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Editor’s note

The first issue of the Reserve Bank Bulletin of 2011 contains articles and documents all loosely linked to the sorts of economic and financial challenges that New Zealand has faced in the last few years, brought into sharp relief by the global recession and the international financial crisis.

Hamish Pepper’s and Enzo Cassino’s article articulates an approach to analysing change in international government bond interest rates and making sense of what they might mean for those countries and for New Zealand. The authors’ decomposition of interest rates in the US and the UK suggests that despite all the volatility, shocks, and crises of the last few years, financial markets at present do not expect the future to be so very different from the pre-recession past. Although short-term interest rates in many countries have now been very low for a number of years, interest rates (real and nominal) are expected to settle back at levels not much different from those seen pre-crisis. The more limited data available for New Zealand suggests that this result could also be true of New Zealand.

Rebecca Craigie’s article reports on a research conference held at the Reserve Bank last December where the papers focused on issues around the transmission of economic and financial shocks in one country to other countries, an issue brought to prominence in the recent unusually synchronised international recession. Many of the papers presented raised as many questions as they posed answers, but together they represented a valuable stimulus, helping the rest of us to think carefully through the issues in this area. And as the author reminds us, debates around the interpretation of the 1930s Great Depression still rage, and so work on the interpretation of the recent recession and associated international dimensions of it is inevitably still at a very preliminary stage.

Rochelle Barrow and Michael Reddell provide an update on the Reserve Bank’s work to improve the range and quality of statistical data on debt securities markets in New Zealand. The article outlines the way in which securities markets and traditional balance sheet-based bank lending interact and complement each other, and how the recent financial crisis brought into focus, both here and abroad, the need for better data on debt securities markets.

The Government-appointed Savings Working Group, of which the Bank’s Head of Economics John McDermott was a member, released its report earlier this year. The Bank’s submission to this Working Group is reproduced here for the record.

Finally, we reproduce the Governor’s 28 January speech to the Canterbury Employers’ Chamber of Commerce, “Looking into the crystal ball: a forecast and some risks for the year ahead”. The Governor emphasised the wide range of risks, positive and negative, that appeared to face the New Zealand economy this year. No one envisaged the tragic events of 22 February. The human and economic aftermath of that earthquake will influence the way in which events unfold here for years to come.

Michael Reddell
(acting) Editor
ARTICLES
Making sense of international interest rate movements
Hamish Pepper and Enzo Cassino

In this article, we describe a framework for analysing movements in government bond interest rates and present some results from applying this approach. Our framework disaggregates movements in nominal rates into estimated changes in real interest rates and inflation expectations. In addition, we discuss a measure of interest rate uncertainty, a factor which will often influence movements in these components. Since any long-term bond can be thought of as equivalent to a sequence of shorter-term bonds, we also calculate implied forward measures of each of these factors to better understand not only which factors are driving movements in nominal interest rates but also over which periods of time (i.e., current, future or some combination of the two) these factors are having an effect. We use the method to analyse movements in term interest rates in the US and the UK, two major markets with good data, since the global financial crisis intensified in 2008. It appears that the global financial crisis has had a largely temporary impact on longer-term measures of interest rate components: looking ahead, markets appear not to expect longer-term interest rates to be much different than they were prior to 2008. There are limits to our ability to apply these techniques directly to New Zealand markets, but the Reserve Bank of New Zealand uses them to help make sense of what is going on in international bond markets which in turn directly affect longer-term interest rates in New Zealand.

1 Introduction
Interest rates in New Zealand are affected by many things. Short-term market interest rates are influenced primarily by actual and expected near-term Reserve Bank policy rates, but also by factors such as banks’ funding needs. The level of longer-term rates tends to be more influenced by factors such as inflation expectations and expected future economic growth.1 Movements in global interest rates, especially in the major world economies, often have a significant impact on New Zealand longer-term interest rates. They can also provide insights into the nature of the shocks hitting those economies. In this article, we examine the relationship between New Zealand interest rates and overseas interest rates and examine how separating nominal interest rates into their components can provide insights into the shocks or disturbances affecting an economy.

We focus in particular on the period since the collapse of Lehman Brothers in September 2008 and the onset of the most intense phase of the global financial crisis. Over that period, there have been large changes in international interest rates as the global economy went through a deep recession and, in response, policy-makers implemented large amounts of monetary and fiscal stimulus. Throughout the crisis and in the more recent period of relative stabilisation, there has been significant debate about the nature of what is going on in interest rate markets. In this article, we illustrate some of the techniques used at the Reserve Bank to explore these issues, as part of our analysis of the international economy and the influences on the New Zealand economy and New Zealand interest rates.

The article proceeds as follows. Section 2 establishes the relationship between New Zealand and offshore interest rates. Section 3 details the methodology and describes the data. Section 4 looks at some recent results. Section 5 concludes.

2 The relationship between overseas and New Zealand interest rates
As a small open economy, New Zealand is sensitive to disturbances hitting major world economies, and those of our main trading partners. These shocks can affect New Zealand’s economy both through trade channels and through financial market channels. Changes in longer-
term international interest rates are one important financial markets channel, and those changes often affect New Zealand almost instantaneously. That makes it important to understand what is affecting international rates. Interest rates on government bonds can vary widely between countries. However, shorter-term changes in New Zealand government bond rates are often closely linked to bond rate changes in other countries.2

Figure 1 plots the correlation of daily changes in New Zealand ten-year government bond yields with changes in government bond yields in some other countries. Several features are apparent. First, the closest correlation is between New Zealand and Australian bond rates. This is not surprising, since the economic cycles in the two countries have historically often been highly synchronised and markets have historically treated them that way. Second, the correlation between New Zealand yields and foreign yields is much higher than it used to be.3 The increasing integration of financial markets across the world has made it easier for investors to identify and exploit profitable opportunities and thereby equalise expected returns across countries. Third, despite the general upward trend, the closeness of the relationship between New Zealand and foreign yields has varied over time. For example, since 2006, the correlation between New Zealand and foreign interest rates has reduced significantly.

That fall probably reflects the changing nature of the shocks hitting the global economy. Some shocks affect all countries simultaneously. For example, the decline in long-term interest rates during the early-mid-2000s as part of the ‘search for yield’ as investors’ appetite for risky assets increased was seen in many countries, generating very similar moves in interest rates across countries. Conversely, other shocks may affect only individual countries or affect a range of countries in different ways. For example, the recent global financial crisis affected different countries to varying degrees: neither New Zealand nor Australia experienced a banking crisis in the way that the US and the UK did; and the New Zealand economy experienced a more severe recession than the Australian downturn.

Therefore, when we monitor developments in the economies and markets that matter most to us, identifying the factors and shocks influencing foreign bond rates helps us to better understand what is driving those economies and to better understand the implications for New Zealand.

3 Methodology and data

When we analyse movements in international interest rates, we typically follow two broad steps. In the first stage, we aim to identify separately the impact of real factors and inflationary factors on interest rates. In the second stage, we examine the importance of these factors at different time horizons. We describe these two steps in more detail below.

Real rates, inflation and uncertainty

Conceptually, the nominal interest rate on a financial asset (i) can be divided into three components: a real interest rate (r), expected inflation over the term of the asset (π) and a risk premium (ε). As a result, we can express nominal interest rates (i) as:4

$$i = r + \pi + \epsilon$$

While this provides a useful conceptual representation of a nominal interest rate, in practice it is not possible to cleanly

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2 For further details of the relationship between New Zealand and overseas interest rates, see Schmidt-Hebbel (2006).
3 This result is not unique to New Zealand yields. The correlation between yields on US government bonds and bond yields in other countries also demonstrates a gradual upward drift.
4 This relationship is known as the ‘Fisher Hypothesis’.
In the short term, however, changes in real interest rates will often have an impact on actual output growth. 

See, for example, Bernhardsen and Kloster (2010). For countries where inflation-indexed government bonds are not available, other financial instruments, if available, can be used to decompose nominal interest rates. For example, ‘inflation swaps’ are often used to calculate inflation expectations for the Euro area. An inflation swap is a derivative that allows a counterparty to pay (receive) the inflation rate that occurs over the period of the swap in return for receiving (paying) a fixed interest rate. In the local market, Westpac carried out the first inflation swap in 2009. However, trading in the New Zealand market has been very limited. Because inflation-indexed bonds pay a fixed real return plus realised inflation, if the inflation outturn equals this break-even level, then the nominal return on the inflation-indexed bond will be equal (i.e., ‘break even’) with the nominal return on the conventional bond.
of inflation expectations, as they also implicitly include an inflation risk premium, i.e., the value market participants place on removing uncertainty about the future inflation rate, as distinct from simply their mean expectation of future inflation. They can also be affected by differences in liquidity conditions in the markets for conventional and inflation-indexed bonds. As a result, it is useful to compare breakeven inflation expectations with survey-based measures of inflation expectations. Surveys have their own weaknesses however. They may provide a more accurate measure of expected inflation among those surveyed, but are generally only available on a monthly or even quarterly basis. In addition, surveys do not require anyone to back their view by putting money on the line in the way that estimates derived from financial market prices do.

Finally, a proxy for uncertainty around future nominal interest rates can be obtained from the implied volatility on ‘swaptions’. Implied volatility is a forward-looking measure of the degree of volatility expected in the price of the underlying instrument that people buying/selling are allowing for and the value they place on eliminating that uncertainty. Implied volatilities are derived from the prices of options on the underlying instrument. Swaptions are options on interest rate swaps, i.e. contracts that give the buyer the right, but not the obligation, to enter into an interest rate swap at a specified date in the future for a specified term. We use swaptions because they are generally more highly traded and standardised than other interest rate options and therefore provide a better measure of implied volatility through time.

During normal times, the volatility in swap rates will move almost one for one with volatility in the underlying risk-free or government bond rate. Consequently, there is usually a high degree of correlation between implied volatilities derived from non-government and government interest rate options. However, in times of market stress there may be some divergence. In those periods, analysts need to cross-check the insights on uncertainty from the swaptions market with whatever other information they can obtain, including that on the less-liquid government bond options markets.

Calculating forward rates

In addition to the decomposition of nominal interest rates described above, we can also decompose term interest rates into a series of shorter spot and implied forward interest rates. Given, say, information on today’s two-year bond rate and today’s one-year bond rate it is a simple matter to derive an implied forward one-year rate one-year hence. The implied forward rate is, in essence, simply the rate that means a holder or borrower would be indifferent between issuing/holding a two-year bond now, or issuing/holding a one-year bond now and then rolling it over into another one-year bond in a year’s time. The relationship can be expressed more formally as:

\[(1 + i_l) = (1 + i_s)(1 + f_s)\]

Where \(f_s\) is the ‘forward’ short rate that equalises the return from investing in the long bond with the expected return from investing in the short-term bond and then rolling the investment over when it matures. If this relationship did not hold, then there would be opportunities for traders and investors to profit from the difference between the long-term interest rate and the short-term interest rate. A term structure of spot interest rates and their component forward interest rates contain the same information, but expressing rates in forward terms provides a clearer view of the impact of different factors at different horizons.

We can calculate forward interest rates in more general cases using a simple formula:

\[f_{l-s} = \frac{i_l - i_s}{(l - s)}\]

Where \(f_{l-s}\) is the forward rate over the period \(l-s\) and \(i_l\) is the interest rate for a particular maturity \(l\), and \(i_s\) is the interest

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9 More complicated methods would allow us to split the uncertainty in real rates and inflation into separate components. See, for example, Haubrich (2009).


11 See Hull (2009) for more details. The calculation as expressed assumes continuously compounding zero-coupon interest rates, whereas we use coupon-bearing data on a semi-annual basis. The differences, in levels and changes, are not material in the context of our analysis.
rate for a shorter maturity. This formula can be used to calculate implied forward rates for nominal and real interest rates, and break-even inflation rates. The formula for calculating forward implied volatility on swaptions is similar, but uses volatilities on long and short options as inputs.

Forward real interest rates are driven by different factors depending on their term to maturity. Changes in shorter-term real interest rates will often be heavily influenced by expected changes in monetary policy. Longer-term forward real interest rates will more often reflect factors such as productivity shocks, and households’ and firms’ desire to spend or save. In practice, there is no hard and fast boundary, and we typically observe changes in expected short-term interest rates also having a material, but muted, influence on longer term spot and implied forward rates.

The implied volatilities on swaptions also tend to be driven by different factors depending on the expiry date of the option. Implied volatility in short-term swaptions will often reflect uncertainty around the expected stance of monetary policy and the cyclical path of economic growth. Implied volatility in longer term swaptions will more often reflect uncertainty around future inflation outcomes and the determinants of long term interest rates, e.g. the expected real return on capital. In addition, changes in actual experienced volatility in the underlying asset also tend to spill over into higher future implied volatility for a period.

All these market price measures can also be affected by technical market factors, such as the degree of liquidity in particular sections of the market. For example, increased demand from UK pension funds for long-dated inflation linked bonds has forced the price of these bonds higher from around 2005 – driving down the yield. UK pension funds have increasingly sought to match their liability cash flows (i.e. ‘defined benefit’ pension payments) with their asset cash flows (through long-dated inflation-linked government bonds) and the fall in yields was exacerbated by relatively limited supply of long-dated inflation linked bonds. In the case of swaption implied volatilities, US swaption markets can be temporarily affected by fluctuations in the activity financial institutions need to undertake to hedge their exposure to mortgage pre-payment risk. In periods of crisis, factors driving each of the components can be particularly challenging to disentangle as the willingness or capacity of market participants to take on additional risk dries up.

4 Analysing movements in US and UK interest rates

In this section, we use the framework to analyse movements in government bond yields in the US and the UK over the last few years. We chose these countries partly because of their importance as major economies and financial markets and partly because they have the widest range of inflation-indexed bonds. The US remains by far the most important international market. Comparing and contrasting the results across the US and UK provides insights into how the events of the last few years have affected different countries in different ways.

Figures 2 and 3 below and overleaf show nominal government bond yields of varying maturities for the US and UK. During 2008, nominal yields fell sharply at all maturities in both countries, although the falls occurred much earlier in the US, which faced financial crisis pressures and recession risks earlier in the year. More recently, yields have rebounded across all maturities in both countries. We can use our framework to help analyse the factors driving these movements in interest rates.

Figure 2
Nominal US government bond yields
Real yields

First, we examine movements in real yields of the same maturity over the same period. Figures 4 and 5 show the large changes in implied real yields during the financial crisis. Real yields in the US fell sharply during the early stages of the financial crisis from late 2007 with five-year real yields even turning briefly negative in early 2008 as nominal interest rates fell below the rate of expected inflation. At this stage of the crisis, there was a very strong differentiation between government securities – still generally seen as credit risk-free in major economies – and any sort of financial sector-related debt. The combination of the ‘flight to quality’ and the unexpectedly deep recession helped drive real interest rates down. Real yields in both the US and UK then surged higher through late 2008, following the announcement of significant additional fiscal and monetary policy stimulus measures, which probably both allayed some extreme aversion to risk and, at least temporarily, restored confidence in the economic outlook. From there, real yields fell steadily in both countries during 2009-early 2010, but longer-term US real yields have increased sharply in recent months. In contrast, UK real yields have remained low. This is consistent with the recent divergence in economic outlooks for the UK and the US economies, with UK economic data continuing to indicate fairly soft growth, while in the US there have been continuing signs of improvement in economic conditions, especially after the second round of quantitative easing was announced by the Federal Reserve. It may also be consistent with the more aggressive approach to fiscal consolidation that has been pursued in the UK.

Taking this one step further, we can determine the periods for which real yields have moved the most by calculating implied forward real interest rates. Figures 6 and 7 below show that forward real interest rates at 0-5 years ahead remain well below pre-crisis levels, consistent with the current level of nominal policy rates, but rates at longer horizons are little changed. In other words, longer-term interest rates are lower than they were prior to the recession largely because of falls in short-term interest rates. This may suggest that interest rate markets have not priced in a significant impact from the financial crisis on long-run potential growth rates in the US and the UK.

Note that over some periods data is missing, as there was not a government bond available with an appropriate maturity.

However, some other analysis suggests the level of potential output may have been lowered by the crisis.
Alternatively, it is possible that the longer-term implied forward rates might reflect some combination of a lower risk-free rate and a higher premium for sovereign credit risk. As the fiscal situation has deteriorated in many countries, sovereign credit risk in advanced countries has come into focus. Spreads on credit default swaps represent a proxy, although not hugely liquid, for the sovereign credit risk premium, as they capture the cost of insuring against the risk of a debt issuer, in this case a sovereign, defaulting on their repayment obligations. Although sovereign credit default swaps for the US and UK have remained fairly static over the last year, even for those countries the spreads are materially higher than they were three years ago (see figure 8 below).

Inflation expectations

As noted above, to give us some insight on the extent to which increases in inflation expectations have driven the recent movements in US and UK nominal bond yields, we examine the break-even rate of inflation. Figures 9 and 10 below plot break-even inflation rates for the US and UK across a variety of maturities. At the peak of the crisis, break-even inflation rates in both the US and UK fell away very sharply, and short-term break-even rates even became negative. While this may partly have reflected concern about an increased risk of deflation occurring, it is also likely to have been due partly to heightened uncertainty more generally and poor liquidity conditions in the inflation-indexed bond market. More recently, shorter-term break-even inflation rates have increased significantly. While US break-even rates have returned to pre-crisis levels except at short-term horizons, UK break-even rates appear to have mostly settled at the persistently higher levels they had reached by mid-2008. This is consistent with growing concern about rising inflationary pressures in the UK.

Looking at which future periods investors expect this inflation to occur in, figures 11 and 12 plot forward break-
even inflation rates for the US and UK. Consistent with unease about possible risks of deflation at the height of the crisis, short-term US and UK break-even inflation rates became negative in late 2008. More recently, near-term inflation expectations have returned to pre-crisis levels in the UK, while US near-term inflation expectations have remained relatively subdued. This is consistent with the pricing in short-term interest rate markets, where an increase in the Bank of England policy rate is expected shortly, while a rate rise from the US Federal Reserve is not expected until some time in 2012.

**Uncertainty**

Finally, it is useful to establish the extent to which changes in investor uncertainty may have played a part in the recent fluctuations in US and UK yields. Figures 13 and 14 below plot the implied volatilities from UK and US options of varying maturities on a one-year interest rate swap. While implied volatility in both markets has ticked up recently, it is still well below the levels seen during the global financial crisis and, more recently, the Euro zone debt turmoil over 2010.

