question of which currency would be the anchor.

Leaving aside for the moment the question of whether a fixed exchange rate is in itself desirable, the structural features of currency boards have not been without criticism. The currency-board structure is designed to be, in principle, run-proof, but critics argue that a 100 per cent reserve requirement is not sufficient to guarantee this. A strict currency board is prevented from acting as a lender of last resort and cannot provide discretionary liquidity support to the banking system or to government securities markets. In effect, the monetary system is anchored to that of the base currency, but without access to discretionary liquidity support from that source. This being the case, it is conceivable that, even with 100 per cent reserve backing of the monetary base, such a system could still be vulnerable in the event that expectations of devaluation triggered attempts to liquidate bank deposits and government securities in order to obtain foreign currency.[9] This point is acknowledged by some proponents of currency boards, and the implication drawn is that reserves well in excess of the monetary base might be needed to secure viability.

Another class of rule-based remedies sometimes put forward by critics of existing monetary arrangements is the commodity standard. The simplest cases of gold or other single-commodity standards have numerous historical precedents, although most proponents in recent years have argued for more sophisticated multi-commodity systems, designed to be less sensitive to changes in the relative prices of the anchor commodities. In the Australian debate, commodity standards have been advocated in recent years by White (1989) and Evans and Dowd (1992). The general form of these proposals is to require currency issuers to guarantee convertibility between the currency and the designated commodity basket at a fixed parity. In principle, such a system could be operated either by a central bank or, as discussed below, by competing private banks subject to the convertibility requirement.

Proponents of these schemes recognise the practical difficulty of requiring conversion of a whole commodity basket, and they therefore envisage a provision that the public could demand conversion using any individual commodity in the basket, based on prevailing relative prices. In this way, it is argued that stability of the commodity-price index as a whole would be ensured without the public having to transact all commodities in the basket. A variant of this proposal, put forward by Dowd (1990), would adjust the parity price of the commodity basket by an amount sufficient to offset movements in the consumer price index. The argument is that this would provide an automatic mechanism guaranteeing general price stability – in effect, whenever the CPI was above its target level, the public would have the right to buy commodities at a discount from the monetary authority.

2.5   Monetary *laissez-faire*

Closely related to the literature on commodity standards are various proposals for monetary *laissez-faire*. Like currency-board proposals, these would involve abolition of central banks, and they therefore appeal to a certain brand of economists with radical libertarian views. There are two main types of proposal in this field, which are often put under the general label of 'free banking'. The less radical of the two, implicit in the work

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9.   This appears to have been an important phenomenon in Argentina in the aftermath of the Mexican crisis; see OECD (1995).

of Dowd (1996) and other commodity-standard proposals, would involve a free-banking regime linked to a legally established commodity standard. The essence of this system is the absence of any government-guaranteed money: the government's role would be limited to defining the unit of account, and private currency issuers would compete to offer sound money denominated in that unit.

The more radical (and truly *laissez-faire*) proposal is that envisaged by Hayek (1990) and others, under which there would be no government-determined nominal anchor at all. Instead, competing private issuers would be free to link their currencies to any value standard, or to issue pure fiat monies, subject only to a combination of self-imposed constraints and market discipline to prevent over-issue. Interestingly, it is recognised that currency issuers in such a system would face a kind of time-consistency problem analogous to that studied in the inflation-targeting literature, since issuers would always have an incentive to inflate away the value of their liabilities. However, provided this could be overcome by appropriate pre-commitment mechanisms, it is argued that competition among money issuers in such a model would lead to a convergence on Friedman's (1969) socially optimal inflation rate (Selgin and White 1994).

Needless to say, these radical systems have not been implemented, so it is not possible to point to practical working models. According to Selgin and White (1994), the nearest approximation to a free-banking system occurred in 19th century Scotland under a gold exchange standard, although even in that case there appears to be some room for debate as to how pure an example of free banking this represents.[10]

3.   Criteria for Choosing between Systems

Leaving aside some of the more radical elements from the above menu, the range of feasible policy options can be viewed as including a spectrum of intermediate- and final-targeting systems, along with policies based on fixed or managed exchange rates. In examining the merits of the various alternatives, three main characteristics of a desirable monetary-policy system would seem to be relevant.[11] First, the system must satisfy the nominal-determinacy requirement. This means that it must anchor the inflation rate, at least in the long run, which rules out fixed nominal or real interest rates along with any rule directed only at real variables. The second characteristic is efficiency, or desirable short-run stabilisation properties in terms of the variables that enter into the social objective function. Thirdly, the system should have desirable properties in terms of discipline, commitment and its effect on inflation expectations.

Arguably there is some trade-off involved between the second and third of these characteristics. In general, complex rules out-perform simple rules in terms of stabilisation properties, since they can encompass simple rules as special cases. But policy credibility – the third characteristic – is usually argued to require a reasonable degree of simplicity in the policy framework. Indeed, the whole debate on choosing among alternative

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10. Goodhart (1988) argues that the Scottish banks benefited indirectly from liquidity support from the Bank of England.

