

---

## Volume 67 No. 3, September 2004

### Contents

Editor's Note	3
<b>Articles</b>	
The long-run effects of monetary policy on output growth <i>Christie Smith, Economics Department</i>	6
NZIER's Capacity Utilisation Index <i>Bernard Hodgetts, Economics Department</i>	19
Promoting strong corporate governance in New Zealand banks <i>Alan Bollard, Governor of the Reserve Bank of New Zealand</i>	27
<b>Speeches</b>	
Supervising overseas-owned banks: New Zealand's experience <i>An address by Alan Bollard, Governor of the Reserve Bank of New Zealand</i>	30
What's happening in the property sector? <i>An address by Alan Bollard, Governor of the Reserve Bank of New Zealand to the Property Council of New Zealand in Rotorua</i>	37
<b>For the record</b>	
Reserve Bank Discussion Papers	47
News releases	49
Publications	55
Articles and speeches in recent issues of the Reserve Bank Bulletin	56

This document is also available on <http://www.rbnz.govt.nz>

Copyright © 2004 Reserve Bank of New Zealand

ISSN 1174-7943



---

## Editor's Note

### Central banking in New Zealand — looking back and looking forward

This is my final issue of the *Bulletin* as its Editor. After four and a half years, I hand over the reins to a new Editor with effect from the December 2004 issue of the *Bulletin*. The new Editor is Bernard Hodgetts, a colleague from the Economics Department of the Reserve Bank.

In my time as Editor, I have used the Editor's Note to summarise the content of each *Bulletin* and to draw connections between articles. On this occasion, I will let the articles speak for themselves and instead dedicate the Editor's Note to a broader theme – the changes that have occurred in central banking in recent times. In particular, I would like to focus on the emergence of a more holistic and integrated approach to central banking, which is something that has become more apparent in my time as Editor. Indeed, many issues of the *Bulletin* have contained articles and speeches that reflect this development.

In New Zealand, as in many countries around the world, central banking has seen major changes in the last 20 years or so. These changes have centred mainly on the two core functions of central banks – monetary policy and the pursuit of financial stability.

The 1980s was a decade of major financial sector reform in New Zealand and around the world. In New Zealand, it saw the deregulation of banks and other financial institutions, the abolition of foreign exchange controls, removal of interest rate controls, abandonment of a pegged exchange rate in favour of a floating rate, the opening up of the banking sector, the privatisation of state-owned financial institutions and the rapid developments in the quality and range of financial services. This liberalisation saw the emergence of a markedly different financial sector in New Zealand — one characterised by foreign ownership and control of the banking system, and the evolution of a more dynamic, sophisticated, and efficient financial system.

However, as with any period of rapid change, not all went well. By the late 1980s and early 1990s, some parts of the corporate sector in New Zealand, and in some other countries, including Australia, were experiencing severe difficulties. These culminated in the collapse of a number of financial institutions, and problems for a number of banks in

New Zealand. In part, these difficulties reflected the severe economic turbulence and sweeping economic reforms of the time. It also reflected the higher risks associated with a liberalised financial system – risks that were insufficiently identified, understood, and managed by the bankers of the day.

The difficulties of the late 1980s and early 1990s spurred the development of improved risk management capacity in the financial system, with the senior management of banks and other financial institutions investing substantial resources in this area. The late 1980s and 1990s also saw an increasing recognition of the importance of financial stability and the damage that occurs, not only within the financial system, but also in the wider economy, when financial systems become unstable. Reflecting this, banking supervision and payment system reform became important central banking themes in the 1990s, both in New Zealand and around the world. Although New Zealand tended to adopt a relatively unintrusive approach to the supervision of banks, the 1990s nonetheless saw the development of a regulatory framework for banking that stressed the importance of risk management, relying on a combination of official supervision, sound corporate governance, and disclosure. The 1990s was also a period in which central banks, including our own, developed greater awareness of payment system risk as a key ingredient in financial system stability, and pursued major reforms to ensure that payment system risk was well managed. The introduction of real-time gross settlement and robust netting arrangements in New Zealand were the result.

Of course, the 1980s and 1990s were also important decades for the development of that other mainstay of central banking: monetary policy. In New Zealand and in many countries, a renewed emphasis came to be placed on fighting inflation, spurred on by the bitter experience of the high inflation that characterised much of the world in the latter half of the 1970s and into the 1980s. At home, this saw the emergence of a monetary policy focused on reducing inflation and then maintaining a low and broadly stable inflation rate. By the late 1980s, this was formalised

---

through the use of inflation targeting and increasing central bank independence. This was encapsulated in the coming into force of the Reserve Bank of New Zealand Act 1989, which enshrined in statute the single monetary policy objective of price stability, and conferred full operational independence on the Reserve Bank in the pursuit of monetary policy. New Zealand was the first country in the world to adopt formalised inflation targeting.

Over this period, to a large extent the development of banking supervision and payment system policies, and the pursuit of inflation targeting, were treated as separate and distinct functions within the Reserve Bank. Although there was a recognition of the connections between them, relatively little emphasis was placed on those connections. This was also a period when price stability was the clear focus of the Reserve Bank, and the inflation target acquired great prominence in the Bank's public communication and internal thinking. Reflecting this, the early Policy Targets Agreements between the Minister of Finance and the Governor of the Bank placed emphasis on keeping inflation within the target band.

More recently, central banking in New Zealand has evolved towards a more holistic approach, with a greater recognition of the connections between price stability, the economy in general and financial stability, and a greater emphasis on the Bank's role in the promotion of a sound and efficient financial system. Although price stability remains the primary function of the Bank, it is now pursued within a somewhat broader context, where price stability is seen as part of a mix of macroeconomic goals. This is reflected in the Policy Targets Agreement, which now gives greater emphasis than in the past to avoiding unnecessary instability in economic output, interest rates, and the exchange in the pursuit of price stability. The inflation target has also become less rigid, with the Bank now being required to keep inflation within the target band on average over the medium term, rather than in every 12 month period.

Recent years have also seen strengthened emphasis on the promotion of financial stability, and a broadening of approach in its pursuit. Banking supervision has received particular attention of late, with a stronger focus on the Bank's role as a host supervisory authority in a foreign-owned

banking system, and with a strengthening of various aspects of supervision policies and practices. The Bank has also broadened its financial stability role, increasing the resources it devotes to the analysis of macro-financial indicators and taking a greater interest in the linkages between the wider economy and the financial sector. We have also increased our attention to the non-bank financial sector, particularly the non-bank deposit-taking financial institutions. The linkages between New Zealand's financial stability and developments in other countries' economies and financial systems have also received increasing attention from the Bank, with especial emphasis on Australia and Asia. We have strengthened and formalised our relationships with other financial sector regulators in New Zealand, and with other central banks and regulators around the world. In some respects, we are now a broader central bank than was once the case.

The broadening of the focus of central banking is by no means unique to New Zealand. Around the world, central banking is increasingly looking at the bigger picture, at the linkages between the real economy and the financial system, and at the connections between the different components within the financial system. It is also focusing more on the international connections between economies and financial systems, with a greater recognition that, in a world of greater global and regional integration, instability in one country can be transmitted to another via a number of channels, and not always obviously.

Although these are phenomena facing all countries, they are of striking relevance to New Zealand, given that ours is a particularly open economy, and we have a financial system that is greatly dominated by foreign ownership and control. These developments make it all the more essential that central banking in New Zealand, as elsewhere, takes a more holistic approach to the pursuit of stability, where monetary policy, banking supervision, payment system policy, exchange rate policy, and macro-financial analysis, are increasingly seen as an integrated package of policy instruments in the pursuit of monetary and financial stability, rather than as distinct elements of central banking.

In recent years, the *Bulletin* has reflected this more holistic approach to central banking. We have featured many

---

articles that highlighted the connections between the different elements of central banking, between financial stability and wider economic stability, and between the health of the New Zealand financial system and economy and that of other countries in the region. I have little doubt that the next few years will see even more attention being given to these issues, and an increasing recognition that, when it comes to central banking, like many things in life, the whole is indeed greater than the sum of the parts.

It has been a privilege to have served as Editor of the *Bulletin* these past four and a half years. I am pleased with what

we have managed to achieve in the *Bulletin*, particularly given that we are a relatively small central bank with limited resources. I am confident that the *Bulletin* will be in safe hands under the stewardship of the next Editor, Bernard Hodgetts. I wish him well in the role. And I wish our readers all the very best for the future. I am sure the *Bulletin* will continue to be a source of constant learning, for its authors, its Editors, and its readers.

Geof Mortlock  
Editor  
*Reserve Bank of New Zealand Bulletin*

# The long-run effects of monetary policy on output growth

Christie Smith,<sup>1</sup> Economics Department

This article looks at how interest rates and inflation affect growth in the capital stock, labour supply, and technology, the main determinants of long-run economic growth. Many additional factors affect long-run economic growth, but most of these factors lie outside the sphere of monetary policy. Monetary policy therefore has only a limited capacity to contribute to economic growth over the longer term. However, the evidence does indicate that keeping inflation low and stable makes a positive contribution to long-run economic growth, and that this is the most effective contribution that monetary policy can make to the economy's performance over time. This finding supports the monetary policy framework operational in New Zealand, which is focused on keeping inflation between 1 and 3 per cent on average over the medium term.

## 1 Introduction

As Nobel Laureate Robert Lucas has noted, once you start to think about output growth it is hard to think about anything else.<sup>2</sup> Because of the miracle of compounding, over long periods of time small changes in average growth rates cumulate into large differences in income levels.

New Zealand's growth experience over the last 40 years shows how important small differences in per capita growth rates can be. In 1960, New Zealand's per capita income was about the sixth highest in the world. However, over the next 40 years many other economies grew faster, overtaking New Zealand. As a result, New Zealand is now ranked twentieth in terms of per capita income and has a per capita income level about 60 per cent of the United States'.<sup>3</sup>

Economic growth and development are complicated processes that reflect a myriad of important factors. Conway and Orr (2000) provide a synopsis of the key events that have affected New Zealand's output growth over the past half century, including the economic reforms that took place over the last two decades.

In light of New Zealand's economic experience, a natural question to ask is whether there are policy interventions that can be adopted to improve New Zealand's growth performance. Since the Reserve Bank's primary domain is monetary policy, it is appropriate to critically assess the contribution monetary policy can make to New Zealand's long-run economic growth. To date, the consensus view is that achieving and maintaining price stability, whilst seeking to minimise volatility in other macroeconomic variables, is the most suitable monetary policy objective.

The primary focus of this article is thus on the long-run effects of monetary policy on the real economy. In particular, we wish to assess whether monetary policy can have sustained effects on real per capita income growth. Sustained differences in growth rates will unambiguously lead to substantial differences in income levels. Similarly, if New Zealand's per capita income grows faster than richer foreign countries', then New Zealand's per capita income should converge on that of richer countries.'

Section 2 begins by briefly looking at the traditional drivers of growth in economic theory.<sup>4</sup> The main determinants of growth are the accumulation of capital, growth in labour force participation, and the accumulation of knowledge and technology, though these near-determinants of growth are affected by a host of other factors. Section 3 looks at

---

1 I would like to thank the following people for helpful comments: Nils Björkstén, Iris Claus, Bernard Hodgetts, Chris Hunt, Geof Mortlock, and Grant Spencer.

2 Lucas (1988, p 5).

3 The ranking for 1960 is based on nominal GDP per capita converted into United States dollars at the 1960 exchange rate from OECD (1998). The most recent OECD comparison of per capita GDPs uses 2002 data. The latter comparison uses purchasing power parity exchange rates, which try to account for price differentials between countries.

---

4 Barro and Sala-i-Martin (1999) and Aghion and Howitt (1999) provide good, albeit technical, discussions of this literature.

---

how monetary policy affects the economy, with particular emphasis on the key factors identified above. The article then discusses the empirical evidence regarding the drivers of growth, and explores how this empirical literature relates to monetary policy.

## 2 Growth accounting and growth theories

### Measuring economic growth

Growth accounting frameworks have been used since the 1950s to decompose output growth into contributions from:

- growth in labour supply;
- growth in capital; and
- growth in total factor (multifactor) productivity.<sup>5</sup>

Output is typically measured using real gross domestic product (GDP) — ie the dollar value of what the economy produces over a given period, normally a year. Since this article looks at the effect of monetary policy (and other factors) on long-run economic growth, the emphasis is on the trend rate of growth through successive business cycles, rather than cyclical variations in economic growth.

Per capita income increases when output grows faster than the population.<sup>6</sup> Consequently, increases in per capita income are strongly dependent on the evolution of non-labour factors of production, ie, capital and total factor productivity (TFP), and on the contributions that these factors make to output. These contributions depend on the interplay between the factors of production.

### The evolution of labour, technology and capital

The growth accounting framework is a useful organising device, but it does not explain how factors of production change over time. Growth theories are more explicit about how and why these factors evolve.

The neoclassical model, developed independently by Solow and Swan, has provided the starting point for analysis of economic growth since the 1950s. In the basic neoclassical model, output is assumed to be a function of capital and labour and technological progress. Markets are assumed to work effectively, so there is no misallocation or under-utilisation of existing resources; resources are always put to their best use. Technological progress and labour supply are both assumed to grow at arbitrary rates.

The main element that the neoclassical model describes is the accumulation of capital. The evolution of capital depends on how much people invest, which in turn depends on how much people save.<sup>7</sup> Higher savings necessarily reduce current consumption but, by increasing the capital stock, will lead to an increase in the level of income and may enable greater future consumption. The accumulation of capital thus crucially depends on decisions about consuming now versus consuming later.<sup>8</sup>

The structure of the neoclassical model is such that firms eventually do not wish to acquire any more capital because of diminishing marginal returns — the marginal contribution of a unit of capital declines because there is not enough labour available to complement an additional unit of capital. Eventually, therefore, firms stop accumulating capital and per capita output growth ends up depending solely on the accumulation of technological progress, which grows at some arbitrary, exogenous rate.

The neoclassical growth model provides some important insights, highlighting the role of capital, labour and technology in generating output. However, the model also

---

5 Total factor productivity (TFP) captures both technical efficiency (doing things well) and allocative efficiency (doing things that are valued). TFP also captures any mismeasurement of capital or labour.

6 Labour productivity (output per worker) and per capita income differ by the extent to which people are not in the workforce and by the number of hours worked.

---

7 The basic neoclassical model is a closed economy model, and hence ignores the possibility of mobilising savings from other countries.

8 This point is made more transparently in the Ramsey-Cass-Koopmans model than in the Solow-Swan model. See Romer (1996, ch 2).

---

has a number of deficiencies.<sup>9</sup> One of the most important deficiencies is that technological progress - the key driver of long-run growth in per capita income - is simply a black box. The endogenous growth literature seeks to remedy this deficiency by exploring how technological progress arises. The adjective 'endogenous' is used to indicate that the growth rate of technological progress is determined 'within' endogenous growth models, in contrast to the 'exogenous' rate assumed by the neoclassical model.

### The evolution of knowledge and endogenous growth theories

The endogenous growth literature has three broad strands: one strand emphasises research and development (R&D) as a driver of knowledge; a second strand emphasises the role played by human capital; and a third strand, introduced by Schumpeter (1934), highlights 'creative destruction', the way in which new ideas (as embodied in new technologies or business practices, for example) may supplant existing ideas.

Although, on the face of it, the various neoclassical and endogenous theories are quite different, they also share an important commonality. Each strand of the endogenous growth literature is about the incentives to accumulate a factor of production: human capital, knowledge, and new Schumpeterian 'technologies'. Each of these factors can be thought of as additional non-labour factors that can be accumulated to improve per capita income.

To summarise, the neoclassical and endogenous models highlight six determinants of economic growth:

- the rate of capital accumulation;
- the amount of effort devoted to research and development (innovation);

- the rate of human capital accumulation;
- the transmission of knowledge;
- the creative destruction of 'technologies'; and
- the interplay between different factors of production.

The six determinants above can be thought of as the main determinants of growth, but there are also other important factors that affect these determinants. For example, the economics literature identifies political stability, size of government, financial development, macroeconomic instability, microeconomic distortions, corruption, geography, trade barriers, resource allocation, inflation, etc as important contributing factors. Broadly speaking, these additional factors can be thought of as affecting output growth through the six determinants described above.

The primary goal of this article is to explore how monetary policy may affect these six determinants. If monetary policy is to have a durable effect on output growth then it must have an ongoing effect on the growth of factors of production (capital, knowledge, human capital and so on). The monetary transmission mechanisms that are discussed next involve real interest rates and inflation.

## 3. Monetary policy: real interest rates and inflation

### Real interest rates

Traditionally, central banks were assumed to affect the economy by controlling the supply of money.<sup>10</sup> By manipulating the money supply, the central bank was thought to be able to control a nominal interest rate. Today, rather than setting a given quantity of money, many central banks simply set an interest rate directly. In New Zealand, for example, the Reserve Bank sets the Official Cash Rate (OCR) as the mid-point of a corridor of interest rates at which it is prepared to borrow or lend to commercial banks with settlement accounts at the Reserve Bank.<sup>11</sup> The OCR is an overnight interest rate, and serves to anchor the short end

---

9 Amongst others, the assumption of perfect markets means that there is no unemployment in the model and there is no leisure, so issues regarding labour force participation are entirely ignored. Cohen and Harcourt (2003) discuss the 'Cambridge capital controversy' - a dispute about aggregating capital into a single good. A key issue here is whether it is difficult to scale up technology or to seamlessly substitute between different technologies. 'Half a machine', for example, will often be incapable of producing anything.

---

10 See the symposium on the monetary transmission mechanism published in the *Journal of Economic Perspectives* (1995).

11 White (2001) provides an in-depth discussion of how monetary authorities control an overnight interest rate.

of the interest rate yield curve. A central policy question is then how this overnight interest rate affects the rest of the economy, and how sustained such effects might be.

In setting a nominal interest rate, such as the OCR, the Reserve Bank is merely promising how much cash it will provide tomorrow for a given amount today, but there is no guarantee as to how much that future cash will be worth in terms of real goods and services, since prices may change. If inflation expectations increased in tandem with every increase in the nominal interest rate, then expected real interest rates would remain unchanged. In practice, inflation expectations exhibit stickiness, so changes in nominal rates will usually be accompanied by changes in expected real rates, at least in the short run.<sup>12</sup> In the longer run, inflation expectations adjust and real interest rates return to levels that equilibrate savings and investment plans.

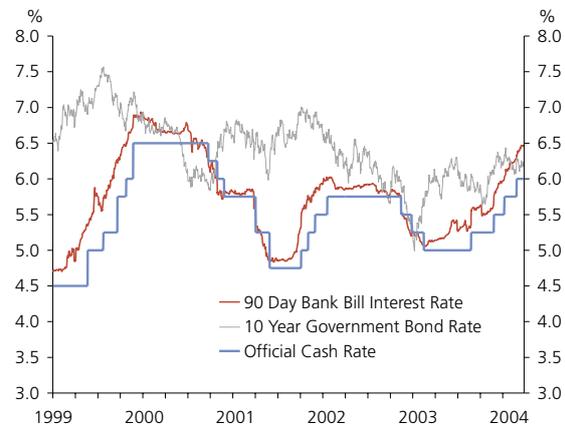
### Limits to monetary control

To a large extent, the most important interest rates for investors are the commercial interest rates that prevail over the lifetime of the capital goods the investors are interested in purchasing. If the Reserve Bank can only engineer temporary changes in real interest rates, then one might expect these temporary interest rate changes to have a comparatively muted effect on investment.

Although there is clearly a relationship between the OCR and the 90 day cash rate, the relationship with bond rates, whose maturities may extend out to a decade or more, is more tenuous (see figure 1). These longer term rates are heavily influenced by people's long term inflation expectations, long term exchange rate expectations, and by foreign long term interest rates. The connection with foreign interest rates arises because New Zealand is part of an integrated international financial system. Borrowing overseas and borrowing domestically are substitute sources of finance.

<sup>12</sup> It should be noted that price stickiness in levels does not necessarily mean that inflation, the growth rate of the price level, will also be sticky (see Ball, 1994). To cope with this conundrum, Mankiw and Reis (2001) suggest that some people may be slow to incorporate macroeconomic information into their decision-making, creating some stickiness in inflation expectations and hence ensuring that monetary policy can have real effects.

