

Economic Update

RBNZ Official Cash Rate Analysis

Finding neutral.

- The OCR remains on hold at 2.5% but is expected to rise over 2010 as the recovery takes hold.
- A variety of dynamics influence our thoughts on the level of the neutral OCR over the coming years.
- We estimate the neutral OCR to be 5%, around 1.25% lower than our pre-financial crisis estimates.

Introduction

There has been much interest in the markets over by how much the RBNZ will need to increase the OCR once it commences its tightening cycle. In order to find out the degree of tightening required, we need to know what the neutral Official Cash Rate (OCR) is i.e. the level at which the OCR is neither spurring on the economy nor holding it back. This note assesses what the neutral level is and the impact recent changes in liquidity conditions have had on this level of the neutral cash rate.

Our analysis indicates the neutral OCR is around 5%, roughly 1.25% lower than our expectations before the financial crisis. This lower neutral cash rate largely reflects the change in liquidity conditions in recent years, and is the new level for the policy rate that would produce market rates equivalent to the pre-crisis level of neutral. However, it is important to note that this lower level of neutral accounts only for the likely shift in bank funding costs. It does not take into account any potential changes in appetite for borrowing or lending. Given that households are presently being far more cautious about debt, the 'true' level of neutral could be even lower than our estimate.

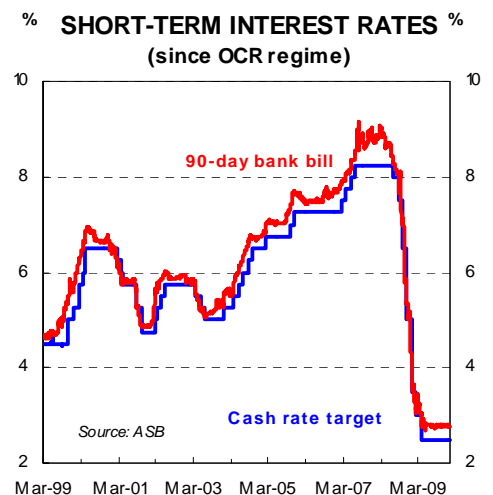
The RBNZ has indicated in recent policy statements that monetary policy is continuing to provide stimulus to the economy. This followed a substantial amount of easing in monetary policy since mid-2008, with 575 basis points of decreases in the OCR. The amount and persistence of this stimulus is determined by how far below the neutral level of interest rates the current level of interest rates are and for how long. Having a better idea of the likely neutral level for the OCR will help guide the RBNZ's decision-making as it starts to move interest rates higher with the objective of withdrawing all (or most of) the stimulus put in place in response to the Global Financial Crisis.

Mechanics of estimation

Components of a neutral interest rate.

Finding neutral on a motorcycle is challenging enough, but far more difficult for interest rates as neutral is not directly observable. It must be inferred from the interest rates that we can observe.

Our estimate of a neutral interest rate is decomposed into an estimate of the neutral real interest rate (NRR), expected inflation, and the spread between banks' funding costs and the OCR. The first two components give us an estimate of neutral market interest rates, from which we take out the spread between the banks' funding costs and the OCR. This approach allows for the change in the funding spread that has occurred as a result of the financial crisis. We discuss the change in this funding later.



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General Advice Warning

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Neutral Real Rate in practice.

We start off by estimating real interest rates. Doing so means that the influence different inflation rates could have over time is stripped out. Part of the interest rate we pay or receive in day-to-day life is compensation for the loss of purchasing power that inflation causes, so periods of high inflation (e.g. the 1980s) also had high nominal interest rates.

The NRR is the real interest rate at which monetary policy is neither expansionary nor contractionary. While the NRR is not directly observable, it can be inferred by looking at the behaviour of inflation and economic growth in response to monetary policy. Time lags mean it is often difficult to ascertain the appropriateness of the current level of monetary policy.

The RBNZ uses the NRR as a guide as to whether the current level of interest rates is expansionary or contractionary.

