HOW MONETARY POLICY INFLUENCES INFLATION

In this article, Craig Beaumont and Michael Reddell explain how monetary policy affects the rate of inflation, and discusses some of the indicators the Bank looks at in taking policy decisions.

Executive Summary

The goal of monetary policy is price stability. But monetary policy actions do not alter the inflation rate directly or immediately. Nor, in the short-term at least, are such actions the only important influence on inflation. However, over the long-haul monetary policy is the prime determinant of inflation, and it is through the influence of monetary policy on the decisions of individuals and firms throughout the economy that a stable price level can be achieved.

This article explains the major ways monetary policy influences economic decision-makers - from ordinary homeowners to the heads of large multinational firms - and ultimately determines the inflation rate. Although expositional clarity requires the many channels to be described individually, it is important not to lose sight of the essentially interconnected and self-reinforcing nature of the routes through which policy actions lead to changes in the inflation rate.

One major and very obvious channel is the relatively-direct impact of the exchange rate on the prices of internationally traded goods. Another is the impact of interest rates on the demand for goods and services, which in turn should affect wage and price setting decisions in industries throughout the economy. Other linkages discussed include the so-called credit rationing and wealth effects, and the direct impact on economic behaviour of clear and transparent policy goals.

The Bank uses a set of indicators to monitor the degree of disinflationary pressure being exerted. In a world characterised by uncertainty and by many different types of economic disturbances, the interpretation of these indicators is not always straightforward. Each of the several indicators must be analysed in conjunction with the others. The importance of each of the indicators is governed primarily by our view of the strength of each of the various transmission channels. Consistent with this approach, the level and term structure of interest rates and the exchange rate are, at present, the most important individual indicators.
Introduction

The goal of New Zealand’s monetary policy is to stabilise the level of prices. However, there is no direct or immediate linkage between the tools (or instruments) used by the Reserve Bank to implement monetary policy, and the decisions about prices being made by people and businesses throughout the economy. Instead, monetary policy operates indirectly, working through a variety of channels (together known as the ‘monetary policy transmission mechanism’). It is through these channels that pricing decisions, and thus the rate of inflation, are influenced.\(^2\)

This article first gives a brief overview of monetary policy. The main focus of the article is, however, on explaining the major channels through which monetary policy ultimately influences the price level. Finally, because the Bank’s use of the various monetary indicators is based on our understanding of the transmission channels, the indicator framework is also discussed.

\[\text{FIGURE 1}\]

The Monetary Policy Process

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2 In the past, administrative wage and price controls have at times been used in an attempt to control inflation directly, but at substantial cost due to the rigidities these controls introduced into the economy. Administrative controls do not provide a permanent solution to the problems of inflation.

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An Overview on Monetary Policy

Under the Reserve Bank of New Zealand Act 1989, the Bank is required to design and run monetary policy with the aim of achieving and maintaining a stable general level of prices. This broad objective is translated into concrete policy goals in the Policy Targets Agreement between the Governor and the Minister of Finance. The first of these agreements required the Bank to aim for 0-2 per cent annual Consumer Price Index (CPI) increases by December 1992. (At the time of writing, a one year extension to this target date appeared imminent, consequent on the change of government.) The policy targets, and any intermediate inflation track outlined in the six-monthly Monetary Policy Statements, are the starting point for monetary policy monitoring and decision-making.

Figure 1 is a schematic summary of how monetary policy is designed and implemented. Monetary policy actions to tighten or loosen monetary conditions (i.e. changes in the ‘instrument settings’) are taken after a comparison between the current inflation outlook and the prespecified inflation objectives. The impact of such actions on economic activity and prices is transmitted through various channels, many of which work relatively slowly. As the transmission channels operate, developments in various observable indicators occur. These include developments in variables which react almost immediately to policy actions, such as interest and exchange rates. But there are also other intermediate indicators, including wage growth, inflation expectations, and the various measures of money and credit, where the impact of monetary policy can take some considerable time to become apparent.

Some of these indicators themselves affect prices fairly directly and quickly. In other cases, the price linkage is itself indirect, slow, and sometimes uncertain. In many markets, particularly that for labour, prices take some considerable time to adjust to economic events. The Bank monitors all the indicators, and uses them to assess the degree of pressure that is being exerted on inflation. New forecasts for inflation can then be made, which in turn will be compared with the inflation targets the Bank is required to pursue. And so the process comes full circle.

The Transmission Channels

An effective monetary policy depends on the ability of the Reserve Bank to influence short-term real interest rates. This influence exists because the Reserve Bank acts as banker to the financial system.3

Most large registered banks have accounts at the Reserve Bank through which transactions between themselves, their customers, and the Reserve Bank and its customers (principally the Government) are settled. Deposits in these accounts are called settlement cash. Banks are not allowed to go into overdraft on their accounts at the Reserve Bank, so if a bank finds itself short of cash in its settlement account it must either borrow some from a bank with surplus settlement cash or sell some of its Reserve Bank bills back.