**Figure 13**

Implied volatility from US options on a 1-year swap

**Figure 14**

Implied volatility from UK options on a 1-year swap

Looking at which future periods investors are most uncertain about, figures 15 and 16 below show that it is near-term volatility that is the highest for both the UK and the US. This probably reflects the extent to which official interest rates in those countries are perceived to be exceptionally low. In

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For example, a two-year option on a one-year swap gives the option holder the right but not the obligation to receive a one-year swap at a rate defined at the outset of the contract. Expectations of volatility, or implied volatility, are a crucial determinant of the price of the option, so markets tend to quote implied volatility directly rather than outright prices.
times such as these, financial market participants face not only the standard uncertainties but also uncertainty around how quickly interest rates will return to more ‘normal’ levels. Near-term volatility in the UK has increased markedly in recent months, perhaps reflecting the recent uncertainty around how monetary policy will respond to higher inflation out-turns in the face of a decidedly weak domestic economy. Longer-term implied volatility is also higher than pre-crisis levels in both the US and UK. That may suggest uncertainty around future inflation outcomes and the extent to which long-term inflation expectations are anchored, but it may also reflect greater uncertainty more generally following the financial crisis.

5 Conclusion
As a small open economy, New Zealand is sensitive to disturbances hitting major world economies, and especially those of our main trading partners. These shocks can affect New Zealand’s economy both through trade channels and through financial market channels. There is typically a high degree of correlation between New Zealand and global interest rates – although this relationship has weakened somewhat in the wake of the financial crisis and the global recession.

This article has outlined a framework to disaggregate movements in global bond yields and help make sense, on a timely basis, of the shocks hitting major countries’ economies, as reflected in financial market prices. Of particular interest from this standpoint is that it appears that, after all the turmoil and uncertainty of the last few years, and the big overhang of future fiscal adjustment many countries still face, markets are not expecting the future to look so very different from the past.

Currently, there is only one inflation-indexed bond on issue in New Zealand and trading in New Zealand inflation swaps is very limited, so it is not possible to apply this framework formally to the domestic markets. However, we have alternative sources of this information in well-established survey measures of inflation expectations and actual and forward measures of New Zealand nominal government bond rates (see figures 17 and 18 below). Figure 18 also includes forward nominal rates for the US and UK. In so far as we can tell, the New Zealand picture is not so different from that in other countries. On survey measures, medium-term inflation expectations have not changed much, and despite a protracted period of a very low OCR implied forward government bond rates in New Zealand look quite similar, if a little higher than, they were five years ago. The New Zealand Debt Management Office has announced plans to issue additional indexed bonds in the future, when market conditions are appropriate. Therefore, at some point, we may be able to extend the more formal analysis of the New Zealand markets using this sort of framework.
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We’re all in this together: the transmission of international shocks to open economies

Rebecca Craigie

As economies have become more integrated, the importance of understanding how shocks in one country can affect the stability of others has grown. This article provides a summary of the 13 papers presented at the conference held in December 2010 by the Reserve Bank of New Zealand and the Australian National University’s Centre for Applied Macroeconomic Analysis, titled “The transmission of international shocks to open economies”. The papers use a variety of methods to address some common themes, including directions for open economy modelling, the changing nature of emerging market economies (EMEs), the transmission of shocks during the recent global financial crisis, and the implications of being a small open economy for monetary policy. The different methodologies and topics provide a broad overview of the issues facing researchers and policy makers in open economies.

1 Introduction

In December 2010, the Reserve Bank of New Zealand and the Australian National University’s Centre for Applied Macroeconomic Analysis (CAMA), hosted a conference titled “The transmission of international shocks to open economies”. As economies have become more integrated, the importance of understanding how shocks (unanticipated changes in economic variables) in one or more countries can affect the stability of others has grown. The recent global crisis has also brought into sharp relief the connectedness between different economies – financial disruptions centred in the US spread beyond US borders and led to a global recession. It was appropriate to hold such a conference in New Zealand, given that our small size and trade and financial openness to the rest of the world make us vulnerable to international shocks. On the trade side, the share of exports plus imports to GDP in New Zealand has been higher than 50 percent since the 1970s (see figure 1). However, New Zealand’s key vulnerability to international shocks may well lie in our financial interconnectedness and reliance on external funds. Figure 2 shows net international investment positions (NIIP) as a share of GDP in selected OECD countries in 2009, where NIIP reflects the balance of total external assets held by New Zealand residents less total liabilities owed to non-residents. New Zealand has one of the more negative NIIPs in the OECD, making us relatively more vulnerable to, for example, changes in international risk appetite.

Figure 1

Trade (exports + imports) as a percent of GDP

Source: World Bank estimates

Figure 2

Net international investment position (percent of GDP) in 2009*

Source: IMF, Stats NZ, author’s calculations.

* In the few cases where the data was only available in USD, end-of-period exchange rates were used to convert the data into national currency. The figure shown for Australia is from 2008, as 2009 estimates were not available from the IMF.
The December conference brought together a wide range of economists from universities and central banks all over the world, and the papers presented analysed the transmission of shocks using a variety of techniques.

The remainder of this article summarises the key themes discussed throughout the conference. In section 2, we focus on Tommaso Monacelli’s keynote address and discuss potential improvements in models of optimal monetary policy in the context of an open economy. Section 3 is centred on Ayhan Kose’s keynote speech and looks at the changing nature of EMEs; we then discuss the global implications of this change. Section 4 looks at whether the recent economic turmoil has signalled a change in how shocks are transmitted globally, with conflicting evidence presented in two of the papers. Section 5 details the responses of open economies to some specific shocks; namely, world demand and domestic productivity shocks. In section 6 we examine the implications of being a small open economy for monetary policy. Section 7 looks at the importance of regional factors when modelling small open economies. Section 8 concludes.

2 Directions for open economy modelling

In his keynote address, Tommaso Monacelli discussed ways that we can improve models of ‘optimal’ monetary policy (policy that maximises the welfare of individuals) in open economies. He discussed two directions in particular: an improved understanding of how firms in open economies set the prices of tradable goods, and the inclusion of “financial frictions” into models in an endogenous way.

In the standard small open economy model, two key assumptions are made:2 The first is that the prices of tradable goods are set in the producer’s currency (PCP – producer currency pricing), so that movements in the exchange rate do not result in deviations from the ‘law of one price’ (the proposition that identical goods expressed in the same currency should trade at the same price across national markets). The second assumption is that domestic and international financial markets are frictionless, in that there are no credit constraints or asymmetric information problems between lenders and borrowers. In much of the literature, these frictions are seen as important in determining fluctuations in economic activity.

In a closed economy model, optimal monetary policy usually involves stabilising domestic inflation and the output gap using interest rates. In an open economy model with PCP and frictionless financial markets, particular specifications of the model result in the same optimal policy – one that solely targets domestic objectives. However, empirical evidence suggests that PCP is not an accurate description of pricing behaviour (in New Zealand, for example, prices of most commodity exports in particular are clearly not set or denominated in New Zealand dollars). Studies such as Gopinath and Rigobon (2008) find that exchange rate movements seem to be only weakly reflected in import prices, instead of matching them one-for-one as would be expected under PCP. This has led to a trend in the modelling literature towards ‘local currency pricing’ (LCP), where prices are set by exporters in the currency of the importing country. This means that deviations from the law of one price may arise, as prices are set directly in the local currency of the consuming country instead of being set in the producer’s currency and then converted into local currency (in which case, movements in the exchange rate would be completely reflected in price fluctuations facing consuming countries).

Because deviations from the law of one price are inefficient within this modelling framework, the welfare of individuals in the economy is lowered (for example, they may be paying relatively more for imported goods than they would in the case where exchange rate movements are perfectly reflected in domestic price adjustments). Optimal monetary policy needs to take this into account when setting interest rates, given the impact of interest rates on exchange rates. LCP can occur at two levels: at the consumer level and at the border. The current typical modelling setup includes LCP at the consumer level (prices at the supermarket, for example). However, recent empirical research suggests that import prices at the border may be even less responsive to exchange rate movements than at the consumer level (Gopinath and Rigobon, 2008), potentially as a result of there being more predetermined contracts. Monacelli argued that we need

2 Leduc, Corsetti & Dedola (2010a).
to understand these two price-setting behaviours better, so that we can more accurately model the effects that exchange rates can have on domestic economies.

Monacelli’s second suggestion was that we need to improve the way in which we model financial frictions, so that we can better understand their impact on transmission mechanisms. Although financial frictions are being increasingly incorporated into economic models, most of these frictions are introduced exogenously. For example, the researcher may directly reduce the value of collateral in the model, bringing borrowers closer to their borrowing constraints. Monacelli argued that researchers need to endogenise these financial frictions, so that optimal monetary policy in good times internalises the probability that financial frictions will become more severe. Over the last decade there have been many advances in models that address ‘good’ and ‘bad’ times separately. However, Monacelli argued that the aim should be to have one model in which bad times arise as endogenous, natural responses to certain events or trends in good times.

3 The importance of EMES in the transmission of international shocks

One of the themes to emerge throughout the conference was the changing nature of emerging market economies (EMEs) over the last several decades, and the significance of this for shock transmission both to and from these countries. China and India, in particular, have gone from being relatively closed economically to being significantly more integrated into the world economy. In population terms, these two economies are the largest in the world. Changes and shocks in these countries are important for commodity exporters such as New Zealand, both through direct exports and indirect trade through countries like Australia. The state of EMEs is also important for countries that have traditionally had large manufacturing sectors, such as the US and many European countries, who now find themselves competing with cheaper imports from countries like China. In his keynote speech, largely based on Kose and Prasad (2010), Kose argued that we should use the global financial crisis as a lens to think about how EMEs have developed and where their place in the world is post-crisis. How EMEs develop will have important implications for the transmission of international shocks, and there are many directions that research on this topic can take.

Between 2003 and 2007, the GDP growth rate of EMEs exceeded that of advanced countries by over five percentage points. During the global financial crisis, there was debate as to whether EMEs could maintain this relatively high rate of growth post-crisis. In fact, the gap between EMEs and developed nations widened further in 2008 and was near seven percentage points by 2009. As a group, EMEs have fared the crisis very well, better in most cases than advanced economies. Kose argued that there are two broad explanations for this resilience: gradual structural change coming out of the Asian financial crisis in the late 1990s and policy-related factors.

Since the Asian financial crisis, EMEs have become more diversified, larger, and more open. They have also strengthened their global linkages, both financial and trade. Although EMEs are trading more overall, primarily as a result of export-led growth strategies, an increasing share of this trade is with other EMEs. In their previous work, Kose and his co-authors find that the importance of global factors for EMEs has been decreasing over time. However, the importance of EMEs for the world economy is increasing. In terms of policies, EMEs are becoming less dependent on foreign financing overall. In addition, the composition of foreign financing is shifting away from debt (denominated in foreign currencies) and towards foreign direct investment. EMEs have also accumulated huge buffers of foreign exchange reserves, which Kose and Prasad (2010) argue has resulted from export-led growth strategies and the desire to self-insure against sudden capital outflows.

Kose described several lessons he feels can be taken from the resilience of EMEs during the crisis. Firstly, it is important

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3 Some notable EMEs are China, India and Brazil. A full list of countries deemed to be “EMEs” can be found in Kose and Prasad (2010), pp. 175-176.

4 Although EMEs on the whole were resilient during the crisis, Kose and Prasad (2010) note that there were also considerable differences between them. Kose and Prasad (2010), p. 95.
to create room for policy flexibility in good times to assist during bad times. Secondly, although countries should enjoy the benefits of financial flows, they need to be wary of too much short-term debt (this is not simply an issue for EMEs, and is being addressed with respect to banks in New Zealand by the implementation of the Core Funding Ratio). Thirdly, countries need to better understand the benefits and costs of accumulating large foreign reserves; EMEs have gone from holding $0.5 trillion of foreign reserves in 1990 to roughly $5 trillion in 2009. Fourthly, countries need to have a growth strategy that is balanced between domestic and external demand, to limit the vulnerability to rapid changes in import demand from other nations. Finally, countries need to have deep and effectively regulated financial systems; this is particularly important for EMEs in limiting the impact of volatility in capital flows.

Kose felt that the key lesson for advanced economies to come out of the resilience of EMEs during the recent crisis is that advanced economies should be expanding their trade and financial linkages with EMEs. As EMEs have become larger and their per capita incomes have increased, they have become less reliant on demand in advanced economies. In conjunction with their decreasing reliance on foreign financing, this has led to a gradual divergence of EME business cycles from advanced economy business cycles (Kose and Prasad, 2010). This divergence suggests that advanced countries should enhance their relationships with EMEs in order to diversify their export base and benefit from the growth potential of EMEs. The growing importance of EMEs in the world economy also has implications for global policy. Kose and Prasad (2010) argue that there needs to be more policy coordination across countries, especially in regards to financial institutions with cross-border operations. In addition, Kose believes that EMEs should have strengthened representation at international financial institutions. Kose and Prasad (2010) argue that, in the absence of reforms to improve the stability of the global monetary system, EMEs will continue to accumulate foreign exchange reserves in order to self-insure against financial crises, with implications for macroeconomic imbalances.

The focus of one of the papers presented at the conference was the transmission of international shocks to one EME in particular – Turkey. Alp and Elekdag use an open economy dynamic stochastic general equilibrium (DSGE) model to perform a counterfactual experiment on how policies introduced in Turkey after 2001 affected the country’s response to the recent crisis. Three reforms are included in the model: the complete overhaul of the Turkish banking sector in an attempt to reduce the overall risk profile of the economy; the abandonment of the fixed exchange rate regime in favour of a floating rate regime; and the implementation of an active inflation targeting monetary policy regime. The model allows the authors to quantitatively estimate how different the impact of the global financial crisis would have been had these policies not been put in place. They estimate that the combination of these policies added approximately ten percentage points to annual GDP growth in Turkey during the crisis.

4 Has the recent crisis signalled a new era of shock transmission?

The recent economic crisis has been the largest global event of its kind since the Great Depression that began in 1929. A relevant issue for researchers and policy-makers is whether the size and reach of the recent financial crisis indicates a fundamental shift in how shocks are transmitted between international economies.

One paper that addresses this issue is Eickmeier, Lemke and Marcellino. This paper attempts to quantify the impacts of major US financial shocks on advanced countries using a Time-Varying Factor-Augmented Vector Autoregressive Model (TV-FAVAR). This model takes time series data for over 200 variables (including measures of productivity, prices, trade, and monetary and fiscal policies) from nine different countries (the G7 with the addition of Spain and Australia) and uses a statistical technique known as ‘principal components’ to estimate the underlying common factors that best explain the fluctuations across the data. How these common factors behave through time is then

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6 See Hoskin, Nield and Richardson (2009).
7 Kose and Prasad (2010), p. 162.
8 It should be noted that this analysis does not include China or other emerging Asian economies.
examined using a vector autoregressive (VAR) model, where each factor is related to contemporaneous and past values of other factors. This large setup allows the authors to capture complex interactions between the nine economies over the period examined (1971 to 2009). The authors also allow key parameters, including those defining the size of the common shocks, how one factor is affected by others, and how movements in the factors directly affect the variables, to vary over time. This enables the model to accommodate any large shocks or potential structural changes in the economy.

US financial shocks in the model are defined as unexpected changes in the Financial Conditions Index (FCI), developed by Hatzius, Hooper, Mishkin, Schoenholtz and Watson (2010). Eickmeier et al find that positive shocks to the US financial system (including, for example, increases in the stock price index and bank credit) have large, positive impacts on growth in the remaining eight countries, and that the converse is also true. The authors also find that the transmission of US financial shocks to GDP growth in the European countries has increased gradually since the 1980s, consistent with increased financial integration. This paper finds that the transmission mechanism of the recent US financial crisis shock did not differ substantially from shocks observed over previous financial crisis episodes; the exceptionally deep worldwide recession was instead driven by the sheer size of the negative shock and the increased propagation of that shock to Europe. Unsurprisingly, the recent financial crisis is the largest shock in the sample. The recent US financial shock explains 30 percent of the variation in GDP growth in the other countries on average between 2008 and 2009, compared to a role for US financial shocks of less than 10 percent on average between 1971 and 2007.

The model also indicates that the effects of this negative financial shock on global GDP growth were dampened by strong countercyclical fiscal policy reactions.

While Eickmeier et al look at the transmission of FCI shocks to GDP growth in other countries, Fry, Hsiao and Tang examine the transmission of shocks between international equity markets in a comparative study of seven crises between 1997 and 2010. In contrast to Eickmeier et al, Fry et al find that the recent global financial crisis was different to and more widespread than any of the other crises in the sample. Given that countries are more directly connected in financial markets than in terms of their GDP, this divergence in results may not be particularly surprising. The analysis in Fry et al focuses on the degree of contagion in 12 equity markets over the period, using daily data. The authors argue that there is evidence of contagion if the correlations between shocks in different countries increase in a predefined crisis period. This paper uses three different tests for contagion, one examining changes in correlations and the other two looking at changes in ‘coskewness’ (the extent to which volatility in one equity market affects the average level of another equity market, or vice versa). Using these tests, the authors find that the global financial crisis was different to all other crises in the past two decades, with a substantially higher degree of contagion indicated by all three tests. For example, the authors find that the other crises that began in the US, namely the Long Term Capital Management crisis of 1998 and the bursting of the dot com bubble in 2000, exhibited very little contagion.

The distinguishing feature of the recent crisis, relative to other recessions in recent decades, was the extent to which it intensified through the core of the financial sector. Kamber and Thoenissen use a stylised two-country DSGE model with banks to study how banking sectors can affect the transmission of international shocks. They find that the presence of a bank in the model does not alter the standard mechanism by which shocks are transmitted across borders. However, they do find that the banking sector can have significant effects on the business cycle characteristics of the model when it is an independent source of shocks. If the shocks are uncorrelated between the two countries, the authors find little evidence of spillover. For there to be a synchronised decline in economic activity in the model there needs to be a highly integrated financial system.