It is important to note that the NRR is not a target at which to set interest rates, as this would depend on the strength and persistence of inflation pressures, and the emphasis the central bank places on minimising volatility in output relative to the volatility of the real NZ dollar.

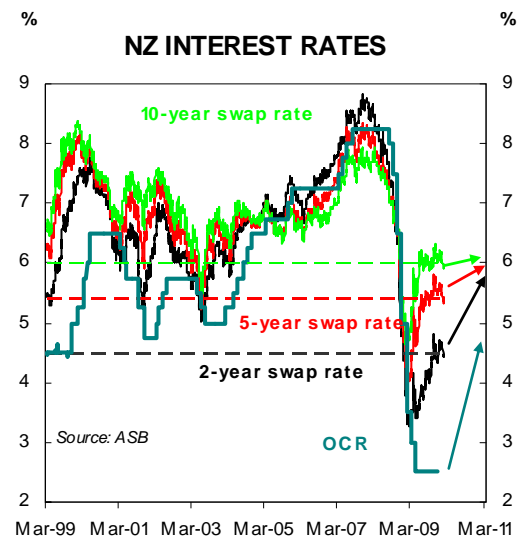
Estimating the Neutral Real Rate

Using annual inflation and inflation expectations, 90-day nominal rate and 10-year nominal bond yields we obtain eight historical estimates. These estimates fall into two broad categories. The first is a simply calculated real short-term interest rate. The second is that same short-term interest rate, but adjusted with the interest rate gap (90-day to 10-year) for NZ. The latter method is intended to adjust the short-term rate for information on expected inflation implicit in long-term rates.

We then also apply the same methods to data for the US and Australia, and then add on the 10-year bond premium NZ has over these countries to obtain alternative estimates for NZ (details on the mechanics of all these calculations are in the *Appendix*).

The real rate is the key rate of interest as it allows us to take into account different rates of inflation over time separately – during periods of high inflation nominal rates will rise to compensate for the higher inflation. Inflation was relatively low over the period of analysis 1992-2009, although it should be noted that the inflation target was amended twice over this period.

We take an average of each of these eight measures over the period 1992-2009 to obtain our range of estimates for the NRR. Given this period incorporates two full business cycles we consider taking an average over this period appropriate for our analysis. This method of estimation involves some key assumptions: 1) there has been no strong trend in inflation over this period, and inflation expectations are stable; 2) mean-reversion occurs in the term premium as represented in the 90-day to 10-year interest rate gap, and; 3) there has been no trend in the neutral cash rate over this period.



A range of estimates are possible.

Table 1

	Real	Nominal
NZ, 2-year inflation expectations deflator	4.56	6.76
NZ, CPI deflator	4.60	6.80
NZ, GDP deflator	4.54	6.74
NZ interest rate gap method, using 2-year ahead inflation expectations deflator	4.54	6.74
US, CPI-deflated with NZ-US bond premium	3.34	5.54
AU, CPI-deflated with NZ-AU bond premium	3.28	5.48
US, interest rate gap with NZ-US bond premium	2.52	4.72
AU, interest rate gap with NZ-AU bond premium	3.29	5.49

As Table 1 shows, these estimates of the neutral real rate range from 2.5 to 4.6 percent. However, we have discounted the low estimates obtained with the US data. These estimates seem far too low for NZ and appear to be affected by the period of unusually low US bond yields after the dot.com bust period and the subsequent buying of US bonds by Asian investors (referred to as the 'savings glut').

Excluding the US-based estimates gives us a range of 3.3 to 4.6 percent. An average of these remaining six measures (four based on NZ data and two on Australian data, so that a greater weight is placed on the NZ data-based measures) yields an estimate of the neutral real rate of 4.1 percent applicable over 1992-2009.

