

# **Shifting gear: why have neutral interest rates fallen?**

*A speech delivered to the New Zealand Institute of Chartered Accountants  
CFO and Financial Controllers Special Interest Group in Auckland*

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## Shifting gear: why have neutral interest rates changed?

*'...most usefully thought of as a concept rather than as a number, as a way of thinking about monetary policy rather than as the basis for a mechanical rule'* (Blinder, 1998).<sup>1</sup>

### 1. Introduction

I want to thank NZICA for providing me with this occasion to speak about neutral interest rates, why they appear to have 'shifted gear' in the last few years, and what that might mean. Neutral interest rates are important to the way the Reserve Bank thinks about monetary policy – especially how stimulatory or contractionary interest rates are – and I want to share some insights from research my colleagues have been undertaking on this topic.

First, let me recap the reasons behind our most recent monetary policy decision when we left the Official Cash Rate (OCR) unchanged at 2.5 percent. Looking ahead, we expect demand in the economy will be boosted by further reconstruction in Canterbury, high export commodity prices, momentum in the housing market and low interest rates. This pick-up in demand will be partly offset by fiscal consolidation and continued strength in the New Zealand dollar, and the starting point is one of very low core inflation. Reflecting the balance of these forces, the Reserve Bank believes that interest rate settings should remain stimulatory for some time yet and we noted in our September *Monetary Policy Statement* that we expect to keep the OCR unchanged in 2013.

Interest rates, whether we look at the policy rate that the Reserve Bank sets or at the interest rates that households and businesses face, have been very low for the last four years, and it seems difficult to imagine that rates can stay at such low levels. We believe 90-day rates have been stimulatory since early 2009, when the OCR was first lowered to 2.5 percent in the wake of the global financial crisis (GFC). Indeed, we noted in the September *Monetary Policy Statement* that while we expect to keep the OCR unchanged in 2013, we do expect to increase the OCR next year. What average might we expect interest rates to head towards when we do eventually start to increase the OCR, and when would we expect to reach that level?

Part of answering that question requires taking a position on just how much stimulus current interest rate settings are adding to the economy. If our economy were growing at a rate with no under- or over-utilised resources in aggregate (often referred to as a zero output gap) and

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<sup>1</sup> See Blinder, A (1998) *Central banking in theory and practice* (MIT Press).

inflation were close to the midpoint of our 1 to 3 percent target band, then interest rates that neither stimulated nor restricted the economy would be appropriate. Such a level of interest rates can be termed the neutral interest rate. Interest rates set below this 'neutral' level tend to boost the pace of activity and inflation in a sluggish economy where inflation would otherwise be falling, and interest rates above this 'neutral' level tend to slow the pace of activity and inflation where inflation would otherwise be rising during economic upswings.

Our latest forecasts project the output gap to be near zero and inflation to be close to the 2 percent midpoint in March 2016 (figure 1). Consequently, the appropriate monetary policy setting at that time should be very close to neutral. Our projections suggest the level of the nominal 90-day interest rate that achieves this is about 4½ percent.<sup>2</sup> This is very close to my best estimate of the neutral nominal 90-day rate at present, though any point estimate of neutral comes from a fairly wide confidence interval – perhaps 100 basis points or more.<sup>3</sup>

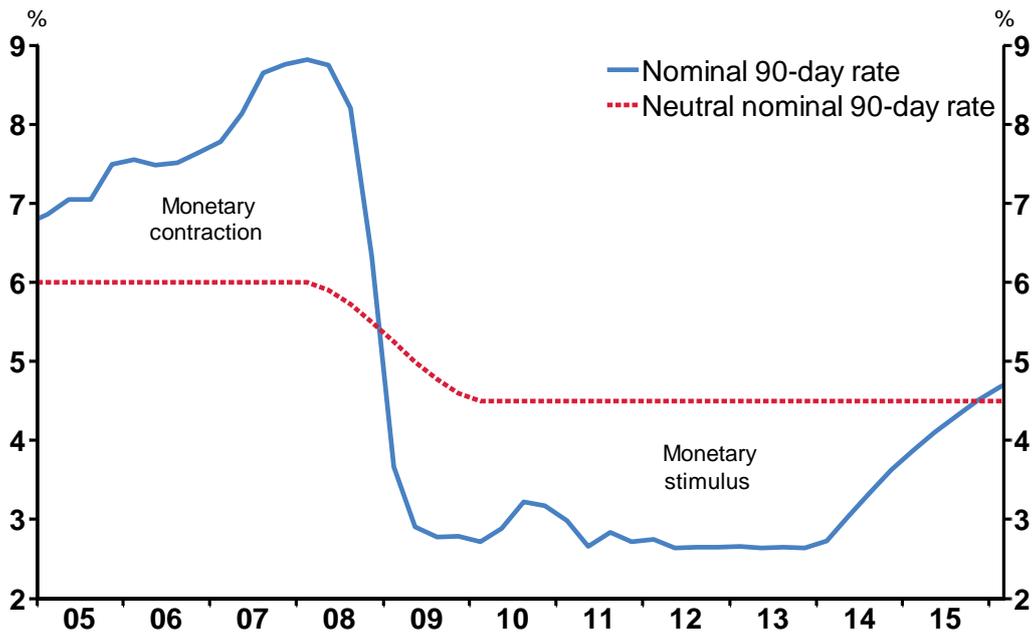
At this point I think it is useful to review the economic factors that determine neutral and explain how the Reserve Bank estimates it.