11. This classification is adapted from Hall and Mankiw (1994).

targeting frameworks presupposes that the relevant choices are among relatively simple rules. I return to this point below after looking in more detail at the question of short-run stabilisation.

3.1 Stabilisation and the sources of shocks

Focusing on relatively simple rules of the types outlined in the previous section, the question can be asked: which class of rules is most likely to provide satisfactory properties of macroeconomic stabilisation? To answer this question comprehensively would require a full-scale simulation exercise along the lines of de Brouwer and O'Regan (1997) and McKibbin (1996) to assess the properties of the competing rules. But without going into that kind of exercise, some general principles can be outlined on the basis of theory combined with evidence about the sources of potential shocks.
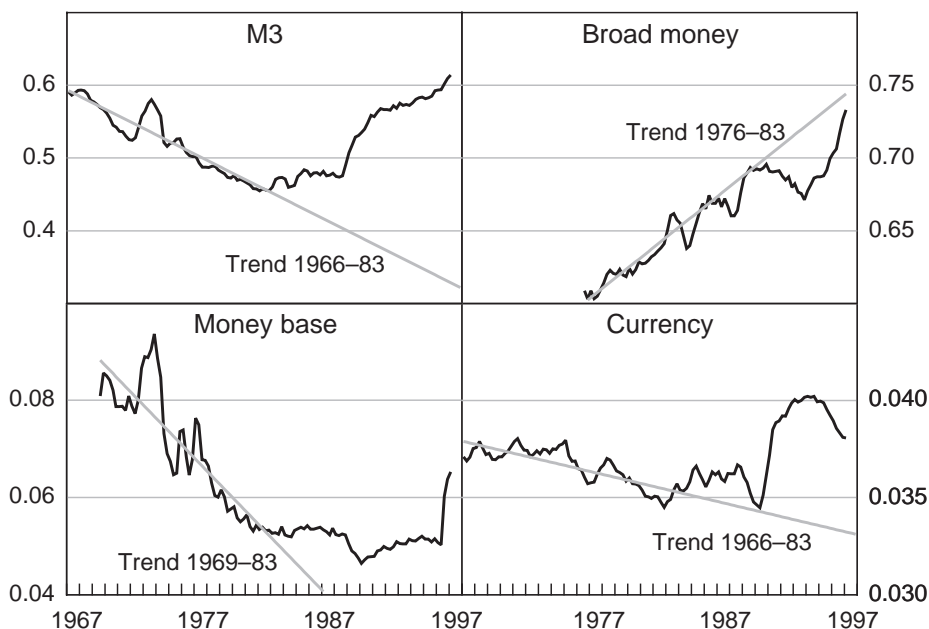
It can be presumed that the policy objective function includes a goal of minimising some combination of price and output variability. Fixed rules in terms of a monetary quantity or an exchange rate will tend to perform badly by these criteria when there are economically significant shocks that move the equilibrium relationship between the fixed variable and the variables in the objective function. The classic cases of this principle are shocks to domestic money demand and external shocks affecting the real exchange rate. There is considerable evidence in Australia that both types of shock are economically important.

3.2 Money-demand stability

In the case of money-demand shocks, the well-known result from Poole (1970) is that, with a fixed money supply, the shock is transmitted directly to interest rates and to the real economy, whereas a rate-setting policy automatically offsets the shock. This intuitive result translates readily into more general theoretical frameworks where the rate-setting policy is linked to final policy targets of the kind discussed above (Edey 1990).

Considerable efforts have been devoted in Australia, as elsewhere, to empirically examining aspects of money-demand stability. In Australia, the most comprehensive recent study appears to be that of de Brouwer, Ng and Subbaraman (1993). This study systematically examined a series of money-demand functions using a range of alternative definitions of the key variables and alternative testing procedures. A key aspect of the study was to test for the existence of a cointegrating relationship between money, income and the short-term interest rate, which would seem a minimal requirement for reliance on a monetary target for policy purposes. The results provided supporting evidence of cointegration in only a small minority of the permutations that were generated (11 of a possible 192). The strongest evidence of cointegration was found in the case of the currency aggregate (8 out of 24 cases), but this relationship has since deteriorated, with the ratio of currency to income shifting markedly in the out-of-sample period. These results confirm the visual impression of instability apparent from the data on money-to-income ratios in Figure 1.

Figure 1: Monetary Aggregates
As a proportion of GDP

Other studies such as those by de Haan and Zelhorst (1991) and Stevens, Thorp and Anderson (1987) approached the issue by focusing on parameter stability, finding evidence that parameters were unstable. This contrasts with earlier results such as that of Pagan and Volker (1981) which found no evidence of instability. A point often overlooked in this literature is that parameter stability is a necessary, but not a sufficient, requirement for viability of a policy that relies on the monetary aggregates. In Poole's and similar analyses, the unattractiveness of monetary targeting stems not from parameter change, but from the variability of the error term in the money-demand equation. It is this term that transmits shocks to the interest rate under a fixed money rule and thereby shocks the real economy, particularly when the interest elasticity of money demand is low. In this context, it is relevant to note that, even in empirical studies where the parameters appear stable, quarterly standard errors in the money-demand equations are quite high – typically of the order of 2 per cent. Given the very low interest elasticities of money demand that are typically estimated, this would imply highly volatile interest rates if the stock of the given aggregate were to be stabilised. (Of course, convinced proponents of monetary targeting would argue that expectations under such a regime would change in a way that would engender greater stability.)