**Figure 1**  
**New Zealand interest rates**



Source: Reserve Bank of New Zealand

The real interest rate is typically thought to mediate between the world supply of saving and the world demand for funds for investment purposes.

Conventional economic theory suggests that monetary authorities have a limited ability to affect long-term real interests even in closed economies. The vast bulk of financial intermediation is performed by commercial banks and financial markets, and the rates at which these institutions are prepared to borrow and lend will depend on people's preference for saving versus consuming, and perceptions of risk and return regarding investment projects. A central bank cannot permanently dictate what real interest rates investors should be charged or what interest rate should be paid to lenders. Any attempt to do so would result in changes in consumption behaviour or would change savers' propensity to invest in assets denominated in New Zealand dollars. Such behavioural changes would affect the availability of funds for domestic investment, and any reduction in capital accumulation would affect New Zealand's per capita income.

Since New Zealand is an open economy with sizeable capital flows, it is possible for there to be a substantial mismatch between investment in New Zealand and domestic savings — New Zealand investors can make use of foreigners' savings. Thus, there is no longer the neat correspondence between saving (not consuming) and investment that one finds in a closed economy. Since New Zealanders collectively spend more than their income, they are net borrowers from

---

the international financial system, as represented by current account deficits. The fact that such international lending involves currency risk contributes to the domestic interest rates faced by New Zealand borrowers. If New Zealanders in aggregate saved as much as they wished to invest then this currency premium would not need to be paid.<sup>13</sup>

### **Real interest rates influence capital accumulation**

Since capital accumulation is one of the traditional drivers determining growth, it is not surprising that many authors have investigated how changes in monetary policy affect the accumulation of capital. Firms' desired capital stock depends on expected real interest rates. In baseline models, a reduction in interest rates only has a temporary effect on capital accumulation, until the new desired capital stock has been achieved. However, financial imperfections<sup>14</sup> (which may constrain investors' ability to borrow) and other frictions may delay the adjustment towards the desired capital stock, so capital accumulation might occur for some substantial period of time.<sup>15</sup> Changing the level of interest rates may have a more permanent effect on capital accumulation depending on what happens to other factors of production, such as knowledge. Developments in knowledge, for example, may prevent the onset of diminishing marginal returns to capital.

### **Real interest rates influence the accumulation of other productive factors**

As mentioned in the endogenous growth section, the accumulation of human capital and knowledge, and the development of new technologies, bear a marked similarity to the accumulation of capital. Since the accumulation of these factors will often be financed by borrowing up-front,

a reduction in real interest rates should temporarily increase the accumulation of these capital-like factors. Since both knowledge and new technologies are thought to be very durable, an increase in their levels should lead to permanently higher levels of income. However, when interest rates return to higher levels, one would expect the growth rate of these factors to fall back to lower levels.<sup>16</sup>

### **The exchange rate and the transmission of knowledge**

The dissemination of knowledge from the international economy to New Zealand is potentially an important driver of growth; trade and other forms of international engagement are likely to facilitate the dissemination of international knowledge. Since changes in real interest rates may affect the real exchange rate, which in turn affects trade, monetary policy may influence the transmission of international knowledge.

There are two caveats to this line of reasoning. First, the empirical importance of openness is subject to some dispute; see for example Rodrik et al. (2002). Second, other factors also affect the real exchange rate (commodity prices, people's risk assessments of NZ dollar assets, etc), and many of these factors are not shaped by monetary policy. Transitory disturbances to real interest rates explain only some of the variation in the level of the exchange rate. The effect of exchange rate volatility will be taken up at the end of section 3.

### **Long-run money growth drives trend inflation**

If the supply of money increases in excess of people's desire to hold money, then people will spend the money to hold other goods instead. If the increase in demand for goods is large relative to firms' capacity to supply goods and services, then firms will be encouraged to increase their prices, resulting in inflation. In the long run, the trend growth rate of money is thought to be the principal driver of inflation. Because of this correspondence between money growth

---

13 The risks associated with a variable exchange rate can be 'sold' to a third party, but that party will usually charge a price to accept the risk, ultimately increasing the cost of borrowing.

14 See Claus and Smith (1999) for a discussion of the credit channel, which details some of these issues.

15 These other frictions include 'time-to-build' constraints: capital must be manufactured, which precludes instantaneous adjustment of the capital stock.

---

16 The new growth rate could potentially be higher if the new technological advances make a material contribution to the process of innovation.

---

and inflation, inflation is sometimes used as a direct proxy for the performance of monetary policy.

### **Inflation can reduce money balances, increasing capital accumulation**

Higher inflation drives up nominal interest rates and causes people to economise on their holdings of money since money earns no direct return. (Money in this context means cheque account balances and currency, rather than savings deposits which earn interest.) Even if nominal interest rates increase one-for-one with inflation, so that real interest rates are unchanged, higher inflation may still affect the desired level of capital and other factors of production.

Money is one type of asset that people have in their asset portfolios. Other assets include property, savings deposits, shares, cars, and direct ownership of physical capital associated with businesses. Since higher inflation reduces the purchasing power of a given stock of money, higher inflation rates reduce the incentive to hold money. If people still wish to save the same amount, but do not wish to save by holding money (due to higher inflation), then they are likely to increase their holdings of other assets, such as capital. Thus, higher inflation may cause people to accumulate more capital in their savings portfolios, a so-called Tobin effect.<sup>17</sup>

However, since assets such as physical capital have higher returns than money, money is a comparatively small component of aggregate wealth. Consequently, the Tobin effect is likely to have a fairly small effect on capital accumulation. This conclusion is consistent with simulation results from theoretical models.<sup>18</sup>

### **Inflation can reduce money balances, reducing capital accumulation**

One of the primary functions of money is to facilitate transactions. In some models, money (like capital and labour) is an additional factor that facilitates production.<sup>19</sup> By making

it easier to purchase the nuts and bolts of business, money facilitates production. Money thus complements capital in production, and hence higher money balances increase the level of capital desired by firms.<sup>20</sup> Conversely, higher inflation reduces the incentive to hold real money balances and thus reduces the desired level of capital. This negative inflation effect is in sharp contrast to the Tobin effect.<sup>21</sup> Perhaps more compellingly, Feldstein (1997) argues that inflation can have a marked effect on capital accumulation because of the way in which inflation interacts with the tax system. His results indicate that keeping inflation at very low rates is highly desirable.

### **Higher inflation can reduce labour participation**

Higher inflation only affects transactions mediated through markets, such as the consumption of goods and services. Since leisure in its basic form does not involve the use of money, higher inflation does not affect the cost of leisure. Consequently, higher inflation makes consumption more expensive relative to leisure, encouraging people to take more leisure. But in taking more leisure people inherently work less, thus reducing their labour force participation. The decline in labour force participation can be even more pronounced when inflation interacts with the tax system — for example higher incomes may bump people into higher income tax brackets, further reducing the incentive to work.<sup>22</sup>

Although changes in labour supply are likely to lead to changes in the level of income, they obviously cannot account for ongoing changes in the growth rate of income, since there are natural limits on how much (or how little) people can work. Similarly, many of the inflation effects on the capital stock relate to the level of capital stock that will ultimately be acquired by firms in the economy, rather than the growth rate. In the long run diminishing returns may mean that there are limits placed on the accumulation

---

17 Tobin (1965).

18 Walsh (1998, pp 75-80) discusses such simulations.

19 See Orphanides and Solow (1990) for a technical discussion of many of these models.

---

20 For a technical discussion, see Levhari and Patinkin (1968).

21 See Ho (1996) for an endogenous growth model with a Tobin effect.

22 See for example Gomme (1993). The welfare costs of lower work are partially offset because working less means that leisure increases which also contributes to welfare.

---

of capital (though 'long' may be quite some time). However, since new capital acquisitions may embody new technologies, the impact of diminishing returns from capital may be rather muted, since the new technologies may be improved substitutes for labour.

### **Inflation can divert effort away from factor accumulation**

Haslag (1997) argues that higher inflation degrades welfare, irrespective of what it does to real variables such as output. One explanation for this decline in welfare is that inflation diverts effort to activities that would not otherwise be undertaken, such as transaction services and management to mitigate the effects of higher inflation.<sup>23</sup> Inflation may also distort portfolio allocations towards assets that are good hedges against inflation (say, land and houses for example) but that are not necessarily very productive.

The diversion effect of inflation affects capital accumulation, and is also likely to draw resources away from research and development and the acquisition of human capital, potentially reducing technological progress or total factor productivity. Efforts to innovate are likely to be one of the most durable sources of ongoing growth, and inflation may be particularly harmful if it reduces such effort. The endogenous growth literature emphasises that knowledge accumulation may not be susceptible to diminishing returns in the same way that physical capital is.

To sum up, a permanent increase in the growth rate of money (an increase in inflation) may affect desired capital stocks and labour participation. Inflation may also divert effort away from research and development and human capital accumulation, thus adversely affecting economic growth. Although some models suggest that inflation may have a positive effect on the desired level of capital, on balance the negative effects of higher inflation are probably more pronounced, hindering long-run economic growth.

### **Can transitory changes in policy have permanent effects?**

The preceding subsections argued that a monetary authority could only have a transitory effect on real interest rates, and that a permanent change in inflation was most likely to have negative effects for output growth. This still leaves the possibility that a transitory change in real interest rates might have permanent effects on output or output growth.

The conventional view is that transitory changes to policy will have transitory effects on real output. Typically, expectations and prices are thought to adjust to new circumstances, and people will change their behaviour, causing the economy as a whole to return to its original state of balance. For example, a temporary monetary policy action might prompt greater investment in capital. If, however, this additional capital was less profitable than originally expected, then investors would either sell the capital or let it depreciate out of existence. Either way, the private sector's subsequent actions would unwind initial decisions, so that the initial monetary policy stimulus only had a temporary effect on output.

The endogenous growth literature opens up new possibilities. Transitory changes in policy might affect the accumulation of knowledge or 'technological progress'. Since knowledge and technological progress are thought to be highly durable, transitory policy disturbances might have near-permanent effects on the level of output.

How does such a possibility affect the implementation of monetary policy? William McChesney Martin, former chairman of the Federal Reserve Board in the United States, once noted that monetary policy is about 'taking the punch bowl away just as the party gets going'. The perspective provided by the endogenous growth literature does not really change this punch bowl problem. The positive effects of higher money growth or lower interest rates have to be weighed against the possibility that unacceptably high inflation outcomes might arise.

Experience from a number of countries demonstrates that high inflation occurs when excessively large volumes of cash are pushed into an economy. For example, following World War I Germany experienced a period of hyper-inflation — inflation rates of over 50 per cent per month — because the

---

<sup>23</sup> See Bonato (1998) for a discussion of the costs of inflation in New Zealand.

---

government simply printed huge volumes of notes to meet its financial obligations.

Although hyper-inflation is an extreme example, the basic problem is just the same at lower rates of inflation: how much monetary stimulus is enough for the economy to work effectively, without drowning the economy in inflation? Taking the punch bowl away sufficiently early may be very important. If inflation gets unacceptably high, there may be substantial costs associated with returning to lower inflation levels, depending on people's expectations of this disinflation process, ie, the credibility of any announced policy change.

### The impact of volatility on long-run economic growth

Long-run analyses of economic growth have typically assumed that the trend in output can be separated from the cycle around that trend. An alternative view is that the trend and cycle are intimately connected. If macroeconomic volatility is harmful to trend growth, and monetary policy can help to mitigate volatility, then there is yet another mechanism by which monetary policy will affect trend growth.

Theory provides competing mechanisms by which volatility may affect the trend. The Schumpeterian view suggests that the acquisition of human capital, or the reorganisation of business routines, will increase when output is low. For example, firms typically try to cut costs when times are bad by reorganising their activities. However, if learning is a by-product of doing then learning is likely to be procyclical: 'doing more' means learning more. Similarly, Fatás (2002) suggests that R&D is procyclical — firms invest more in R&D when the aggregate economy is growing strongly. If the effects of the upside and downside are asymmetrical, then having greater volatility may adversely affect the trend.

The effect of uncertainty on capital accumulation is theoretically ambiguous, since it depends on the properties of capital goods and on the costs of adjusting capital stocks. Increased uncertainty about returns means that delaying investment can be desirable (to avoid getting stuck with a capital stock that is too big), whereas other kinds of

uncertainty can actually increase investment.<sup>24</sup> The empirical evidence regarding volatility also tends to be mixed — different data sets and techniques yield differing conclusions as to the relationship between output volatility and output growth.

As mentioned in the discussion of the monetary transmission mechanism, decisions about domestic interest rates can affect the exchange rate. Volatility in monetary policy may also have important effects on exchange rate volatility, and recent work suggests that exchange rate volatility may have non-trivial effects on welfare.<sup>25</sup> Consequently, reducing monetary policy volatility may benefit welfare by helping to reduce exchange rate volatility.<sup>26</sup>

Reductions in inflation volatility should also make it easier to make good decisions about investment, savings, and consumption. Empirically, inflation is also found to be more volatile at higher levels, so aiming for lower levels of inflation is likely to reduce inflation volatility.

Erratic and unpredictable interest rate movements may also make it difficult for individuals to assess relative price movements, which in turn may affect their willingness to invest in capital goods (since money is typically borrowed to purchase capital). Typically these effects are thought to be short-lived, but if there are connections between volatility and trend growth, then the effects may be more substantial.

The general policy sentiment is that the costs of macroeconomic volatility are likely to outweigh any benefits. Consequently, clause 4b of the Policy Targets Agreement, signed by the Governor of the Reserve Bank and the Minister of Finance, states that in implementing monetary policy the Reserve Bank should seek to avoid unnecessary volatility in output, interest rates, and the exchange rate. Hunt (2004) discusses the Reserve Bank's interpretation of clause 4b in more detail. As a whole, the inflation-targeting framework

---

24 See Romer (1996, ch. 8) for a discussion of some of these issues.

25 Obstfeld and Rogoff (2001).

26 Bachetta and van Wincoop (2000) argue that different exchange rate regimes may be optimal from a welfare perspective depending on people's preferences and the choice of monetary rule. Thus, bad outcomes from exchange rate volatility need not imply that a fixed exchange rate regime is optimal.

---

adopted by the Reserve Bank of New Zealand is intended to be both transparent and credible, to avoid erratic monetary policy behaviour that would exacerbate other, unavoidable economic uncertainties.

Section 3 began by discussing the effects of monetary policy on interest rates. It was argued that the Reserve Bank has a limited ability to affect long term real interest rates. Since changes in interest rates should affect the level of the desired capital stock, rather than the long-run growth rate, these temporary changes in interest rates may only have temporary effects on capital accumulation. Money models show that an increase in the inflation rate may have permanent effects on the level of output, though different models suggest that the real effects may be positive or negative. On the whole, the costs of higher inflation are thought to outweigh the benefits. Macroeconomic volatility may yield an additional channel by which monetary policy affects trend growth.

Since different theories provide competing and sometimes contradictory conclusions as to the outcomes of monetary policy, it seems appropriate to visit the data, to see what the real world has to say about the relationships between monetary policy and long-run output growth.

## 4 The empirical literature — cross-sectional evidence

The empirical growth literature has tried to identify variables that explain why there have been such large variations in different countries' growth outcomes. Different studies have investigated political factors, historical factors (such as colonial history), financial development, macroeconomic stability, culture, foreign aid, and so on. In response to this outpouring of research, a number of economists have become concerned about the robustness of the relationships that are 'found' in the data.

So what relationships appear robust in growth regressions? The short answer is 'it depends'. Different authors identify different variables as being robust determinants of growth.<sup>27</sup>

---

27 See Levine and Renelt (1992), Sala-i-Martin (1997), Ley and Steel (1999), Hoover and Perez (2004), and Kalaitzidakis et al. (2002) among others.

Equipment investment and schooling are fairly common robust determinants, as are predominant religious affiliations and geographical locations. Monetary and financial variables often do not make the cut in robustness comparisons, though some authors have argued that adequately specified regressions require the standard deviation of inflation and the standard deviation of domestic credit as explanatory variables.

In the long run, inflation is typically understood to be a monetary phenomenon, and so inflation can be thought of as a proxy for the performance of monetary policy. Brook et al. (2002) provide a summary of the evidence from cross-country studies regarding the consequences of inflation for growth. Although not significant in all regressions, high rates of inflation generally appear to be harmful to growth and, at least for developed countries, the detrimental effects appear to occur at quite low rates of inflation (say 3 per cent).<sup>28</sup> The cross-country studies also generally imply that higher inflation volatility is harmful to growth. Since inflation volatility is positively correlated with the level of inflation, maintaining low and stable inflation appears to be an appropriate policy goal, supportive of long-run growth. The OECD (2003) suggests that lower inflation volatility primarily affects per capita output through allocative efficiency (allocating resources to their best use), whilst lower inflation rates foster capital accumulation.

## 5 What do New Zealand data say about monetary policy's effect on output?

One of the key difficulties associated with cross-country data is that individual countries are very unlike their peers in many different dimensions. An alternative approach to cross-country regressions is to consider how a single country responds to innovations in monetary policy variables, such as money or interest rates.

---

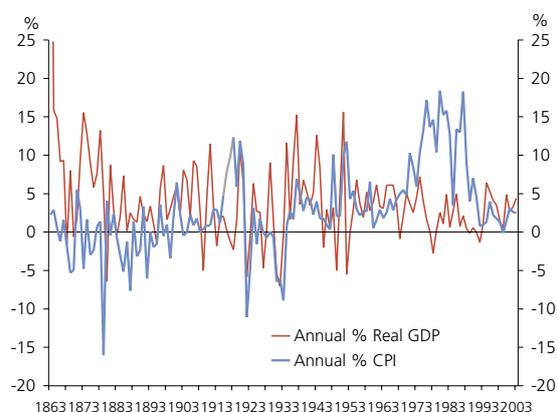
28 Somewhat higher inflation might be warranted for less developed countries (LDCs) since seigniorage — government income obtained from printing money — is an important source of revenue for LDCs with ineffective taxation systems.

To understand the long-run effects of monetary policy one needs to be able to trace out the effects over a long period of time — multiple decades, rather than simply one or two. Annual prices and real gross domestic product data are available for New Zealand going back to 1863. Figure 2 illustrates the annual growth rate of output and annual inflation.

There are four things that are notable from this figure. First, both GDP growth and inflation are volatile. Second, there are short periods where inflation and output move together, in the late 1920s and early 1930s for example. Third, although the volatility of output growth has changed in the last 40 years or so, relative to the pre-World War II experience, it is not obvious that the average growth rate has changed. Fourth, the 1970s and 1980s are notable for much higher rates of inflation.

If higher inflation was intrinsically beneficial, then one would expect output growth over the 1970s and 1980s to be higher on average. However, growth actually appears to be lower during this high inflation period.<sup>29</sup> Statistical tests indicate that the average GDP growth rate has remained constant over the entire period in figure 2, indicating that no change in monetary policy has permanently increased — or decreased — the average growth rate of output. Interestingly, the data in figure 2 also span a number of different monetary policy

**Figure 2**  
**Annual real GDP and CPI growth rates**



Source: Reserve Bank of New Zealand

<sup>29</sup> There is an obvious caveat to this observation about the inflation-growth relationship: as we saw in the cross-sectional literature, the relationship between inflation and growth may be distorted by simultaneous developments in other variables.

regimes, including both floating and fixed exchange rates, and yet the average level of real output growth appears stable. The stability in average growth rates suggests that changes in monetary policy regimes are not the most important drivers of output growth.

In a study of 14 countries, Rapach (2003) suggests that a permanent increase in inflation would permanently increase the level of output (the level of output, not the growth rate). Rapach's results hinge crucially on whether inflation has permanently changed in these countries, a claim which is controversial. New Zealand's inflation rate does not appear to have experienced any permanent changes, so it is not possible to assess the impact such permanent changes would have.<sup>30</sup> From this perspective, the run up in inflation during the 1970s and 1980s was actually a temporary, though lengthy, phenomenon and New Zealand has now returned to the generally low inflation environment that prevailed through to the 1960s.

Rapach's analysis uses three variables (output, interest rates and prices), compared with the more usual approach that simply focuses on money and output. A general problem with these small systems of variables is that all of the developments in the economy are being attributed to just two or three variables. For example, in a two variable model of money and output, a non-monetary shock might be responsible for both a permanent effect on output and a permanent effect on money, but could be misidentified as a permanent shock to the money supply. One way around this problem is to generalise the model, to incorporate more variables into the analysis.

