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## Editor's note

Twenty years have passed since the New Zealand dollar was floated on 4 March 1985. To mark this anniversary, your copy of the *Bulletin* contains a poster showing the path of the exchange rate over the period, which I hope you will find interesting. Those wishing to read more about the background to the float may wish to consult an article entitled 'Exchange Rate Policy Developments', which appeared in the May 1985 issue of the *Bulletin* and can be accessed at [www.rbnz.govt.nz](http://www.rbnz.govt.nz).

Two articles in this issue of the *Bulletin* also focus on matters related to the exchange rate. During 2003, the Bank conducted a comprehensive review of its policies on foreign exchange intervention. The first stage of this review looked at the level of reserves the Bank holds for crisis management purposes – those rare occasions when the normal operations of the foreign exchange market break down, requiring supportive action on the part of the Reserve Bank. Following the review, the Bank recommended to the Minister of Finance in March 2004 that the Bank's intervention capacity for this purpose be increased to around \$7 billion. The first article, by Michael Gordon of the Financial Stability Department, looks at the issues around foreign exchange market dysfunction, the rationale for holding reserves, and the framework the Bank used to review the optimal level of reserves.

The other part of the review culminated in an extension to the Reserve Bank's intervention capacity to allow for intervention at the extremes of the exchange rate cycle. In effect, the Bank now has some scope to lean against trends in the exchange rate at times when it assesses the level of the exchange rate to be unjustified by economic fundamentals. In the second article, Kelly Eckhold (Financial Stability Department) and Chris Hunt (Economics Department) describe this new intervention role and the implications for the management of the Bank's foreign exchange reserves.

While intervention to influence the level of the exchange rate may affect the level of foreign reserves held by the Bank, it should be pointed out that the Bank did not seek any additional foreign exchange reserves for the purposes of carrying out such intervention. However, as intervention does imply a higher level of financial risk compared to the Reserve Bank's other activities, the Bank has been given a

\$1 billion capital injection to cover the potential for short-term losses associated with intervention.

In the third article, Jane Turner of the Economics Department provides a brief overview of trends in the manufacturing sector over the past few years. An interesting finding is that strong domestic conditions appear to have bolstered sales for some manufacturers at a time when export revenues have been under some pressure. I am hoping that this article will be the start of a series focusing on particular sectors of the economy.

The fourth article, by Ken Matthews of the Financial Stability Department, briefly outlines amendments to the rules covering disclosures by registered banks on a range of financial matters.

Finally, this *Bulletin* contains a chronology of key economic and financial events during 2004. It was prepared by Madeline Penny, a summer student in the Economics Department, and should be useful to anyone wanting to quickly locate and date key events. Madeline has now backdated the chronology to the early 1990s and it is intended to make the full period available on the Bank's website shortly.

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# Foreign reserves for crisis management

Michael Gordon, Financial Stability Department<sup>1</sup>

This is the first of two articles detailing the Reserve Bank's recent review of its foreign exchange market intervention capabilities. This article deals with the review of the adequacy of foreign reserves that could be used to calm a disorderly foreign exchange market during times of stress. The Bank developed a framework for balancing the costs and benefits of holding reserves, and recommended an increase in the Bank's intervention capacity to around \$7 billion.

## 1 Introduction and background

Since the New Zealand dollar was floated 20 years ago, the Reserve Bank has limited its policy on foreign exchange market intervention to periods of 'extreme market disorder', when the operation of the market itself is under threat. New Zealand's flexible exchange rate regime means that periods of extreme disorder are likely to be very rare, and to date the Bank has not found it necessary to intervene for this purpose.

However, the Reserve Bank of New Zealand Act 1989 (the Act) does allow the Bank to operate in the foreign exchange market under a wider range of conditions. First, the Bank can deal in the market on its own terms, with the expectation that this power will be used to support the Bank's everyday functions, such as monetary policy implementation. Second, the Minister of Finance can direct the Bank to intervene, within set guidelines, for the purpose of influencing the exchange rate. This is intended to be more of an emergency power than a routine one. Under this section of the Act, the Minister has given the Bank a standing order to intervene at any time to ensure the continuous operation of the foreign exchange market.

The Act also establishes the Bank's obligation to hold foreign reserves in order to carry out intervention at short notice. The Minister is required to review the appropriate level of reserves "from time to time", although the target range for the value of reserves has been broadly unchanged at around

\$4–5 billion since 1988.<sup>2</sup> The level of reserves has not kept pace with the size of New Zealand's economy or the foreign exchange market, and has lagged the recent growth in reserves held by other central banks.

In 2003 the Bank conducted a two-part review of its intervention capacity. The first part, reviewed in this article, was a formal review of the level of reserves held for crisis management purposes. The other part – a reappraisal of the role of intervention beyond crisis management purposes – is detailed in Kelly Eckhold and Chris Hunt's article in this issue of the *Bulletin*.

This article proceeds as follows: Section 2 looks at the reasons for intervening in the foreign exchange market and for holding foreign reserves. Section 3 reviews recent thinking on the appropriate level of reserves, and compares New Zealand's reserves with international benchmarks. Section 4 explains the framework that the Bank developed to assess the costs and benefits of holding reserves. Section 5 details the Bank's recommendation to the Minister on the appropriate level of reserves.

## 2 The role of intervention and foreign reserves

The role of foreign exchange intervention depends on a country's exchange rate regime. Some currencies operate as managed floats, where there is a central role for intervention to support exchange rate policy. For a free-floating currency such as the New Zealand dollar, the role of intervention is

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<sup>1</sup> This article expands on the background paper provided to the Minister of Finance on 9 February 2004, which is available at [www.rbnz.govt.nz/finmarkets/foreignreserves/intervention/0144001.html](http://www.rbnz.govt.nz/finmarkets/foreignreserves/intervention/0144001.html). The recommendation was the product of a substantial body of work by many people within the Bank, in particular Wai Kin Choy, Aron Gereben, Danica Irvine, Daniel Wills and Ian Woolford.

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<sup>2</sup> In 1998 it was agreed to specify the target in IMF Special Drawing Rights (SDRs), which are based on a basket of international currencies. In a crisis situation the Bank would sell foreign currencies to buy New Zealand dollars, so it is the level of foreign currency holdings that matters. For this article, all values are in New Zealand dollars.

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less clear-cut. But there are two general situations where a central bank may still need to intervene.

The first is to calm the foreign exchange market when it becomes disorderly. Disorderly behaviour is largely in the eye of the beholder – central banks tend to refer to behaviour such as excessive short-run volatility, trends driven by momentum trading rather than fundamentals, or a perceived overshoot of ‘fair value’ at the top or bottom of the exchange rate cycle. In this case, the goal of intervention is to influence the level or direction of the exchange rate. The central bank could be buying or selling the domestic currency, and can also transact in the forward market, so it does not necessarily need to hold foreign reserves in advance.

The second situation is avoiding market dysfunction, or a complete breakdown in the market for the domestic currency. Recent work on the microstructure of foreign exchange markets suggests that even a free-floating currency can be vulnerable to a market breakdown.<sup>3</sup> Foreign exchange markets resemble a complex network: small shocks can be absorbed, but larger shocks may be transmitted or even amplified, and parts of the network could cease to function under pressure. In this case, the main priority of intervention is to keep the foreign exchange market functioning, and to maintain the market’s confidence in the currency as the exchange rate adjusts to a new equilibrium.

The New Zealand dollar market has some features that make it more vulnerable than most to a breakdown. The market is relatively small, there are only a few committed price-makers (dealers that quote buy and sell prices throughout the day), and there is an unusually high reliance on capital inflows from overseas, which investors could attempt to withdraw at short notice in a crisis.

The expected costs of a market breakdown go beyond the losses from exchange rate exposures. Banks and other firms may have difficulty finding counterparties that are willing to provide hedging for future exposures. Offshore investors would almost certainly require a larger premium for lending in New Zealand dollars, which would mean substantially higher

interest rates and lower credit ratings. Appropriate and well-designed intervention could prevent the development of self-propagating crisis mechanisms, and would significantly reduce the costs to the wider economy.

### Imagining a dysfunctional market

Since there is no history of foreign exchange market breakdowns for free-floating currencies, it is difficult to anticipate what it may look like when one occurs, or to determine when it would be necessary for the Bank to intervene. Nevertheless, it is unlikely that a crisis would unfold so quickly that the Bank would have no warning of a market breakdown. The following section is an attempt to capture the most likely sequence of events in a dysfunctional market.

A market breakdown would need a trigger, such as a major economic shock – an example that the Bank has used before in its research is an outbreak of foot-and-mouth disease in New Zealand.<sup>4</sup> The initial reaction would be a sharp fall in the exchange rate, since a negative economic shock would require a lower equilibrium exchange rate. The exchange rate would also be quite volatile as traders struggled to ‘find’ the new equilibrium level.

The adjustment process could become disorderly if traders suffered losses and attempted to exit their positions at the same time. The response by speculators is uncertain – arguably they would serve a useful role in moving the exchange rate towards its new equilibrium; but if the market were in danger of breaking down, it may be more sensible for speculators to get out of the market altogether. This would actually reduce the market’s liquidity and increase the risk of a breakdown.

At first, price-makers may respond by increasing the spread between their quoted buy and sell prices, and reducing their exposure to exchange rate risk. But they may decide that no spread is large enough to compensate them for the risks of dealing in a volatile and unpredictable market, and would stop quoting prices. If one price-maker pulled out of the

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<sup>3</sup> Some of the relevant features of the market are noted in Archer, D and J Halliday (1998), “The rationale for holding foreign currency reserves”, *Bulletin* 61(4), 346–54.

<sup>4</sup> For example, see “Stress testing the New Zealand banking system”, *Financial Stability Report*, Reserve Bank of New Zealand, October 2004.

small New Zealand dollar market, there would be pressure on the remaining price-makers to do the same.

Eventually, price-making would cease altogether, and the market would be considered dysfunctional. While the market may not be completely paralysed, trades would only occur if buyers and sellers could be matched up directly. There would be substantial short-term costs arising from delays in settling trades, extremely wide spreads, and volatile exchange rates. The Bank would need to intervene before this point, in order to maintain confidence in the New Zealand dollar market. It would be difficult to persuade price-makers and investors to re-enter the market once it has already broken down.

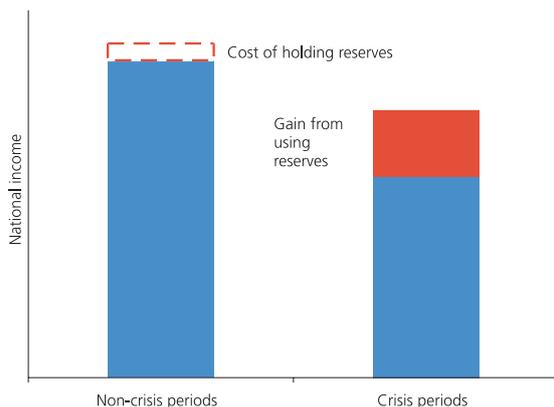
### Foreign reserves as insurance

In a way, foreign reserves are a form of insurance. If a country sets aside some of its income during normal times, it will have some protection to draw on for those rare occasions when a crisis occurs. The Bank would probably not be able to acquire foreign currencies in the middle of a crisis, just as a homeowner would not be able to buy insurance for their house while it is burning down.

The appropriate amount of insurance depends on the trade-off between the price of the premium and the payout following a trigger event. The 'premium' in this case is the ongoing costs of holding and managing foreign reserves, and the 'payout' is the fall in national income that can be avoided by using reserves in a crisis, as shown in figure 1.

Arguably, if there is a role for insurance, then participants in the foreign exchange market should insure themselves

**Figure 1**  
**Balancing the costs and benefits of reserves**



against the possibility of losses. But the major costs of a dysfunctional market would arise from the breakdown of the network, rather than losses from individual exposures. Similarly, individuals can easily insure against personal losses from an earthquake, but not against damage to infrastructure such as electricity and water supplies. This suggests that there is a role for a central institution, such as the Reserve Bank, to provide a socially optimal level of insurance.

### 3 How much is enough?

Many countries have increased their foreign reserves, at least in absolute terms, in the last five years. In particular, some of those countries that experienced large capital outflows during the Asian crisis in 1997–98 have increased their reserves several times over. Given the economic and social costs of that event, those countries may justifiably feel that more is better when it comes to reserves.

But the costs of holding too many reserves, while less apparent, can also be substantial. Foreign reserves are not a panacea for financial crises, particularly when the underlying cause is an imbalance in the domestic economy. Many Asian countries held large amounts of reserves even before the Asian crisis, which may have created a false sense of security about their ability to deal with financial crises.

Another issue is that once a central bank enters the foreign exchange market, it may find it difficult to exit. If intervention becomes a regular activity, market participants may come to rely on the central bank to take on exchange rate risk on their behalf. As a consequence, the optimal level of reserves is probably not open-ended, but lies within a certain range.

An international comparison of the level of foreign reserves is a useful starting point. International investors and credit rating agencies seem to regard the size of a country's reserves as an indicator of its financial soundness, regardless of whether they contribute to a country's debt servicing capability. These parties would probably express concern if New Zealand's reserves were substantially out of line with the rest of the world.

**Table 1**  
**Comparison of reserves**

Reserves to:	Value	Ranking
GDP	6.0%	20/31
Imports	2.7 months	20/36
M2 money supply	6.9%	29/33
Foreign short-term debt	27.3%	20/21
Daily foreign exchange turnover	3.1 days	21/32

The Bank compared New Zealand's reserves with a peer group of 35 countries, which included all of the OECD countries and some of the more developed emerging market countries with access to international capital markets. The level of reserves was divided by a range of measures, to adjust for the size of the real economy or the level of activity in the foreign exchange market.

Table 1 shows a selection of ratios and New Zealand's rankings. Countries were ranked from highest to lowest; so for example, New Zealand's ratio of reserves to M2 was the fifth-lowest. The number of comparator countries for each ratio depends on data availability, and the measurement of reserves, money supply, short-term debt and turnover can differ across countries. Therefore, the broad picture is more important than the individual rankings. New Zealand tends to sit at the lower end of the range, but is not an outlier by any of these measures.

There have been a few attempts to relate these types of ratios to the adequacy of reserves. An old rule-of-thumb states that reserves should cover at least three months' worth of imports. This rule originated at a time when terms-of-trade shocks were the major cause of currency crises. Today, capital flows are much larger and potentially more volatile than trade flows, so the import coverage rule has become less relevant for a country with open capital markets such as New Zealand.

A more recent rule-of-thumb suggests that countries should manage their external position so that they could live without overseas borrowing for one year. In practice, this means that foreign reserves should cover at least 100 per cent of foreign short-term debt (maturing in less than one year). This rule is considered more appropriate for developing economies, where financial crises tend to be longer-lived. Even so, recent

work by the IMF suggests that this rule, with some extra conditions, is an appropriate guide to the level of reserves.

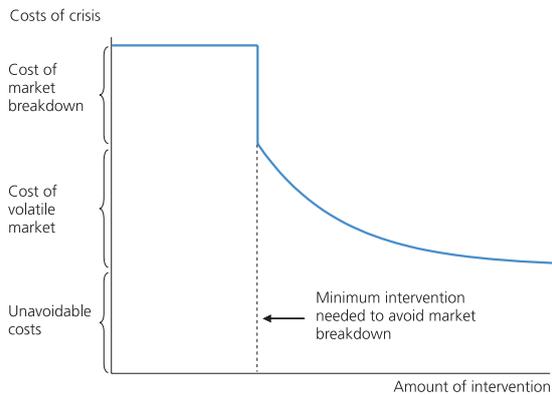
International comparisons and rules-of-thumb suggest that New Zealand's reserves are lower than many of its peers, but are not abnormally low. However, neither approach deals with the crucial issue of whether reserves are adequate for a country's specific circumstances. This problem led the Bank to develop a generic framework for assessing the costs and benefits of holding reserves.

## 4 A framework for the optimal level of reserves

Rather than generating the 'right' number for the level of reserves, the framework was designed to bring together a combination of theoretical literature, empirical research, conventional assumptions, and professional judgement. The framework reflects many of the ideas discussed in this article so far. Reserves are treated as a type of insurance that can be exercised in the rare event of a currency market breakdown. In normal times, the country pays a premium to hold and manage its reserves. When a crisis occurs, much of the value of intervention comes from keeping the foreign exchange market functioning.

Figure 2 is a stylised version of the relationship between the amount of intervention and the economic cost of a dysfunctional market. Without intervention, the foreign exchange market would break down in a crisis, imposing a substantial cost on the economy. If there is too little intervention to prevent a market breakdown, the cost to the economy would be the same as if there is no intervention at all. But if the Bank intervened enough to avoid a market breakdown, there would be a substantial one-off reduction in the total cost of the crisis.

**Figure 2**  
**Stylised function of the costs of a currency crisis**



Even if the market continues to function, it could still be disorderly and volatile. Any further intervention beyond this point could be used to calm the market and reduce the damage to the economy, although it would become less effective as intervention increased, and some of the economic costs would be unavoidable. The curved section in figure 2 reflects the effectiveness of intervention in reducing market volatility. But the value of further intervention has to be weighed against the costs of holding additional reserves during normal times.

The framework requires values for several parameters, some of which are more difficult to estimate than others. Table 2 lists the main parameters, roughly in order of difficulty, and notes the central estimates where appropriate. Given the high degree of uncertainty around some of these variables,

the Bank also conducted sensitivity tests with a plausible range of values for each parameter. The rest of this section elaborates on the estimation of the major parameters.

### Costs of holding reserves

The first two parameters are the annual costs of holding reserves.<sup>5</sup> The fixed costs of managing reserves include staff salaries, computers, and access to information services. Fixed costs were assumed to be \$3 million per year on average, although the results were not very sensitive to this parameter. The variable cost is the margin between the cost of borrowing in foreign currencies and the returns from investing in low-risk assets. The recommendation was based on the estimated variable cost at the time of the review, which was 7.5 basis points or \$750,000 per \$1 billion of reserves.

Recently, the Crown has been able to borrow at substantially lower rates by raising New Zealand dollars and swapping them into foreign currencies. As a result, the margin is actually positive for the Crown – as large as 40 basis points – and as matured loans are rolled over, holding reserves should become profitable in time. The margin may not always be so favourable, but the Crown will continue to fund reserves in this way as long as it is economical. This reinforces the point that the cost of holding reserves is small relative to the expected benefits from intervening in a crisis period.

**Table 2**  
**Parameters of the framework**

Parameter:	Value:
Fixed costs of holding reserves	\$3m per year
Variable costs of holding reserves	0.075% of reserves
Probability of a crisis	2% per year
Crisis-related output loss	4% of GDP
Minimum intervention needed to avoid market breakdown	\$5bn
Risk aversion	Standard assumption
Costs of volatile market	>10% of total cost
Unavoidable costs	20% of total cost
Effectiveness of additional intervention	Varies

<sup>5</sup> For more detail, see Hayward, T, P McKenzie and W Potter (2002), “Managing New Zealand’s foreign reserves”, *Bulletin* 65(4).

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## Probability of a crisis

The probability of a financial crisis in any given year was set at 2 per cent. For most individual countries, major financial crises have been fortunately rare, but this makes it difficult to say anything about their regularity. One stylised fact is that many developed countries experienced financial distress in the 1890s, the early 1930s and the late 1980s – roughly once every 50 years.

Ultimately, though, financial crises are not probabilistic events. They are due to specific developments, such as the severe economic depression in the 1930s, or the burst of speculative activity following widespread deregulation in the 1980s. Once in 50 years is a reasonable approximation, but it was necessary to test for other possibilities. In the sensitivity analysis, the probability of a crisis ranged from 1 to 4 per cent per year.

## Crisis-related output loss

The economic cost of a dysfunctional foreign exchange market would depend on the nature and severity of the event. The most relevant literature looks at the historical costs of currency crises, defined as a sharp fall in the exchange rate at a time when a country's wider financial system is under strain.<sup>6</sup>

There are two issues in estimating the costs of currency crises. The first is that currency crises often coincide with banking sector crises, which in turn may arise in a recession. Few studies have attempted to isolate the costs that are directly related to the strain in the foreign exchange market. The second issue is the assumed 'counterfactual', that is, how quickly the economy would have grown if the crisis had not occurred.

The average estimated cost of a currency crisis is around 6 to 12 per cent of GDP, but with substantial variation across countries – in some cases the cost was 20 per cent of GDP or more, while in a few cases the impact on growth was virtually zero. The cost tends to be lower in developed countries than in developing countries, although the small

number of crisis events among developed countries makes it difficult to draw strong conclusions.

Financial crises are either caused or magnified by factors such as fixed or pegged exchange rates, poorly-executed deregulation of the financial sector, poor monetary and fiscal policies, or corruption. None of these factors are expected to be an issue for New Zealand in the foreseeable future. Therefore, it is more likely that the cost of a crisis in New Zealand would be at the lower end of historical estimates. The Bank settled on a central estimate of 4 per cent of GDP, and tested for values between 2 and 8 per cent.

