Supporting Paper A2
A review of economic developments and monetary policy since 2000

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Introduction

This paper reviews New Zealand's broad macroeconomic experience over the period from 2000 until the present time (the review period), focusing on the role of monetary policy over that time. The purpose of the paper is to illustrate the main factors influencing the conduct of monetary policy over the period, and to discuss and evaluate how the Reserve Bank responded to them.

The start of the review period has been chosen to pick up from where earlier reviews of New Zealand's macroeconomic experience finished.[1] We discuss the major influences on inflation, growth, interest rates and the exchange rate, and evaluate the conduct of monetary policy in that context.

The rest of this paper is structured as follows. We first describe the broad macroeconomic outcomes over the review period, and briefly compare them to the experience over the 1990s and against the average experience of other OECD countries. We then discuss the major external influences and fiscal policy effects on the economy over the review period. We present a chronological account of the major phases in the Reserve Bank's Official Cash Rate (OCR) decisions over the period, setting them in the context of the flow of information at the relevant times. We look at the interest rate experience over the period, and how the OCR decisions influenced wholesale and retail market interest rates. The major factors influencing the exchange rate over the period are discussed. We then look at the sectoral composition of growth and inflation. The particular role of the housing market and house price inflation, perhaps the standout feature of the macroeconomic experience under review, is discussed in some detail. We evaluate the conduct of monetary policy against the requirements of the Policy Targets Agreement, and then conclude with a brief discussion of the lessons learned and issues for further work and research.

New Zealand's broad macroeconomic experience since 2000

The review period has been remarkable for the strength and persistence of spending growth. Demand has been mostly driven by strong consumption and residential investment, with pronounced and sustained house price inflation, prolonged pressure on the economy's productive resources, and tight monetary conditions. Overall, inflation has been kept within the target range in the face of, at times, intense pressures.

Inflation

Annual CPI inflation averaged just over $2^1/_2$ percent over the review period, with peaks of around 4 percent in 2000 and in 2006. The trough in inflation over the period was $1^1/_2$ percent in 2003. Overall, inflation remained well contained, and in line with the Policy Targets Agreement.

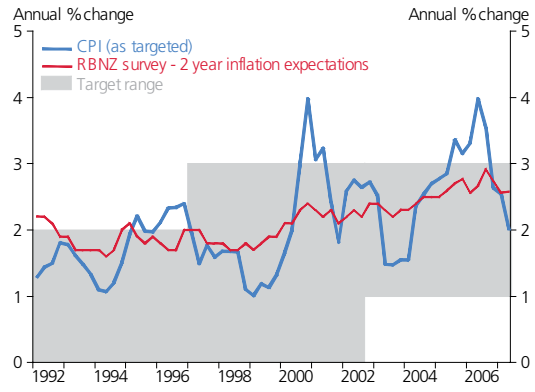
Inflation has been kept broadly within successive target ranges since 1991. After the years of high and variable inflation in the 1970s and 1980s, this has been a major achievement. Although there have been a few occasions when inflation has moved (briefly) outside the target range, the year-to-year variability of inflation has been brought down to quite low levels.

Inflation expectations generally remained well anchored through the review period (see figure 1). A small upward shift in the trend level of inflation expectations is evident over the review period compared to the 1990s. This is consistent with the shift upwards in the midpoint of the inflation target range from 1.5 percent to 2.0 percent. However, there is little evidence that the expectations of firms and households have become inconsistent with the inflation target range. This suggests that the credibility of the Reserve Bank's efforts to maintain price stability has been broadly maintained throughout the period.

[1] Brook et al. (1998), Drew and Orr (1999), and RBNZ (2001) review the macroeconomic experience over the 1990s.

Figure 1

Annual CPI inflation and inflation expectations

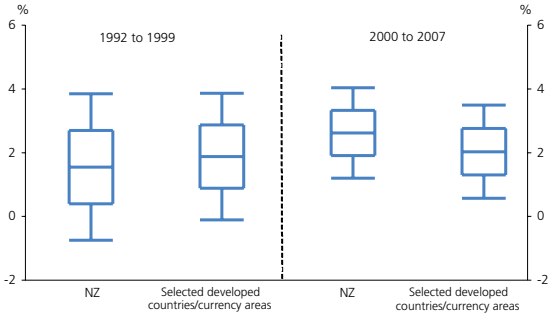


Source: Statistics New Zealand, RBNZ.

New Zealand has not been alone in turning in a good inflation performance over recent years. Most other OECD countries have also successfully achieved and maintained low and stable inflation at similar levels for some time (see figure 2).

Figure 2

CPI inflation*



Source: Statistics New Zealand, Datastream.

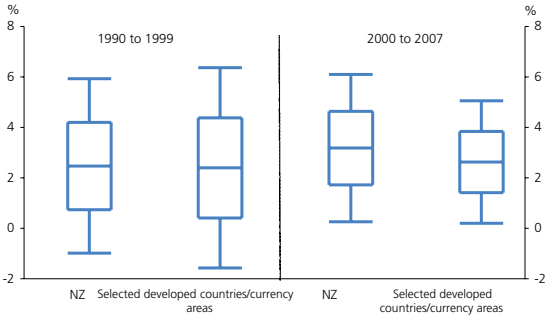
* Figure 2 shows the average annual inflation rate over the 1992-99 and the 2000-07 periods for New Zealand and selected developed-country currency areas (Australia, Canada, the eurozone, Japan, Sweden, the United States and the United Kingdom). Also shown are the one-standard-deviation bounds around the average annual rates for these periods (the boxes) and the two-standard-deviation bounds (the lines). For the sample of other developed-country currency areas, we show the mean of the average inflation rate and standard deviations.

GDP growth and the economy's productive capacity

New Zealand's growth performance has also been very good over the review period. Growth has averaged more than 3 percent during the review period, a rate that is a little higher than the OECD average and similar to New Zealand's performance over the 1990s (see figure 3). New Zealand's improvement in both the level and the year-to-year variability of the growth performance over the past couple of decades has also been seen in other countries, though the shift has been more marked in New Zealand's case.

Figure 3

Real GDP growth*



Source: Statistics New Zealand, Datastream.

* Data have been calculated analogously with those in figure 2.

Using a common definition of recession – two consecutive quarters of negative growth – New Zealand has not had a recession since 1998, a period of almost ten years. The four-year expansion in the mid-1990s was also quite long in comparison to New Zealand's history. Over the two decades prior to that expansion, New Zealand's growth performance had very much a stop-start character, with expansions lasting only a few quarters before ending in recession.

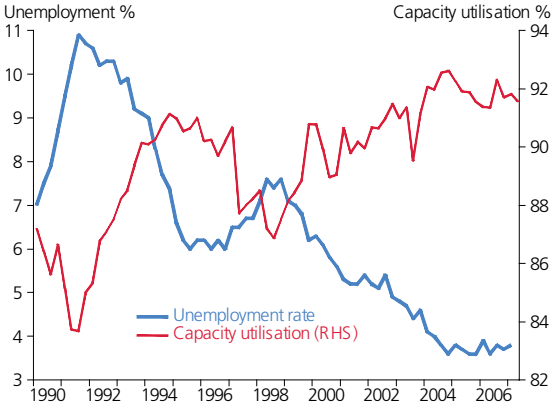
This strong economic growth performance enabled strong employment growth since 1999. The unemployment rate fell from around 6 percent at the beginning of the review period to around 4 percent by the end. The current New Zealand unemployment rate is the lowest for several decades. The unemployment rate experience compares favourably against the OECD, which averaged 6½ percent for the review period and 5½ percent at the end of the period.

Indeed, the review period has been characterised by a sustained high level of pressure on the productive capacity of the New Zealand economy. Over the review period, the proportion of respondents to business surveys citing the availability of labour as the factor most limiting their production rose to 20 percent or more, whereas in the 1990s this proportion did not exceed 10 percent. The median level of capacity utilisation reported over the review

period was also substantially higher than in the 1990s and earlier periods in New Zealand's history (see figure 4).

Figure 4

Indicators of pressure on productive capacity



Source: Statistics New Zealand, NZIER.

Although both growth and employment have been remarkably strong over the review period, labour productivity growth (real output per hour worked) has been surprisingly weak, especially in the last two or three years of the period. Over the 1990s, annual labour productivity growth averaged about 1 percent, whereas over the review period the average was only about $^1/_2$ percent. Supporting paper A5 discusses New Zealand's productivity performance and long-run growth in more detail.

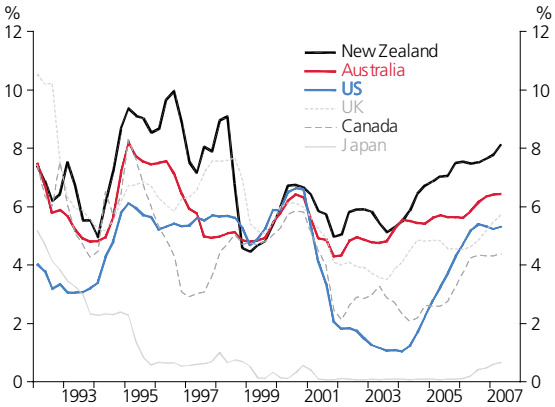
Interest rates

Over the review period, 90-day interest rates in New Zealand averaged around 6$^1/_2$ percent, some 150 basis points higher than the developed-country average[2] of around 5 percent for the period. The gap is about the same in real terms,[3] and did not substantially narrow over the review period. Supporting paper A4 discusses some possible reasons why New Zealand real interest rates remain so persistently high.

Compared to the 1990s, short-term (90-day) interest rates went through less of a cycle over the review period. Since 2000, there have been two episodes where 90-day interest rates fell briefly in response to monetary policy actions, but overall, 90-day interest rates rose throughout the period, beginning the period around 5 to 6 percent and tracking around 8$^1/_2$ percent by the end of the period. In contrast, in the 1990s, 90-day interest rates troughed at 5 percent at the beginning of 1994, then rose sharply to peak just over 10 percent, then troughed again around 4$^1/_2$ percent by 1999. The pattern of 90-day interest rate movements almost completely reflects the actions of monetary policy over the period, which we discuss in detail in the later section setting out the chronology of monetary policy.

Figure 5

90-day bank bill rates



Source: RBNZ, Datastream.

Long-term (10 year) interest rates fell very gradually through the period, from around 7 percent at the beginning of the period to about 6 percent by the end. The stability of long-term interest rates over the review period contrasts with the experience of the 1990s (both in New Zealand and elsewhere), when long-term interest rates followed more of a pronounced cycle, against the background of a considerably steeper downward trend. The difference in the trends over the review period compared to the 1990s reflects the achievement of low and stable inflation in much of the developed world.

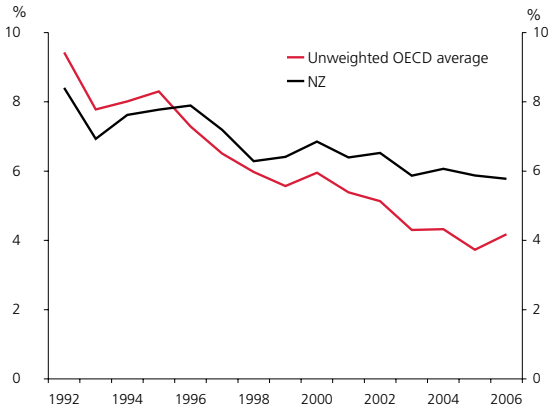
The longer-term interest rates of most relevance for fixed rate residential mortgage lending in New Zealand – those for terms of around two years – showed the same broad profile as short-term interest rates over the period. Wholesale two-year interest rates generally remained above 90-day interest rates, though through 2005 to 2006, two-year interest rates fell below 90-day interest rates by around $^1/_4$ to $^1/_2$ percent. This material gap contributed to a rise in the average term of outstanding residential mortgage loans through this period,

2 OECD excluding Mexico and Turkey.

3 Using annual CPI inflation as a proxy for inflation expectations.

Figure 6

10 year government bond rates



Source: RBNZ, Datastream.

an effect of some consequence for monetary policy that we discuss further in the later section on the interest rate experience.