In a forthcoming Reserve Bank of New Zealand discussion paper Cîtu (2004) develops a small model with output, prices, interest rates, and the exchange rate as constituent variables. He estimates the model parameters using data from the late 1980s to 2002. Theoretically, one can use this model to assess how permanent changes in interest rates affect the other variables in the model. In practice, statistical tests suggest that there are no permanent shocks to interest rates,

<sup>30</sup> Speculating what would happen when policy is changed may be problematic if one does not take into account how private sector expectations evolve: the 'Lucas critique'.

so it is not possible to assess how such permanent changes would affect output. As a whole, Citu's model suggests the parameters cannot be estimated precisely enough to provide a clear statement about whether monetary policy – in the form of inflation or interest rates – has permanent effects on real output. To make statements about the long run requires a long span of data.

Figure 3 provides a more recent snapshot of New Zealand data, illustrating five-year moving averages of year-on-year inflation and growth in GDP per capita. The standard deviations are for year-on-year growth rates of output per capita and inflation, but are also calculated for five - year samples. Again, the usual caveats apply regarding the importance of additional factors that have not been depicted.

The bars in the chart represent volatility in inflation and output. Inflation volatility has dropped markedly since the 1980s, and has stabilised at low levels. Output volatility, with the exception of the very beginning of the sample, has remained fairly constant. Still, there is no obvious relationship between output volatility and the trend in per capita output growth.

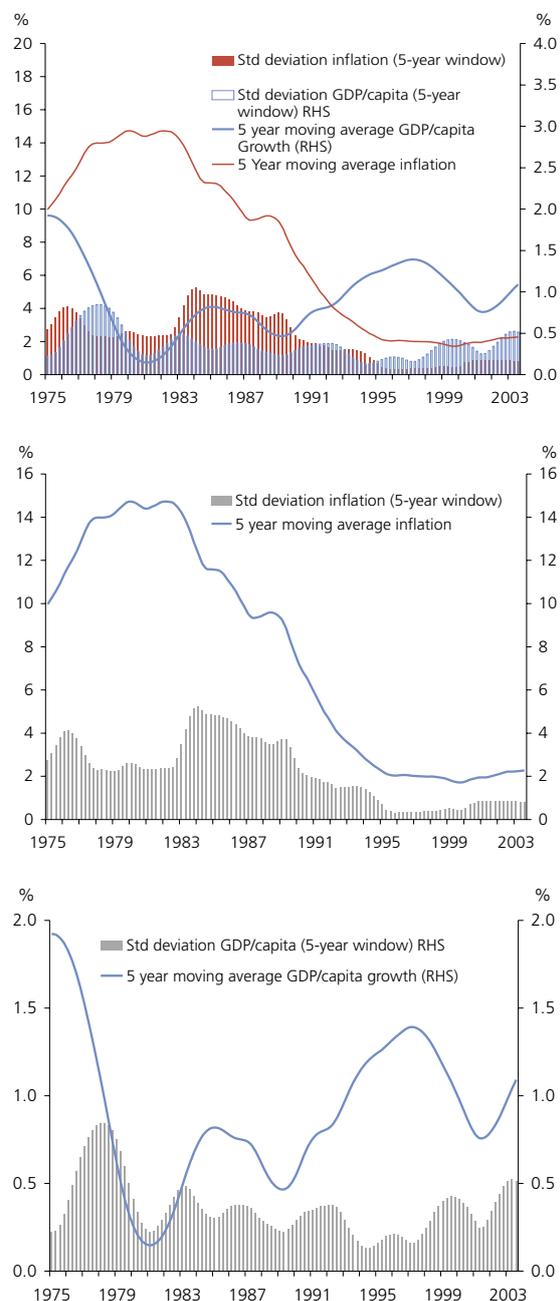
In general, the macroeconomic out-turns over the last decade or so appear to be reasonably promising in comparison to all but the early 1970s. Nevertheless, if New Zealand's per capita income growth averages 2.5 per cent per year, it will still take 20 years to reach the per capita income levels of the United States, even if the United States stands still.

## 6 Conclusion

This *Bulletin* article began by outlining the causes of growth and theories of how those causes evolve. Section 3 described how monetary policy affects the real economy through real interest rates and inflation. Macroeconomic volatility, and policy efforts to stabilise volatility, may also have implications for growth.

The theoretical literature discussed in section 3 noted that monetary policy is constrained in its ability to institute permanent changes in real interest rates, particularly in the context of globally integrated financial markets. Transitory

**Figure 3**  
Per capita growth and inflation — levels and variability



Source: Reserve Bank of New Zealand

changes in interest rates are generally thought to have a transitory impact on factor accumulation (eg, capital investment), and hence should not permanently affect the growth rate of output. Although monetary policy only has a transitory effect on real interest rates, it can determine the average rate of inflation. Section 3 illustrated that permanent changes in inflation rates may have mixed effects on capital accumulation, at least theoretically, though on balance

---

higher inflation rates are thought to be negative for output growth.

The empirical cross-country literature looks at how growth outcomes are related to different determinants. Although there are questions about robustness, empirical cross-country analyses suggest that lower inflation variability and lower inflation levels enhance growth.

On the basis of the cross-country literature, the maintenance of price stability appears to be the main contribution that monetary policy can make to growth. This view is embodied in the Reserve Bank of New Zealand Act (1989), and in the Policy Targets Agreement signed by the Minister of Finance and the Governor of the Reserve Bank. As a subsidiary objective, the Reserve Bank also seeks to minimise volatility, though the exact connections to trend growth or welfare have not been demonstrated unequivocally.

Ultimately, though, the accumulation of capital and knowledge, alongside mechanisms that relocate resources to their best use, are likely to be the most important drivers of per capita income growth. Microeconomic policies that affect research and development, the acquisition of human capital, the transmission of information, and the incentive to participate in the labour force are likely to have more substantive effects on growth than monetary policy. The New Zealand Treasury, the Ministry of Economic Development and other branches of government have active research programmes that seek to analyse how such interventions might be made.<sup>31</sup>

## References

Aghion, P and P Howitt (1999), *Endogenous Growth Theory*, Cambridge, Mass: The MIT Press.

Bacchetta, P and E van Wincoop (2000), "Does exchange rate stability increase trade and welfare?," *The American Economic Review*, Vol 90, No 5, 1093-1109.

Ball, L (1994), "Credible disinflations with staggered price-setting," *The American Economic Review*, Vol 84, No 1, 282-289.

Barro, R J and Sala-i-Martin (1999), *Economic Growth*, Cambridge, Mass: The MIT Press.

Bonato, L (1998) "The benefits of price stability: some estimates for New Zealand," *Reserve Bank of New Zealand Bulletin*, Vol 61, No 3, 212–20.

Brook, A-M, Ö Karagedikli and D Scrimgeour (2002), "An optimal inflation target for New Zealand: lessons from the literature," *Reserve Bank of New Zealand Bulletin*, Vol 65, No 3, 5–16.

Cîtu, F (2004), "A VAR investigation of the transmission mechanism in New Zealand," *Reserve Bank of New Zealand Discussion Paper* (forthcoming).

Claus, I and C Smith (1999), "Financial intermediation and the monetary transmission mechanism," *Reserve Bank of New Zealand Bulletin*, Vol 62, no 4, 4–16.

Cohen, A J and G C Harcourt (2003), "Whatever happened to the Cambridge capital theory controversies?," *Journal of Economic Perspectives*, Vol 17, No 1, 199–214.

Conway, P and A Orr (2000), "The process of economic growth in New Zealand," *Reserve Bank of New Zealand Bulletin*, Vol 63, No 1, 4–20.

Fatás A (2002), "The effects of business cycles on growth," In N Loayza and R Soto (eds) *Economic Growth: Sources, Trends, and Cycles*, Santiago, Chile: Central Bank of Chile.

Feldstein, M (1997), "The costs and benefits of going from low inflation to price stability" in *Reducing inflation: Motivation and strategy*, C D and D H Romer (eds) NBER Studies in Business Cycles, vol. 30. Chicago and London: University of Chicago Press, 123–56.

Gomme, P (1993), "Money and growth revisited: Measuring the costs of inflation in an endogenous growth model", *Journal of Monetary Economics*, Vol 32, No 1, 51–77.

Haslag, J H (1997), "Output, growth, welfare, and inflation: A survey," *Federal Reserve Bank of Dallas Economic Review*, 11-21.

Ho, W-M (1996), "Imperfect information, money and economic growth", *Journal of Money, Credit, and Banking*, Vol 28, No 4, 578–603.

---

<sup>31</sup> See <http://www.treasury.govt.nz/release/economicgrowth/> for example.

- 
- Hoover, K D and S J Perez (2004) "Truth and robustness in cross-country growth regressions," *Oxford Bulletin of Economics and Statistics* (forthcoming).
- Hunt, C (2004), "Interpreting clause 4(b) of the Policy Targets Agreement: avoiding unnecessary instability in output, interest rates and the exchange rate," *Reserve Bank of New Zealand Bulletin*, Vol 67, No 2, 5–20.
- Kalaitzidakis, P, T P Mamuneas and T Stengos (2002), "Specification and Sensitivity Analysis of Cross-Country Growth Regressions," *Empirical Economics*, Vol 27, No 4, 645–56.
- Khan, M S and A S Senhadji (2000), "Threshold effects in the relationship between inflation and growth," *International Monetary Fund Working Paper*, WP/00/110.
- Levhari, D and D Patinkin (1968), "The role of money in a simple growth model," *The American Economic Review*, Vol 58, No 4, 713–53.
- Levine, R and D Renelt (1992), "A sensitivity analysis of cross-country growth regressions," *The American Economic Review*, Vol 82, 942–63.
- Ley, E and M F J Steel (1999), "We just averaged over two trillion cross-country growth regressions," *Working Paper of the International Monetary Fund* WP/99/101.
- Lucas, R E, Jr (1988), "On the mechanics of economic development," *Journal of Monetary Economics*, Vol 22, 3–42.
- Mankiw, N G and R Reis (2001), "Sticky information: A model of money nonneutrality and structural slumps," No. 8614.
- New Zealand Treasury (2004), "New Zealand economic growth: An analysis of performance and policy," <http://www.treasury.govt.nz/release/economicgrowth/nzeg-app-apr04.pdf>
- Obstfeld, M and K Rogoff (2001), "Risk and exchange rates," mimeo. <http://emlab.berkeley.edu/users/obstfeld/riskexch.pdf>.
- OECD (1998), *National Accounts: Main Aggregates, Vol 1, 1960–1995*. Paris: Organisation for Economic Cooperation and Development.
- OECD (2003), *The Policy Agenda for Growth: An Overview of the Sources of Economic Growth in OECD Countries*, Paris: Organisation for Economic Cooperation and Development.
- Orphanides, A and R Solow (1990) "Money, inflation and growth," B H Friedman and F H Hahn (eds), *Handbook of Monetary Economics*, Vol 1, 223, 261, Amsterdam: North Holland.
- Rapach, D E (2003), "International evidence on the long-run impact of inflation," *Journal of Money, Credit, and Banking*, Vol 35, No 1, 23–48.
- Romer, D H (1996), *Advanced Macroeconomics*, New York: McGraw-Hill.
- Sala-i-Martin, XX (1997), "I just ran four million regressions," *NBER Working Paper*, No 6252.
- Schumpeter, J (1934), *The Theory of Economic Development*, Cambridge, Mass: Harvard University Press.
- Rodrik, D, A Subramanian and F Trebbi (2002), "Institutions rule: The primacy of institutions over geography and integration in economic development," *NBER Working Papers*, No 9305.
- Tobin, J (1965), "Money and growth," *Econometrica*, Vol 33, No 4, 671–684.
- Walsh, C E (1998), *Monetary Theory and Policy*, Cambridge, Mass: The MIT Press.
- White, B (2001), "Central banking: Back to the future," *Reserve Bank of New Zealand Discussion Paper*, DP2001/5.

---

# NZIER's Capacity Utilisation Index

Bernard Hodgetts, Economics Department

The Institute of Economic Research (NZIER) produces an index of capacity utilisation from its Quarterly Survey of Business Opinion (QSBO) known as CUBO (standing for Capacity Utilisation, Business Opinion). CUBO is a useful indicator of the business cycle and inflation pressures, but its behaviour has changed over its 43-year history. The average level of CUBO fell sharply between 1974 and 1991 but has since increased again. Although that shift may be explained by economic factors, changes to the QSBO sampling framework could also be relevant. This article summarises a joint project led by the NZIER to investigate this issue. Reassuringly, it found that changes to the sampling framework do not appear to have had a significant impact on CUBO. Moreover, alternative calculations of CUBO produce a series which also shows a sharp fall over the 1974 to 1991 period.

## 1 Introduction

The New Zealand Institute of Economic Research (NZIER) has conducted a comprehensive quarterly survey of business opinion — known as the QSBO — since 1961. This survey asks respondent businesses a range of questions about their output, costs and prices, and employment and investment intentions. It also measures their perceptions of general business conditions. The survey data are widely used as indicators for assessing various aspects of New Zealand's macro-economy.

An indicator of particular interest is an index of capacity utilisation, known as CUBO (an acronym standing for Capacity Utilisation, Business Opinion). Capacity utilisation is a measure of the intensity with which firms are using their plant and equipment. CUBO is calculated from the responses of the manufacturing and building sectors to a question about the extent to which they could expand production without raising unit costs. CUBO is one of a range of variables that the Reserve Bank uses to help gauge the overall state of the business cycle and inflation pressures.

Although CUBO varies with the business cycle, there have also been distinct shifts in its average level over its 43-year history. The survey question from which CUBO is derived has remained unchanged over this entire period, but there have been important changes to the sampling framework. A reasonable question to ask therefore is whether the changes in the average level of CUBO over time reflect economic and structural changes, or whether they are due, even partly, to these sampling changes. This is an important issue given

the role played by CUBO in the assessment of inflation pressures.

The NZIER, the Reserve Bank, and The Treasury recently undertook a joint project to examine the extent to which the path of CUBO has been affected by changes in the survey. The project also looked at how the method of calculating CUBO may have affected its path over time. This article briefly provides some general background on how CUBO is constructed and its role in the Bank's analysis of the economy. It then summarises the results of this project, which are detailed in a fuller research report.<sup>1</sup>

## 2 What does CUBO measure?

Although there is no universally agreed definition of a firm's capacity utilisation, two general approaches are evident in the economic literature. The first focuses on the physical limits of the production process and is represented by the likes of Johansen (1968), who defines capacity utilisation as the "ratio of [a firm's] actual output to the maximum that could be produced per unit of time with existing plant and equipment".

However, this definition may not be particularly useful from an economic standpoint. Well before absolute physical constraints on production become binding, most firms will start to experience an increase in their average cost of production as output increases (assuming no change in the

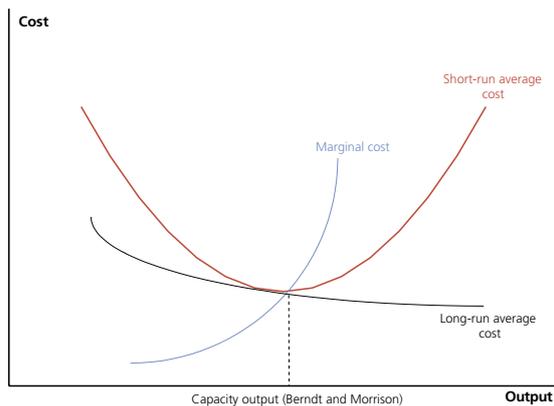
---

<sup>1</sup> Analysis of NZIER's Capacity Utilisation Index (CUBO), Report to The Treasury and Reserve Bank, NZIER, December 2003. A copy of the report can be found at [www.nzier.org.nz](http://www.nzier.org.nz).

level of plant and equipment used). For instance, higher average costs could arise due to the need to operate extra shifts, undertake additional plant maintenance, and so on.

An alternative approach to measuring capacity utilisation is to focus on the ratio of actual output to the level of output beyond which the average cost of production begins to rise. As noted by a number of authors, such as Berndt and Morrison (1981), this point may be best represented by the minimum point on the firm's short-run average cost curve (figure 1). Although this point is sometimes termed 'capacity output', a firm could, of course, increase output beyond this point, albeit with higher unit costs in the short term.

**Figure 1**  
Berndt and Morrison approach to capacity utilisation



The cost-based approach to measuring capacity utilisation of Berndt and Morrison appears to correspond closely to that used by the NZIER in compiling and constructing CUBO. Manufacturing and building sector respondents to the QSBO<sup>2</sup> are asked:

**Table 1**  
Response to capacity utilisation question – June 2003 quarter  
(excludes non-responses)

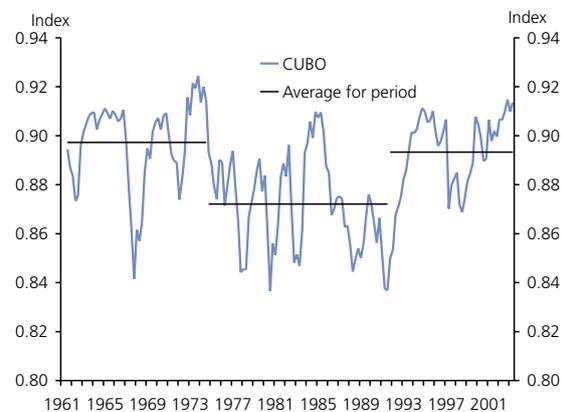
% increase	0%	1 – 5%	6 – 10%	11 – 20%	Over 20 %	Total
No. responses	35	44	49	51	45	224
Per cent of responses	15	19	21	22	19	96

2 Note that there is no attempt to measure the capacity utilisation of merchants and service sector respondents in the QSBO.

*Excluding seasonal factors, by how much is it currently practicable for you to increase your production from your existing plant and equipment without raising unit costs?*

As shown in table 1, respondents are asked to tick one of five ranges representing the percentage increase in output possible before unit costs begin to rise. The data are then used in the calculation of CUBO, the details of which are shown in the Box. Figure 2 shows the full history of CUBO since the index was first compiled in 1961.

**Figure 2**  
Capacity utilisation (CUBO)



### 3 Use of CUBO as an indicator

As a measure of the intensity with which firms are using their plant and equipment, CUBO is a useful indicator of the business cycle. As figure 3 shows, capacity utilisation tends to rise as economic growth accelerates, and fall when growth is slowing. CUBO appears to be a leading indicator, providing a one quarter lead on changes in GDP. This correlation means that CUBO can be used to help estimate GDP prior to when the official data become available, several

## Box

### The Calculation of the Capacity Utilisation Index (CUBO)

Calculation of CUBO each quarter involves three steps:

- Identifying which of the five response intervals the median (middle) response sits in (non-responses are ignored). In the example in table 1, this would be the 6-10% interval.
- It is assumed that the responses in the category containing the median response are distributed evenly across the category. The value of the median response is then calculated using the following formula:

$$\text{Median} = \text{Lower limit of median interval} + \left[ \frac{\frac{n}{2} - \text{number below median interval}}{\text{number within median interval}} \right] * \text{width of median interval}$$

where  $n$  is the number of responses. This median value represents the degree of spare capacity across manufacturers and builders. In the example in table 1, the median would be calculated as:

$$6 + ((224/2 - (35+44))/49) * 5 = 9.37$$

- The index of capacity utilisation — CUBO — is then derived by calculating the implied ratio of actual output to capacity output. Assuming actual output = 100, then capacity utilisation or actual output over capacity output is equal to  $100/(100+m)$  where  $m$  is the median value of spare capacity calculated above. So for the data in table 1, CUBO would be  $100/(100+9.37) = 91.4\%$ .

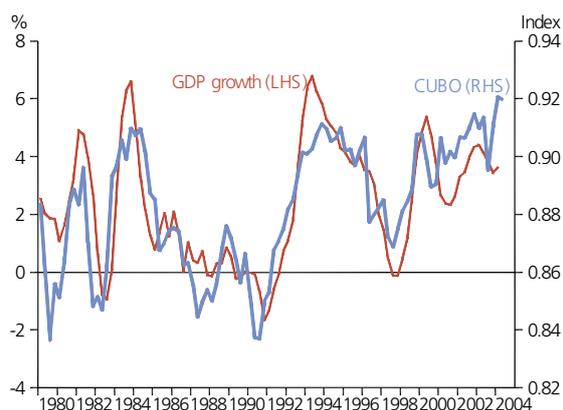
months after the end of the quarter in question. At present, the Bank maintains two types of CUBO-based indicator models as part of a wider suite of models developed to help identify the current strength of activity:

- A model that uses lagged changes in CUBO to predict the latest quarterly growth rate of GDP.
- Models that combine the lagged value of CUBO with the quarterly change in retail sales and various measures of primary export production (data for which are available prior to GDP) to predict the quarterly GDP growth rate.