## Minimum intervention needed to avoid market breakdown

The amount of intervention required to avoid a market breakdown is probably the most important variable in the framework. To avoid a breakdown, the Bank would need to ensure that key transactions could be completed even when the market is under stress. A single foreign exchange transaction can generate several 'pass-the-parcel' trades, as dealers pass on the associated risk and rebalance their inventories.<sup>7</sup> This means that the volume of core trades – those trades that need to occur on a given day – is probably much lower than total foreign exchange turnover.

The three approaches that the Bank used to estimate the value of core transactions are described in box 1. Within each approach the Bank tested a range of assumptions, to create a distribution of estimates. The distribution suggested that \$5 billion of intervention capacity would be enough to prevent market breakdown in most circumstances.

## Risk aversion

The risk aversion parameter reflects society's preference for certain over uncertain outcomes. Higher risk aversion would suggest a greater degree of income smoothing between crisis and non-crisis periods, which would mean a higher optimal level of reserves. The Bank used a conventional assumption

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<sup>6</sup> A comprehensive review can be found in Hoggarth, G, R Reis and V Saporta (2001), "Costs of banking system instability: some empirical evidence," Bank of England Working Paper 144.

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<sup>7</sup> This is one of the microstructure aspects of the foreign exchange market that could lead to a market breakdown under stress.

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## Box 1

### Three approaches to measuring core transactions

*Liquidity-based:* the market requires a minimum level of liquidity to remain functional. Liquidity can be measured in several ways; the Bank used measures such as total trading volume and volume relative to price volatility. The minimum level of liquidity was varied, with the upper limit being the lowest level of liquidity observed in the past (because the New Zealand dollar market has never broken before). On average, currency crises in other countries have seen a 40 per cent fall in liquidity, lasting for about six days. This provided an estimate of the shortfall in liquidity that the Bank would need to provide, in order to return the market to at least the minimum level of liquidity.

*Balance of payments-based:* using balance of payments data, the Bank attempted to separate core flows – those transactions that would have to occur on a given day, such as import payments and debt repayments – from

discretionary flows such as speculative investments and ‘pass-the-parcel’ trades. Core flows were estimated to be about 25 per cent of total foreign exchange market turnover. Assuming a six-day crisis period, and some changes in hedging behaviour, the Bank estimated the total core transactions that would need to be funded during a crisis.

*Limit-based:* price-makers in the foreign exchange market build up positions in various currencies as orders arrive throughout the day. The price-makers set limits on how much exchange rate risk they are willing to bear for each currency, and as they approach these limits they will look to reduce their exposure. By surveying the price-makers in the New Zealand dollar market, the Bank estimated the amount of New Zealand dollar sales that price-makers would be willing to absorb in a crisis. Once they reached their limits, the Bank could intervene to clear their New Zealand dollar positions, allowing them to continue dealing.

of 2 (risk-averse), but also tested for values between 0 (risk-neutral) and 5 (extremely risk-averse).

#### Additional intervention

The final three parameters in the framework deal with the effectiveness of additional intervention, beyond what is needed to avoid a market breakdown. These parameters are not directly observable, and they were determined through a combination of judgement and understanding of intervention in financial markets. The Bank tested a range of assumptions for this part of the framework.

Because the New Zealand dollar market is relatively small, and there are few offshore parties that need to take on exchange rate risk, most offshore investment in New Zealand is discretionary. This means that the market has to maintain a good reputation in order to continue to attract investment. It was felt that most of the crisis costs would result from the loss of reputation following a breakdown of the market.

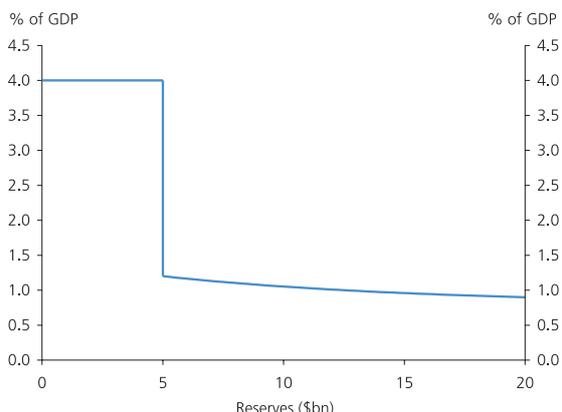
The unavoidable costs of a crisis were believed to be relatively low, and were set at 20 per cent of the total cost. It is important to note that the ‘total cost’ refers strictly to the costs of foreign exchange market dysfunction. In practice, a currency crisis may coincide with a wider banking sector crisis or a severe economic slowdown. The unavoidable costs would be quite high in this instance, because reserves would be of no use in dealing with the crisis.

Given the Bank’s intended approach to intervention, the benefits of reducing volatility would be relatively small. The Bank would not target a particular level of the exchange rate, but would continue to supply liquidity by acting as a price-maker. However, this is a role that the Bank would be aiming to hand over to private sector price-makers as soon as practical. As a result, it is not clear that further intervention would add much value.

The Bank’s overall view on the effectiveness of extra intervention is reflected in the shape of the loss function in figure 3. Sensitivity analysis showed that in almost

Figure 3

Loss function



every situation, there would be some benefit to having an intervention capacity beyond the required minimum, but not by a great margin.

## 5 Recommendation

The Bank recommended that its intervention capacity for crisis management should be increased to a minimum of \$7 billion.<sup>8</sup> The recommendation was accepted by the Minister of Finance in February 2004.

The recommended level was at the lower end of the range of estimates produced within the framework, although it should be recognised that the framework was just one input in the process. The most crucial factor – the minimum intervention needed to avoid market breakdown – was estimated at

\$5 billion, with a chance that it could be as high as \$7 billion. With a minimum of \$7 billion in reserves, the Bank could avoid a market breakdown in most circumstances, and in many cases would have the capacity to dampen market volatility if necessary.

In the recommendation, the Bank noted that the total amount of foreign currencies that could be made available in a crisis situation extended beyond the Bank's existing foreign reserves of \$3.7 billion. The Treasury holds liquid foreign currency assets of around \$500 million, and New Zealand has a reserve tranche position with the International Monetary Fund (IMF) of about \$900 million, giving a total of \$5.1 billion that could be accessed at short notice. Therefore, the Bank requested an additional \$1.9 billion of reserves in order to reach the new target.

The additional reserves will be provided over four years. Given the Crown's current approach to funding, the increase in reserves will not create any *net* New Zealand dollar flows, so it will not have a direct impact on the exchange rate.

It is likely that the Bank will review the level of reserves again some time in the next few years. The optimal reserves framework will help to make this more transparent and straightforward, although re-estimating all of the parameters will not be a simple task. The framework is general enough that it could also be used to assess the level of reserves under different intervention policies, so other central banks may find it useful as well.

<sup>8</sup> More accurately, the Bank recommended an increase in the target range from SDR 1.45–1.75 billion to a minimum of SDR 3.0–3.3 billion. The conversion rate at the time of the review was NZD 1 = SDR 0.45.

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# The Reserve Bank's new foreign exchange intervention policy

Kelly Eckhold, Financial Stability Department, and Chris Hunt, Economics Department

Last year the Reserve Bank concluded a review of its foreign exchange intervention policy. The review resulted in a recommendation to the Government that the Bank be given the capacity to broaden the objectives of foreign exchange intervention towards helping the Governor achieve monetary policy objectives as dictated by the Policy Targets Agreement (PTA). This article describes our new intervention role and the implications for the management of the Bank's foreign reserves.

## 1 Introduction and background

On 30 March 2004, the Government approved a Reserve Bank proposal that gives the Bank the capacity to use foreign exchange intervention in order to influence the level of the exchange rate. This new approach allows for intervention at the extremes of the exchange rate cycle, directed at leaning against trends in the exchange rate which the Bank assesses to be unjustified by economic fundamentals.

The new policy is in addition to our usual foreign exchange (FX) intervention objectives. Since the exchange rate was floated in 1985, the Reserve Bank's policy has been to use intervention only in times of 'extreme market disorder'. The focus of our existing policy is on preserving the functioning of the foreign exchange market in a crisis, rather than preserving any given level of the exchange rate *per se*.<sup>1</sup> This policy is for those very rare occasions when the market itself breaks down, transactions are unable to be completed, and where the stability of the wider financial and economic system is threatened. Thankfully, in the 20 years since the New Zealand dollar was floated the Reserve Bank has not needed to intervene to forestall such a crisis. The Bank's NZD 3.3 billion portfolio of foreign reserves is maintained for the purpose of providing a stock of foreign exchange that can be used to finance crisis intervention. The Bank's existing crisis intervention policy and the reserves required to fulfil that role are not affected by the new intervention policy.

The new policy provides the Bank with another monetary policy tool – in addition to the Official Cash Rate (OCR). The PTA requires the Bank to maintain price stability whilst avoiding unnecessary volatility in output, interest rates, and the exchange rate. This new tool is designed to help trim those peaks and troughs of the exchange rate cycle that

make the task of achieving price stability while minimising unnecessary volatility difficult. Usually the Bank will use the OCR to implement monetary policy, but sometimes (probably rarely) intervention may assist the Bank to achieve its PTA obligations.

The Bank will implement its new intervention policy independently of the Government, in the same way it sets the OCR. Intervention will only be used at times when it is most likely to be effective and when intervention is consistent with the PTA. The Bank has developed criteria to help judge when it is most appropriate to use intervention. These criteria have been publicly disclosed and agreed with the Minister of Finance, consistent with the Bank's generally transparent approach to the formulation of monetary policy. If intervention occurs, it will be transparently communicated to the public after the fact, allowing stakeholders to hold the Bank accountable for its actions.

Underpinning the new intervention policy are adequate financial resources which ensure the Bank's ability to implement its strategy independently of the Government, while maintaining its credibility with markets and the public.

This article lays out the framework for the new policy. Section 2 summarises the broad objectives and strategy of the new policy. This is followed in section 3 by a discussion on the criteria the Bank will use to assess the merits of

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<sup>1</sup> As part of its ongoing legal commitment to advise the Minister of Finance on exchange rate matters, the Reserve Bank is also increasing the level of reserves it holds for 'insurance' purposes. For a discussion of the Bank's crisis management foreign exchange policy, see Michael Gordon's article in this issue of the *Bulletin*.

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intervention in any given circumstance. In section 4 the implications of the new policy for the Reserve Bank's balance sheet are highlighted. The final section describes how intervention will be implemented, and how the intervention policy will be communicated to markets, the public and the Government.

## 2 Intervention objectives and strategy

### What is FX intervention?

Foreign exchange intervention by the Reserve Bank is the purchase or sale of New Zealand dollars in exchange for foreign currencies in the foreign exchange market, with the objective of influencing the level of the exchange rate. This is distinct from merely transacting in the FX market to manage normal foreign exchange requirements as such transactions are done with the aim of minimising any impact on the exchange rate.<sup>2</sup>

### Objectives of the new policy

The new intervention policy is aimed specifically at trimming the peaks and troughs of medium-term fluctuations in the New Zealand dollar (NZD) exchange rate, where there is a misalignment between the exchange rate and its 'fundamentals'.

In general, a floating exchange rate helps the economy to adjust to ever-changing domestic and global conditions, and encourages the efficient allocation of productive resources. The value of the exchange rate over the medium to long run is determined by, among other things, relative inflation and interest rate differentials, the stage in the business cycle in relation to its trading partners, movements in the terms of trade, and productivity differentials.<sup>3</sup> These relationships mean that the exchange rate can act as a significant buffer for the economy. When the New Zealand economy is weak,

for example, profitability and asset returns tend to be low, reducing demand for New Zealand dollar denominated assets. This, in turn, is likely to lead to a depreciation of the exchange rate, helping to promote a return to stronger activity.

But there may be times when exchange rate fluctuations do not fully reflect fundamentals. Examples might include instances where the short-run value of the exchange rate over- or under- shoots its 'fair value' because of non-fundamental factors such as the trend-following behaviour implied by some 'technical' trading rules followed by foreign exchange dealers, or other short-term speculative behaviour.

Non-fundamental drivers may at times push the exchange rate to extreme levels, putting undue pressure on some parts of the economy, such as the export sector. For example, when the New Zealand dollar is significantly over-valued in relation to 'equilibrium' or its long-run average, exporters may experience declines in their New Zealand dollar denominated export returns.<sup>4</sup> These firms may refrain from investing or expanding their operations in such a climate, while some may go out of business altogether.<sup>5</sup>

Instances where there is a significant misalignment between the exchange rate and its fundamental value are probably few and far between. Further, it can be hard to identify exchange rate misalignments. Consequently, it is likely that we will intervene relatively rarely to influence the level of the exchange rate.

### Basic strategy

Figure 1 (overleaf) presents a stylised picture of the basic strategy. When the New Zealand dollar is too high (under the benchmark criteria explained in section 3), the Reserve

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<sup>2</sup> Some examples of standard FX transactions include those associated with the payment of bills denominated in foreign currencies or transactions to help manage the Bank's exposure to exchange rate risk.

<sup>3</sup> For a discussion of some of these factors see, Anella Munro (2004) "What drives the New Zealand dollar?" *RBNZ Bulletin*, Vol. 67, No. 2, pp. 21-35

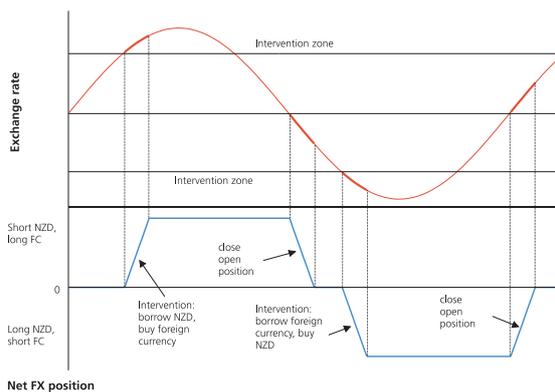
<sup>4</sup> Note that exporters may experience fluctuations in their incomes due to factors other than the exchange rate, such as variations in foreign currency commodity prices. Declining export earnings are not necessarily a sign that the exchange rate is over valued.

<sup>5</sup> Such developments raise the possibility of 'hysteresis' effects, whereby the growth of firms during low exchange periods is not sufficient to offset declining numbers in high periods. In turn, the overall result could be slower growth of the export or tradables sector than might otherwise be the case.

Bank will sell New Zealand dollars and buy foreign currency in the foreign exchange market. Conversely, when the currency is too low, the Reserve Bank will buy New Zealand dollars and sell foreign exchange.

Intervention near the peaks of the exchange rate cycle will leave the Bank with an open (unhedged) net 'long' foreign currency position, while intervention at troughs will result in an open net 'short' foreign currency position.<sup>6</sup> Open foreign currency positions will be closed when the exchange rate nears the middle of the normal cyclical range – that is, when the exchange rate is near its long term equilibrium value. For example, if the Bank had a net long foreign currency position, it would look to buy back New Zealand dollars at that point.

**Figure 1**  
Illustrative intervention scenario



### How intervention works

Intervention is thought to work best in situations where it provides a signal to markets about future monetary policy settings or the level of the equilibrium exchange rate. The signal might relate to information the central bank has but market participants do not. The act of intervention may convey a message about monetary policy settings or the exchange rate that gives market participants greater confidence to trade in ways that will encourage the exchange rate to revert towards more justified levels.<sup>7</sup>

<sup>6</sup> A net 'long' ('short') foreign currency position is one when the value of the Bank's foreign currency assets exceeds (is less than) that of its foreign currency liabilities.  
<sup>7</sup> For a discussion of the relevant literature see L Sarno and M P Taylor (2001), "Official intervention in the foreign exchange market: is it effective and, if so, how does it work?", *Journal of Economic Literature*, No. 39, pp. 839-868.

Another reason why intervention might have an impact on the exchange rate in some cases is the idea that exchange rates are partly determined by the underlying structure of the financial markets.<sup>8</sup> For example, simple technical trading rules that try to take advantage of the continuation of short term trends in financial prices are used widely in the markets.<sup>9</sup> If exchange rates are at times partially determined by trend following behaviour rather than fundamentals, then it is possible intervention could have an impact on exchange rates if intervention disrupts the signals that trend followers look for. A relatively modest transaction by the central bank at the right time may be sufficient to slow or even prevent further movements of the exchange rate away from equilibrium. It might also be the case that intervention could encourage short term traders to jump in behind the Bank reinforcing the efficacy of the initial intervention transaction.

However, all of these mechanisms are subtle drivers of markets. We do not expect that intervention will be effective enough to offset the impact of fundamentals. This view is consistent with the experience of other central banks who have tried to intervene against fundamental trends and have been unsuccessful (e.g the Bank of England's attempt to defend the pound in 1992).

## 3 Criteria for assessing the appropriateness of intervention

The previous section briefly discussed how the new intervention policy would work, with the goal of trimming the peaks and troughs of extreme medium term movements in the exchange rate.

To successfully implement foreign exchange intervention the Bank has developed a framework and criteria to guide

<sup>8</sup> Sarno and Taylor (2001) provide a light overview while M Evans and R K Lyons (2002), "Order flow and exchange rate dynamics", *Journal of Political Economy*, Vol. 110, No. 1, pp. 170-180, provides a more in depth examination.  
<sup>9</sup> See Y Cheung and M D Chinn (2001), "Currency traders and exchange rate dynamics: a survey of the U S market", *Journal of International Money and Finance*, 20, pp. 439-471 for a survey of the practices of market participants.

decision making on when to intervene. This will help to ensure that the Bank implements intervention in line with its stated objectives, and that any financial and reputational risks of intervention are managed in a prudent fashion.

Specifically, before intervening the Bank will need to be satisfied that all of the following criteria are met:

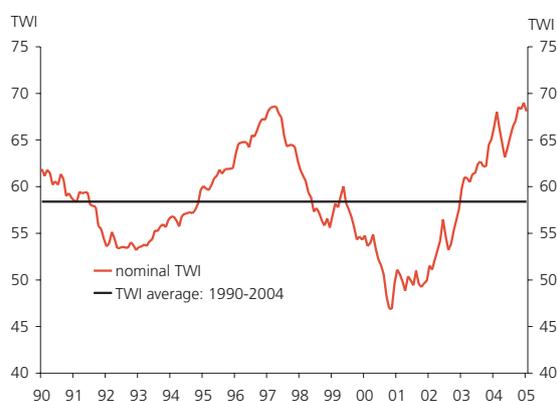
- the exchange rate must be exceptionally high or low;
- the exchange rate must be unjustified by economic fundamentals;
- intervention must be consistent with the PTA; and
- conditions in markets must be opportune and allow intervention a reasonable chance of success.

### When is the exchange rate exceptionally high or low?

Since the float of the New Zealand dollar in 1985, the nominal trade weighted index (TWI) has fluctuated in a wide range around a fairly stable 'equilibrium' or long-run average (see figure 2).<sup>10</sup>

Assessing when the exchange rate is exceptionally high or low is largely a statistical exercise. We compare the current level of the exchange rate to historical deviations from its long-run average, and look for situations when the deviations are unusually large. This criterion probably involves the least amount of judgement in comparison to the others.

Figure 2  
Nominal TWI



<sup>10</sup> The TWI comprises the currencies of Australia, the Euro zone, Japan, the US and UK, weighted according to each currency's share of New Zealand's merchandise trade and their share of the 5-country aggregate GDP.

Our main focus is on the 'effective' exchange rate or TWI, as this best represents a measure of the exchange rate relevant for the whole economy on average. However, we also look at individual exchange rates as a cross-check to see whether our broad measure is being unduly driven by factors specific to particular currencies.

### When is an exchange rate unjustified by fundamentals?

Although the first requirement for intervention might be satisfied – the exchange rate could be *exceptional* by historical standards – it does not automatically follow that the level is unjustified.

In reaching a judgement as to whether the exchange rate might be unjustified, the Bank will look for evidence of a disjuncture between the value of the exchange rate and the broader cyclical position of the economy, or the specific fundamental factors underpinning medium-term trend movements in the exchange rate.

Any assessment of whether a given exchange rate is *unjustified*, requires a judgement of where the currency should be relative to where it actually is, based on particular information on the direction of economic fundamentals. This judgement involves bringing together information from a number of sources. This information set includes, among other things:

- The *broad cyclical position* of the economy relative to our trading partners: the exchange rate should depreciate if our expected relative growth rate slows. Specific factors include indicators relating to domestic consumption, net migration, the housing market, and relative output gaps. Relative cyclical positions are also often reflected in interest rate differentials, especially given that most TWI partner countries target low inflation. For example, a softer economy implies lower New Zealand interest rates, and hence lower interest rate differentials with our trading partners.
- The *terms of trade*: this measures the ratio of merchandise export prices to merchandise import prices. An increase in the terms of trade indicates that the real purchasing

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power of exports has increased, and this tends to be associated with a strengthening of the New Zealand dollar.