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<sup>2</sup>The uncertainty in estimating neutral can be gauged from past work at the Bank which has produced error bands of between 1 and 2 ½ percentage points. These error bands are based in some cases on formal confidence intervals. In others they are based on the range of results produced by a collection of different estimation methods. For the rest of the talk I'll only refer to the point estimate, but it should be taken as understood that there is always a band of uncertainty around our estimate of neutral.

<sup>3</sup> Here I am talking about neutral *nominal* interest rates. However, for the rest of the discussion when I talk about the concept of neutral interest rates I will mean *real* neutral interest rates. Therefore, if we were to assume inflation expectations are anchored at 2 percent, then the corresponding neutral real 90-day interest rate would be 2½ percent.

**Figure 1: A stylised view of monetary policy settings**

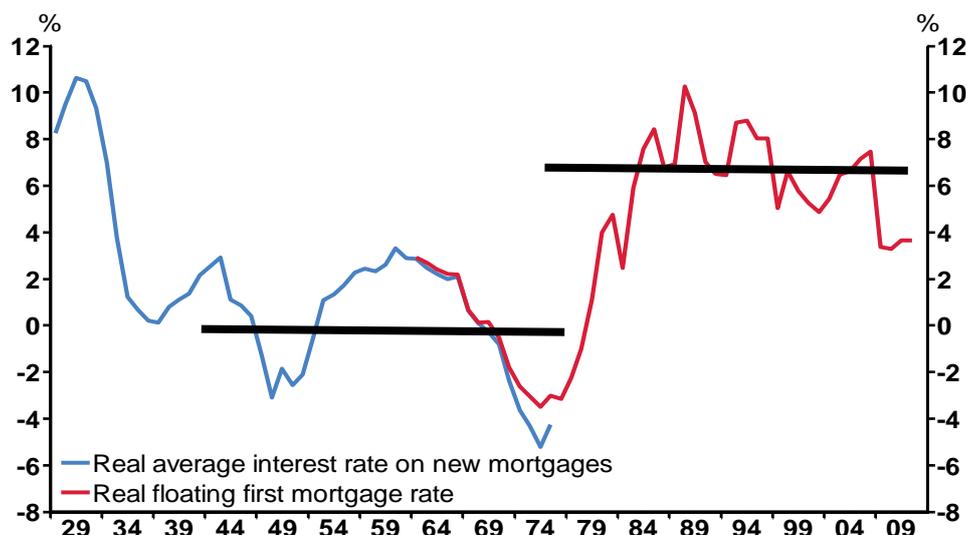


Source: RBNZ

## 2. What is a neutral interest rate?

To set the scene, it is worth reflecting on exactly what interest rates are. Interest rates reflect the price of shifting resources from one period to the next. Over long spans of history, changes in neutral interest rates have been a significant part of the variation in actual interest rates (figure 2). For example, the change we can see in real mortgage rates over the past 90 years or so is greater than can be accounted for by business cycle fluctuations and monetary policy.

**Figure 2: Real floating mortgage interest rates over a long horizon\***



Source: RBNZ

\*Nominal interest rates deflated by CPI inflation

Economic theory tells us that changes in neutral interest rates reflect changes in real economic factors such as population growth, productivity growth, preferences for savings and also world conditions.<sup>4</sup> So it's private preferences and opportunities that determine neutral – the neutral rate balances the choices of all participants in the market, on average over time.

How can savings and investment decisions of New Zealanders affect neutral interest rates? As a starting point, the interest rate can be thought of as the mechanism which reconciles the demand for funds (consumption and investment) with the supply of funds (savings). What we see is, in general, people put somewhat more value on consuming today than deferring consumption until tomorrow. This means a positive interest rate is required to encourage people to save today. In that context, the fact that New Zealand interest rates normally tend to be higher than in some other advanced countries reflects New Zealanders' tendency to invest more than we save.<sup>5</sup>

<sup>4</sup> In classic models, such as Ramsey or Solow models, the neutral interest rate is associated with the long-run equilibrium interest rate. This is determined by factors such as productivity growth and household rate of time preference (i.e. the strength with which households prefer to consume more now). In New Keynesian models, the neutral real interest rate is determined by domestic productivity growth, the household rate of time preference, and expected growth in the global economy. See Galí, J (2008) *Monetary policy, inflation and the business cycle* (Princeton).

<sup>5</sup> In an open economy the neutral interest rate in New Zealand is related to global neutral interest rates but need not be the same.

As I have mentioned, interest rates can change over time. If there is a change in preferences so that people now have a greater desire to save today and consume tomorrow, a lower interest rate will be required to equate savings and investment. And if at the same time underlying preferences for investment remain unchanged, then we would generally expect the neutral interest rate to be lower.