Figure 4 (overleaf) shows that even the simplest of these models contains useful information about the latest quarterly change in GDP. Lagged changes in CUBO explain about 45 per cent of the quarterly change in GDP.<sup>3</sup>

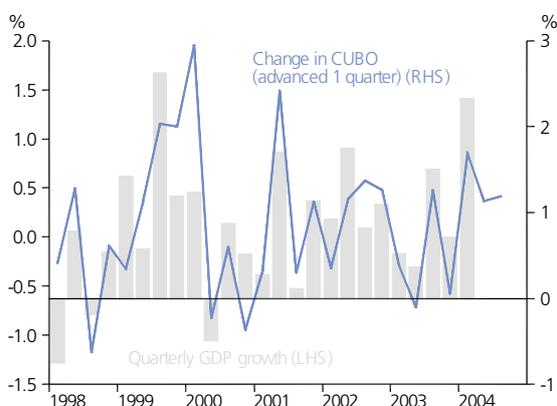
<sup>3</sup> In practice, forecasts from these sorts of models would be supplemented with additional information about activity over the quarter in question.

**Figure 3**  
Capacity utilisation and year on year GDP growth (CUBO is seasonally adjusted)



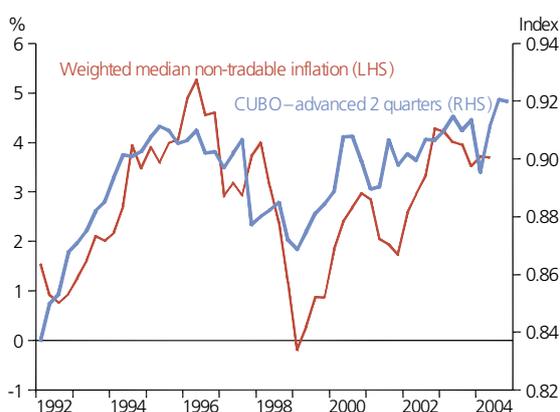
Since CUBO measures the extent to which firms are facing higher unit costs of production, it is also valuable as a leading indicator of demand-led pressures on output prices (CUBO typically has a two to four quarter lead on inflation). As figure 5 (overleaf) shows, CUBO is closely correlated with the non-tradables component of CPI inflation — a measure of inflation for goods and services mainly produced

**Figure 4**  
**CUBO-based indicator models of GDP (CUBO is seasonally adjusted)**



and consumed locally.<sup>4</sup> In the correlation shown in figure 5, movements in CUBO explain about 55 per cent of the annual change in non-tradables prices. The Bank uses this relationship to help derive estimates of the extent to which economic activity may be above its trend or potential level (sometimes called its non-inflationary level).

**Figure 5**  
**Capacity utilisation and annual non-tradables inflation (CUBO is seasonally adjusted)**



In arriving at these estimates of potential output, GDP data is filtered (ie, smoothed) to provide an initial statistical estimate of its trend. The estimate of this trend at the end of history is then 'conditioned' using the latest values of CUBO

4 Non-tradables inflation is less affected by world prices and exchange rate fluctuations, and therefore tends to reveal the influence of domestic demand and supply conditions more clearly than tradables inflation.

along with other information about inflation pressures, including the extent of skill shortages in the labour market.<sup>5</sup> The difference between actual output and this estimated 'potential' level provides a summary measure of the degree of cyclical inflationary pressure present in the economy, and is known as the 'output gap'.

The output gap plays a key role within the Bank's Forecasting and Policy System (FPS) model. Within FPS, projections of inflation depend to a large extent on the projected evolution of the output gap over time. The assumed starting level of the output gap — which CUBO helps to determine — plays an important part in these projections.<sup>6</sup>

## 4 The NZIER Study

As noted in the previous section, CUBO is inherently cyclical in its behaviour, fluctuating over the business cycle. Over longer periods of time, CUBO may also be affected by structural changes in the economy. Changes in productivity, working patterns, cost structures, or technology could all potentially affect the average level of CUBO prevailing over time. For example, an economy-wide removal of penal rates for overtime could potentially increase the level of output possible without raising unit costs, resulting in a fall in CUBO (relative to any given level of output). In other words, the average level of CUBO could well change over time.

As figures 2 and 3 show, although CUBO clearly fluctuates throughout the business cycle there have also been distinct, long-lived periods during which the average level of CUBO has differed. The average level of the index was high from 1961 to 1974 but dropped in the period through until 1991. Since 1991, the average level has increased and has been only slightly lower than during the 1961 to 1974 period.

This shift down in CUBO from 1974 to 1991 can be given an economic interpretation. As the NZIER study notes, this was a difficult period for the New Zealand economy. It encompassed the effects of two oil price shocks, widespread economic deregulation and reforms, the 1987 share-market crash, and a severe global recession. Monetary policy was

5 This variable is also surveyed in the QSBO.

6 See Reserve Bank (2003).

tightened significantly over the latter half of the 1980s, with the aim of reducing high rates of inflation at the time. Between 1974 and 1991, growth in GDP, although highly variable, averaged just 1.8 per cent per annum. In contrast, growth in both the period between 1961 and 1973 and 1992 to 2003 averaged about 3 per cent. These differences would go some way to explaining the persistently lower level of CUBO from 1974 to 1991.

However, during the 43-year history of the QSBO, there have been significant changes to the sample and range of businesses covered, as well as the methodology used to weight the results of different sized firms. A key question addressed by the NZIER (2003) study was whether the sampling and weighting changes may have unwittingly led to changes in CUBO. This is clearly an important issue for the Bank given the potential for misleading inferences to be made about the business cycle and inflation.

The initial QSBO survey in June 1961 was restricted to 100 manufacturing and building firms drawn from the pool of NZIER members at the time. Additional sectors were gradually added to the survey during the early 1960s and the overall sample size was enhanced. Survey respondents were generally larger firms, but up until 1986 no attempt was made to weight individual firms according to size — as far as the calculation of CUBO (and other survey metrics) was concerned, each firm carried an equal weight.

The NZIER conducted a significant re-sampling exercise in 1986 with the aim of including all New Zealand businesses with more than 200 staff. All firms with fewer than six employees were excluded from the sample. Other firms were selected on a probability proportional to size basis, using the number of employees to proxy size. Firms from the existing sample still responding to the survey were retained. A new weighting system was adopted whereby individual firm responses — those for large firms — were duplicated based on their number of employees. In principle, CUBO would thus tend to be influenced more by the responses of larger firms than those of smaller ones.<sup>7</sup>

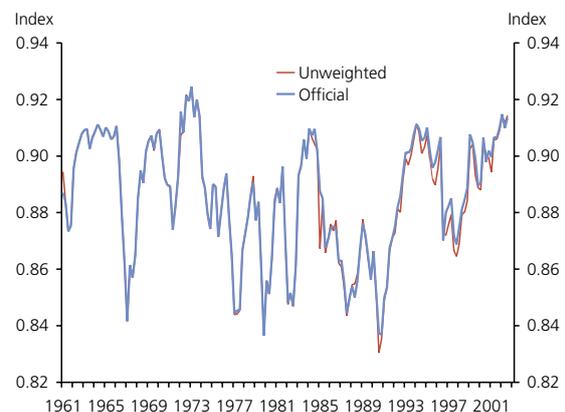
7 Similarly, other survey metrics -- such as expectations of the general business outlook -- would also tend to be influenced more by the responses of larger firms following this change.

There was a further re-sampling exercise in 1991, which saw a slightly different weighting system adopted. Firms were stratified (placed in one of several categories) based on the number of employees. The results for each stratum were weighted according to that stratum's share of total employment, to calculate the aggregate responses to the questions in the survey. This approach was retained following a further survey update in 2000.

The main conclusion to be drawn from these changes is that the 'official' CUBO series is essentially a sequence of somewhat different series. This raises the possibility of structural breaks in the CUBO series that are not due to economic factors. Statistical tests described in the NZIER study identify three likely breakpoints in the CUBO series in 1974, 1985 and 1991. The last two of these three dates correspond closely to periods when the QSBO survey was re-sampled.

To determine the effect of weighting changes, the NZIER study recalculated CUBO for the entire period since 1961 using unweighted firm responses for the entire period. As shown in figure 6, the recalculated index differs only marginally from the official published series, being just a little lower in the post-1986 period. This minor difference aside, the high-low-high pattern of behaviour shown by the official series is still clearly evident in the unweighted index. Moreover, the unweighted index continued to show the breakpoints evident in the official CUBO series when subjected to formal statistical tests.

**Figure 6**  
**Unweighted and official CUBO**

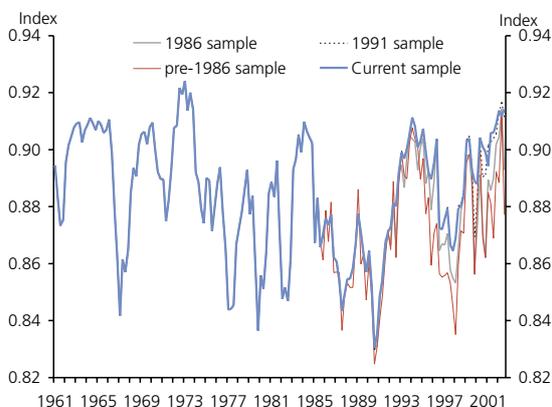


Although the above finding provides some confidence that changes to the weighting methodology used by the NZIER have had little impact on the CUBO series, there is still a question of how the process of re-sampling (the addition of new firms over time) has affected it. To examine the impact of re-sampling, the survey was divided into four sub-groups:

- The pre-1986 sample;
- The 1986 sample — the pre-1986 sample plus those added in 1986;
- The 1991 sample — the 1986 sample plus those added in 1991;
- The current sample — all firms, including those added in 2000.

Separate CUBO indices were calculated using each of these four samples and without weighting the firms by size.<sup>8</sup> Any differences between the series could therefore be attributed entirely to the different samples. At each of the re-sampling points, the average level of CUBO calculated using the updated sample was higher than the average level of CUBO calculated using the older sample (figure 7). However, test statistics suggested that this effect was only statistically significant when comparing CUBO calculated using the 1986 sample with that calculated using the 1991 sample.

**Figure 7**  
CUBO calculated by sample

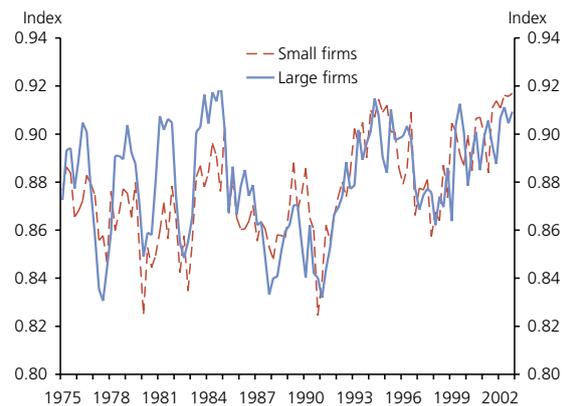


<sup>8</sup> Note that at each re-sample NZIER has added new firms to the existing sample, with firms in the existing sample (and still responding) carried over. Approximately 50 firms from the original survey are still active in the survey today.

An explanation for why CUBO has a tendency to shift up at the re-sampling points may reside in a life-cycle effect. New and upcoming firms may tend to operate at higher rates of capacity utilisation than more established companies (or those potentially in decline). In support of this explanation, figure 7 shows that the CUBO index calculated for firms in the pre-1986 sample (ie, those still surveyed today) has a considerably lower mean than the series calculated using all firms in the current sample.

Another issue examined is whether changes in the proportion of different types or sizes of firms occurring due to re-sampling may have caused CUBO to alter around the re-sampling points. An earlier study by Silverstone and Hughes (1992) had found that larger firms tended to have a higher CUBO than smaller firms during the 1977-91 period. An update of this analysis by the NZIER study, however, showed that this disparity has since largely disappeared (figure 8). Moreover, at least up until the 2000 re-sample (when the proportion of larger firms was increased), the relative proportion of small and larger building and manufacturing firms has actually been relatively constant over the survey history.

**Figure 8**  
CUBO by firm type



Since CUBO covers both manufacturers and builders, changes in the relative proportion of these respondents could also potentially have affected CUBO. However, that proportion has also remained relatively constant, at least until the 2000 re-sample (table 2). When separate CUBO indices are calculated for builders and manufacturing firms, differences in the indices appear to reflect differences in the

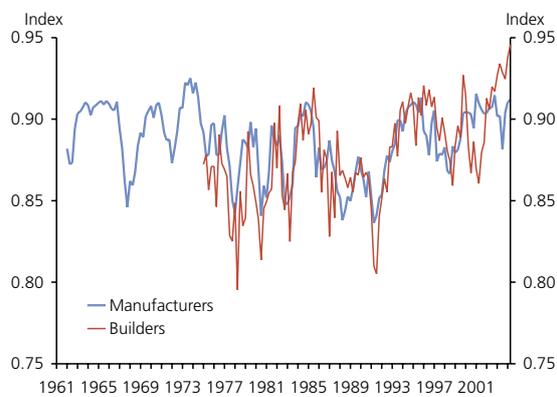
Table 2

Manufacturers and builders included in CUBO (average responses)<sup>9</sup>

Years	Number of builders	Number of manufacturers	Total	Builders as % of total
1975 – 86	52	148	199	26
1986 – 91	63	180	243	26
1991 – 99	62	167	229	27
2000 –	70	154	224	31

building and manufacturing cycles, rather than changes in the sample per se. However, the basic high-low-high pattern affecting the aggregate index is still evident in each of the two indices (figure 9).

Figure 9  
Builders' and manufacturers' capacity utilisation



As a final check on whether re-sampling was causing the high-low-high pattern, another version of CUBO was calculated by splicing together the individual CUBO indices (calculated using the different samples). This approach corrects for any differences in the levels of the indices calculated for each subgroup at the point where they cross over. The resulting series continued to show the structural breaks evident in the official series.

## 5 Alternative methods of calculating capacity utilisation

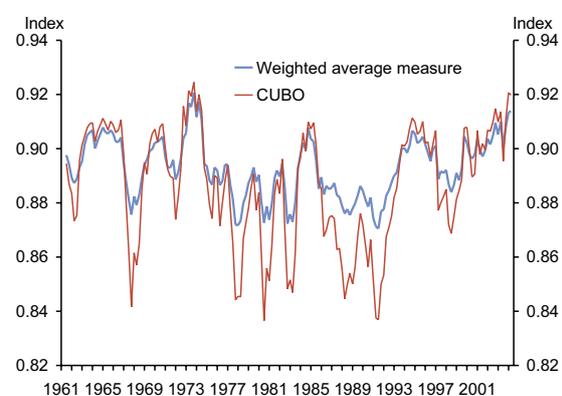
The Box in section 2 described how CUBO is calculated based on the median value of spare capacity. The index is then generally used as if it represents the 'average' level of capacity utilisation across the building and manufacturing sectors. However, the true survey average could well

be higher or lower than the median, depending on the distribution of responses. Consequently, another issue that the NZIER study considered was the extent to which CUBO would differ were it calculated as an average.

The use of open-ended categories for the extremes of the question on spare capacity (see table 1) means that a true survey average cannot be readily established. The uppermost of the five categories captures those firms saying they could increase production by 'over 20 per cent' before experiencing higher unit costs, but the actual percentage for each firm responding in this category is unknown (eg, a particular firm might well be able to increase production by 50 per cent with no increase in unit costs). Similarly, some firms responding to the 'none' category will essentially have negative spare capacity – that is, they are likely to be already experiencing a rise in their average costs of production.<sup>10</sup>

One way around this problem would simply be to assume that all firms answering 'over 20 per cent' can increase production by 21 per cent and simply assign 0 to all firms

Figure 10  
CUBO and a weighted average measure



<sup>10</sup> The use of open-ended categories could also potentially be an issue for the calculation of the median, but in practice the median never resides in these categories.

<sup>9</sup> Totals may not add due to rounding.

---

answering none. A weighted average of responses can easily be calculated. As shown in figure 10, such a series moves in a similar fashion to the official CUBO, but with less variance, particularly in downturns. This presumably reflects the limits placed on the outer categories.

A potentially better solution to the problem is to fit a distribution to the responses to the spare capacity question and, in effect, obtain estimates of these two 'tails'. Fitting a distribution is a relatively complex process, the details of which are beyond the scope of this summary article. The essence of the approach adopted by the NZIER study was to fit a lognormal distribution<sup>11</sup> to the spare capacity responses, extract the mean of this fitted distribution, and then use this to recalculate CUBO. Several variations around this approach were examined and are contained in the full report.

The overall finding of this work was that the alternative calculations of CUBO continued to show a similar profile to the official (median) series, albeit with a slightly different level over time. Each of these series continued to display a higher average up until 1974, before stepping down to a lower level through until 1991. Like the official series, they again step up to a higher average level after about 1991.

## 6 Concluding comments

CUBO plays a significant role in the Reserve Bank's analysis of inflation pressures, so it is important to be confident about the properties of this index. The NZIER study examined the history of the QSBO survey and the manner in which the capacity utilisation index is calculated. A key finding was that the behaviour of CUBO has not been significantly affected by changes in the survey sample and weighting methodology over time. Moreover, some alternative methods of calculating CUBO — for example, as a weighted average — do not appear to fundamentally alter the behaviour of the series. Although the levels of such series do differ slightly, they tend to show similar movements over time.

These findings provide some confidence about the resilience of CUBO as an indicator of business cycle and inflation pressures, suggesting that shifts in the average level of CUBO over time have been due principally to economic rather than 'methodological' reasons. In particular, the difficult economic conditions prevailing over the 1974 to 1991 period appear the most likely explanation for the lower average level of CUBO seen over that period.

## References

- Berndt, E and J Morrison (1981), "Capacity Utilisation Measures: Underlying Economic Theory and an Alternative Approach", *American Economic Review*, 71, 48-52
- Johansen, I (1968), "Production Functions and the Concept of Capacity," *Collection Economie Mathematique et Econometrie*, 2, 46-72
- Reserve Bank (2003), "An Introduction to the Forecasting and Policy System at the Reserve Bank of New Zealand," available at [www.http://www.rbnz.govt.nz/research](http://www.rbnz.govt.nz/research)
- Silverstone, B and W Hughes (1992), "Assessing the NZIER Measure of Capacity Utilisation," paper presented to the New Zealand Association of Economists Conference, University of Waikato.

---

<sup>11</sup> A lognormal distribution is skewed to the right and was chosen due to the skew evident in the distribution of responses to the capacity question.

---

# Promoting strong corporate governance in New Zealand banks

Alan Bollard, Governor of the Reserve Bank of New Zealand

*This is a reprint of an article developed by the Reserve Bank of New Zealand for external publication.*

The Reserve Bank of New Zealand has responsibility for registering and supervising banks in New Zealand. We do this for the purpose of promoting a sound and efficient financial system and for avoiding significant damage to the financial system that could result from the failure of a bank, as required by the Reserve Bank of New Zealand Act 1989.

The Bank's approach to banking supervision rests on three main pillars:

- A "self discipline" pillar, whereby we encourage sound corporate governance and risk management practices in banks.
- A "market discipline" pillar, whereby we seek to reinforce the incentives for depositors and other creditors of banks, and the market generally, to exercise scrutiny of banks and reinforce bank self discipline.
- A "regulatory discipline" pillar, whereby we apply some prudential requirements on banks, such as minimum capital ratio requirements and limits on lending to related parties, to further encourage sound risk management. We also monitor banks on a continuous basis, meet with the senior management of banks annually, and have extensive powers to deal with bank distress or failure events.