The authors consider two different bank ownership structures, one with foreign-owned, locally incorporated banks and one with foreign-owned, globally-integrated banks. In this model, locally incorporated banks are those that are operated locally (in that they use local labour and accumulate capital locally) but are owned by foreigners, so

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9 This FCI summarises 45 different US financial variables, including stock prices, house prices, interest rates, exchange rates and credit aggregates.
that profits accrue to the foreign economy (as is the case for New Zealand’s largest banks). When banks are globally integrated, the foreign-owned domestic bank is completely financed by the foreign bank. In the case with locally incorporated banks, the authors find that a negative shock to the domestic banking sector results in a recession in the domestic economy and a modest output expansion in the foreign economy as it experiences capital inflows, being now more attractive than the domestic economy. When there are globally-integrated banks, negative shocks to the banking sector result in large and persistent declines in output in both the domestic and foreign economies. These results imply that we need to further our understanding of the effects that bank ownership structures have on the international transmission of shocks, and suggest that the increased global integration of financial sectors leading up to the recent crisis may have enhanced the transmission of banking sector shocks between countries.

5 Shocks to open economies and their effects: some examples

There are many types of international shocks, including financial, real and nominal shocks. For example, the growth in global trade (figure 1) has increased the importance of understanding how shocks to world demand affect open economies. New Zealand’s exports make up over 30 percent of our GDP.

Two papers in particular analyse the impacts of world demand shocks. Karagedikli and Thorsrud estimate a FAVAR model to examine the transmission mechanisms through which international and regional shocks affect the New Zealand economy. As in Eickmeier et al, the FAVAR approach enables the authors to use a large dataset (363 variables from 28 countries) in order to estimate common underlying factors, which are consequently placed into a Value At Risk model. Karagedikli and Thorsrud structure the FAVAR model so that each of the underlying factors is specific to the world, regional or domestic economy. The model is also structured so that the domestic economy is too small to affect the regional or world economies and the regional economy is too small to affect the world economy. By using New Zealand data for the domestic economy, Australian data for the regional economy, and a combination of data from 26 other countries (including the US, UK, China and Japan) for the world economy, the authors are able to examine the transmission of shocks to New Zealand in particular.

Karagedikli and Thorsrud look at a number of shocks, one of which is a positive shock to world demand. In this model, an increase in world demand leads to an increase in world inflation, which results in an increase in domestic headline inflation as the prices of tradable goods increase. In response, the domestic interest rate increases. After about one year, non-tradable inflation (and thus headline inflation) declines, most likely as a result of the higher domestic interest rate. Overall, both GDP and consumption in the domestic economy fall, although not noticeably so, for over a year. The authors suggest that this may be coming from several sources. One source is the rise in tradable prices that leads to a fall in demand due to income effects (people can no longer afford to buy as much). Another source is the high world inflation that increases the cost of imported intermediate goods for production (such as oil). The authors also argue that the high domestic interest rate following the increase in inflation puts downward pressure on domestic activity. In addition, all of these effects are reinforced by the indirect effects of the Australian economy on New Zealand, given that the world demand shock also affects the region.

A similar result is obtained in Buckle, Kim, Kirkham, McLellan and Sharma (2002), where the authors find that a positive shock to world activity generates an eventual decrease in New Zealand’s GDP. In that paper, the effect occurs because, although the shock increases both export and import prices, the negative impact of the higher import prices on New Zealand GDP outweighs the positive impact of the rise in export prices.

The negative effect of a positive world demand shock on New Zealand GDP and consumption in Karagedikli and Thorsrud’s model can in part be explained by the nature of the ‘world demand shock’ itself. This is a shock to the

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10 Headline inflation is the combination of both tradable and non-tradable inflation, and is targeted by the central bank.
11 The world interest rate also increases in response to higher world inflation.
common underlying world demand factor, and so can be thought of as an increase (or decrease) in demand across the 26 countries. It is not a shock to the demand for one good, such as dairy, or in one country that imports New Zealand goods. By contrast, a sudden increase in the world demand for dairy products would not by itself lead to higher world inflation or higher tradable goods inflation in New Zealand. However, it would increase the value and volume of our dairy exports, and so we would expect New Zealand GDP and consumption to increase. Because Karagedikli and Thorsrud use data from 26 countries, the shock to the common world demand factor means that the combined increase in inflation across all of the countries is large enough to require a contractionary interest rate response in New Zealand and decreases how much people can purchase at the higher prices. However, the overall result deviates from what the authors initially expected, and suggests avenues for further research. No such mechanism is incorporated in the Reserve Bank’s own forecasting models.

Another paper that considers the effects of world demand shocks on open economies is by Claus. This paper uses a DSGE model to examine the effects of information asymmetries between borrowers and lenders. Information asymmetries in this model arise because only borrowers can costlessly observe their actual returns from production (funded by borrowing). In response to this, lenders increase the return that they demand on borrowed funds, which reduces overall investment, capital and output. The effects of these information asymmetries are exacerbated in small open economies, for several reasons. First, access to risk-free foreign bonds in international capital markets increases the opportunity cost of lending to risky domestic borrowers, so lenders demand a premium to do so. Second, returns in international capital markets are influenced by movements in the exchange rate. Finally, small economies tend to have a large number of small firms that are more affected by asymmetric information than large firms, because of economies of scale in acquiring and monitoring information. Claus finds that a positive foreign demand shock leads to an increase in exports and output in the small open economy. This leads to inflationary pressures, a consequent increase in the interest rate as monetary policy tightens, and a consequent appreciation of the real exchange rate. In this model, an appreciation of the real exchange rate now implies an expected real depreciation in the future. As a result, domestic lenders want to buy foreign bonds now and sell them once the exchange rate has depreciated, increasing their expected return. This increases the opportunity cost of lending to domestic borrowers, so lenders will demand a higher premium to do so. The presence of asymmetric information in an open economy results in a larger decrease in investment and a smaller increase in output in response to a positive world demand shock than the model without asymmetric information.

There has been intense debate in recent years around how to explain the marked widening in the US current account and trade deficits. Some authors and commentators have argued that monetary or fiscal policy shocks (for example, the substantial loosening of monetary and fiscal policy after 2000) explain most of this deterioration in the external position of the US. Others focus on East Asian exchange rate policies, while others again have focused on the role of technology and productivity shocks (for example, the dot-com bubble in the late 1990s). The paper presented by Jacob and Peersman uses a two-country DSGE model, calibrated for the US on the one hand and a group of 16 OECD economies on the other, to shed some light on these issues and especially on the type of US productivity shocks that might be expected to have affected the US trade balance. They find that traditional total factor productivity shocks, that affect the efficiency with which capital and labour are combined to produce output, have had relatively little impact on the cyclical behaviour of the trade balance in the US. By contrast, they find that shocks to the so-called ‘marginal efficiency of investment’ (MEI) in the US may have played a very important role in explaining movements in the trade balance. These MEI shocks can be thought of as changes in the efficiency with which savings can be transformed into physical capital and hence capture a number of phenomena, including attitudes to risk and the way in which the financial system operates.

Improvements in the MEI materially increase US demand for investment goods and widen the US trade deficit, which is also consistent with the disproportionate share of capital
goods in US foreign trade (imports and exports). Jacob and Peersman’s results, emphasising the role of MEI shocks, and secondarily of risk premium shocks, appear to go some way in explaining developments in the US trade balance over the past three decades. However, there are two important caveats. First, the paper looks at MEI shocks emanating from the United States only, and not at the role of either common global shocks or those emanating from other advanced economies. And secondly, while much of the policy focus in the last decade has been on the large surpluses in emerging Asia as the countervailing to deficits in the US (and countries like New Zealand and Australia), for data reasons the calibrations in Jacob and Peersman’s paper are limited to a sample that includes only advanced economies.

6 Monetary policy in a small open economy

Several papers examine the implications of being a small open economy on monetary policy. Leduc, Corsetti and Dedola study optimal monetary policy in an open economy DSGE model. In their model, real exchange rate misalignments (here defined as deviations from an “efficient” real exchange rate that arises in a hypothetical, frictionless economy)\(^\text{12}\) and demand imbalances (when the price of consumption is not higher in the economy whose agents value it more) arise from the dual role of exchange rates as both relative prices in the goods market and asset prices in financial markets. The authors find that when demand for tradable goods is highly price elastic (consumers are happy to substitute between foreign and domestic goods), it is optimal for monetary policy to focus solely on domestic objectives (low inflation and the output gap). This is not because there are no misalignments, but because these misalignments are not large enough to warrant significant deviations of monetary policy from domestic objectives. When the elasticity of trade is low, these misalignments are sizable and it becomes optimal for both countries to cooperate (instead of adopting a ‘beggar-thy-neighbour’ policy, where interest rates are set to benefit one country at the expense of another) and use monetary policy to lean against the real exchange rate misalignment. However, the implications from this paper are not particularly applicable to New Zealand monetary policy, given that we are a small country with an independent central bank and are unlikely to be able to induce cooperation with central banks in larger open economies.\(^\text{13}\)

Lipinska and Haberis examine the monetary policy of a central bank in a small open economy when it is faced with a zero lower bound (ZLB) on interest rates at home and abroad. The authors focus on a situation where there is a large global shock that pushes the nominal interest rates to zero. When the large foreign economy is at the ZLB, its central bank is unable to stabilise the output gap (at least using the interest rate instrument). Since the foreign output gap will be non-zero, it will create inefficient fluctuations in the domestic output gap and domestic inflation. Whether these effects are positive or negative within this model depends on the degree of substitutability between foreign and domestic goods. The ZLB at home limits the extent to which the domestic central bank can stabilise the economy in response to the global shock and the spillover from the foreign economy. In addition, the choices of the central banks to either set optimal policy rates each period or commit to a future path of policy rates in the first period will influence the size of the spillover. These choices will also affect how long the central banks stay at the ZLB and the speed at which interest rates are increased once they are raised above the ZLB.

Although not directly addressed in this paper, it is likely that a small open economy will still be affected by the presence of a ZLB in larger economies even if it is not at the ZLB itself. Such a situation is relevant for New Zealand, where the Official Cash Rate has not fallen below 2.5 percent. The inability of the foreign central bank to stabilise its output gap and inflation will still have spillover effects on the small economy. Although the domestic central bank will be

\(^{12}\) This definition of exchange rate misalignment is in contrast to the concept of an ‘equilibrium exchange rate’, traditionally studied by international policy makers, that is based on a notion of long-term external balances.

\(^{13}\) It is not mentioned in the paper whether a small country could still achieve the same welfare improvements by setting monetary policy in response to a large economy’s monetary policy. The model in Leduc et al assumes that the two economies are of the same size, so adjustments would need to be made in order to address this question.
able to use monetary policy to respond to these spillover effects, the environment in which it does this is unusual. Usually, for example, a lowering of the policy rate would lead to an exchange rate depreciation and a consequent improvement in relative competitiveness. However, when foreign economies are at the ZLB, a lower domestic interest rate will still be higher than foreign rates, limiting the scope for such an exchange rate depreciation to occur.

Kulish and Rees investigate the independence of the yield curve in a small open economy. Long-term nominal interest rates in a number of inflation-targeting small open economies tend to move very closely with those in the US, more so than short-term nominal interest rates, and have done so for the last 15 years. This can be seen in figure 3 as the case for New Zealand; the 10 year bond rates in New Zealand and the US move together a lot more closely than the 90-day rates. This observation leads some to argue that there has been a decoupling of the short-end of the yield curve from its long-end such that, contrary to the ‘expectations hypothesis’, fluctuations in long rates are not substantially driven by changes in expected short rates. This in turn may suggest that the strength of monetary policy in these small open economies has lessened. The authors use a small open economy DSGE model to demonstrate that the high co-movement of the US long-term nominal interest rates with the small open economy’s long-term nominal interest rates does not require a decoupling of the short- and long-ends of the yield curve. This result tends to confirm policy-makers’ judgement that small open economies still have control over monetary policy in that actual and expected movements in domestic short-term rates are reflected in long-term rates, both of which have an impact on aggregate demand.

7 The importance of regional factors when modelling small open economies

Many of the current small open economy models have only two representative countries, one large (that may represent the rest of the world) and one small. However, two papers at the conference find that factors at the regional level are also important in the transmission of international shocks. Australia has long been recognised as having an important influence on the New Zealand economy. For example, Neely and Rapach (2008) find that the relative influence of regional factors on New Zealand’s inflation rate has increased in the period 1979-2006 compared to the period 1951-78. In Karagedikli and Thorsrud’s FAVAR model previously discussed in section 3, the authors provide further support for this argument by showing that the Australian region is important for the transmission of various shocks to New Zealand, both directly and indirectly through the reinforcement of world shocks. In this model, the region is assumed to be driven by underlying world factors as well as regional factors. By including factors at a regional level the authors are able to examine the transmission of shocks to the New Zealand economy.

Coleman and Karagedikli (2010) also find that releases of macroeconomic news in Australia have substantial impacts on the NZ/US bilateral exchange rate, as well as the AU/NZ bilateral exchange rate.

Figure 3
Short-and long-term nominal interest rates New Zealand and the US

Source: MarketWatch

For more information on yield curves, see Krippner (2010).
New Zealand in more detail, given that they can explicitly account for Australia. In particular, Karagedikli and Thorsrud find that the underlying regional inflation factor explains 15 and 17 percent of the variation in domestic non-tradable inflation and domestic wages respectively.

Canova and Ciccarelli use a VAR model to analyse cyclical fluctuations in the Mediterranean basin over the last two decades. The authors find that a model that divides the Mediterranean basin into three regional blocks fits the data the best. Fluctuations in the Eastern and Southern Mediterranean countries differ from those in the major European Mediterranean countries in terms of volatility, persistence, and synchronisation within the region. However, although a model with regional factors fits the data best, country-specific factors remain important. Canova and Ciccarelli find that the importance of national components does not appear to have diminished over time, except during the recent crisis, that was unusually large and synchronised across countries.

8 Conclusion
The 13 papers presented at the December conference cover a wide range of topics relating to the international transmission of shocks, and there is also significant variation in the types of methods or models used to address this topic. These methods help advance understanding of how international shocks are transmitted to open economies, such as New Zealand. Naturally, there are many more issues relating to international shock transmission that were not covered at the December conference, including the extraordinary drop in trade volumes seen during the recent crisis, shocks to funding liquidity and issues surrounding sovereign debt. The recent global financial crisis highlights the importance of understanding how international shocks are transmitted across borders, and the issues examined at the conference are likely to become even more relevant for policy-makers to the extent that the world becomes more integrated. The research agenda opened up by the recent recession and financial crisis is likely to keep researchers occupied for decades to come; debates around the Great Depression, for example, are still not fully resolved.

Conference programme
Thursday 16 December 2010
“The changing international transmission of financial shocks: Evidence from a classical time-varying FAVAR”, Sandra Eickmeier (Deutsche Bundesbank), Wolfgang Lemke (European Central Bank and Deutsche Bundesbank) and Massimiliano Marcellino (European University Institute, Bocconi University and CEPR).

“Shocked by the world! Introducing the three block open economy FAVAR”, Özer Karagedikli (RBNZ) and Leif Anders Thorsrud (Norges Bank).

“Keynote address: Resilience and growth amid global turmoil”, Ayhan Kose (International Monetary Fund).

“Financial intermediation and the international business cycle”, Güneş Kamber (RBNZ) and Christoph Thoenissen (Victoria University).

“The role of monetary policy during the global financial crisis: The Turkish experience”, Harun Alp (Central Bank of the Republic of Turkey) and Selim Elakdağ (Central Bank of the Republic of Turkey and International Monetary Fund).

“Dissecting the dynamics of the US trade balance in an estimated equilibrium model”, Punnoose Jacob (Gent University) and Gert Peersman (Gent University).

“Demand imbalances, exchange rate misalignment and monetary policy”, Sylvain Leduc (Federal Reserve Bank of San Francisco), Giancarlo Corsetti (Cambridge University, University of Rome III and CEPR) and Luca Dedola (European Central Bank and CEPR).

Friday 17 December 2010
“The yield curve in a small open economy”, Mariano Kulish (Reserve Bank of Australia) and Daniel Rees (Reserve Bank of Australia).

“The effects of asymmetric information between borrowers and lenders in an open economy”, Iris Claus (Inland Revenue, New Zealand).

“Keynote address: The New Keynesian approach to
exchange rate policy analysis: Looking forward”, Tommaso Monacelli (Innocenzo Gasparini Institute for Economic Research, Bocconi University).

“A comparison of seven crises”, Renee Fry (CAMA), Yu Ling Hsiao (CAMA) and Chrismin Tang (CAMA and La Trobe University).

“Policy trade-offs and international spillover effects at the zero bound”, Anna Lipinska (Bank of England) and Alex Haberis (Bank of England).


Additional references


Towards better data on New Zealand debt securities markets

Rochelle Barrow and Michael Reddell

The recent global recession and international financial crisis have sparked fresh interest in financial data. Traditionally, data on the balance sheets of financial intermediaries has been collected fairly comprehensively, but data on debt securities markets has been considerably more patchy. New Zealand’s financial system is still dominated by lending intermediated by the balance sheets of banks. However, debt securities markets are likely to continue to grow in importance, and understanding developments, and changes through periods of stress, will be of growing importance, both to the Reserve Bank and to others wanting to understand the financial aspects of the New Zealand economy. The Reserve Bank has been seeking to build up its resources in this area and the next step in this will be the development of a security-by-security database covering the issuance of securities within New Zealand. This article outlines some of the reasons for wanting better, more comprehensive and more timely information on activity in New Zealand’s debt securities markets, and some of the issues and challenges around developing such a database.

Introduction

Financial markets and institutions play a critical part in modern economic life. For individuals, they allow us to finance the purchase of a house early in our working lives, and then allow us to accumulate a diversified range of investments to help supplement our retirement income. And businesses are able to tap debt and equity capital beyond that which could readily be provided by the promoters of the business alone. In that sense, the quality and depth of financial institutions and markets, and the efficiency with which they accumulate and allocate savings and investment, are an important part in the overall mix of elements that makes a strong and growing economy.