- the *current account position*: the current account is a broad indicator of both external and internal balances which may indicate whether the exchange rate is justified. For example, an unusually large current account deficit in New Zealand compared to our trading partners might suggest that the exchange rate is overvalued and that a downward correction in the New Zealand dollar is warranted to bring about external balance.
- Other evidence about the general condition of the tradables sector of the economy. For example, indicators of a significant change in activity or profitability within the export sector could provide corroborative evidence that a particular level of the exchange rate was unjustified.

These indicators are not intended to be a fixed checklist relevant for all situations. An all encompassing set of indicators suitable for deciding whether the exchange rate in every situation is unjustified does not exist. This means that the Bank cannot take a mechanistic approach to deciding whether intervention is warranted. Each potential intervention will be assessed on a case by case basis using information that seems most appropriate to the situation at hand.

### Intervention consistent with the PTA

The third hurdle that must be overcome before we consider intervention is that intervention must not conflict with the PTA. The PTA states that the Bank must aim for inflation outcomes between 1–3% over the medium term, while avoiding unnecessary instability in output, interest rates, and the exchange rate.

At one level, the new intervention policy can help contribute directly to avoiding unnecessary instability in the exchange rate if intervention helps offset a misalignment of the exchange rate from economic fundamentals.

But intervention must not compromise the overriding objective of price stability. In other words, the Reserve

Bank will need to be comfortable that any inflationary or disinflationary impact from intervention will not push inflation outside the target range over the medium term.<sup>11</sup> For example, intervention to dampen an upward exchange rate cycle implies less exchange rate restraint on inflation pressures, all else being equal. Hence the Bank will also have to be confident that future interest rate increases will not be necessary to compensate for a successful foreign exchange intervention.

An implication of the PTA consistency criterion is that intervention should be timed to roughly coincide with the broad thrust of interest rate settings. For example, it makes little sense to intervene to try and push the exchange rate lower when the Bank believes that higher interest rates may be required in the near future to control inflation pressures. In this situation, a successful intervention would inappropriately loosen monetary conditions. Normally, the Bank would look to adjust its main policy lever – the OCR – when overall monetary conditions seem too tight or easy. However, there might be occasions when the Bank is reluctant to move the OCR. For example, the Bank might conclude that further interest rate tightening to offset domestic inflation pressures is inappropriate, but that it is too soon to begin actually cutting interest rates. The Bank could intervene in response to an overvalued exchange rate that is extreme and unjustified, thereby effectively loosening monetary conditions without prematurely beginning an interest rate easing cycle.

### Intervention must be opportune

Even if intervention is warranted from a policy standpoint (ie, intervention satisfies the first three criteria), conditions in the foreign exchange markets must be conducive to having a meaningful impact on the exchange rate. It would be pointless, and potentially costly, to intervene in circumstances where there was little chance of affecting prevailing market

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<sup>11</sup> A depreciating dollar makes imports of consumption goods and inputs more expensive in New Zealand dollar terms and so adds to inflation pressure. Conversely, an appreciating currency constrains inflation pressure by reducing the cost of imports in New Zealand dollar terms.

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trends. At the extreme, speculators could be encouraged to trade against the Bank in the foreign exchange market.

Intervention is more likely to be opportune and thus effective when most of the following apply:

- there is a relative absence of capital flows that might offset intervention;
- market participants are becoming less sure that the exchange rate will remain significantly above or below fair value;
- market participants are becoming less confident that recent trends in the exchange rate that have taken the exchange rate further away from fair value will persist;
- the balance of capital flows is shifting towards pushing the exchange rate back towards equilibrium, and there is some prospect that capital flows in the future will bias the exchange rate to move in a similar direction to that implied by intervention; and
- market participants are positioned in such a way that they are vulnerable to a sudden movement in the exchange rate towards fair value – should such a movement occur then they would need to transact to reduce their exposures, with such transactions supporting the direction of intervention.

The Bank is a regular participant in the foreign exchange market and maintains an extensive array of contacts from whom we can extract information useful in making judgements on whether the above considerations are satisfied, and thus whether intervention is opportune.

Taken together, the four criteria provide a robust framework for assessing when to intervene. If the exchange rate is exceptionally and unjustifiably high, and it is opportune to intervene, then it is most likely that intervention will be effective in trimming the peaks and troughs of the exchange rate cycle. It is also more likely that the financial and reputational risks associated with intervention will be minimised as much as possible. The reputational risks are managed because the criteria minimise the chance that intervention will conflict with monetary policy. The financial risks are managed as the criteria reduce the chances of the Bank running down its capital and thus its reputational

standing trying to defend a particular level of the exchange rate, or going against fundamentally determined trends in the exchange rate.

## 4 Financial implications for the Bank

This section describes the implications that intervention has on the Reserve Bank's annual net income and on the structure of our balance sheet.

### The impact of intervention on the Bank's profitability and capital requirements

Intervention, if required, will add significant volatility to the Bank's earnings. This volatility mainly reflects the nature of a floating currency and thus the exchange rate risk inherent in net open foreign positions accumulated through intervention.

Corporations hold capital partly to see them through the times when the company is less profitable than average. In bad years, companies 'dip' into their capital to cover financial losses so they can continue operating. The Reserve Bank is no different in this respect. The Bank holds capital in the form of investments in New Zealand government securities that can be liquidated to cover any losses incurred while conducting normal business activities.

As intervention implies a higher level of financial risk compared to the Reserve Bank's other activities, the Bank needed additional capital to cover the potential for losses associated with intervention.

The Bank estimated the amount of capital required to be NZD 1 billion, given the strategy it wished to implement and a conservative view of the peak losses that might stem from the strategy. The Bank's request for a capital injection from the Government, to give it the financial capability to implement intervention independently of the Government, was one of the key recommendations the Bank made to the Minister of Finance. The Minister of Finance and Cabinet endorsed the Bank's request for additional capital and that capital was delivered to the Bank in June 2004.

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The following two sections describe in more detail the nature of the factors that give rise to the financial risks associated with FX intervention: specifically exchange rate and interest rate risks.

### The impact of exchange rate changes

Generally, the Reserve Bank's balance sheet has quite a low exposure to changes in exchange rates. This is because the Bank typically matches the currency denomination of its assets with the liabilities that finance those assets. In normal times, if the exchange rate rises (falls), the New Zealand dollar value of its foreign currency assets and liabilities falls (rises), together creating no net change in the equity of the Bank.

In contrast, foreign exchange intervention deliberately creates a mismatch between the currency denomination of the Bank's assets and liabilities. For example, if the Bank intervenes by selling New Zealand dollars for foreign currencies and the exchange rate rises further, then the Bank records a loss as the New Zealand dollar value of the foreign currencies purchased falls relative to the New Zealand dollar amount originally paid.

The potential for exchange rate risk is relatively large as exchange rates are volatile. The criteria used to decide when to intervene can mitigate but not entirely eliminate this exchange rate risk. Losses from net open intervention positions could accrue for a while. However, these are likely to be temporary or 'unrealised' losses, as in the end, unrealised losses will disappear provided the exchange rate reverts back to its equilibrium or long run average.

A more serious situation is one where the Bank might not identify a change in the equilibrium exchange rate and intervenes inappropriately. In this case losses could well become 'realised', or appear permanently on the Bank's balance sheet. However, the appropriate application of the intervention criteria will help minimise the potential for permanent realised exchange rate losses being incurred. Indeed, the basic strategy of buying low/selling high should prove profitable in terms of realised exchange rate gains over the medium term for the Bank's balance sheet.

### The impact of interest rates

The Bank's normal approach of matching the currency denomination of its assets and liabilities implies that the average carrying cost of holding reserves (ie the difference between the interest earned on reserves investments and interest paid on the loans financing reserves) is low and relatively stable. This is because the rates at which the New Zealand Government can borrow foreign currencies to fund reserves are reasonably close to the rates the Bank earns on its invested reserves.<sup>12</sup> For example, in the 2003/04 financial year the passive holding costs of reserves totalled around NZD 2.3 million for the Bank's NZD 3.9 billion reserves portfolio (as at 30 June 2004).

Intervention results in the Bank investing and borrowing in different currencies at potentially quite different interest rates, making the average carrying cost of holding reserves more variable and perhaps larger.

New Zealand interest rates tend to be higher than those in the countries where the Bank invests reserves (currently the US and Europe). This means that when the Bank intervenes to lean against a high exchange rate, and thus when it has borrowed New Zealand dollars to invest offshore, the average carrying cost of holding reserves will rise.

At the other end of the exchange rate cycle the opposite occurs. The Bank earns extra income by borrowing at relatively low foreign interest rates and investing at higher New Zealand rates.

Over the entire exchange rate cycle, the periods when the Bank's carrying cost of holding reserves is higher than usual should be broadly balanced by periods when the reserves carrying cost is lower. However, it is probably the case that interest rate differentials will be a bit higher on average at the top of the exchange rate cycle than when the exchange rate is relatively low. Hence on average it is quite likely that intervention will add a modest amount to the average carrying cost of holding reserves. These higher average carrying costs should be balanced by the potential

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<sup>12</sup> In fact, recently the Government has been able to borrow foreign currencies for the Bank to invest in reserves at historically attractive rates that should imply that reserves are profitable to hold in the future.

for realised gains on the exchange rate described earlier, implying that intervention overall shouldn't prove costly over the medium term, and may prove to be profitable.

### The impact of intervention on the level of foreign reserves

Foreign exchange intervention requires the Bank to take on an exchange rate exposure to try to influence the exchange rate. Taking that exchange rate exposure may or may not affect the level of foreign reserves the Bank holds, depending on the mechanism it uses to create a currency mismatch between our assets and liabilities.

Intervention will result in a change in the level of our foreign reserves if we have to borrow to accumulate further assets. For example, intervention at the top of the exchange rate cycle will result in an increase in the Bank's reserves if its sales of New Zealand dollars are financed by borrowing New Zealand dollars from the Government. The total size of our balance sheet will grow and the level of foreign reserve assets will increase.

#### Stylised RBNZ balance sheet

*RBNZ buys FX, sells NZD to reduce the value of the*

NZD	
Assets	Liabilities
Foreign reserve assets	
– in foreign currency    ↑	Foreign currency loans
– in NZD	NZD loans                    ↑

Intervention at the troughs of the exchange rate cycle will increase the level of the Bank's reserve assets if it chooses to build up a stock of New Zealand dollar denominated investments financed through foreign currency denominated loans. Note that in this case the Bank's stock of foreign currency reserve assets does not increase as it is New Zealand dollar denominated assets that are accumulated. However, the Bank's total reserve assets (defined as foreign currency denominated assets and New Zealand dollar denominated assets) will rise.

#### Stylised RBNZ balance sheet

*RBNZ sells FX, buys NZD to increase the value of the NZD*

Assets	Liabilities
Foreign reserve assets	
– in foreign currency    ↑	Foreign currency loans    ↑
– in NZD	NZD loans

However, intervention need not affect the Bank's total holdings of reserve assets as there are other ways for the Bank to create a mismatch between the currency denomination of its assets and liabilities. An alternative approach at the top of the exchange rate cycle is to finance intervention by changing the currency denomination of the foreign currency loans the Bank already has (by using derivatives, or by repaying existing loans early and replacing them with new New Zealand dollar denominated loans). The Bank's existing stock of foreign currency assets would be unchanged by intervention of this form – but the structure of its liabilities changes, creating the exchange rate exposure implied by intervention.

#### Stylised RBNZ balance sheet

*RBNZ sells FX, buys NZD to increase the value of the NZD*

Assets	Liabilities
Foreign reserve assets	
– in foreign currency    →	Foreign currency loans    ↓
– in NZD	NZD loans                    ↑

The Bank could also use foreign exchange (FX) swaps to finance intervention transactions. In a FX swap the Bank simultaneously agrees to buy New Zealand dollars and sell foreign currency now, and reverse the deal at some time in the future. This deal has no impact on the exchange rate (there is no net sale or purchase of New Zealand dollars from the FX swap), but when combined with a transaction in the spot market to sell New Zealand dollars and buy foreign exchange (which does affect the exchange rate), effectively delays settlement of the Bank's intervention transactions until some time in the future. At that time, the Bank could either refinance its intervention by doing another FX swap,

or it could close out its FX exposure by buying New Zealand dollars and selling foreign exchange.

*Transactions when intervention is financed using FX swaps, RBNZ sells NZD, buys FX to reduce the value of the NZD*

	Spot	In 3–6 months
<b>Intervention</b>		
– sell NZD	↓	
– buy FX	↑	
<b>Swap financing</b>		
– buy NZD	↑	– sell NZD ↓
– sell FX	↓	– buy FX ↑
<b>Net</b>	Nil	Short NZD Long FX

### Intervention and the maintenance of adequate crisis reserves

In principle, intervention could result in the Bank running its foreign reserves down to the point where it has insufficient reserves to adequately deal with market dysfunction in a crisis. For example, when intervening at the bottom of the exchange rate cycle, it could fund purchases of New Zealand dollars by selling foreign currency assets held as reserves. In practice this will not occur, as the Minister of Finance has instructed the Bank to ensure that in conducting intervention the Bank maintain a stock of foreign currency investments of at least SDR 2.45b (currently around NZD 5.1b).<sup>13</sup> This means that the Bank will have to borrow in foreign currencies to finance intervention at the bottom of the exchange rate cycle.

At an aggregate level, intervention at the bottom of the exchange rate cycle implies that the Bank’s foreign currency denominated liabilities exceed its assets. Whilst this means that the Bank will have negative net foreign

reserves in aggregate, its crisis intervention capacity will not be significantly impaired as it ensures that no more than 20 per cent of its foreign currency loans come due in any year. The foreign currency loans used to finance intervention would be medium term, leaving the Bank’s short-term crisis management capacity intact.

Intervention at the bottom of the exchange rate cycle can also be financed with FX swaps by doing the opposite of the transactions described earlier. As long as the swaps are of a medium-term maturity then the Bank’s crisis intervention capability will not be substantively affected by intervention.

## 5 How will intervention be implemented?

### Institutional framework

The Bank conducts its crisis intervention policy as an agent of the Minister of Finance using section 17 of the Reserve Bank Act, which allows the Minister to instruct the Bank to deal in the foreign exchange markets on the Government’s behalf. This means that, while the Bank advises the Minister on crisis intervention, and would implement crisis intervention, the actual decision on whether to intervene and the financial implications of that intervention rest with the Minister and the Crown.

The new intervention role is set up differently. Foreign exchange intervention in support of the PTA has been organised to give the Bank full operational independence from the Minister and the Government, in the same way the Bank has independence to formulate and implement monetary policy. This operational independence for FX intervention is provided for in section 16 of the Reserve Bank Act. The implication of this greater independence is that the Governor and the Bank accept the full financial implications of intervention – profits and losses accrue to the Bank and sit on the Bank’s balance sheet.

The reason why FX intervention for monetary policy purposes has been set up differently from crisis intervention reflects an effort to manage some of the risks that can be inherent with intervention in non-crisis situations. In particular, as the

<sup>13</sup> Currently, the Bank holds foreign reserves for crisis intervention of SDR 1.6 billion. The amount of our crisis reserves will grow to SDR 2.45 billion over the next few years. See Michael Gordon’s article in this issue of the *Bulletin* for details.

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Bank has sole responsibility for the timing of intervention and the subsequent squaring out of intervention positions, there is little scope for the Bank to be forced to abandon its strategy early under pressure from the Government. This would help to manage some of the financial risks inherent in intervening at cyclical extremes, as it gives the Bank the ability to hold positions for the time that will generally be required to exit at a profit (once the exchange rate reverts to more average levels). Another reason for maintaining operational independence around FX intervention concerns the potential for intervention policy to conflict with monetary policy if decisions to intervene did not rest solely with the Bank. Because the Bank has control of intervention decisions, there is little scope for conflicts between intervention policy and price stability to arise, given that the Reserve Bank Act clearly defines a single objective: price stability.

### Transactions

Intervention will usually be conducted in the New Zealand dollar/US dollar currency pair. This is because market participants quote this currency pair the most actively and most other currency pairs are derived with reference to the NZD/USD exchange rate.<sup>14</sup> Using this currency pair best allows the Bank to conduct its intervention in the quickest and most efficient manner, maximising the impact on the New Zealand dollar exchange rate against all other currencies.

The Bank intends to be flexible in its implementation style and will not adopt any fixed method of implementation. However, transaction actions will generally be with wholesale market participants, and would typically be of a similar size as the standard market parcel (NZD 10 million) or larger. To maximise the strength of the intervention signal the Bank is likely to transact with a number of market makers simultaneously. The Bank will not transact directly with corporates or individual exporters or importers.

The style of intervention transaction is key to the effectiveness of intervention. Normally, market participants (including the

Reserve Bank) try to conduct FX transactions in a manner that will minimise the impact of the transaction on the exchange rate. This is usually optimal, as to do otherwise results in higher transaction costs. The execution approach in intervention situations will be quite the opposite, as the aim of the operation would be to maximise the exchange rate impact. This implies that the Bank would look to intervene at times when there is relatively little interest by other market participants to trade against it. Also the style of execution will be relatively aggressive – the Bank will ask market participants to quote it a price and would deal on those prices, thereby forcing transactions into the market. This approach is more likely to result in the Bank's counterparties quickly acting to pass on the Bank's deals to others, creating ongoing transaction activity in the direction the Bank desires, maximising the impact on the exchange rate. The intervention execution approach stands in contrast to the Bank's normal approach of easing transactions into the market with the aim of having no impact on the exchange rate.

Generally, intervention will be quite open and will involve as many market makers as possible, to maximise the signalling impact of intervention. On occasion, though, it may be the case that intervention is covert, involving only one or two market makers, if it seems that this is more likely to lead to a greater chance of success.

The Bank's open foreign exchange position will be closed once the exchange rate returns to near its long-term equilibrium value. The associated transactions will be performed in a manner consistent with minimising the impact on the exchange rate. For example, the Bank will pick times when there are a number of other investors interested in trading in the opposite direction, and its execution style will be very passive. Such transactions have quite a different character to intervention, reflecting their quite different objectives and style.

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<sup>14</sup> For example, a market quote in the NZD/JPY would normally be calculated as the product of the NZD/USD and USD/JPY exchange rates – both of which are individually and actively quoted.

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## Communications

The Reserve Bank adopts a very transparent approach to communicating its policies and operations in general. This will also apply to its approach to foreign exchange intervention.

Often, intervention will be very open and public. In these cases the Bank will issue a press release shortly after having intervened, noting it has intervened and the rationale for the intervention. Sometimes, though, the Bank may wish to intervene covertly, which will mean that there will be no comment from the Bank at the time of intervention. The policy regarding commentary is that the Bank will comment on intervention if it thinks such commentary is useful in enhancing the effectiveness of the operation. Otherwise it will not make on-the-record comments to anyone in response to questions regarding intervention.

Regardless of whether intervention is open or covert, intervention will be apparent after the fact. Each month the Bank and the Crown publish data on the status of the Bank's balance sheet and the foreign exchange transactions the Bank has made with the markets. This information will clearly indicate when intervention has occurred within a month or two of intervention actually having occurred.

Finally, the Bank's Monetary Policy Statements, testimony to Parliament's Finance and Expenditure Committee, and the Bank's Annual Report will all contain commentary describing the Bank's intervention activities, their rationale, and their impact on the Bank's balance sheet. All of these communication media are important in ensuring that the Bank is accountable for any intervention activities.

## 6 Summary

This article has provided an elaboration on the Reserve Bank's new foreign exchange intervention policy. The new policy adds another instrument to the monetary policy toolkit, one specifically designed to trim only those peaks and troughs of the exchange rate cycle that are viewed as exceptional and unjustified by economic fundamentals.

The Bank has full operational independence to conduct intervention, but any decision to intervene must be consistent with the Bank's primary objective of price stability laid out in both the Reserve Bank Act and the PTA.

The conditions attached to intervention manage the financial and reputational risks the Bank may face when pursuing intervention. This prudent approach to intervention is further reinforced by both the NZD 1 billion of capital reserves added to the Reserve Bank's balance sheet, and the transparency attached to the intervention regime as a whole.

The degree of judgement required to undertake intervention, and the management of risks associated with any actual intervention, present an on-going challenge for the Bank to develop and maintain an appropriate level of intervention capability. This capability involves ensuring that the Bank's monitoring and forecasting of economic data is of a high standard, and that there exists a level of technical expertise (and relationship management) to carry out intervention in the foreign exchange market.