A less-demanding requirement that might be made of the monetary aggregates is that they convey useful short-run information on prices and output even where they do not have a stable long-run relationship with those variables. Even here, however, the evidence is not particularly encouraging. Weber (1993) did find a significant role for M1 as an explanator in a VAR system including output. However, a more exhaustive study

by Tallman and Chandra (1996), covering a range of financial aggregates and specifications over the period 1976 to 1995, found little evidence of a consistently useful information role for the aggregates over most of the period.

Related to the issue of money-demand stability is that of controllability of the targeted aggregate. The experience of most monetary-targeting regimes has been that monetary aggregates were not controlled with the degree of accuracy implied by their target bands, either because they could not be controlled to that degree or because, as a result of money-demand instability, it was not sensible to do so. Outcomes of monetary targets in a range of these countries are summarised in Table 1. Difficulties in control and interpretation are evident in the fact that many countries experimented with more than one aggregate in the search for a reliable relationship, and most, with the possible exceptions of Germany and Switzerland, eventually downgraded or abandoned their targets. In most of the countries included in the table, the specified targets or projections were achieved only about half the time and, on average, monetary growth deviated from target midpoints by about 2 percentage points. In these respects, the two countries usually regarded as the most serious monetary targeters, Germany and Switzerland, fared no better than the rest.

Table 1: Monetary Targets and Projections

Country		Period	Average absolute deviation from target midpoint	Proportion of years within target range (%)[a]
Australia		1977–1985	2.6	33.3
Canada		1976–1982	1.3	71.4
France		1977–1996	2.5	50.0
Germany		1975–1996	1.8	54.5
Italy		1975–1996	2.7	31.8
Switzerland		1975–1996	2.6	47.6
United Kingdom		1976–1996	2.7	52.4
United States	M2	1975–1996	1.5	63.6
United States	M3	1975–1996	1.8	40.9

Australia – M3

Canada – M1

France – M2 (1977–1983), M2R (1984–1985), M3 (1986–1987), M2 (1988–1991), M3 (1992–1996)

Germany – Central Bank Money (1975–1987), M3 (1988–1996)

Italy – TDC (1975–1985), M2 (1986–1996)

Switzerland – M1 (1975–1979), Monetary base (1980–1996)

United Kingdom – M3 (1975–1983), M0 (1984–1996)

Note: (a) Where a point target was specified, a range of 1.5 percentage points either side of the midpoint has been assumed.

Source: Argy, Brennan and Stevens (1989) updated from national sources.

3.3   Terms-of-trade shocks and the real exchange rate

It is well documented that Australia's real exchange rate is subject to significant cyclical swings and that terms-of-trade movements, driven by commodity export prices, are the principal medium-term contributor to that process (Gruen and Wilkinson 1994). Given Australia's position as a small economy and a price taker in world markets, these terms-of-trade movements can, to a first approximation, be regarded as exogenous. From the point of view of the monetary framework, this raises the question of how the nominal exchange-rate response to these shocks should be managed: whether the nominal rate should be allowed to adjust, or whether the required real exchange-rate changes should be effected through price-level adjustment. Most standard models would imply a preference for nominal exchange-rate flexibility in these circumstances, which would seem to be a major reason why advocacy of a return to fixed exchange rates has remained a minority view in the Australian debate.