In New Zealand, financial institutions – mostly banks – dominate the financial system. Banks gather deposits and wholesale funding, and make a wide range of loans which collectively underpin the claims of depositors. By contrast, securities markets cut out the middleman: companies or institutions looking to raise money do so directly from end-investors. Institutions such as the investment banking wings of financial institutions may help to arrange the placement and distribution of such securities, and may even underwrite the issue. But the intention is that the risk associated with the specific security will be held by end-investors themselves. Securities can take the form of either debt or equity (or, indeed, some hybrid combination of the two). The focus of the discussion in this article, and the Reserve Bank’s principal area of interest, is on debt securities. Simple equity securities – claims on the residual income flows of a business, without any specified maturity date – have their own issues and analytical challenges, but rather different ones from those associated with debt securities. In particular, debt securities mature and, hence, often need to be renewed or rolled over. And debt securities involve a claim that is independent of the underlying economic health of the business. Those features mean that debt securities, much like bank loans, are characterised by liquidity risk to the issuer and by credit risk to the holder. The similar economic roles played by bank loans and debt securities – and the interactions between the two markets, which can change quite quickly under stress – are a large part of the reason why the Reserve Bank has been putting more focus on trying to materially improve the data that are available on debt securities in New Zealand.
One of the great potential strengths of traditional banking is diversification – your house mortgage loan is provided by a bank, which has tens of thousands of other such loans, typically spread quite widely across the country. Someone providing the savings – a depositor – cares greatly about the overall quality of the bank’s loan book, and the level of capital shareholders have provided, but does not need to worry about or monitor closely any individual mortgage. And a small individual borrower does not need to search out a handful of individuals who will trust him and be able to monitor him, to supply the savings required for his mortgage.

The situation with securities issuance is almost reversed: the borrower is big enough to persuade savers to lend directly, confident that there are enough monitoring tools to manage the exposure they are taking on. But the holder of the security has no diversification. Someone buying, say, a Fonterra corporate bond is exposed wholly to the fortunes of that particular large company. To get the sort of diversification a bank deposit might provide, investors need to put together a portfolio of different securities.

From a depositor’s perspective, the other great attraction of traditional banking is liquidity – the ability to withdraw one’s deposit on demand. Most of us use that facility almost daily.

Various types of securities present in New Zealand

**Government securities**
The New Zealand government currently issues three types of domestic debt instruments to meet its core financing requirements:
- Treasury bills – short-term zero coupon wholesale debt instruments;
- Government bonds – medium-term instruments paying a fixed coupon interest rate, aimed at the wholesale market; and
- Kiwi bonds – a fixed-interest instrument designed for retail investors.

**Corporate debt**
Bank certificates of deposit and corporate bills of exchange are important sources of short-term funding in New Zealand. Longer-term corporate debt instruments tend to be similar in structure to bonds issued by the government, although some may include additional features.
- Money market instruments - registered commercial paper and bank bills
- Corporate bonds - issued by State Owned Enterprises (SOEs), local authorities, banks and private sector corporations.
- Kauri bonds - bonds issued in New Zealand, and denominated in New Zealand dollars, by non-New Zealand issuers.

**Equities**
The New Zealand stock (or share or equity) market instruments consist of:
- Ordinary shares;
- Preference shares;
- Redeemable preference shares;
- Convertible preference shares;
- Rights; and
- Warrants.

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2 “Banking” here refers to loans and funding undertaken across the balance sheet of a financial intermediary. In a New Zealand context, banks are the largest such intermediaries, but credit unions, building societies and finance companies all play much the same economic role.
when we pay by EFTPOS or write a cheque. But that liquidity
is also one of the great vulnerabilities of traditional banking – if lots of people (retail or wholesale) all want to withdraw
funds at once (if, say, there are concerns, valid or otherwise,
about the health of the bank) there can be a run on a bank.
The risk of a run is constantly factored into banks’ planning
and operations.

Issuers of securities typically don’t face the same sort of
immediate liquidity risk: the issuer of a typical five-year
bond has no expectation, or obligation, of having to return
cash to those buying the security until the maturity date.
If investors want cash in exchange for their security, they
need to find another investor willing to buy the security, at
whatever price they can mutually agree. Changes in the
price of any particular security can provide useful information
to potential investors (and other analysts).

In New Zealand – and most other advanced countries,
including Australia – banks remain at the heart of the
savings accumulation and credit allocation process. Most
credit is booked on the balance sheet of a bank-like
institution. The situation is somewhat different in the US,
where bank assets are much smaller relative to GDP than in
most advanced economies, and markets in debt securities
are commensurately more important. There is a variety of
reasons why securities markets are more important in the
US; some grounded in regulatory distortions, and others
founded on more fundamental factors.

There is a good reason why banks retain a very important
role in the process. One of the fundamental challenges
of providing credit is overcoming the asymmetry of
information, in which borrowers know much more about
themselves and their finances than potential lenders do.
That problem is less severe for large entities (for example,
stock broking analysts constantly monitor the financial
health of major corporations) – which is why they can use
securities markets themselves – but for individuals and for
small-to-medium businesses in particular, it is handled in
practice partly through the relationship built up between
banks and borrowers.

Although balance sheet lending remains very important in
all Western countries, debt securities markets have tended
to grow in significance over time. To some extent, this
involved new types of borrowers being able to tap securities
markets directly. But perhaps more important, especially in
the US, was the growth of securitisation – where bundles
of loans that might have been originated by banks were
turned into tradable securities (perhaps with quite complex
structures) and sold on to end-investors. For a variety of
reasons, securitisation has not yet become important in New
Zealand. Of more immediate relevance to New Zealand,
in many countries’ banks themselves became larger issuers
of securities to help efficiently fund their on-balance-sheet
lending.

In many circles, including among many policy-makers, there
had been a sense that the growing use of debt securities
markets, was a ‘good thing’. The apparent reduction in
liquidity risk, and the notion of continuous market pricing
of traded debt securities, were widely (and in many respects
rightly) seen as virtues. The resulting reduction in the relative
size of bank balance sheets was seen as potentially reducing
the challenges posed by institutions that might have been
regarded as ‘too big to fail’.

Experience during the financial crisis and global recession
of the last few years helped confirm that things were not
quite so simple. Many of the securities that had been
issued in the US weren’t in fact traded very much at all, and
many were rather complex, so getting a good sense of the
value of those securities wasn’t particularly easy. In other
cases – as had also happened earlier in the decade during
the previous recession – big US corporates had counted
on being able to fund themselves by regularly rolling over
short-term securities (commercial paper) only to find that in
crisis conditions investors (each individually with no ongoing
relationship with the issuer) simply were not interested in
buying such paper at all. And in many cases, banks were
actually quite closely associated with the securities that were
issued, in ways that put pressure on them to provide liquidity
support or even credit support when there might have been
no legal obligation to do so.3 Thus, for example, Structured
Investment Vehicles (SIVs) in the US were often sponsored by banks,
and held long-term mortgages, funded by the direct
issuance of short-term commercial paper. A failure
of a bank-sponsored SIV was often judged by the
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and held long-term mortgages, funded by the direct issuance of short-term commercial paper. A failure
of a bank-sponsored SIV was often judged by the sponsoring bank as being likely to reflect badly on
the distinctions between securities-based lending and bank-based lending become more blurred, but the way those markets were used changed very quickly, in periods of stress when the ‘fog of war’ was at its height.

New Zealand provided an example of how, even during the crisis period, the changes in the roles of the respective markets was not all in a single direction. Short-term commercial paper issuance, always rather limited in scale, fell away quite markedly during the crisis period, here and elsewhere. But in 2008 and 2009, a number of corporates found themselves somewhat over-reliant on bank debt, and in some cases breaching, or coming close to breaching, covenants on those bank debts. With banks uneasy about their own funding situation and nervous about the state of the economy, in some cases it proved much more attractive for firms to cover some of their debt needs by tapping the corporate bond market directly. In New Zealand, it is relatively straightforward to sell corporate bonds directly to the household sector (more so, say, than in Australia). In the midst of the crisis one senior New Zealand financial market participant was heard to comment that the New Zealand retail corporate bond market was one of the few funding markets in the world to have remained open.

Overall, the experience of the last few years, including the fresh perspectives that the recession and financial crisis have provided on the complex and changeable connections between debt securities markets and traditional financial intermediaries, has reinforced the importance of understanding debt securities markets better. If stresses are beginning to build up, policy-makers will expect to be able to get answers relatively quickly to questions such as:

- Which types of institutions are dependent on debt securities markets?
- What scale of rollovers is expected in the period ahead?
- What sorts of back-up facilities might those issuers have?
- What types of investors have typically held the paper?

In more normal times, it is also important – if less urgent...
to have good data on credit provided to the non-financial sectors by securities markets. The implications of such credit growth for, say, aggregate demand and asset price, is much the same as for credit intermediated through institutions such as banks.

The Reserve Bank has long kept an eye on developments in debt securities markets in New Zealand, and has been active in maintaining and disseminating some of the data that already exist. However, there is clear scope for material improvements to provide better and more systematic information on debt securities in New Zealand. The Reserve Bank is not alone in its increased interest. Recently, two government working groups have also highlighted the need for more information and statistics on securities.

Producing statistics

Since it was founded in 1934, the Reserve Bank has put considerable focus on collecting good balance sheet data from financial intermediaries operating in New Zealand whose focus is on credit creation. Thus, today, we have comprehensive data on intermediation by lending institutions through our monthly and quarterly reporting requirements. There is always room for improving these collections, which need to stay abreast on continuing developments in the sorts of products offered, and – as far as possible – in line with international standards of comparability. These data collections do not encompass all bank-based credit provided to New Zealand borrowers – they do not capture, for example, lending by foreign banks to New Zealand borrowers where those banks are operating into New Zealand directly from abroad, rather than from New Zealand registration. At times, that sort of credit can become important at the margin (as it was for the property development sector late in the boom), but for lending entities with established operations in New Zealand the data collections are systematic and comprehensive.

The comprehensive nature of those collections has been helped by the relatively small number of entities involved, most of whom in any case now fall directly within the Reserve Bank’s regulatory net. Securities markets offer slightly different challenges: there is a wide range of potential issuers, and most are not subject to powers under the Reserve Bank Act.

In other areas of economic activity, statisticians often have to source the data required to produce statistics using sample surveys. They often select a subset of individuals or businesses from the population that they are interested in due to the cost and complexity of collecting information from everyone. A questionnaire or interview is used to collect the information required, which is then aggregated to represent the entire population using a survey methodology. Surveys place reporting burden on those selected into the sample and are subject to various types of error. Developing, maintaining and operating surveys can be costly and making changes can be difficult without imposing additional reporting burden on those surveyed.

Security-by-security database

An alternative to surveying that statisticians are exploiting more often is the use of administrative data to produce statistics. Administrative data, in the context of statistical activities, is data that was originally collected for a non-statistical purpose, which is used secondarily to produce statistics (a good example, in a national accounts context, is the use of Inland Revenue tax data).

Administrative data offer the route towards more comprehensive and systematic data on securities markets. In particular, a security-by-security database collates a large quantity of low-level data on securities from many different sources and stores and manages it in a flexible manner. The objective of a security-by-security database is to hold complete, accurate, consistent and up-to-date information on all individual securities relevant for statistical purposes. Statisticians can then use the database to produce aggregate statistics and analysts can use it for ad-hoc querying of micro-data.

Data can be sourced at the lowest level possible but, in practice, data for individuals is aggregated to preserve confidentiality.
Benefits
For data on securities, a security-by-security database approach has many benefits over a survey.

Reporting burden
The data required for a security-by-security database is raw, low-level administrative data extracted from a reporting system. The volume of data being reported might suggest that this would be burdensome for data providers. However, it is often far easier for respondents to provide raw data, despite its volume, than to structure and aggregate the data prior to delivering it. This is particularly the case when reporting needs change and new aggregation rules must be applied.

Quality of data
Administrative data sources can often provide near complete coverage of the population of interest and to the extent that this is so, are not subject to sample error. However, given that administrative data are not originally collected for a statistical purpose, sometimes the data are not exactly what is required and compromise is required. In the case of securities, this is not the case because the information required to properly document debt issuance and ownership is closely aligned with what is of interest to agencies like central banks. In practice, surveys are not really an option for collecting reliable data on the debt securities market; good surveys require a clear definition of the characteristics of the relevant population, but since a wide range of types of borrowers can at times choose to issue securities, but most never do, the relevant population is not well defined.

Statisticians use statistical classifications to compile statistics, for example, ANZSIC (Australian and New Zealand Standard Industry Classification), and are reliant on survey respondents to understand these and apply them. One of the benefits of collecting raw, low-level data is that the statistician can apply all classifications required in a consistent manner.

Finally, data from a security-by-security database can help improve other statistics by validating data collected via surveys, pointing statisticians to reporting issues in a timely manner.

Timeliness
Data sourced directly from administrative systems, with no aggregation required, can be delivered to the statistician within days of the end of the reference period. This enables statistics to be produced in a much more timely manner than those compiled from surveys or, in the financial system, from traditional balance sheet-based reports (our current balance sheet data on banks is not published until the end of the month following the relevant reporting date).

Flexibility
New aggregate data requirements can be implemented very easily from a security-by-security database, with no need to trouble respondents. New ways of arranging and presenting data can also be easily implemented. The design of the database is such that data can be sliced and diced many different ways, which supports micro-financial analysis.

Costs
Building a security-by-security database incurs upfront costs. However, the operational costs of a security-by-security database are relatively low compared to alternative, less reliable, methods of collecting data. Statisticians and analysts face the additional work of manipulating and classifying a large volume of data, but the extra input is considered worthwhile for the improved quality of output.

What data are required to build a security-by-security database?
At the core of a security-by-security database is a register of all securities on issue. Nearly all securities issued in New Zealand are allocated a unique, standardised, internationally comparable identification number, or ISIN. The ISIN provides a useful, unique key for the database, which enables data from many different sources to be integrated with the issuance register.

In New Zealand, there are three main registers of securities. These businesses are responsible for registering securities, allocating ISINs and maintaining registers of those that are
holding the security. These registers are:

- Computershare Investor Services Limited is the register of all central government securities and also registers other debt and equity securities.

- Link Market Services Limited registers debt and equity securities.

- NZClear Limited, owned and operated by the Reserve Bank, is New Zealand’s primary wholesale settlement system and is the register for wholesale market RCDs (registered certificates of deposit).

By combining data from the three registries, we can compile a list of all securities issued in New Zealand by residents and non-residents.

Securities are held on register by the registered holder. In some cases, this is the beneficial owner; however, owners may also hold securities through an intermediary, such as a nominee company or a security depository. In New Zealand, there are two main security depositories:

- NZ Central Securities Depository Limited (NZCSD) is fully owned and operated by the Reserve Bank. NZCSD becomes the legal registered owner of the securities on the relevant register, holding securities on behalf of its member, the beneficial owner. The inventory of securities held in the depository currently stands at around $100 billion.

- New Zealand Clearing and Depository Corporation Limited (NZCDC) is a wholly-owned subsidiary of NZX Limited. It operates through New Zealand Clearing Limited (NZCL), which operates a clearing house and the New Zealand Depository Limited (NZDL), which operates a depository.

Information from depositaries and intermediaries is required in order to determine information such as the economic sector to which the beneficial owner of the security belongs and their residency.

Other types of data that can supplement the register include:

Information about the instrument

What type of instrument is it? Is it a government bond, a treasury bill or a share? What is its maturity date?

Information about the issuer

What is their country of residence? Are they based in New Zealand, or do they come from overseas? What sector of the economy do they operate in? Are they government? Are they a private business? Are they a registered bank?

In some countries, security-by-security databases are linked to the business register held by the national statistical office, which may hold additional information about the issuer.

Figure 3
Stylised diagram of a security-by-security database
Information about the holder

This information is similar to that collected for the issuer. However, while issuance data is usually public information, information on who is holding securities is usually not. While, technically, it is possible to collect data on individuals and businesses and store this in a security-by-security database, in practice the Reserve Bank requests a sectoral aggregation be performed prior to reporting. This ensures the privacy of individuals and businesses.

Price and yield

What is the current market price of the security? Have dividends been paid?

Statistical classifications

What is the issuer’s industry or sector code?

All of this information for any particular security is integrated into a database using the unique ISIN.

What issues arise with security-by-security databases?

Identifying the holder of a security

While information on the issuance of securities is readily available, identifying the holder or holding sector of securities can pose a challenge to statisticians. Individuals and institutions often hold securities through intermediaries, such as nominee companies or fund managers.

To address this issue, a security-by-security database can be supplemented by a survey. For example, in the case of nominee companies, a follow-up question can be the residency and economic sector of the individual or institution that they are holding securities for. This, of course, does not always result in the residency or sector of the ultimate beneficial holder, as the security may be being held by yet another intermediary.

In the case of managed funds, which are predominantly used by individuals to diversify their investments, information could be requested, or an assumption made, about the proportion of the business that is on behalf of households.

Collecting or deriving a market price

Many of the international statistical frameworks, like the system of national accounts, require statistics to be represented at market prices. Where securities are regularly traded in a liquid market, the price is relatively easy to collect. However, where a market is illiquid, a market price cannot always be collected and has to be derived using other information. One of the benefits of the security-by-security database is that these types of valuation calculations can be applied consistently.

Issuance offshore

Of particular interest to the Reserve Bank are the securities New Zealand banks issue when they raise funds offshore—which make up a significant portion of their total funding. A security-by-security database that is dependent on data from New Zealand settlement systems and registries will only capture issuance, whether by New Zealand residents or others, in New Zealand markets. Data on offshore issues by New Zealand residents may be able to be obtained from commercial data suppliers or - in the case of banks - directly from those institutions.

A New Zealand database will also not capture issuance offshore in New Zealand dollars by non-resident issuers – the so-called Eurokiwi and Uridashi market, though data can be collated in a manual way using various commercial data sources. Activity in these markets can be important to understanding market conditions in New Zealand, since the New Zealand dollars are usually intermediated back to ultimate New Zealand borrowers.

In the future, as more countries build security-by-security databases, there may be scope for an international initiative to pull the data together on a global scale. This would help to address a number of these limitations.
Kauri, uridashis and eurokiwi bonds

A Kauri bond is a New Zealand dollar-denominated security, registered in New Zealand and issued by a non-resident issuer. They are similar to the Australian Kangaroo, Canadian Maple and American Yankee bonds. The issuance of such securities is quite a recent development and most of the issuers have been supranational institutions; for example, the World Bank. Most issuers have no fundamental need for New Zealand dollars and so opportunities for issuance depends on the funding needs of domestic banks and the pricing in relevant swaps markets. The chart below highlights the large volume of issuance in 2008 and 2009. Market conditions for the issuance of these securities has since been less favourable.

Figure 4
Kauri bonds

Source: Bloomberg, Reuters

Uridashis and eurokiwis are New Zealand-dollar denominated bonds issued in offshore markets, mostly by highly-rated non-New Zealand entities. They were very popular at the peak of the boom when domestic credit was growing rapidly, New Zealand interest rates were high and the New Zealand dollar was buoyant.