Inflation component estimates centre on 2.2%

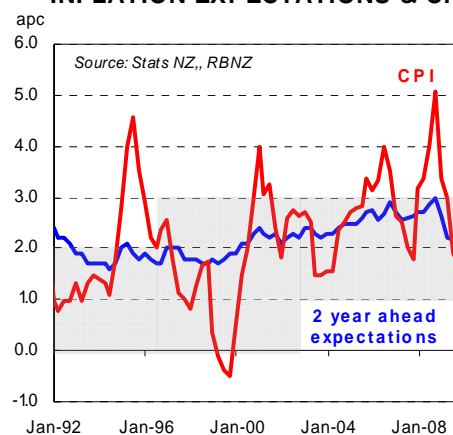
We can obtain a nominal estimate of the neutral cash rate by adding an inflation component back to our real estimates. Conveniently, the average of annual CPI inflation, 2 year-ahead inflation expectations and annual GDP deflator are all 2.2 percent, slightly higher than the middle of the Reserve Bank's target band of 2 percent. We assume the trend annual inflation rate will be 2.2 percent in the future i.e. no change from the past. Adding this inflation measure to our estimates of the real neutral rate gives us estimates of the nominal neutral market rate, which range from 5.5 to 6.8 percent, with the average of these being 6.3 percent. This is close to the average OCR of 6.0 percent since its introduction in March 1999.

Financial crisis impact on neutral cash rate

The change in credit conditions that resulted from the financial crisis since late 2007 saw an increase in funding costs, as illustrated in the chart titled *Indicator of Short Term Funding Costs*. As the credit crisis unfolded, the cost to banks of raising wholesale funds from offshore increased substantially, particularly in USD terms. This largely reflected heightened risk aversion, with investors demanding higher risk premiums to lend to banks and other borrowers. The financial crisis highlighted the vulnerability of local banks' funding to global financial market stress, given the high proportion of funds raised offshore to fulfil domestic borrowing demand. In response, banks began increasing their retail deposit bases. During the peak periods of strain during the crisis, offshore markets were not functioning, putting strain on local funding sources such as bank bills and retail deposits. Bank bill yields spiked higher, although not to the extent seen offshore.

The financial crisis highlighted vulnerability of local banks.

INFLATION EXPECTATIONS & CPI



Focus shifted to local deposits.

The demand for local deposits led to a lift in the deposit rates offered and hence a sharp increase in banks' retail funding costs relative to short-term wholesale interest rates. The lift reflects the limited amount of domestic deposits in light of the spike in demand.

Changes have now occurred more formally in the form of the RBNZ's prudential liquidity policy, which, from April 2010, sets a minimum threshold for the overall proportion of funding from non-wholesale sources (which includes retail deposits) and long-term wholesale funding.

Local focus made formal.

The above funding sources are more secure than short-term wholesale funding, which tends to be 'hot money'. The phasing in of the RBNZ's liquidity policy over the next two years is likely to keep upward pressure on rates offered in the retail deposit market.

Stability enhanced with long-term funding focus.

The benefit of the policy is that over the longer term it sets a cap on banks' reliance on short-term wholesale funding, thus enhancing the stability of the NZ financial system. However, by capping use of relatively cheap short-term wholesale funding, the policy steers banks to use greater amounts of more expensive long-term wholesale and retail funds.

Retail deposit rates are now very high compared with the current OCR and the 90-day bank bill rate. Prior to the financial crisis, retail deposit rates were generally slightly lower than the OCR, bank bills or underlying swap rates.

Paying the price for long-term funds.

Term deposit rates are now much higher than the underlying funding instrument of matching timeframe. For example, at the time of writing banks are offering rates between 3% and 3.75% for 90-day deposits, well above the 2.5% OCR and 2.7% 90-day Bank Bill rate.

The gap is also wide for longer-term rates, with banks paying around 1.5% more for 5-year term deposits compared to the 5-year swap rate (see appendix for a swap rate definition).