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FIGURE 2

Instruments

- Short-term Wholesale Interest Rates
- Retail Interest Rates
- Asset Prices e.g. Equity Property
- Nominal Domestic Demand
- Exchange Rate

Transmission Channels

- Credit Rationing
- Nominal External Demand

Objective

- Goods and Labour Market Restructuring
- Internal and External Competition
- Wholesale and Retail Margins
- Productivity
- Unit Labour Costs
- Wage Rates
- Traded Goods Prices
- Overseas Prices
- Tariff Rates

Policy Targets Agreement

Inflation Expectations

(Dashed boxes indicate influences on inflation outside of the process of monetary policy implementation.)
to the Reserve Bank. If the banking system in total is short then clearly only the latter option, known as discounting, is available. Discounting is costly to banks, as the Reserve Bank will only buy back Reserve Bank bills at a penalty interest rate.

Monetary policy operations consist of being able to alter the supply of settlement cash, or the demand for it. The Reserve Bank has four main instruments to alter the supply and demand for settlement cash, and thus influence money market interest rates. The daily settlement cash target determines the average supply of settlement cash. The Reserve Bank bill issue, the discount margin, and the (below market) settlement cash interest rate can be used to alter the demand for settlement cash.4

Changes in these instruments affect the overnight money market rate almost immediately, as they affect directly the willingness of the banks to bid aggressively in the overnight market to win a larger share of a fixed supply of settlement cash. (Here, as throughout the article, monetary policy actions are illustrated with reference to a tightening. The impact of a loosening is generally symmetrical, although the speed of reaction may vary between the two cases.)

Having secured a movement in very short-term real interest rates, the various transmission channels now come into play. The major transmission channels are shown in Figure 2. What follows will be based around the links shown in that diagram. Some less important potential links have been omitted for the purposes of illustrative clarity. It should also be emphasised that there is generally a range of other influences on each of the variables shown, and in some cases these influences will be of greater importance than those portrayed in Figure 2.

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4 The details of the practical operation of monetary policy and of each of these instruments will be described by John Tait in "The Operation of Monetary Policy" (which will appear in the next issue of the Bulletin).
Wholesale Interest Rates

Because the Reserve Bank can readily alter very short-term money market interest rates, like the overnight call rate, it can also secure indirect, but significant, influence on other wholesale interest rates. This influence exists because the yields on longer maturity instruments are heavily influenced by the expected future path of short rates. If, for example, following a tightening, lenders in the wholesale money markets would receive a lower return on 30 day bank bills than they expect to receive from rolling over call loans each day for a month. Many will prefer to lend on call rather than purchase bills. In implementing this strategy the yield on bills will rise.

Moreover, if, after a tightening, there is no information to suggest that the Reserve Bank will change its monetary policy instrument settings in the near future, and in the absence of other information affecting future liquidity conditions, the wholesale money market will have no reason to expect call rates to move from around their new higher level (at least until the policy measures have brought about a reduction in the inflation rate). As a result of the sort of portfolio reallocations described in the previous paragraph, interest rates on relatively short-term instruments like bank bills can then generally be expected to fluctuate around the average call rate. (The close relationship between the overnight call interest rate and the interest rate on 30 day bank bills is illustrated in Figure 3.)

![Figure 4: Exchange Rate and Interest Rate Differentials](image)

*Exchange Rate and Interest Rate Differentials
Australia/N.Z. Exchange Rate vs. Gap between N.Z. and Australian 90 Day Rates

December Years

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Exchange Rate Effects

As shown in Figure 2, the most direct connection between short-term wholesale interest rates and the inflation rate is through the exchange rate and its impact on the prices of internationally traded goods. This effect is particularly important in New Zealand because we are a small country generally unable to influence the foreign currency prices of the goods we buy and sell.

Following the removal of New Zealand’s exchange controls on capital flows in 1984, funds are now highly mobile between New Zealand and other countries. Individuals and financial institutions are free to seek the best return on their assets, regardless of whether that return is available in New Zealand or overseas. So following a tightening in monetary policy which raises domestic interest rates relative to foreign interest rates, demand for New Zealand dollar denominated securities is likely to increase. With a floating exchange rate, this increased demand puts upward pressure on the exchange rate as overseas investors purchase New Zealand dollars to buy New Zealand dollar securities. Other things being equal, the exchange rate will continue to rise until the higher interest rate available in New Zealand is offset by an expected future fall in the exchange rate. At that point, overall risk-adjusted returns to overseas investors in New Zealand are no higher than those available to them in other markets. (For one example of the broad linkage between interest and exchange rates, see Figure 4. There are, of course, other influences on the exchange rate.)

When the value of the New Zealand dollar rises, imports priced in a foreign currency can be purchased at a lower New Zealand dollar cost. Competitive pressure gradually forces importers and producers to pass on the resulting reduction in their costs, so that the domestic prices of imported goods, and goods with imported materials or components, will tend to fall (or rise less rapidly). Similarly, New Zealand firms producing goods which compete with imports will come under pressure to lower their prices (and profit margins) if they are to maintain market share. The domestic prices of exportable goods, like meat and wool, are also likely to be reduced by an exchange rate appreciation. Following an appreciation, exporters receive fewer New Zealand dollars when they sell their goods at the fixed foreign currency price and competitive pressure should therefore reduce the domestic prices of these goods.