Figure 5
Eurokiwi and uridashi bonds

Source: Bloomberg, Reuters

Uses of a security-by-security database

A security-by-security database supports two main uses: the production of aggregated statistics and the ad-hoc querying of micro data. Continued improvement in the quality and comprehensiveness of data on New Zealand’s financial sector and markets is crucial to the Reserve Bank.

Financial stability analysis makes use of both macro-financial statistics and micro-financial data, such as information on individual securities, issuers and types of instrument. Interest in the risks associated with different types of instruments and in the exposure of debtors and creditors, which is likely to grow as a consequence of the recent financial crisis, is also of interest. For monetary policy analysis, the stock and flow of debt held by sectors of the economy is essential. In addition, quality information on sectoral wealth, in particular household, and the development of asset prices related to securities is important.

A security-by-security database is a rich analytical tool for a central bank and will enable more detailed analysis of such things as market liquidity, maturity mismatch and roll-over risk. Better statistical data of this sort will complement the sorts of perspectives that the Reserve Bank can obtain from its close day to day contact with financial market participants.

A wide range of aggregated statistics can be produced from a security-by-security database, limited only by the data that is collected. For example, typical outputs include the value
of securities on issue by type, the value of securities held by each sector of the economy and the value of domestic securities held by non-residents.

The stylised and purely illustrative matrix in figure 6 shows how data can be presented to show, for the sectors of a notional economy, those sectors that issue securities and those that hold them.

The statistics produced by a security-by-security database will be able to be used to further improve the quality of New Zealand’s macroeconomic statistics, such as the international investment position. Better data on securities markets will help plug important statistical gaps such as sectoral wealth statistics, financial accounts and flow-of-funds statistics. The data will be able to be used to produce new statistics, validate survey responses, lower data collection costs and improve the timeliness of some statistics.

A security-by-security database for New Zealand

As the owner and operator of NZClear, the Reserve Bank has for some time been making use of administrative data on debt securities sourced from the system. To date, our work has focused on the issuance of government securities (government bonds and Treasury bills) and the non-resident holdings of those securities. Data from one of the registries has also been collected for some time. A survey of nominee companies is used to supplement NZClear data to better estimate the country of holder. These statistics are available on the Reserve Bank website.

However, while NZClear has full coverage of government securities, it has incomplete coverage of securities issued by other sectors, such as local authorities and businesses.\(^5\)

The absence of an authoritative list of all securities on issue in New Zealand has been an obvious weakness in New Zealand’s financial data. The gap makes it more difficult to measure and analyse the evolution of New Zealand’s capital markets. Over more recent years, we have been working together with the registries in New Zealand to source the information required to build a security-by-security database and, with the ongoing support of Computershare Investor Services Limited and Link Market Services Limited the Reserve Bank intends to have a security-by-security database for debt securities completed in 2012.

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\(^5\) At 28 February 2011, NZClear had 100 percent coverage of government securities and Kauri bonds, approximately 74 percent coverage of other fixed interest securities and approximately 42 percent coverage of equities.
Conclusion

The financial crisis has heightened interest in debt securities and intensified demand for quality macroeconomic and financial sector statistics.

This article has shown how a security-by-security database is one tool that can help statisticians in New Zealand meet the increasing and evolving demand for securities statistics. The usefulness of such information is only likely to grow in importance as New Zealand financial markets deepen and become more sophisticated. And periods of financial stress will recur, renewing the demand for easy access to timely accurate information on securities markets and the interface between them and traditional balance sheet-based bank lending. There are no silver bullet solutions that will quickly provide all the information analysts would like to have available, but a security-by-security database will have a wealth of data that can be sliced and diced many ways, enabling evolving user needs to be satisfied more quickly, with no need to collect additional data from respondents. Statistics derived from security-by-security databases are very timely and typically available within a matter of days, and the data is of high quality due to the full coverage of securities and because classifications are applied in standardised way. And because the data is administrative in nature – already held for underlying business purposes – the burden on respondents is minimised.

The activity of New Zealand borrowers in international markets will not be captured in this project, highlighting the way in which a New Zealand single security database will be simply one important component in the continuing project to lift our understanding of the role of debt securities markets as they affect New Zealand.

References


Reserve Bank of New Zealand: Bulletin, Vol. 74, No. 1, March 2011
Submission to the Savings Working Group

Reserve Bank of New Zealand
November 2010

Executive summary

An increase in New Zealand residents’ (firms, households, and government) savings preferences would be likely to improve New Zealand’s medium-term economic performance by reducing pressure on real interest rates and the real exchange rate, and also reduce the risks associated with the current very heavy dependence on borrowed international capital.

National savings – the savings of New Zealand residents – are, of course, not a policy lever; something that governments can simply adjust at will. Nor is a specific rate of national savings an appropriate target for governments to set. National savings (in aggregate) are the outcome of a whole series of individual choices by people and firms acting in pursuit of their own best interests and their sense of the economic opportunities and risks they face.

Microeconomic policies can affect the climate for private savings, and the government’s own savings and investment choices are also part of the mix. Policy measures that inadvertently discourage private savings should be kept to a minimum. For the most part, the New Zealand policy framework appears to do that job relatively well – our welfare system, for example, is less distorting of private choices than those in most other advanced countries. There are, nonetheless, a number of areas of public policy where we think that reforms that are probably desirable on their own terms would also be likely to lift national savings. These include:

- A faster return to government operating surpluses. In the relatively short-term (perhaps 3-5 years) a faster move to a better fiscal position is the measure most likely to result in a material increase in national savings.
- Considering a move towards a Nordic tax system (in which income earned on capital is taxed at a lower rate than the maximum marginal tax rate levied on labour). This approach recognises that capital (savings and investment) is typically more responsive than labour to changes in after-tax returns.
- Inflation-indexing the tax treatment of interest (both earnings and deductions).
- There may be opportunities to refine Kiwisaver in ways which generate much the same private savings outcomes at considerably less fiscal cost (hence improving the national savings outcomes with more cost-effective incentivisation).

Macro-prudential policy tools are likely to become a somewhat more important part in central banks’ toolkits over the coming years. Our judgement, at present, is that such tools would improve the resilience of the financial system in the event of a crisis, and may have some mild natural counter-cyclical tendencies, but that they are unlikely to materially affect the average national savings picture over long periods of time.

The Bank has not taken a view on the merits of compulsory private savings, beyond the default enrolment provisions that already exist in Kiwisaver. Compulsory schemes have typically been focused on dealing with retirement income issues (which is not the focus of the Savings Working Group). Any position taken on this issue needs to involve a very careful assessment of the extent to which such schemes abroad (notably that in Australia) have, in fact, raised national savings.

Introduction

The Reserve Bank welcomes the opportunity to provide this submission to the Savings Working Group (SWG). The Terms of Reference for the Working Group focus on national savings, which is the dimension of savings most likely to be relevant to overall economic performance, and not on retirement income issues.
The Terms of Reference touch, at times quite closely, on several areas of the Bank’s responsibility. As the Terms of Reference recognise, the issues around national savings that are likely to be relevant to New Zealand public policy choices are mostly about the possible implications for:

- macroeconomic or financial vulnerability, and
- achieving the sort of economic growth aspirations (towards narrowing the income gaps with other OECD countries) that successive governments have articulated.

We have been researching, and commenting publicly on, some of these issues for many years.

The Reserve Bank has a variety of statutory responsibilities. Of particular relevance to the ground covered in this submission, we have formal responsibility for the conduct of monetary policy to maintain medium-term price stability, and are responsible for the regulation of deposit-taking financial institutions to promote the efficiency and soundness of the financial system. Analysis of issues around macroeconomic stability and imbalances, including the role of possible policy distortions or weaknesses, falls naturally into this territory.

The New Zealand national savings picture

As the Working Group will appreciate, the New Zealand data available to analyse savings, and to make economic sense of what even good data on savings flows might mean, are far from ideal. New Zealand’s consistent under-investment in providing and maintaining a rich array of top-quality economic statistics makes it more difficult than it should be for officials, researchers, and groups such as the SWG to provide incisive and compelling analysis and advice on economic issues of the sort the Working Group is grappling with. The magnitude of New Zealand’s economic challenges means that this under-investment is not something that should be treated lightly. Collection and dissemination of good economic data is a core public good and needs to be much better funded.

In measuring savings the biggest weaknesses are probably in the sectoral breakdown of savings and particularly around the, always slightly artificial, split between business and household saving. We look forward to the new institutional sector accounts Statistics New Zealand will be producing. However, even these new series will not include financial accounts and balance sheets for each sector. The Reserve Bank is keen to see such data being produced and is willing to consider working jointly with Statistics New Zealand to achieve this. A full set of sectoral accounts would enable a far richer analysis and better understanding of issues related to saving and wealth.

Our focus in this submission, and the focus of the SWG, is on national saving and on the breakdown between public and private savings. We also focus on saving in a conventional national accounts sense. Saving is that portion of a year’s factor incomes (wages, profits, interest, rents etc) not used for final consumption in that year. Revaluations in the prices of existing assets may, in some circumstances, represent a genuine change in real national wealth. And savings choices may well be influenced by asset price changes and expectations of them, but changes in asset values are not themselves saving.

The measurement issues are generally regarded as being less severe in respect of national savings and public (i.e., government) savings data. We accept that judgement. Thus, in comparing national savings rates across countries - the focus of much of the analysis – New Zealand official data are a reasonable starting point. Measurement issues are a challenge for every country to some extent. In some respects, consistency of measurement across time and across countries is as important as anything.

To briefly recap on what those international data show, in the 10 years prior to the recession (1998 to 2007), New Zealand’s annual national savings rate averaged 17.1 per cent of output produced in New Zealand (GDP). New Zealand’s average national savings rate was above those in the US and the UK (both averaged 15.4 per cent) and below those in Australia (21.8 percent) and Canada (22.4 percent). New Zealand’s savings rate was well above the lowest in the OECD (Greece, Iceland, and Poland) but even further below the highest saving countries in the OECD (Korea, Norway, and Switzerland).

Inflation can distort the measurement and interpretation
of national savings across time and across countries. A portion of any interest payment is simply compensation for the reduction in the purchasing power of the underlying financial instrument because of inflation. The full extent of nominal interest payments is recorded as an expense, but the inflation compensation component is better thought of as a repayment of principal. Although inflation rates among the countries we typically compare ourselves with are now quite similar over time, New Zealand's high net dependence on external debt means that this issue still affects the cross-country interpretation of our savings data. For a country with no net dependence on foreign debt, all the interest payments and receipts are (net) between residents, and net out for the purposes of national savings statistics. But New Zealand has net foreign debt of just over 80 per cent of GDP and survey measures of expected medium-term inflation are around 2.5 per cent. That combination means that the real national savings rate for New Zealand is understated by up to 2 percentage points. The inflation distortion works in the other direction for countries with large net foreign assets (such as Switzerland or Norway or Singapore). Correcting for this factor tends to narrow international differences in reported national savings rates a little.

One other factor relevant to New Zealand comparisons is the gap between GDP and GNI (gross national income). GDP is the value of all income generated in New Zealand, while GNI is the value of incomes accruing to New Zealand residents. In most countries the two are very similar. That is not so in New Zealand, because of our large negative IIP position and the relatively high cost of servicing that position (that is, our typically relatively high real interest rates). National savings are the savings of New Zealand residents. But national savings rates are usually calculated relative to GDP – the measure of all income generated in New Zealand – even though a significant portion of that GDP accrues to residents of other countries. For some purposes a GDP-based comparison makes sense, but if we want to better understand the choices New Zealand residents are making, it is preferable to look at GNI-based comparisons. Doing so would raise the national savings rate by around 1 per cent.

Taking account of these two factors suggests that the national savings rate of New Zealand residents (government and private sector) from New Zealand residents’ incomes may have been less far below the typical or median OECD country’s national savings rate over the last decade or so than is commonly understood.

Of course, none of that changes the fact of the large negative net international investment position. But much of the gap between New Zealanders’ savings and the real investment (gross fixed capital formation), and the resulting increase in the net stock of foreign liabilities, occurred in the 1970s and 1980s. By 1990, the negative net international investment position was already around 60 percent of GDP. Thus, although what New Zealand residents now save from the incomes left over after we have serviced our debts looks a little low by international standards, as important is the effect of the large accumulated overhang of debt that needs to be serviced year after year. In effect, New Zealand as a whole is borrowing to service the debt.

Against that backdrop, a higher national savings rate which was closer to, or above, that typical in advanced countries would have limited the further deterioration in the NIIP position over the last 10-15 years. Alternatively, a higher savings rate might have been associated with a somewhat higher rate of investment, which could have been expected to have lifted future living standards.

How should we think about national savings?

Nations, as such, do not have savings preferences and do not make savings choices. A national savings rate is the aggregation of a series of individual choices made by firms and households, and by the government in respect of its own finances, each responding to their own perceived opportunities, risks, and constraints.

The point may seem obvious but it is important. ‘The national savings rate’ is not a policy lever that can, or should, be adjusted or set in the way that, say, an interest

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1 In the remainder of this document the term “New Zealanders” is used interchangeably with “New Zealand residents”, to encompass individuals resident in New Zealand, firms operating in New Zealand, and the New Zealand government.
rate or a tax rate can. It is, rather, an outcome of a series of mostly private choices. In that sense, understanding national savings behaviour should centre on (a) the aggregate economy-wide implications of such choices, and (b) material policy distortions or obstacles that might be inappropriately skewing savings behaviour one way or the other.

At an individual level, deferring consumption today, and taking advantage of a positive interest rate (or rate of profit) earned on the savings, lifts future income and consumption prospects.

Each individual will have a different view on the weight they put on the value of future consumption relative to today’s consumption. There are reasons to think some people are more short-sighted in making such decisions than might really be in their own long-term interest, but that is just as true of other advanced economies as it is of New Zealand. The default enrolment provisions in a scheme like Kiwisaver are partly a response to that sense – no one is compelled to do anything, but through that low cost provision people are given a nudge to consider choices that they might, on reflection, find to be in their own interests.

The focus of the SWG is, rightly, more macroeconomic in nature. At a macroeconomic level, it is also important not to consider national savings rates in isolation. The focus should be on the possible implications of New Zealanders’ savings choices for macroeconomic or financial vulnerability, and for the achievement of a better medium-term economic growth performance. Both of those in quite different ways have to do with the linkage, or otherwise, between national savings and the capital formation that is occurring in New Zealand.

To illustrate this briefly, consider two hypothetical stylised economies. An economy with a very low savings rate and a correspondingly low investment rate (gross fixed capital formation as a share of GDP) might be quite poor or growing only very slowly. But such an economy would also be in balance, there would be no net accumulation of liabilities to the rest of the world, and there would little risk of nasty corrections. On the other hand, an economy with a very high investment rate and a much lower national savings rate might be growing quite strongly, but would have a growing dependence on external finance. Depending on the form that external finance took, that might involve some material macroeconomic or financial risks. And as the experience of Japan from the late 1980s helps illustrate, even a high national savings rate is, in isolation, no guarantee that an economy will not face different types of macroeconomic or financial risks.

**Long-term growth connections**

The ‘need’ for additional investment (and, hence, capital stock), to support any anticipated path of per capita income, differs from country to country.

The implications of a relatively low national savings rate in the United Kingdom, with slow population growth, could be quite different from the implications of the same savings rate in New Zealand and Australia which have experienced quite high immigration and, hence, quite rapid population growth. More new people means a need for new houses, schools, roads, shops, factories etc, all of which need to be financed, from local or foreign savings. Rapid population growth means that a larger share of GDP needs to be devoted to investment simply to maintain a base level of capital stock per person.

Different industry structures probably also matter. For example, Australia and the United Kingdom have similar per capita incomes but whereas the financial and business services sector (critical in the UK) needs relatively little physical capital (per employee), the mining sector (critical in Australia) needs a lot of physical capital. In that sense, what is likely to matter much more than the national savings rate per se is the gap between national savings and the intended or actual rate of investment. And the gap that matters is not usually that for a single year, but rather the accumulation of such gaps, on average, over quite long runs of time.

Over the last two decades, New Zealand’s real interest rates have averaged consistently higher than those of the countries we typically compare ourselves with. That appears to be linked to gap between the amount of consumption we are happy to defer until tomorrow (i.e., the amount of saving we New Zealanders are willing to do) and the amount of investment that should, in some sense, be taking place to take advantages of the opportunities New Zealand offers.
When those differences are persistent, a persistently higher New Zealand interest rate will be needed to consistently maintain domestic price stability. The persistently higher interest rates tend to hold the cost of capital to domestic investors higher than otherwise, which deter some of the investment that would otherwise take place in New Zealand. Investment deferred in turn holds back, to some extent, the full realisation of New Zealand’s longer-term growth prospects.

Domestic considerations (local saving and investment preferences) have resulted in persistently high real interest rates (across the entire yield curve). That has tended to bias New Zealand towards an overvalued real exchange rate relative to the medium to long-term fundamentals, such as trends in relative productivity performance. It is striking that over 30-40 years there has been no sustained decline at all in New Zealand’s real exchange rate, despite the marked deterioration in our relative productivity performance and the large gap that has opened up between New Zealand incomes and those in other advanced countries. Through this channel the large ex ante imbalance between national savings and domestic investment has also tended to reinforce a skew towards economic growth that is concentrated in the non-tradables sectors of the economy, something that has become increasingly apparent since around 2004.

In an elementary textbook account of a globalised economy, national savings do not matter for medium to long-term economic growth prospects. But the nature of elementary textbooks is that they over-simplify for expositional clarity, and miss important features of the real world. Of particular importance here is way that real interest rates can stay away from some stylized ‘world real interest rate’ for surprisingly long periods of time, and the way in which those surprisingly persistent interest rates divergences can be reflected in protracted misalignment of the real exchange rate.

A higher desired or ex ante national savings rate would be likely, on average over time, to lower New Zealand’s average real interest rate (relative to those abroad), and lower the real exchange rate. A lower cost of domestic capital and a lower real exchange rate would provide a better platform for faster, better-balanced and hence more sustainable, growth in potential per capita GDP.

Vulnerabilities

The nature of the vulnerabilities that can arise from large gaps between desired savings and investment, and from large accumulated net external liability positions, depends on a variety of factors.

An economy that is drawing in mainly more stable foreign direct investment, and achieving rapid growth in export and domestic sectors, is likely to be relatively less vulnerable even if it accumulates substantial net foreign liabilities for a time. In many respects, that description fitted Singapore as it lifted GDP rapidly in the 1960s and 1970s and ran persistently large current account deficits. It is not a model that describes New Zealand at present.