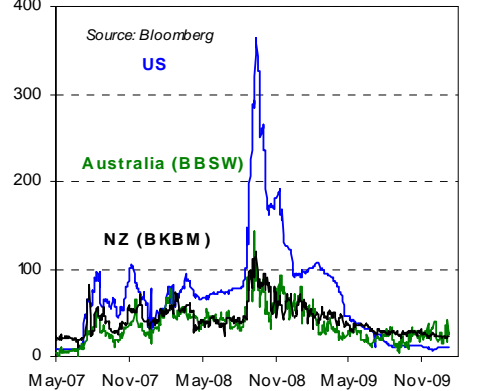
Short-term funding costs returning to normal.

The relationship between the OCR and bank wholesale funding costs has also changed significantly since the global financial crisis. Prior to the crisis, banks could raise funds at rates very close to swap rates, regardless of the term.

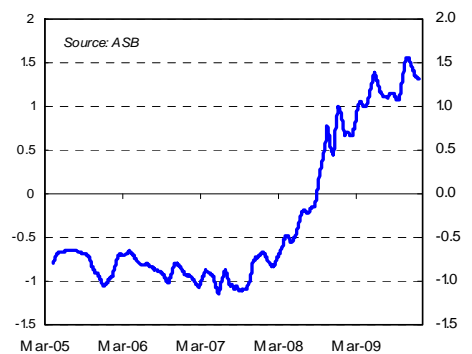
Banks issued short-term bills (e.g. 90-day bank bills) at very narrow margins to the OCR. The difference between the OCR and the 90-day bank bill rate has been between 15-30 basis points since the OCR was introduced in 1999. The spread has returned to these levels now, having blown out significantly during the past two years. However, short-term instruments such as 90-day bank bills will be less significant to banks in the future compared with before the global financial crisis. The RBNZ's liquidity policy will likely steer banks away from bank bills in favour of retail deposits or longer-term wholesale funding.

Longer-term funding now costs significantly more (relative to the underlying swap rate) compared to pre-crisis levels. Arguably, long-term risk premiums were too low pre-crisis. Little or no reward was being paid for the greater amounts of uncertainty that exist the further out into the future you go. But the crisis triggered huge lifts in risk premiums on long-term debt.

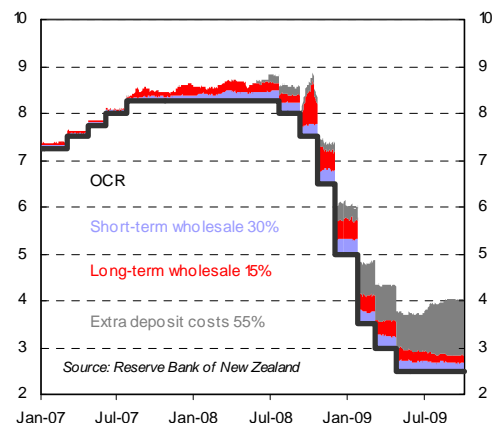
INDICATOR OF SHORT TERM FUNDING COSTS
(Yield on 90-day bank bills minus OIS)



NZ RETAIL SPREAD
(Term deposit rates vs. bank bills & swap rates)



MARGINAL BANK FUNDING COSTS RELATIVE TO THE OCR



Long-term funding remains expensive...

...particularly compared to pre-crisis levels.

Funding costs higher than pre-crisis levels.

Prior to 2007 the credit spread between swap rates and Australian AA bank bonds was low and stable. AA-rated banks could obtain long-term funding at rates less than 25 basis points over swap rates, regardless of the term. At the peak of the crisis these credit spreads widened to well over 2%. These spreads did compress over 2009, but are nowhere near pre-crisis levels. A higher risk premium will be paid in the future, as the market demands an appropriate term premium for credit risk. The spread between bank bonds and the corresponding swap term is expected to remain wide – in the range of 100 to 150 basis points. Furthermore, issues such as sovereign debt concerns (think Greece) and concerns that loose global monetary policy will ignite inflation may contribute to high long-term funding costs.

What it all means for the neutral cash rate

Our primary conclusion is bank funding costs will remain high relative to the OCR in the future. The important question is how much higher? A second question is will this situation improve?