We have been reviewing each of these pillars in the last year or so, taking into account international and national developments in banking, and changes to the structure of the New Zealand banking system. In this context, we are reviewing the self discipline pillar, by looking at whether corporate governance arrangements in banks continue to be sufficient to ensure a strong level of risk management. We want to ensure that corporate governance arrangements are effective — not just for the benefit of shareholders, but also for the benefit of bank depositors and other creditors, and for the ultimate benefit of the New Zealand banking system. This recognises the fundamental role that governance plays in a bank — and in any organisation for that matter. Sound governance provides the foundation for everything else,

including maintaining systems and controls for identifying, monitoring, and managing business risks effectively. Conversely, poor corporate governance tends to undermine any other efforts to promote a strong risk management culture in a company, including a bank.

The Reserve Bank has a number of policies that seek to promote sound corporate governance and risk management in banks:

- All banks incorporated in New Zealand must have a non-executive chairman and at least two non-executive and independent directors, who must be unconnected with any parent company.
- Although the responsibility for assessing the suitability of a senior manager or director of a bank rests with each bank and its shareholders, the appointments are subject to the Reserve Bank's approval. The Bank's approval is based on a "negative assurance" test, whereby we check with other regulators and other sources to ensure that the appointee does not have a criminal record or any other attributes that would be of concern.
- All banks are required to publish quarterly financial and risk-related disclosures, including information on each bank's and banking group's capital position, concentration of credit exposures to individual counterparties, related party exposures, asset quality, provisioning, and market risks. Banks must also maintain and disclose a credit rating. These disclosures are intended to strengthen the incentives for the prudent management of risks, and assist depositors, among others, to make well-informed banking decisions.
- Each disclosure statement is required to include attestations, signed by a bank's directors, stating whether or not the bank has adequate systems in place to monitor and control risks, and whether those systems are being properly applied at all times. The directors are also required to attest that prudential requirements are being complied with and that exposures to related

---

parties (such as a parent bank) are not contrary to the interests of the local bank.

- Each bank director is required to sign their bank's disclosure statement and to certify that disclosures made are not false or misleading. If a disclosure statement is found to be false or misleading, directors are subject to potentially severe legal penalties, including substantial fines and imprisonment. In addition, directors may face unlimited personal liability for creditors' losses where creditors relied on a bank's disclosure statement that was false or misleading.

Taken together, these policies go a long way in reinforcing existing incentives for banks to maintain strong corporate governance practices. However, in view of the importance we attach to corporate governance as the foundation for sound risk management in banks, we are currently reviewing aspects of bank governance arrangements, with a view to assessing the scope for further improvements. That review is taking into account the wide range of corporate governance developments that have occurred in recent years, both in New Zealand and around the world. It also takes into account the particular characteristics of the New Zealand banking system, especially the fact that all banks in New Zealand are wholly-owned subsidiaries of other entities (mostly banks) or branches of foreign banks, and all but two banks are foreign-owned. These are important factors in shaping the dynamics of bank management and have important implications for bank governance structures. In particular, the nature of bank ownership has a significant effect on the roles of directors and senior management of banks in New Zealand; on the nature of potential conflicts between the interests of the parent banks and the interests of the banks in New Zealand; and the capacity of local banks to maintain core operations on a stand-alone basis if the parent bank fails or otherwise becomes dysfunctional.

With these factors in mind, the kinds of issues the Reserve Bank is taking into account in its review of bank corporate governance include:

- The role of a board of directors of a bank that is wholly owned by another bank. This includes the extent to which the local board places reliance on the parent

bank in satisfying itself on the local bank's systems and controls, the interaction between the local board and parent board, and the extent to which local senior management is accountable to the local board.

- The role of independent directors, the acceptable minimum number of independent directors on a bank board, and what an acceptable level of independence should be. Consideration is also being given to the role of independent directors in reviewing the dealings between a bank subsidiary and its parent, and in assessing the bank subsidiary's capacity to operate on a stand-alone basis.
- The role of board committees, especially audit committees and risk management committees, and whether these should be mandatory.
- The nature of disclosures made by banks of their corporate governance arrangements, including the functions and composition of board committees, the means by which boards have assessed the performance of management, and the means by which boards have satisfied themselves as to the adequacy of their banks' risk management systems.
- The scope of director attestations in bank disclosure statements, including whether attestations should be widened to include reference to outsourcing arrangements and some other specific risk areas.
- Whether the CEO of each bank should be required to make attestations in respect of their bank's risk management systems and related matters.
- The independence of bank auditors, including whether additional requirements might be appropriate to ensure an adequate degree of auditor independence.
- Whether it might be appropriate for the Reserve Bank to provide high-level guidance to bank directors, setting out our expectations of their role in overseeing their banks.
- The nature of the Reserve Bank's interactions with bank directors and auditors.

---

At this stage, these are just issues that the Reserve Bank is reflecting on. We have not yet reached any decisions on these matters. The Reserve Bank plans to release a Discussion Paper later this year to banks and other interested parties, setting out the Bank's preliminary thinking in these areas and seeking reactions to possible proposals for changes to corporate governance requirements for banks in New Zealand.

The 'bottom line' in all this, from the Reserve Bank's perspective, is that we want to be absolutely satisfied that bank boards in New Zealand have unambiguous authority

and capacity to ensure that their banks are being managed prudently in the interests of the New Zealand banking system. We want to be satisfied that the boards of banks in New Zealand are clearly in the driver's seat of their bank, within the constraints of being part of a wider banking group. We want the boards to ensure that their banks are able to maintain core business functions if the parent bank or other outsource functionality provider were to fail. And we want the boards to be fully accountable for their responsibilities.

## Supervising overseas-owned banks: New Zealand's experience

An address by, Dr Alan Bollard, Governor, Reserve Bank of New Zealand, to the Trans-Tasman Business Circle in Sydney

11 August 2004

In many respects the Australian and New Zealand economies are similar. With banking, however, there is a big difference - the New Zealand banking system comprises banks owned overwhelmingly from abroad, whereas in Australia the banks are mainly Australian-owned.

Of course, the main overseas-owned banks in New Zealand are Australian-owned banks and, in this sense, it might be said that banking is another thing we have in common. But that would be to overlook that banking authorities in countries with predominantly overseas-owned banks face some additional, and different, issues from those in which the banks are mainly locally-owned.

These differences include different roles in the supervision of banks, depending on whether one is the supervisor of the "home" country parent bank, or, as is predominantly the role of the RBNZ, a "host" supervisor of overseas-owned banks.

More broadly, and more importantly, for a country whose banking system comprises predominantly overseas-owned banks, there are different issues concerning the capacity of its banking system to weather a crisis. In this regard, overseas ownership can be both an undoubted strength, but also a potential risk.

There are also issues concerning the depth and breadth of financial services that overseas-owned banks provide to the local economy. In New Zealand we are a very welcoming host of overseas-owned banks, but we also look for our "guests" to be good guests, and to make a positive contribution to the New Zealand economy.

A number of things have happened recently to raise interest in these issues.

First, there has been the take-over by the ANZ of the National Bank of New Zealand, previously owned by the British bank, Lloyds TSB. This means that about 85 per cent

of New Zealand's banks, measured by total assets, are now Australian-owned. Australia and New Zealand also now share the same "big four" banks. The ANZ owns the merged ANZ National in New Zealand; NAB owns the BNZ; the Commonwealth owns ASB; and Westpac in New Zealand trades as a branch operation.

Second, early this year the New Zealand Minister of Finance and the Australian Treasurer put trans-Tasman banking supervision on the initial agenda of issues for working towards a single trans-Tasman economic market. The other issues identified for consideration were accounting standards and competition policy. On banking supervision, Ministers commissioned New Zealand and Australian officials to report jointly on trans-Tasman mutual recognition and harmonisation possibilities. This process is now well advanced, with a report currently before Ministers. I expect that Ministers will be indicating soon the direction to be taken.

Third, there have been issues in New Zealand in relation to the seemingly small amount of tax the banks have been paying.

And this has all been happening at a time when the RBNZ has been seeking to reinvigorate the regulatory arrangements for New Zealand's banking system, to give it more resilience in times of financial stress. This has been behind our policies to require systemically-important banks (and some others) in New Zealand to be incorporated in New Zealand, that better ensure effective banking sector corporate governance, and that place some constraints on banks out-sourcing key operations.

I will say more on these policies, and on our approach to banking supervision in New Zealand more generally, in a moment, but before doing that I would like to provide some context. Banking supervision policy needs to be viewed

---

against the backdrop of the importance of the role of the banking system in the economy.

## Why the banking system matters

Banks play a key role in mobilising and allocating the economy's resources - mobilising from those who, for the meantime, have surplus resources, and allocating to where resources can be put to best use. This role is particularly important for meeting the funding requirements of growing small- and medium-sized firms, given that these firms have limited abilities to access funding directly from the securities markets, or from abroad. With SMEs comprising a large share of the New Zealand economy, as is also the case in Australia, this makes the banking system important for the economy's growth prospects.

Equally as critical is the role banks play in the payments system. The overwhelmingly- used means of payment these days is the bank deposit, whether it be to pay for the groceries, to pay wages, to make settlement on a property transaction, or to settle dealings in the wholesale financial markets. And we use a number of bank-provided systems to make these payments. These include EFTPOS, cheques, telephone banking, and internet banking.

If it were not for the fact that a small number of banks dominate the banking system, bank failures might not be so much of a problem. But to shut down a bank with a 20 per cent plus market share, and thus to shut down the ability of perhaps 20 percent of the economy to access working capital and to make payments, is quite another thing - to say nothing of the risk that one bank failure can precipitate others, and wider financial system collapse.

Banks therefore play a critical role, but at the same time they are potentially fragile organisations. They are different from most other firms, because their ability to operate is so dependent on maintenance of market confidence in their financial soundness. If a manufacturing firm's solvency is in doubt, the public generally does not suddenly stop buying the product. But if there is material doubt in the marketplace about a bank's ability to meet its financial obligations, without official intervention to restore public confidence, it can no longer operate.

This fragility is inherent in what banks do. Their business is to take deposits and make loans, which means that, necessarily, they are very highly geared. No other industry operates with a capital ratio as low as 8 per cent.

And for deposit liabilities to serve as a means of payment, they need to be liquid. Hence, banks generally have a balance sheet structure also characterised by borrowing short and lending long. With this financial structure, the margins for error are fine and, in an uncertain and competitive marketplace, there are always risks.

Indeed, banks on occasion do get into trouble, and probably more often than is commonly thought. Recently in Australia, there have been some high profile incidents at the NAB. In the late 1980s and early 1990s, both Australia and New Zealand had much more serious incidents to deal with. There was the failure of state banks and the parlous condition of Westpac in Australia, and similar problems at the BNZ and DFC in New Zealand. Before that, in 1979, there was the problem at Bank of Adelaide, and both countries have experienced fringe financial institution failures.

None of this makes Australia and New Zealand unique. It is easy to find other countries that have experienced banking system difficulties that were even more serious. Sweden, Finland and Norway all experienced systemic banking collapses in the early 1990s, which required fiscal support in the vicinity of 5-10 per cent of GDP. In the Asian financial crisis later in the 1990s, Indonesia, Korea and Thailand all needed to provide fiscal support to their banking systems in excess of 30 per cent of GDP. Other cases include Japan (8 per cent of GDP), Spain (16 per cent) and the United States saving and loan crisis (3.2 per cent).

And these are just the fiscal costs. The cost of bank failures is not limited to the cost of rescuing banks or bailing out depositors. The real economy costs can be greater and longer term, including weakened investor and consumer confidence, higher borrowing costs, potentially protracted credit contractions and, in consequence, lower economic growth.

Given this combination of critical importance and potential fragility, no country can afford to view its banking system with indifference. The banking system is something that is

---

central to a nation's economy. And that applies whether the banks are locally- or foreign-owned. Indeed, some countries, including Australia, appear to see banks - at least the large, systemically-important, ones - as being so central to their economy as to preclude them from being foreign-controlled.

By contrast, in New Zealand, as a matter of policy, we don't restrict foreign ownership in banks, and all our systemically-important banks are foreign-owned. But, while we have seen no need to restrict foreign ownership, we do see a need for regulation of overseas-owned banks so as to provide reasonable assurance that the New Zealand banking system could weather a period of banking stress.

Sometimes it is suggested that having banks that are owned by substantial foreign-owned banks is actually an advantage, because the foreign owners can be relied on to mount a bail out if the need arises. While this may often be true, I think it would be imprudent to rely on such an assumption.

To be sure, experience indicates that, usually, parent banks do stand behind their overseas operations, since not to do so could seriously undermine market confidence in the parent's own financial position, and would involve writing off the franchise value embedded in their overseas investment. But there will be occasions when an overseas owner is either unable, because of its own financial weakness, or because of home country regulatory constraints, to provide that support.

These cross-border issues are something that many countries, particularly the growing number with a significant foreign bank presence, are having to come to grips with. Increasingly we are being confronted with the fact that shareholders, customers, and taxpayers, not only have different interests in the banking system, but increasingly reside in different jurisdictions.

## The international framework for supervision of multi-national banks

The internationally-agreed framework for the supervision of multinational banks, as devised by the Basel Committee on Banking Supervision, is known as the Basel Concordat (not

to be confused with the Basel Accord on capital standards for banks). The Concordat assigns clear, and deliberately overlapping, roles to the supervisors of multinational banks in those banks' "home" and "host" countries.

The home country supervisor is responsible for consolidated supervision of the global bank. It sets standards to be met on a group consolidated basis, for example, that group capital is sufficient to support the global business. (Some home country supervisors additionally set standards to be met by the bank in its home country alone - so-called "solo" standards.) Host supervisors, that is, the authorities in the other countries where the bank operates, are charged with supervising the bank in their individual jurisdictions. This framework recognises the reciprocal and over-lapping, though not identical, interests of the respective authorities, and the importance of sharing information.

As mainly a host supervisor, the prime role of the RBNZ is to promote sound banking by the overseas-owned banks operating in "our patch". We do this mainly for our own purposes, in recognition of the vital role of our banking system to the New Zealand economy, but there is also a significant element of contributing to the effective supervision of the multinational banking groups of which the overseas-owned New Zealand banks are a part.

In return, we have a close, reciprocal interest in the parents of the overseas-owned banks in New Zealand, and in the supervision of those banks by the relevant overseas authorities. With New Zealand's banks almost entirely foreign-owned, there is at least as large a probability that shocks to the New Zealand banking system will originate from abroad as from within New Zealand.

## RBNZ supervision for promoting banking soundness

The Reserve Bank of New Zealand, as the New Zealand banking supervisor, conducts its supervision of New Zealand banks that are overseas-owned within this internationally-agreed framework. (In New Zealand, unlike in Australia, the central bank is also the bank supervisor.)

---

The RBNZ's responsibility to supervise banks in New Zealand is prescribed in the Reserve Bank of New Zealand Act. This Act requires us to use the powers it gives to the Bank to promote the soundness and efficiency of the New Zealand financial system, and to avoid significant damage to the financial system that could be caused by the failure of a registered bank.

There are three central pillars to how we promote sound prudential management by banks, including by overseas-owned banks, in New Zealand.

First, we look to the banks themselves for self-regulation. This is about policies and structures that promote effective governance by banks' boards of directors, including effective oversight by local boards of the local banks' managements. We expect high standards of corporate governance from the boards of New Zealand banks, and this expectation is reinforced by some quite severe penalties that could apply should a bank's directors fail to properly discharge their responsibilities.

In these regards, we have observed a trend for overseas-owned banks in New Zealand increasingly to adopt "matrix management" arrangements, under which the reporting and accountability lines of local managements to their local boards may be weakened by direct reporting lines to overseas head-office managements. Hence, we took the opportunity when approving the amalgamation of the ANZ and National banks, to reinforce that the board of the merged bank must carry prime responsibility for oversight of the bank in New Zealand. Consistent with this, we have required that the chief executive of the bank must be appointed by, and be primarily accountable to, the New Zealand board.

We will be consulting with other systemically-important banks about the application of similar requirements to them. We are also reviewing more generally the governance arrangements in banks to ensure that bank boards are sufficiently empowered to oversee the management of their bank in New Zealand and that they bear the appropriate accountabilities in performing their responsibilities.

A second pillar is market discipline. For many years, banks in New Zealand have been subject to obligations to make quite comprehensive quarterly financial and prudential disclosures

to the market-place. These disclosures, combined with a policy of not bailing out failed institutions, help to strengthen market scrutiny of banks, and the market disciplines that go with that.

This is an area of policy where the RBNZ has played a leading role, although other countries' banking authorities too are now seeing an important place for disclosure by banks as a means of reinforcing prudential discipline. Globally, banks are making much fuller disclosures to the market than used to be the case, and that trend will be reinforced by new international disclosure requirements being introduced as part of the new Basel 2 capital requirements, on which I will say a little more in a moment.

Third, we have some regulatory and supervisory requirements. Although our regulatory framework is somewhat less intrusive than that of many countries, it nonetheless contains most of the standard features. The IMF in its Financial Sector Assessment Programme (FSAP) review of the New Zealand financial system last year confirmed that we have a good model for host country supervision.

The centre-piece of the regulatory requirements is a requirement that banks in New Zealand be adequately capitalised. We apply the standard Basel I capital accord in much the same way as do other supervisors. In the case of overseas-owned banks, we require the bank in New Zealand to be sufficiently capitalised in its own right, with not less than 8 per cent capital. This serves two purposes. It reinforces the responsibilities of the local board and management, since they have a balance sheet for which they are clearly responsible. And it provides a financial buffer should the bank incur losses in New Zealand, or should the parent bank fail and its New Zealand subsidiary have to be "cut loose".

## **Banking supervision and failure management**

This brings me to the second element of our statutory responsibilities - to avoid significant damage to the financial system that could be caused by the failure of a registered bank. Absolutely critical in this situation would be that the New Zealand authorities have the ability to take control of

---

the failed bank in New Zealand. Without that ability to take control, and to take control quickly, we could not manage the situation.

And in the case of a systemically-important bank, just shutting the doors generally would not be an acceptable response. In most cases, our objective would be to maintain the provision of critical banking services, but without resorting to a bail-out; certainly not a bail-out of existing shareholders, and desirably not of depositors and creditors, who could expect to bear some of the losses. To achieve those outcomes, the New Zealand authorities would need to have access to the critical operating and information systems necessary to operate the bank, and more or less immediately on the failure occurring.

I should hasten to add that none of this means that, in the event of a bank crisis involving an overseas-owned bank, the RBNZ's first preference would be to act unilaterally. In most situations a co-ordinated response involving home and host country authorities would be much preferred - from both authorities' points of view.

But a co-ordinated response requires that both authorities have a capacity to manage the situation in their jurisdiction. It would also be unrealistic to assume that co-ordination would always be readily achievable, as there would be a risk that the interests of the different regulatory authorities would diverge. This could occur if, for example, an economic shock places stress on the financial system in one country, but not the other; or the respective regulators in the two jurisdictions have different priorities in terms of the future of the failed bank.

This is why we focus on ensuring that we have an effective failure-management capacity in respect of banks operating in New Zealand, including those that are owned from abroad. That in turn requires those banks, at least those that are systemically-important, to have key systems and key management available, either on the ground, or at least within our jurisdictional reach. This is another issue we addressed with the ANZ in the context of the ANZ-National Bank amalgamation, and intend also to take up with the other systemically-important banks.

Another key requirement, if local authorities are to be able to manage a bank failure, is that there is clarity about the local bank's balance sheet, that is, clarity on what its financial obligations are, and on what assets it has to meet those obligations. That clarity is not readily achievable for a bank that is a branch of an overseas bank because, legally, the assets and liabilities of a branch are inseparable from those of the overseas parent or head office. This is the main reasoning behind most countries' requirements that systemically-important banks be incorporated locally, a requirement that now also applies in New Zealand.

All systemically-important banks in New Zealand currently comply with the requirement to be incorporated locally, except for Westpac. Westpac has always been a branch bank in New Zealand. It has been engaged in discussions with us on this issue for some time, and currently has before us a proposal under which it would "buttress" its present branch structure, in ways it believes would deliver the policy outcomes we are seeking. However, as the proposal is still under our consideration, it would be inappropriate for me to comment further on that alternative structure at this time.

## **Are these RBNZ banking supervision requirements burdensome?**

Our requirements of overseas-owned banks in New Zealand are not onerous or costly for those banks. Let me explain why not.

First, there is nothing in what we require that APRA would not require of an overseas-owned bank that was systemically important to Australia. I say "would not" because Australian policy to date has precluded systemically-important overseas-owned banks in Australia.