The magnitude of terms-of-trade effects on the economy under different exchange-rate regimes is illustrated in Figure 2, adapted from Gruen and Dwyer (1995). This illustrates the impact of major terms-of-trade shifts in three historical episodes – the first two under a fixed exchange-rate regime in the 1950s and 1970s, and the third floating. The differences in outcomes under the two regimes seem clear. With a fixed exchange rate, terms-of-trade shocks were transmitted more or less directly to domestic inflation and, to a lesser extent, to the business cycle whereas, in the floating-rate episode, the shock was largely absorbed by exchange-rate fluctuation.[12]
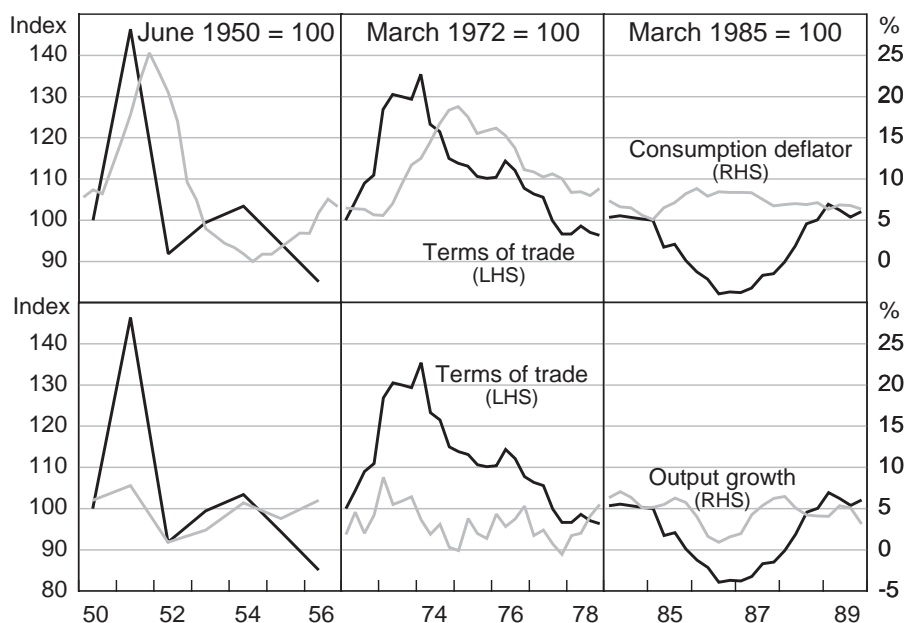
The international comparisons presented in Table 2 suggest that this issue is likely to have greater relevance for Australia than for most other countries. In international terms, Australia's terms of trade are highly variable, with only Japan and New Zealand among OECD countries experiencing greater variability in the period since 1970. Terms-of-trade variability reflects, among other things, differences in the commodity intensities of a country's exports and imports. New Zealand and Australia are relatively intensive commodity exporters, and manufactured-goods importers, while in Japan the reverse is the case. Both configurations result in relatively high terms-of-trade variability. In contrast, many of the European countries have relatively stable terms of trade and are therefore likely to be less subject to shocks to their real exchange rates from that particular source. These rankings point to one possible reason why fixed exchange rates have remained more popular, or have been more sustainable, in Europe than elsewhere.[13]

Another dimension of this issue is the correlation between a country's terms-of-trade movements and those of potential partners in a fixed exchange-rate arrangement. The case might be made that terms-of-trade movements would be less likely to disrupt a fixed exchange-rate arrangement where they are closely correlated among the countries concerned. To examine this, some terms-of-trade correlations with the major economies are presented in the right-hand columns of Table 2. The pattern emerges that the closest

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12. In the 1970s episode, however, discretionary exchange-rate adjustments probably dampened the effects.

13. This line of argument ignores possible endogeneity of the terms of trade but, in the case of small countries, which must be regarded as price takers on world markets, this seems likely to be a reasonable approximation.

Figure 2: Terms of Trade, Inflation and Output Growth

terms-of-trade correlations involving any of the three major economies are generally those between the continental European economies and Germany. No doubt this is partly a consequence of imposed exchange-rate stability among these countries, but it is also likely to reflect similarities in their composition of trade which imply that they are less exposed to divergent relative-price shocks. Australia's terms of trade are not only highly volatile, but are only weakly or negatively correlated with those of the major economies. This again points to the relative unsuitability for Australia of a fixed exchange rate to one of those countries.

These arguments point, at least impressionistically, to the likelihood that terms-of-trade variability would make a significantly greater contribution to macroeconomic variability in Australia under a fixed exchange rate than under an alternative policy focused on final objectives. Recent theoretical contributions such as those of Eichengreen and Wyplosz (1993) and Obstfeld (1994) have focused on another disadvantage of fixed exchange-rate regimes, namely their potential vulnerability to self-fulfilling attacks. This literature, stimulated by the European exchange-rate crises of 1992–93, points to an important interaction between the macroeconomic stabilisation properties of exchange-rate regimes and their vulnerability to attack.

A self-fulfilling attack in this context is defined as arising where the expectation of a devaluation raises the domestic interest rate to a point that reinforces devaluation risk and makes further currency defence unsustainable. This was arguably an important feature of the ERM experience in 1992–93. Eichengreen and Wyplosz argue that the growth of international capital mobility has significantly increased the risk that this form of instability of a fixed exchange rate can arise. The theory suggests that speculative

Table 2: Terms-of-trade Variability, 1970–95[a]

	Standard deviation (per cent)	Correlation with: United States	Japan	Germany
Asia-Pacific				
Australia	8.7	0.20	-0.05	-0.22
Hong Kong	1.7	0.00	-0.50	-0.60
Japan	11.4	0.57	1.00	0.75
Korea	7.9	0.70	0.70	0.60
New Zealand	10.1	0.22	0.28	0.09
Singapore	2.0	0.20	-0.40	-0.30
North America				
Canada	3.3	-0.42	-0.51	-0.41
United States	4.4	1.00	0.57	0.43
Europe				
Austria	3.0	0.30	0.41	0.73
Belgium	7.1	0.00	0.05	-0.14
Denmark	3.7	0.55	0.75	0.87
Finland	4.1	0.31	0.27	0.45
France	5.0	0.66	0.82	0.88
Germany	4.9	0.41	0.73	1.00
Greece	4.3	0.09	-0.07	-0.41
Iceland	2.8	0.15	0.58	0.44
Ireland	5.1	0.56	0.54	0.54
Italy	5.4	0.42	0.63	0.84
Netherlands	1.8	0.59	0.39	0.48
Norway	7.2	-0.27	-0.76	-0.76
Portugal	4.6	-0.03	0.63	0.55
Spain	6.8	0.32	0.65	0.63
Sweden	3.7	0.53	0.38	0.55
Switzerland	4.5	0.55	0.68	0.79
United Kingdom	4.3	0.32	0.11	0.23

Note: (a) Calculated from percentage changes in terms of trade. Hong Kong data begin 1983, Singapore 1980, Iceland 1975 and Switzerland 1972.