Compared with the other transmission channels, the direct effect of the exchange rate on the prices of traded goods and non-traded goods which have imported inputs is generally reliable and fairly quick to operate. As discussed later in the article, the strength of this linkage is one of the reasons why in recent years, as the Reserve Bank has focused more on specific inflation objectives, the Bank has also come to pay much greater attention to movements in the exchange rate.

Importers and producers may delay passing through changes in their costs to prices because they hold unsold stocks, or because they regard an exchange rate movement as being only temporary and wish to avoid making price and/or output adjustments which would later have to be reversed. The latter factor may have been particularly significant in New Zealand over the early years of the floating exchange rate (1985-88) when the
exchange rate was relatively volatile. However, empirical research undertaken by the Bank suggests that, on average, a 10 per cent appreciation in the exchange rate will directly (before any second-round effects on wages) lower the general price level by around 4 per cent after a year. All these effects work more slowly in relatively highly protected markets where price-smoothing appears prevalent. However, the extensive programme of trade liberalisation and domestic deregulation undertaken in recent years has probably helped to increase the speed at which exchange rate effects pass into domestic prices.

As well as affecting the New Zealand dollar price of traded goods, the exchange rate has a less direct influence on inflation through its impact on demand and domestic activity. After a policy-induced rise in the exchange rate, exporters selling the same quantity of goods overseas at an unchanged foreign price will receive less revenue in New Zealand dollars. With an unchanged cost structure, profit margins will be squeezed and some producers will be forced temporarily to curtail production, and these pressures will continue until wage and price-setting behaviour adjusts into line with the anti-inflationary policy stance. At the same time, the real exchange rate appreciation lowers the local price of imports and, by shifting relative prices in favour of imports, encourages the purchase of these goods rather than domestically produced import-competing goods. Producers of import-competing goods must reduce their prices to compete and/or reduce their output, either of which reduces their revenue.

Overall, a policy-induced real exchange rate appreciation lowers net external demand by reducing export revenues and increasing expenditure on imports. As discussed later in the article, this reduction in demand then affects the domestic cost structure and inflation, and as cost structures come into line with the inflation targets, and competitiveness and profit margins will also improve, as the required degree of policy pressure on real interest and exchange rates eases. (The distinction between real and nominal variables is discussed in the accompanying box).

It is important to recognise that although actions which push up the real and nominal exchange rate may be a largely unavoidable part of reducing inflation, maintaining an overvalued real exchange rate is not a part of maintaining a stable price level. Rather, a temporarily higher exchange rate is part of the process by which the necessary changes in wage-setting behaviour and inflation expectations are generated. As this behaviour changes, lower inflation can be cemented-in without long-term economic costs, and pressures on real interest and exchange rates can ease allowing the benefits of price stability to be realised. An example of this occurred in 1988 when the Reserve Bank was able to accommodate a fall in the exchange rate following a marked moderation in inflation pressures.

**Retail Interest Rates and Expenditure**

Another important way in which monetary policy works is through retail interest rates. Competitive pressures mean that higher short-term wholesale interest rates lead banks relatively quickly to offer higher interest rates on retail deposit. As the cost of both wholesale and retail funds rises, banks must eventually raise their lending interest rates, to restore margins between funding costs and lending rates. Some lending rates respond

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5 In this and later discussion, the term 'banks' refers to all financial institutions making loans and accepting deposits, not only registered banks.
REAL AND NOMINAL ECONOMIC VARIABLES

This box briefly illustrates the difference between real and nominal economic measures

A real economic variable is measured in terms of a basket of goods and services (i.e. adjusted for movements in prices over time), while a nominal variable is measured in terms of current dollars. Fundamentally, people work and save not for the dollar value of their incomes or savings, but for the goods and services they can purchase with those dollars. In other words, what they are concerned about is the real value of their income and savings. For example, a person’s wage might rise by 10 per cent in nominal terms, but if the prices of the basket of goods they purchase also increase by 10 per cent, they can only purchase the same quantity of goods, so their real wage is unchanged.

Similarly, if a person receives a 10 per cent nominal interest rate on a bank deposit, but over the term of the deposit they expect an inflation rate of 5 per cent, the real interest rate, or the extra amount of goods they expect to be able to purchase at the maturity of their deposit, is only 5 per cent. Thus, when people are choosing between saving and spending, what generally matters to them is the real interest rate, rather than the nominal interest rate. When the role of interest rates in the transmission channels is discussed, this should usually be understood as referring to real interest rates.