As with any other facet of monetary policy, the performance of the Governor of the Reserve Bank in carrying out any intervention decisions would be subject to specific accountability arrangements. These include monitoring by the Bank's Board, the Finance and Expenditure Committee, and the Minister of Finance, together with the general scrutiny provided by market participants and the public at large.

The Bank does not envisage that intervention will be used frequently, as by and large its view is that New Zealand's floating exchange rate does a good job buffering the economy from external shocks. The new policy gives the Bank the capability to consider intervention in those rare instances when it is appropriate and useful. The new policy will not be a panacea for the large swings in the value of the New Zealand dollar that are a fact of life for a floating exchange rate. At best, intervention offers a mild palliative, and the bulk of exchange rate risk management will continue to sit with firms and individuals within New Zealand.

# Overview of the manufacturing sector

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This article examines recent trends in New Zealand's manufacturing sector. It finds that sales to the domestic market have been reasonably robust in recent years, reflecting the strong local economy. However, the share of imports in local sales has been rising, partly due to structural factors and partly due to the rising exchange rate. Manufactured export activity has fluctuated in recent years, with key influences including the exchange rate, commodity prices, and cycles in trading partner economies. After some weakness in 2002 and 2003, export sales strengthened in 2004, helped by the global economic cycle. The article finds that profitability (the earnings to sales ratio) has fallen for many industries over this period, which is likely to reflect a rising exchange rate and ongoing competitive pressures.

## 1 Introduction

New Zealand's manufacturing sector accounts for just over 15 per cent of Gross Domestic Product, with total sales of around \$69 billion in 2004 (see table 1). Around one third of the sector's output is exported directly, with an estimated 10 to 20 per cent exported indirectly as inputs into other sectors' production. This still leaves a significant portion of output that is used to meet demand in New Zealand. Consequently, both external and domestic demand conditions are important in shaping overall prospects for the manufacturing sector.

The aim of this article is to provide an overview of recent performance in the manufacturing sector and a brief look

at trends in the various sub-industries. The main source of information is the Quarterly Manufacturing Survey (QMS), which provides details on sales, volumes, costs of production and inventories. Unfortunately the QMS only provides aggregate statistics and does not decompose sales into their 'domestic' and 'export' components. In this article, export statistics have been used to estimate the share of domestic sales residually. However, the QMS sub-industry classification differs from that used to report export and imports. Although we have attempted to reconcile the two classification systems, there are limitations with this approach. Consequently, the statistics reported in this article should be treated as indicative only.

**Table 1**  
**Manufacturing sector sales**  
**(Year to September 2004)**

	Sales (\$ M)	% of Total
Meat and Dairy	17,050	24.9
Other Food	7,030	10.3
Metal Products	7,008	10.2
Machinery and Equipment	6,506	9.5
Wood Products	4,584	6.7
Rubber, Plastics and Other Chemicals	4,443	6.5
Printing, Publishing and Recorded Media	3,596	5.2
Petroleum and Industrial Chemicals	3,063	4.5
Beverages, Malt and Tobacco	3,036	4.4
Textiles and Apparel	2,815	4.1
Paper and Paper Products	2,756	4.0
Transport Equipment	2,329	3.4
Non-Metallic Mineral Products	2,303	3.4
Furniture/Other	2,044	3.0
Total	68,564	100.0

## Box 1

### The manufacturing sector at a glance

Manufacturing sector's contribution to GDP	15%
Manufacturing sales (year to September 2004)	\$68.5 Bn
<i>of which</i>	
Export sales <sup>1</sup>	\$24.5 Bn
Domestic sales	\$44.0 Bn
Average domestic sales growth over last five years	5.8%
Average export sales growth over last five years	4.6%
Number of employees (February 2004) <sup>2</sup>	258, 570
Number of manufacturing enterprises <sup>2</sup>	21, 853

	1998	2004
Manufacturing share of real GDP	16.5%	15.2%
Manufacturing share of total employment <sup>3</sup>	17.7%	15.7%

#### Exports by destination (% of total manufacturing exports)

	1996	2001	2002	2003	2004
Australia	20.1	18.2	19.2	20.4	20.1
US	10.1	16.2	16.9	16.6	16.6
Japan	16.6	13.4	11.5	10.7	10.9
UK	6.5	4.8	4.9	4.9	5.0
China	2.9	3.8	4.7	5.2	5.6
South Korea	5.1	4.0	4.5	3.5	3.9
Hong Kong	3.5	2.5	2.0	1.9	1.8
Taiwan	3.1	2.4	2.3	2.4	2.5
Malaysia	2.7	2.3	2.1	1.9	1.9

#### Fastest growing export markets (by average annual growth since September 1997)

China	14.8
US	10.6
Australia	4.5

<sup>1</sup> Includes exports of processed meat and dairy

<sup>2</sup> Source: Enterprises, Geographic Units and Employee Count, Statistics New Zealand's Business Demography Statistics

<sup>3</sup> Source: Household Labour Force Survey – Hours Worked

Two other caveats should be made. First, individual firm experiences are likely to differ significantly relative to that of the 'industry'. Second, the backward nature of these statistics means they provide limited insight into the likely fortunes of the sector going forward.

## 2 Broad trends

Figure 1 shows the path of domestic and export sales growth since 1997, while figure 2 shows the price-volume split of total sales.<sup>4,5</sup> Falling export prices brought about by the rising exchange rate saw sales growth stagnate during 1997,

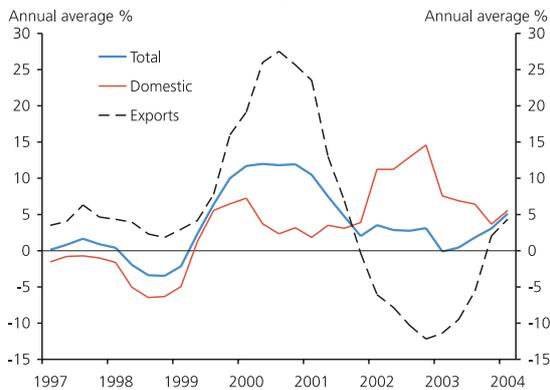
although the volume of sales continued to grow modestly. Following the onset of the Asian crisis in late 1997, sales registered an outright fall, driven by falling domestic and export sales growth. Over this period, manufacturers faced weaker demand locally, as the economy cooled down, as well as weaker international markets (particularly in South East Asia). Export prices for manufactured goods appear to have been driven lower over this period, notwithstanding a falling exchange rate, in part, due to intense efforts by Asian exporters to re-grow their own export markets.

By 1999, both domestic and export sales were recovering. Export conditions had become more favourable due to the combination of strong commodity prices (benefiting meat and dairy manufacturing), a lower exchange rate, and recovering demand from Asia. The domestic economy was also recovering strongly over this period, with a sharp lift in both consumption and business investment spending benefiting a range of manufacturers.

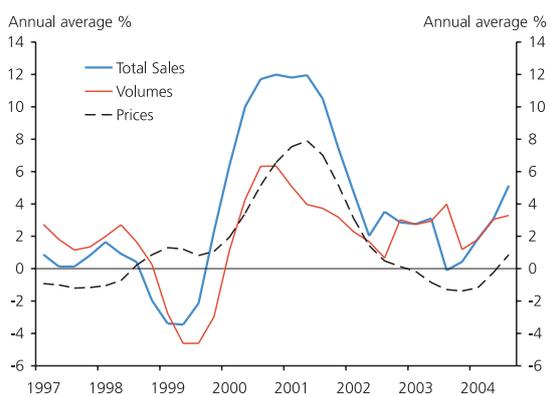
In 2001, as commodity prices began to fall and the exchange rate started to appreciate, the pace of the manufacturing sector's recovery began to ease, with more moderate export and domestic sales growth. Since 2002, domestic sales growth has been robust – reflecting a strong local economy. However, export revenues were driven lower during 2002 and 2003 by an appreciating exchange rate and, for some manufacturers, weaker international prices. During 2004, export sales appear to have gained some momentum again, reflecting a recovery in some export commodity prices (especially for meat and dairy) and an improvement in trading partner economies. These factors would have been offset, to some extent, by a further rise in the exchange rate.

Trends in manufacturing sales by industry are summarised in table 2 (overleaf) while table 3 (overleaf), shows growth in sales volumes (ie sales adjusted for price movements).

**Figure 1**  
Growth in manufacturing sector sales



**Figure 2**  
Growth in manufacturing volumes and prices



<sup>4</sup> The relatively short horizon examined in this article is due to the period for which data is available in its current format.

<sup>5</sup> Aggregate sales and export trends should be interpreted with caution as the sales and export data do not account for hedging. The values of exports are recorded at the spot exchange rate, not at the price actually received by the producer due to hedging. When the exchange rate is falling, export values may be inflated (to the extent exporters are hedged at higher exchange rates); conversely when the exchange rate is rising export values may be understated.

Table 2

Growth in manufacturing sales by industry  
(annual average growth)

	1998	1999	2000	2001	2002	2003	2004
Meat and Dairy	5.3	-7.1	17.6	24.6	5.9	-9.0	6.6
Other Food	4.2	-0.3	5.8	7.8	3.5	1.6	2.8
Beverages, Malt and Tobacco	12.1	9.0	12.2	10.0	1.1	10.1	1.2
Textiles and Apparel	-10.3	2.6	9.7	5.5	1.4	2.0	-7.1
Wood Products	-1.1	8.9	19.5	-6.2	9.2	5.1	8.7
Paper and Paper Products	-5.9	10.9	20.4	-4.0	-3.3	-5.7	1.9
Printing, Publishing and Recorded Media	3.0	-5.3	5.0	7.9	-6.2	-2.0	5.7
Petroleum and Industrial Chemicals	-11.4	-10.0	24.3	31.1	-9.8	4.0	-3.1
Rubber, Plastics and Other Chemicals	2.2	2.4	7.7	2.2	9.7	2.7	6.5
Non-Metallic Mineral Products	3.7	0.7	-0.2	1.7	11.2	12.4	8.4
Metal Products	-2.2	-4.8	10.4	2.9	5.8	5.1	10.2
Transport Equipment	-3.3	-27.4	13.7	6.8	15.7	5.5	0.3
Machinery and Equipment	-1.6	0.7	8.6	14.6	-3.0	2.8	9.8
Furniture/Other	-2.7	7.2	-4.9	-0.2	14.9	1.7	3.4
Total	0.4	-2.1	11.7	10.5	3.5	-0.1	5.1

Table 3

Growth in manufacturing sales volumes by industry  
(annual average growth)

	1998	1999	2000	2001	2002	2003	2004
Meat and Dairy	6.1	-8.3	8.4	11.8	7.7	-3.8	3.8
Other Food	2.6	-4.2	1.9	2.8	0.0	1.6	2.8
Beverages, Malt and Tobacco	8.0	6.8	10.3	5.8	-3.5	5.9	-2.4
Textile and Apparel	-7.6	4.1	6.1	-1.3	0.4	1.5	-5.4
Wood Product	-1.8	8.9	14.3	-8.7	9.6	7.0	10.8
Paper and Paper Products	-6.7	12.6	6.9	-6.5	-1.4	-3.2	4.3
Printing, Publishing and Recorded Media	-0.7	-10.3	-1.1	5.3	-6.4	-5.8	4.1
Petroleum and Industrial Chemicals	-9.2	-6.9	13.0	12.7	-7.1	2.5	-0.2
Rubber, Plastics and Other Chemicals	1.4	2.1	4.9	-3.2	8.0	2.6	6.2
Non-Metallic Mineral Products	3.3	1.1	-0.2	-1.4	7.1	11.1	6.0
Metal Products	-2.4	-1.7	8.2	-2.3	4.1	6.0	7.6
Transport Equipment	-4.0	-28.7	10.6	1.5	14.8	5.2	0.9
Machinery and Equipment	-0.2	-1.5	5.5	7.8	-4.9	2.7	8.5
Furniture/Other	-1.9	6.2	-6.4	-4.9	12.6	0.2	3.0
Total	0.3	-3.0	6.3	3.2	3.0	1.2	4.2

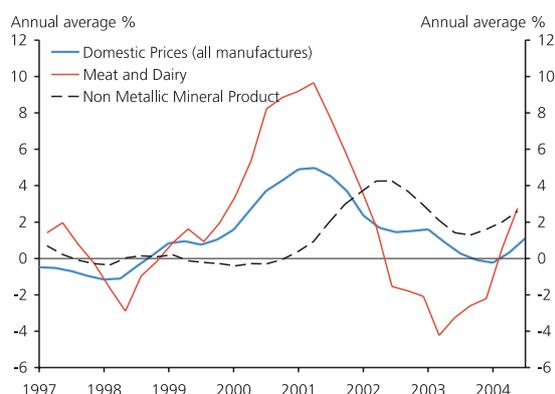
### 3 Domestic trends

Table 4 shows our estimates of domestic sales growth by industry. As shown by the table, aggregate domestic sales of locally produced manufactures continued to expand quite rapidly in 2004, although there was considerable variation in performance across the sub-industries. Those industries related to the construction sector, such as wood products, metal products and non-metallic mineral products (which includes commodities such as cement and other building aggregates) continued to grow quickly with rising production volumes – although the rate of increase moderated. Sales in the rubber, plastic and other chemical products (including pharmaceuticals) industries also achieved high growth rates underpinned by rising volumes. Domestic sales contracted for producers of beverages, textiles, apparel and paper products – this following relatively strong growth in previous years. This slowdown in domestic sales may, in part, reflect greater import competition brought about by the higher exchange rate.

For meat, dairy and non-metallic mineral products, moderate increases in prices helped boost domestic sales revenues in

Figure 3

#### Growth in domestic prices of locally produced manufactures



2004. However, for the remainder of manufactures prices remained subdued, as suggested by figure 3. Despite strong domestic demand, price rises may have been suppressed by falling import prices of similar products due to a rising New Zealand dollar. For some manufacturers, the rising exchange rate may also have helped to contain the cost of imported inputs.

Table 4

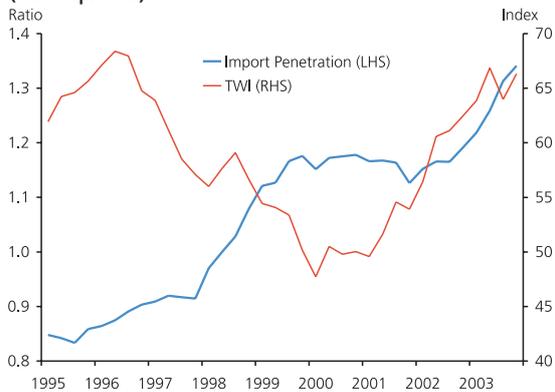
#### Estimates of growth in domestic manufacturing sales (annual average growth)

	1998	1999	2000	2001	2002	2003	2004
Meat and Dairy	6.4	-17.0	24.0	5.4	27.6	-5.3	3.1
Other Food	2.2	-4.6	4.5	0.3	3.1	12.1	2.2
Beverages, Malt and Tobacco	12.0	7.6	9.0	7.4	0.7	11.6	-1.8
Textiles and Apparel	-22.9	21.9	8.1	6.6	8.0	0.4	-7.3
Wood Products	13.1	0.6	9.4	-19.6	6.8	29.1	23.9
Paper and Paper Products	-15.5	11.2	12.3	-8.3	3.8	14.0	-4.2
Printing, Publishing and Recorded Media	3.0	-5.4	4.9	7.7	-6.2	-2.1	5.6
Petroleum and Industrial Chemicals	-6.6	-13.8	2.8	26.7	25.0	30.2	-0.3
Rubber, Plastics and Other Chemicals	-8.1	-0.2	-2.3	-33.4	57.9	23.1	16.7
Non-Metallic Mineral Products	2.6	-0.2	0.0	1.6	12.2	13.3	8.6
Metal Products	-6.6	-6.0	7.8	-0.4	12.6	12.1	10.4
Transport Equipment	-2.7	-33.2	7.7	4.8	18.0	0.4	6.7
Machinery and Equipment	-8.0	1.8	1.0	16.4	-3.5	3.8	9.1
Furniture/Other	-3.1	6.4	-6.7	-4.3	18.6	2.4	5.1
Total	-1.6	-5.0	7.3	1.8	11.2	7.6	5.6

## 4 Imports of manufactures

Domestic consumption of manufactured goods is supplied from both local production and imports. Stronger domestic sales have been accompanied by rising production volumes for many manufacturers. However, the rate at which production is increasing has been relatively subdued, which may partly reflect increasing competition from imports of similar products. As shown in figure 4, import penetration of manufactured goods into the New Zealand market has accelerated in the past few years, along with the appreciation of New Zealand's exchange rate. It is difficult to be sure whether the strong import volume growth has been for goods that are in direct competition with local output; whether it represents greater reliance on imported components in the production process; or whether it has been in areas for which New Zealand has limited domestic productive capacity. But there is a strong likelihood that local producers have faced greater competition due to the fall in import prices, and some manufacturers have reported scaling back production of certain products locally.

**Figure 4**  
**Import penetration of manufactured goods**  
 (1991q1 = 1)



The strong exchange rate is likely to have been a key driver of the recent acceleration in import penetration, and some of this increase is likely to reverse when the exchange rate eventually declines. In some cases, strong demand has led to production capacity constraints in some industries, with greater reliance on imported product (this has reportedly been the case for some building materials). However, the rise in import penetration may also reflect a structural change brought about by intense competition from other countries producing manufactured goods, such as China and some

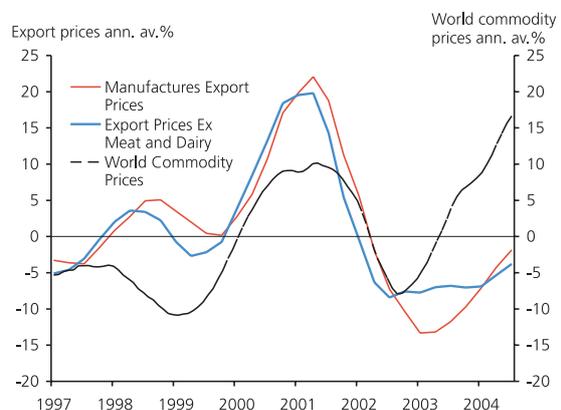
other Asian economies. Lower production costs (particularly lower labour costs) have enabled these countries to significantly expand their trade with countries such as New Zealand, and to compete directly with local manufacturers in world markets. The progressive dismantling of New Zealand's import tariffs during the 1980s and 1990s is likely to have further encouraged imports from a range of countries.

## 5 Export Trends

China and the United States have been New Zealand's fastest growing export destinations over the past decade (see Box 1). Strong growth in export sales to the United States during the late 1990s increased the United States' share of total exports. This has offset a gradual decline in Japan's export share, as growth in export sales remained marginally lower than that of other trading partners. Strong demand from China has seen its share of total exports increase rapidly. Over 2001 to 2003 growth in export sales to China has been significantly stronger than growth in exports to the rest of Asia.

Over 2002 and 2003, export sales suffered due to deteriorating trading conditions as world commodity prices declined sharply, exacerbated by weak demand in many trading partners, such as the US, Japan and the EU. Export sales growth recovered in 2004, as export prices stabilised and external demand conditions improved. Table 5 shows

**Figure 5**  
**Manufactures export prices and world commodity prices**



**Table 5**  
**Growth in manufactured exports**  
**(annual average growth)**

	1998	1999	2000	2001	2002	2003	2004
Meat and Dairy	4.5	0.7	13.6	38.0	-5.7	-11.6	9.4
Other Food	8.1	8.0	8.0	20.0	4.2	-12.3	3.9
Beverage Malt and Tobacco	13.0	22.8	40.0	28.0	3.7	1.6	19.1
Textile and Apparel	2.4	-12.1	11.4	4.3	-5.5	3.9	-6.8
Wood Product	-14.0	18.8	29.6	5.2	10.7	-10.0	-4.9
Paper and Paper Product	15.4	10.5	33.6	2.0	-12.0	-34.4	17.2
Printing, Publishing and Recorded Media	3.3	3.2	14.7	22.1	-4.8	7.0	13.1
Petroleum and Industrial Chemical	-18.4	-3.7	56.3	35.4	-41.7	-47.6	-17.0
Rubber, Plastics and Other Chemical	16.7	5.3	18.2	32.9	-11.2	-13.0	-4.5
Non-Metallic Mineral Product	31.6	17.6	-4.4	3.1	-5.2	-6.7	3.9
Metal Product	13.2	-1.2	17.2	11.3	-9.3	-14.3	9.4
Transport Equipment	-9.4	37.8	46.7	14.9	7.3	25.9	-20.1
Machinery and Equipment	13.2	-1.2	23.4	11.9	-2.1	1.3	11.0
Furniture/Other	0.3	13.6	9.0	27.1	-3.7	-2.5	-7.2
Total	4.3	3.0	19.1	23.5	-6.1	-11.4	4.4

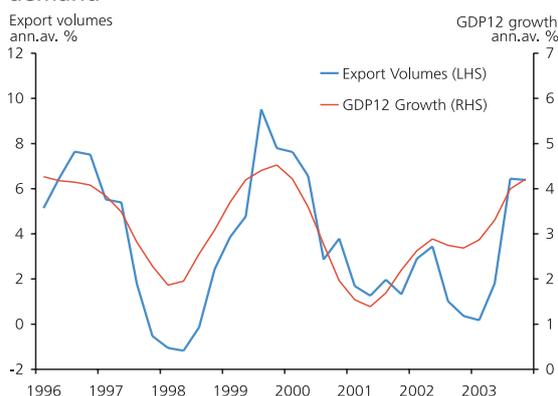
our estimates of export sales growth by industry since 1998. Once again, the variation in performance across the various sub-industries is striking. Meat and dairy sales (which account for 40 per cent of all manufactured export sales) recovered in 2004 due to a sharp lift in world prices for these commodities. Machinery and equipment sales accelerated due to strong growth in volumes – this may be partly due to strong sales in durable goods related to the building cycle in Australia. Export sales contracted for textiles, wood products, rubber, plastic, chemicals and petroleum.