Based on the increased cost of funding discussed above, and the requirements of the RBNZ's liquidity policy, we estimate that banks' relative funding costs are 150 basis points or 1.5% higher than pre-crisis levels (which are in line with the RBNZ's own estimates). We do not expect the liquidity policy to change in any way which would lower funding costs in the future. A focus on long-term funding is appropriate in order to ensure the stability of the NZ financial system.

Therefore, any reduction in banks' funding costs relative to the OCR would need to come from either retail deposit rates falling relative to the OCR, or the wide margins that bank bonds are currently trading over swap rates to compress significantly. We believe that competition between banks for retail deposits will remain. As global growth improves, savers will gain the confidence to take higher risks, and banks will need to pay reasonable returns to attract funds. A wildcard for long-term interest rates over the next few years will be global government bond issuance. The debts of governments of the major economies are increasing sharply. At present global bond markets are absorbing the flow of bonds quite comfortably. However, in time investors may become wary of lending money to indebted governments without a little extra compensation – in other words without being paid progressively higher bond yields. If that happens it will lift global costs of borrowing (including for banks), particularly at the longer terms at which governments tend to issue bonds. We will monitor developments carefully, but given the developments in credit markets over recent months, our base assumption is that long-term wholesale funding will continue to remain expensive, and trade at a significant premium to the underlying swap rate.

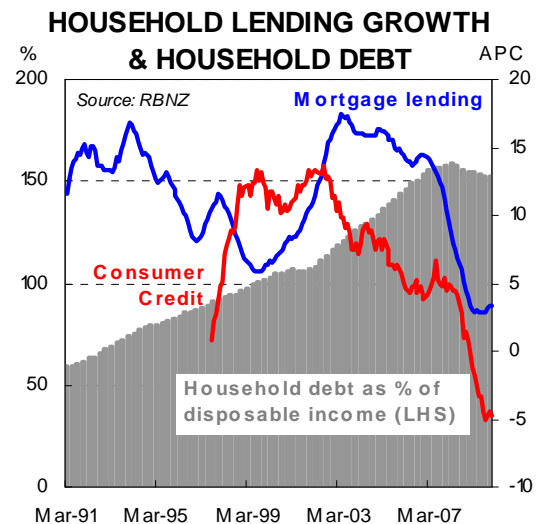
Relative to pre-crisis times, the change to banks' funding costs suggests the neutral level of the OCR is now 1.25% to 1.5% lower i.e. around 5%. High funding costs for banks (particularly for longer terms) have driven a 1.5% wedge between the OCR and lending rates. This wedge means the RBNZ can be more confident they can lift market borrowing costs up to an appropriate level through a lower OCR than would have been required before the financial crisis. As the OCR rises, and time passes, the wedge may move to the lower end of the 1.25% to 1.5% band.

Other influences

It is possible that borrowers' appetites have changed. Recent data indicate the household debt ratios has fallen over the past couple of years, while household credit has been subdued in recent quarters. This suggests borrowing demand at a given interest rate may be lower now. Furthermore, it is hard to ascertain the extent of the changes in credit markets globally on credit availability. Given these uncertainties, it is possible the neutral OCR is even lower than our current estimate.

Legislative changes that would reduce the incentive to invest in property could also help the RBNZ. Tax changes could help moderate future housing-driven inflation pressures. This could reduce the level of the OCR required to

RBNZ has less work to do than previously thought.



keep the housing market in check. With the May Budget the Government is likely to reduce the tax effectiveness of property investment, most likely through eliminating the ability to claim depreciation on buildings.

Policy implications

Small OCR moves seem prudent.

We expect the RBNZ will now raise the OCR in 0.25% increases. This contrasts our 2009 view that the RBNZ would want to raise the OCR by larger amounts in order to return the cash rate to a less stimulatory level. The key factor behind our view change is the relationship between the OCR and lending rates. We think this relationship is likely to be a lot firmer during the upcoming tightening cycle than we previously assessed. The RBNZ will face uncertainties over exactly what impact the OCR will have on lending rates (and also what impact property tax changes could have). Overall, this means the RBNZ will not need to be as aggressive in its tightening of monetary policy.