The third example relates to the exchange rate. When trading with overseas countries, the competitiveness of our businesses depends on the real exchange rate rather than the nominal exchange rate as quoted in foreign exchange markets. The nominal exchange rate is the amount of foreign currency that can be purchased with one New Zealand dollar. By contrast, the real exchange rate is, in effect, the quantity of a basket of foreign goods and services that can be purchased with a basket of New Zealand goods and services (calculated by adjusting the nominal exchange rate for the differences in the inflation rates of New Zealand and the overseas country). Movements in the nominal exchange rate predominantly determine short-run movements in the real exchange rate. However, in the longer run, our competitiveness depends crucially upon the rates of productivity growth and wage inflation in New Zealand relative to those in foreign countries.
very quickly to changes in the cost of funds; for example, large corporate overdraft rates are now generally linked to movements in call rates. Administrative and other costs, however, mean that base lending rates and housing mortgage rates can often take a few months to adjust fully to changes in the cost of funds. Most lending in New Zealand is at variable interest rates, so that most borrowers are affected fairly rapidly by a tightening in monetary policy which leads to a change in lending rates. As discussed below, this feature of New Zealand markets has implications for the way monetary policy works. (The relationship between the wholesale cost of funds and retail lending rates is illustrated in Figure 5.)

Deposit and lending interest rates influence a range of economic decisions which affect domestic demand for goods and services. However, it should be noted that, as interest rates were substantially fixed for most of the period until 1984, there is little formal evidence about the current empirical magnitudes of the interest rate effects in New Zealand.

On the investment front, higher interest rates directly reduce the profitability of an investment project because of the higher finance costs, and indirectly reduce it because of the prospect of a slowdown in consumption growth. The lack of a well-developed long-term corporate bond market, or long-term fixed rate loans from banks, means that New Zealand companies are more dependent on variable rate loans than those in overseas economies. Short-term variable rates will generally fluctuate more widely than rates on longer-term fixed rate loans. However, unless a company faces a severe cashflow constraint, a change in a short-term variable interest rate will not necessarily determine the fate of a medium to long term investment project. Moreover, the removal
of exchange controls on capital flows may have made domestic investment (at least by larger companies) less sensitive to domestic monetary policy than would otherwise be the case because of the freedom firms now have to borrow in foreign currencies, with minimal risk for firms engaged in the production of traded goods.

On the consumption front, a rise in interest rates will tend to encourage many people to reduce current consumption, because the return on savings and the cost of borrowing to finance consumption have both increased. In practice, this deferral of consumption is likely to be strongest in respect of durable goods such as home appliances, but non-durable consumption could also fall. Because most loans are at variable interest rates, and most deposits are for very short terms, a rise in interest rates sends a relatively rapid and pervasive signal to individuals and firms.

Distributional effects can also be important in considering the impact of interest rates on aggregate demand. As lending rates rise, people with outstanding loans which have adjustable interest rates will spend a larger proportion of their income on interest payments, which restricts their spending on goods and services unless they take on a larger loan to cover the higher servicing costs. On the other hand, due to the rise in deposit rates, deposit holders receive more income as interest payments, which increases their ability to spend (although also increasing their incentive to save). So an increase in retail interest rates redistributes income from people with net financial liabilities to those with net financial assets. It is found overseas that households with net financial liabilities (predominantly younger households with mortgages) spend more out of an increase in their income than households with net financial assets (typically older households preparing for retirement). This pattern of cashflow-constrained consumption is quite plausible in New Zealand also.

Greater competition in credit markets, following the deregulation of entry into the banking system, and the removal of quantitative credit controls, has made credit much more readily available. The result has been growth in the volume of household credit and deposits relative to income. This growth means the effect of a change in interest rates on income distribution is greater than prior to financial deregulation. To the extent that cashflow constraints are significant, this would increase the impact of interest rates on expenditure through the income distribution effect. However, competition in the financial system has also brought innovations which allow households with net financial liabilities to mitigate, to some extent, the effect of interest rate rises on their disposable income. These innovations include a greater willingness to extend mortgage terms and to provide loans allowing at times the repayment of interest only. (See Figure 6 for the growth in financial assets (M3) and liabilities (private sector credit, (PSC) relative to income over the 1980s.)

The impact of higher retail interest rates is also reflected in the supply of and demand for money. Higher lending rates tend to reduce the rate of growth in the broad money supply, by reducing the demand for credit (credit growth is the main determinant of monetary growth). However, higher deposit interest rates relative to returns on other assets also increase the proportion of bank deposits which people want to hold in their portfolio of assets. So as retail interest rates increase, there is a tendency for the demand for money

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to rise. This increased demand will be reflected in reduced expenditures on a wide range of goods and assets, as people seek to adjust their deposit holdings to the higher level they desire.

As a footnote to this section on the impact of interest rates it is worth focusing briefly on the claims of some commentators that higher interest rates are themselves inflationary, and thus that an orthodox disinflationary monetary policy is counterproductive. The claim is based on the fact that a rise in interest rates increase business costs, and directly increases the CPI through the higher cost of mortgage servicing. These effects exist but, at worst, they are one-off effects on the price level. They do not keep inflating prices continually after the initial effect. The New Zealand and overseas evidence is clear that in the medium term tight monetary policies which initially raise interest rates not only result in a fall in inflation but also in interest rates.