Sources: National government publications.

attacks are most likely to occur under conditions where the exchange-rate link is not in some sense a natural fit: for example, where the relevant countries are subject to divergent shocks, or where the exchange-rate commitment is not underpinned by some exogenous political logic. Recent empirical work on currency crises by Funke (1996) provides some support for these models.

For the purposes of the present discussion, the important point is not just that fixed exchange rates are potentially vulnerable to attack, but that the degree of vulnerability, both in theory and practice, seems to be related to the performance of an exchange-rate regime in terms of domestic macroeconomic stabilisation. Speculative attacks are most likely to occur where there is perceived to be a strong domestic policy logic favouring realignment, and this situation in turn is most likely to arise in countries where there are significant shocks that move the real exchange rate. In light of the preceding discussion this point has obvious relevance to the choice of monetary regime for Australia.

3.4   The role of intermediate targets

The evidence described above is supportive of the general claim that Australia is subject to important shocks to domestic money demand and to the real exchange rate. These shocks tend to worsen the performance of fixed money-supply or fixed exchange-rate rules relative to policies based on targeting of final objectives. A useful way of formalising this argument in the case of money-supply rules is to consider the following three types of rule (where the notation is interpreted as deviations of variables from steady-state or target values):

(i)   *Fixed money supply*

Assuming the money-demand function is of the form

$$m_t = p_t + y_t - \delta i_t + u_t$$

a fixed money supply rule implies that the interest rate is determined by

$$i_t = \frac{1}{\delta}(p_t + y_t) + \frac{1}{\delta} u_t.$$

(ii)   *Money target*

Under this rule the interest rate is assumed to adjust according to

$$i_t = \gamma m_t.$$

Combining this with the money-demand function, the equation for the interest rate is

$$i_t = (\frac{\gamma}{1+\gamma\delta})(p_t + y_t) + (\frac{\gamma}{1+\gamma\delta})u_t.$$

(iii)   *Final-targeting policy*

Policy responds to some weighted combination of expected deviations of prices and output from normal or targeted values,

$$i_t = \gamma_1 E(p_t) + \gamma_2 E(y_t).$$

The structure of these rules is such that each can be considered a restricted case of the one below it. The problem faced by the policy-maker in the case of rules (ii) and (iii) is to choose optimal response parameters, given available knowledge about the structure of the economy and the sources of shocks. Expressed in this way, the money-supply target can be viewed as a restricted version of the final-targeting policy, where the money stock is considered as a signal conveying information about the variables in the reaction function. An intermediate target for the money stock, rigorously followed, thus amounts to an information restriction that requires the monetary authority to ignore all other sources of information about prices and output. At the next level in the hierarchy of rules, the fixed money rule can be viewed as a special case of the money-targeting rule; it corresponds to the case of perfect control, where the response elasticity with respect to deviations of the money stock from target tends to infinity. Given this hierarchical structure, it can thus be argued that final-targeting policies encompass intermediate monetary targets and fixed money rules as special cases, and therefore outperform them. An analogous argument could be made with respect to the potential role of the exchange rate as a target or policy indicator.

Related to this argument is Svensson's (1996) view that, under inflation targeting, the inflation forecast can be seen as the intermediate target of policy. The policy rule, in effect, is to adjust the instrument to ensure that the inflation forecast is continually consistent with the target. Again, this makes clear that a conventional intermediate monetary-targeting strategy is really a restricted form of a final-targeting policy that uses the money stock as the sole signal for the expected value of the final target variable.

3.5   Simplicity and credibility

The preceding discussion underlines the point that simple rules are outperformed, in terms of stabilisation properties, by complex rules. But simple rules are argued to carry advantages in terms of transparency and credibility. This leads naturally to the idea that some flexibility could be given up in order to obtain those benefits.

This issue is related to, but not identical to, the question of rules versus discretion in the conduct of monetary policy. The rules-versus-discretion debate defines discretion as policy that is unconstrained by pre-commitment. Discretionary policy in this sense is argued to give rise to a short-term focus by the policy-maker that results in inflationary bias. This principle underlies much of the theoretical literature on inflation targeting, which seeks to devise pre-commitment technologies and incentive schemes to 'solve' the time-consistency problem.

Opinions differ as to the practical relevance of this approach. Summers (1991) claims that the time-consistency problem is central to the design of appropriate policy institutions. A similar claim is implicit in the literature on optimal incentives for central bankers, which models the way governments can use contracts and other constraints to stop central banks from generating excessive inflation. Others such as McCallum (1995) and Blinder (1996) are sceptical that a presumed desire of the public and politicians to restrain inflationist central banks could really be the key issue. Arguably, the reverse is more likely. McCallum (1995) makes the further point that, even on this literature's own terms, government-imposed constraints do not solve the time-consistency problem but merely

re-locate it; governments who set the policy parameters would be subject to the same time-consistency problem as is assumed to exist for central banks.