Second, the Reserve Bank of New Zealand Act requires that we promote the efficiency as well as the soundness of the New Zealand financial system. This is a responsibility we take seriously, and it is reflected in what we do in a number of ways. Not least, we see retaining the openness of the New Zealand banking system to overseas ownership as important for promoting competition and innovation in the New Zealand banking market.

---

Another feature of our approach to banking regulation, as it applies to all banks in New Zealand, not just overseas-owned banks, is that it is largely “principles” based, and relatively light on “black-letter” regulation.

Our approach to banking supervision is sometimes described as “light-handed”. That is a description that may give the wrong impression, at least if it gives the impression that we are not serious about our role. We are serious about the principles we apply, and in seeing to it that they are applied. But we endeavour to supervise in a way that not only is effective, but also is cost-efficient, including for the banks. The way to achieve that, we think, is to get the basic structures and incentives right - particularly the incentives for directors to monitor and to exercise effective oversight so as to avoid having to disclose bad news.

Also, as already outlined, our supervision of overseas-owned banks is conducted very much within the internationally-agreed framework of “home-host” supervision. We seek to ensure that our requirements do not cut against home-country requirements and, consistent with meeting our own responsibilities, dovetail as much as possible with those requirements.

My more general point here is that avoiding unnecessary compliance costs is something we attach importance to. On the whole, I think we have been quite successful in achieving that. And, as part of the effort to enhance trans-Tasman co-ordination, we will be reviewing our requirements to see where we could achieve better alignment.

It also bears stating that our requirements do not deny the many overseas-owned banks operating in New Zealand the benefits of large overseas-bank parentage, nor overseas banks the benefits of a New Zealand presence.

New Zealand banks with overseas parentage benefit a lot from that parentage. Parent banks generally are a source of capital, a source of rating strength, which helps to lower New Zealand bank funding costs, as well as a source of risk management and systems expertise.

For overseas banks, New Zealand is an open and welcoming market, with a level playing field for local and overseas participants. And for the Australian-owned banks, New

Zealand has provided a significant addition to their home market, and one that, in recent years, has been very profitable. With operations on both sides of the Tasman, the Australian banks are well placed to service trans-Tasman customers, and our banking supervision requirements place few, if any, impediments in the way of that.

## Next steps

Having said all that, the recent report to Ministers that I mentioned in my opening remarks has usefully sharpened the focus on achieving increased coordination of trans-Tasman banking supervision. We already have a formal Memorandum of Understanding with APRA and we will be looking to work with APRA on how best the two organisations can coordinate, both in terms of day-to-day prudential supervision and crisis management. New Zealand certainly will be prepared to carry its share of the regulatory burden under such co-ordinated arrangements.

At the same time, co-ordination need not mean that our requirements need always be identical to those of APRA. On some matters we may adopt different approaches. One that is starting to receive some publicity concerns the implementation of new Basel 2 capital adequacy standards for banks. Under Basel 2, national authorities will have a choice between adopting a more sophisticated, internal model-based, approach to calculating capital requirements, or a simpler methodology that is closer to the existing Basel 1 regime.

APRA has indicated that it proposes to apply the internal model-based regime in its consolidated supervision of Australian banks’ global operations, which, of course, encompass their operations in New Zealand. In considering this issue, we will be looking to ensure that the adoption of Basel 2 does not result in a general weakening in the capital adequacy of New Zealand banks, and our general preference is for a simpler rather than more complex approach, in part to keep compliance costs down. But we are also aware that if our and APRA’s requirements are not reasonably well-aligned, that could increase compliance costs, and we will be seeking to avoid that.

---

More generally, given the high degree of integration of the New Zealand banking system with the Australian banking system, there may well be an opportunity to develop arrangements for trans-Tasman banking supervision into a world-class model of “home- host” supervision. One area where more coordination may be possible is banks’ disclosure requirements, where international developments in accounting and disclosure standards will have implications for both countries. Another area where more structured co-ordination obviously would be useful is in crisis management.

## Concluding remarks

By way of conclusion let me recap on what I see as the main points.

First, the banking system matters. For any country, the banking system is one of the most critical elements of its economic infrastructure. This is as true for a country whose banking system comprises mainly overseas-owned banks, as it is for one whose banks are predominantly locally-owned. In that sense, while almost all the banks in New Zealand are overseas-owned, the banking system as a whole must still meet New Zealand’s needs - in fair weather and foul.

Second, it is essential that the New Zealand authorities can supervise the New Zealand banking system and can respond quickly, decisively and effectively to a banking crisis. All countries need to shoulder the responsibility for the sound functioning of their banking systems. This is why we require systemically-important banks in New Zealand to be incorporated locally. And it is why we require such banks

to maintain the capacity to function on a stand-alone basis, if required. Without that capacity, there is a material risk of the banking system becoming dysfunctional in a banking crisis. Avoiding that risk we see as being fundamental to the soundness of the New Zealand financial system. The measures we are introducing to counter that risk recently have been affirmed by Standard and Poors, who have noted that they “could well enhance the strength of the New Zealand banking sector and its ability to withstand a period of financial stress”.

Third, the Reserve Bank is concerned to ensure that its supervision is efficient as well as effective. This is reflected in our emphasis on principles, and structures that emphasise incentives and accountabilities, rather than detailed prescriptive, or “black-letter”, regulation. It is also reflected in the internationally-agreed framework for the supervision of international banking groups, within which we operate. This sets up a basis for co-ordination amongst home and host country authorities, and avoids unnecessary duplication.

With regard to the supervision of trans-Tasman banks, we already have a formal arrangement with APRA which provides, mainly, for information sharing. In the period ahead we will be looking to build on that arrangement, in a way that ensures that our supervision of Australian-owned banks in New Zealand is both effective and cost-efficient. Indeed, with the New Zealand banking system now comprising predominantly Australian-owned banks, there exists an opportunity to develop arrangements for the supervision of trans-Tasman banks that would be a world-class model of cross-border banking supervision.

---

# What's happening in the property sector?

A speech to the Property Council of New Zealand, Alan Bollard, Governor, Reserve Bank of New Zealand.

2 September 2004

## Introduction

The property sector, in the broadest terms, is something that fascinates most people. Most New Zealanders own or aspire to own some kind of property, and property forms a significant part of the wealth of many of New Zealand's households. As a country with a substantial reliance on agriculture, both currently and historically, the buying and selling of rural properties also has a particular potency in our national imagination. The Reserve Bank, by contrast, has a technical interest in the property sector, though of course we too know how perceptions can be everything.

The Reserve Bank is charged with two key tasks, aside from issuing currency. They are implementing monetary policy to achieve price stability, and maintaining the stability of the financial system.

Changes in asset prices, for the most part property prices, can have consequences for both of these tasks. Most asset prices do not directly enter the Consumer Price Index; the prices of new houses and cars are included, but that's about all. However, even changes in the prices of assets that are not included in the CPI can have an indirect effect on consumer prices. For example, a sharp lift in commercial property prices or rentals ultimately impacts on the 'cost of doing business'. In turn, that has an impact on the prices faced by consumers.

Changes in asset prices can also have consequences for financial stability. We know from the experience of the late 1980s that a large fall in commercial property prices can result in some large firms running into serious financial difficulties, with major consequences for financiers and banks. It is important that our financial system is robust enough to withstand such shocks.

So, in short, the property sector is definitely on our radar screens. What I want to do, therefore, in this speech is give you an idea of how we view the sector and its various parts.

Of course, one can start with the core economic idea of supply and demand. However, we also know that the property market behaves differently from the market for consumer goods. In the property market, supply tends to be relatively inelastic. Or rather, it tends to respond quite slowly to changes in demand.

In fact, the demand for buildings can increase dramatically as output rises. Consider a single firm. The value of the building stock that a firm uses can be large relative to the annual output that the firm produces. Hence a rise in output can result in a change in demand for building stock that is even larger, in value terms, than the initial rise in output.

We know that the amount of new building work that can be put in place in a short time period is limited. For one thing, new buildings, and even alterations, involve design time, and time to get through the planning process. Second, there is always a limit on the building industry's ability to meet demand. Such bottlenecks have been in clear evidence over the past couple of years as the demand for new housing and apartments has accelerated.

Because supply often lags demand in the property market, there is the potential for a mismatch between the supply and demand, and this can work in both directions. When demand for property cools, due to a slowing economy, it's hard to switch off new supply in the pipeline. So a rapid rise in prices can be followed by quite significant declines later on. All property sectors tend to exhibit price cycles, with these cycles reflecting this mismatch between demand and supply.

Demand for most kinds of properties over recent years seems to have outstripped increases in supply -- prices and rentals across most property classes have generally been moving upwards and vacancy rates downwards. We can attribute much of that strength directly to developments in the broader economy. Whilst it hasn't been all plain sailing, this year the New Zealand economy entered its fifth year of unbroken growth. Just as that expansion has drawn heavily

on the economy's surplus labour and productive capacity, so too has it fuelled the demand for property. When you consider some of the causes and consequences of that growth, it's not hard to see why the property sector has fared pretty well over this period. Some of the following statistics may help to put some perspective around the demand for property. Since 1998/1999, when the business cycle caused by the Asian crisis and drought bottomed out:

- the total output of the economy has expanded by about 20 per cent;
- the volume of retail sales has expanded by about 25 per cent;
- export volumes have risen by nearly a third, driven heavily by the primary sector;
- the annual operating surplus in the agricultural sector has risen, in real terms, by around 35 per cent;
- the number of people employed, either full time or part time, has increased by around 220,000;
- net immigration has added 67,000 new people to the normally resident population, and when increases in foreign students and those here on work permits are included, the figure is considerably larger still;
- the annual number of tourists visiting New Zealand has risen by nearly 1 million; and
- there are about 40,000 more business units now operating throughout the country across a variety of industries.

Clearly all of that will have helped to fuel the demand for property in some way. But each segment of the property market is different and each has its own drivers. So let me move on and make some remarks about the major areas of property — rural, commercial and industrial and housing.

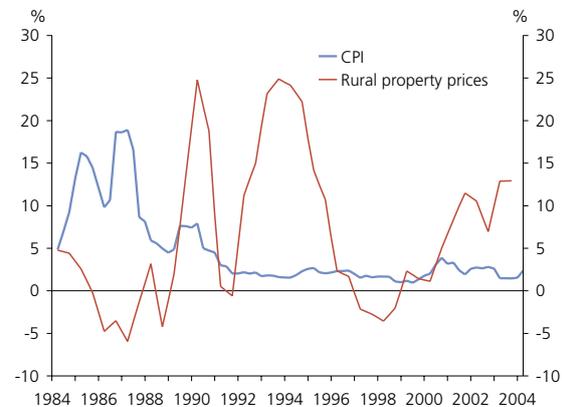
## Rural property

Prices of various rural land types — dairy, fattening land, etc — have tended in the past to move in a similar fashion. This suggests that a similar set of factors is driving the demand in each sector. World growth, which in turn affects commodity

prices, is probably one of these factors. Another reason why the prices of different land types tend to move together may be competition for land between different primary sub-sectors. For example, increased demand for dairy products will tend to increase the value of land used for dairying, but the effects are also likely to be felt by other sub-sectors, lifting the price of land that is currently being used for other purposes.

Figure 1 shows changes in rural property prices and changes in the CPI. The profiles of the two series are clearly different. Consumer inflation was very high in the mid 1980s, but then fell to 2 per cent in late 1991. It has generally stayed low since then. In contrast, rural property prices showed large rises in the late 1980s and early 1990s before levelling off. Rural property prices have shown further gains in recent years, and increased by 12.9 per cent in calendar year 2003.

**Figure 1**  
Rural property prices and the CPI  
(Annual per cent change)



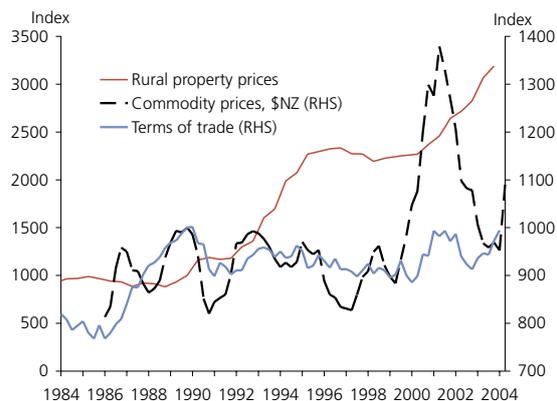
What caused the large rises in prices that began in the late 1980s and continued over the 1990s? The levelling off in prices in 1991 appears to have been the result of a sharp fall in world commodity prices in the second half of 1990 on the back of a weak world economy.

The first thing to note is that rural property prices fell through much of the 1985-89 period, following the abolition of subsidies. In real terms, this fall was severe. In figure 1, we can view the gap between the rural property prices and the CPI as being the change in real property prices. The fall in

real prices in the 1980s was huge, since nominal property prices were falling at the same time as consumer inflation was high. Given this, a lot of the rise in property prices that occurred in the early 1990s could be viewed as 'catch up' with real prices correcting back to a more normal level.

However, other factors were also at work -- the exchange rate eased in late 1988 which flowed through into export prices; interest rates fell sharply between 1990 and 1992; a new government was elected in late 1990 and began carrying out further reforms; confidence was returning to farmers after they realised that they could in fact operate profitably without subsidies; and growth in the economy overall began to rise in early 1993.

**Figure 2**  
**Rural property prices, commodity prices and**  
**merchandise terms of trade**  
**(Indexes with base 1989Q4 = 1000)**



What has driven the rise in rural property prices since 2000? The initial boost came from an extraordinary rise in export earnings which occurred in the 18 month period beginning in June 1999. During this period world prices for our exports rose strongly, while the exchange rate declined. Figure 2, which shows property prices in index form (i.e. in level terms rather than growth rates), illustrates the strong climb in commodity prices as expressed in New Zealand dollars.

On top of this climb in export prices, export volumes also rose. Export earnings peaked in December 2000 and have declined a bit since then. Even so, they are still at a much higher level than they were in the early 1999. This is despite the current strength in our exchange rate (which, I

might add, is due in part to the weakness of the US dollar). Fortunately our exchange rate appreciation has occurred at a time when world commodity prices have been high. Also, given the speed with which our currency has appreciated, some exporters still have significant foreign exchange cover in place. They had taken out much of this cover in the period when the exchange rate was low. This has partly offset the impact of the exchange rate rise on their earnings.

Another factor that drove land prices in the early 2000s was the conversion of farms to dairying. Over the second half of the 1990s, dairy prices rose relative to those for alternative pastoral products like meat and wool, with the positive effects of the Uruguay GATT round becoming apparent. The formation of Fonterra may have also been a factor in the move to dairy.

In the last two years, other forms of farming have come to the fore. The continuing fall in sheep numbers in the EU, and residual anxieties about BSE and CJD in Britain, have pushed lamb prices to new highs. At the same time, the BSE outbreak in the US, which was traced back to a Canadian herd, has resulted in North American beef being virtually shut out of the world market. With demand for beef from North Asia continuing to be strong, world beef prices have risen sharply.

While the outlook for agriculture remains positive, it is too early to say that prices for the commodities that we produce have shifted up a level and will stay there. It can be argued, for example, that increasing demand for dairy products from China means that our dairy prices will move to a higher level. Even if this was the case, it would be unwise to think that commodity price cycles would disappear altogether -- prices will continue to cycle, even if they cycle around a higher level.

The National Bank, in its Rural Report of March 2004, suggested that even now rural land might be too expensive. The National Bank notes that the value of an asset in economic terms is the present value of future expected income discounted at the required rate of return. The National Bank estimates that for the future income stream to equal the current price of rural land a discount rate of around 4 per cent is required, which is very low. Provided

that the future income stream is being estimated correctly, this suggests that rural land is currently overvalued.

Analysis that we have undertaken at the Reserve Bank indicates that the ratio of rural land prices to agricultural operating surplus is now above its long run average value. However, the ratio is not yet out of line with the values that it reached in the mid 1990s.

Whether there will be a downward adjustment in prices presumably depends on whether market participants also reach the conclusion that rural land is overvalued. Rural dwellers often remind us that non-economic factors - - lifestyle considerations in particular -- are also important reasons for wanting to hold rural land.

## Industrial and commercial property

The prices of industrial and commercial buildings rose sharply in the mid 1980s during the growth surge that followed the first moves to deregulate the economy. By industrial buildings I mean factories, cool-stores, warehouses and the like. By commercial buildings, I mean offices, retail buildings, hotels, and other similar places of business. Looking back, we can see that we had a price bubble. (Bubbles are often difficult to identify when they are occurring, but are clearly obvious once they've burst.)

In a bubble, asset prices become disconnected from reasonable expectations of the future earnings of those assets. Markets fail to get prices right. This mis-pricing gets reinforced and exaggerated by herd behaviour, or irrational exuberance. Investors convince themselves that someone else will pay even higher prices for the assets in future.

In the case of commercial buildings in the 1980s, the pace of construction was frantic, as supply rose to meet the high demand which was manifesting itself in high prices. Anyone who was around at that time can remember the cranes that cluttered the skylines of our major cities. While prices for industrial properties also rose sharply in the 1980s, construction of new industrial buildings was actually fairly steady during this period.

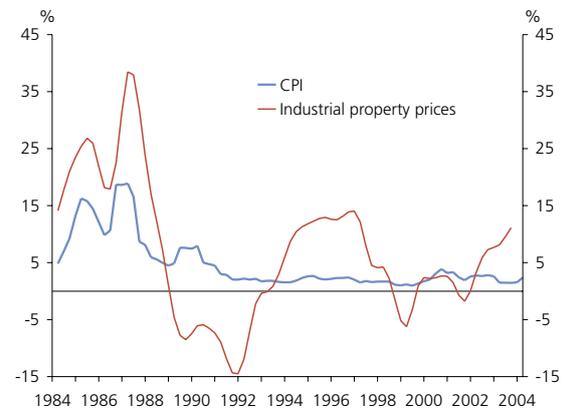
The bubble that occurred in the mid 1980s was not limited to business property. The SE40 share market index doubled

in one year and then halved in the following year, after the crash. Nor was the bubble limited to New Zealand; it occurred in other countries too, notably in the US.

The bubble burst in late 1987 when the US share market crashed. It suddenly became obvious that asset prices had been out of line with economic fundamentals. We had witnessed a sustained period of misplaced investment, with the returns from this investment proving to be low. Misdirecting resources in this manner can be very costly for the economy.

The consequences for New Zealand were serious. Some companies went bankrupt and the economy went into a recession. It didn't recover from this recession until 1992. In terms of the loss of output relative to potential output, this recession was probably New Zealand's second worst of the twentieth century.

**Figure 3**  
**Industrial property prices and the CPI**  
(Annual per cent change)



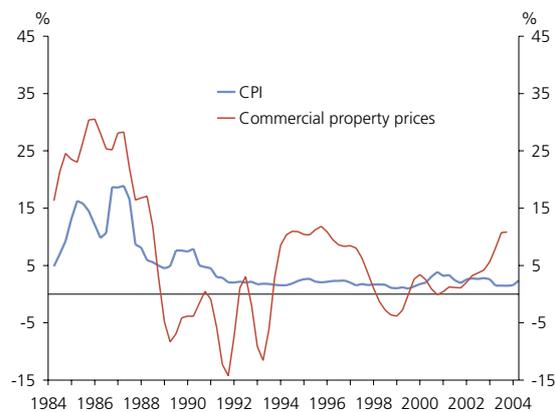
When the recovery did arrive, it was strong. Manufacturing, much of which had been restructured and was running under new ownership and management, began to thrive. For a number of years we had double digit percentage growth in manufactured export volumes. Consequently, the demand for industrial property rose sharply. In the newly deregulated environment of the labour market, employment growth was strong, and unemployment began a steady decline. The growth in service sector employment increased the demand for commercial property.

The Asian crisis and the drought of 1997 slowed demand for both industrial and commercial properties. But prices have

lifted again in recent years, fuelled by the economic growth stemming from all the factors I mentioned earlier.

In general, these recent rises do not appear to be cause for concern. As I see it, we have learnt from the lessons of the past, especially the lessons from the 1980s. An incremental approach to industrial and commercial building appears to have been adopted. Little speculative building is being done, and arrangements regarding the tenancy of new buildings are often finalised before building begins. Additions and alterations continue to be a major component of total building activity, with office space being refurbished in order to meet clients' needs. The clients too have probably played their part, by moving to open plan arrangements and paring back their requirements for floor space. I hope these trends continue.