**Credit Rationing and Wealth Effects on Expenditure**

Credit rationing occurs when banks restrict the supply of credit to below the demand for credit at the existing level of lending rates, rather than adjusting lending rates upwards. Some households and businesses are then unable to borrow as much as they wish to, constraining their expenditures. Administrative decisions by banks, rather than the market mechanism of interest rates, determine who gets access to credit. In the past credit rationing was one of the major mechanisms through which monetary policy operated in New Zealand because of extensive interest rate controls, in conjunction at times with direct regulation on the volume of credit growth. Memories remain vivid of the difficulty of securing a house mortgage in the years prior to 1984. By contrast, in a deregulated environment, credit is generally available, provided the borrower can afford the interest rate. Credit rationing effects now appear to be of distinctly secondary importance.

However, banks do still sometimes ration credit, even following financial deregulation. The main reason why banks may ration credit is the limited information they have to judge the creditworthiness of potential borrowers. As interest rates increase, the set of customers still willing to borrow will include proportionately more customers who are overly optimistic about the prospects of their investment proposals, and their ability to service the loan. If banks cannot clearly distinguish overly optimistic borrowers from other borrowers, they will face a greater risk of default on loans made at higher interest rates. Higher interest rates may also encourage borrowers to engage in activities offering higher returns, but which also are more risky. For the banks such behaviour is a problem because the legal and other costs of bankruptcy mean that the collateral offered on loans is often insufficient for the bank to recover its funds fully in the event of a default.

In these circumstances, rather than simply using higher interest rates to allocate credit, and thus further increasing the risk of defaults, banks may tend to reduce the size of loans they are willing to make, or refuse to lend to some borrowers at all. This approach both reduces the risk of defaults, and the cost of defaults to banks. This reduction in the size of loans available means that even some borrowers who are not overly optimistic and do not engage in particularly risky activities, cannot borrow as much as they wish at the current interest rate, thus constraining their expenditure.
The actual significance of this type of credit rationing in the current competitive financial environment, where banks actively seek information on their borrowers’ plans and performance, is perhaps debatable. However, it appears that for some time farmers had difficulty obtaining bank loans readily, perhaps because the banks were wary of the costs (including those of adverse publicity) associated with mortgagee sales in the event of default. More recently, after large corporate loan losses, reports have suggested that some institutions have been wary of certain types of business lending.

Rises in short-term interest rates, especially if they are expected to last into the future, can reduce the prices of assets like long-term bonds, shares and property, as investors shift from these assets into the shorter-term fixed-interest securities offering a greater return. The fall in asset prices reduces the wealth of asset holders. These individuals are likely to tend to reduce their spending and increase their saving so as to restore their wealth. This wealth effect is generally considered to be subsidiary to the direct effect of retail interest rates on expenditure. Major changes in wealth, such as resulted from the October 1987 sharemarket crash, appear not to have impinged significantly on expenditure, although this may have been because the previous asset price rises were regarded as uncertain and temporary.

The impact of interest rates on some asset prices, notably those of houses and commercial property, also has some more direct favourable price effects. House prices have a significant weight in the New Zealand CPI, and fluctuations in house price inflation have at times in recent years significantly influenced the path of CPI inflation. Commercial property prices affect rental costs, which feed directly into measures of producer prices.

The Impact of Aggregate Demand on Pricing

The primary channels through which domestic demand for goods and services is affected by monetary policy have been discussed above, together with the impact of the exchange rate on net external demand. The next step is to outline the ways in which these changes in aggregate demand feed through into pricing decisions and thus affect the inflation rate.

Reducing the rate of growth of nominal expenditure on goods and services, from both domestic and external sources, will lower growth in nominal economic activity (i.e. the value of goods actually produced), though there may be a lag, and stocks will build up during any such period. The fall in nominal activity growth will take the form of some mixture of slower price increases and lower growth in real activity: in the short-term mainly the latter, because prices adjust slowly.

Downwards ‘stickiness’ in prices and wages (and rates of increase in these variables), especially with respect to wages, appears to be a feature of modern developed economies, and has proved particularly significant in respect of wages. Price stickiness and the resulting inertia in inflation can be attributed to a number of factors. These include slow adjustment in inflation expectations, and the existence of contracts (which may be implicit agreements rather than legal documents) providing for the delivery of goods and
labour in the future at a fixed price in real or nominal terms. This stickiness in prices means that initially much of a reduction in nominal activity growth results in slower growth in real activity, i.e. the volume of goods produced falls, and workers are laid-off. In fact, there is little or no formal empirical evidence in New Zealand suggesting that a fall in demand slows price inflation directly. Rather, the adjustment appears to take place, and even then relatively slowly, mainly through the labour market.

A short-lived reduction in real activity growth has little effect on employment initially, except perhaps amongst casual workers. Employers will generally prefer to retain workers even though they are not working to their capacity, so as to avoid the often very high costs of making employees redundant, and then hiring and training workers when activity recovers. However, if activity is weak for a prolonged period, a recovery does not appear imminent, and businesses cannot improve their competitiveness by negotiating lower wage rises, then employers will find the cost of retaining workers outweighs the cost of redundancies, so they will make some employees redundant, increasing unemployment.