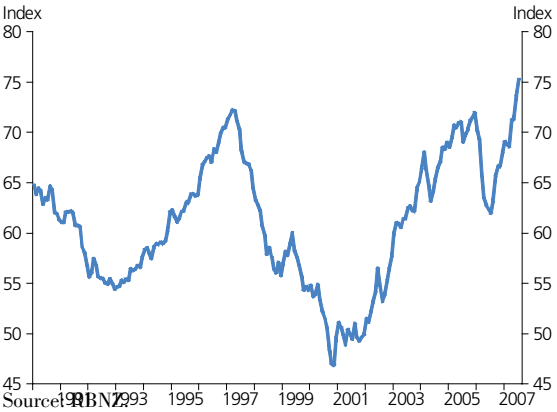
The exchange rate

The exchange rate showed a very substantial appreciation through the review period (with two brief episodes of depreciation that were subsequently reversed). Starting from a low at the beginning of the review period of around US40c, the New Zealand dollar rose strongly through the period to reach around US78c by the end of the period. The appreciation over the review period took the effective exchange rate from a position at the trough around 30 percent below its long run average, to a position at the peak around 30 percent above.

Substantial exchange rate appreciations were also seen over the period in a range of other countries, but the New Zealand dollar's appreciation is one of the larger among the OECD. We discuss the exchange rate experience further in a later section of this paper.

Figure 7

Nominal effective exchange rate (TWI)*

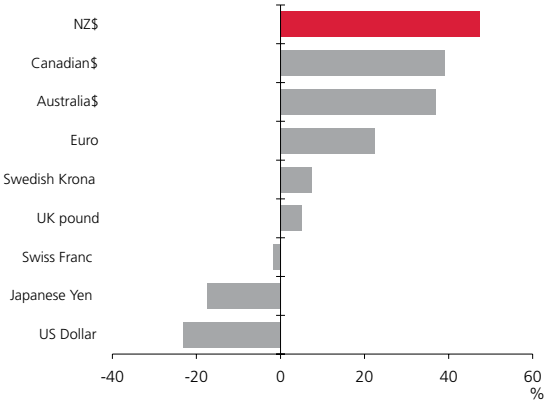


Source: RBNZ.

* Note that, to construct a consistently measured effective exchange rate for historical comparison purposes, this paper uses the official Trade-Weighted Index (TWI) for data from 1999, and for data prior to 1999 uses the current TWI calculation methodology to backdate. Because in 1999 the RBNZ changed the calculation methodology, over the 1990 to 1999 period the effective exchange rate reported in this paper differs from the official TWI in use at the time. For that period, the TWI in use at the time is not directly comparable with the effective exchange rate backdated using the current TWI calculation methodology. See Kite (2007) for further details.

Figure 8

Changes in effective exchange rate indexes since 2001



Source: RBNZ, Bank of England.

Savings, investment and the national debt position

Although New Zealand's overall growth and inflation performance over the review period was sound, the savings-investment imbalances in the economy seen over the 1990s continued to widen. These imbalances did not themselves appear to have much impact on demand or inflation pressure over the period. Nor, somewhat surprisingly, did the increasing indebtedness appear to increase by very much the responsiveness of borrowing demand to rising interest rates when monetary policy tightened.

Despite employment and incomes growing strongly over the review period, household consumption grew even more strongly, resulting in a continued trend decline in the rate of household saving out of disposable income. The household

saving rate fell more steeply than in the 1990s, from around zero at the beginning of the period to a dis-saving rate approaching 15 percent of disposable income.

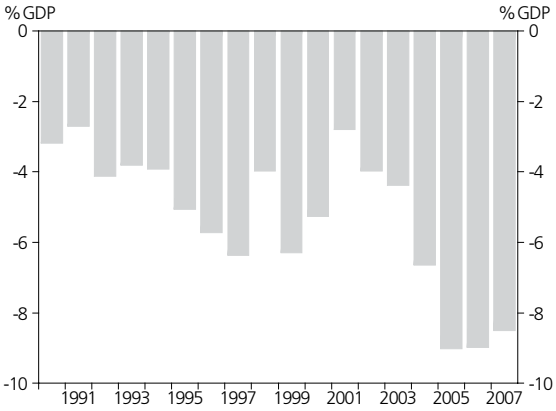
As was seen over the 1990s, over the review period household debt continued to increase at rates well exceeding the growth in household disposable income. The household debt to disposable income ratio rose over the review period from around 100 percent to around 160 percent.

At the same time as households were rapidly accumulating debt, their house prices were of course rapidly rising (to produce an overall doubling of house prices over the review period). The effect of housing valuation gains on household net worth swamped the negative effects of the dis-saving. As a result, household net worth measured at current prices rose substantially (and itself probably contributed to the strong consumption and investment expenditure seen over the review period). We have commented elsewhere on the concerns that this phenomenon of a rapidly expanding household balance sheet raises for monetary policy and financial stability.[4] We discuss further the particular role of the housing market in the later section devoted to this topic.

The excess of saving over investment by the government and business sectors of the economy was not sufficient to fund the household sector's accumulation of debt over the review period. The shortfall, as reflected in the current account deficit, expanded substantially over the period to almost 10 percent of GDP, a level not seen since the mid-1970s and considerably larger than that seen in the 1990s cycle, during which the current account deficit had been roughly stable at about 5 to 6 percent of GDP. The expansion of the current account deficit over the review period also occurred in spite of improvements in New Zealand's terms of trade.

Figure 9

Current account deficit



Source: Statistics New Zealand. RBNZ estimate for 2007.

External influences and fiscal policy

This section discusses the major independent influences impinging on the New Zealand economy over the review period. We cover the world economy and trading partner demand, overseas monetary policy, the prices of New Zealand's imports and exports on international markets, migration flows and domestic fiscal policy.

The world economy and trading partner demand

From sluggish beginnings, world economic conditions improved over the review period, providing a generally favourable backdrop to New Zealand's own economic experience. Growth in New Zealand's major trading partners[5] tracked around its long-run average over the period, providing somewhat less stimulus, however, than that seen over the 1990s before the Asian crisis.

Following an initial recovery from the Asian crisis of the late 1990s, the world economy suffered a range of further major adverse events at the beginning of the review period. These included the bursting of the dotcom bubble, the 11 September terrorist attacks in the US and their aftermath,

[4] For example Bollard (2006) and Reserve Bank of New Zealand (2007).

[5] To measure trading-partner growth we usually look at an aggregate of GDP in New Zealand's top 12 trading partners weighted by export value (GDP-12). These trading partners are the US, Australia, Japan, Eurozone, UK, Canada, China, South Korea, Singapore, Malaysia, Hong Kong and Taiwan. For further details see Smith (2004).

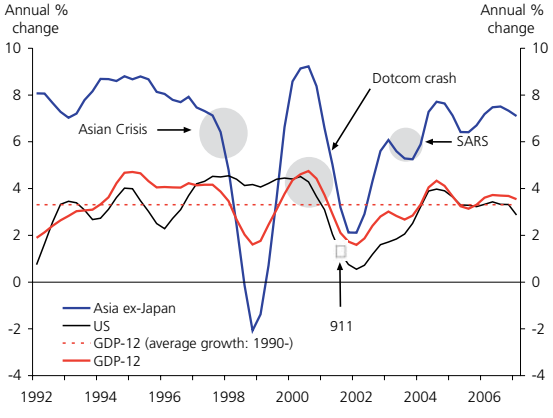
and the emergence of SARS. Overlaid upon these events was a large perturbation to the normal pattern of investment spending caused by Y2K.

The overall result of these events for trading-partner growth over the first few years of this decade was for growth to fall below 2 percent, a similar level to the trough reached during the Asian crisis and in the global downturn of the early 1990s. Subsequently, growth gradually picked up to run at around 3½ percent from 2004 for the rest of the review period. The Australian economy remained quite buoyant throughout the period, but globally the pick-up in growth was initially led by the recovery in the United States. Global monetary policy had been eased quite sharply, with the lead taken by the US Federal Reserve, which cut its official rate from 6½ percent at the start of 2001 to the extraordinarily low level of 1 percent at the trough.

The sustained expansion in the world economy and the gradual dissipation of uncertainty about economic and financial prospects led, by the later part of the review period, to a prevalent sense of optimism. This, combined with a large expansion in the quantity of funds seeking investment returns worldwide, contributed to general climate of risk-seeking by the final few years of the review period. The risk-seeking itself, through its downward effect on the cost of funds, has played a role in helping to prolong the strong growth. We pick up on this theme of global risk-seeking in the section discussing the exchange rate experience.

Figure 10

Growth: emerging Asia, US and New Zealand's major trading partners



Source: Datastream, RBNZ calculations.

The fairly substantial swings in economic conditions and sentiment in the major developed economies, and particularly the US, perhaps overshadowed an important underlying feature of world economic developments over the period. Growth in the Asian countries other than Japan (Asia ex-Japan, AXJ)[6] was rapid, and the decade has seen the increasing emergence of China as a major economy.[7] The AXJ growth experience over the latter half of the review period was surprisingly strong to most observers, including the IMF, the Asian Development Bank[8] and market analysts.[9] China now accounts for around a sixth of world GDP (against an eighth at the beginning of the period),[10]and is now New Zealand's fifth (rather than seventh) largest export market behind Australia, the US, Japan and the Eurozone. The sustained expansion and growth in per capita incomes in AXJ has been an important influence on the New Zealand terms of trade, a topic we pick up below.

Although the magnitude and profile of overall growth in AXJ over the period was perhaps not that remarkable – being similar to the levels seen in the mid 1990s prior to the Asian crisis – the economic and financial management strategies of the AXJ countries underlying the growth were quite different to those seen in the 1990s. The Asian crisis had been characterised by the sudden emergence in a number of AXJ countries of severe financial distress caused by (among other things) inability to service foreign-currency debt that had built up during the preceding few years of high growth driven by domestic demand. Following these traumatic experiences, a common theme among AXJ countries through the growth phase over the review period has been to include in their financial management strategy a focus on maintaining large current account surpluses and accumulation of foreign exchange reserves.

China has been the largest contributor to the activities of the region overall in this regard. In 2000, China's foreign

6 Asia-ex-Japan is defined in this paper as the Asian-country subset of New Zealand's top 12 trading partners, ie China, South Korea, Singapore, Malaysia, Hong Kong and Taiwan.

7 These issues are discussed in more depth in Hunt (2007).

8 See Asian Development Bank (2006).

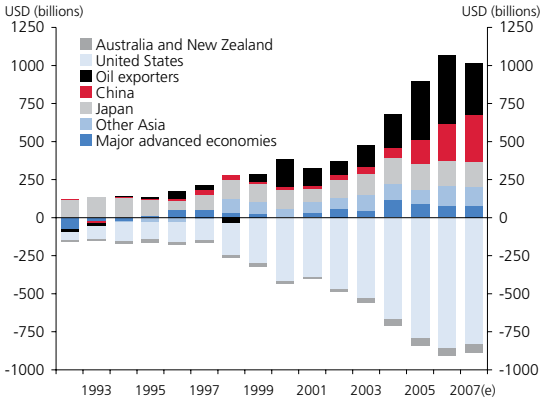
9 As measured in the Consensus Inc. international survey of economic forecasters, the baseline for the Reserve Bank's projections for world economic prospects.

10 As at 2006, purchasing-power-parity basis. Source: IMF.

reserves were growing by around 5 to 10 percent per annum, but this rapidly increased to a peak of over 50 percent per annum in 2005, and by the end of the review period was running at just over 30 percent per annum. By the end of the period, China was accumulating reserves at a rate of around US$1^1/_2$ billion per day (equivalent to around 15 percent of New Zealand's annual external funding need as measured by the current account deficit).

The sustained large current account surpluses by AXJ countries have contributed in large measure to a substantial growth in the flows of investment funds across borders worldwide. Together with large current account surpluses run by the oil-exporting countries as the price of oil has climbed sharply, these surpluses have helped fund the large current account deficits of many Western countries, and particularly that of the United States.

Figure 11
Current account balances



Source: IMF World Economic Outlook, 2007.

In addition, financial innovation has been an important feature of the period. More and more emerging countries have been able to borrow internationally in their own currencies, and hedge funds and private equity firms have become increasingly active in both new and traditional financial markets. New ways of unbundling and repackaging risk through advances in financial engineering have resulted in new ways for investors to take on risk.

These developments have all contributed to a remarkable growth in the supply of funds seeking investment returns worldwide, and may have contributed to the sustained strength of currencies in some Western countries, including Australia and New Zealand, in spite of the large and growing current account deficits being run in those countries. We discuss this issue further in the later section on the exchange rate experience.