When the Reserve Bank sets the OCR, this affects other interest rates in the economy. We set the policy rate away from neutral when inflationary pressure is rising or falling, to slow or accelerate demand growth and so alter inflationary pressure. Interest rates above neutral, for example, will generally discourage people from investing and consuming and encourage more saving, leading inflation to slow. So if the policy interest rate is at its neutral level, monetary policy will be neither expansionary nor contractionary.

For our purposes, then, the neutral interest rate is the rate consistent with inflation being steady at, or close to, the midpoint of the inflation target band and a zero output gap.<sup>6</sup> In the Reserve Bank's framework we have a view of neutral levels for both the policy interest rate, represented by the neutral 90-day rate, to which I referred earlier, and the interest rates that households and businesses pay, which we typically proxy by the neutral floating mortgage rate.

### **3. What might have affected neutral interest rates in New Zealand?**

As I have noted, when I think about whether neutral interest rates might have changed, the typical factors I look at are world conditions, domestic productivity growth, population growth, and preferences for savings and investment. While our research indicates that the main reason for the apparent fall in neutral interest rates currently looks to be weaker productivity growth, I will go through each of those factors to illustrate how they matter, and why I think the others have been less important for the recent change.

#### **a) World conditions**

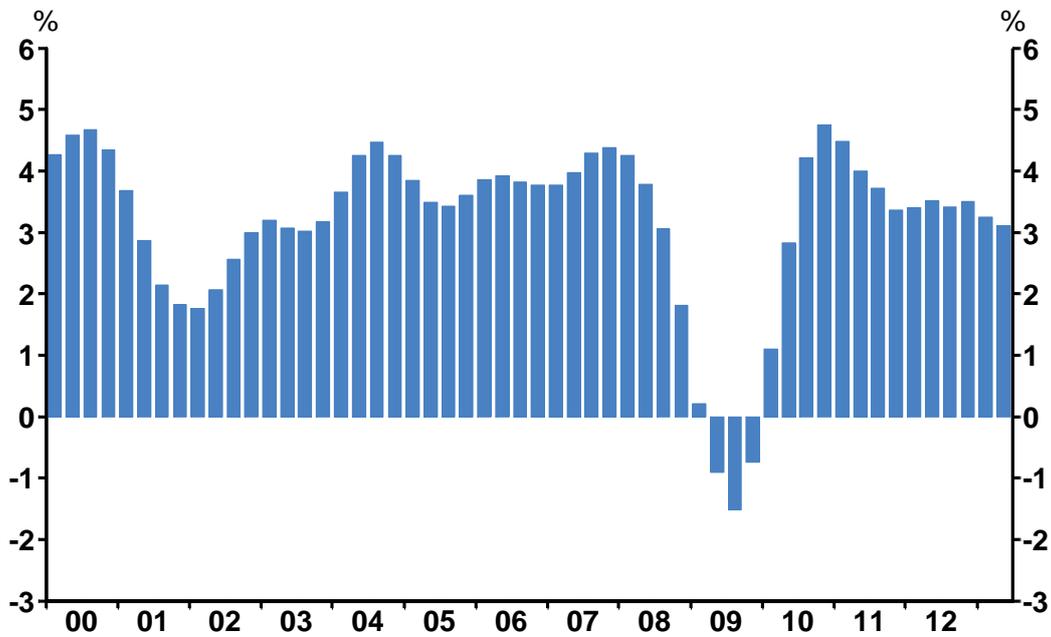
Although there was a fall in gross domestic product (GDP) growth around the world at the onset of the GFC (figure 3), I do not see the world outlook as having more than a marginal effect on neutral interest rates in New Zealand. The fall in GDP growth following the crisis is certainly consistent with the drop in actual long-term interest rates seen throughout the world, but GDP growth in our major trading partners is expected to return to around its pre-

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<sup>6</sup> This assumes that no new economic 'shocks', such as changes in global tastes for our exports, or financial crises, or changes in government spending here and abroad, push the economy away from that state.