Growth in unemployment increases the perceived risk of redundancy to those workers with jobs, which can be expected to moderate the wage claims of unions. At the same time, employers find it easier to hire any new or replacement staff as the number of unemployed grows. Moreover, the reduction in activity growth encourages employers to seek ways to reduce costs and so they should become less willing to grant high wage claims. Thus wage settlements tend to be dampened by high or rising unemployment. Lower wage settlements reduce the rate of growth in the cost of labour per unit of output facing producers, and as labour costs are a significant share of production costs for many goods and services, this cost moderation contributes directly to lowering inflation. It is also important at this point to remember the interconnected nature of the monetary transmission process and the feedback mechanisms which exist; in particular, the direct impact on the exchange rate of a policy tightening will have lowered the inflation rate, in turn tending to make workers more receptive to lower wage settlements.

Lowering inflation itself has no permanent adverse implications for real wages or unemployment. In the absence of rapid adjustment, some rise in unemployment is generally an unavoidable part of lowering wage and price inflation, but there is no strong theoretical or empirical reason to believe that there is a long-term adverse trade-off between maintaining price stability and real wages or employment. The longer-term implications of economic restructuring for the level and structure of wages must be considered independently and are not directly relevant to the subject of this article.

The response of wages to a tightening of monetary policy in New Zealand has tended to be rather slow, particularly as wage settlements are made only once a year. Implicit contracts governing either real or nominal wage rates (or rates of increase) are one factor. Another important problem has been that under a system of binding predominantly-national occupational awards the degree of wage response can also depend upon just who

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is undertaking the negotiations. In particular, firms in the sheltered and non-traded sectors are generally more able to pass on any wage increase than are producers in the exposed traded goods sector, and in the early years of New Zealand’s disinflation there were strong perceptions that sheltered sector producers were dominant in many sectors. Further moves towards a more flexible labour market should, over time, improve the speed at which monetary policy signals are reflected in wages and prices.

**Overseas Inflation, Tariffs and Indirect Taxes**

The exchange rate has an important effect on the New Zealand dollar prices of traded goods. But the prices of imported and exported goods are also affected by overseas inflation. If the prices of imported goods, and exported goods used domestically, rise in foreign currency terms while the exchange rate remains unchanged then New Zealand will import overseas inflation. However, countries with a policy stance aimed at maintaining lower inflation than their trading partners also have nominal exchange rates that, other things being equal, tend to appreciate over time. This trend appreciation in the nominal exchange rate of low inflation countries insulates them from imported inflation but does not harm the competitiveness of their traded goods producers, as their costs also rise less rapidly than in high inflation countries. (This discussion abstracts from issues of the appropriate long term level of the real exchange rate.)

When tariff rates on imports fall, the prices paid by producers for imported inputs, and by consumers for imported final goods, will also fall. Such reductions in tariffs will only cause one-off reductions in prices, rather than providing a sustained reduction in the inflation rate. They may nevertheless play a helpful role in cementing-in a successful anti-inflation programme by helping to lower the measured inflation rate initially faster.

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**Figure 6**  
Money and Credit Relative to Economic Activity  
Ratios of M3 and PSC to Nominal Gross Domestic Product

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than might otherwise have been possible. On the less positive side, increases in indirect taxes like the Goods and Services Tax or in government charges also have only a one-off effect on prices, rather than causing continuing inflation, but as has been repeatedly experienced in New Zealand in recent years the resulting rise in measured inflation can affect the rate of inflation expected in the future, exacerbating inflationary pressures in respect of wage claims and credit demand.

The Role of Inflation Expectations

As monetary policy works through the various transmission channels to bring inflation down, and people become more confident that the Reserve Bank is committed to keeping inflation down, they will revise down the rate of inflation they expect (either explicitly or implicitly) to face in the future. This revision will, in turn, affect many of their economic decisions. Employers will expect their output prices to rise more slowly than in the past, placing more pressure on them to offer lower nominal wage rises. Similarly workers and their unions will expect the prices of consumption goods to rise less quickly, in turn making them more willing to lodge lower nominal wage claims. Together lower wage settlements are likely to result, reducing the growth rate of nominal unit labour costs, without the same degree of policy pressure that was previously required.

Interest rates on longer-term assets like 5 year government stock will tend to fall as expected inflation falls, because domestic bond holders will not expect to lose as much purchasing power on their investment due to inflation, while foreign bond holders will perceive less risk of an exchange rate depreciation that would reduce the value of their investment in terms of their home currency. The fall in interest rates will also flow into lower shorter-term rates. These lower interest rates will not pose a threat because with

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lower inflation expectations borrowers will be less willing to borrow at any given nominal interest rates than they were previously. (Figure 7 shows that short-term interest rates have tended to fall with long-term rates, as long-term rates have responded to falling inflation expectations.)

The faster inflation expectations fall, the less costly it is to achieve price stability, in terms of losses of real output and employment. Because lower inflation expectations reduce nominal wage settlements, less pressure from unemployment on wages, and from the exchange rate on the traded goods sector, is required to achieve the same rate of disinflation. The Reserve Bank’s monetary policy goal is to achieve price stability at the lowest cost. So the Bank aims to implement monetary policy in a manner which makes achievement of price stability credible to price setters, so as to lower their inflation expectations.