Although export revenues have increased for some manufacturing industries, the rising New Zealand dollar

has continued to put downward pressure on export prices over the past couple of years. However, as suggested by figure 5, rising world commodity prices will have contained the fall in prices for some manufacturers (especially meat and dairy product producers) although this will not be the case for many others. Since 2002 world commodity prices have been improving for all our major exports, such as meat, dairy and aluminium. Forestry prices turned down during 2004 and may exacerbate falling export revenues for wood products.

A recovery in external demand<sup>6</sup> was a factor driving export volumes higher for many manufacturers in 2004 (figure 6). Volume growth in machinery continued to accelerate despite weak export prices. Volumes also performed well for metal products, paper products and printing, publishing and recorded media. Volumes of dairy and meat exports continued to grow at a steady pace. Exports of beverages grew substantially – supported by higher production of wine due to bumper grape harvests. Export volumes fell for wood products, compounding the effect of weak prices.

**Figure 6**  
**Manufacturing export volumes and external demand**



<sup>6</sup> Measured by GDP12 – this proxy for external demand is a trade weighted measure of gross domestic production growth from major trading partners. For more information on the estimation of GDP12 see Smith (2004).

## 6 Profits, costs and competitiveness

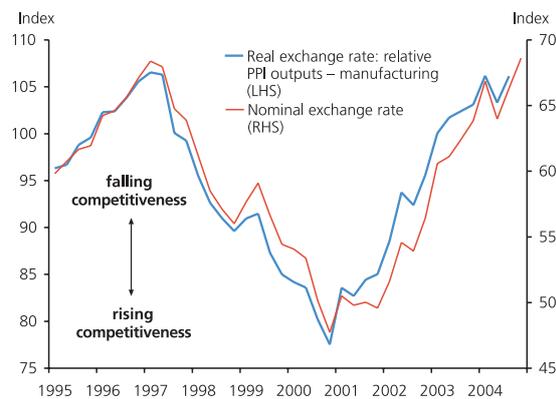
Although trends in sales and volumes provide a barometer of manufacturing performance, looking at measures of profitability and competitiveness provide additional perspective on the overall performance of manufacturing, and likely developments in the future.

A key underlying driver of manufacturing sector profitability is the competitiveness of manufacturers within their key markets. There are a number of dimensions to competitiveness, many of which are difficult to measure. Comparisons of production costs between New Zealand manufacturers, and overseas manufacturers against which they compete, can provide one gauge of their ability to compete in overseas markets (or locally against imported products). However, such measures can be hindered by data limitations. Other dimensions to competitiveness include relative product quality, branding and regulatory factors, all of which can be difficult to measure and compare across countries.

Figure 7 provides a simple measure of relative price competitiveness between New Zealand and its key trading partners. This measure compares relative manufacturing output prices between New Zealand and its five major trading partners in world currency terms.<sup>7</sup> A rise in New Zealand's output prices abroad relative to those of its trading partners implies a loss in competitiveness. With only small differences between relative inflation rates in manufacturing across countries during recent years, changes in relative competitiveness have been driven primarily by movements in the nominal exchange rate.<sup>8</sup> A falling exchange rate during the 1999 to 2001 period boosted New Zealand manufacturers' price competitiveness and, as noted earlier, coincided with an increase in export activity. More recently, falling relative competitiveness brought about by a rising exchange rate has made trading conditions more

challenging both domestically and externally. Note that the simple measure in figure 7 may understate the decline in competitiveness as it excludes countries such as China which have become an increasingly important trading partner (and competitor in export markets). Another limitation of the measure is that it is based on a comparison of output prices

Figure 7  
Relative competitiveness  
(relative producer output prices)



rather than core production costs, which may be a better indicator of long-term competitiveness.

Turning to measures of profitability, information from the QMS allows a range of profitability measures to be calculated. A measure of profit (net earnings before interest and taxation, or EBIT) can be calculated by subtracting labour costs and other expenses from operating income. An estimate of profit margins can then be calculated by dividing net earnings by total sales. This measure is shown in table 6.

As suggested by the table, the combination of higher commodity prices and a lower exchange rate increased profitability for most manufacturing industries over the period from 1999 to 2001. Margins have since fallen back to around 1997 levels for most industries, primarily reflecting the effect of the appreciating exchange rate on earnings. Note that because the analysis in this paper is based on annual average data, these measures will not necessarily reflect very recent developments.

On average, non-labour costs make up 83 per cent of New Zealand manufacturers' operating expenses. The majority

<sup>7</sup> The higher the real exchange rate, the lower is New Zealand's manufacturing competitiveness relative to the following five trading partners: Australia, US, EU, Japan and the UK.

<sup>8</sup> As shown by the difference between the real exchange rate and the nominal exchange rate.

Table 6

Earnings before interest and taxes relative to sales<sup>9</sup>

	1997	1998	1999	2000	2001	2002	2003	2004
Meat and Dairy	6.9	7.7	2.3	6.7	6.1	3.9	6.1	3.2
Other Food	8.0	10.8	16.1	14.1	14.8	15.3	14.1	15.4
Beverages, Malt and Tobacco	24.9	26.0	23.3	24.3	24.5	19.0	19.6	20.2
Textiles and Apparel	4.9	-0.5	6.1	10.3	8.5	12.1	12.5	11.3
Wood Products	11.5	12.1	14.7	16.9	12.4	9.4	6.7	10.2
Paper and Paper Products	13.5	16.9	18.7	24.8	18.4	18.2	13.1	12.7
Printing, Publishing and Recorded Media	16.8	19.0	19.9	17.8	19.0	16.1	17.9	17.4
Petroleum and Industrial Chemicals	19.9	9.3	8.2	18.2	17.7	19.6	19.7	15.2
Rubber, Plastics and Other Chemicals	9.8	6.2	11.4	7.7	8.2	11.3	14.9	16.3
Non-Metallic Mineral Products	21.2	19.5	20.6	19.5	18.0	18.1	20.0	19.1
Metal Products	14.4	13.2	15.3	17.3	14.5	10.7	12.0	13.8
Transport Equipment	7.3	7.1	-13.3	4.8	5.6	11.7	11.0	6.6
Machinery and Equipment	11.4	10.9	9.6	9.2	16.0	12.8	11.7	10.6
Furniture/Other	14.0	13.1	13.6	11.9	10.6	13.6	12.9	12.6
Total	11.5	11.1	11.0	13.1	12.5	11.3	11.9	11.2

of these non-labour costs are for raw materials, which may be sourced domestically or imported. Other significant costs are likely to be energy and transport. Changes in world export prices or the exchange rate will tend to impact both New Zealand dollar export prices and the cost of imported inputs. Typically, the change in export prices will dominate the effect of any change in imported input prices, as the latter are only a fraction of total costs. However, the overall impact on profitability also depends on the currencies in which imports and exports are denominated. For example, discussions with our business contacts suggest that a number of manufacturing exporters servicing the Australian market rely heavily on imported inputs purchased in US dollars. To an extent, profitability for these exporters has been cushioned over the past few years, during which the NZD/USD has risen by more than the NZD/AUD.

## 7 Labour productivity

Labour productivity is another important metric of manufacturing performance, as it reflects the sector's ability to increase production from its existing labour input. The ability to generate additional output per worker has an important bearing on competitiveness and profitability. From a national perspective, productivity is a key ingredient in lifting per-capita incomes.

Measures of labour productivity can be estimated by dividing real value added in manufacturing from the national accounts by hours worked. Unfortunately there are multiple sources of data, which yield different results. In recent work The Treasury uses the Household Labour Force Survey (HLFS) estimate of hours worked, which is based on respondents recalling how many hours they worked.<sup>10</sup> In contrast, the Quarterly Employment Survey (QES) estimate of total hours paid collects data directly from firms. The QES data might be more accurate as it is sourced directly from administrative records and will not include recollection errors. We have used both measures of hours worked to estimate labour productivity trends in manufacturing over the past 15 years.

<sup>9</sup> These measures are intended to illustrate trends within individual industries and should not be used to infer relative levels of profitability across the different industries.

<sup>10</sup> See Black, Guy and McLellan (2003)

**Table 7**  
**Trend estimates of labour productivity**  
**(compound growth rate)**

	GDP growth	QES Hours paid	Productivity	GDP growth	HLFS Hours worked	Productivity
<i>Manufacturing sector</i>						
1990–1997	2.0	0.4	1.5	2.0	1.8	0.2
1997–2004	1.7	-0.5	2.2	1.7	-0.6	2.2
<i>All sectors</i>						
1990–1997	2.7	1.4	1.3	2.7	1.9	0.8
1997–2004	3.0	2.1	0.8	3.0	1.5	1.4

The different measures produce different estimates of productivity and different profiles of productivity growth over the short term. However, when comparing trends over cycles, both yield similar conclusions.<sup>11</sup> Table 7 compares productivity estimates under both measures for the periods 1990–1997 and 1997–2004. These periods correspond approximately to a full growth cycle in manufacturing output. As shown in the table, trend labour productivity in manufacturing appears to have lifted over the 1997–2004 cycle. While the average growth in manufacturing sector GDP has eased slightly over this period, labour hours have actually declined, lifting productivity growth.

The table shows that labour productivity in manufacturing has been higher relative to labour productivity for the whole economy (calculated using either HLFS or QES hours data). Driving this is the difference in labour growth, with substantial growth in employment throughout the rest of the economy. This is also consistent with employment data which shows that manufacturing’s share of total employment has declined from 18.0 per cent in 1990 to 15.7 per cent in 2004.<sup>12</sup>

A range of factors may have led to an increase in productivity growth over the latest cycle. Investment has accelerated in recent years as firms have responded to strong demand and tighter labour market conditions, and so the productivity

gains may reflect an element of ‘capital deepening’. Many manufacturers are likely to have continued to seek further efficiencies due to intense competition from foreign competitors, and in response to the impact of the rising exchange rate on export profitability. It is likely that the pressure to continue improving productivity will be sustained going forward.

## 8 Conclusion

This overview of the manufacturing sector has briefly discussed recent trends for domestic and export sales, as well as volumes and price developments in each market.

A key finding is that strong domestic sales have been an important feature of manufacturing sector performance over the past few years. Some parts of the sector appear to have performed quite well over this period, in part because of the strength in the domestic environment, which has acted to buffer against weak export sales.

On this score, prospects for the manufacturing sector in 2005 will depend, to a large extent, on developments in the domestic economy as much as the ongoing adjustment to the exchange rate and external conditions. A flattening in the residential construction cycle after last year’s rapid growth spurt could potentially result in weaker domestic sales growth for manufacturers than in 2004. Industries such as wood products and non-metallic minerals appear to have been disproportionate drivers of domestic manufacturing sales in 2004, and it may be unrealistic to expect growth to be sustained at the double-digit growth rates seen in 2004.

<sup>11</sup> McLellan (2004) looks at productivity growth over peak to peak periods of the economic cycle. These periods are 1985–1989, 1989–1997 and 1997 to present. Given that the QES data begins in 1989 we have looked at productivity growth over 1990–1997 and 1997–2004.

<sup>12</sup> Estimated using Household Labour Force Survey Hours Worked.

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There are some positive signs regarding exports, with both trading partner activity remaining strong and world prices for New Zealand commodities at high levels. But the further rise in the exchange rate in recent months, the gradual expiry of exchange rate hedges, and a probable cooling in the rate of expansion of domestic demand, means that manufacturing prospects are likely to prove challenging in 2005.

## References

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# Amendments to bank disclosure requirements

Ken Matthews, Financial Stability Department

Banks are required to issue quarterly disclosure statements covering a wide range of financial and prudential data. The rules under which registered banks are required to make these disclosures are set out in Orders in Council. These Orders in Council have recently been republished with a number of amendments, relating to the disclosure of information about insurance business, rating-contingent limits on exposures to connected persons, credit rating information in respect of large credit exposures, and additional New Zealand balance sheet information by banks that are branches of overseas banks. There are also some miscellaneous amendments to improve the effectiveness of existing disclosure requirements. This article describes the amendments and the reasons for them.

## Background

Section 81 of the Reserve Bank of New Zealand Act 1989 provides that Orders in Council may be made prescribing information or data that must be published by registered banks. These Orders in Council may be made by the Governor-General, on the advice of the Minister of Finance, in accordance with a recommendation of the Reserve Bank. Such Orders in Council were first made in 1995.

The Orders in Council form the basis of disclosure-related banking supervision requirements that are a critical part of New Zealand's banking supervision system, requiring quarterly disclosures of a range of financial and prudential information by all registered banks. The disclosure statements published by banks are designed to be an important mechanism for encouraging good risk management and governance within banks, as well as assisting the financial market to exert appropriate market discipline on banks. The original disclosure requirements have been described in detail in a previous *Bulletin* article.<sup>1</sup>

The Orders in Council were first amended in 1998 to increase the range of information that banks must disclose. These amendments have been described in a previous *Bulletin* article.<sup>2</sup> Further amendments to the content of the Orders in Council have just been made (the Orders in Council have been re-published in a consolidated form). The latest amendments apply to the disclosure statements of all registered banks from the quarter ending 31 March 2005. The Reserve Bank consulted with banks and other interested parties in developing these amendments, as it is required to do by the Reserve Bank Act.

This article describes these latest amendments and the reasons for them. Copies of the full Orders in Council are available from the Reserve Bank's website.<sup>3</sup>

## International financial reporting standards

A version of international accounting standards and international financial reporting standards approved by the International Accounting Standards Board has been approved by the New Zealand Accounting Standards Review Board for use in New Zealand. These standards are intended to apply to all New Zealand reporting entities, including banks, and will replace New Zealand-developed accounting policies and financial reporting standards that currently apply in New Zealand. From 1 January 2005, New Zealand reporting entities could voluntarily adopt the international standards. The use of international standards to produce financial statements will become mandatory for New Zealand entities from 1 January 2007.

Some banks have indicated that they want to become early adopters of the international standards. The Orders in Council were based around banks' financial statements being produced using New Zealand standards. Unless the Orders in Council were amended to allow for the use of international standards, banks that wished to use the international standards to produce their financial statements would have had to produce two sets of financial statements – one using New Zealand standards for disclosure statement purposes, and one using international standards for other purposes.

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<sup>1</sup> Reserve Bank *Bulletin*, March 1996

<sup>2</sup> Reserve Bank *Bulletin*, September 1998

<sup>3</sup> [www.rbnz.govt.nz/finstab/banking/regulation/0094291.html](http://www.rbnz.govt.nz/finstab/banking/regulation/0094291.html)

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The Orders in Council have been amended to allow banks to use the international standards prior to 1 January 2007 if they choose to, while still allowing the use of the New Zealand standards by banks that do not wish to become early adopters of the international standards. The amendments involve inserting a number of new definitions that refer to the international standards, and inserting clauses that allow their use for the production of financial statements that are contained in disclosure statements. The Orders in Council also require disclosures additional to the international standards in areas such as set-offs, related party transactions, information on the composition of the banking group, and hedge effectiveness. These additional disclosures were included to enhance comparability and understanding of banks' financial information.

## Insurance business

During 2004 the Reserve Bank implemented a policy on conglomerate activity by registered banks. This policy, which is implemented through a standard condition of registration, limits the amount of insurance business a bank may have to no more than 1 per cent of the assets of its New Zealand banking group. Excessive mixing of insurance and banking activities on the same balance sheet would make interpretation of financial disclosures more difficult, and reduce the usefulness of capital adequacy measures. The Orders in Council have been amended to require all registered banks to disclose the amount and the nature of insurance business that is conducted within the New Zealand banking group, and, in the case of overseas incorporated banks, information about insurance activities and non-financial activities that are conducted by them in New Zealand outside the banking group. The financial statements of such business must be available.

## Exposures to connected persons

During 2004, the Reserve Bank redefined its policy in respect of registered banks' credit exposures to connected persons.<sup>4</sup>

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<sup>4</sup> The term 'connected person' is defined in the Reserve Bank document entitled 'Connected Exposure Policy BS8', which is available from the Reserve Bank's website.

The Reserve Bank sets exposure limits to connected persons (as a percentage of tier 1 capital) that New Zealand incorporated registered banks may have, in order to prevent excessive de facto reduction of capital. Previously a standard limit applied to all New Zealand incorporated registered banks. The policy change was to replace this standard limit with rating-contingent limits. That is, the higher the credit rating of the bank, the higher the limit the bank is allowed. These rating-contingent limits are defined and implemented through a condition of registration that applies to New Zealand incorporated registered banks.

The Orders in Council applying to New Zealand incorporated registered banks have been amended to require the disclosure by each bank of: the rating-contingent limit that applies to the bank; changes to the limit; whether limits have been complied with over the latest quarter; and, if not, the nature of any breaches. Also, banks must disclose whether their credit exposure to connected persons has been calculated on a gross or bilateral net basis. If it is on a bilateral net basis, the bilateral netting agreement must be contained in the disclosure statement. If the bilateral netting agreement is not an industry standard agreement, then expert third party validation of the agreement must also be disclosed.

## Concentrations of credit exposures

Amendments have been made to the manner in which the concentrations of credit exposures to individual counterparties is disclosed. Previously, all registered banks were required to disclose the number of exposures they had to individual counterparties that exceeded 10 per cent of the bank's equity (in bands of 10 per cent). Exposures to banks and other parties are disclosed separately. Banks are still required to disclose this information, but must now also break down the aggregate of such exposures into three categories: rated exposures that are of an investment grade credit rating (BBB- and above); rated exposures that are below investment grade; and other exposures. The reason for this amendment is to help indicate the relative financial strength of a bank's large creditors, as well as the number of such creditors.

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## Branch balance sheet information

Overseas incorporated registered banks are now required to disclose the amount of retail deposits they have (as defined in conditions of registration). This disclosure is related to the Reserve Bank's policy on local incorporation. A registered bank must be locally incorporated if it has retail deposits in New Zealand exceeding \$200 million, and it is domiciled in a country whose law gives priority in the event of a winding-up to depositors in that country ahead of New Zealand depositors, or there is inadequate disclosure in its home jurisdiction.

Overseas incorporated registered banks must also now disclose the amount of their New Zealand branch liabilities net of related party funding. Reserve Bank policy is that banks must be locally incorporated if their New Zealand liabilities net of related party funding exceed \$10 million.

## Miscellaneous amendments

A new category of assets, called 'other assets under administration', is now required to be disclosed as part of the information about asset quality. This new category is designed to capture assets which are not 'impaired assets' or 'past due assets', and on which losses are not necessarily expected, but which are subject to some form of external administration (eg, a loan to a company that is in receivership).

Locally incorporated banks are now required to disclose the name of each person who has a direct or indirect ownership interest in the registered bank of 5 per cent or more, or who can appoint 25 per cent or more of the directors. This new disclosure follows amendments to the Reserve Bank Act in 2003 requiring any person who wants to obtain such a significant interest to first obtain the approval of the Reserve Bank. The amendments to the Act have been described in a previous *Bulletin* article.<sup>5</sup>

Some amendments have been made that provide for the disclosure of additional corporate governance information. Independent directors must be identified, and details of any board audit committee must be disclosed. If disclosure

statements are signed for directors or chief executives by an agent, the persons on whose behalf the agent is signing must be identified.

All banks are required to obtain a credit rating from a rating agency approved by the Reserve Bank. Most banks have ratings from more than one approved agency. The Orders in Council have been amended to clarify that all such credit ratings must now be disclosed.

If a bank is subject to overseas laws that might restrict its ability to support its New Zealand operations by giving priority to overseas creditors, details of those laws must be disclosed. This information helps New Zealand creditors make an informed decision about their dealings with the bank in New Zealand.

Previously, all disclosures were subject to a materiality criterion – ie, information need only be disclosed if it is considered material. This criterion has been removed from some disclosures relating to prudential information because some prudential information may be of interest even if not material in a numeric sense.