Foreign monetary policy and interest rates

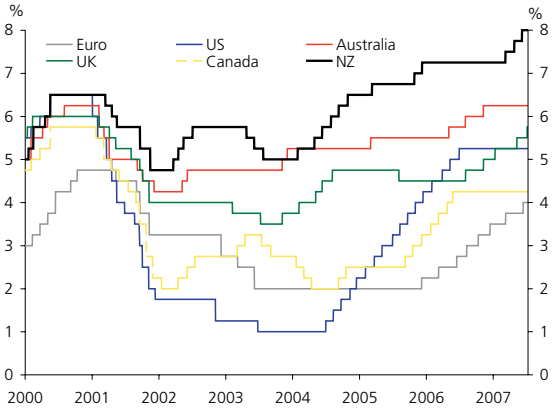
Over the review period, monetary policy in the rest of the world generally followed a more pronounced cycle than that seen in New Zealand. Overseas official interest rates were generally cut quite substantially over roughly the first half of the period, before being raised again more recently.

Against the backdrop of weak demand early in the review period, central banks around the world generally moved their policy rates to stimulatory levels. The monetary policy easing response in the US to the September 11 attacks was particularly sharp and deep, taking the official US interest rate from $6^1/_2$ percent at the end of 2000 to $1^3/_4$ percent by the end of 2001 (a difference of almost 500 basis points). Although the US interest rate cuts over this period were by far the largest, central banks from other major developed economies also made substantial interest rate cuts - with the exception of Japan, whose official interest rate was already at very low levels reflecting the sluggish domestic conditions in Japan that had persisted for several years prior. The Canadian central bank cut by about 350 basis points. Australia's easing was similar to New Zealand's and smaller, at around 200 basis points, similar to the cuts by the eurozone and UK central banks.

The low level of overseas official interest rates persisted until around the middle of 2003 in most of the developed world, reflecting only apparently weak improvement in growth prospects as discussed earlier. The exception to this pattern was Australia, which began raising its official interest rates in 2002 in response to strong domestic conditions. By 2004, it was becoming clearer that world growth prospects were looking better, and fears of deflation had receded. Most major economy foreign central banks began raising their policy rates. By the end of the review period, the official rates in the US, Australia, the eurozone and the UK had reached levels close to their long-run averages.

Figure 12

Overseas official interest rates



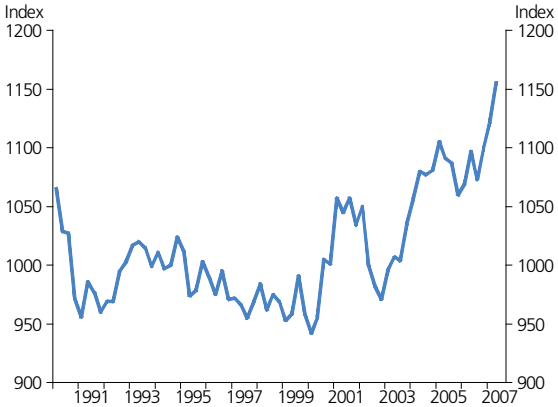
Source: Datastream

New Zealand's terms of trade and its components

Developments in the world economy led to an overall improvement in New Zealand's terms of trade in goods over the review period. This improvement was the net result of the strengthening of global growth which lifted the prices of commodities in general, and supply and demand dynamics in the markets for particular commodities relevant to New Zealand. The average level of the terms of trade over the review period was more favourable than in the 1990s, and during that time the terms of trade declined slightly. Indeed, the terms of trade are now at their highest levels since the early 1970s, when New Zealand's favourable access to the United Kingdom came to an end with the UK's entry to the European Economic Community.

Figure 13

Terms of trade*



Source: Statistics New Zealand.
* Figure for June quarter 2007 is an RBNZ estimate.

The improvement in New Zealand's terms of trade (around 20 percent) was not as large as for some other commodity-exporting developed countries. For example, Australia enjoyed an improvement of around 50 percent, due to the predominance of "hard" commodities such as iron ore and coal in its export basket, as well as its status as a net energy exporter – in contrast to New Zealand, a net energy importer and an exporter principally of "soft" commodities such as dairy products and meat. The strength in global growth over the review period drove the international prices of hard commodities and energy up much more than those of soft commodities.

On the exports side, towards the end of the review period there were sharp and substantial increases in dairy prices on world markets,[11] but there have also been slower-moving, but nonetheless sizeable, rises in the prices of some other important New Zealand commodity exports. On the import side, the most marked movements have been the large and rapid movements in oil prices, and a trend decline in the prices of imported manufactured goods. We discuss these developments below.

International prices of New Zealand exports

New Zealand exports are primarily commodities (approximately 65 percent of total exports of goods), and hence overall export prices received strong support from strengthening global growth over the review period. The strong growth of the AXJ countries in particular was reflected in rising prices of New Zealand exports of protein products such as dairy products and meat, as rising per capita incomes in the AXJ countries have markedly increased consumption of protein there.

Towards the very end of the review period, international dairy prices received a further sharp boost from rises in the price of corn (maize), which is an important food source for dairy herds in most of the world's dairy producers apart from New Zealand.[12] The rise in the price of corn has itself been

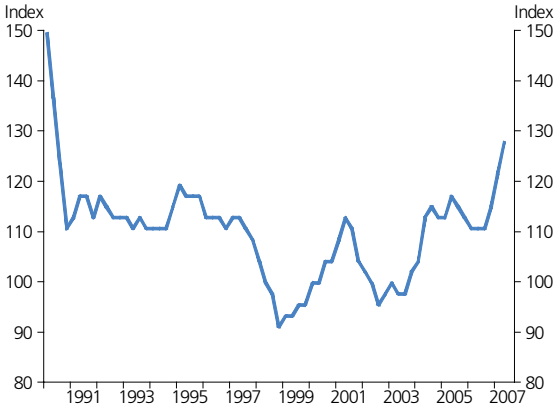
[11] A June 2007 speech by the Governor looks at the recent dairy price rise in more detail.

[12] The March 2007 Monetary Policy Statement contains further discussion of the effect of AXJ growth on the demand for protein, and Bollard (2007b) discusses in detail the recent rise in international dairy prices.

due to a substantial increase in biofuel production lifting demand for corn.

Figure 14

Real world prices for New Zealand's commodity exports*



Source: ANZ, Datastream, RBNZ calculations.

* The real world price index is calculated using ANZ's SDR commodity price index deflated by CPIs.

International oil prices

The price of oil on international markets increased very substantially over the review period, particularly through 2005 and 2006. From around US$20 to US$30 in 2000, oil prices rose more or less throughout the period, peaking at US$72 in 2006 and tracking at similar levels now. This compares to a period of relatively low and stable oil prices throughout the 1990s. Over the review period, episodes of geopolitical uncertainty at times caused fluctuations in the price, but the more durable underlying influence over the period now appears to have been the strength in global growth, and in particular, very strong demand growth in China. The demand-driven character of the substantial oil price rise over the review period stands in stark contrast to the 1970s oil price "shocks", which were due to supply restrictions and caused a global downturn.[13]

Figure 15

Dubai oil price

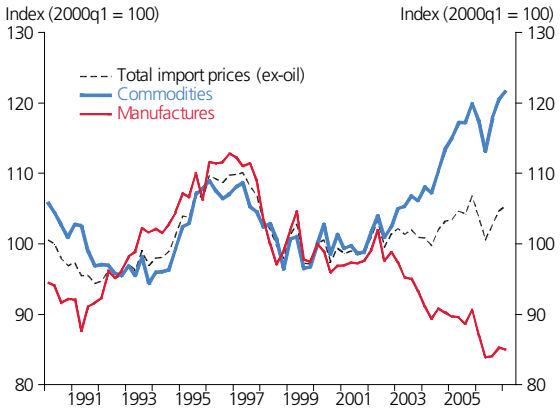
Source: Datastream.

International prices of imports other than oil

Over the review period, the effect on overall import prices of oil and other commodities was almost completely offset by a sustained fall in the prices of New Zealand imports of manufactured goods. Indeed, the international price of non-oil imported goods rose only slightly over the period. The downward pressure on non-oil import prices can be mostly attributed to falling prices for imported manufactured goods, especially from China, but the lifting of parallel importing restrictions in the late 1990s also helped.

Figure 16

International prices of New Zealand imports by category



Source: Statistics New Zealand.

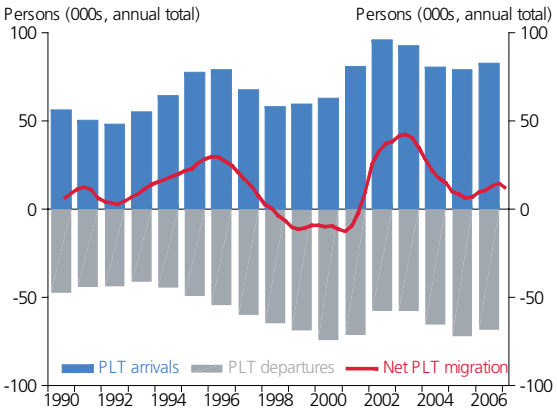
[13] Delbruck (2005) discusses the impact of oil prices on the New Zealand economy in more detail.

Migration

A very sudden, substantial and unexpected surge in net migration into New Zealand was one of the more major driving influences on the economy seen over the review period. During the early years of the period, the net migration flow very suddenly and substantially turned around, from a net permanent and long-term (PLT) emigration rate of around $^1/_4$ percent of the population in 2000 to a net PLT immigration rate of about 1 percent of the population by 2003. Net migration flows into and out of New Zealand as a proportion of the population are both quite large and more cyclical compared to those in most developed countries, accounting for almost all of the variation in the population from year to year and often materially influencing economic developments. Although a steady and anticipated flow of net migration at moderate levels may not tend to affect demand and inflation pressure very much, unexpected or sudden changes in the flows generally do materially influence the degree of pressure on the economy's resources.

The large net PLT immigration flow was only slightly larger than the peak reached in the mid 1990s, but was reached much more rapidly. Compared to the 1990s experience, the inflow of PLT migrants was less concentrated in Auckland. Subsequently, the rate of net PLT immigration subsided to between 0 and $^1/_2$ percent of the population by 2004, but this occurred rather more gradually than the earlier rise.

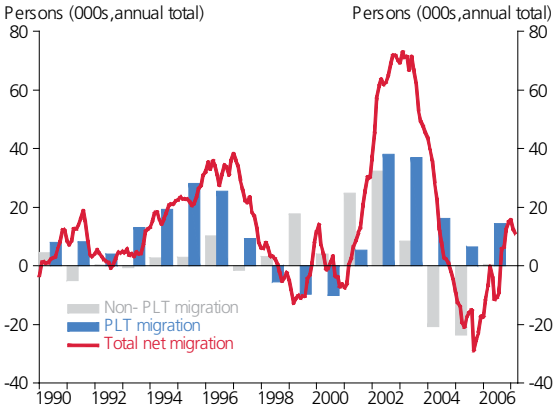
Figure 17
Permanent and long-term arrivals and departures



Source: Statistics New Zealand.

Net inward PLT migration typically increases when economic prospects in New Zealand look good relative to the rest of the world, and this probably contributed to the rise in net inward migration at the beginning of the period. In addition, the influence of the September 11 terrorist attacks and the role of New Zealand as a perceived safe location is suggested by the sharpness of the fall in PLT departures immediately afterwards. Finally, the beginning of the review period also saw a very strong growth in net non-PLT migration, which until 2001 had been an insubstantial part of total net migration. The non-PLT inward migration at this time appears mostly to have been short-term international students, mainly from China. From about 2003 net non-PLT inward migration trended back down, and fluctuated around zero for the rest of the review period.

Figure 18
Net migration



Source: Statistics New Zealand.