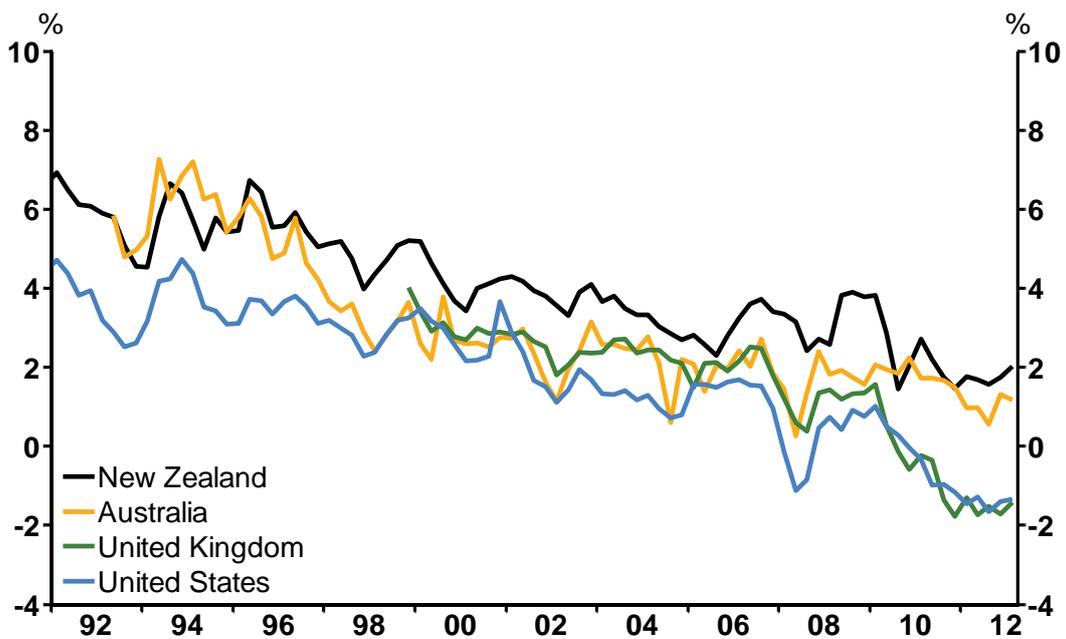
crisis trend. However, we remain wary about the future growth prospects of our trading partners. The global economy has seen many adverse shocks in the past few years and many downside risks remain.

**Figure 3: GDP growth in selected trading partner economies**



Source: Haver Analytics

**Figure 4: Real 10-year government bond rates\***



Source: Haver Analytics, Federal Reserve Bank of St Louis FRED database, Bank of England, RBNZ

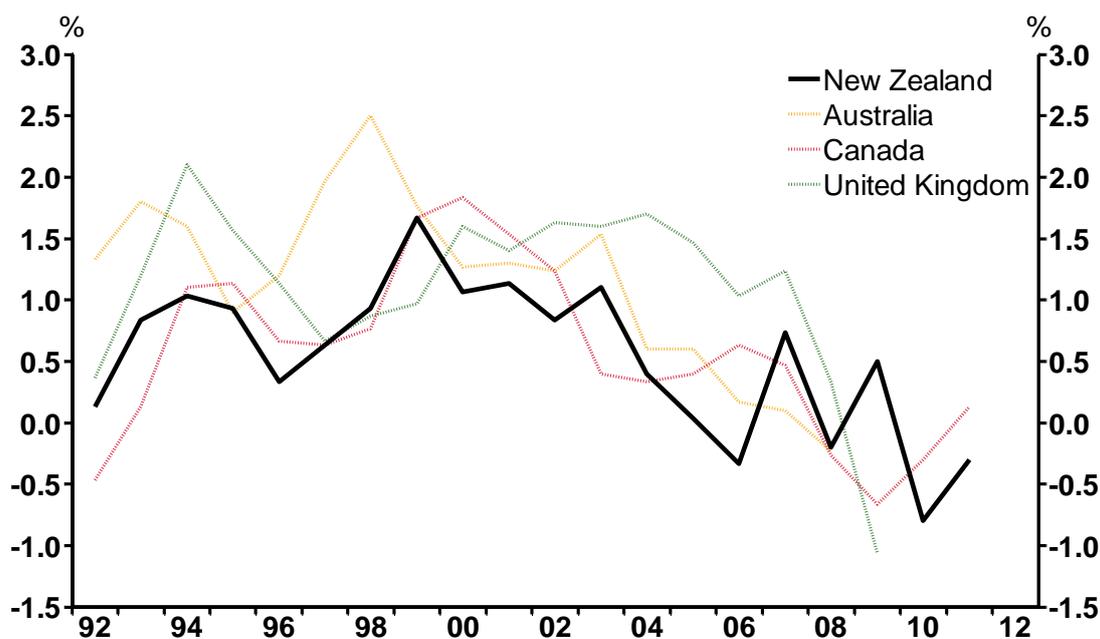
\*Real rates are nominal rates deflated by one-year-ahead inflation expectations.

### b) Productivity growth

As noted, weaker productivity growth looks likely to be the main explanation for a fall in New Zealand's neutral rates. In the past few years, productivity growth has fallen in New Zealand when compared to the two business cycles before the crisis. And this story is not unique to New Zealand (figure 5).

Why does a fall in productivity growth suggest neutral interest rates have fallen? A sustained fall in the pace of productivity growth will lower returns to investment, making it less desirable to invest. If the desire to invest falls and the desire to save remains unchanged, a lower neutral interest rate will be required reconcile savings and investment plans.