**Figure 4**  
**Commercial property prices and the CPI**  
**(Annual per cent change)**



I do see some future challenges for the commercial and industrial property sectors. Building consent data over the past 12 months have indicated an increase in new building intentions in the sector. High levels of activity in the housing and apartment sectors have deflected some resources and labour away from the commercial building sector. Those pressures are likely to remain in the near future. In addition, planned government investment in roading and other areas of infrastructure will continue to place heavy demand on civil engineering and related professions as well as the demand for labourers, many of whom might otherwise choose to work in the property construction field.

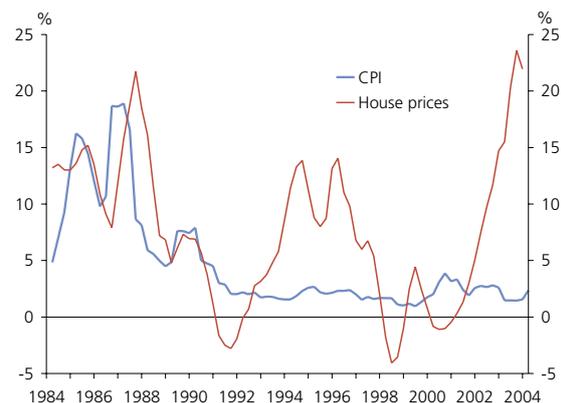
In fact, there are currently pressures on factors of production across all sectors of the economy. For a number of years now, firms across all industries have been reporting that it is getting harder to recruit both skilled and unskilled labour. There appears to be an emerging view on the part of employers that, over the last 10 years or so, the country as a whole has not done enough training, particularly in the skilled trades area. Hence, delivering on commercial construction projects over the next few years will be a challenge requiring careful management.

## Housing

I'd now like to make some comments about New Zealand's residential property market, which has experienced a strong cyclical upswing over the past three years. During that period, we have seen record numbers of house sales together with a significant lift in the construction of new dwellings, both houses and apartments. Unlike the residential upturn during the mid 1990s, which affected mainly the upper North Island, this one has been spread across the country, including many parts of the South Island.

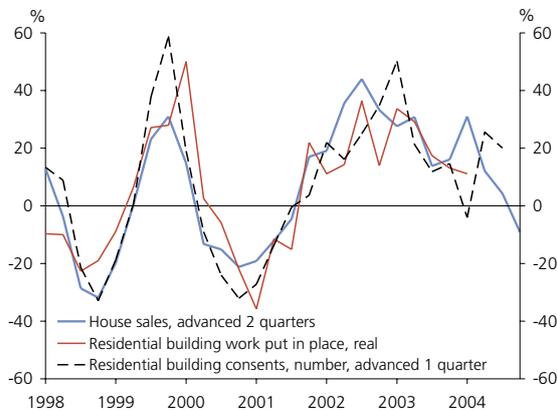
House prices have increased substantially and by significantly more than we've seen in other New Zealand property markets over the same period. Indeed, Quotable Value New Zealand data suggest that house prices measured across the country as a whole have increased by nearly 50 per cent over the past three years. In some regions, the increase has been much more dramatic than that.

**Figure 5**  
**House prices and the CPI**  
**(Annual per cent change)**



Most market observers, the Reserve Bank included, agree that the upswing has now peaked and that demand is gradually beginning to cool. House sales, which are a good barometer of demand and a good leading indicator of future building activity, have edged down over 2004. The number of new building consents issued, although fairly volatile, appears to be easing after rapid growth in both 2002 and 2003. We're also now seeing some cooling in the rate of growth in credit extended for housing purposes.

**Figure 6**  
**Indicators of housing activity**  
**(Annual percent change)**



Nevertheless, both house sales and new consents remain at high levels by historical standards and current residential construction activity is very high as the sector continues to work off a considerable backlog of demand built-up over the past couple of years.

To some degree, the residential construction sector has been able to enhance its own capacity to supply. The Household Labour Force Survey shows that employment in the wider construction sector has risen by nearly 40,000 people since 2001. A number of building companies have gone to great lengths to overcome shortages of labour either by accelerated training or by tapping into labour markets abroad. Even so, the sector remains stretched, with clear shortages of particular skills. The frustration households seem to face in finding a builder, plumber or other tradesperson at reasonable notice these days has become part of the national folklore.

In talking about the various property sectors, it's fair to say that economic analysts in New Zealand, including analysts at

the Reserve Bank, tend to focus more heavily on the housing market than other markets. One of the reasons for this is simply that this is where much of the action has been over recent years; activity and prices in the markets for most other types of property, other than perhaps rural property, have been relatively more subdued. Another reason is the role that residential construction plays in economic growth. Residential construction accounts for around 6 per cent of total GDP, which is about twice the amount accounted for by non-residential construction. (However, if 'other construction', which includes infrastructure spending, is added to non-residential construction, the amount gets closer to the residential construction total.)

Another reason why analysts are interested in the housing market is the 'wealth effect'. A rise in house prices increases the wealth of households. In fact, in recent times, house prices have tended to be the major driver of changes in household wealth. A rise in household wealth in turn results in a rise in household consumption; with households feeling richer, they tend to spend more on consumption items. Given that private consumption accounts for nearly 60 per cent of expenditure on GDP, it can be seen why we take such an interest in the 'wealth effect', and what house prices are doing.

Over the past three years, these linkages have been of particular interest to monetary policy. The upsurge in housing activity and construction has added directly to domestic inflation pressures. Residential construction costs, as measured by the Consumers Price Index, have increased by nearly 20 per cent, contributing significantly to overall inflation. We've also witnessed very strong household spending over this period which appears to have been reinforced by the rapid increase in house prices. Whilst I would not want to overplay the significance of housing and construction in our policy decisions - stronger inflation pressures have been evident in many other parts of the domestic economy as well - we have clearly had to take the strong housing sector into account when determining policy settings.

The recent period of strength in the residential property market is hardly unprecedented in New Zealand. The early 1970s, the early and late 1980s, and the mid 1990s were

also periods marked by intense activity in the housing market and strong house price inflation.

There were some unique features to each of those cycles, but also some common drivers. Each coincided with a substantial acceleration in population growth to levels well above normal, due mainly to a spurt of high net immigration - more arrivals and fewer departures. Each cycle was also reinforced by some other stimulus, such as a lift in export prices received from abroad, fuelling household incomes.

A sharp lift in net immigration and the sharp improvement in export returns from about 2000 through to 2002 were also catalysts for the recent upturn, although there are now indications that the migration pressures on housing are easing. Figure 7 shows estimates of the annual demand for dwellings from migrants. These estimates, which are indicative only, were derived by assuming that the number of persons per household would be the same for migrants as for the rest of the population. As figure 7 shows, the demand from short term visitors has been negative over the last year, as the number of visitors leaving the country has outnumbered those arriving. This has largely reflected a very sharp fall in the number of short-term overseas students in the country over the past 18 months (i.e. those here for periods of less than a year).

There have also been other factors acting to reinforce demand for new dwellings in recent years. These include the drift of New Zealanders to warmer regions and into the

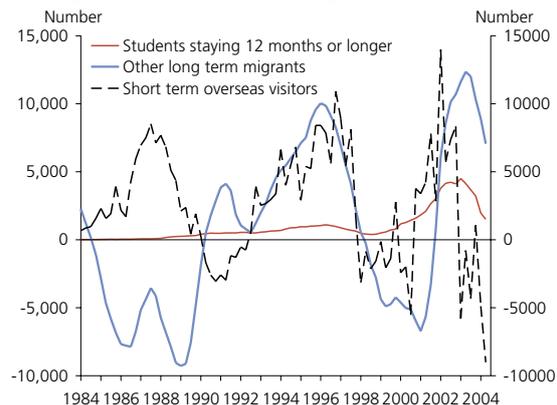
cities, as well as social changes that have seen the average number of persons per dwelling steadily decline. Life-style changes and preferences have increased the demand for inner-city apartments and more exotic alternatives to the traditional New Zealand family home - the one bathroom, three bedroom bungalow. Strong economic activity, which means more income and more jobs, gives households the capacity to accelerate these changes. But when the supply of such housing is inelastic - as it always is in the short-run - the result is upward pressure on house prices and construction costs.

Another source of demand during the latest cycle, at least in its early stages, has been the significant demand for properties by non-residents particularly in coastal and lakeside regions. The relatively low New Zealand dollar up until about 2002 helped to make such properties particularly attractive to foreign buyers. Although we have no reliable way of telling how much of New Zealand's housing stock is now owned by people living abroad, that proportion has almost certainly increased substantially over the past few years. Demand coming from people living abroad is likely to be less sensitive to monetary policy than demand coming from resident population.

The housing markets in some parts of the country where such activity was prevalent a year or two ago, such as Nelson, appear to have been cooling recently. The significant rise in house prices in these regions following a surge in demand, coupled with the stronger New Zealand dollar, has presumably dampened overseas investor enthusiasm to buy such properties. However, by all accounts, Australian investors are still active in purchasing New Zealand properties at the moment.

All of the factors I have mentioned help to explain why housing demand has been strong, but they are not the full story. One of the more noteworthy aspects of the housing upturn has been that very similar cycles have been seen in a large number of other countries around the world. Along with New Zealand, many countries, including Australia, the United States, United Kingdom, Ireland, France, Italy, Spain, and some other OECD countries, have all experienced very strong housing markets with significant increases in house prices in recent years. In many cases their upturns started a

**Figure 7**  
**Estimated annual demand for dwellings from migrants.**  
**(Number of dwellings calculated as net migrants/ average persons per dwelling)**



little earlier than New Zealand's and the subsequent cooling seems a little more advanced. An associated feature is that debt to income ratios have continued to lift sharply in many of these countries over recent years, including Australia, the United States and New Zealand, reflecting the enthusiasm for buying houses. However, the question to arise is what the common drivers, if any, might have been?

The investment motive seems to be a common factor. Households in most of these countries appear to have viewed investment in housing as a preferred alternative to other forms of savings and investment. In many countries, there also appears to have been something of an aversion on the part of the household sector to other forms of investment, such as shares or superannuation funds. That aversion is likely to reflect the losses that some investors incurred at the beginning of the decade as the world economy slowed and the 'tech-wreck' unfolded. In our own case, one only has to look at the low level of net inflows into managed funds over the past few years, to see how investors have behaved in the wake of poor returns received earlier in the decade.

Relatively low interest rates in most countries in recent years have also undoubtedly made the debt financing of housing purchases relatively more attractive for many households. One might argue that interest rates in some countries were set at too low a level over this period, but it should be remembered that until quite recently central banks have had to contend with weakness in general activity in many of these countries, notwithstanding stronger housing markets.

Those buying a house primarily driven by an investment motive may or may not choose to live in the house themselves. An increasing number of purchases appear to have been by those wishing to let the house on the rental market and expecting to make a capital gain. We lack comprehensive statistics on such activity in New Zealand, but our contacts in the banking sector confirm that a substantial part of the recent growth in housing credit has been for that purpose. Investor housing activity has, of course, been a key driver of the recent property boom in places such as Sydney and Melbourne, as the Reserve Bank of Australia has noted. Such activity often relies on a steady stream of rental income in order to meet the financing obligations on the property.

Growth in housing rentals in New Zealand has been lagging rising house prices for some time now, and thus rental yields in many parts of the country appear to be declining. Consequently, the success of 'housing as an investment' may largely depend on the prospect for sustained capital gain over the coming years. Last year I commented on the potential vulnerabilities that some investors could face when the housing market or the economy inevitably cools.

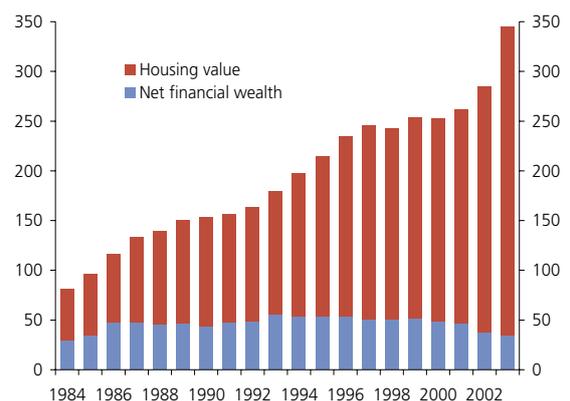
Those vulnerabilities arise either from being disappointed in respect to capital gain or being unable to meet outgoings should interest rates rise further or the rental market weaken in the future.

Looking at the balance sheet of New Zealand households one might well ask whether these vulnerabilities are overstated. The recent sharp rise in house prices has to date made New Zealand households considerably more wealthy, at least on paper.

To illustrate that proposition, the Reserve Bank's own estimate of the household sector's net wealth (including the current market value of housing) stood at \$345 billion (about 3 times annual GDP) at the end of 2003. That was up from \$260 billion (or about 2.5 times annual GDP) in 2001. This improvement in net wealth was despite households taking on an extra \$23 billion worth of debt over the same period. Surely, we would need a very large and unprecedented fall in house prices to reverse that improvement?

The answer, of course, is that the aggregate household balance sheet gives very limited perspective on the exposures

**Figure 8**  
**Net wealth of households**  
**(\$billion as at December)**



---

of individual households or investors. For example, some households or investors are clearly considerably more highly geared than the average New Zealand household represented in the balance sheet figures I just quoted. Moreover, there is a composition issue here. New Zealanders hold a very large, and increasing, portion of their wealth in housing. That itself creates a potential vulnerability. Past experience shows that individual house prices can and do fall by significant amounts even if the national average house price appears comparatively resilient.

Consequently the Reserve Bank has been giving a consistent message to households and investors over the last year. Prudent buyers and investors need to satisfy themselves that they could withstand a reasonably significant fall in house prices and rentals and/or a reasonably significant rise in interest rates. In housing, as with any other investment, it's the investor who takes the risk, thus it's the investor who needs to be careful.

I should point out that the Reserve Bank is certainly not projecting a calamitous fall in house prices over the next few years. However, some of the fundamental drivers of the housing cycle that I mentioned before, such as rapid population growth, certainly appear to be easing, and the evidence does point to a cooling market. A reasonable view is that house prices are unlikely to rise much further over the next two years, and some falls are certainly possible, particularly in some regions.

## Financial System Stability

Although the possibility of falls in house prices at some point in the future is something investors in housing need to be wary about, the Reserve Bank is also interested in what the consequences of a widespread fall would be for the stability of the banking system. More generally, we are also interested in the potential stability implications of a significant change in values for other types of property such as commercial or rural properties, against which the banking system extends significant amounts of debt.

Last year, New Zealand participated in the International Monetary Fund's (IMF) Financial Stability Assessment Programme (FSAP). In preparation for the FSAP, the Reserve

Bank, in conjunction with the major banks, examined the potential vulnerability of the banking system to a significant fall in house prices combined with a marked rise in unemployment.

One aspect of this exercise was to look hypothetically at what might occur if house prices did fall substantially and if the unemployment rate increased sharply, given current lending exposures. The exercise assumed movements that were extreme, but by no means implausible, by international standards.

I am pleased to say that the results of this stress test were favourable - the banking system itself appears well placed to withstand a marked fall in house prices and an associated deterioration in the labour market should these events ever occur. In part, this reflects measures banks have taken to effectively insure themselves against the risk of default on housing lending. Of course, on matters related to financial stability there's never room for complacency. Moreover, this positive finding does not remove the onus on individual households and investors to be careful. While the result of the stress test does give us a measure of confidence in the likely resilience of the banking system to a marked fall in house prices, some individuals could nevertheless be hurt if such a scenario was to eventuate.

As part of the same exercise, we also examined the possible effects of a sizeable fall in both commercial property prices and corporate earnings for the banking system. Once again, this exercise suggested the banking system is well placed to absorb such a shock. And again, this positive finding does not remove the onus on commercial property investors to exercise appropriate care as they go about their business.

## Conclusion

Summing up, property market developments in New Zealand over the past few years can be explained largely in terms of the economic cycle. The relative strength of many segments of property - in terms of prices, rentals, vacancies, or new building activity - largely reflects growing levels of demand for property as the scale of the economy and the number of people in it expands. To that extent, these developments provide little reason for concern.

---

However, like any other asset markets, property markets can get out of kilter with the underlying requirements of the economy and investor preferences can change independently of the economy at large. As I have said before, at the margin this may have been the case in parts of the housing market over the past two years, with some investors becoming

unrealistic about prospective returns. There are, no doubt, examples of overzealous investors in the commercial and rural property markets too. Since property markets, and the economy that they serve, are inherently subject to cycles, market participants need to remain wary of the risks and structure their affairs accordingly.

---

## RESERVE BANK DISCUSSION PAPERS

This section sets out the abstracts of recently issued Reserve Bank Discussion Papers. Papers are available for download on [www.rbnz.govt.nz](http://www.rbnz.govt.nz), and may also be requested in hard-copy from the Reserve Bank.

### **DP2004/02: Do inflation targeting central banks behave asymmetrically? Evidence from Australia and New Zealand**

*Özer Karagedikli and Kirdan Lees, April 2004*

This paper tests the standard quadratic approximation to central bank preferences on data from Australia and New Zealand, two of the earliest explicit inflation targeting countries. The standard linear-quadratic monetary policy model assumes central bank preferences over key macroeconomic variables, such as inflation and output, can be usefully approximated by a quadratic function. This approximation implies that a deviation from a target is considered to be equally costly irrespective of whether the deviation is positive or negative. Combined with a linear model of the economy, quadratic preferences are useful because they yield a first order condition that implies a linear interest rate reaction function. This paper relaxes the assumption of quadratic preferences by allowing central banks to regard the costs associated with positive and negative output gaps differently. Our models also test for the possibility that positive and negative deviations of inflation from target to be treated differently. During the inflation targeting period in both countries, evidence suggests that we cannot reject quadratic preferences over inflation deviations (from target). We cannot reject that New Zealand's preferences regarding deviations of output from trend are quadratic, but Australia's behaviour does not appear to be consistent with quadratic preferences. Instead, the preferences of the Reserve Bank of Australia appear to be more accurately modelled with an asymmetric loss such that the Reserve Bank of Australia views negative output gaps as more costly than positive output gaps.

### **DP2004/03: The equilibrium exchange rate according to PPP and UIP**

*Dominick Stephens*

This paper uses Purchasing Power Parity (PPP) and Uncovered Interest Rate Parity (UIP) to estimate a time-varying equilibrium for the \$NZ/\$US nominal exchange rate over

the period 1992 to 2003. While PPP is supported, the data does not support the strictest form of UIP. The estimated equilibrium can be considered a Behavioural Equilibrium Exchange Rate (BEER) that is conditional on interest rates and price levels. The large swings in New Zealand's exchange rate during the 1990s were broadly consistent with the estimated conditional equilibrium, while the equally large swings in the exchange rate since 2000 were moves away from the conditional equilibrium. This may be because some factor other than interest rates or price levels has driven the exchange rate away from the conditional equilibrium since 2000. Alternatively, the long-run relationship between interest rates and the exchange rate may have changed since the 1990s.

### **DP2004/04: Estimates of the output gap in real time: how well have we been doing?**

*Michael Graff*

This paper addresses the real-time versus ex-post properties of the output gap as quantified by the Reserve Bank of New Zealand's multivariate (MV) filter, starting with the second quarter of 1997, when the current procedure was implemented.

There are three sources of revisions of the output gap: revisions of real GDP data, the end point problem of symmetric filters and changes to the calibration of the MV filter.

The performance of the output gap with respect to signalling inflationary pressure, as measured by future non-tradables inflation, has been reasonably good, both in real time and ex post. However, during the recorded history of the MV filter, the revisions to real-time output gap have been no smaller than had a standard Hodrick-Prescott (HP) filter been used. Moreover, the MV filter leads to permanently different levels of the output gap estimates if compared to a purely statistical trend.

The MV filter is a hybrid construct. The empirical reference to indicators of inflationary pressure distances it from the

---

original concept of the output gap, where a deviation of observed from potential output is taken as a cause of inflationary pressure. There is some indication that a major recalibration of the MV filter in 2002 helped to maintain the correlation with a target variable that it is supposed to “explain”.