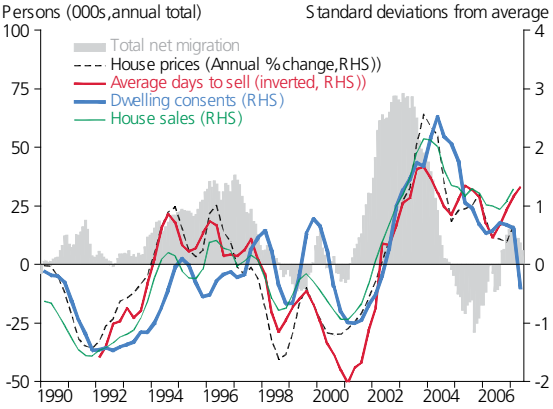
The proportion of PLT arrivals and departures who participate in the labour force is about the same as for the general population. However, net PLT immigration has an immediate effect on demand substantially exceeding its effect on the productive capacity of the economy. This is because new arrivals have an immediate need for somewhere to live and for other set-up goods and services whose cost is several times average income. The net effect on demand may be even larger for students, who will generally not participate in the labour force to the same degree as other migrants. For accommodation services in particular, the economy takes some time (months or years) to supply the additional housing stock needed. Hence, a large sharp and unexpected

increase in net immigration, such as that seen in the early part of the review period, has substantial implications for demand pressure.[14]

In the housing market, these pressures typically show up in elevated activity and house price inflation, and this effect was clearly visible in the early part of the review period. Indicators of housing market activity all rose sharply to levels exceeding their peaks reached in the 1990s, immediately after the turnaround towards net immigration.

Figure 19

Net migration and housing market indicators



Source: Statistics New Zealand, REINZ, Quotable Value Limited.

Fiscal policy

Over the review period, the Government continued to run large and growing fiscal surpluses. Operating surpluses have been maintained since the early 1990s, and the Crown's net debt has declined steadily over this period. Indeed, by the end of the period, New Zealand was one of the few OECD countries with no net debt, and accumulating net financial assets.

The impact of discretionary fiscal policy on the business cycle can be substantial, but is complex and difficult to measure. Generally speaking, it is the change in the operating balance, rather than its level, which influences demand pressure and inflation. Measuring the impact of changes in the operating balance requires two steps. First, the independent or discretionary component of the change – that attributable to fiscal policy choices – must be extracted, as distinct from the component arising from the natural counter-cyclicality of revenue and expenditure (the "automatic stabilisers") due to the benefit and progressive tax system. Second, adjustments need to be made for the likely differences in the impact on actual domestic spending of different types of recorded government revenue, expenditure and transfers. For example, spending on imports will not impact greatly on domestic demand, and a dollar of tax cuts is likely to have a lower impact than a dollar of spending on a new road, because some of the tax cut is likely to be saved by its recipient.[15]

The Treasury's indicative measure of the impact of fiscal policy (the "fiscal impulse")[16] does the first adjustment but not the second. Looking at this fiscal impulse measure, over the first few years of the review period, fiscal policy in New Zealand appears to have had a mildly restraining effect on the economy, before turning around over the final few years to have an increasingly stimulatory effect, mainly due to government spending initiatives such as Working for Families and increases in government sector employment. The Budget announced for the 2007/2008 year in particular appears to be among the more stimulatory of those seen over the review period and in the 1990s, and compared to the typical fiscal packages seen in OECD countries. In the 1990s, tax cuts led to a similarly sized fiscal stimulus.

The Treasury's fiscal impulse measure, though it has the advantage of simplicity, does not purport to be a perfect indicator and there is a range of reasons why alternative measures may be preferable for particular analyses. For the purposes of the present paper, our analysis of the measure suggests that it may understate the degree of stimulus provided by fiscal policy over the review period, for the following reasons:

- During 2003 to 2005, it appears that a number of companies exhausted tax losses accumulated from the early 1990s, and reached a point where they became liable for company tax – hence the large increase in the measured restraining impact on the revenue side in 2005. It is doubtful whether this tax increase would have materially altered firms' or their shareholders' spending plans (even aside from the fact that some

[14] The Reserve Bank's March 2003 *Monetary Policy Statement* contains a Box discussing in more detail the impact on the economy of net migration.

[15] Dunstan et al. (2007) discuss in more detail.

[16] Philip and Janssen (2002).

of the shareholders were non-residents), because the emergence of the tax liability was predictable, even if it happened surprisingly fast.

- The Treasury's fiscal impulse measure assumes that changes in revenue have the same impact as changes in (domestic) expenditure, which, as noted above, is unlikely to be the case.

An adjusted impulse measure taking these issues into account would have looked more stimulatory over the last few years.

Budget projections have to be taken with some caution as the projected fiscal impulse has often ended up exceeding the actual impulse for any particular year. However, on Budget projections of spending and revenue patterns our analysis suggests that the fiscal impulse in 2007/2008 would amount to about 2 percent of GDP.

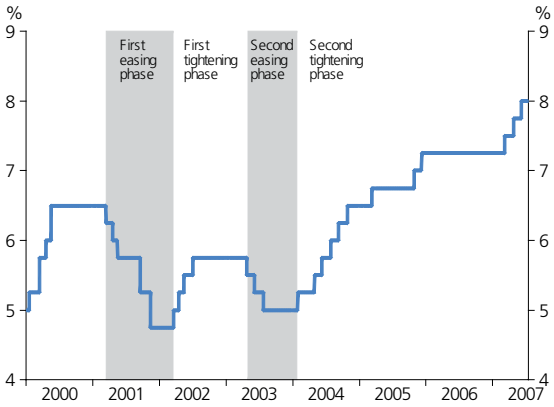
Fiscal contributions to demand on this scale happen every decade or so in most OECD countries. Thus, the magnitude of the current fiscal stimulus is not that remarkable, especially if out-turns are more favourable than projections. What is striking is that this relatively large fiscal boost to demand and activity is coming at a time when resources in the economy have been severely stretched for several years. It will thus serve to exacerbate the demand pressures that are already present in the economy.

A chronology of monetary policy decisions

This section briefly summarises the monetary policy decisions made over the review period, setting them in the context of the state of the economy and the inflation outlook, as they appeared to us at the time. We separate the review period into four rough "phases" of monetary policy – two easing and two tightening – during which the OCR was moving consistently in one direction in response to unfolding developments. (This characterisation of monetary policy into phases is, of course, a simplifying convenience. The reality of monetary policy over the period is a sequence of more than 50 discrete economic assessments and OCR decisions, each taking on board a plethora of data and information each time, and subject to considerable uncertainty and alternative interpretation).

The first phase was an easing one, from around late 2000 to the end of 2001. This was followed by a tightening phase until the end of 2002. The second easing phase lasted from then until the end of 2003, followed by the second tightening phase, which lasted the rest of the review period. We discuss these phases in detail below.

Figure 20
Official Cash Rate



Source: RBNZ.

First easing phase – end-2000 to end-2001

In the first easing phase, the OCR was cut a total of 175 basis points, in roughly two episodes. These easings occurred against the international background of substantial monetary policy easing, as discussed in the earlier section on foreign monetary policy. The first episode was largely in response to the actual weakness in the world economy as investment spending slumped in the United States and Europe. The second set of cuts was largely of a precautionary nature after the September 11 terrorist attacks which reinforced the sense of downside risks around the world economy.

The OCR began this first easing phase at $6^{1}/_{2}$ percent. The Reserve Bank had raised the OCR by 200 basis points between the end of 1999 and the first few months of 2000, believing that the outlook for the world economy had improved and that there was less spare capacity in the domestic economy than had been thought previously. At this time, the exchange rate was still very low compared to its long-run average, and the Reserve Bank believed that monetary conditions remained somewhat stimulatory. Given the positive outlook at that time, it was felt that some further

tightening of monetary conditions would be necessary.

That tightening did not prove necessary – growth subsequently began slowing, apparently for mostly domestic reasons. The trading-partner outlook remained good. Investment seemed to be pausing after the Y2K boost and winding down after the America's Cup. Changes in government policy in 2000, including a rise in the top marginal tax rate to 39 percent and new employment legislation that was deeply unpopular in the business community, had created some uncertainty, and business and consumer confidence overall were at low levels. The exchange rate, though, remained weak and the Reserve Bank was mindful of the inflation pressures it might be creating.

By around March 2001, the Reserve Bank's tone changed, and the Reserve Bank began to place increasing emphasis on the risk that the weakness in the world economy would drag activity in New Zealand down. This risk was felt to outweigh the upside risk to inflation coming from the strengthening domestic situation. Three cuts of 25 basis points each were made in March, April and May, against the background of official rate cuts in the US and Australia. By August 2001, the Reserve Bank began shifting the emphasis to the risk that domestic inflation pressure would persist and thus eventually require a rise in the OCR rates.

A lot changed between August and November 2001, that once again turned the balance of risks to the downside, and further widened the apparent gap between strong domestic economic conditions and a weak and uncertain international environment. Not only had the September 11 terrorist attacks occurred, but the effects of the bursting of the dotcom bubble were being felt strongly in the world economy. The Reserve Bank reduced the OCR by 50 basis points on 19 September 2001 in an unscheduled OCR announcement, and by a further 50 basis points at the scheduled review in November 2001. The post-9/11 cuts were quite explicitly seen as precautionary cuts against the possibility of very adverse outcomes in the world economy.

First tightening phase – end-2001 to end-2002

In the first tightening phase, the OCR was raised a total of 100 basis points, mostly in response to a stronger outlook for the domestic economy, including the sharp boost to demand from the turnaround in net immigration flows.

The feared adverse effects of global events on New Zealand through trade-related channels did not eventuate, at least not to the degree that had earlier seemed likely. In fact, quite the reverse happened, as the relative strength of the New Zealand economy, coupled with the insecurity created by the September 11 terrorist attacks, led to the very sharp and substantial surge in net immigration (exacerbated, coincidentally, by the large influx of international students) to New Zealand discussed in the section on migration. After having spent several years in the doldrums, housing market activity accelerated quickly and house prices began rising. The gap between the strength of the economy in New Zealand and that in the rest of the world widened further. Unemployment continued trending down, capacity utilisation up, and inflation was tracking in the upper half of the target range.

The Reserve Bank responded to the strength in the domestic economy by lifting the OCR four times, by 25 basis points each time, taking the OCR to $5^{3}/_{4}$ percent by the middle of 2002. Over this period, prospects for the international economy continued to look weak, and overseas central banks (except Australia) were generally either continuing to cut official interest rates or were holding them steady. By the end of 2002, the gap from the OCR to the official interest rate in the US was 450 basis points, to that in the eurozone 300 basis points, to that in the UK 175 basis points and to that in Australia, 100 basis points. The exchange rate had already begun climbing in response to the widening of the gap relative to the US towards the end of 2001.

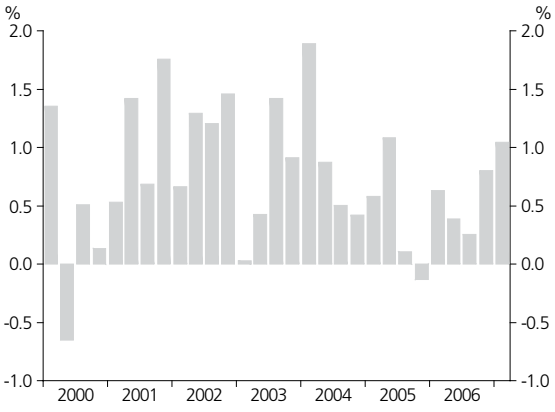
Second easing phase – end-2002 to end-2003

Weak domestic growth, the apparent re-emergence of material downside risks to the world economy, and a rising exchange rate led the Reserve Bank to the second easing phase, which lasted for almost a year. The international environment was again one where the major central banks were cutting their official interest rates. In New Zealand, the OCR was cut by a total of 75 basis points in this phase.

By March 2003, the Reserve Bank was forming the view that the rising exchange rate would be quite likely to provide quite a drag on the economy, in an environment where the

world economy was still looking weak and commodity prices were easing. Despite continued strength in domestic consumption and residential investment, and house price inflation continuing to rise, GDP growth data for the first half of 2003 were very weak, showing almost no growth. At home, drought was affecting agricultural production and raising fears of electricity shortages, while abroad, the emergence of SARS, the invasion of Iraq, and general pessimism on world economic prospects all contributed to the sense that, overall, cuts in the OCR were warranted. The OCR was cut to 5 percent in three steps of 25 basis points each, by the middle of 2003.

Figure 21
Quarterly GDP growth



Source: Statistics New Zealand.

Although the prevalent interest rate of around 5 to 6 percent was very low compared to New Zealand's historical experience (90-day interest rates averaged around 8 percent over the 1990s), and despite this phase of cuts, the OCR remained above overseas interest rates by up to several hundred basis points. Around this time risk aversion among international financial markets began to abate, and the appetite for high-yielding assets such as those denominated in the New Zealand dollar increased markedly, especially as perceptions among international investors became more widespread that the New Zealand economy had considerable underlying strength, both in an absolute and a relative sense. The exchange rate rose by 30 percent during 2002 and 2003, and by the beginning of 2004 the New Zealand dollar had reached US67c, a level well above its long-run average.