**Figure 5: Multifactor productivity growth**



Source: OECD

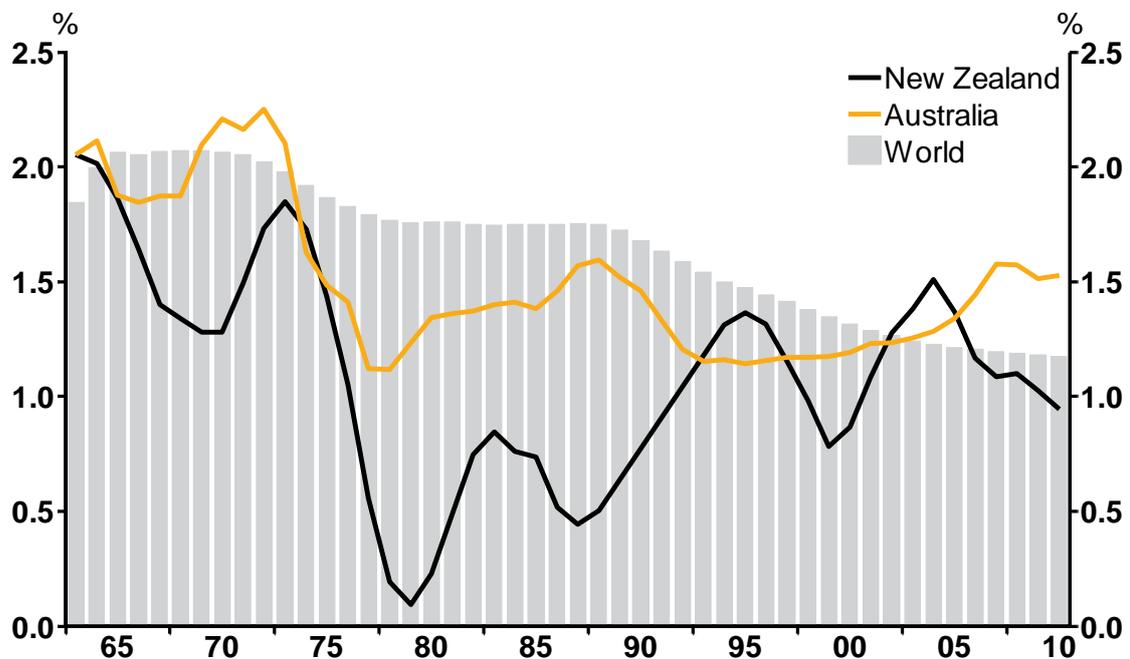
### c) Population growth

World population growth has been trending downwards since the 1960s. However, New Zealand population growth has only fallen more recently, and does not appear to be an important explanation for lower neutral rates in New Zealand (figure 6).

Lower population growth decreases the number of people in the labour force, meaning less investment is needed to provide the necessary capital stock to employ the average labour force. As investment falls, a lower neutral interest rate – the one that equalises the supply of and demand for funds – will be required.

Population growth in New Zealand over the last couple of cycles has tended to fluctuate in a way that does not match the apparent movements in neutral rates, and the recent fall in population growth is small by the standards of past movements. At the same time, the longer-lasting downtrend in world population growth raises interesting questions about the implications for neutral rates abroad.

**Figure 6: Population growth (5 year moving average)**



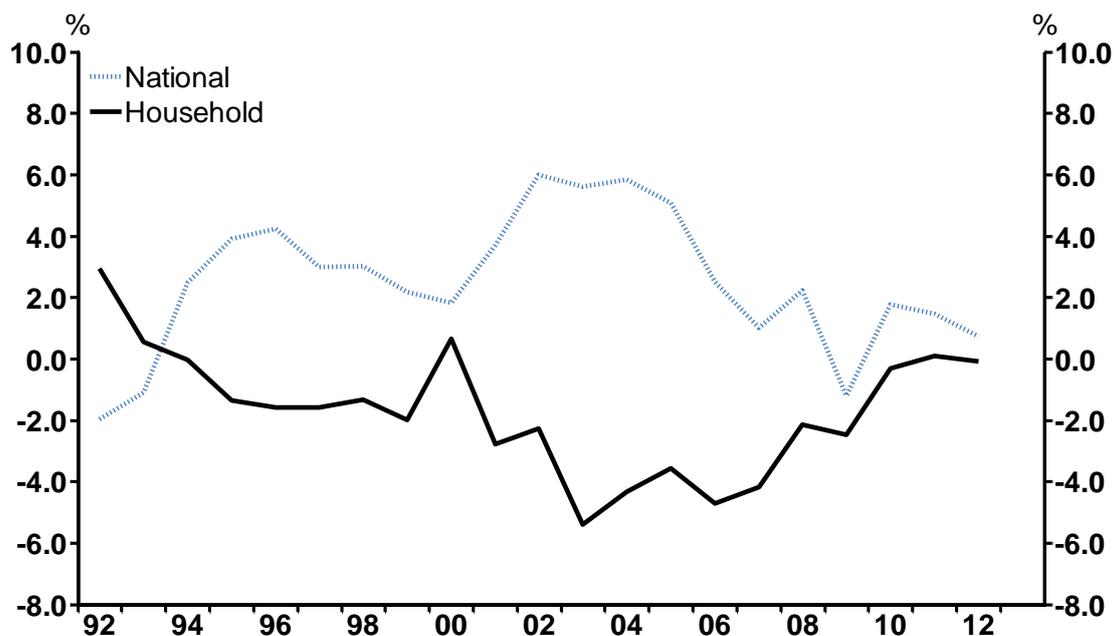
Source: World Bank

#### **d) Preferences for savings**

As I have mentioned, if people decide to save more and consume less a lower interest rate would be required to boost the pace of activity and inflation and reconcile saving and investment plans. But while savings rates have changed since the crisis in New Zealand, this appears to be more for cyclical reasons than because of a change in underlying behaviour. For that reason I would not expect it to explain much if any of the fall in neutral interest rates.