## Future amendments

The amendments made to the Orders in Council that relate to the voluntary use of international accounting standards are temporary in nature. The Orders in Council will need to be amended again from 1 January 2007 when the use of international accounting standards will become mandatory for all registered banks. From that date the Orders in Council will only permit the use of international accounting standards for the production of financial statements included in disclosure statements. It is intended that the Orders in Council will be amended in 2006 to provide for this.

It is likely that the opportunity will also be taken at this time to make other amendments to the Orders in Council that may be appropriate. The Reserve Bank intends, within the next 12–18 months, to review the disclosure system to ensure that it remains effective and in keeping with international best practice. Harmonisation between New Zealand and Australian disclosure requirements will also be a factor taken into consideration.

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<sup>5</sup> Reserve Bank *Bulletin*, March 2004

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# New Zealand economic and financial chronology 2004

Madeline Penny, Economics Department

This chronology documents key economic and financial events that occurred during 2004. A longer chronology, covering the period from 1993 to 2004, will shortly be published on the Bank's website.

## **20 January**

The CPI increases by 0.7 per cent in the December quarter, bringing CPI inflation for the year to December 2003 to 1.6 per cent.

## **29 January**

The Reserve Bank increases the OCR by 25 basis points to 5.25 per cent at its intra-quarter review, noting that it is prudent to begin returning interest rates to levels that will have less stimulatory effects on demand.

## **11 March**

The Reserve Bank releases its March *Monetary Policy Statement* and leaves the OCR unchanged at 5.25 per cent. It notes that the latest activity indicators remain quite robust and that bottlenecks in the economy could persist for some time, raising policy risks. The Bank notes that it is appropriate to wait and watch the data, to see whether a further small increase in interest rates will be required during 2004.

The Reserve Bank announces it has provided advice to the Minister of Finance recommending that, as one of its monetary policy implementation tools, it should have the capacity to intervene in the foreign exchange market to influence the level of the exchange rate. The Reserve Bank's stance to date has been to use its foreign exchange reserves to intervene only if the foreign exchange market became "disorderly".

## **26 March**

Production GDP figures show that the New Zealand economy grew by 0.6 per cent in the December quarter 2003, bringing growth for the year to December 2003 to 3.5 per cent.

## **29 March**

Meridian Energy cancels Project Aqua, its proposed hydro scheme on the Lower Waitaki River in North Otago.

## **6 April**

The Government ratifies an amendment to the Reserve Bank's Funding Agreement to broaden its foreign exchange intervention capacity.

## **19 April**

Figures show the CPI increased by 0.4 per cent in the March quarter, bringing CPI inflation for the year to March 2004 to 1.5 per cent.

## **29 April**

The Reserve Bank increases the OCR by 25 basis points to 5.50 per cent, noting that "moving interest rates to less stimulatory levels appears prudent to ensure inflation remains within the target range over the medium term".

## **1 May**

The European Union undergoes its biggest enlargement with 10 new countries, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia joining with a combined population of over 100 million people.

## **5 May**

The IMF publishes its Financial System Stability Assessment for New Zealand following an examination undertaken in October/November 2003. The main findings are that

- There is a profitable and well-functioning financial system.
- Banking regulation is based on disclosure and market discipline.
- Foreign ownership of major banks poses unique challenges to the RBNZ.
- Recent reforms had strengthened the securities regulatory framework, but further reform is needed to fully implement the International Organization for Governmental Securities Commissions (IOSCO) principles.

## **27 May**

The Budget 2004 is released by Finance Minister, Michael Cullen. Key features include:

- \$2.4 billion of new spending for 2004/05, including a \$1.1 billion Working for Families programme .
- An appropriation for a capital injection to the Reserve Bank to provide capacity to weather short-term financial losses that could arise under the Bank's new foreign exchange intervention policy.
- The Operating Balance excluding revaluations and accounting changes (OBERAC) is estimated to be a surplus of \$5,986 million for the 2003/04 fiscal year, higher than forecast in the December 2003 Economic and Fiscal Update.

#### **10 June**

The Reserve Bank releases its June *Monetary Policy Statement*. The OCR is increased by 25 basis points to 5.75 percent. The Bank notes that the economy has enjoyed strong growth over an extended period. Stretched productive resources are causing inflation pressures to increase across a range of industries. The Bank states that further increases in interest rates are likely to be needed over the year ahead, but to a modest degree by historical standards.

#### **25 June**

The Reserve Bank agrees to a merger between ANZ and the National Bank, to form a single bank known as ANZ National Bank Ltd.

Production GDP figures show that the New Zealand economy grew by 2.3 per cent in the March quarter of 2004, bringing growth for the year to March 2004 to 3.6 per cent.

#### **15 July**

Statistics New Zealand figures show that the CPI increased by 0.8 per cent in the June quarter, bringing CPI inflation for the year to June 2004 to 2.4 per cent.

#### **29 July**

The Reserve Bank increases the OCR by 25 basis points to 5.75 per cent at the interim review in line with forecasts in the June *Monetary Policy Statement*.

#### **11 August**

In a speech to the Trans-Tasman Business Circle in Sydney, Reserve Bank Governor, Alan Bollard, says that the Reserve Bank still needs to be vigilant in its banking supervision role

, even though most of the main banks in New Zealand are foreign owned.

#### **17 August**

The Reserve Bank issues a *Statement of Intent*, outlining its plans for the 2004-07 period. The document is a pilot for an accountability obligation that will be required of the Bank prior to each financial year from 2005 onwards.

#### **9 September**

The Reserve Bank releases its September *Monetary Policy Statement* and increases the OCR by 25 basis points to 6.25 per cent, noting that further tightening in monetary policy may be required given a strong economy and limited inflation headroom.

#### **24 September**

Production GDP figures show that the New Zealand economy grew by 0.9 per cent in the June quarter of 2004, bringing growth for the year to March 2004 to 3.6 per cent.

#### **12 October**

Oil prices reach record highs, with the West Texas Intermediate price rising to over US\$54 a barrel.

#### **15 October**

The CPI increased by 0.6 per cent in the September quarter, bringing CPI inflation for the year to September 2004 to 2.5 per cent.

#### **20 October**

The Reserve Bank issues its first *Financial Stability Report*, a document assessing and reporting on the soundness and efficiency of the New Zealand financial system. The Bank notes that it sees the New Zealand financial system as being stable and functioning effectively, and the banking system as being financially robust and resilient. However, in discussing the risks to this outlook it notes that financial instability often has its origins in periods of long economic expansion, such as New Zealand has enjoyed in recent years.

#### **28 October**

The Reserve Bank increases the OCR from 6.25 to 6.50 per cent at its interim review, noting that it believes monetary policy is now doing enough to ensure price stability as defined under the Policy Targets Agreement (PTA).

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### **11 November**

The Reserve Bank announces proposals to modernise New Zealand's 'silver' coloured coins and seeks feedback from the public with a final decision to be made in early 2005. The proposals are that the current 50, 20 and 10 cent coins be made smaller, and of lighter and lower-cost plated steel, and that the 5 cent coin be taken out of circulation.

Statistics New Zealand's Household Labour Force survey shows that the unemployment rate in the September 2004 quarter fell to 3.8 per cent, the lowest level since 1985 and the second lowest in the OCED.

### **2 November**

The Reserve Bank publishes a proposed policy on outsourcing by large New Zealand banks. Under the proposal, boards of directors would need to ensure their banks have the legal and operational ability to operate their bank as a stand-alone entity if necessary.

### **2 December**

New Zealand and Thailand conclude a Closer Economic Partnership (CER). The CER involves preferential liberalisation of trade in goods investment and the scope for cooperation in areas such as standards and conformance, competition policy, labour and environment issues and technology transfer.

### **6 December**

The New Zealand dollar reaches a 16 year high of 72.68 cents against the US dollar.

The Reserve Bank announces that, as from 6 December, the New Zealand dollar has been included in an international system designed to eliminate risks associated with settling foreign exchange transactions across national boundaries. The system is known as 'continuous linked settlement' (CLS) and addresses the risks that can arise after one party has transferred funds as its part of a deal and is waiting for the other side of the transaction to be completed. Under CLS, both legs of foreign exchange transactions can be settled simultaneously. This is done through a New York-based multi-currency bank called CLS Bank International (CLS Bank), which holds accounts for each settlement member and an account at each eligible currency's central bank, through which funds are received and paid.

### **9 December**

The Reserve Bank releases its December *Monetary Policy Statement*. The Bank leaves the OCR unchanged at 6.50 per cent, noting that this appears sufficient to achieve inflation between 1 and 3 per cent on average over the medium term, with significant pipeline effects from past interest and exchange rate increases to work through and constrain the economy over the period ahead. The Bank notes that economic indicators have continued to surprise on the upside, however, a slowdown is still expected in 2005. Inflation is projected to rise close to 3 per cent before easing back later in 2006, with little headroom, if stronger than expected pressures emerge a further policy tightening cannot be ruled out.

### **14 December**

The Government releases its December Economic and Fiscal Update. Forecasted GDP growth for the 2004/05 fiscal year is considerably revised upwards from the Budget 2004; it is now expected to be 4.0 per cent (up from 2.4 per cent).

### **15 December**

The Reserve Bank confirms that Westpac has decided to incorporate in New Zealand, meaning that all systemically important banks operating in New Zealand will be locally incorporated on the conclusion of this process. The Reserve Bank's local incorporation policy provides, among other things, a well-understood legal framework for the conduct of business in New Zealand and a local board to act in the best interests of the New Zealand bank. These features promote the maintenance of a sound and efficient financial system, and assist in the avoidance of significant damage to the financial system that could result from the failure of a registered bank.

### **16 December**

The Reserve Bank announces that it intends to invest USD 50 million in the newly created Executive Meeting of East Asian and Pacific central banks (EMEAP) Asian Bond Fund 2 (ABF2) as part of its foreign reserves. ABF2 will be a fund devoted to investing in bonds denominated in the home currencies of EMEAP countries and follows on from ABF1, launched in June 2003, which invested in USD denominated bonds of EMEAP nations.

## New Zealand's potential growth rate

An address by Dr Alan Bollard, Governor, Reserve Bank of New Zealand, to the New Zealand Canterbury Employers' Chamber of Commerce in Christchurch

28 January 2005

### 1. New Zealand's growth performance has improved

What a difference a decade makes. If we look at New Zealand's economic growth over the last decade, and compare it with the previous decade, we see that there has been a large lift in the country's growth rate. Average growth over the earlier decade, 1984–1994, was 1.5 per cent per annum, while over the last decade it has averaged 3.4 per cent

Clearly, there were difficulties in the 1980s as firms struggled to come to grips with the new economic environment: exports subsidies were gone, government trading entities were corporatised and some privatised, there was a move towards user pays for government services, and various markets were deregulated. Then there were the other factors. These included the sharemarket crash of 1987, which was to have large flow on effects, especially for some local property sector firms. Another factor was the international recession of the early 1990s.

Neither has the last decade been all plain sailing. We had the Asian crisis of 1997–98, but fortunately this did not last long. The economy was also affected around this time by droughts. Then in late 2000 and early 2001 we saw the onset of a major slowdown in the US following a sharp fall in the value of high tech shares. Nevertheless, the New Zealand economy did more than simply survive these difficulties; over the decade it had a much improved growth performance.

Two broad factors appear to have been influencing growth over the last ten years:

- The economic reforms of the 1980s and early 1990s have resulted in a more competitive environment for the private sector. Also, since the early 1990s we have had a more decentralised approach to wage setting in the private sector, which has given firms more flexibility in how they operate.
- Reforms in the government sector have resulted in more stable macroeconomic policies. The Reserve Bank Act was passed in 1989; price stability was achieved by 1992, and has been maintained since then. We have also seen fiscal stability since the early 1990s, reinforced by the passing of the Fiscal Responsibility Act. We have seen a more medium-term approach to planning and undertaking government expenditure, without the volatility associated with attempts to 'pump prime' the economy.

Our growth performance over the last five years has been particularly strong, with growth averaging 3.8% per annum. This was higher than growth over the same period for Australia, the US, and for the OECD as a whole (see Table 1)

There are particular reasons as to why we have done so well over this period:

- In 2000 and 2001 we had a period where the exchange rate was low and commodity prices had blipped up.

**Table 1**  
Economic growth over the last 20 years  
(Average annual % change)

Period	New Zealand	Australia	United States	OECD
1984–1994	1.5	3.3	3.2	2.9
1994–2004	3.4	3.9	3.3	2.6
1999–2004	3.8	3.3	2.8	2.3

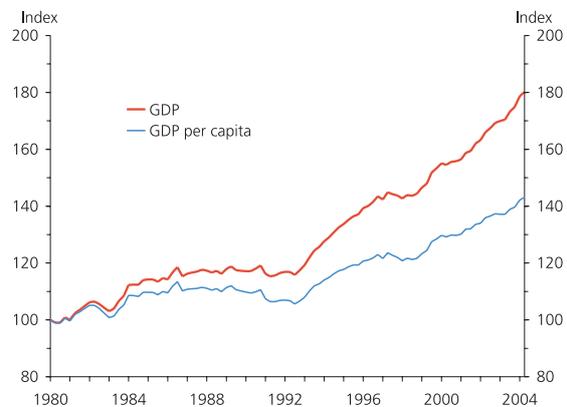
Climatic conditions were also good in this period, lifting the volume of agricultural exports. Consequently, many exporters got a major boost to their incomes. Many firms were able to pay off debt and improve their balance sheets.

- Following September 11 2001 New Zealand suddenly looked like a more attractive place to Kiwis, to would-be migrants, and overseas students, as well as tourists. The resulting large gains from net migration had a positive impact on the level of economic activity.
- World commodity prices have risen sharply over the last two years, reflecting both recovery in the US and continuing strong growth in China. There have also been particular factors affecting the prices of commodities that New Zealand trades in. These include: the outbreak of BSE in the US, which stopped the exporting of US beef to Japan; the continuing rundown of sheep numbers in the EU; and droughts in Australia, which have affected that country's rural exports.
- Growth in private consumption has been very strong, aided by higher employment levels, and also by increases in house prices, which made households feel wealthier. Consumer confidence has remained high.

Not all industries have experienced strong growth over the last five years. But the benefits from the strong growth in the macroeconomy have been clear to see. Job growth has been strong, unemployment has fallen, household incomes have risen, company profits are strong, and the Government has a substantial fiscal surplus. These benefits are reflected in the rise in GDP per capita. (GDP is taken here, and throughout what follows, as being real GDP, or the volume of value added, rather than nominal GDP.)

Given that GDP per capita is a broad measure of general living standards, it is the rise in GDP per capita that really matters to us, rather than the rise in just GDP itself. However, as can be seen from figure 1, variations in GDP per capita have tended to reflect changes in GDP. (The gap between GDP and GDP per capita in figure 1 reflects population growth.) Growth in GDP per capita averaged 2.2 per cent in the 1994-2004 period, compared to 0.7 per cent in the previous decade.

**Figure 1**  
Real GDP and real GDP per capita  
Indexes, base 1980=100

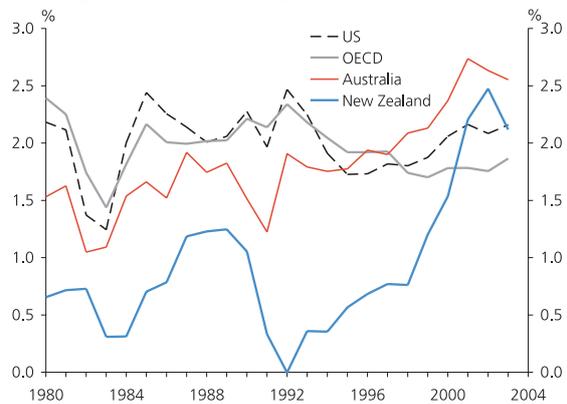


The rise in GDP growth over the past decade has also lifted our growth in GDP per capita relative to the growth rate for the OECD as a whole (figure 2). However, our level of GDP per capita in 2002, in terms of purchasing power parity (PPP), was still 14 per cent below that of the OECD.

Having enjoyed a return to strong growth, and a rise in GDP per capita, we naturally want this situation to continue. Some of the factors which have lifted our growth rate recently, especially the impacts from policy reforms, can be expected to persist, thus improving the economy's productive capacity or potential output in the long run.

However, there are signs that the level of economic activity is currently higher than the level of potential output, thus giving rise to inflation risks. The capacity utilisation measure

**Figure 2**  
Changes in real GDP per capita  
Average annual % change over 10 year period



Source: OECD. GDP per capita has been calculated in US dollars using price levels and PPPs of 2000. Data is currently available only to 2003.

from NZIER's quarterly survey of business opinion is at a record high level. Clearly many firms are stretched, running at full capacity, or close to it. Furthermore, firms have been reporting for some time now – for over three years – that they are having increasing difficulty in finding both skilled and unskilled staff.

## 2. Monetary policy aims to keep the level of activity in line with potential

We know that when output exceeds potential over extended periods, as has been happening recently, inflation tends to rise. Hence, the overnight cash rate (OCR) was lifted from 5.00 per cent to 6.5 per cent over the course of last year, in order to slow the pace of growth. Our forecast is for economic activity to move closer to its potential level over the next year, reflecting not only the effects of higher interest rates on private consumption and residential investment but also an easing in commodity prices.

Determining the current level of potential output is a key issue for monetary policy.

Analysis shows us that when GDP is significantly above its potential level, inflation increases. In this situation, aggregate demand is higher than what can be comfortably produced, and the result is a rise in inflation. Similarly, when GDP is significantly below its potential level, inflation falls. The role of monetary policy therefore is to keep the economy running close to potential, otherwise inflation will either increase or decline.

Note that we are using the word 'potential' in a slightly different way to its normal use. When something achieves its potential, we usually mean that it achieves a maximum value. But in the way that we are using the word here, we can have the economy operating above its potential. However, potential output is a maximum value of a sort – it is the highest level of output that will not produce upward pressures on inflation.

Potential output is not a variable that can be observed directly. It is often estimated as a smoothed track of GDP. The smoothing takes out the short-term fluctuations in GDP

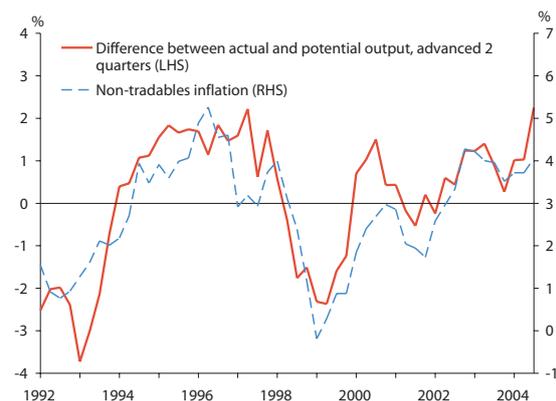
and it is assumed that the resulting smoothed series reflects changes in the productive capacity of the economy. In effect, it is assumed that the smoothed series reflects the underlying growth in such things as capital equipment and labour.

Estimating potential GDP presents some challenges. For example, we are more confident of what potential GDP was say three years ago than of knowing what it is today. This is largely because smoothing methods don't work as well at the end of data series as they do in the middle of the series. This is frustrating, given that it is the end value – the latest value – that we are most interested in. Because of this 'end point' problem, potential GDP is often estimated using methods that incorporate information from other cyclical series as well as actual GDP.

Figure 3 shows the percentage difference between actual output and potential output. Potential output is estimated using an MV (multi-variate) filter. The method has been well documented. This MV filter, which is a smoothing mechanism, uses not only GDP data but also data on capacity utilisation and the unemployment rate. The chart also shows inflation for non-traded goods or services, which can be generally viewed as domestic inflation. The chart shows a strong relationship between the two series.

The difference between actual and potential output is by no means the only factor driving inflation. For example, the world price of imports, the exchange rate, and wage settlements also have an impact on inflation, and these factors are taken into account. In general terms though,

**Figure 3**  
Domestic inflation vs difference between actual and potential output



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when output has moved significantly above its potential level, and looks likely to stay there, a tightening in monetary policy is likely to follow.

There appears to be widespread community acceptance of the need to keep inflation under control. But some people may still have doubts, saying that they would be happy to put up with higher inflation if we were getting higher growth. The problem is that as inflation rises, peoples' expectations regarding future inflation also rise. This affects behaviour regarding the setting of prices and wages. Inflation therefore tends to get locked in at a higher level. We had ample evidence of this in the 1970s and 1980s.

A tightening will affect economic growth in the short term, but does monetary policy also have an effect on long-term growth? We have done some research on this at the Reserve Bank.