Second tightening phase – end-2003 to 2007

The second tightening phase might be characterised as one where the Reserve Bank responded with a fairly long series of OCR increases to surprisingly persistent inflation pressure, resulting from excess domestic demand. Along the way, a number of new positive impulses to demand arrived, such as the terms of trade increase and increasingly expansionary fiscal policy.

By January 2004, projected inflation pressures had increased enough for the Reserve Bank to raise the OCR. However, there was still a view that some slowing in growth was likely due to the high exchange rate and a projected slowdown in population growth. Although the projected slowing in population growth did eventuate much as projected, the Reserve Bank kept getting surprised over this period (but less so than other forecasters) when the overall economy and inflation pressures proved much stronger than expected. Although the Reserve Bank continued to believe that there would be some slowing in growth, partly because the housing market appeared to have turned, it noted that inflation continued to run in the top of the target range, wage inflation was rising, consumer confidence was strong, and commodity prices were strengthening on the back of a strong world economy. Moreover, the exchange rate fell back briefly over the first half of 2004, which was attributed in part to the prospect of rising official interest rates in the US (which began in June 2004).

From the beginning of 2004 through to October 2004, the OCR was raised six times (with moves at every review opportunity apart from the March 2004 review), by 25 basis points each time. In October 2004, with the OCR at $6^{1}/_{2}$ percent, the Reserve Bank indicated that it thought the tightening to that point was sufficient.

By December that year, the Reserve Bank was projecting falling real house prices, but continued to note that there was little headroom in the inflation target range, and hence there was little scope for a cut in the OCR in the foreseeable future. The Reserve Bank continued to use phrasing similar to this in all its *Monetary Policy Statements* up to (and including) the December 2006 *Statement*.

In March 2005 the Reserve Bank raised the OCR by a further 25 basis points, noting the continuing strength in the economy and the intense competition among the retail

mortgage lending banks around the end of 2004 and early 2005, as well as evidence suggesting the housing market might be turning back upwards. However, the Reserve Bank expressed uncertainty about whether any more rises would be needed. It felt that the rapid rises in the OCR to that point should be given time to take effect on the economy. Subsequently, GDP growth outturns for 2005 showed some weakness, including zero growth for the second half of 2005. During this time it appeared that the policy tightenings and the high exchange rate (which had reached US70c by late 2004) were doing the job of reducing inflation pressure.

The outlook was little changed by the latter half of 2005, except for rapid increases in oil prices (whose one-off price effects the Reserve Bank "looked through"). The balance of inflation risks remained on the upside due to ongoing growth in debt-financed household spending and increases in business costs. By October 2005, the Reserve Bank had become sufficiently concerned that the pressure on productive capacity and the persistence of inflation pressure were not abating, that another rise of 25 basis points in the OCR was necessary. The Reserve Bank raised the OCR by a further 25 basis points in December 2005, noting in the *Monetary Policy Statement* that "whether further tightening is needed will depend on the extent to which housing and demand pressures show signs of moderating over the months ahead" (p.2). The OCR was at $7^{1}/_{4}$ percent.

Over the first half of 2006, the Reserve Bank believed that no more rises in the OCR were needed to maintain price stability, but that there was no scope for policy easing in 2006 as inflation remained near the top of the target range. In the June *Monetary Policy Statement*, the Reserve Bank said that economic growth was slowing and that the "much awaited economic rebalancing from domestic spending to exports commenced in late 2005, and is expected to continue over the next two years" (p.2).

Over the first few months of 2006, the exchange rate fell by around 20 percent on a TWI basis. This was at a time of declining world prices for New Zealand export commodities and together with falling business and consumer confidence, and signs of a weakening housing market, financial markets were increasingly focused on the timing of a possible first cut in the OCR (very much at odds with the Reserve Bank's own assessment at the time). Over this period, the central banks of Australia, the United States, Japan and the Eurozone increased policy interest rates and maintained tightening biases for the most part, thus lowering the differential with interest rates available on New Zealand dollar-denominated assets.

Domestic spending continued to run more strongly than expected. By September 2006, the exchange rate had begun rising rapidly again, and the Reserve Bank was saying in the Monetary Policy Statement that "economic activity appears to have been stronger than expected through the first half of 2006, with the expansion of employment particularly surprising" (p.2). As a result, the Reserve Bank felt that the outlook for monetary policy had become more finely balanced and that further rises in the OCR might now be required. In March 2007 the Reserve Bank raised the OCR by 25 basis points, citing continued pressure on capacity and surprising strength in the housing market, a move towards expansionary fiscal policy (discussed in the fiscal policy section), and the rise in international dairy product prices. The Reserve Bank increased the OCR again in both April and June 2007 by 25 basis points each time, as these factors continued to paint a picture of persistent inflation pressure in the economy.

As at July 2007, the OCR is at 8 percent, and the exchange rate has averaged around US78c for the month to date.

The interest rate experience

Over the review period, changes in the OCR were generally reflected in shorter-term market interest rates, for both wholesale funds and retail mortgage lending, in more or less the normal manner. However, a range of other influences on market interest rates were also important at various times. In the wholesale market, these included divergences in the expectations of market participants about the future path of the OCR and very low overseas longer-term interest rates, which tended to reinforce the inversion of the yield curve in 2005 and 2006. Intense competition among retail mortgage lenders further complicated the story.

This section looks in more detail at the interest rate experience over the period. We begin with wholesale interest rates and then discuss retail interest rates.

Wholesale interest rates

The wholesale interest yield curve is driven by a range of factors. The level of the OCR and the phase of monetary policy (easing or tightening) dominate at the shorter end of the yield curve, to maturities of three or four years. The shorter-run movements in monetary policy settings are generally expected to "average out" over longer horizons, and at longer-term maturities interest rates are thus determined mostly by overseas interest rates, adjusted for country risk (immaterial for countries with a high credit rating such as New Zealand) and any difference in long-term inflation expectations (also relatively minor in New Zealand's case).[17]

Over the review period, the level of the OCR, and indications by the Reserve Bank regarding its "bias" for future movements in the OCR, generally dominated the determination of the yield curve slope out to around the three or four year term, in line with this typical pattern. This was true for the two easing phases and first tightening phase of monetary policy discussed in the monetary policy chronology section.

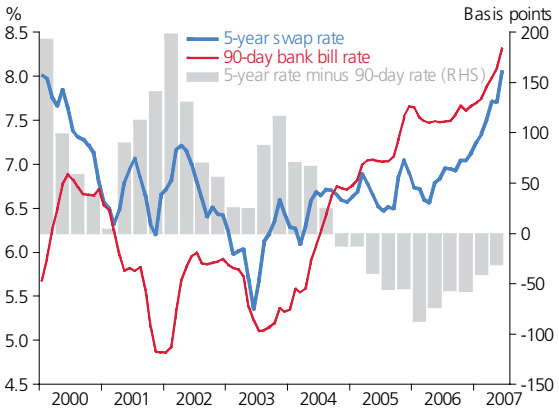
The main period when this relationship was weaker was in 2005 and 2006, during the second tightening phase. During this time, market interest rate futures indicated a belief that the OCR would tend to be cut, in spite of the Reserve Bank's indications that it believed interest rates would either tend to stay stable or need to rise further. In December 2005, for example, interest rate futures suggested a belief in the market that the 90-day rate would fall by around 80 basis points by December 2006, contrary to the Reserve Bank's projections of roughly no change. Through this period, market analysts also tended to believe that interest rates were more likely to fall than to rise. As a result, movements in the OCR had less of an effect on one and two-year wholesale interest rates than might have been expected had market analysts and market pricing been more consistent with the Reserve Bank's assessments. The overall result was that the yield curve flattened and then became negatively-sloped (inverted) quite substantially and early on in the second tightening phase of monetary policy.

For much of the decade, overseas interest rates had dropped to very low levels (the US 10-year bond rate averaged just over 4 percent through 2003-2005, against its average of around 6½ percent over the 1990s). These low overseas interest rates tended to reinforce the tendency of interest rates in New Zealand of around the two- or three-year terms and longer to fall below the 90-day rate. During 2004 and 2005 in particular, US long-term interest rates still remained very low despite the beginnings of the prolonged tightening phase in the US. The low level of US long-term interest rates was surprising given the growth and inflation outlook in the US, for reasons that are not particularly well undersood.[18] It is possible that the very low level of overseas interest rates compared to New Zealand interest rates at this time created a degree of disbelief in the markets, and especially among international investors, that inflation pressure in New Zealand could be so strong that the OCR would need to be held at relatively high levels or even be raised further.

Nevertheless, the series of OCR increases between 2004 and 2007 was eventually followed by a commensurate increase in shorter-term wholesale interest rates - even if this was slower to occur than might have otherwise been the case. By the end of 2006, the OCR and two-year swap rates were at similar levels.

Figure 22

90-day bank bill and 5-year swap rates



Source: RBNZ.

[17] See Eckhold (1998) for more detail.

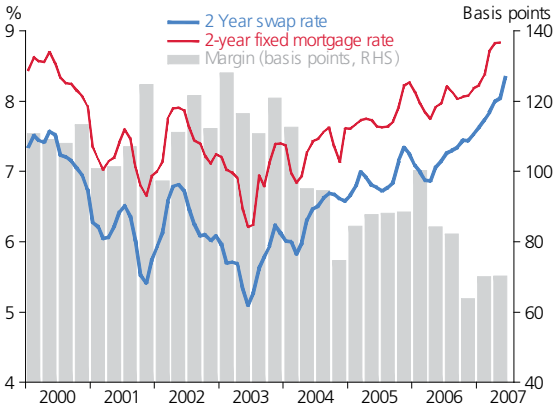
[18] Candidate explanations include a reduction in term and risk premia associated with the maintenance of low inflation, and the impact of global excess savings coming from the large current account surpluses being run in Asia and the oil-exporting countries, as discussed in the earlier section on the world economy. A recent speech by Governor Alan Bollard (2007a) explores these issues in more detail.

Retail mortgage interest rates

Retail mortgage interest rates are typically set at a margin of around 100-150 basis points above wholesale rates for the same terms, and this relationship prevailed during the first three phases of monetary policy. During the fourth phase, at the same time as the wholesale yield curve was becoming substantially inverted, the margin for two-year fixed rate mortgages fell substantially below its 10-year average of just over 100 basis points as lending banks competed aggressively to maintain or grow market share. Two "mortgage price wars" saw the margins on advertised two-year fixed rates fall to historic lows around 60 basis points, particularly during late 2004 and late 2006/early 2007. Market reports suggest that during this time mortgages were actually being written at even lower margins than those suggested by advertised rates, with indications that some mortgages were being written during late 2006/early 2007 at margins of 30 to 40 basis points.

Figure 23

The margin on two-year fixed mortgage rates

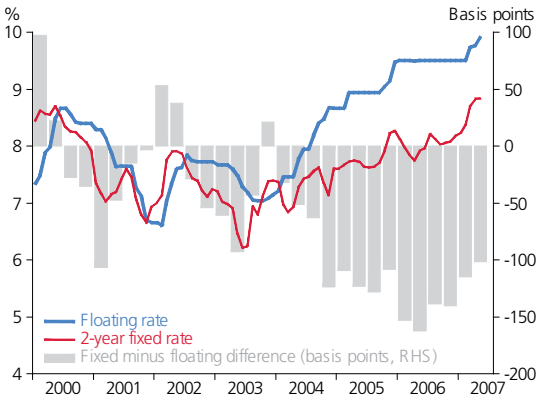


Source: RBNZ.

This retail mortgage rate margin compression further exacerbated the sluggish response of fixed mortgage rates to the OCR increases through this period. From the beginning of the review period until the end of 2004, fixed mortgage rates had remained within about 50 basis points either side of floating rates, but from the end of 2004 during the second tightening phase, fixed rates consistently remained 100-150 basis points below floating rates.

Figure 24

Mortgage rates offered to new borrowers



Source: RBNZ.

Borrowers responded to the absolute and relative changes in mortgage rates by increasingly favouring fixed rates. From about the middle of 2003, the weighted average time to re-pricing for mortgages increased from about eight months to about 20 months by the middle of 2007. This substantial increase in the average length of mortgage terms acted to mute and delay the impact of policy tightening during the second tightening phase.