After the crisis hit, businesses and households became more cautious leading to a rise in the household savings rates (figure 7), with the household sector trying to reduce debt and exposure to financial risk.<sup>7</sup>

**Figure 7: New Zealand savings rate by sector (share of Gross National Income)**



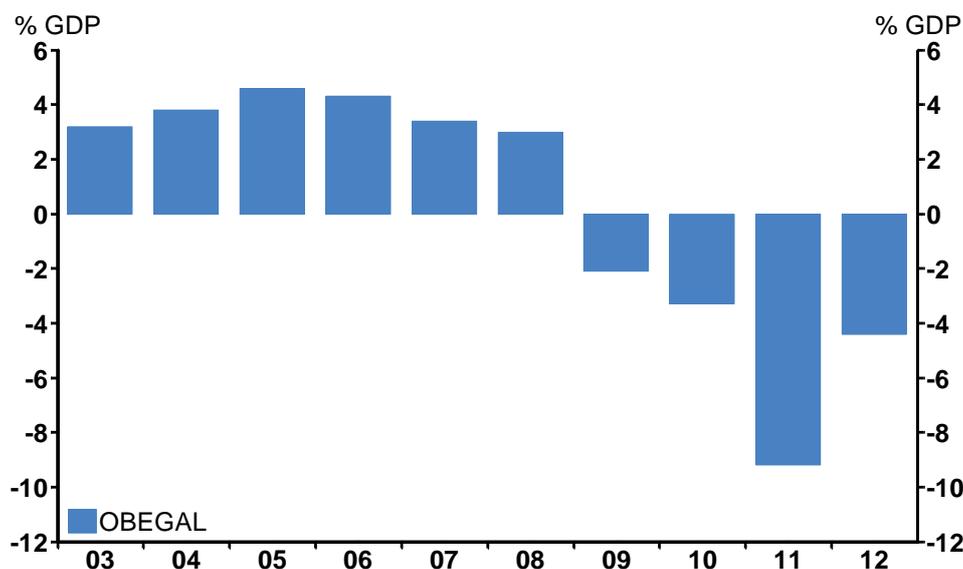
Source: Statistics NZ

During the aftermath of the crisis, the Reserve Bank recognised that it was difficult to assess how long-lasting household caution would be, with the possibility that behaviour could either be simply a typical cyclical response to a period of economic weakness, or the early stages of a more structural change in New Zealander’s attitude to debt. As such, we were restrained in how we changed our view of neutral interest rates (see section 4).

Household savings rates have continued to rise. But national savings has flattened more recently, driven by the sharp fall in the government savings rate (figure 8). Given that national savings are what matters in identifying whether neutral interest rates have fallen, preferences for savings can be only a small part of any recent change in neutral interest rates.

<sup>7</sup> Higher national savings also reflects higher corporate savings but this might well be more because of the corporate sector responding cautiously to falls in domestic and global demand than because of a change in underlying preferences.

**Figure 8: Government OBEGAL (operating balance before gains and losses)**



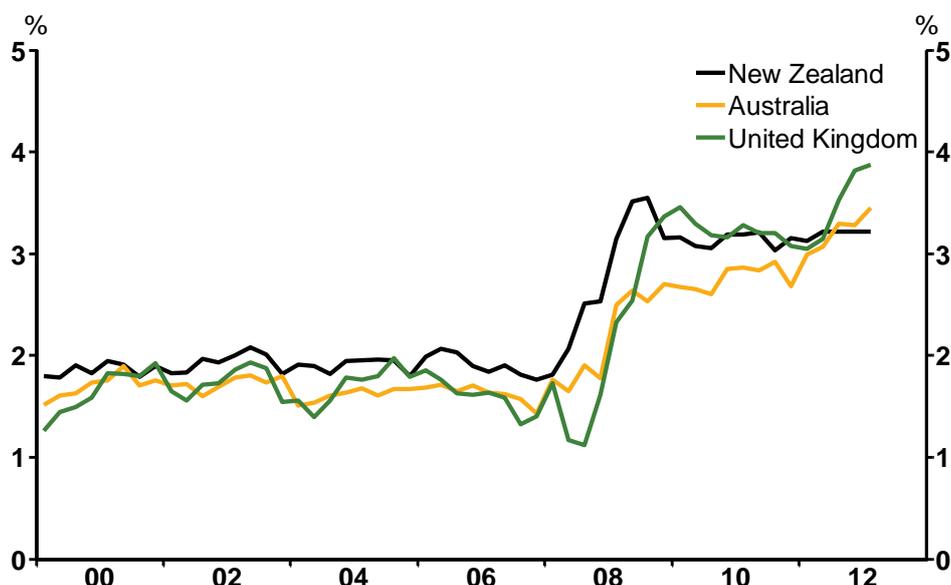
Source: New Zealand Treasury, Budget and Fiscal Update 2013

To re-cap, of the four factors I have considered today the most likely to explain a fall in neutral interest rates in New Zealand is the fall in productivity growth. World conditions, domestic population growth and changes in preferences for savings have probably not changed enough to influence New Zealand neutral interest rates materially even if they have generally moved in the right direction. That said, these other drivers do have the potential to affect neutral rates in the future if recent movements are in fact the beginning of longer-lasting structural changes. These factors have certainly been evident in the general downward drift of neutral interest rates internationally.