On the other hand, if most of the capital inflow takes the form of debt denominated in foreign currencies, assumed by borrowers with no natural hedges, the danger can be quite marked. That was the situation in various heavily indebted countries, including Hungary in the last few years, and was also an aggravating factor in Iceland. But, again, it is not an issue in New Zealand. The net external debt of New Zealanders is mostly hedged back into New Zealand dollars.

When an economy has gone through a debt-fuelled asset price boom and a period of strong consumption, as New Zealand has, there would be significant macroeconomic adjustment risks even in a closed economy. Those challenges would be all the greater when the government budget had been allowed to move from surplus into quite significant structural deficit. When much of the financing has been from foreigners, and much of it for relatively short-terms (albeit longer than before the global crisis) the vulnerabilities are heightened. No one is quite sure how much vulnerability a net international investment position of around 90 per cent of GDP implies. But we are not aware of any other advanced country having had an NIIP position that high in modern times without some fairly difficult subsequent transitions (many of which are underway at present, in countries such as Portugal, Iceland, Spain, Greece, and Hungary). Any transition is, of course, made easier for New Zealand by our floating exchange rate and well-hedged debt.

There is an important distinction between macroeconomic and financial vulnerabilities. Accumulated imbalances and...
materially overvalued asset prices, of the sort that face New Zealand, can be followed by a prolonged period of relatively weak GDP growth, and little or no growth in consumption. Living standards may improve only slightly over quite long periods of time. Adjustments of that sort are likely to be costly and very uncomfortable, but need not of themselves threaten financial stability. (As just one, rather extreme, historical example, through the period of the Great Depression, GDP and living standards contracted very markedly in New Zealand and in the UK, Canada, and Australia, and none of those countries experienced the collapse of a major financial institution.)

The costs of a serious financial crisis are often much greater. Our judgement is that New Zealand banks, and their Australian parents, are well-capitalised to cope with economic shocks. Rating agencies appear to agree. But banks in both New Zealand and Australia are heavily dependent on foreign wholesale funding. Despite significant improvements over the last year or so, much of that funding is still relatively short-term in nature, and banks’ confidence in their ability to continue to access foreign funding in future is almost as important to their behaviour as the ability to roll over any particular funding line. At present, Australasian banks find it relatively easy (although not cheap) to raise term funding, apparently because many lenders believe that collateral values (house, farm and commercial building prices) in Australia and New Zealand are relatively robust and that banks can readily cope with any falls in asset values. If that confidence were to be materially undermined, or if global markets were to seize up again on wider concerns about adjustment pressures in Western countries, that could result in a substantial disruption to the flow of credit and risk a rather nastier real economic adjustment.

Managing vulnerabilities once the net external debt has accumulated and the large increases in domestic debt and asset prices have occurred is no simple matter. The Bank’s core funding ratio requirement will progressively reduce rollover risk and the higher levels of capital banks are now holding also help to increase the resilience of the financial system. But even a voluntary increase in private savings, or the sorts of measures that would probably be required to lift public savings, would themselves be likely to help bring about the sort of, perhaps inevitable, adjustment in asset prices that could itself increase perceived risks. There are no fail-safe ways through a period of the sort of macroeconomic vulnerability New Zealand faces.

Given the likely investment needs of a thriving New Zealand economy, the patterns of national savings apparent in New Zealand in the last decade or so would, if continued, be likely to act as something of a drag on our growth prospects, and to pose risks of some difficult economic adjustments. The adjustments could be particularly problematic if external funders were to become more concerned about our imbalances (or the somewhat similar ones in Australia). Although the composition of national savings has changed over the last couple of years (in particular, large fiscal deficits have re-emerged), Treasury, Reserve Bank, IMF and OECD forecasts all show a return over the next year or two to quite large continuing current account deficits. If the exchange rate remains at around the levels experienced recently, it would be difficult to avoid either such a current account outcome, or – at some stage – a period of much more subdued economic growth (and private domestic demand) than we are currently projecting.

What might explain relatively weak national savings?
It is difficult to be definitive about why desired private savings appears to run below the investment needs of a growing New Zealand economy. And without that definitive diagnosis it is wise to be modest in advocating significant policy measures that might affect private behavior. It is sometimes argued that our retirement income system, or the welfare system more generally, acts as a deterrent to private savings (not fully compensated for by government savings). There is no doubt some truth to this, but it sheds no light on the cross-country comparisons among advanced economies. Our welfare system is no more generous than those in most other countries, and in important respects may deter private savings less than models used in other countries (because in New Zealand neither unemployment nor superannuation benefits are linked to the recipients’ prior earnings but instead are paid at a flat rate).
In its 2007 report on New Zealand, the OECD highlighted a sense - also noted in the documents for the Henry review in Australia - that in New Zealand taxes on income on capital are more important than they are in most countries, which may discourage both investment and private savings. The private savings rate appear to have fallen materially following the change in the tax treatment of superannuation and life insurance in the late 1980s, but whether there is a causal connection needs a more in-depth examination. This area probably warrants more investigation, but it is difficult at this stage to identify major underlying causes of the modest national savings performance that are grounded in tax issues. Moreover, although it is very difficult to properly test, the international evidence on the responsiveness of private savings to changes in real after-tax returns suggests the effects are typically fairly muted.

Our relatively poor overall economic performance itself may help explain savings outcomes. Much of the discussion of saving quickly tends to drift back to the saving behavior of wage and salary earning households. In fact, trends in business savings and retained earnings are likely to be at least as important. New Zealand’s economy has done poorly relative to the OECD as a whole, or to Australia, for 30-40 years. In that environment it is likely that there are fewer growing business than there otherwise would be, and perhaps firms and their owners have seen less basis for retaining profits and ploughing them back into expanding the business than they might in a stronger and more dynamic economy.

Overall, a variety of factors may have been at work, and none individually may explain very much. Indeed, it may be that, as the numbers quoted earlier suggested, our national savings rate has not, in effect, been quite as unusually low as is often thought. But the investment needs of an economy with aspirations to catch up with the rest of the world, and to sustain strong population growth at the same time, might point to the desirability of a national savings rate a bit higher than is typical in richer countries with slower-growing populations. Our current vulnerabilities and accumulated imbalances suggest that the ongoing gap between savings and investment will narrow for a sustained period at some point. It is likely that in a successful economy per capita investment would be rising, suggesting that desirably adjustment would come in the form of choices that result in higher national savings.

**Policy options**

The Terms of Reference the government has set for the Savings Working Group is rightly focused on policy issues and options; things that governments can sensibly and usefully do. It is important here to focus on making a difference over the medium to longer-term. Imbalances that have built up over years and, in some cases, decades cannot be removed overnight, and nor can the associated vulnerabilities. In the shorter-term, however, some of the pressures can be relieved and the risks be better managed. In providing your recommendations we encourage you to focus on getting the policy framework right for the long term, focusing on first-best policy options and eschewing short-term measures that focus on symptoms rather than underlying distortions or causes. Taken together, we believe there are a number of areas where policy measures could improve the climate for national savings.

**Aggregate fiscal policy**

New Zealand ran structural fiscal surpluses for around 15 years, which greatly strengthened the government’s own balance sheet, and acted as a healthy counterweight to the growing private sector domestic and external indebtedness. Very rapid expenditure growth and tax cuts in the last five years, and a belated recognition that the permanent tax base was not as large as it may have appeared at the peak of the boom, mean that New Zealand now has large and structural deficits. Deficits will not go away as the effects of the recession pass. Even in terms of the Crown’s own balance sheet these deficits are not sustainable in the medium to long term, especially as the ageing population pressures are already beginning to mount (the first baby boomers turn 65 next year). The 2010 Budget includes projections showing the government’s intention to return to operating surplus by 2015-16, although the specific measures that would make that possible have not been determined or implemented.
There is no strong or obvious case for the New Zealand government to be running a structural fiscal deficit for a prolonged period. Indeed, the large deficits are now probably exacerbating the overvaluation of the exchange rate, simply because they are providing support for domestic demand in ways that mean the OCR is set higher than it otherwise would be. Against this backdrop, a faster return to significant surplus would also be the single most effective change the government could make to the national savings outlook for the coming five years. Raising government savings would, to some extent, be offset by a cut in private savings, but reasonable estimates suggest no more than around a 50 per cent offset even taking a medium to long-term perspective. If the structural fiscal deficit is now around 5 percent of GDP, closing that deficit quite quickly could also quite quickly add 2.5 percentage points to the national savings rate, with a commensurate reduction in the current account deficit. No other plausible policy changes could reasonably be expected to have effects on that scale over, say, the next five years.

The precise way in which an accelerated fiscal consolidation would affect the economy and national savings depends on a number of specific factors. These include the composition of the consolidation package, the extent to which it was well-signalled in advance, public sentiment at the time, and to some extent the response of monetary policy. The monetary policy framework operates in a way that means that if fiscal consolidation looked like dampening overall economic activity and lowering the inflation outlook, the OCR would be set somewhat lower than otherwise.

One argument sometimes mounted against the case for expecting an improved fiscal position to lift the national savings rate is that New Zealand had fiscal surpluses for 15 years but also a rapid run-up in private debt. It is likely that higher private debt was, in part, a substitute for lower public debt. However, the rise in household debt and rapid asset price growth was seen in a wide range of OECD countries, including many with fiscal positions that were much inferior to that in New Zealand. In other words, there is good reason to suppose that much of the increase in private debt was quite unconnected to national fiscal developments. Moreover, the widespread sense that there is now a large overhang of private debt (especially household and farm debt) suggests that there is little likelihood of a new generalised private credit boom if the fiscal deficit were to be closed more rapidly. Of course, the lower interest and exchange rates could be expected to result in additional investment and borrowing by firms in the tradables sector in particular.

**Taxation**

We noted in our submission to the Finance and Expenditure Committee’s inquiry on monetary policy and associated issues in 2007 that there was likely to be merit in looking in more depth at some changes in the tax system.

In thinking about tax issues, we urge that full consideration be given to the insights of the economic literature about how taxes on different types of income affect behaviour in different ways. Simplicity of tax administration is an important consideration in tax design, but it should not be the dominant one.

Of particular relevance given New Zealand’s growth and imbalance challenges is the literature suggesting that business investment (and saving) typically responds more aggressively to tax changes than the willingness of people to work does. Linked to this, it is important to look at the economic incidence of taxes, not just at which entity or sector legally pays the tax. Research evidence is clear that the bulk of the taxes that are levied on owners of capital are actually, in economic effect, borne by wage and salary earners. Less private investment means, over time, less productivity and less wage growth.

In its 2007 survey of New Zealand, the OECD also suggested that the Nordic approach to income tax warranted consideration. In the Nordic tax system, capital income (profits, rent, interest, dividends etc) is taxed at a rate lower than the maximum marginal rates on labour income. Norway, for example, has much higher overall tax rates than New Zealand does, but differentiates quite starkly between the quite progressive tax rates on labour income (a maximum marginal rate of 56 percent) and the tax rate on capital income (28 percent). There are, of course, significant operational issues associated with Nordic systems but these
appear to have been effectively managed, with appropriate resourcing of the tax authorities, in the countries which have adopted this approach.

A more Nordic system would align well with meeting the longer-term growth challenges facing New Zealand. Investment appears to be more sensitive to changes in tax regimes than national savings does. That means the increase in investment might exceed the increase in national savings, at least for a time. However, the improved longer-term growth prospects would help to support investor perceptions of New Zealand’s prospects and the creditworthiness of New Zealand borrowers.

Although somewhat unwieldy, to some extent the PIE regime introduced a few years ago already recognizes a difference between labour and capital income (income earned in a PIE faces a maximum final tax rate of 28 per cent, while other income is subject to a maximum marginal tax rate of 33 per cent). There could be scope to generalize this system somewhat. One other option would be to consider ear-marking some of the current rate of taxation of labour income as a social security tax. New Zealand and Australia are the only OECD countries without a social security tax.2 These taxes apply only to labour income, and the choice not to use a social security tax means that, compared with others countries, income from capital is taxed more heavily relative to labour income in New Zealand than it sometimes appears.

We have also long considered that when interest is either assessed for tax or deductible against other income for tax purposes, only the real component of interest (and not the inflation compensation component) should be assessed/deducted. At present, the marginal tax rate on the real income earned on a pensioner’s modest bank deposits may well be considerably higher than that on a wealthy business person’s labour or entrepreneurial income. That seems neither fair nor efficient, and the case for taxing nominal interest fully is not compelling on any grounds. There is some reason to think that allowing full deduction of nominal interest in respect of investment properties may have exacerbated the recent housing boom. Change in this direction would be unambiguously beneficial for the economy in the longer-term. We would not expect this change in isolation to result in a material change in national savings behaviour in the foreseeable future, although the current account deficit might narrow to some extent because of the removal of the subsidized tax treatment of debt-financed business investment.

Structural policy changes

A better performing real economy would itself lift the attractiveness of investment in New Zealand, whether undertaken by New Zealand firms or by foreign entrants bringing new equity. As discussed above, if firms and their owners see improving long-term growth and investment opportunities here, it is likely that their own savings will increase. If households really anticipated much better times ahead, they might well look to spend the gains in anticipation. However, that risk seems considerably less than usual given the overhang of high debt and unsustainable asset prices to be worked through over the next few years.

Kiwisaver

The Kiwisaver programme has been in place for only a few years, and its impact on savings behavior (private and national) is uncertain. There is now a considerable volume of funds accumulating in Kiwisaver accounts, but what is less clear is how much of that represents additional total savings, as distinct from a change in the vehicle within which the funds are held. It is clear, however, that the tax subsidies are quite generous, and it is likely that any gains in private savings could be achieved at rather less fiscal cost.

We do not have strong views on the details in this area but, for example, considering putting a time limit on the eligibility for the tax credits, sufficient to allow people to establish a savings habit, could result in large fiscal savings and, hence, improve the national savings outcomes of the Kiwisaver programme. In general, more cost-effective methods of incentivising savings should be considered. Any gains in changing long-term cultural attitudes towards saving are likely to be realised only gradually over many years but should not be discounted for that reason.

2 Other than the ACC earners’ levies.
Compulsion
The Terms of Reference rule out discussion of issues around the parameters of New Zealand Superannuation. As we noted above, it is probable that New Zealand Superannuation deters private savings less than many state pension schemes abroad do. Moreover, New Zealand Superannuation already handles basic income adequacy needs in retirement (reflected in the low elderly poverty rates reported for New Zealand in OECD comparisons). Compulsory private savings schemes in other countries have typically been linked to retirement income considerations.

Thus in considering the possible costs and benefits of a compulsory private savings scheme careful consideration would have to be given to a full assessment of the microeconomic efficiency effects, and the scale of any increase in the national savings rates that such schemes have generated elsewhere. That is not easy to do well, and we are aware that views differ widely on the overall economic impact of the Australian scheme.

Macro-prudential policy
In the wake of the recent recession and international financial crises, there has been intensified interest in the possible scope for the use of macro-prudential tools by central banks to improve the resilience of the financial system and, perhaps, to dampen big swings in credit and asset prices. Work in this area is likely to continue for some considerable time, both here and abroad, and we will learn better over time what potential, and what limitations, such instruments have.

At present, our judgement is that the macro-prudential tools may offer the prospect of improving the resilience of the financial system (and hence limiting the macroeconomic costs) in the event of a crisis. We are more sceptical that such instruments could materially dampen the very strong credit-driven upswings that occur in market economies from time to time. From the perspective of the Savings Working Group’s remit, we do not think that macro-prudential instruments, however they were deployed, would be likely to materially affect the medium-term national savings and investment patterns in New Zealand.

Conclusion
An exogenous and sustained change in private savings preferences would improve New Zealand’s overall economic performance. A faster improvement in the government’s own savings (a quicker return to fiscal surplus) would be similarly beneficial. We would expect to see a reduction in the cost of capital, a fall in the real exchange rate towards something more in line with New Zealand’s longer-term productivity performance, and a reduction in asset prices and internal debt levels. Those changes would be expected to assist medium-term growth prospects and reduce the risk of the current vulnerabilities crystallising under external pressure.

The national savings rate is an outcome of a series of, mostly private, choices. The national savings rate is neither a policy lever, nor something that public policy can simply deliver. We have, however, outlined a number of areas of reform that would be efficiency-enhancing and would be likely to lift national savings rates over the medium term. Many of the likely gains would become apparent quite gradually over a period of years as the overall climate for savings and investment shifted. Over the shorter-term, faster fiscal consolidation offers the best prospect of relatively quick gains in lifting national savings, better-positioning New Zealand against the risk of future adverse shocks, reducing some of the pressure on the real exchange rate, and assisting in a transition to stronger and better-balanced growth.
Looking into the crystal ball: a forecast and some risks for the year ahead

Speech delivered to the Canterbury Employers’ Chamber of Commerce, Christchurch, 28 January 2011

Alan Bollard and Kirdan Lees

Introduction

For New Zealanders, Christmas and New Year are the times for family, relaxation and reflection on the year past. January is the month when we traditionally look ahead, and consider what the year may hold. This speech presents our economic view of 2011, and then poses a series of international and domestic risks to that forecast. Of course our forecasts will not turn out to be completely accurate. The risk analysis is a way to examine some of the complexities that may affect us.

What we can and cannot forecast

There are limits to what we, the Reserve Bank, and indeed any economists, can forecast. Like meteorologists, economists have a reasonable understanding of what might happen in the near term, but over the longer term, perhaps beyond six quarters or so, uncertainty begins to increase. We generally find we can predict movements over the business cycle but struggle to adequately deal with big changes in structures or behaviours.

Over the long term, we resort to analysing patterns and trends in the data in ways not dissimilar to how meteorologists look to La Nina and El Nino events to help understand the longer term picture. These patterns and trends do contain useful information but, like long-term weather forecasts, provide limited comfort if you want to know if it will rain on your wedding day in Christchurch in early summer.

We regularly assess our forecast performance and look for ways to improve what we do. We find our activity forecasts a year ahead are reasonably accurate and likewise, we can forecast some price information, particularly for that part of the economy little affected by international trade. However, exchange rates and international prices are much harder to forecast.

Of course forecasting has been particularly difficult as the world pulls out of the Global Financial Crisis. People’s behaviours and business’s behaviours have changed significantly and we have little from history to guide us about how enduring or deep these changes may go. In addition, the recovery has been rocky and fragile. In this speech we go further and look at some “what-ifs”, identifying some economic developments that could make a sizable difference to our forecast picture. We examine a number of international and domestic scenarios that could conceivably impact us. These scenarios contain both “good” and “bad” outcomes, and some have perverse or indeterminate collateral implications that make it hard to classify them.