The exchange rate experience

The substantial and sustained appreciation of the exchange rate through the review period has reflected, first and foremost, the substantial and increased gap between domestic and foreign interest rates. One feature of the appreciation was the role of strong issuance of New Zealand dollar liabilities to overseas investors, and the possibility that this may have exacerbated the tendency of the exchange rate to appreciate in response to the interest rate differentials. This section explores these phenomena in more detail.

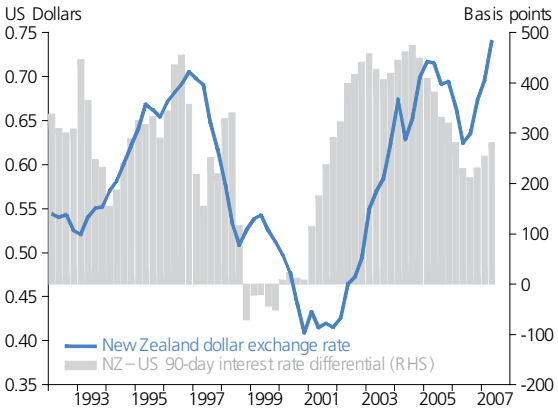
The gap between domestic and foreign interest rates

The large exchange rate appreciation associated with the widening of the gap between prevalent and expected New Zealand and overseas interest rates is neither a new phenomenon, nor one unique to New Zealand. For example, both over the review period and over the 1990s, Australia

also ran its official interest rate at a level substantially above overseas interest rates, and saw its exchange rate appreciate around 60 percent against the US dollar over the period.[19]

Figure 25

The New Zealand dollar and the NZ-US 90-day interest rate differential



Source: RBNZ, Datastream.

That New Zealand's exchange rate started to rise in 2001, during a phase of easing domestic monetary policy, illustrates that it is the gap that matters, as foreign official interest rates were being cut further and faster than New Zealand's official rate. The gap was opened up early in the review period by relatively large falls in foreign official interest rates, and persisted later in the period when both domestic and overseas interest rates were tending to rise.

Movements in the relative expected directions of foreign and domestic monetary policy also largely explain the brief depreciation of around 10 percent in early 2004, when the market came to expect US interest rates to start rising back to "normal" levels. During the more substantial depreciation of 20 percent over the first half of 2006, the market was consistently (but wrongly) expecting monetary policy to enter an easing phase, and this will have contributed to the downward pressure. However, it is also worth noting that this period was also a time of apparent weakening in the trend in the prices for New Zealand's commodity exports and when the current account deficit was approaching 10 percent of GDP.

[19] See Munro (2004).

The role of risk appetite and cross-border investment flows

As noted earlier, the increase in the risk appetite of international investors has boosted the New Zealand dollar, as a relatively high-yielding currency, over the review period. Although this is not a new phenomenon, over the review period it was perhaps strengthened by the substantial increase in the supply of funds seeking cross-border investment opportunities, as discussed in the earlier section on the world economy.

In the early part of the period, risk appetite was fairly low, reflecting the uncertainty about world growth. But as world growth recovered and fears about the impacts of September 11 and other adverse events such as SARS and the invasion of Iraq waned, risk appetite increased to levels similar to those seen in the mid-1990s. The increased risk appetite reflected volatility across a range of financial asset prices falling to low levels, which has itself been attributed to increasing investor confidence about the likelihood that macroeconomic stability will persist.

From about 2004 the widening recognition of New Zealand dollar-denominated assets as among the highest yielding available led quickly to high and increasing levels of offshore issuance of New Zealand dollar debt, such as Eurokiwi and Uridashi bonds.[20] Reflecting the growing interest of international investors in holding New Zealand dollar-denominated debt,[21] the daily turnover of the New Zealand dollar doubled each year from 2004, and saw the emergence of new classes of foreign investors in New Zealand dollar-denominated debt such as Japanese investment trusts.

It is possible that the growth in new instruments and types of intermediaries seen worldwide over the review period has contributed to increased participation by a range of foreign investors in New Zealand dollar assets. However, the extent of this is not clear as comprehensive data are not available.

The degree to which the substantially increased international interest in investment in New Zealand dollar-denominated assets has influenced the dynamics of the

[20] Drage *et al.* (2005) provide a review of this issuance activity.

[21] Popularly known as the "carry trade".

exchange rate (independently of the effect of interest rate differentials attributable to monetary policy) is also unclear. Net issuance of New Zealand dollar assets increases the demand for New Zealand dollars and therefore tends to be supportive of the exchange rate. But, as noted above, this effect is difficult to distinguish from the effect of high and persistently rising New Zealand interest rates relative to overseas interest rates. Looking at the review period as a whole, it is not obvious exchange rates have been much more responsive to the emergence of interest rate differentials than they were in the 1990s, either in New Zealand or elsewhere (for example, Australia). The peaks reached by the exchange rate at the very end of the review period were, however, a little higher than those seen in the 1990s, despite the interest rate differential on most measures being smaller.

The role of structural features of the economy

Over the longer haul, the underlying structural features of the economy, such as productivity growth, the currency's purchasing power, foreign indebtedness, the terms of trade and the long-run inflation rate, could be expected to dominate exchange rate movements, with the cycle in monetary policy settings and interest rates having little or no impact. Over the review period, the structural factor that has changed most has been the terms of trade. The terms of trade generally moved in the direction supportive of the exchange rate.

A persistent terms of trade increase should lead to a persistently higher exchange rate, because the terms of trade increase allows a given quantity of exports to fund a greater quantity of imports. A given current account deficit can thus be sustained at a higher exchange rate. (Of course, this structural exchange rate effect is difficult to distinguish from the cyclical exchange rate effect coming from the terms of trade increasing domestic inflationary pressure and prompting monetary policy to raise interest rates.) Relevant questions are thus how much, if any, of the terms of trade increase over the review period could be considered to be persistent, and what order of magnitude of exchange rate impact a permanent shift in the terms of trade could be expected to have.

Regarding the persistence question, the effect of growing Asian per capita incomes on international protein prices and the effect of biofuel production on dairy prices might be considered to persist, at least over the several years it will take for world supply of the relevant commodities to respond. Reserve Bank analysis suggests that the increase in the terms of trade of around 15 percent over the review period, even if fully permanent, is unlikely to have had a sustained impact on the exchange rate, independently of the monetary policy response, of more than a few percent.[22]

Given the expansion of the current account deficit over the period to almost double digit levels, it is perhaps surprising that this development did not appear to exert more of a downward force on the exchange rate. As discussed earlier, the strong domestic expenditure combined with a weak net exports performance over the period contributed a fairly large cyclical component to the current account deficit's expansion. To that extent at least, the high current account deficit has probably been discounted by the financial markets as temporary only.

Relative sectoral performance and the impact of monetary policy

Over the review period, domestic expenditure made a much larger contribution than net exports (i.e. exports less imports) to GDP growth. Although this relative performance was also a feature of the 1990s cycle, the difference between net exports and domestic expenditure contributions to GDP growth has been more pronounced over the review period.

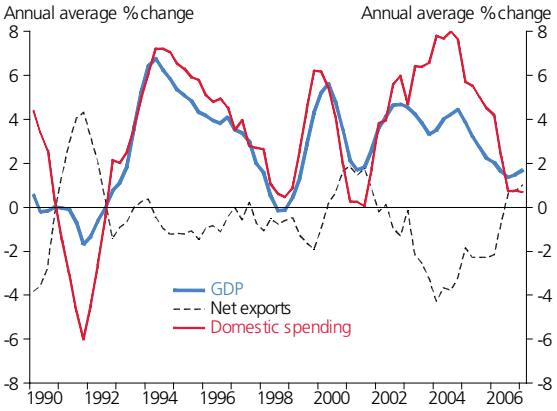
The larger gap during the review period partly reflects the persistently strong house price inflation this decade, and the (not unrelated) longer sustained period of an overvalued exchange rate, than in the 1990s.[23] The high exchange rate probably accelerated the penetration of import substitutes for domestic manufactures, which was already being assisted by the fall in the world prices of manufactured goods as

[22] Hargreaves and Brook (2000) discuss some issues concerning the impact of structural factors on the exchange rate.

[23] The impact of exchange rate variability on the economy's long run growth performance is discussed in supporting paper A5.

Figure 26

GDP growth, net exports and domestic expenditure



Source: Statistics New Zealand.

discussed in the earlier section on international prices of imported goods.

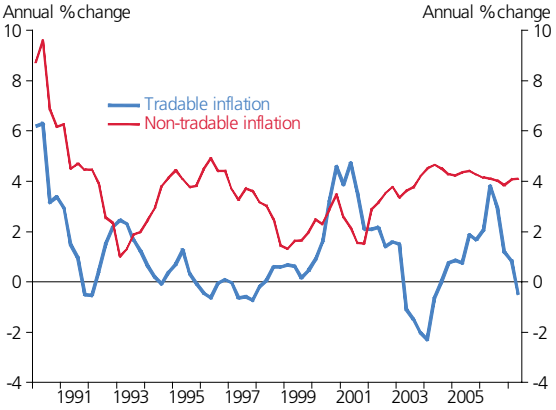
Partly reflecting these patterns of expenditure, the tradables sector has, overall, come under pressure while the non-tradables sector has performed very strongly.

The relative sectoral performance over the review period is also evident in the pattern of tradable and non-tradable inflation. In line with the strengthening domestic economy, non-tradables inflation picked up in 2002 and stayed up through the rest of the review period. Tradables inflation fell sharply as the exchange rate appreciated from 2003, and was also kept down by the decline in world import prices discussed earlier. The effect on domestic petrol prices (despite the exchange rate appreciation) of the very large international oil price increases boosted tradables inflation from 2004 to 2006.

Various parts of the primary sector were also subject to drought at times during the review period, which suppressed production, but dry weather is of course not an extraordinary event in New Zealand. Finally, as discussed earlier, increasingly favourable world prices for certain commodity exports, especially of dairy products most recently, supported incomes in those sectors.

Figure 28

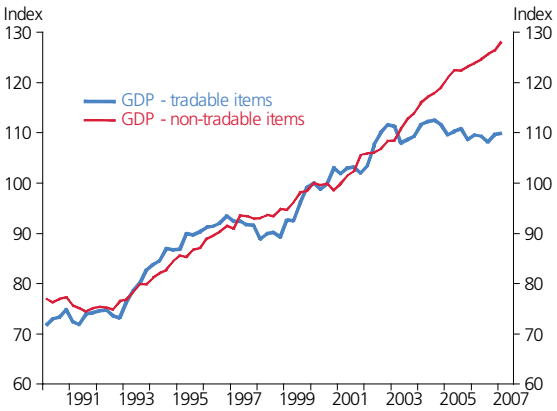
CPI inflation: tradables and non-tradables



Source: Statistics New Zealand.

Figure 27

Real output: tradable and non-tradable sectors*



Source: Statistics New Zealand, RBNZ calculations.

* Tradable sector real output is defined as the sum of real output in the agriculture, manufacturing, forestry, fishing and mining production sectors and real expenditure on exports of services. Non-tradable sector real output is defined as total production GDP less tradable sector real output.

The role of the housing market

The rise in New Zealand house prices is probably the standout feature of the review period. During the 1990s, house prices rose 50 percent over the decade, but over the review period, they doubled. Affordability (measured by the ratio of house prices to household disposable income) fell markedly over the period, with average house prices rising from four times average annual household disposable income to about six times. In real terms, similarly high annual rates of house price inflation were last seen in the early 1970s boom.

Developments in the housing market have a direct impact on CPI inflation, with construction costs of new dwellings and a range of housing-related expenditures (included dwelling rents and real estate agent fees) making up part of the CPI regimen. The more important influence for

monetary policy, however, is the role of the housing market in perpetuating strong domestic demand. It is this latter role that was of most relevance during the review period.

In New Zealand, cycles in consumption spending are closely correlated with residential house price cycles, and this relationship was borne out over the review period. The relationship probably reflects that rising house prices increase perceived wealth, and enable increased consumption to be funded either by borrowing against a higher valued asset, or by the increased households' equity being withdrawn passively when the house is sold.[24] It is also likely that strength in the economy driven by other reasons also has a tendency to lift both consumption and house prices, in line with households' incomes and lifestyle aspirations.