#### **4. How has the Reserve Bank changed its view of neutral interest rates?**

Figure 1 showed how we at the Reserve Bank stepped down our view of the neutral 90-day rate over 2008 to 2010. Although we altered our neutral policy rate assumption, we made no change to our assumption about the neutral interest rate faced by households and businesses. We assumed that the increase in the spread between retail rates, such as the floating mortgage rate, and the policy rate was a result of the premium banks have had to pay on longer-term funding, with institutional savers being more wary about the risk of term investments than they were previously. Consequently, borrowing costs are higher for households and firms, relative to the 90-day interest rate, than in the previous business cycle (figure 9).

**Figure 9: Spreads between nominal floating mortgage rates and 90-day rates**



Source: Haver Analytics, RBNZ

But as I have discussed, we now have more information on the underlying trends that determine neutral interest rates for households and businesses both in New Zealand and overseas. The evidence is pointing more and more to lower neutral interest rates. As a result we have now adjusted our view of the neutral rate for households and businesses, as proxied by floating mortgage rates, downwards. This view was fully factored into the September *Monetary Policy Statement*. Of course, because spreads remain higher than before the crisis, we have reduced the neutral floating mortgage rate by less than we adjusted the neutral 90-day rate down.

## 5. Measurement of neutral interest rates

We have seen these changes in the real economy, but how in practice do we estimate the level of the neutral interest rate? Neutral interest rates are not observable in the way that the 90-day rate or retail interest rates are. Instead, neutral has to be inferred from the economic information that we have available. Neutral can also change over time, and it may not always be clear whether the change is caused by cyclical movements or an underlying trend in real economic conditions.

One way to estimate neutral interest rates is to use time series econometrics to extract trends in interest rates over time, and to look at these in the context of behaviour of the drivers of neutral rates discussed above. The Reserve Bank's estimates of trends in real

long-term interest rates do suggest the neutral real 90-day interest rate has fallen since the GFC, both in New Zealand and in other countries (figure 10).<sup>8</sup> And estimates based on equations that describe how monetary policy has responded to inflation and demand pressure in the past also suggest the neutral 90-day rate might be lower since the crisis.<sup>9</sup> As I have discussed, adjustments in the Reserve Bank's forecasting framework between 2008 and 2010 incorporated much of this fall. During this time, the neutral 90-day rate assumption in our models was lowered by 150 basis points. Because of the rise in spreads of floating mortgage rates over the 90-day rate we have not reduced our assumption of neutral interest rates for households and businesses by as much.

Econometric techniques will always involve some estimation error. To give an idea about the wide confidence intervals around neutral estimates, between 2000 and 2008 the Reserve Bank's published research has offered estimates of between 3 and 6 percent for neutral real 90-day interest rates since the early 1990s (Chetwin and Wood, 2013, forthcoming, reviews these estimates).

However, we have processes for assessing and forecasting economic conditions that manage this uncertainty. As I talked about earlier this year, we draw on a wide range of information such as official data, surveys, visits to businesses and labour organisations, external agencies and external monetary policy advisors to form a coherent picture of international and domestic conditions and a macroeconomic projection.<sup>10</sup> This information captures our view of the most likely future developments in inflation, output, employment, interest rates, the exchange rate and other key macroeconomic variables. We also forecast often – every 6 weeks – which ensures we update and correct our view of real economic conditions regularly.