A recent *Bulletin* article (Smith 2004) examined both theoretical and empirical studies on this issue. The theoretical studies suggest that transitory changes in interest rates are likely to have only a transitory impact on factor accumulation (eg, capital investment) and hence should not permanently affect the growth of output. The empirical studies suggest that high inflation, or even moderately high inflation, is harmful to growth. Studies have also looked at whether macroeconomic volatility is harmful to trend growth. The general view appears to be that the costs of macroeconomic volatility – in variables such as the exchange rate and inflation – are likely to outweigh any benefits. The article notes that the maintenance of price stability appears to be the main contribution that monetary policy makes to growth.

These overall findings or conclusions, the article suggests, are already embodied in the Policy Targets Agreement (PTA). The PTA charges the Reserve Bank with keeping inflation between 1 per cent and 3 per cent over the medium term while avoiding unnecessary instability in output, interest rates and the exchange rate.

The conclusions that we draw from this study and others are that:

- A one-off easing of monetary policy will have no impact on long run real output – it will only affect the long-run price level.
- Good monetary policy applied consistently over time is a necessary condition for achieving a high long-term average growth rate. (Good monetary policy is defined here as achieving stable and low rates of inflation while minimising short-term disturbances to output and other variables ie successfully implementing the PTA).
- Good monetary policy will not by itself ensure that long-run growth is as high as it could possibly be. But bad monetary policy, if sustained, will prevent the economy from reaching its maximum growth rate. In this context, ongoing bad monetary policy will reduce growth below its maximum rate over a period of many years, leading to a permanent loss of output.

Clearly, bad monetary policy, or the inadequate implementation of policy within the current framework, is something we want to avoid.

### 3 Accounting for growth

Determining what our potential level of output is, and what the growth in potential output is, are important issues in implementing good monetary policy. As we will see, potential GDP changes over time. We will look at what drives these changes.

The level of a country's potential output at any point in time is dependent on a number of factors, including:

- natural resources, including land and soils, rivers, ocean areas and climate;
- capital equipment (buildings, machinery, transport equipment);
- the amount of labour employed, and the skills and education that this labour has,
- infrastructure;
- a well-functioning and effective government and judicial system.

These factors generally influence the productive capacity of the economy, that is, they affect the supply side of the economy. However, demand factors can also ultimately affect the level of potential output. For example, suppose we have a permanent upward shift in the terms of trade. That is, we have a permanent shift up in export prices relative to import prices. The end result of this would probably be a higher level of employment and an increase in the amount of capital equipment being used. In other words, there would have been a rise in the country's productive capacity or potential output.

In trying to determine what the level of potential output might be, economic analysts usually look at the relationship between output and the primary inputs of capital and labour. By capital, we mean here the capital stock, or the real value of existing capital equipment. However, in recent times there has been a growing interest in defining sustainable development in terms of the impact that development has on natural resources. However, we will focus here on the primary inputs, capital and labour.

Another factor that has a major influence on productive capacity, and which is not listed above, is productivity. Productivity is a measure of the ability of inputs, like capital and labour, to produce output. In simple terms it is output divided by inputs.

The ratio of output to labour input, usually measured in GDP per hour worked, gives us a measure of labour productivity. Another measure of productivity is multi-factor productivity (MFP). In general terms MFP is output divided by a weighted average of the capital stock and labour. Economists tend to see potential growth as depending on the capital stock, labour, and MFP. MFP is the 'unexplained' part of economic growth – it is that part of growth which is not accounted for by the primary inputs of capital and labour. One factor that influences MFP is technological change. We will come back to this later.

As mentioned earlier, GDP per capita is the important variable, the one that we want to see growing. We can decompose GDP per capita into two factors as follows:

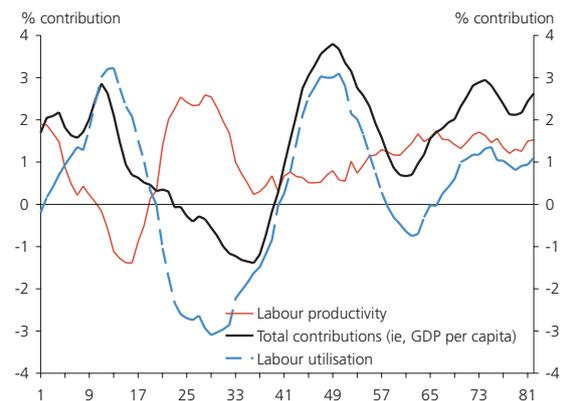
$$GDP/population = [GDP/hours worked] \times [hours worked/population]$$

That is, GDP per capita equals labour productivity times labour utilisation. Hence we can lift GDP per capita by raising labour productivity or labour utilisation, or both. This simple decomposition is the basis of the saying 'We can lift our standard of living by either working harder, or by working smarter'. That is, we can do it by working more hours, or by lifting labour productivity.

Lifting the hours we work can be achieved by higher labour force participation, which is something that has been happening over recent times. Another way of lifting hours worked is simply for those of us who are already employed to work longer hours. I suspect that a large proportion of the workforce wouldn't find this attractive, at least on a sustained basis. This underlines the importance of lifting productivity if we are to be better off.

Figure 4 shows growth in GDP per capita, and the contributions to this growth coming from changes in labour utilisation and labour productivity. The recent rise in labour utilisation reflects higher participation rates and a decline in unemployment. Given that participation rates are currently higher than they have been for nearly 20 years, and the

**Figure 4**  
Contributions to changes in GDP per capita  
% contribution to annual change



unemployment rate is at a historically low level, it seems that rises in labour utilisation are unlikely to be as high in future. This means that gains in GDP per capita are increasingly going to have to come from productivity gains.

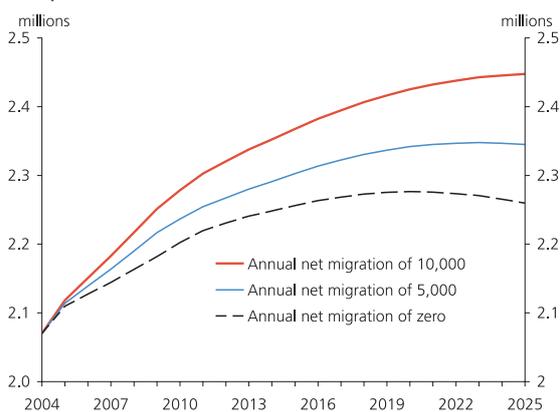
Note: The chart was derived using 3-year averages of GDP per capita, hours worked, and population in order to

show the underlying trends in labour utilisation and labour productivity.

Labour productivity is currently increasing by around 1.5 per cent per annum. Labour productivity growth has averaged 1.2 per cent per annum over the last 10 years. In the previous decade, it averaged only 0.7 per cent, despite the strong growth in labour productivity that occurred in the recession of the late 1980s and early 1990s.

The importance of labour productivity growth to the long-run economic outlook becomes very clear when we look at demographic trends. Figure 5 shows labour force projections which are based on three population projections. All three projections assume medium fertility and medium mortality but each has a different assumption regarding migration. With zero net migration the size of the labour force begins to decline from 2018. Higher levels of migration push the track up, but even with an annual net gain of 10,000 from migration, the growth in the labour force slows, and the labour force eventually levels off. Net gains from permanent and long-term migration have averaged 13,600 per annum over the last decade, compared with -4,700 per annum in the previous decade.

**Figure 5**  
**Projected labour force**  
**People in the in labour force, millions**



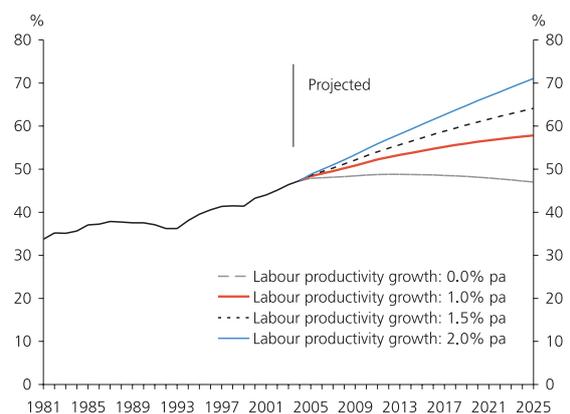
These projections reflect the ageing of the population. Birthrates underwent a long term decline from the 1890s through to the 1970s, although the post war baby boom provided a temporary interruption. Around 2010, the number of people leaving the labour force - mainly baby boomers - is projected to rise sharply. Even if these people were to put off retirement for a while, growth in labour utilisation is still

likely to slow. Any substantial growth in the labour force would have to come via high levels of migration.

Taking one of our labour force projections – the one based on annual net migration of 10,000 – we can derive scenarios for future GDP per capita based on assumptions about labour productivity. Let's assume that labour productivity grows at 1.5 per cent per annum, which as we have seen, is similar to the present growth rate. For each year of the projection we add this growth to the projected growth in the labour force to get GDP growth. (In doing this, we are assuming that number employed will grow at the same rate as the labour force. That is, we are assuming that the unemployment rate will stay constant over the projection period.) For each year of the projection, we can then calculate GDP per capita, using the projected population figure.

The result is shown in figure 6, along with projections using alternative labour productivity assumptions. The lowest scenario assumes no growth in labour productivity, and hence annual changes in GDP simply reflect changes in the labour force. Under this scenario, GDP per capita begins to decline from 2014. In this year, the growth in the labour force, and hence the growth in GDP, falls below the growth in the population. Reassuringly, the chart shows that labour productivity growth of 1 per cent per annum is enough to keep GDP per capita increasing. However the chart suggests that in order for GDP per capita to keep growing at a rate similar to which it has done over the last decade, labour productivity needs to grow at 2 per cent per annum rather

**Figure 6**  
**GDP per capita, projected**  
**2004/05 dollars, thousands**



than 1.5 per cent per annum. We will come back to this issue.

The chart certainly illustrates the importance of labour productivity growth to ongoing improvements in the standard of living. The chart also illustrates the power of compounding. A lift in labour productivity by 0.5 per cent annum will, if sustained, produce large differences in GDP per capita over time.

Perhaps the most direct and obvious way to go about lifting labour productivity is to raise the skills of workers. That is, we would improve the quality of the labour which is an input to production. But workers cannot be the total focus of lifting labour productivity. With a bit of algebra it can be shown that labour productivity can be expressed in terms of MFP, or multifactor productivity, and the capital stock to hours worked ratio, which is often referred to as the capital to labour ratio. In general, a rise in the economy's capital/labour ratio can be expected to lift labour productivity since labour now has more equipment to support it.

A rise in MFP will also lift labour productivity. Unfortunately, measuring MFP is never easy. There are always issues regarding the accuracy of data on the capital stock, hours worked, and even GDP. And when we combine all these variables to calculate MFP – the ‘residual’ factor which affects output - the measurement errors in the component series can make analysis difficult. Furthermore, we are more interested in the underlying trends in MFP, rather than short term changes. One way of deriving a trend series for MFP is to use trend series for capital, labour, and GDP in calculating MFP. In fact, the GDP series that is used in deriving MFP in the context of the Reserve Bank FPS model is potential output. This is the smoothed series of GDP produced by using the MV filter.

The labour input series used in the calculation is a smoothed series of total employment. The capital stock series is ‘productive capital’; it does not include housing. This series changes gradually over time and hence needs no smoothing. Figure 7 shows changes in these two series. Since 1996 the capital stock has increased at a higher rate than the labour input. Hence since 1996 there has been a rise in the capital/

labour ratio. This rise, together with a slight lift in MFP, explains the rise in labour productivity over this period.

This rise in the capital stock reflects strong investment growth. Real business investment accounted for around 13 per cent of real GDP in 1994; it now accounts for nearly 19 per cent.

**Figure 7**  
Changes in capital and labour

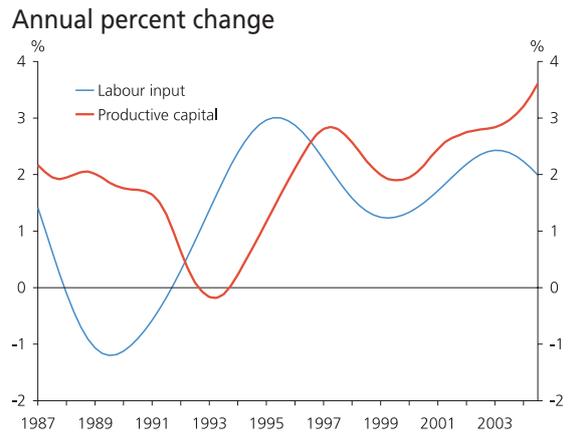
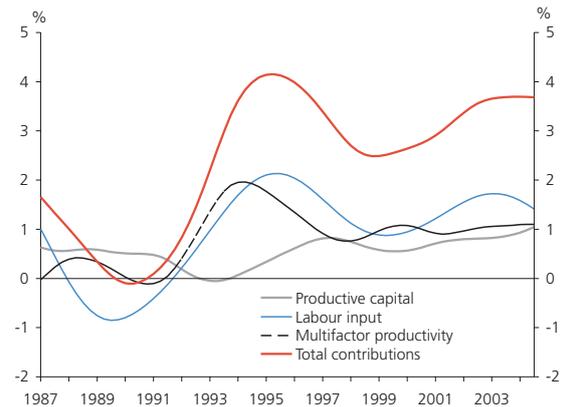


Figure 8 shows the estimated contributions to potential output coming from capital, labour and MFP. The chart also shows total contributions, which is the annual percent growth in potential output. As can be seen the growth in potential output, as estimated using the MV filter, is currently around 3.7 per cent per annum.

To some people this might seem surprisingly high. However, our estimates show that growth in potential GDP has generally been high over the last decade, with the lowest

**Figure 8**  
Contributions to growth in potential output  
Contribution to annual percent change



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annual growth rate being just under 2.5 per cent in late 1998. And as we saw earlier in table 1, growth in actual GDP was also high over the last 10 years. Estimated annual growth in potential output over the decade to March 2004 averaged 3.3 per cent, compared with average growth of 3.4 per cent in actual GDP.

Turning now to the contributions to potential output growth in figure 8, perhaps the first thing we should note is that the contribution from capital is generally lower than the contribution from labour. This is despite capital increasing faster than labour since 1996. The reason for this is that in calculating these contributions to potential growth we give a lower weight to capital than labour. These weights are based on capital's and labour's share of income GDP. The weights we have used are 0.29 for capital and 0.71 for labour.

The contribution to potential growth from labour has been high in recent years, reflecting migration inflows, higher labour participation, and falling unemployment. However, the contribution from labour is now beginning to decline, as migration eases.

The contribution from capital has generally increased over the period from 1993, although it eased slightly during the Asian crisis/drought period of 1998–99.

The contribution from MFP surged in the mid-1990s, reflecting the recovery from the recession of the late 1980s and early 1990s. Since this surge ended in 1997 the contribution from MFP appears to have trended upwards, although the rise has been gradual.

Overall, the higher growth in potential output over the last five years ties in with the factors that we identified back at the start as influencing growth. The boost to export earnings that began in 2000 and which has largely been sustained through recent rises in world commodity prices has flowed through into firms' balance sheets and has boosted investment. Also, gains from migration have lifted potential growth through their impact on the supply of labour.

Looking ahead, growth in potential output is expected to ease slightly during the coming year. The contribution from labour will continue to fall, reflecting lower net migration. However, this fall will be largely offset by continuing growth

in the contribution from capital, as firms seek to alleviate current capacity constraints.

## 4 Factors that might influence future potential growth

We can lift our potential growth rate by increasing capital, increasing labour, and by lifting MFP. We will look briefly at each of these factors.

We'll look first at capital. We have seen the capital/labour ratio rise over recent years, indicating capital deepening. Is there scope to go even further in this regard? We know from recent work done at The Treasury (Black et al 2003) that the capital/labour ratio is still significantly lower than in Australia. However, we have to be careful about making international comparisons, particularly at the macro level. The difference between countries might simply reflect the different industry composition of each economy. We know for example that, compared to New Zealand, Australia has a large mining sector, which is capital-intensive. In general, any comparison between countries regarding productivity measures needs to be done at the industry level, and even then, there are always difficulties in ensuring that the data is comparable across countries.

Nevertheless, we expect the capital/labour ratio to rise in the longer term, as we use more capital to do our jobs.

Turning to labour, a lot of attention is often given to lifting the quality of labour through education and training. The benefits of this would show up in higher MFP. Also, the quantity of the labour input can be raised by increasing average hours worked, lifting the participation rate, and increasing net migration. However, while higher migration would lift potential growth, the impact on GDP per capita is not so clear-cut. To have a direct effect on lifting GDP per capita, migrants would need to be more productive on average than the resident population. Or they would need to have skills which, when used here, enable some proportion of the resident population to lift their average level of production. That is, these migrants would be needed to alleviate bottlenecks. Current migration policy is largely based on ensuring that these criteria are met. There may

**Table 2**  
**Contributions to growth in GDP per capita**  
**Average annual % changes**

	1984–1994	1994–2004	2004–2014 Scenario 1	2004–2014 Scenario 2
Labour utilisation	0.0	1.0	0.3	0.3
Labour productivity	0.7	1.2	1.5	2.0
GDP per capita	0.7	2.2	1.8	2.3
Population	0.8	1.2	1.0	1.0
GDP	1.5	3.4	2.8	3.3

also be scale or agglomeration effects from migration; there is some evidence that larger population centres tend to have higher productivity growth and higher GDP per capita than smaller ones.

What drives MFP? Two factors are likely to be most important. Technological change is one of the most important drivers. The measure of capital stock that we use in estimating MFP does include some adjustments to take account of changes in technology that are embedded in new equipment. But these adjustments are only partial. Hence many improvements in potential output arising from technological change would be accounted for by the growth in MFP. Research into why MFP has risen strongly in the US over the last decade, during the so called ‘productivity miracle’, often points to information and computer technology (ICT) as being a major factor. It is likely that ICT has played a role in the gradual rise in MFP that we have seen in New Zealand. And given that we tend to lag the US in implementing ICT, we may see larger MFP gains yet from ICT in the future.

The other main factor influencing MFP is the ability to reorganise and redirect resources to more productive and innovative uses. In all industries, there are probably still many efficiency gains that could be made, if only we could find them. Government activities, such as the provision of infrastructure, commercial law legislation, and town planning procedures may also have consequences for productivity. Productivity, and how to improve it, are currently topics that are being extensively researched by Treasury (see McLellan 2004).

Clearly, the issue is important. Productivity growth is a key issue in lifting potential output, and hence, in lifting our sustainable growth rate. It is an important issue at the firm level too. Most people in business would be aware of the links between productivity and price setting at the firm level. For example, a rise in a manufacturer’s productivity will produce a fall in average unit costs, enabling the firm to either increase profits or to pay higher wages without having to increase prices. This highlights the fundamental importance of productivity gains; not only do they lift real GDP per capita, they also inhibit inflation.

## 5 The decade ahead

We can use our analysis to give us an indication of what growth in GDP and GDP per capita could be in the coming decade. This is not a forecast, but rather an illustration of two scenarios.

Table 2 sets out two scenarios for the 2004–2014 period. We have seen these two scenarios before, in figure 6. The first scenario assumes that labour productivity will grow at 1.5% per annum, which is similar to the growth rate that we have had over the past five years. The second scenario assumes that labour productivity will grow at 2.0 per cent per annum.

Given that both scenarios are based on the same demographic projections, the changes in population and labour utilisation are the same for each scenario. As Table 2 shows, the projected increase in labour utilisation over the next decade is much lower than the increase that we saw over the last decade. This reflects the participation rates in

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the official labour force projections that we have used, as well as our assumption that the unemployment rate remains constant. These projected increases in labour utilisation are indicative only. Nevertheless these low increases gel with what we know. With participation rates already very high, future rises are unlikely to be as large as they were over the last decade. Furthermore, from around 2010 many baby boomers will be retiring, putting downward pressure on the overall participation rate. Also, given that the unemployment rate is already low, we definitely won't see the same falls in unemployment that occurred over the last 10 years.

Our projections suggest that if we want to see GDP per capita grow at the same rate over the next decade as it did in the previous 10 years, we will need to lift our labour productivity. If labour utilisation was to grow by 0.3 per cent per annum – which doesn't seem to be unrealistic – then we would need to lift our productivity growth from its current rate of around 1.5 per cent per annum to nearly 2 per cent per annum.

## 6 Conclusion

What can we take out from this mass of data and evidence?

- After a low growth decade economic growth has been high in New Zealand over ten years, and more importantly growth in GDP per capita has been encouragingly high relative to other members of the OECD.
- Partly as a result of this experience, in recent years the Reserve Bank has raised its estimates of New Zealand's potential growth rate. Despite this higher potential, we have been growing at unsustainably high levels over the last year or two. We can't keep growing near 5 per cent.
- A significant amount of this growth improvement has come from increased labour utilisation, which is now

high by international standards and unlikely to keep increasing at the same rate.