#### **DP2004/05: What can the Taylor rule tell us about a currency union between New Zealand and Australia?**

*Nils Björkstén, Arthur Grimes, Özer Karagedikli & Christopher Plantier*

The merits of a trans-Tasman currency union have been debated in both New Zealand and Australia. It has been suggested that the New Zealand economy may not behave too differently from at least some of the Australian states, ie they have similar characteristics and they face similar shocks. We test this, under the presumption that the differences in Taylor rule implied interest rate paths for different regions over a business cycle can give us some indication about the nature of the differences in “aggregate” shocks that hit different economies. We compare the implied Taylor rule interest rates for the Australian states to the implied Taylor rule rates for New Zealand. We also compare them to the realised 90 day rates. We find that the Taylor rule implied interest rate paths in Australian regions and in New Zealand are not very different.

#### **DP2004/06: Improving implementation of inflation targeting in New Zealand: an investigation of the Reserve Bank’s inflation errors**

*Philip Liu*

This paper extends the ‘Five Area Bilateral Equilibrium Exchange Rate’ (FABEER) model used in Wren-Lewis (2003) to include New Zealand and Australia. This model calculates medium term exchange rates conditional on assumptions for ‘sustainable’ current accounts. The model suggests that the equilibrium value of both currencies has been declining over the last ten years and that both currencies were near fair

value (on average) during 2002. Equilibrium values against the US dollar are estimated to be around .50 (New Zealand) and .59 (Australia), although these estimates are sensitive to the assumed equilibrium values for variables like commodity prices and the current account.

#### **DP2004/07: A model of Equilibrium Exchange Rates for the New Zealand and Australian dollar**

*Simon Wren-Lewis*

This paper extends the ‘Five Area Bilateral Equilibrium Exchange Rate’ (FABEER) model used in Wren-Lewis (2003) to include New Zealand and Australia. This model calculates medium term exchange rates conditional on assumptions for ‘sustainable’ current accounts. The model suggests that the equilibrium value of both currencies has been declining over the last ten years. On the assumption of a 4 per cent sustainable New Zealand and Australian current account deficit to GDP ratio, results suggest an equilibrium value for a New Zealand TWI for 2002 of just (2 per cent) below historical values, and a value for an Australian TWI for 2002 of 51, compared to an actual of 52. Equilibrium values against the US dollar in 2002 are 2.0 and 1.7 respectively. The equilibrium rate for both countries is sensitive to persistent shifts in commodity prices and to assumptions about sustainable current accounts.

---

## NEWS RELEASES

### For the record: news and information releases issued by the Reserve Bank, July-September 2004

#### RBNZ gives go-ahead to ANZ National Bank merger

*25 June 2004*

The Reserve Bank has agreed to the ANZ and the National Bank merging to form a single bank, which will be known as ANZ National Bank Ltd.

This follows the Reserve Bank back in October 2003 agreeing to the ANZ buying the National Bank, but at that stage the Reserve Bank required that the two banks remain separate legal entities.

Reserve Bank Deputy Governor Adrian Orr said "The Reserve Bank has set two additional conditions of registration for the new bank.

"The new bank is required to operate under a governance structure where the primary duty of the New Zealand board of directors and senior management is to the New Zealand bank. Also, the new bank must have unambiguous access to the technical and management capacity necessary to stay in business if any of its major outsourced service providers, including its Australian owner, fails to deliver.

"The new bank's management has undertaken that by 31 December 2005 they will have facilities in place so they can operate stand alone if required. The governance requirements take effect immediately".

A letter from the Reserve Bank to the ANZ explaining the Reserve Bank's thinking and a background note are available on the Reserve Bank's website at [www.rbnz.govt.nz](http://www.rbnz.govt.nz).

Letter sent on 18 June 2004 to Sir John Anderson, ANZ Banking Group (New Zealand) Limited.

18 June 2004

Sir John Anderson

Managing Director

ANZ Banking Group (New Zealand) Limited

PO Box 1791

WELLINGTON

By Fax: 802 2517

Dear Sir John

We sent to you yesterday a letter advising you of conditions of registration we propose to apply to ANZ Banking Group (New Zealand) Limited from the date of its legal amalgamation with The National Bank of New Zealand Limited. We note your target date of 26 June 2004 for the legal amalgamation. If no substantive issues with the proposed conditions are raised, the Reserve Bank would expect to agree to the legal amalgamation occurring, and to impose the conditions on that date, amended if necessary in light of any additional submissions you wish to make on them.

Over the past few weeks, ANZ staff and Reserve Bank staff have worked constructively together to develop an integration proposal that meets both the business needs of ANZ and the policy objectives of the Reserve Bank. For these purposes, the Reserve Bank considers the proposal to be that documented in the ANZ materials provided to us in April and May 2004, as elaborated upon and updated in materials provided this month.

From our point of view, this work has been a success. ANZ has provided us with assurance that the integration solution proposed will meet our basic requirement that the core functionality of the bank will be available to a statutory manager in a failure management situation, while not, in our view, imposing unnecessary efficiency costs on ANZ. Our understanding is that much of the integration solution

---

developed is, in any case, consistent with the post-acquisition business plans of ANZ.

We note that the proposal includes governance arrangements for the New Zealand bank that recognise the importance we place on the New Zealand board of directors exercising meaningful oversight of the management of the bank, and on the staff of the bank owing their primary responsibility to the chief executive officer and board of the bank. We intend to reinforce these arrangements through proposed condition of registration 12. These qualities of governance are important not only for the New Zealand bank to be managed on an ongoing basis in its own best interests, but also for adequately dealing with stress or failure management circumstances, under which the directors or a statutory manager will need unfettered practical access to key staff and thereby the ability to manage the New Zealand bank through its difficulties.

The reporting requirements set out in the proposed conditions of registration do not preclude effective working relationships existing between the New Zealand bank's staff and their parent-bank counterparts. We expect that these relationships will co-exist effectively with the New Zealand staff's primary reporting relationship to the New Zealand bank's executives and board. Such working relationships obviously have the potential to benefit the New Zealand bank and financial system through the adoption of best practices developed by the parent bank, and through efficiencies and risk reduction associated with the harmonisation of risk management and other functions. The bottom line of our requirements, though, is that the New Zealand board and executives must have meaningful rights, ability, and incentives to test parent-bank policies for their appropriateness for New Zealand circumstances, and, in light of those tests, to modify the policies if necessary for their application in New Zealand.

It is clear that much detailed planning remains to be done by ANZ to flesh out the process for the integration and for the achievement of standalone capability by December 2005, consistent with the proposed conditions of registration. I understand that ANZ has undertaken to provide to the Reserve Bank by August 2004 a detailed project plan, including auditable milestones, for the process. We look

forward to receiving this project plan, which will form the basis for the Reserve Bank's monitoring of ANZ's progress on the integration project and compliance with its conditions of registration in respect of the integration.

We recognise, of course, that as the project proceeds and further analysis is done, it may become necessary or desirable to vary the plan. The Reserve Bank would expect to be fully consulted on any material proposed variations to the plan, in order for us to understand the implications of any such variations for compliance with the conditions of registration or for the achievement of standalone capability by December 2005. As discussed in our correspondence with all banks in August 2003, we view banks' standalone capability as a critical influence on systemic risk in the New Zealand banking system, and would not wish to see that capability undermined. Were that capability to be undermined, we would of course reserve the right to address the increase in systemic risk through measures such as higher capital requirements.

We appreciate the efforts you and your staff have made to work with the Reserve Bank as the integration plan has developed. As you know, strengthening the financial system's resilience to stress - including to the failure of a systemically important bank or of a major outsourcing provider to such a bank - remains a key policy priority for the Reserve Bank. The understanding reached with ANZ represents substantial progress in this work.

Yours sincerely

Dr A E Bollard

Governor

### **Background to Reserve Bank consent to ANZ/ National Bank amalgamation**

This note provides some background to the basis on which the Reserve Bank has given its consent to the amalgamation of the ANZ and National Bank into a single bank.

The merger has required the Reserve Bank to apply recently developed policy objectives for large overseas-owned banks to a specific case, for the first time. As a result, a new

---

template has been established that we are looking to apply to the other large banks in due course.

That template includes standard conditions of registration relating to, amongst other things, capital adequacy and the nature and scope of the business. But there are also two additional conditions relating to the role and responsibilities of the bank's board of directors and of its senior management, and to the need for the bank to have an independent operating capability in New Zealand.

First, we have firmed up on the requirement that the board of directors of a foreign-owned bank must act in the interests of the New Zealand bank, rather than in the interests of the overseas banking group of which it is a part. This policy will be effective across all major banks from July 1 2004.

In addition, for ANZ National Bank, we require that the primary reporting relationships of senior executives in New Zealand be to the New Zealand chief executive, and through the chief executive to the New Zealand board. This is in contrast to a trend in recent years for New Zealand bank managements to operate under arrangements that included direct reporting to overseas parent bank management. The Reserve Bank expects to apply a similar condition to all major banks in due course.

Second, ANZ National Bank must maintain systems that would enable the New Zealand bank, if required, to operate independently from key service providers, including, in the case of a foreign-bank owned bank, independently from its foreign parent.

The requirement that ANZ National Bank maintain an independent operating capability is to ensure that the New Zealand bank could continue operating if the provision of management or systems services by an overseas parent bank, or other major service providers, were to be withdrawn, say, in the event of the service provider becoming insolvent. Again, the Reserve Bank expects to apply a similar condition to all major banks in due course.

These qualities of governance and operating capability are important if New Zealand banks are to be managed on an ongoing basis in the best interests of the New Zealand financial system. In particular they are necessary

for adequately dealing with financial stress or failure management situations, when the directors of a bank, or a statutory manager acting in the place of the directors, will need unfettered practical access to key staff and systems to manage the New Zealand bank through its difficulties.

## **OCR increased to 6.00 per cent**

*29 July 2004*

The Reserve Bank today increased the Official Cash Rate from 5.75 per cent to 6.00 per cent.

Reserve Bank Governor Alan Bollard said "Today's OCR increase reflects a continued buoyant economy that is placing considerable strain on resource capacity and hence leading to inflation pressures. This broad assessment and policy decision remains consistent with our June Monetary Policy Statement.

"Overall, the domestic economy remains strong. Labour markets remain tight, and productive resources are stretched. However, as we have projected for some time now, there are signs of a slowing in some domestic sectors.

"There has been positive news on the export front. Commodity prices have been rising and export incomes are improving. This is despite the continued strength and volatility in the New Zealand dollar.

"It appears that current economic strength may be maintained for longer than we anticipated in June and it could add to price pressures. Further tightening of monetary policy looks likely to be necessary."

## **Reserve Bank Assistant Governor/Head of Economics appointed**

*4 August 2004*

The Reserve Bank today announced the appointment of Mr Grant Spencer as Assistant Governor/Head of Economics.

Mr Spencer will be a key member of the Reserve Bank's policy making and senior management teams; with particular responsibility for the economic forecasting and analysis that forms the basis for monetary policy decisions.

---

Mr Spencer comes to the Reserve Bank with an extensive background in banking and financial policy. His current position is Head of Strategy and Business Development for ANZ Bank Group (NZ) Limited.

Mr Spencer will take up his appointment on 30 August 2004.

## **RBNZ MPS and OCR dates for 2005**

### ***16 August 2004***

The following is the Reserve Bank's schedule for the release of its quarterly Monetary Policy Statements and Official Cash Rate announcements for 2005. Each Monetary Policy Statement includes within it an OCR announcement, so, as usual, in total there will be eight OCR announcements during 2005. Each announcement will be made at 9.00 am on the day concerned.

27 January	OCR announcement
10 March	Monetary Policy Statement
28 April	OCR announcement
9 June	Monetary Policy Statement
28 July	OCR announcement
15 September	Monetary Policy Statement
27 October	OCR announcement
8 December	Monetary Policy Statement

The Reserve Bank reserves the right to make changes to this schedule, if required due to unexpected developments. In that unlikely event, the markets and the media will be given as much warning as possible.

## **RBNZ issues Statement of Intent**

### ***17 August 2004***

The Reserve Bank today made public a Statement of Intent which outlines the Bank's plans for the period 2004 to 2007.

This Statement of Intent has been prepared as a pilot document for an accountability obligation that will be required of the Reserve Bank from 2005 onwards. Under

impending legislation, section 162A of the Reserve Bank of New Zealand Act 1989 will require the Reserve Bank, prior to each financial year, to provide the Minister of Finance with a Statement of Intent traversing the following three years.

The Act is expected to stipulate that the Reserve Bank's Statement of Intent must contain:

- key background information about the Reserve Bank and its operating environment;
- the nature and scope of the Bank's functions and its principal areas of operations;
- the nature of the Bank's specific objectives;
- the proposed strategies for achieving objectives and carrying out operations;
- The proposed strategies for managing the organisational health and capability of the Bank; and
- a statement of the projected income and expenditure for the first financial year in the three financial year period to which the Statement of Intent relates.

The document released today has been prepared both to inform the public and to establish the format of these documents in the future.

## **RBNZ assesses property risks**

### ***2 September 2004***

The Reserve Bank is reminding investors in property - rural, industrial and commercial, and residential - that property markets are inherently subject to cycles and market participants need to structure their affairs accordingly.

That's come in notes for a speech in Rotorua to the New Zealand Property Council by Reserve Bank Governor Alan Bollard.

Dr Bollard said "The property market behaves differently from the market for consumer goods ... Because supply often lags demand in the property market, there is the potential for a mismatch between the supply and demand, and this can work in both directions. When demand for property cools, due to a slowing economy, it's hard to switch off new supply in the pipeline. So a rapid rise in prices can be followed

---

by quite significant declines later on. All property sectors tend to exhibit price cycles, with these cycles reflecting this mismatch between demand and supply.”

Looking at rural property, Dr Bollard said “The ratio of rural land prices to agricultural operating surplus is now above its long run average value. However, the ratio is not yet out of line with the values that it reached in the mid 1990s. Whether there will be a downward adjustment in prices presumably depends on whether market participants also reach the conclusion that rural land is overvalued.”

On commercial and industrial property, Dr Bollard said investors seemed to have learnt from the lessons of the 1980s. “An incremental approach to industrial and commercial building appears to have been adopted. Little speculative building is being done and arrangements regarding the tenancy of new buildings are often finalised before building begins.”

Turning to residential property, Dr Bollard said over the last three years house prices nationwide had gone up nearly 50 per cent. “The Reserve Bank is certainly not projecting a calamitous fall in house prices over the next few years. However, some of the fundamental drivers of the housing cycle ... such as rapid population growth, certainly appear to be easing, and the evidence does point to a cooling market. A reasonable view is that house prices are unlikely to rise much further over the next two years, and some falls are certainly possible, particularly in some regions.”

## **2004 Monetary Policy Challenge winner announced**

### ***7 September 2004***

Hillcrest High School from Hamilton has won the Reserve Bank’s 2004 Monetary Policy Challenge school competition.

The competition involved secondary students becoming mock central bankers and preparing written advice on what they think the Official Cash Rate should be. The competitors then presented this information to a panel of Reserve Bank judges.

The National Final was held today at the Reserve Bank, with Hillcrest High School emerging as winner ahead of Logan

Park High School and Tawa College who placed second and third, respectively. The other competitors were Howick College, Manurewa College and Nelson College.

Grant Spencer, Reserve Bank Assistant Governor and member of the judging panel, commented “The Monetary Policy Challenge brings to life for students the dilemmas that central bankers face. Rather than just expecting students to learn established facts, this competition confronts students with the challenges, ambiguity and uncertainty of actual decision making. All of the teams that competed today displayed an excellent knowledge of how monetary policy works.

## **OCR increased to 6.25 per cent**

### ***9 September 2004***

The Reserve Bank has increased the Official Cash Rate from 6.00 per cent to 6.25 per cent. The Bank has also stated that further tightening of monetary policy is likely to be required.

Speaking at the release of the Reserve Bank’s September 2004 Monetary Policy Statement, Reserve Bank Governor Alan Bollard said “The New Zealand economy is performing very strongly. On balance, the recent economic data has delivered positive surprises. Economic growth is near its peak, but resources will remain stretched for some time, and inflation pressures remain strong.

“In terms of the economic outlook, there are risks to consider. The consensus view in our projections is that global economic activity is expanding at a reasonable pace. However, high world oil prices and softer growth in the US could slow global economic growth. Further, if the TWI continues to rise, or if commodity prices fall sharply, our growth prospects would be weaker.

“Domestically, the economy is heavily influenced by housing activity, which we expect to continue to slow over coming months. However, if that weakening is delayed, then household spending would continue to expand at a rapid rate, fuelling inflation pressures. This could be compounded by continuing strength in the labour market.

---

“So far, inflation has been kept in check by the rising New Zealand dollar, which has pushed import prices lower. We expect domestic inflation to remain strong due to tight production capacity. Assuming the exchange rate is near a peak, import prices are unlikely to continue falling. As a result, even though economic growth is likely to be slowing next year, inflation is projected to increase.

“The Reserve Bank is required to keep inflation between 1 and 3 per cent ‘on average over the medium term’. Also, section 4(b) of the Policy Targets Agreement requires us to minimise unnecessary instability, hence monetary policy must always be a balancing act. We are using this flexibility to the full. However, looking ahead we do not have much inflation headroom, which is why we are continuing our incremental tightening of monetary policy.”

#### **Five cent coin now part of “silver” coin review**

*14 September 2004*

The Reserve Bank said today that, as part of its previously announced review of the nation’s ‘silver’ coins, the Bank is now considering whether to retain the 5 cent coin.

Reserve Bank spokesman Paul Jackman said: “Some months back, when the Reserve Bank first mooted reducing the physical sizes of the 50, 20 and 10 cent coins and changing the metal used in them, we put the fate of the 5 cent coin to one side as an issue best kept separate for a later date.

“However, as we have been consulting with retail, consumer, and other groups, and as we have looked carefully at the production implications of a revised range of ‘silver’ coins, it has become increasingly clear that we ought at least to consider whether it is better to take the 5 cent coin out of circulation as part of an overall updating of this range of coins.

“No decisions have been made. The Reserve Bank is currently undertaking further research on the options available, and we expect to seek public feedback later this year. If decided, changes to any or all of the silver coins would not take place until mid 2006.

---

## PUBLICATIONS

*Annual Report*  
*Monetary Policy Statement*

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

*Reserve Bank of New Zealand Statement of Intent, 2004-2007*  
*The Real Story - saving and investing now that inflation is under control*

### Recent Reserve Bank Discussion Papers

#### 2003

DP2003/01	Financial deregulation and household indebtedness Leslie Hull
DP2003/02	On applications of state-space modelling in macroeconomics Olivier Basdevant
DP2003/03	Modelling structural change: the case of New Zealand Olivier Basdevant and David Hargreaves
DP2003/04	Monetary policy transmission mechanisms and currency unions: A vector error correction approach to a Trans-Tasman currency union Alfred A Haug, Özer Karagedikli and Satish Ranchhod
DP2003/05	Learning process and rational expectations: an analysis using a small macroeconomic model for New Zealand Olivier Basdevant
DP2003/06	Estimates of time-varying term premia for New Zealand and Australia Matthew Shapiro
DP2003/07	Has the rate of economic growth changed? Evidence and lessons for public policy Michael Gordon
DP2003/08	The stabilisation problem: the case of New Zealand Kirdan Lees
DP2003/09	Monetary policy and the volatility of real exchange rates in New Zealand Ken West
DP2003/10	Speculative behaviour, debt default and contagion: a stylised framework of the Latin American crisis, 2001-2002 Louise Allsopp

#### 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 & 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

Full lists of Discussion Paper series 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

---

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

### Vol. 66, No. 3, September 2003

#### *Articles*

Recent developments in New Zealand's financial stability

Neutral real interest rates revisited

Risk management in the Reserve Bank: a 2003 perspective

International efforts to combat the financing of terrorism

Monetary policy and the volatility of real exchange rates in New Zealand: Summary of a lecture by Professor Ken West

Has the rate of economic growth changed? Evidence and lessons for monetary policy:

Summary of a lecture by Matthew D. Shapiro

Summary of a new Reserve Bank of New Zealand paper: Overview of New Zealand financial sector regulation

#### *Speeches*

Financial system regulation in New Zealand

Extract from an address to the Property Council of New Zealand

### Vol. 66, No. 4, December 2003

#### *Articles*

New Zealand's financial sector regulation

The relationship between inflation expectations, survey data and inflation

The Reserve Bank Inflation Calculator

#### *Speeches*

After the National Bank acquisition: living with big Australian banks

Investing in a low inflation world

### 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