The Policy Targets Agreement between the Governor and the Minister of Finance is one of the mechanisms intended to directly influence inflation expectations and make the achievement of price stability more credible to price setters, by making the Governor directly accountable for achieving price stability. This structure has been a positive step, although it must be acknowledged that surveyed inflation expectations have proved less amenable to direct influence than had been hoped. Given the repeated past failure of successive New Zealand governments to deliver on stated commitments to low inflation previously, it is perhaps understandable that many people will wait until they have experienced low inflation before they are willing to transact confidently on the basis of low expected inflation in the future. (Figure 8 compares the path of surveyed expectations of inflation with the actual inflation rate.)

As an economy approaches price stability and inflation expectations fall into line, monetary policy will be able to move towards a neutral stance, accommodating lower real interest rates and a lower real exchange rate. It is critical to the achievement of price stability, and the return of the tradeable goods sector to a more competitive position, that any falls in the real exchange rate taking place at that point in a disinflationary strategy do not reignite the wage-price spiral. Near the end of the disinflationary process, inflation expectations should have fallen, which along with the high rate of unemployment that has arisen as a result of restructuring and disinflationary pressure, should hold back nominal wage increases, allowing real exchange rate adjustment to occur without creating inflationary pressure.

In view of repeated criticism of the Bank on this point, it can only be reiterated again that the ability to influence the real exchange rate is not the long-term basis of sustainable price stability. The temporarily overvalued real exchange rate which occurs during disinflation is a largely inevitable part of the adjustment mechanism; a means of generating essential changes in wage-setting and inflation expectations which are critical if the fruits of price stability are to be realised. Because traded goods sector producers have the strongest incentive to achieve the greater wage restraint, the exchange rate is now a particularly potent part of the monetary transmission mechanism in most developed countries, including New Zealand.

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The Indicator Framework of Monetary Policy

As discussed in the previous section, there can be relatively long delays in the operation of some of the monetary transmission channels, because not all markets adjust quickly in response to new information on the stance and objectives of monetary policy. Despite continuing progress in deregulating and promoting competition in goods and labour markets, relatively sluggish adjustment is likely to continue to be a feature of our economy, as it is in most developed overseas economies.

Because of this sluggish adjustment, the Bank cannot simply rely on inflation measures when assessing the consistency of monetary conditions with the path to price stability, but must monitor indicators from relevant markets which adjust more quickly to new information. The option of, say, using the most recently observed inflation rate as the sole guide to policy would simply not be a sound basis for monetary policy. Inflation today is determined not by monetary policy today, but by monetary policy perhaps 12-18 months ago. Accordingly, a monetary policy guided solely by actual measured inflation would tend to be destabilising. For example, if under such a rule inflation was judged to be too high then monetary policy would be tightened even though the delayed effects of past monetary conditions and previous actions might already be acting to slow inflation.

The Reserve Bank uses a `checklist’ of such indicators because no single indicator adequately summarises the monetary stance, and because each of the indicators is subject to influences aside from monetary policy. This relatively eclectic approach is particularly important at a time of rapid structural change in the real economy and the financial sector.

The main indicators monitored by the Reserve Bank are the exchange rate, the shape of the yield curve, the level of interest rates relative to expected inflation, and the money and credit aggregate growth rates. Movements in these indicators are analysed in conjunction with one another, and against the background of other relevant information, including developments in the real sector and asset markets. It is important to note that the real economy is monitored not because it represents an independent monetary policy goal, but rather because the state of the real economy will influence the strength of inflationary pressures for any given monetary settings.

The Bank’s interpretation of the implications of movements in the various indicators is based on its understanding of the operation of the monetary transmission channels and of the nature of the shocks (random disturbances) faced by the economy and the financial system. As the transmission channels have changed with changes in the economic policy regime, and as the ‘noise’ around the various indicators has altered, the Bank has adapted the framework it uses to interpret the indicators, altering their importance in the checklist. Due to its rapid direct effect on inflation, and the difficulty of reliably interpreting the other indicators, the exchange rate has assumed an important place amongst the various indicators since mid-1988.
A rise in the nominal exchange rate, other things being equal, will tend to reduce inflation, and thus indicates a firming in monetary conditions. If the inflation rate was already satisfactory, some easing in policy might then be thought appropriate. However, the proviso that other things be equal is important when using the exchange rate as an indicator. For example, a rise in the exchange rate might, instead, reflect increasing prices for New Zealand’s export commodities, and thus an improved balance of payments outlook. Some rise in the exchange rate may then be necessary to offset the inflationary consequences of the higher commodity prices, so it would clearly be incorrect to interpret all exchange rate appreciations as a firming in monetary conditions.

The yield curve is the pattern of interest rates arranged by term to maturity. A downward sloping yield curve - one where short-term interest rates are higher than long-term interest rates - generally indicates that short-term interest rates are expected to fall in future, probably because inflation is also expected to fall. In general, the greater the negative slope of the yield curve (which the Bank usually measures by the difference between the 90 day bank bill yield and the 5 year government stock yield) the more disinflationary is the stance of monetary policy. As illustrated in Figure 2, a fall in short-term interest rates may either be induced by an easing in policy settings, or be due to the feedback from lowered inflationary expectations. However, if long-term bond-holders expect monetary policy to be eased to cause the fall in short-term interest rates, they will also realise that this will fairly rapidly cause inflation to accelerate through the various transmission channels, which will substantially reverse the fall in short-term interest rates and possibly push longer-term rates higher still.