Another criticism of the time-consistency literature is that it fails to identify the attractions of simplicity. In the time-consistency approach the key requirement of a credible policy is pre-commitment. This has no necessary link with simplicity: in general, complex or conditional rules will still outperform simple fixed rules provided full pre-commitment to such a rule is possible. While it might be argued that pre-commitment would be more effective with a simple rule, this does not seem to capture the main practical arguments for simplicity. In practice, simple rules are sought partly because they are less likely to be model-dependent and, perhaps more importantly, because they are likely to foster public understanding and learning about the policy framework. King (1996) notes that these latter considerations are hard to model but likely to be important in practice.

It can be argued that final-targeting rules such as inflation targets have become popular because they reflect a balance of simplicity and flexibility. These considerations are also relevant to the more detailed questions of target design within a final-targeting regime. As King's paper notes, any final-targeting framework can be thought of as a combination of an inflation target and a response to real shocks. The need to balance flexibility and simplicity is clearly relevant to decisions as to how tightly to specify the inflation target and how much emphasis to give to factors other than inflation in the policy rule.

In this context, it is relevant to ask the question: in what sense are the final-targeting or rate-setting rules discussed in this paper really rules? As Blinder (1996) notes, this question is partly one of semantics. Any systematic way of conducting policy can in principle be written down in algebraic form and called a rule. But usually when we talk about rules there is some connotation of simplicity and verifiability, in the sense that an observer would be able to monitor ongoing compliance with the rule by the policy-maker. The final-targeting policies described here do not have that characteristic because they generally require policy to respond to forecasts which can never be determined purely objectively. This suggests a better characterisation of final-targeting policies such as inflation targets is Bernanke and Mishkin's (1997) concept of 'constrained discretion'. The targeting framework defines the objectives sufficiently tightly to constrain central bank behaviour, but not to the extent of precisely prescribing movements in the instrument. The central bank's job is to filter information for its implications for inflation and other relevant variables, and to assess the required response in terms of the policy instrument. The framework could thus be described as allowing discretion at the level of interpreting information, but subject to constraints at the level of goals and ultimate outcomes.

4.   The Policy Spectrum in Practice

The point has already been made that differences among alternative policy approaches are not as great in practice as they can be made to appear in theory. Tables 3 and 4, adapted from the BIS and Padoa-Schioppa (1996), classify a range of industrial countries into four groups according to their broad policy approaches. The clearest practical distinction is between the exchange-rate-oriented approaches that prevail in continental Europe and

the rest. Reasons for the policy preference for exchange-rate stability in the European countries are well known and have already been alluded to. They include the desire to 'import' monetary discipline and credibility through the currency anchor, the relatively high degree of integration and macroeconomic convergence among at least the core group of European countries, and the role of exchange rates in the longer-run strategic program for monetary and political integration.

With regard to the strictest form of fixed exchange-rate arrangement – the currency board – there are several working examples at present (Table 5). Generally, the countries that now have currency boards are either extremely small former-colonial economies (not included in the table), or are countries that have had special historical reasons for adopting such an arrangement. For example, Hong Kong's currency board was adopted in the midst of serious financial turmoil associated with uncertainty about the colony's political future. In Argentina, a currency board was adopted in 1991 in an effort to bring to a definitive end several decades of unsatisfactory monetary performance characterised by bouts of hyperinflation. Currency boards have been adopted in Estonia and Lithuania and have been proposed recently in other countries such as Bulgaria, as part of the program of transition to market-based economic systems in these countries. The common element in all these country experiences was a desire, as a result of the particular historical circumstances of each country, to make a decisive break with the previous monetary regime.

Table 3: Styles Of Monetary Management
G7 Countries, 1970–94

	Exchange-rate pegging	Money supply	Inflation	'Classic Style'[a]
United States	—	1979–84	—	1970–78, 85–94
number of years		6		19
Japan	1970–71	—	—	1972–94
number of years	2			23
Germany	—	1975–94	—	1970–74
number of years		20		5
France	1970–71, 79–94	—	—	1972–78
number of years	18			7
United Kingdom	1970–71, 90–92	1980–83	1993–94	1972–79, 84–89
number of years	5	4	2	14
Italy	1970–71, 79–92	—	—	1972–78, 93–94
number of years	16			9
Canada	—	—	1991–94	1970–90
number of years			4	21
Total number of years	*41*	*30*	*6*	*98*

Note: (a) The terminology is Padoa-Schioppa's and refers to floating exchange-rate countries that do not place a heavy reliance on numerical targets.

Source: Padoa-Schioppa (1996).