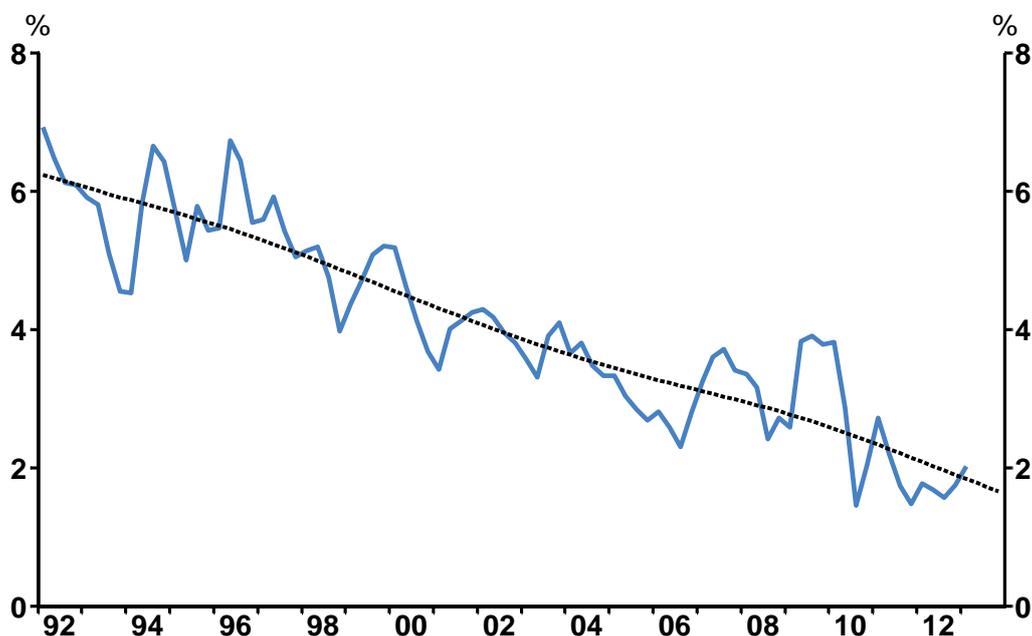
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<sup>8</sup> See Chetwin, W and A Wood (forthcoming, 2013) 'Neutral interest rates in the post crisis period', Reserve Bank of New Zealand *Analytical Note*.

<sup>9</sup> Kendall, R and T Ng (2013) 'Estimated Taylor rules updated for the post-crisis periods', Reserve Bank of New Zealand *Analytical Note* AN2013/04.

<sup>10</sup> See 'The role of forecasting in monetary policy', Reserve Bank of New Zealand speech, delivered to FINSIA, Wellington, 2013.

**Figure 10: Trend in New Zealand real 10-year government bond rates\***



Source: RBNZ

\*The real rate is a nominal 10-year rate deflated by one-year-ahead CPI inflation expectations.

Despite all the sophisticated work my colleagues have done to estimate neutral, uncertainty can never be removed and there remains the chance that neutral may have fallen even further than we currently assume. This could be consistent with the weaker than expected inflation seen over the past year or so.<sup>11</sup> But this low inflation could also be due to one-off factors such as telecommunication prices or driven by the high New Zealand dollar. This is why the Reserve Bank continues to watch developments very carefully. Indeed, there is some clear evidence that current interest rates are quite stimulatory to some types of activity – look at the Auckland housing market.

There are many other factors that complicate the measurement of neutral interest rates in addition to future developments in the real economy. These include the needs to derive real rates from nominal rates and account for risk premiums. In practice, the Reserve Bank needs an estimate of the *real* neutral interest rate. To do this we require estimates of inflation expectations which are also unobservable and so must be proxied by surveys or different measures of trends in actual inflation.

<sup>11</sup> See Kergozou, N and S Ranchhod (2013) 'Why has inflation been low?', Reserve Bank of New Zealand *Bulletin*, 76 (3), September.

We have also seen changes in risk behaviour since the GFC, which has affected risk premia. Although changes in financial market sentiment need to be considered when making monetary policy decisions, the high frequency of changes in sentiment in financial markets offers little insight into whether neutral has changed or not.

## **6. Conclusion**

Having a view on the neutral interest rate helps the Reserve Bank in reaching a view about where actual interest rates need to be set. We constantly use a wide range of tools – economic theory, data and econometric methods – to examine whether neutral might be changing so we have the most up-to-date view on the economy possible. Nevertheless, because neutral is unobservable and estimates are uncertain, this process cannot be made into a simple mechanical exercise. Judgement will always be needed – indeed the same kind of judgement as is needed when making any economic forecast – when forming a view of the neutral interest rate.

What I have talked about today highlights that over time, there can be changes in the level at which interest rates switch between being stimulatory and contractionary. Lower neutral interest rates are not necessarily a good or bad thing; it depends on the reasons for the fall. For example, if interest rates fall because of falls in productivity growth, that generally would not be seen as desirable.

The evidence and research we have accumulated does point to neutral interest rates being lower than in previous cycles. The neutral level of nominal 90-day rates looks to have fallen to around 4½ percent, though there is a confidence band around that figure. Based on the uncertainty we've typically found in the past, the band might be in the order of ½ percentage point each side of the central estimate. We have lowered the view of neutral 90-day rates in our forecasting framework in line with that (figure 1). That estimate compares with figures in 2003 of somewhere between 5½ and 6¼ percent.

At the same time, we have reduced our view on the neutral lending rate for households and businesses by less than only about 1 percentage point. That is less than the drop in neutral 90-day rates because of the significant increase in the spread between the two since the GFC.

An implication of a lower neutral interest rate is that households and businesses will face lower interest rates 'on average', but this should not be read as a promise of lower interest rates all the time. Interest rates will need to be adjusted in response to the state of the economy. For times when demand in the economy is expanding more rapidly than the

economy's ability to meet that demand interest rates will need to be above neutral. Moreover, there is no reason to suppose how far interest rates move from trough to peak will be any different in the next business cycle than they moved in previous cycles.