- Labour productivity growth has shown more recent improvement, lifting in the late 1990s. This is important because strong economic growth will depend crucially on this improvement continuing. In fact we will probably need to raise labour productivity growth to around 2 per cent per annum (comparable to Australia and the US) to continue to achieve continuing economic growth much over 3 per cent per annum.
- Lifting labour productivity growth to 2 per cent per annum seems potentially achievable, given the improvements in labour productivity that have already occurred. But it will require continued strong investment, clever innovation, good quality decision-making, and skilled labour. Lifting labour productivity will be mainly the role of the private sector.
- The Reserve Bank's role is to help promote stability, including price stability, monetary policy stability, and financial stability, things that become even more important during periods of strong growth.

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## NEWS RELEASES

### For the record: news and information releases issued by the Reserve Bank, November 2004–February 2005

#### Snakes and Ladders

*24 November 2004*

The Reserve Bank today made public a new publication that seeks to inform households about how to manage the risks inherent in saving and investing.

The 48 page publication has been commissioned by the Reserve Bank and written by investment commentator Mary Holm. Its title is *Snakes and Ladders: A guide to risk for savers and investors*, and it follows on from Mary Holm's 1998 booklet *The REAL Story: Saving and investing now that inflation is under control*.

Reserve Bank Governor Alan Bollard commented "The quality of households' savings and investments is critical to whether or not the New Zealand economy performs well in the medium to long term. It's not for the Reserve Bank to tell people how to save and invest, as that depends on individual situations. However, we do think it is useful to help people to think intelligently about the judgements that they need to make in working out what's right for them.

"In past speeches I've warned that some households may be taking on risks in their financial strategies without being aware of those risks. Mary's booklet provides clear and well presented information on how to identify risks and to work out whether they are worth taking."

Mary Holm commented "Saving and investing involves managing risk. That doesn't mean eliminating risk. With the exception of paying off debt, there are no risk-free investments. Indeed, some savers and investors need to ask 'Am I taking enough risk?' It's a matter of being well informed, and getting the balance right. In this short book I try to help people to think that through, and to apply sound principles to their particular circumstances."

Free copies of *Snakes and Ladders: A guide to risk for savers and investors* can be obtained from The Knowledge Centre, the Reserve Bank, PO Box 2498, Wellington, or at phone 04 471 3770. It can also be viewed (PDF 569KB) on the Reserve Bank's website.

#### FX settlement risk reduced for NZ financial system

*6 December 2004*

The Reserve Bank today announced that the New Zealand dollar has today been included in an international system that reduces the risk of things going wrong when substantial foreign exchange transactions are settled across national boundaries.

Financial institutions undertaking foreign exchange transactions face the risk of severe losses if the transaction falls apart part way through. This can occur after one party has transferred funds as its part of a deal and is waiting for the other side of the transaction to be completed. Indeed, overseas there have been examples in the past of financial institutions being bankrupted as a result, and the risk grows when institutions are trading across time zones which can cause delays of many hours between a transaction being initiated and completed – up to 18 hours in New Zealand's case.

To, as much as possible, eliminate this risk, major international banks have in recent years set up a system known as 'continuous linked settlement' (CLS), by which both legs of foreign exchange transactions can be settled simultaneously. This is done through a New York-based multi-currency bank called CLS Bank International (CLS Bank) which holds accounts for each settlement member and an account at each eligible currency's central bank, through which funds are received and paid. As of today the New Zealand dollar is included in this system.

Reserve Bank Governor Alan Bollard commented "This is a substantial step forward for financial stability in New Zealand. I want to especially thank all those in the financial sector, including the major banks, who have together set up the systems that make this possible. This is a good example of the way the sector can work together. The Reserve Bank's role has been to encourage and to ensure that the Reserve Bank's settlement systems can be linked to CLS Bank,

but we have needed the support of the financial sector throughout.

This initiative is part of a larger effort to make the New Zealand financial system as sound and efficient as possible," Dr Bollard concluded.

A fact sheet is attached to this press statement.

**Fact Sheet: Continuous Linked Settlement**

Approximately \$10.6 billion of NZD foreign exchange contracts are transacted every day. Financial institutions undertaking these transactions face the risk of severe losses if the transaction falls apart before the contract can be finalised. This can occur after one party has transferred funds as its part of the contract and the other party is unable to meet its obligation.

From here on, the bulk of these transactions will take place through the CLS system. This will eliminate this kind of settlement risk in these transactions.<sup>1</sup>

Settlement in CLS Bank occurs in a five-hour window, though for the currencies in the Asia-Pacific region, this is reduced to a three-hour window starting at 5pm New Zealand time (or 7pm during daylight saving time).

The payment flows as at present and in CLS Bank are illustrated in figures 1 and 2.

At present the trade is made between the two banks and then settled in two different time zones.

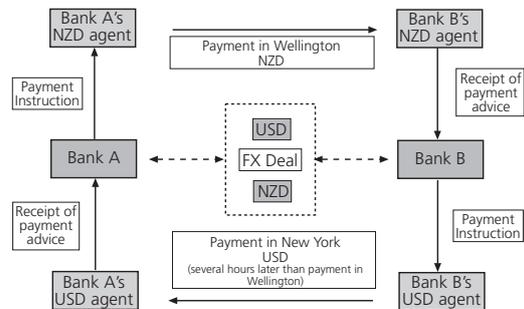
In CLS Bank, the settlements occur at the same time. CLS Bank receives payment instructions from each bank and matches them in its systems. It then generates a payment schedule. Once funds have been received from Bank A and from Bank B into CLS Bank's accounts, CLS Bank then settles the trade between the two parties. If one party were to default, the trade is not settled and no monies are transferred from CLS Bank to the defaulting bank.

Because there are large numbers of banks and trades being matched within CLS Bank, its matching algorithms enable a high percentage of the trades to be settled on the basis of

a net funds flow. The net flows are typically about 25 per cent of the gross flows that would otherwise have occurred outside CLS Bank. CLS Bank has other algorithms and trade processes that enable further reductions to be made, resulting in net flows as low as 5 to 10 per cent of the initial gross payment flows.

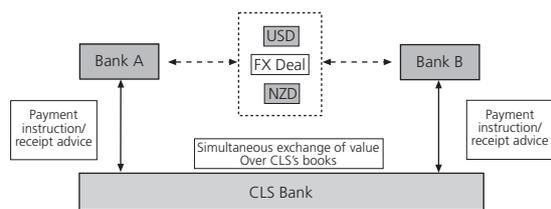
The reductions in flows enable banks to make large savings in their liquidity requirements for settling foreign exchange transactions, as well as eliminating the default risk that they otherwise faced with foreign exchange trades settled outside CLS Bank.

**Figure 1**  
Payment flows for both legs of a NZD/USD trade at present



Foreign exchange transaction: Bank A sells NZD to Bank B for USD.

**Figure 2**  
Payment and instruction flows for a NZD/USD trade in the CLS environment



Foreign exchange transaction: Bank A sells NZD to Bank B for USD.

CLS Bank in New Zealand has an account in the Exchange Settlement Accounting System (ESAS), and together with ESAS is a designated payment system under the Reserve Bank of New Zealand Amendment Act 2003. By being designated, under New Zealand law all payments made through it will be final and irrevocable. This means they cannot be unwound in the case of bankruptcy of one of the two parties, once the payment has settled.

For more information on CLS go to [www.cls-group.com](http://www.cls-group.com).

<sup>1</sup> See "Foreign exchange settlement risk survey", Reserve Bank Bulletin, December 2001

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## OCR unchanged at 6.50 per cent

*9 December 2004*

The Reserve Bank has left the OCR unchanged at 6.50 per cent.

Speaking at the release of the Reserve Bank's December 2004 Monetary Policy Statement, Reserve Bank Governor Alan Bollard said "As indicated in our October Review, we continue to expect that the current policy position will achieve inflation between 1 and 3 per cent on average over the medium term. This outlook assumes that significant pipeline effects from past interest and exchange rate increases will eventuate and act to further constrain the economy over the period ahead.

"Since the last review, overall economic indicators have continued to surprise on the upside. As a result, we have revised upwards our GDP estimates for the second half of 2004 and pushed out our expected timing of the economic slowdown. But the slowdown is still expected in 2005. The easing in house sales, residential building consents and net immigration remain in line with our earlier projections. Reinforcing this outlook is a weakening exports picture, based on softer world growth and the constraining effects of the strong NZ dollar.

"Inflation is projected to rise close to 3 per cent before easing back later in 2006. The risks to the inflation outlook are two-sided. On the upside there is clearly a risk that the current momentum in household demand will hold up longer than expected. Rising wage and salary pressures also present an upside inflation risk given the current labour market tightness. On the downside there is the possibility of more exaggerated movements in the US dollar and US interest rates, leading to a stronger New Zealand TWI, weaker exports and less inflation pressure.

"The tightening in monetary policy over the past year currently looks sufficient to keep medium term inflation pressures in check. However, with inflation expected to remain toward the top of the 1 to 3 per cent target band over the medium term, there is little headroom to absorb stronger than expected inflation pressures. If such pressures emerge, a further policy tightening cannot be ruled out. Further, the current outlook offers little scope for an easing

in policy in the foreseeable future. We will continue to assess inflation pressures carefully as the economic data come to hand."

## Westpac to incorporate in New Zealand

*15 December 2004*

The Reserve Bank today confirmed that Westpac has decided to incorporate in New Zealand. Once this process is completed, all systemically important banks operating in New Zealand will be locally incorporated.

Reserve Bank Governor Alan Bollard commented, "The Reserve Bank's local incorporation policy requires systemically important banks to incorporate in New Zealand. Local incorporation provides, among other things, a well-understood legal framework for the conduct of business in New Zealand and a local board to act in the best interests of the New Zealand bank. These features promote the maintenance of a sound and efficient financial system, and assist in the avoidance of significant damage to the financial system that could result from the failure of a registered bank.

"Earlier this year, Westpac asked the Reserve Bank to consider a 'buttressed branch' proposal as an alternative to compliance with the local incorporation policy. Westpac's proposal followed open discussions between Westpac and the Reserve Bank.

"After careful consideration of the issues, the Reserve Bank reached the conclusion that Westpac's 'buttressed branch' proposal would not be acceptable as an alternative to compliance with the local incorporation policy.

"The Reserve Bank will be working closely with Westpac to assist in the local incorporation process."

Further details on the Reserve Bank's local incorporation policy are available on its website at [www.rbnz.govt.nz](http://www.rbnz.govt.nz).

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## RBNZ invests in Asian Bond Fund 2

*16 December 2004*

The Reserve Bank today announced that it intends to invest USD 50 million in the newly created EMEAP Asian Bond Fund 2 (ABF2) as part of its foreign reserves.

The Reserve Bank of New Zealand is a longstanding member of EMEAP (Executive Meeting of East Asian and Pacific central banks), a group comprising the central banks of Australia, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, The Philippines, Singapore, and Thailand.

ABF2 will be a fund devoted to investing in bonds denominated in the home currencies of EMEAP countries and follows on from ABF1 launched in June 2003 which invested in USD denominated bonds of EMEAP nations.

The key features of ABF2, as currently proposed, include:

- An initial size of around 2 billion US dollars and will initially be offered only to EMEAP members;
- Nine sub-funds; one fund in each of the eight EMEAP countries that have relatively less developed bond markets (ie excluding Australia, Japan and New Zealand); and a Pan Asian Index Fund including a selection of benchmark bonds across the EMEAP region. Eligible investments in any of the funds will be bonds issued by EMEAP sovereigns, supranational agencies and government supported agencies in EMEAP countries; and
- The ability for private sector investors to invest in the sub-funds sometime during 2005.

The motivation for the Asian Bond Fund is a desire to see the bond markets of EMEAP countries develop more quickly. It is expected that ABF2 will play a catalytic role in the development of the EMEAP bond markets, by helping promote new financial products, improving market infrastructure and minimising regulatory hurdles. This should help promote the soundness and efficiency of financial markets and systems in the wider EMEAP region and thus in New Zealand, given the importance of linkages between Asian markets and economies and New Zealand.

Details on the Fund can be found at the official EMEAP website at [www.emeap.org](http://www.emeap.org).

## Changes to New Zealand's 'Silver' coins?

*26 January 2005*

The Reserve Bank today reminded the public, that the close off date for feedback on the Bank's proposals to modernise New Zealand's 'silver' coloured coins is 4 February 2005.

The Bank's proposals announced in November 2004 are:

- the current 50, 20 and 10 cent coins would be made smaller, and of a lighter and lower-cost plated steel; and
- the 5 cent coin would be taken out of circulation.

The Reserve Bank emphasised that no decisions have been made and if changes are to occur, they will be implemented in mid-2006.

Analysis of the public feedback will be undertaken by a third party and the Bank expects to make final decisions in late March 2005.

For more information on the proposals visit the Bank's website ([www.rbnz.govt.nz/silvercoin](http://www.rbnz.govt.nz/silvercoin)). Feedback can be provided by emailing [silvercoin@rbnz.govt.nz](mailto:silvercoin@rbnz.govt.nz) by 4 February 2005 or by writing to:

Silver Coin Review  
Reserve Bank of New Zealand  
P O Box 2498  
Wellington

## OCR unchanged at 6.50 per cent

*27 January 2005*

The Reserve Bank has left the OCR unchanged at 6.50 per cent.

Reserve Bank Governor Alan Bollard said "As indicated in our last *Monetary Policy Statement*, we continue to expect that the current policy position will achieve inflation between 1 and 3 per cent on average over the medium term. This outlook assumes that significant pipeline effects from past interest and exchange rate increases will eventuate and act to further constrain the economy over the period ahead.

"Economic developments are generally proving at least as strong as we anticipated, although a slowdown is still expected over the year ahead. Inflation has risen to close to

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3 per cent and is expected to remain around this level before easing back later in 2006. On the upside there is clearly a risk that the current momentum in household demand will hold up longer than expected. Rising wage and salary pressures also present an upside inflation risk given persistent labour market tightness. On the downside there is the possibility of more exaggerated movements in the US dollar and US interest rates, leading to a stronger New Zealand TWI, weaker exports and less inflation pressure.

“The tightening in monetary policy over the past year currently looks sufficient to keep medium-term inflation pressures in check. However, with inflation expected to remain toward the top of the 1 to 3 per cent target band over the medium term, there is little headroom to absorb stronger than expected inflation pressures. If such pressures emerge, a further policy tightening cannot be ruled out. Further, the current outlook offers little scope for an easing in policy in the foreseeable future. We will review the situation at the March *Monetary Policy Statement*.”

## **RBNZ assesses New Zealand's potential growth rate**

**28 January 2005**

The Reserve Bank today emphasised that if we want to see New Zealand's GDP per capita grow at the same rate over the next decade as it did in the previous ten years, we will need to lift our labour productivity.

Speaking to the Canterbury Employers' Chamber of Commerce on New Zealand's potential growth rate, Reserve Bank Governor Alan Bollard outlined that “New Zealand's growth performance over the last ten years has been particularly strong, with GDP growth averaging 3.4% per annum. This was amongst the highest average growth rates in the OECD.

“Partly as a result of this performance, in recent years the Reserve Bank has raised its estimate of New Zealand's potential growth rate. However, despite this higher potential we have been growing at unsustainably high levels over the last year or two. We can't keep growing near 5 per cent without putting excessive pressure on resources.

“Growth in real GDP per capita, has also been high over the past decade. GDP per capita is a broad measure of living standards and is the measure that really matters. Growth in real GDP per capita averaged 2.2 per cent per annum in the 1994-2004 period, compared to 0.7 per cent per annum in the previous decade.

“The factors that affect GDP per capita are labour utilisation (average hours worked per person) and labour productivity. Over the last decade both labour utilisation and labour productivity have increased strongly. The rise in labour utilisation has been driven by rises in participation rates and a long term decline in unemployment. Labour productivity growth has averaged around 1.2 per cent per annum over the last decade, compared to 0.7 per cent in the previous decade, and is now running close to 1.5 per cent per annum.

“Looking ahead to the next decade, growth in labour utilisation is expected to slow. With participation rates already very high, future rises in participation are unlikely to be large. From around 2010 many baby boomers will be retiring, tending to reduce the overall participation rate. Further, given that the unemployment rate is already low, we won't see the same falls in unemployment that occurred over the last 10 years.

“Given this lower growth in labour utilisation, we will need to focus on lifting labour productivity if we want to see GDP per capita grow at the same rate as it did over the last decade. Indications are that we would need to lift our labour productivity growth from around 1.5 per cent per annum to around 2 per cent per annum to achieve this.

“In order to increase labour productivity, we will need to look at increasing the amount of capital equipment in production, and at implementing technological improvements. We will also need to keep reorganising and redirecting resources to more productive uses, wherever we can.

“Responsibility for making gains in labour productivity – and lifting potential output – will rest largely with the business sector, provided that the government continues to maintain a competitive and stable economic environment.

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“A review of research on the links between monetary policy and growth indicates that high inflation, or even moderately high inflation, is harmful to growth. Hence the Reserve Bank’s role in terms of promoting long term growth will be in continuing to maintain price stability, to allow the business sector to get on with its job. The Bank’s other major role – that of maintaining financial stability through oversight of the financial system – will also be a fundamental part of maintaining a stable economic environment that is conducive to growth.”

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## PUBLICATIONS

*Annual Report*  
*Financial Stability Report*

*Monetary Policy Statement*

*Reserve Bank of New Zealand Statement of Intent, 2004–2007*

*Snakes and Ladders – a guide to risk for savers and investors*

Published in October of each year

Published six-monthly. A statement from the Bank on the stability of the financial system. First copy free.

Published quarterly. A statement from the Bank on the conduct of monetary policy. First copy free, subsequent copies \$12.00.

### Recent Reserve Bank Discussion Papers

2004

DP2004/01	Estimating a time varying neutral real interest rate for New Zealand Oliver Basevant, Nils Björkstén, and Özer Karagedikli
DP2004/02	Do inflation targeting central banks behave asymmetrically? Evidence from Australia and New Zealand Özer Karagedikli and Kirdan Lees
DP2004/03	The equilibrium exchange rate according to PPP and UIP Dominick Stephens
DP2004/04	Estimates of the output gap in real time: How well have we been doing? Michael Graff
DP2004/05	What can the Taylor rule tell us about a currency union between New Zealand and Australia? Nils Björkstén, Arthur Grimes, Özer Karagedikli and Christopher Plantier
DP2004/06	Improving implementation of inflation targeting in New Zealand: An investigation of the Reserve Bank's inflation errors Philip Liu
DP2004/07	A model of equilibrium exchange rates for the New Zealand and Australian dollar Simon Wren-Lewis
DP2004/08	Examining finite-sample problems in the application of cointegration tests for long-run bilateral exchange rates Angela Huang

Full lists of Discussion Papers are available from Administration, Economics Department. Lists of the Working Papers and the Research Notes can also be obtained from the Economics Department.

### Pamphlets

Central banking in New Zealand  
This is the Reserve Bank  
Monetary policy over the business cycle  
Your Bank's disclosure statement – What's in it for you?

For further information, go to [www.rbnz.govt.nz](http://www.rbnz.govt.nz), or contact:

Knowledge Centre,  
Knowledge Services Group,  
Reserve Bank of New Zealand,  
2 The Terrace, P O Box 2498  
WELLINGTON  
phone (04) 4722–029

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## Articles and speeches in recent issues of the *Reserve Bank of New Zealand Bulletin*

Vol. 67, No. 1, March 2004

### *Articles*

Impact of the exchange rate on export volumes

The Reserve Bank of New Zealand Amendment Act 2003

Designation of payment systems – new Part VC of the Reserve Bank of New Zealand Act 1989

### *Speeches*

Asset prices and monetary policy

Vol. 67, No. 2, June 2004

### *Articles*

Interpreting Clause 4(b) of the Policy Targets Agreement: avoiding unnecessary instability in output, interest rates, and the exchange rate

What drives the New Zealand dollar?

Developments in the New Zealand banking industry in 2003

Outcomes of the Financial Sector Assessment Programme for New Zealand

Musings on financial stability issues: an interview with Professor George Kaufman

Bank regulation and foreign-owned banks

### *Speeches*

Speech excerpt on the Reserve Bank's exchange rate intervention proposal

Vol. 67, No. 3, September 2004

### *Articles*

The long-run effects of monetary policy on output growth

NZIER's Capacity Utilisation index

Promoting strong corporate governance in New Zealand banks

### *Speeches*

Supervising overseas-owned banks: New Zealand's experience

What's happening in the property sector?

Vol. 67, No. 4, December 2004

### *Articles*

Liquidity management in the New Zealand banking sector

Currency hedging by exporters and importers

GDP-12 – the Bank's measure of trading partner demand

A note on the Reserve Bank inflation calculator

### *Speeches*

Systemic financial crises – resolving large bank insolvencies

A prosperous but vulnerable nation