Table 4: Classification of Monetary-policy Approaches
Selected OECD Countries, 1997

Exchange-rate pegging	Monetary target	Inflation target	No numerical target
France	Germany	UK	US
Italy	Switzerland	Canada	Japan
Netherlands		Australia	
Belgium		New Zealand	
		Sweden	
		Spain	
		Finland	

Sources: Padoa-Schioppa (1996) and BIS Annual Reports (1996, 1997). Padoa-Schioppa's classifications are used for the G7 countries, except that Italy is now counted as having returned to a narrow exchange-rate band. Other countries are counted as exchange-rate peggers where they are classified as having a narrow exchange-rate band by the BIS. Otherwise, the BIS classification as to the 'domestic anchor' is used. Spain is an unusual case because it is classified by the BIS as having both a narrow exchange rate band and an inflation target.

Table 5: Currency Boards
Countries with Population Greater than 1 Million

Country	Base currency	Year established
Argentina	US dollar	1991
Estonia	Deutschemark	1992
Hong Kong	US dollar	1983
Lithuania	US dollar	1994
Namibia	South African rand	1993

Of more relevance to Australia are the remaining countries listed in Table 4, where the three remaining policy approaches cited are inflation targets, monetary targets, and policies without explicit numerical objectives. The sources cited for the table count Germany and Switzerland as currently the only two monetary-targeting countries in the group. According to Padoa-Schioppa (1996), a monetary target has been the main policy anchor in only two other cases among the G7 countries in the period since 1970: the US in 1979–84 and the UK in 1980–83. Switzerland has, since 1980, conducted a monetary-base target, first on an annual basis and subsequently, since 1990, on a five-year moving-average basis with a target average growth rate of 1 per cent per annum. In Germany, a target for M3 has been in operation since 1988, replacing an earlier target for Central Bank Money.

As was noted in the previous section, neither the Swiss nor German targets have been adhered to with the sort of mechanical precision assumed in the textbook analysis of monetary rules; on average, targets in the two countries have been achieved with about the same frequency as was typical in countries that subsequently abandoned or downgraded their targets. Monetary authorities in both countries pay attention to more general macroeconomic developments in determining policy settings, and both have publicly announced numerical objectives for inflation in the longer term (2 per cent in Germany, 1 per cent in Switzerland). The monetary target in Germany is explicitly derived each year from desired outcomes for inflation and growth in the year ahead. In this sense, the differences in approach from those of countries with inflation targets or non-explicit objectives would seem to be primarily at the level of public explanation: the monetary target, particularly in Germany, functions as a device for communicating and explaining the policy strategy.[14]

The most numerous group of countries in Table 4 comprises those classified as inflation targeters. The distinguishing feature of these regimes is an explicit numerical inflation objective which serves as a basis for the central bank's decision-making and for a process of accountability and public explanation; policy is generally conducted through the short-term interest rate, although some countries focus on a monetary conditions index as a short-term policy indicator. Within this general definition, there are a number of shades of difference relating to the target level, time horizon and the nature of the mechanisms for pre-commitment and accountability, some key features of which are summarised in Table 6.

In terms of target levels the various countries are fairly close together, with the most common target midpoint being 2 per cent; Australia and the UK have target midpoints of a half percentage point above that, while New Zealand is a half percentage point below. The more important differences in system design would seem to be those that govern the degree of flexibility permitted to the central bank to tolerate temporary variations in inflation around the target midpoint. In principle, systems with hard-edged bands and commitments to keep inflation continuously within a specified range, as in New Zealand, can be contrasted with systems such as those of Australia and Finland that focus on the average rather than the permitted range; however these differences can be easily exaggerated given the presence of caveats and exclusions in many systems. Also relevant are the reporting mechanisms for explaining policy and for requiring the central bank to account for its actions, including potentially accounting for any failure to achieve inflation outcomes consistent with the target. Issues of appropriate design of these characteristics are to be covered by other papers at this conference and are not analysed here. For the current discussion, the main point to note is that these design features can be thought of as placing the inflation-targeting countries on a spectrum, within which there is an underlying similarity of objectives for inflation but with varying degrees of pre-commitment to limiting its variability.

One could take this argument further and argue that non inflation-targeters such as the US and Germany can be placed on the same spectrum. There is an obvious affinity with the inflation targeters in their anti-inflation objectives, as well as a similarity in the style

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14. This view is supported by Clarida and Gertler's (1996) estimates of a German policy reaction function.