Estimates of the responsiveness of consumption to changes in house prices in New Zealand tend to be larger than those for other OECD countries. This probably mostly reflects that in New Zealand, the proportion of housing assets in total household wealth is considerably larger than in other OECD countries.[25]

Unlike in the mid-1990s, New Zealand was not alone in the experience of rising house prices over the review period. New Zealand's episode of house price inflation started later, but house prices in the UK also roughly doubled over the period, Australian house prices almost did so, and US house prices increased around 50 percent (though US house prices appear to have either stabilised or are beginning to fall slightly).

Another difference compared to the 1990s experience is that the rise in property prices in New Zealand has been seen not only in house prices. Urban and rural land prices more than doubled over the review period, while industrial property prices rose by around 80 percent and commercial property prices by around 60 percent. Finally, compared to the mid-1990s cycle, the house price increase seen over the review period has been more dispersed across New Zealand, as opposed to being concentrated largely in Auckland.

Understanding the reasons for house price rises matters for monetary policy. Just as with other asset prices, house prices may move for enduring "structural" reasons, such as shifts in the costs of construction, the supply of available land, general inflation, demographics and cultural preferences. But house prices may also move as a result of speculative activity driving prices away from their fundamentally justified levels, and causing a destabilising self-perpetuating "bubble" to emerge. We discuss below whether the fundamentals can explain all of the house price rises seen over the review period.

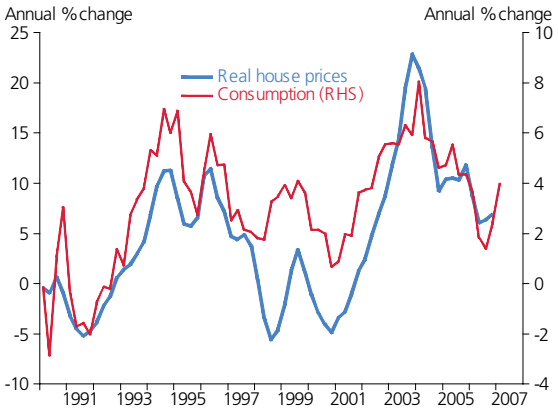
The two most obvious structural factors over the review period were the sharp and unexpected surge in net immigration early on in the period, and the strong growth in employment and incomes more or less throughout the period. The migration surge caused an immediate upswing in house prices, consistent with previous experience of the effects of migration. Subsequently, house price inflation continued throughout the rest of the period, even after net immigration subsided.

The persistence over some years of a rise in house prices after a sharp rise in the population is understandable given the short-term supply constraints in the housing sector, possibly reflecting lengthy planning processes and the scarcity of available land on which to build, as well as the value of location, which cannot be replicated easily in the short term.[26]

A combination of factors may have contributed to continued demand for houses and supported house prices

Figure 29

Real house price inflation and consumption growth



Source: Statistics New Zealand, Quotable Value Limited, RBNZ calculations.

[24] Smith (2006) discusses the withdrawal of equity from housing wealth.

[25] See, for example, Hull (2003).

[26] See Grimes et al. (2006).

after the migration impulse subsided. Most clearly, economic growth continued to run at high levels. Also, the low inflation environment established in the early 1990s, with the subsequent decline in nominal interest rates, enabled households to service larger loans. Financial deregulation, the introduction of new mortgage lending products and vigorous competition among mortgage lenders may have expanded the availability of mortgage credit to new borrowers. Finally, a perception has clearly developed that there is a tax advantage associated with the ability to debt-fund investments in housing.

In addition to the impact of immigration, New Zealand house prices may have been supported by an increase in interest among overseas buyers in the New Zealand housing market, especially in the early years of the review period (when the exchange rate was relatively low). The lack of good data makes it difficult to measure the extent to which overseas demand has supported New Zealand house prices. Partial information and industry reports suggest that though the proportions of house sales to overseas buyers and of the housing stock held by non-residents have been increasing, they remain small (less than 5 percent of all residential dwellings).[27]

Although movements in these structural factors may be able to explain some rise in the level of house prices, none seems capable of explaining persistent house price inflation that has led to a doubling of house prices in just over five years.

It therefore seems very likely, in hindsight, that a material factor was the increasingly widespread expectation of continuing rises in house prices taking hold. This meant that the effective real interest rate for housing investment (the mortgage rate less expected house price inflation) dropped to very low or negative levels, and it became difficult for rising nominal interest rates to dampen housing market activity.

When the OCR was raised in response to rising general inflation pressure during the second tightening phase, rising interest rates were insufficient to stem demand for borrowing to invest in housing assets. They were undermined to some degree by the inversion of the wholesale yield curve and compression of mortgage lending margins discussed in the section on the interest rate experience. Towards the end of the review period, a further unhelpful perpetuation of housing lending and investment emerged as lenders began to compete in riskier areas of lending, by relaxing lending criteria such as the maximum loan-to-value ratio (LVR) on loans, including in some cases offering "no deposit" deals.

Reviewing the conduct of monetary policy

This section reviews the conduct of monetary policy against the requirements of the Policy Targets Agreement. The Agreement's definition of the inflation target changed somewhat during the period. However, a consistent requirement throughout has been that in pursuit of the inflation target the Reserve Bank should seek to avoid unnecessary instability in output, interest rates and the exchange rate.

In early few years of the period, the main surprising event for the Reserve Bank was that the world economy turned out to be more robust than expected or feared. Later on, the major surprise was the resilience of the domestic economy, and especially the ongoing substantial house price inflation, in the face of tightening monetary conditions.

The second tightening phase (i.e. from 2004) could be characterised as a period of catching up to the strong domestic demand. A materially complicating factor during this phase was the prolonged and substantial appreciation in the exchange rate. The second tightening phase generally featured real interest rates at substantially lower levels than in the mid-1990s, but still materially above those in the rest of the world. Real interest rates at these levels have been sufficient to keep medium-term inflation at levels consistent with the PTA. However, inflation pressures have remained persistent despite the very high exchange rate for most of the second tightening phase.

The rest of this section discusses these aspects in more detail.

[27] Net overseas purchases of residential property each year are also likely to be a small portion of total sales.

The Policy Targets Agreement – framing the conduct of monetary policy

The conduct of monetary policy is governed by the PTA. Supporting paper A1 discusses the evolution of the PTA in more detail.

The requirement that the Reserve Bank "must [in the pursuit of price stability] seek to avoid unnecessary instability in output, interest rates and the exchange rate" (clause 4(b)) was introduced to the PTA in 1999 and remains in place.[28]

In 2002, the definition of the inflation target was changed from "12-monthly increases in the CPI of between 0 and 3 percent" to "future CPI inflation outcomes between 1 percent and 3 percent on average over the medium term". As well as a shift upwards by $^1/_2$ percent in the midpoint of the numerical indications of the target range (from $1^1/_2$ percent to 2 percent), the change included a reduction in the precision of the specification of how the relevant CPI outcomes should be measured, with the adoption of the undefined "on average over the medium term" qualifier.

In its November 2002 *Monetary Policy Statement*, the Reserve Bank noted that the new PTA provided monetary policy with a little more flexibility than had previously been the case. It allowed the Reserve Bank to be more gradual in its monetary policy responses in some cases, but this extra flexibility was conditional on the Reserve Bank being confident that short-term fluctuations, which we would normally seek to "look through", would not lead to an ongoing inflation problem.

In interpreting the requirement to maintain future inflation within the range "on average over the medium-term", the Reserve Bank noted that it placed most of its attention on the outlook for CPI inflation over the next three years or so. In general, the Reserve Bank would aim to ensure that, in the absence of significant unforeseen events, inflation would be comfortably back within the target range in the latter half of that three-year period.

The Reserve Bank did not cut the OCR in response to the changed PTA, observing in the November 2002 *Monetary Policy Statement* that "current policy settings appear consistent with [the changed inflation target definition]" (p.2).

As noted in the section on the broad inflation experience, surveyed inflation expectations gradually shifted upwards consistent with the higher midpoint. This meant that for any given real interest rate required to keep inflation pressure contained, a slightly higher level of nominal interest rates was necessary.

Thinking along the lines of the 4b requirement influenced the Reserve Bank's reactions to a range of events over the review period. In particular, the Reserve Bank generally took the "look through" approach to the direct CPI effects of the oil price rise and the impact of exchange rate movements on the prices of imported goods, rather than respond with adjustments to the OCR. This practice is well established among inflation-targeting central banks. On the output side, the Reserve Bank's response to adverse turns in the outlook for the world economy in both easing phases included the use of precautionary cuts to the OCR. These cuts, and especially those in late 2001, were not clearly called for by the central outlook for inflation pressure, but were made in light of the clear risks of large adverse output fluctuations.

Anticipating (let alone exploiting) the interaction between monetary policy, interest rates and the exchange rate over the review period, was more problematic. Evaluating that interaction and deciding upon the right monetary policy approach in the context of the 4b requirement regarding interest and exchange rates was even more so. In a March 2007 speech,[29] the Governor remarked that "[a] further practical constraint for us has been that, although the TWI is influenced by a wide range of global events, in recent years we have not wished to add to upward pressure on the NZ dollar. We have also remained conscious of our obligation to avoid unnecessary instability in output, the exchange rate and interest rates, as required under section 4b of the Policy Targets Agreement. This has meant we have been more cautious in our OCR tightening path than might otherwise have been the case."

The Reserve Bank's emphasis on caution during the second tightening phase, given how responsive the exchange rate appeared to be to the interest rate differential, was one among two polar – both difficult – choices. Had the apparent tightness in monetary conditions (the combination

[28] See Hunt (2004) for a discussion of this requirement.

[29] Bollard (2007a).

of interest rates and the exchange rate) through this period been sufficient to relieve the inflation pressure in the domestic economy, it might well have turned out that, as the Reserve Bank expected during the second tightening phase, the OCR could have been held "cautiously" at levels closer to overseas interest rates, with the exchange rate appreciating less overall. In the event, trading partner demand grew more strongly than expected and boosted the terms of trade, and the strength of domestic demand (in particular, the housing market) proved very resilient to the (substantial) tightening of monetary conditions, meaning that a sustained period of domestic interest rates higher than overseas rates was necessary.

This meant that the exchange appreciation was an almost inevitable result of the substantial difference in the strength of the domestic economy compared to the world economy, over much, if not all, of the review period. The more interesting question is whether the exchange rate appreciation could have been more attenuated if the Reserve Bank had raised the OCR earlier and faster in response to the evidence of persistent domestic strength - in other words, did a trade-off between high interest rates and a high exchange rate exist, and if it did, could or should the Reserve Bank have exploited it?

The answer partly depends on the reaction of the foreign exchange markets to Reserve Bank indications of the need for an even greater differential than was seen early in the tightening phase. As discussed in the section on the interest rate experience, our view of the necessary level of New Zealand interest rates in that period was met with scepticism by the markets as it was. On the one hand, if such indications had been interpreted as evidence that there was even more domestic resource pressure to counter, the exchange rate might have risen even further (by the beginning of 2004 it had already reached US70c). On the other hand, if such indications had been interpreted as a resolute desire to make sure that the catch-up happened and that the domestic economy cooled substantially, the exchange rate might have fallen back towards its long-term average level, reflecting a return to "normal" economic conditions.

At the time, it seemed highly likely that a faster tightening would have materially exacerbated the already substantial appreciation in the exchange rate. With hindsight, there seems no reason to revise that judgement.

The Reserve Bank's forecasting performance

Monetary policy formulation requires both good near-term forecasts so that unfolding events can be responded to promptly, as well as a reasonable sense of the more medium-term and persistent developments that drive the broad cycle of inflation pressure. The Reserve Bank forecasting performance over the review period, while not perfect, was generally better than the average of other forecasters.[30]

Forecasts are inevitably subject to error. The importance of good near-term forecasts is underlined by three occasions during the review period (2000, 2003 and 2005) when sudden or unexplained drops in quarterly growth rates appeared materially to influence the outlook for inflation pressure. Notwithstanding that the quality of New Zealand's official statistics could probably be improved (a topic we take up in supporting paper A10), New Zealand's economy is small and volatile, and GDP out-turns can suddenly suggest a turning point in the economy when one does not exist. Such false turns can create delays while monetary policy needs to wait for a better steer. Even worse, false turns can lead to a movement in the OCR in the wrong direction, which needs to be reversed. In 2003 and 2005, the "noise" caused by volatile or surprising quarterly GDP data probably contributed, to a degree, to monetary policy not catching up perhaps as fast as it could have to the underlying strength in inflation pressure.