Moreover, these scenarios are not necessarily independent events. Interactions between shocks can be complex and important; and when it comes to the Global Financial Crisis, nothing is simple. For example, Howard Davies’ recent book documents 38 different things that went wrong during the Global Financial Crisis.\(^1\) Many of these were inter-related, and those interrelations made the situation worse.

But before we turn to the risks to our outlook, we will focus on what we think will happen over 2011, based on our view at the time of the latest Monetary Policy Statement, updated for data over the last month.

What we think will happen over the next year

The Global Financial Crisis was a deep and damaging event. Even in New Zealand where we have been less affected, recovery has been slow and patchy. In fact, 2010 was a disappointing year: we initially saw recovery happening, but the second half went unexpectedly soft (as it did in many

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OECD countries). During 2011 we expect the recovery to pick up and gradually become more secure.

The international outlook continues to be uneven. Growth in the Asian region has been strong but has brought its own difficulties with inflation and asset price bubbles building. The outlook for Western and developed economies is still spongy as these economies slowly recover from the aftershocks of repairing damaged bank balance sheets and ongoing government fiscal exposures. Commodity prices have reached very high levels, driven by emerging market demand. These high commodity prices generate stronger export revenue and provide a much-needed boost to incomes.

However, farmers continue to use this income boost to repair balance sheets. Indeed the business sector, broadly speaking, continues to behave cautiously, opting to rebuild company balance sheets rather than take on new investment. We think that investment will start to pick up in the second half of this year as confidence returns, but it is by no means clear how persistent business caution will remain.

The national construction market remains very soft. But the picture for the next few years is dominated by the significant impact of the Canterbury earthquake. Major damage has been done to homes, businesses and infrastructure, with a consequent significant loss of value. At the same time, there will be a big increase in economic activity as the repair work gets underway. There are many estimates, but we think that earthquake-related construction spending will add at least $5 billion to New Zealand’s nominal GDP. While essential infrastructure rebuilding will be frontloaded, our business contacts suggest much of the commercial rebuild may be a prolonged process lasting several years. All else being equal, this will add some pressure to prices and the exchange rate, but we think this is manageable.

Housing turnover within the Canterbury region has been impaired, and nationally turnover remains at low levels, despite the floating mortgage market being well below historic norms. While firming over the past couple of months, we believe the current level of house sales is consistent with continued softness in house prices this year.

As forecast, the December consumer price index jumped 4% as a result of the GST increases. Despite this, we think price inflation remains comfortably under control. This is the message that was communicated in the December Monetary Policy Statement and repeated in our January OCR Review this week. Consequently, it now seems prudent to keep the OCR low until the recovery becomes more robust and underlying inflation pressures show more obvious signs of increasing.

Four international risks
The forecasts for the year are crucially dependent on a number of international risks. A number of large economies have faced very unusual conditions as they emerge from the Global Financial Crisis, and this has resulted in high uncertainty. We highlight a number of these risks.

1 US economic gloom or boom:
US recovery has been quite slow overall, but the labour and housing markets have been hit particularly badly. The US labour market remains just below double-digit rates of unemployment, with over 15 million men and women unemployed. The number of long-term unemployed is particularly worrying, with over 6 million unemployed for more than six months. As the effects of the crisis linger, it becomes particularly difficult for the unemployed to find work. With the US housing market moribund from low household income, confidence effects, falling prices and lengthy legal delays on the mortgage foreclosure process, workers have been either unwilling or simply unable to move to seek new employment.

Moreover, in the US, both monetary policy and fiscal policy face constraints. While the Federal Reserve can pump more money into the system this risks losses on the securities they hold in return for this cash. In addition, quantitative easing no longer has the same surprise impact; reducing mortgage interest rates at the margin has little impact on households facing unemployment and unable to sell their own home. There is little room for further fiscal stimulus since Federal and State debt positions are extremely stretched. While US
firms and households continued their deleverage at the end of 2010, the US government is still increasing its debt position.

If this US domestic gloom continues or worsens, it is difficult to see American consumers playing any part in driving world recovery. Further, it could impact equity markets, and start to focus financial markets on the size of US state and Federal debt.

But just as possible, the US may surprise us with economic strength over 2011. Many US businesses hoarded cash over 2010. But now flow of funds data show non-financial firms started borrowing again in the third quarter of last year, though retaining cash from bond issuance rather than undertaking new investment. It would not be difficult for businesses to ramp up investment quickly, and then demand for labour could increase almost as rapidly as labour was shed going into the crisis.

Under this scenario, US consumers would start to spend again, acting as an engine of growth for trans-Pacific trade. Incomes would rise, providing a much needed boost to the US housing market. Markets might even worry about a pick-up in inflation from the current extremely stimulatory settings, in which case the Federal Reserve would have to rapidly call in stimulus measures, increasing policy rates during 2011, with some consequent market disruption. In this scenario, the US dollar would presumably appreciate, taking some pressure off the New Zealand dollar and providing an improved opportunity to rebalance our economy towards export growth.

2 Sovereign debt reaches crisis point

The Global Financial Crisis cruelly exposed some governments with extended public debt positions, high fiscal deficits, inappropriate regulatory environments and low productivity environments. Stimulus packages for the economy and rescue packages for certain banks have pushed some sovereign balance sheets into crisis. Financial markets have been merciless in the way they have signalled sovereign weakness, and indicate tough treatment ahead. This has most obviously occurred with the PIIGS group of countries in the Euro zone, pushing European authorities into the very uncomfortable positions of having to underwrite individual country balance sheets.

There is a possibility that this situation could worsen in 2011. So far, the risk spreads on sovereign bonds have stayed stubbornly high. More European countries are feeling the heat. Managed sovereign defaults could still occur, and these could impact the banking systems of core European countries. Investors continue to re-evaluate the price of sovereign debt in the Euro area. Moreover the countries that have implemented austerity plans could find the terrain rougher and the recovery harder than first thought. This would imply more spill-over to the wider euro area economy. Some eastern European economies on the periphery could suffer, and countries outside the euro area might not be immune.

Renewed fragility in funding markets could have other effects. Slow growth and high debt in Japan, together with its skewed demographic profile, could worry volatile markets, and other Western countries would not be immune from this. A scenario of renewed capital market fragility would also make life much tougher for Australian and New Zealand banks, and that would be extremely damaging to our economic recovery.

3 Emerging markets outperform and bubbles burst

One feature of the post-crisis world has been the ability of emerging markets, characterised by the BRICs grouping of Brazil, Russia, India and China, to recover rapidly from the massive fall in global demand during the recession. This suggests that these countries now contain many of the institutional features, some put in place in the Asian region as a result of the Asian crisis, that will foster growth and provide more resilience to shocks that may hit the global economy across 2011 and beyond.

This group of countries has managed to finally attain their place at the world table as the new G-20 order is hammered out. This change in the underlying geopolitics will be complex and not just occur over 2011, but during the next decade. But in the short-run strength in the BRICs is underpinning the global recovery and this could intensify further. If this
happens, it will boost New Zealand’s trading prospects. At the same time there is a real risk of over-heating.

Much of the strong growth in China was driven by the extension of credit through the latter part of the crisis. This helped China to post double digit growth rates for most of the past year. But now there are general signs of over-heating through Asian economies, risking asset bubbles: Chinese asset prices, Hong Kong and Singaporean property, capital inflows into other East Asian economies, inflation in India, and house prices in Australia. A worse scenario for New Zealand would see the Asian banks, which until now largely have been insulated from the Global Financial Crisis, affected by deflating asset prices. Domestic demand could slow, Asian countries turn protectionist, and current account surpluses rise.

A material slowing in Chinese growth appears a likely scenario. After recent extended efforts to moderate this economy, policymakers might need to apply the brakes in response to rising consumer prices. This could be very disruptive, risking loan defaults, poor bank balance sheets, capital controls, exchange rate tensions, import protection and a regional slowdown.

One effect would be to hit industrial commodity prices. A disruption of this magnitude would have another undesirable effect: knocking Australia’s terms of trade, and exposing rising imbalances in that country. New Zealand would lose the advantage of the China/Australia growth locomotive that has helped drive our own export demand over the last 12 months. In such a situation, some of the shock would likely be offset by a lower New Zealand dollar, though this would have to be balanced against higher imported inflation.

4 The commodity boom intensifies

One possibility for 2011 is that the commodity boom could intensify, surprising us with stronger export prices for primary exporters, continuing the theme in 2010. With a strong dollar hurting manufacturing exporters, so far the boom has been widespread across most commodities. This includes hard commodities, like the coal, copper and iron ore used to help fuel China’s growing economy, and also soft commodities like dairy, meat and fish, as food demand grows throughout the Asian region.

Over the long term, the infrastructure construction in China is likely to sustain high prices for hard commodities, while rising demand by emerging middle classes in Asia suggests increased demand for protein and soft commodities. Moreover, as the global economy settles into a new post-crisis order, many long held structural supply chain relationships are changing, often exacerbated by weather-related shocks. In the last year we have seen the effects of Ukrainian drought, Russian log taxes, US oil spillages, Chilean earthquakes, and Brazilian and Queensland floods on primary production and prices. La Nina weather conditions could suggest more volatility ahead.

New Zealand farmers are still recovering from the last commodity boom when some over-committed, and are still looking to reduce the debt they built up. A more measured reaction this time is important. New Zealand stands well placed to benefit from some of these changes through 2011. As oil prices rise, Western governments encourage bio-fuel conversion which exacerbates the soft commodity price pressures. New Zealand Inc.’s import bill rises, but farmers and primary exporters do well. But as oil prices rise, this places pressure on inflation not just in New Zealand, but globally, risking a bursting of the commodity boom just like the 2007-08 event. Indeed if oil prices escalate beyond $100 for long, growth in much of the world will suffer again.

As trade relationships change this creates opportunities for New Zealand exporters. For example, Australia supplying meat to Asia and Russia leaves a gap for New Zealand to export beef to the US market; while prices for New Zealand forestry have benefited from regulatory controls implemented in the Russia Federation that have created a shortage of logs for Chinese markets, increasing the price of New Zealand logs.

However, high commodity prices put upward pressure on food prices and any intensifying of the boom will generate potentially severe inflation in the Asian region in particular. Additionally, over the past two or three years many financial market participants have looked to build a position in commodities as a new asset class in its own right, alongside
more traditional assets, such as stocks. The extent of these positions and how this might play out if the boom intensifies is yet to be determined but it constitutes a key risk for 2011.

**Four domestic risks:**
Of course, just as there are international drivers and risks to the outlook, there are several key risks and drivers to New Zealand’s growth path on the domestic front. One overarching theme for the domestic economy is the extent to which households, firms, and even the government want to keep reducing their respective debt position, and how much they are able to do so.

1 **New Zealanders save but don’t spend**
One possibility we could confront during 2011 is that the cautious household reaction we saw over 2010 turns out to be a structural change in behaviours rather than a cyclical response to a marked recession. House prices could be forced to drop much further to reach true economic values. This would cast a pall of gloom over the market, with homeowners keeping houses off the market, not rebuilding, and trying to pay off mortgages faster, saving more, and spending less. The construction and retail sectors would suffer as a result. Under this scenario, the Reserve Bank might have to reconsider some further monetary policy stimulus. Such restrained spending would keep domestic demand in check for 2-3 years, constraining growth short-term but building a stronger base for long-term growth.

The positive side of this risk is that it would accelerate New Zealand’s much discussed rebalancing, reducing the current account deficit, improving competitiveness, reducing exchange rate pressure, relieving pressure on funding markets, and reducing our external vulnerability generally. The negative side is that New Zealanders would have to reduce their consumption compared with pre-GFC years, and that could create an emigration exodus.

2 **Financial market fragility**
Another negative scenario would be if financial markets, scarred by European debt, were to become more allergic to indebted small countries generally. In that situation local banks could find their funding markets increasingly fragile, and with an overly cautious eye on Basel III, and more interesting expansion opportunities elsewhere, the cost and availability of credit would tighten for New Zealand business. This would limit business re-investment and mean some businesses might hit capacity bottlenecks later in the year when demand starts to recover.

In addition, funding market fragility would be bad news for our public debt. If participants in fragile sovereign funding markets were to form a view that New Zealand exposure is less attractive, credit rating agencies might re-assess New Zealand sovereign debt, meaning that debt servicing costs could rise. If the market were to form the view that the government deficit was increasingly structural and hard to correct, and if the New Zealand Government were forced to consolidate faster, this could generate a contractionary effect on consumption, which would be difficult to counter with monetary policy. And in such an environment, looser fiscal policy would not be a serious option.

3 **Construction boom**
While we have outlined a number of negative risks to the business environment, one that could be more positive would be a large pick-up in construction this year. There are two obvious drivers. Firstly the Canterbury earthquake: our estimates suggest that the $5 billion rebuild added to nominal GDP comprises about $1 billion of damage to infrastructure and about $1 billion to commercial buildings, with the remaining $3 billion comprising residential claims.

In itself this is very big by New Zealand standards, indicated by the fact that it will add one percentage point to growth each of the next two years. However, these estimates are uncertain and damages from ongoing aftershocks, suggest the extent of the ultimate rebuild could be significantly larger.

In addition the relatively strong inward migration, the limited investment during the last few years, growing demand in the Auckland region, and leaky homes rectification means that the stock of housing could be falling behind demand. Rectifying these would put additional pressure on
resources, increasing prices already lifted by GST and other taxes/charges. Households might start to ratchet up their expectations about future inflation and in such a case the Reserve Bank could be confronted with the need to increase policy rates to dampen the accelerating inflation outlook.

4 The Rugby World Cup
One driver of growth over 2011 is, of course, the Rugby World Cup. We think the event will add about $700 million to the New Zealand economy over the six weeks of the event, contributing approximately a third of a percent to GDP. More optimistic assumptions about multiplier effects would suggest a stronger impact, during months which are normally a tourist down-time. Winning the World Cup would also boost general confidence.

How likely is it that New Zealand will win? We have asked our expert team of forecasters to answer this question. They have pointed out several solid facts: we have always won the World Cup at home; we will have a Cantabrian leading the team and another directing the back-line. Our expert team of forecasters predict that on average, the All Blacks will beat Australia in the final at Eden Park, by 23.9 to 15.6.

How to plan your business for whatever 2011 brings:
Sorry, that’s your job! Good luck for the year!
DISCUSSION PAPERS

DP2010/11
A theoretical foundation for the Nelson and Siegel class of yield curve models, and an empirical application to U.S. yield curve dynamics

Leo Krippner
This article establishes that most yield curve models within the popular Nelson and Siegel (1987, hereafter NS) class may be obtained as a formal Taylor approximation to the dynamic component of the generic Gaussian affine term structure model outlined in Dai and Singleton (2002). That fundamental theoretical foundation provides an assurance to users of NS models that they correspond to a well-accepted set of principles and assumptions for modeling the yield curve and its dynamics. Indeed, arbitrage-free NS models will parsimoniously and reliably represent the data generated by any Gaussian affine term structure model regardless of its true number of underlying factors and specification, and even non-arbitrage-free NS models will adequately capture the dynamics of the state variables. Combined with the well-established practical benefits of applying NS models, the theoretical foundation provides a compelling case for applying NS models as standard tools for yield curve modeling and analysis in economics and finance. As an illustration, this article develops a two-factor arbitrage-free NS model and applies it to testing for changes in United States yield curve dynamics. The results confirm those of Rudebusch and Wu (2007) based on a latent two-factor essentially affine term structure model: there was a material change in the behaviour of the yield curve between the sample prior to 1988 and the sample from 1988 onwards.

DP2010/12
Monetary policy implementation and uncovered interest parity: empirical evidence from Oceania

Alfred Guender and Bevan Cook
The close integration of Australian and New Zealand financial markets and the similarity of the monetary policy regimes provide the perfect backdrop for testing the empirical relevance of uncovered interest rate parity (UIP) in Oceania. We find that changes in the bilateral exchange rate have become more sensitive to the short-term interest differential over time. Most important, after the introduction of the Official Cash Rate regime in New Zealand, the responsiveness of the exchange rate has accelerated to such an extent that it is incompatible with UIP. Evidence on UIP over longer horizons is mixed with a 10-year horizon since 1990 providing the strongest support for the theory.

DP2010/13
What drives core inflation? A dynamic factor model analysis of tradable and non-tradable prices

Michael Kirker
I develop a new estimate of core inflation for New Zealand and Australia based on a dynamic factor model. By using an over-identification restriction, the factors of the model are classified as tradable and nontradable factors. This innovation allows us to examine the relative contributions of tradable and nontradable prices towards core inflation. The results show that core inflation in both countries is primarily driven by the nontradable factor. The nontradable factor also explains significantly more of the variance in headline inflation relative to the tradable factor. Finally, both the tradable and nontradable factors show similar profiles across both countries suggesting common drivers.

DP2010/14
Monetary Policy, inflation and unemployment

Nicolas Groshenny
To what extent did deviations from the Taylor rule between 2002 and 2006 help to promote price stability and maximum sustainable employment? To address that question, this paper estimates a New Keynesian model with unemployment and performs a counterfactual experiment where monetary policy strictly follows a Taylor rule over the period 2002:Q1 –2006:Q4. The paper finds that such a policy would have generated a sizeable increase in unemployment and resulted in an undesirably low rate of inflation. Around mid-2004,
when the counterfactual deviates the most from the actual series, the model indicates that the probability of an unemployment rate greater than 8 percent would have been as high as 80 percent, while the probability of an inflation rate above 1 percent would have been close to zero.

DP 2011/01
Any port in a storm? The impact of new port infrastructure on New Zealand exporter behaviour

Richard Fabling, Arthur Grimes, and Lynda Sanderson

This paper investigates the impact of port infrastructure on exporter behaviour, focusing on the opening of Metroport, a new inland port in Auckland. We model adoption of the new port facilities among local firms, and then relate uptake to future export growth performance. We find that the main determinants of uptake are product- and firm-related, rather than location-specific. Firms use the new port infrastructure in conjunction with the existing port in order to mitigate capacity constraints and/or access a greater range of transport options. We take early adoption of Metroport as a signal of an existing capacity constraint and analyse the effect of the new port on subsequent export growth, finding a positive but insignificant impact on export volumes.
NEWS RELEASES

Reserve Bank Bulletin released

16 December 2010

The Reserve Bank today released the December 2010 issue of the Reserve Bank of New Zealand Bulletin.