Other uncertainties are any sustained shifts in borrowing appetites and desire to save. To the extent that borrowing demand reduces, the neutral cash rate could be lower than our estimate through a lower "neutral" for customer lending rates.

Conclusion

OCR on its way to 5%.

Overall, our analysis indicates the neutral level for the OCR is around 5%. This is 1.25% to 1.5% lower than our estimate for the period prior to the financial crisis. A key factor behind this lower estimate is the fact that banks' funding costs relative to the OCR have increased substantially, and we expect little reduction in this 'wedge'.

The key monetary policy implication from this analysis is that these tighter financial conditions reduce the amount of work the RBNZ will need to do with the OCR in order to set the lending rates businesses and households face at an appropriate level.

Appendix

Neutral Rate Estimation

We obtain a range of estimates for the Neutral Real Rate using the real interest rate, and one adjusted with the interest rate gap between the 90-day rate and the 10-year bond yield. As outlined in Basdevant, Björkstén and Karagedikli (2004) the latter method involving a yield curve adjustment takes into account expected changes in inflation. We estimate these with the NZ data and data from the US and Australia (to which we then add the 10-year bond premium of NZ bond yields over the relevant countries' bond yields). These various methods of deriving the NRR can be characterised by:

$$1) NRR_t = 90day_{NZ_t} - \pi_{NZ}$$

$$2) NRR_t = 90day_{NZ_t} - rirgap_{NZ_t} - \pi_{NZ_{t+1}}^e$$

$$\text{where } rirgap_{NZ_t} = (90day_{NZ_t} - 10year_{NZ_t}) - (90day_{NZ_{avg}} - 10year_{NZ_{avg}})$$

$$3) NRR_t = 90day_{foreign_t} - \pi_{foreign_t} + (10year_{NZ_{avg}} - 10year_{foreign_{avg}})$$

$$4) NRR_t = 90day_{foreign_t} - rirgap_{foreign_t} - \pi_{NZ_{t+1}}^e + (10year_{NZ_{avg}} - 10year_{foreign_{avg}})$$

$$\text{where } rirgap_{foreign_t} = (90day_{foreign_t} - 10year_{foreign_t}) - (90day_{foreign_{avg}} - 10year_{foreign_{avg}})$$

Where π is the annual inflation rate for the relevant countries, $\pi_{NZ_{t+1}}^e$ is 2 year-ahead inflation expectations.

For equation 1, the real interest rate is obtained by deflating 90-day interest rates with an inflation measure (π), we used the annual Consumer Price Index, the RBNZ 2 year-ahead inflation expectations survey measure, and the annual GDP deflator. The real interest rate gap (in equation 2 and 4) is derived by taking the difference between the 90-day nominal rate and 10-year nominal interest rate and netting out the long-term average for the difference in these rates. We consider 90-day nominal rates to be a good approximation of effective short-term funding costs in the pre-crisis period.

Swap rates

A **swap rate** is the fixed rate that the counterparties are willing to exchange for a series of floating rate payments – in New Zealand's case the BKBM rate (the 90-day bank bill mid-market settlement rate - this is the standard interest rate set each day at which banks can effectively borrow funds from other banks in the money market). The swap rate for any given term (typically 1-10 years) reflects the counterparties' expectations of the compounded return on a series of 90-day loans. e.g. the 1-year swap rate is equivalent to the compounded return of the current 90-day BKBM rate and the estimated return on the 3 subsequent 90-day BKBM rates. Interest rate swaps are a swap of one cash flow stream (calculated off the floating rate) for another (the fixed rate). Prior to the financial crisis, swap rates were regarded as a close approximation for banks' term funding costs (although the swap rate does not include a credit risk premium, which was small before the crisis). However, the relationship between swap rates and the true cost of borrowing for financial institutions has changed significantly in the last two years. Click [here](#) for more on swap rates.

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