Probably more important than getting the exact timing of monetary policy moves right, is for the catch-up, when it happens, to broadly match the medium-term cycle in inflation pressure itself. Although domestic demand in the latter part of the period proved substantially stronger than the Reserve Bank expected, the Reserve Bank's evolving view was closer to the mark than that of market analysts at the time. The Reserve Bank's actions in the second tightening phase recognised the emerging evidence of this underlying strength rather earlier than most market analysts. Indeed, there was some, quite vocal at times, criticism about the degree of tightness of monetary conditions and whether it was necessary.

In the early part of the period, both the Reserve Bank and most market analysts were surprised by the robustness

[30] See Turner (2006) and Turner et al. (2007) for detailed assessments.

of the domestic economy to the adverse events in the world economy. The Reserve Bank's precautionary cuts in response to the adverse world economy events were generally seen as reasonable by market analysts – as were the subsequent reversals of the cuts.

The strong and sustained growth in the AXJ countries, with its consequences for the global savings-investment imbalances and cross-border flows that would feature in the latter part of the period, also took most observers by surprise. For New Zealand, this surprise contributed to a mild unexpected improvement in the terms of trade (with the improvement becoming stronger in the last year or so of the period, reflecting the sharp rise in international dairy product prices), and, more significantly for monetary policy perhaps, prolonged support for the New Zealand dollar and its responsiveness to the interest rate differential prevalent throughout most of the period.

The persistently surprising strength of the domestic economy, and particularly the elevated activity in the housing market, explains the bulk of the second tightening phase and why it has been fairly drawn out. Although the Reserve Bank recognised the impact of the migration surge on the housing market in 2001-2002, the contribution of low interest rates to prolonging the strength in the housing market was probably underestimated, as was the degree to which interest rates would need to rise to stem the strong growth in borrowing to finance housing.

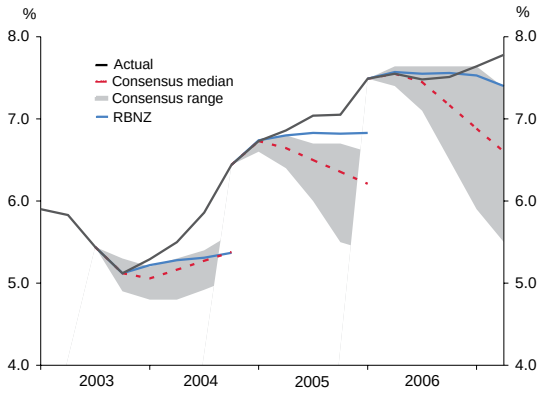
The Reserve Bank had noted for some time that rising household debt levels would lead to an increase in the impact of interest rate rises on household disposable income, but the effect of this on domestic demand turned out to be outweighed by the wealth effects of rising house prices and the relative unresponsiveness of the housing market to rises in the interest rate. The effects of the rising OCR were blunted and delayed to some degree by the inversion of the yield curve and the compression of retail mortgage margins discussed earlier. That made it more difficult for monetary policy to catch up to strong and sustained domestic demand once it became apparent.

A contributing factor to the strengthening of demand was the movement of the fiscal impulse from restrictive to stimulatory in the latter few years of the period. Although the Reserve Bank recognised this movement, the extent of the stimulus was probably underestimated. At the time, the impact of the revenue component of the fiscal impulse discussed earlier was taken largely at face value (i.e. dollar-for-dollar with the expenditure component), rather than downweighted as it probably should have been.

As noted already, through most of the second tightening phase, the Reserve Bank persistently perceived greater strength in the domestic economy than did market analysts. Through this phase, the Reserve Bank consistently projected stronger GDP, inflation and monetary conditions than the average of market analysts, even though the out-turns were of course stronger still (in the case of inflation, because of the oil price surge as well as the strong domestic economy). The Reserve Bank's two-year-ahead projections of 90-day interest rates exceeded those of the average market analyst by up to $^{3}/_{4}$ percent through 2005 and 2006. As discussed in the section on the interest rate experience, market analysts' views of future interest rates were fairly consistent with interest rate futures pricing, and the divergence in the market's and the Reserve Bank's view of the likely future path of the OCR put material downward pressure on interest rates for terms out to one or two years, exacerbating the tendency for the yield curve to invert at that time.

Figure 30

RBNZ and Consensus 90-day rate projections*



Source: Consensus Economics Inc., RBNZ

- Consensus forecasts are published by Consensus Economics Inc., which regularly surveys reputable private-sector forecasters on a range of economic and financial variables. For New Zealand, the survey covers 16 forecasting institutions within New Zealand and the Asia-Pacific region..

Benchmarking the conduct of monetary policy over the review period

As noted already, both over the review period and over the 1990s, inflation outcomes have generally remained within the respective target ranges. Growth over the review period was longer and stronger. The length of time the exchange rate has been well above long-run average levels is greater. This is probably mostly explicable by the greater strength of the economy and the consequently longer and larger gap between domestic and overseas (especially US) interest rates. It is evident that monetary policy could have been even tighter, which would have kept inflation closer to the middle of the target range.

The difference between the relative strength of domestic demand and the external sector has been more marked than it was in the previous cycle. As a result, the "mix" of monetary conditions has been even more problematic than in the 1990s experience, especially around 2002-2003 when world interest rates were still very low, but the domestic economy was gathering considerable strength. Over the period as a whole, real short-term interest rates averaged around 4 percent, some 200 basis points lower than the average for the 1990s, but the exchange rate reached around the same or higher levels and remained there for considerably longer. The interest rate cycle over the period was more muted than in the mid-1990s, when 90-day rates moved further and faster.

An interesting comparison is with the experience of Australia over the period. Australia faced much the same trading-partner environment, but did not have a net migration surge. Australian monetary policy, like New Zealand's, eased in response to the weak world outlook early in the period, but not as far as that in most overseas countries. In late 2002 and early 2003, when the major central banks and the Reserve Bank of New Zealand were cutting official interest rates, Australia did not cut. Reflecting the resulting interest rate differential, the Australian dollar also appreciated substantially through the period. An expanding current account deficit through the period was seen in both countries.

Australia enjoyed even more of a boost to its commodity export prices than New Zealand, as noted earlier. However, a given boost to the terms of trade is likely to have a substantially stronger impact on New Zealand than Australia, because of the greater proportion of exports in New Zealand's GDP and because substantial parts of the Australian industry exposed to commodity prices are overseas-owned. The overseas ownership dampens the domestic spending impact compared to the New Zealand case where the export sector is largely domestically owned.

Despite not having a migration surge, Australia's broad experience through the review period is of domestic strength, including a period of substantial house price inflation and a secular increase in household debt. The house price inflation episode in Australia began much earlier, and appears to have ended.

Australian interest rates over the review period have in general been below New Zealand's, though this is not a new phenomenon (discussed further in supporting paper A4). As discussed in supporting paper A3, the evidence suggests that the Reserve Bank of Australia tends to respond to economic developments in much the same manner as the Reserve Bank of New Zealand.

Over the review period, both central banks cut official interest rates because of the adverse events in the world economy early in the period. Both central banks reversed those cuts when it became apparent that the respective economies were performing robustly in spite of the downturn in the rest of the world. The two countries have both had to revise up their views of the level of interest rates needed to keep inflation pressure contained.

Through the first tightening phase in New Zealand, the gap between New Zealand and Australian official interest rates opened up to about 100 basis points, and was subsequently closed again in the second easing phase. This first gap can perhaps be explained by the net migration surge that occurred in New Zealand but not in Australia. In the second tightening phase, the gap opened up early in the middle of 2004 and persisted at about 100 to 175 basis points from then on.

The reasons why New Zealand domestic demand has proven so resilient remain elusive and a topic for further research. We discuss this and other such topics in the next section.

Overall assessment and conclusion

Over the review period, the Reserve Bank successfully maintained price stability, in spite of difficult circumstances and a number of surprising events. Challenging times in the world economy, a prolonged period of very low global interest rates, and subsequently a dramatic increase in the supply of funds seeking investment returns proved major issues for all central banks.

In the context of these trying times, the Reserve Bank early in the review period made a series of precautionary cuts to the OCR as "insurance" against low-probability, but highly adverse, outcomes. Those outcomes did not occur, which of course does not invalidate the wisdom of taking out insurance. As those cuts were reversed out, however, a number of positive surprises – the growth of the AXJ countries, and the strength of domestic demand and the housing market in response to the migration surge – did occur.

Of all the influences discussed on the economy above, probably the most unusually large event was the migration surge. As discussed already, the Reserve Bank recognised the migration surge at the time, but (like others) underestimated how much monetary policy would have to respond to the strong domestic demand and housing market surge it triggered. The relative contributions of structural factors and of rising house price inflation expectations to the house price inflation episode, and the reasons why house price inflation was so resilient in the face of rising interest rates, remain poorly understood.

The gap between the strength of the New Zealand economy and the world economy that persisted through the review period was reflected in interest rate differentials and the evolution of the exchange rate. As in the 1990s cycle, the resulting highly adverse mix of monetary conditions provoked large imbalances in the relative performance of the tradable and non-tradable sectors and a resulting substantial expansion in the current account deficit, and there was limited self-correction to this development from financial markets. Supporting paper A7 discusses supplementary instruments and structural measures that may assist monetary policy in managing domestic demand and inflation pressure at times when there is a large gap in the relative performance of the New Zealand and world economies.

A perennial lesson is that a number of important macroeconomic drivers and influences are hard to forecast, but material for the development of inflation pressure. Over the review period these have included the migration surge and the terms of trade increase. More generally, OCR decisions are taken in light of interpretations of contemporary moves in the exchange rate, and projections of future moves, which are always fraught with difficulty given the short-term volatility of the exchange rate. Managing this interaction was made no easier over the review period by the responsiveness of the exchange rate to interest rate differentials. This responsiveness may persist while the global supply of funds seeking investment returns remains ample. To date there has been little evidence that this global "surplus" of capital will dissipate any time soon.

Monetary policy always impacts with long and variable lags, but those lags lengthened somewhat over the review period, in part due to the substantial lengthening of the average residential mortgage term. This development may not endure. As the yield curve slope "normalises" and floating rate mortgages become more attractive, borrowers may shift back to shorter terms. That is not to say, however, that future tightening cycles may not see a lengthening of mortgage terms in similar fashion. The financial markets effects over the review period are not difficult to explain, even if they did feature an unfortunate (for monetary policy) confluence of events in low global interest rates, scepticism among the market about the need for high domestic interest rates, and stiff retail mortgage lending competition over fixed rates. Meanwhile, notwithstanding the variability of the lag between the OCR and effective mortgage rates, as household debt grows, interest rates can be expected to become more potent as a monetary policy instrument.

Looking over the review period as a whole, the circumstances the Reserve Bank faced, while difficult, were not so inexplicable. The New Zealand economy was "out of synch" with the rest of the world to a material degree and for a material length of time. New Zealand was one of the few OECD countries facing sustained inflation pressure throughout the review period. The consequent unfortunate mix of monetary conditions was exacerbated this cycle by monetary policy tightening being confounded at times

by disbelief among the market about the necessity for high interest rates. These doubts held down longer-term interest rates, while competition among mortgage lenders reinforced the difficulty of raising borrowing costs through OCR increases. As a result, the OCR needed to be higher than otherwise to deliver the intended increase in borrowing costs. At the same time, the growth in issuance of offshore New Zealand dollar liabilities may have exacerbated the effect on the exchange rate of the gap between domestic and overseas interest rates.

In hindsight, the Reserve Bank could be criticised for not forecasting the strong domestic economy, and when the strength became apparent for not tightening faster in response. That, of course, was not the thrust of the criticism we generally received at the time. If the Reserve Bank had tightened earlier or faster, the monetary conditions cycle might have had a different shape, but the basic fact of the asynchrony with respect to the rest of the world, and the resulting adverse mix of monetary conditions, would still have prevailed. Specifically, even if the Reserve Bank had better judged the degree of tightening required and had acted to tighten more sharply (even more strongly against the clear consensus of market analysts and other commentators at the time), the initial exchange rate overshoot would probably have been even worse than we have seen. A sharp tightening in the hope of attenuating the exchange rate cycle would have been bold indeed.

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