Table 6: Characteristics of Inflation Targets in Selected Countries

Country	Target first announced	Current target range	Target details			
			a. Target variable	b. Other caveats	c. Set by	d. Target horizon
New Zealand	March 1990	0–3% band; no explicit midpoint	a. Consumer price index (CPI) excluding interest-cost components, government charges, indirect taxes and subsidies and significant changes in import or export prices. b. Natural disasters. c. Policy Target Agreement (PTA) between Finance Minister and central bank Governor. d. PTA for the five-year tenure of the Governor.			
Canada	February 1991	midpoint 2%; ±1% band	a. CPI. b. Food and energy prices, indirect taxes, natural disasters. c. Finance Minister and central bank Governor. d. December 1993: 1995–98 target; new target by end 1997.			
United Kingdom	October 1992	2.5%; ±1% reporting range	a. Retail price index excluding mortgage interest payments. b. Indirect taxes and subsidies. c. Chancellor of the Exchequer. d. Indefinite.			
Sweden	January 1993	midpoint 2%; ±1% band	a. CPI. b. Indirect taxes and subsidies, interest costs and effects of depreciation after the move to a flexible exchange rate. c. Bank of Sweden. d. 'in 1995 and beyond'.			
Finland	February 1993	2%; no explicit band	a. CPI excluding indirect taxes, subsidies and housing-related capital cities. b. – c. Bank of Finland. d. 'permanently'.			
Australia	1993	average of 2–3% over the medium term	a. CPI excluding fruit and vegetables, petrol, interest costs, public-sector prices and other volatile prices. b. – c. Reserve Bank of Australia. d. Indefinite.			
Spain	Summer 1994	3.5–4% by first quarter 1996; <3% by late 1997	a. CPI. b. – c. Bank of Spain. d. Medium-term objective for 1997.			

Source: BIS 1996 Annual Report, updated to incorporate recent changes to targets in the United Kingdom and New Zealand.

of decision-making.[15] What distinguishes the inflation targeters is their use of the targets as a formal pre-commitment mechanism and as a vehicle for focusing the public's inflation expectations and explaining policy actions.

Developing a theme from the previous section, we might expect to find that tighter pre-commitment mechanisms would be adopted in countries that have felt the greatest need to signal a clear regime shift. This seems most likely to be the case where inflation performance in the past has been relatively unsatisfactory. The historical inflation experiences summarised in Table 7 seem broadly consistent with that pattern. The countries that now have inflation targets are those that had relatively high inflation rates in the late 1970s, were slow to bring inflation down in the 1980s, and did not have a

Table 7: Consumer Price Inflation
Average annual rate

	1976–80	1981–85	1986–90	1991–96	Latest
Pegged exchange rate					
France	10.5	9.7	3.1	2.2	0.9
Italy	17.0	14.0	5.7	4.9	1.6
Belgium	6.4	7.0	2.1	2.4	1.7
Netherlands	5.9	4.2	0.7	2.6	2.2
Average	**10.0**	**8.7**	**2.9**	**3.0**	**1.6**
Monetary target					
Germany	4.0	3.9	1.4	3.2	1.6
Switzerland	2.3	4.3	2.5	2.8	0.5
Average	**3.1**	**4.1**	**2.0**	**3.0**	**1.1**
Inflation target					
United Kingdom	14.4	7.2	5.9	3.2	2.6
Canada	8.8	7.5	4.5	2.1	1.5
Australia	10.6	8.3	7.9	2.5	1.3
New Zealand	14.8	12.1	9.4	2.1	1.8
Spain	18.6	12.2	6.5	4.9	1.5
Sweden	10.5	9.0	6.2	3.6	0.2
Average	**13.0**	**9.4**	**6.7**	**3.1**	**1.5**
No numerical objective					
United States	8.9	5.5	4.0	3.1	2.2
Japan	6.7	2.8	1.4	1.2	1.9
Average	**7.8**	**4.2**	**2.7**	**2.2**	**2.1**

Source: Datastream.

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15. This view receives some support from Chinn and Dooley (1997), who find no significant differences in estimated policy reaction functions for the US, Japan and Germany.

satisfactory option of importing low-inflation credibility through the European exchange-rate mechanism. New Zealand, which probably has the hardest-edged target, had one of the worst inflation records to overcome. In contrast, countries like the US and Germany, with much better track records, arguably had less need for that kind of policy constraint. Notwithstanding these differences in starting points, the table illustrates that there has been a substantial convergence in inflation outcomes in the 1990s across all four policy approaches.

5.   Conclusions

The debate on policy alternatives in Australia in the past decade has canvassed a wide range of approaches, some radical and some more conventional. The argument developed in this paper is that the combined logic of theory, empirical evidence and international experience point to what I have termed final-targeting systems, of which inflation targets are a special case, as the approach most likely to deliver satisfactory outcomes. The policies of most industrial countries at present, other than those where policy is directed at exchange-rate stability, can probably be placed under this general heading.

Final-targeting systems would seem to fit somewhere in between traditional concepts of rules and discretion in monetary policy. They embody an element of rule-like behaviour because they constrain monetary policy within certain broad bounds, but they are not true rules in the sense of describing a precise and indisputable path for the policy instrument at each point in time. The description of these systems as a form of 'constrained discretion' (in the terminology of Bernanke and Mishkin) probably best captures their essential characteristic.

Within this category of policy systems, there is a spectrum of possible choices with respect to such design features as the choice of target, width of tolerance bands, accountability and pre-commitment devices and the like. The existence of this spectrum points to a basic and inescapable trade-off between simplicity and flexibility in the design of a policy system. It is not surprising that there is no consensus model at the level of detailed system design, since these characteristics are likely to be valued differently by different countries. The advantages of simplicity are that it promotes accountability, discipline and public understanding of the policy. These things are likely to be considered most valuable where past policies are viewed as unsatisfactory, and so a country's chosen position on the spectrum will tend to reflect its own monetary-policy history.

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