Set against the backdrop of the Bank’s expanded regulatory responsibilities, the first two articles look at aspects of these new functions. The lead article explains rules introduced for non-bank deposit taking institutions (NBDTs) such as building societies, credit unions and finance companies aimed at further advancing the soundness and efficiency of New Zealand’s financial system.

The second article is dedicated to another arm of the Bank’s bolstered regulatory duties, detailing the Insurance (Prudential Supervision) Act 2010. As the failure of an insurer can have a significant impact on large numbers of policyholders, the new Act is aimed at bringing minimum prudential standards to the sector. The article explains the rationale behind the legislation, its objectives and how the Reserve Bank plans to achieve these.

The final two articles in the December Bulletin delve into currency trading trends during the global financial crisis and New Zealand’s imbalances in a cross-country context.

The currency trading article notes continued growth in the daily turnover of foreign exchange, although this growth has more recently slowed. It also highlights a fall in the popularity of the ‘carry trade’ and in the international focus on the New Zealand dollar.

The final piece examines New Zealand’s net international investment position in a cross-country context. New Zealand’s net international investment position is the counterpart of running persistent current account deficits. This makes New Zealand vulnerable to changes in the availability of offshore finance although market pressures and the Reserve Bank’s Prudential Liquidity Policy have helped to improve New Zealand’s debt maturity recently. The paper also looks at the potential effect of fiscal consolidation on economic rebalancing.

New rules finalised for bank corporate governance

22 December 2010

The Reserve Bank has released its new corporate governance requirements for registered banks, following consultation.

The Bank issued a consultation paper on corporate governance in June 2010, aimed mainly at strengthening the independence of locally-incorporated banks. It has now adapted those proposals in response to feedback.

Deputy Governor Grant Spencer said the overhaul complements changes the Reserve Bank has already made in other areas, such as its local incorporation and outsourcing policies.

“The governance changes are aimed at reinforcing the expectation that overseas-owned locally-incorporated banks will operate independently, in a way more likely to protect New Zealand’s financial stability in a crisis,” he said.

Key changes to the existing corporate governance regime include:

- imposing a minimum board size of five;
- requiring at least half of the directors on a board to be independent and at least half of those independent directors to be resident in New Zealand;
- tightening the definition of an ‘independent’ director; and
- providing guidelines around the individual and collective knowledge and experience required from bank boards.

Mr Spencer said the new rules will apply to all locally-incorporated banks; however, the Reserve Bank does not anticipate significant changes will be required to existing bank boards.

Consultation on changes to banks’ Conditions of Registration – required to bring the changes into effect for each bank – will be carried out in the first quarter of 2011, after which a one-year transition period will apply.

The new policy document, along with a feedback statement and regulatory impact assessment, can be downloaded from the Reserve Bank’s website.
Update on covered bonds

21 January 2011

The Reserve Bank has announced that a regulatory limit will be applied to the issuance of covered bonds by New Zealand banks.

It will set an initial limit of 10 percent of the total assets of an issuing bank, with this limit calculated on the value of assets encumbered for the benefit of covered bond holders.

The move follows the completion of a consultation initiated last October on the introduction of a regulatory framework for covered bond programmes developed by New Zealand banks.

Deputy Governor Grant Spencer said: “An initial limit of 10 percent will allow banks to develop covered bond programmes, whilst providing a conservative ceiling on issuance in the short term”.

Mr Spencer said the Bank will review the appropriateness of this limit within the next two years, taking into account evidence as it emerges in the market.

The Reserve Bank will write to banks shortly to update their Conditions of Registration to give effect to the change.

Consultation on the appropriate regulatory framework supporting covered bond issuance was also carried out by the Bank. Further announcements on the form of the legislative support and the relevant disclosure requirements, will follow later this year.

The original consultation paper on covered bonds is available on the Reserve Bank website at http://www.rbnz.govt.nz/finstab/banking/4206833.pdf

OCR unchanged at 3.0 percent

27 January 2011

The Reserve Bank today left the Official Cash Rate (OCR) unchanged at 3.0 percent.

Reserve Bank Governor Alan Bollard said: “The outlook for the New Zealand economy remains consistent with the projections underlying the December Monetary Policy Statement.

“Domestic economic activity was weaker than forecast through the second half of 2010. September quarter GDP declined unexpectedly, and retail spending appears to have fallen in the December quarter.

“Forward indicators of activity have firmed somewhat. Trading partner activity continues to expand and New Zealand's export commodity prices have increased further. Within New Zealand, business confidence, across a range of industries, has picked up and imports of capital equipment have grown. Furthermore, there are tentative signs that housing market activity has stabilised, after having trended lower for some months.

“The recent increase in the rate of GST has caused headline CPI inflation to spike higher as expected, but underlying inflation remains comfortably inside the target band.

“As noted previously, while interest rates are likely to increase modestly over the next two years, for now it seems prudent to keep the OCR low until the recovery becomes more robust and underlying inflationary pressures show more obvious signs of increasing.”

Looking into the crystal ball: A forecast and some risks for the year ahead

28 January 2011

Reserve Bank Governor Alan Bollard today said the recovery is expected to pick up, but a wide range of scenarios could impact upon the economy in the year ahead.

Speaking to the Canterbury Employers’ Chamber of Commerce this afternoon, Dr Bollard said the behaviour of people and businesses had changed significantly since the Global Financial Crisis, making economic forecasting particularly difficult.

“We have little from history to guide us about how enduring or deep these changes may be. In addition, the recovery has been rocky and fragile,” he said.

Dr Bollard described the Global Financial Crisis as “a deep and damaging event”.

“Even in New Zealand where we have been less affected, recovery has been slow and patchy. In fact 2010 was a
disappointing year: we initially saw recovery happening, but the second half went unexpectedly soft (as it did in many OECD countries). During 2011 we expect the recovery to pick up and gradually become more secure.”

Dr Bollard said several international dynamics could impact on people and businesses in the year ahead, including further economic ‘gloom’ in the US. However, it was just as possible the US could surprise us with economic strength in 2011, he said.

“In this scenario, the US dollar would presumably appreciate, taking some pressure off the New Zealand dollar and providing an improved opportunity to rebalance our economy towards export growth,” Dr Bollard said.

Other international risks included sovereign debt reaching crisis point, emerging markets over-heating and an intensification of the commodity boom.

“New Zealand farmers are still recovering from the last commodity boom when some over-committed, and are still looking to reduce the debt they built up. A more measured reaction this time is important,” Dr Bollard said.

However, he believed New Zealand was well placed to benefit from some of these changes through 2011, but warned a continued escalation of oil prices would cause world growth to suffer again, as well as adding inflationary pressure globally.

Closer to home, Dr Bollard said domestic risks with the potential to derail the Bank’s forecasts included further fragility in the financial markets and New Zealanders continuing to save and not spend – beyond what might be expected after a marked recession.

“This would cast a pall of gloom over the market, with homeowners keeping houses off the market, not re-building and trying to pay off mortgages faster, saving more, and spending less. The construction and retail sectors would suffer as a result,” Dr Bollard said.

However, the positive side of this was an acceleration of New Zealand’s much discussed rebalancing, reducing the current account deficit, improving competitiveness, reducing exchange rate pressure, relieving pressure on funding markets, and reducing our external vulnerability generally.

Dr Bollard said a potential positive factor for New Zealand businesses was a construction boom, driven by reconstruction following the Christchurch earthquake and relatively strong inward migration.

The Rugby World Cup also had the potential to affect forecasts in a positive way.

“We think the event will add about $700 million to the New Zealand economy over the six weeks of the event, contributing approximately a third of a percent to GDP. More optimistic assumptions about multiplier effects would suggest a stronger impact, during months which are normally a tourist down-time,” Dr Bollard said.

Reserve Bank responding to Christchurch earthquake

23 February 2011

The Reserve Bank said today it is working closely with authorities and financial institutions to ensure financial services are available to people and businesses in Christchurch following the damaging earthquakes yesterday.

Reserve Bank Governor Alan Bollard extended sympathy to the people of Christchurch affected by the disaster.

“We can only imagine how difficult this is with the loss of lives, homes and buildings, the injuries and dislocation for people in Christchurch. The Reserve Bank is working hard to assist the recovery as fast as possible in terms of access to financial services, and ensuring markets remain stable,” Dr Bollard said.

The Reserve Bank is coordinating its assistance in the recovery efforts with the Government’s National Crisis Management Centre in Wellington.

“We are also working with affected banks and cash-in-transit companies to ensure the availability of cash in Christchurch. The Reserve Bank is ready and able to supply any cash required by banks. We have ample cash reserves and will issue cash to banks on any day required during this emergency situation.”

The Bank understands that some ATMs are operational. It is working closely with banks through issues of accessibility,
electricity and telecommunications to ensure cash is available.

Dr Bollard said the Bank is monitoring financial markets, noting that New Zealand has well-established emergency procedures and insurance protocols.

“We have also been informed by banks that they are reinstating the loan assistance policies that were put in place after the September 2010 earthquake, and that the four major banks have each donated $1 million to support the immediate and long-term recovery.”

No problems have been reported with the national payments and settlement systems that the Bank operates (ESAS and NZClear).

OCR reduced to 2.5 percent

10 March 2011

The Reserve Bank today reduced the Official Cash Rate (OCR) by 50 basis points to 2.5 percent.

Reserve Bank Governor Alan Bollard said: “The Reserve Bank extends its sympathies to all those affected by the Christchurch earthquake. Our condolences go especially to those who have lost family, friends and colleagues.

“The earthquake has caused substantial damage to property and buildings, and immense disruption to business activity. While it is difficult to know exactly how large or long-lasting these effects will be, it is clear that economic activity, most certainly in Christchurch but also nationwide, will be negatively impacted. Business and consumer confidence has almost certainly deteriorated.

“Even before the earthquake, GDP growth was much weaker than expected through the second half of 2010. Households have continued to be very cautious, with retail spending volumes and residential investment both declining. The export sector has benefited from very high commodity prices, however, farmers have focused on repaying debt rather than increasing spending. Also the early summer drought constrained farm output through this time. Signs that the economy was beginning to recover early in 2011 have been more than offset by the Christchurch earthquake.

“In putting together the forecasts underlying this Monetary Policy Statement, the Bank has had to make many important assumptions based on limited information. Over the coming weeks and months, these judgments will be tested as new information comes to hand. For now, GDP growth is projected to be quite weak through the first half of the year. This will gradually build up to a very large reconstruction programme by 2012 that will last for some years and contribute to a period of relatively strong activity.

“Future monetary policy adjustments will be guided by emerging economic data. We expect that the current monetary policy accommodation will need to be removed once the rebuilding phase materialises. This will take some time. For now we have acted pre-emptively in reducing the OCR to lessen the economic impact of the earthquake and guard against the risk of this impact becoming especially severe.”

Pre-positioning for Open Bank Resolution

14 March 2011

The Reserve Bank today released a consultation paper (PDF 146KB) on the pre-positioning requirements that banks will be expected to comply with to fully implement the Open Bank Resolution (OBR) policy, as referred to by the Minister of Finance in his statement on 11 March 2011.

Open Bank Resolution is a long-standing policy option aimed at resolving a bank failure quickly, in such a way that the bank can be kept open for business, thus minimising stresses on the overall banking and payments system.

Reserve Bank Deputy Governor Grant Spencer said: “The OBR policy provides for continuity of core banking services to retail customers and businesses, while placing the cost of a bank failure primarily on the bank’s shareholders and creditors rather than the taxpayer.

“The global financial crisis highlighted the potentially enormous fiscal cost associated with supporting troubled banks. The government therefore needs OBR to be an operational and effective policy option for containing the cost of a bank failure, while not threatening the safety of the overall financial system.”
Banks are being consulted on the systems requirements that are needed to ensure the concept can be put into operation.

Mr Spencer said: “The design of major Reserve Bank prudential policies such as outsourcing and local incorporation will help to facilitate the implementation of OBR. The pre-positioning of banks’ internal systems represents the next stage in that implementation process.”

Submissions for the consultation paper close on 30 June 2011.

The consultation paper can be accessed on the Bank’s website http://www.rbnz.govt.nz/finstab/banking/.

**Macro-prudential tools may bolster financial system**

**25 March 2011**

Macro-prudential instruments may help bolster financial system resilience and possibly moderate credit cycles, but expectations need to be realistic about what can be achieved, Reserve Bank Governor Alan Bollard told a conference on Basel 3 in Sydney today.

Dr Bollard said a strong micro-prudential framework – focused on ensuring the balance sheets of individual institutions are robust to shocks – is still essential for a robust financial system, and remains at the heart of New Zealand’s efforts to maintain stability in the financial system.

“However, the Global Financial Crisis showed that a micro-prudential approach may on its own not guarantee system-wide financial stability,” he said. “Policymakers are increasingly looking at macro-prudential instruments – policy tools that might be used to promote a more stable and resilient financial system and help smooth the credit cycle, reducing the risk of boom-and-bust cycles.”

Dr Bollard said there has not been a pressing need for the use of such tools given recent weakness in the credit cycle. “However, we do need to keep preparing for how we might deal with credit and asset price booms when they recur in the future.”

Dr Bollard said the Reserve Bank has undertaken a review of macro-prudential tools and identified several that it would contemplate using in appropriate circumstances, while keeping expectations realistic. These include credit-based measures, accounting tools, liquidity instruments and capital buffers.

“While none would be a silver bullet in terms of moderating the credit cycle, we believe some could make a useful contribution,” he said.

Moreover, the Bank considered that macro-prudential tools could be employed more effectively to influence the credit cycle by adopting a multi-pronged approach where several tools are employed in tandem. “For example, faced with evidence of excessive credit growth, counter-cyclical capital requirements could be used alongside increases in the Bank’s own Core Funding Ratio, and this might represent a more even-handed approach than focussing on either one alone”.

The Bank would expect to use such tools infrequently. “The Basel Committee has suggested that some countries might only use the counter-cyclical capital buffer once every 10 to 20 years when faced with exceptionally strong credit growth. We think this is a useful perspective,” Dr Bollard commented.

“The world has little practical experience with some of the macro-prudential tools currently under consideration. There will be an important learning period ahead as countries start to use these instruments and develop their implementation frameworks. We can expect our understanding of this broad area to have evolved significantly in five or 10 years’ time.”
PUBLICATIONS

Regular publications

Annual Report
Published in October each year.

Financial Stability Report
Published six-monthly. A statement from the Reserve Bank on the stability of the financial system.

Monetary Policy Statement
Published quarterly. A statement from the Reserve Bank on the conduct of monetary policy.

Reserve Bank of New Zealand Statement of Intent, 2010-2013

Recent Reserve Bank Discussion Papers

2010

DP2010/01 Evaluating household expenditures and their relationship with house prices at the microeconomic level
Mark Smith

DP2010/02 All together now: do international factors explain relative price co-movements?
Özer Karagedikli, Haroon Mumtaz and Misa Tanaka

DP2010/03 Multi-period fixed-rate loans, housing and monetary policy in small open economies
Jaromír Beneš and Kirdan Lees

DP2010/04 Internationalised production in a small open economy
Aurélien Eyquem and Güneş Kamber

DP2010/05 Using estimated models to assess nominal and real rigidities in the United Kingdom
Güneş Kamber and Stephen Millard

DP2010/06 Sharing a risky cake
David Baqaee and Richard Watt

DP2010/07 Exporting and performance: market entry, expansion and destination characteristics
Richard Fabling and Lynda Sanderson

DP2010/08 Intertemporal choice: a Nash bargaining approach
David Baqaee

DP2010/09 Debt dynamics and excess sensitivity of consumption to transitory wealth changes
Emmanuel De Veirman and Ashley Dunstan

DP2010/10 Does the Kiwi fly when the Kangaroo jumps? The effect of Australian macroeconomic news on the New Zealand dollar
Andrew Coleman and Özer Karagedikli

DP2010/11 A theoretical foundation for the Nelson and Siegel class of yield curve models, and an empirical application to U.S. yield curve dynamics
Leo Krippner

DP2010/12 Monetary policy implementation and uncovered interest parity: empirical evidence from Oceania
Alfred Guender and Bevan Cook

DP2010/13 What drives core inflation? A dynamic factor model analysis of tradable and non-tradable prices
Michael Kirker

DP2010/14 Monetary Policy, inflation and unemployment
Nicolas Grosheenny

2011

DP 2011/01 Any port in a storm? The impact of new port infrastructure on New Zealand exporter behaviour
Richard Fabling, Arthur Grimes, and Lynda Sanderson

A full list of Discussion Papers is available from Administration, Economics Department.
Selected other publications
Testing stabilisation policy limits in a small open economy: proceedings from a macroeconomic policy forum
Finance and Expenditure Select Committee inquiry into the future monetary policy framework: submission by the Reserve Bank of New Zealand

Pamphlets
Explaining Currency
Explaining Monetary Policy
The Reserve Bank and New Zealand’s Economic History
This is the Reserve Bank
Your Bank’s Disclosure Statement – what’s in it for you?
Snakes and Ladders – a guide to risk for savers and investors, by Mary Holm

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Articles in recent issues of the Reserve Bank of New Zealand Bulletin

Vol. 73, No. 1, March 2010
The crisis and the Reserve Bank’s stabilisation rate
Twenty years of inflation targeting
Inflation targeting, the financial crisis and macroeconomics: an interview with Mark Gertler
How may the new architecture of financial regulations develop?
Lessons from previous US recessions and recoveries
The crisis and monetary policy: what we learned and where we are going
Recent trends and developments in currency

Vol. 73, No. 2, June 2010
The Reserve Bank and macro-financial stability
Financial sector amplification and credit cycles in New Zealand
World trade interdependencies: a New Zealand perspective
The Reserve Bank’s new approach to holding and managing its foreign reserves

Vol. 73, No. 3, September 2010
Connecting the dots: a yield curve perspective on New Zealand’s interest rates
The New Zealand dollar through the global financial crisis
Anti-money laundering and countering the financing of terrorism - the Reserve Bank’s responsibilities and approach
The currency denomination of New Zealand’s unhedged foreign reserves

Vol. 73, No. 4, December 2010
Regulating non-bank deposit takers
Bringing financial stability legislation to the insurance industry - the Insurance (Prudential Supervision) Act 2010
Global currency trends through the financial crisis
New Zealand’s imbalances in a cross-country contest