But as with the exchange rate, interpreting movements in the yield gap is not always straightforward. The yield on long-term bonds is influenced by foreign interest rates, and contains a premium for risk that fluctuates in response to domestic and overseas investors’ perceptions of the future course of New Zealand’s economic policies. Events like political poll results can affect long-term interest rates, and thus the yield gap, even though there has been no change in the monetary stance or in the objective prospects for inflation. Periods of political uncertainty, with the consequent effects they have on uncertainty about future economic policies, can result in a larger, and more volatile risk premium in long-term interest rates. The resulting volatility in the yield gap during such periods, makes it less useful as an indicator of monetary conditions. The frequency of such disruptions over the last three years was one important reason why the role of the yield gap in the checklist has come to be downgraded.

Surveys can provide a more direct measure of inflation expectations than those embodied in long-term interest rates. Surveys are not subject to problems with changing real interest rates overseas, or changing risk premia for New Zealand, although, on the other hand, it is difficult to be sure of the extent to which reported expectations match those upon which people are actually trading. Nevertheless, surveyed inflation expectations do help the Reserve Bank to gauge the level of real interest rates that borrowers and savers see themselves as facing and thus of the degree of policy pressure being imposed.


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Given a stable financial structure, declining rates of credit and monetary growth indicate sustained firm monetary conditions, as there will be less demand pressure from spending funded by credit expansion, or from spending using excess money holdings. However, there has been rapid structural change in the New Zealand financial system in recent times following financial deregulation, so the relationships between money, credit and nominal demand have not been sufficiently stable to allow developments in money and credit growth rates to be interpreted reliably. This instability is illustrated in Figure 6 showing the changing ratios of the money and credit aggregates to nominal income, following the deregulation of the financial system.

The Bank continues to maintain an active programme of research into the money and credit aggregates, with a view to eventually being able to place somewhat greater weight on these indicators. To date, the results have not been particularly encouraging. The best results showed a relatively stable long-term relationship between nominal income and M3, but that relationship did not hold over the short term in which policy is actually implemented (see Figure 9). Clearly money and credit growth are linked to inflation, but at present the statistical linkages are insufficiently precise to allow us to make much use of the relationship.  

The Bank has at times come in for considerable criticism over its failure to place greater weight on the aggregates. In the absence of stronger research results however, and given similar problems in almost all developed countries overseas, the Bank believes that the relative low weight given to the aggregates is the only responsible approach at present.

The usefulness of the checklist approach, in preference to exclusive focus on a single indicator, when faced with a range of different real and monetary shocks can be briefly demonstrated. If the exchange rate is depreciating, and short-term interest rates are also falling, narrowing the yield gap, then monetary conditions are unambiguously easing, as both indicators suggest more inflationary pressure will come through the transmission channels. However, if the exchange rate is easing, but interest rates are rising, perhaps because some news has caused foreign investors to sell New Zealand dollar securities, then looking at the exchange rate alone would suggest an easing in monetary conditions, while looking at interest rates alone would suggest a firming. Taken together, the inflationary consequences of the fall in the exchange rate may be cancelled out by the disinflationary consequences of the firming in interest rates, with there being no change in overall monetary conditions. In these circumstances the movements in the indicators tend to reflect a real shock (such as a fall in the terms of trade) rather than a monetary shock (such as an autonomous change in the demand for settlement cash).

A rule of thumb to use is that a monetary shock will result in interest rates and the exchange rate moving in the same direction, while a real shock will cause them to move in opposite directions. A monetary policy focused on price stability can and should be used to smooth out the effect of autonomous monetary shocks on both interest rates and the exchange rate, to avoid the consequent price effects of an unwanted easing/tightening of conditions. Handling a real shock is considerably more difficult. Real adjustments must take place, but the monetary policy response will depend on the degree of inflationary pressure in the economy, and on any provisions in the Policy Targets Agreement allowing monetary policy to facilitate a smoother adjustment to real shocks.

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Conclusion

As we have emphasised on several occasions, the Reserve Bank does not have direct control over inflation. Rather the Reserve Bank makes progress towards price stability by affecting short-term interest rates which, through a variety of transmission channels, bear upon the behaviour of people and firms setting prices and wages throughout the economy. Because of the sluggish adjustment of many prices, monetary policy pressure on inflation works partly through temporary reductions in economic growth and rises in unemployment. Success in lowering expected inflation and in promoting more competitive and flexible markets can, however, reduce these costs. The Reserve Bank implements monetary policy in a manner designed to enhance the credibility of the price stability objective, so as to encourage inflation expectations to fall, and thus minimise the short-term costs of disinflation. In the long term, of course, these temporary costs are expected to be more than offset by the permanent benefits of price stability.

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