

Before and after

The new interest rate landscape: Introduction

This is the first in a series of articles exploring the interest rate environment in New Zealand in the wake of the Global Financial Crisis (GFC). We start with some stylised facts on how the banking system operated before the GFC, and detail the key changes – market-based and regulatory – that have emerged since. In later articles we use this framework to draw some conclusions about the level and variability of interest rates in the post-GFC world. In some instances, our answers are very different to those put forward by other market economists and the RBNZ.

Money in, money out

In capital markets, the impact of the GFC has been clear: the cost of borrowing has risen sharply for all but the safest of the safe. But for banks – which dominate the financial system in New Zealand – the effects have been more opaque. That's because banking, by nature, internalises a number of important decisions: how to raise funds from a range of sources, who to lend to and on what terms, and how to manage any mismatch between the two sides of the ledger.

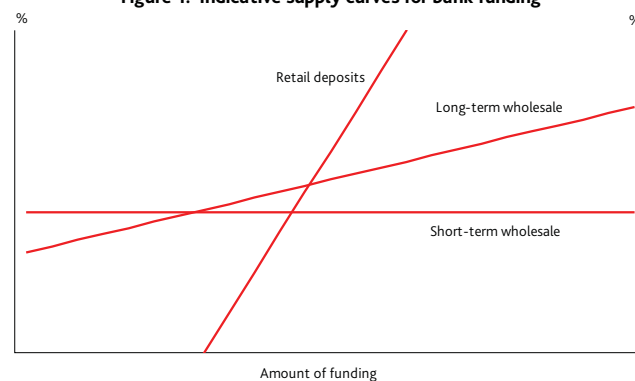
The GFC has affected each of these decisions, though we can only observe the end result, which has been a rise in lending and deposit rates relative to wholesale rates. To fully understand the impact of the crisis to date, and to make any statements about its influence in the future, we need a basic framework of how the banking system operates, starting with the funding side of the equation.

Banks' funding comes from three broad sources. *Retail deposits* include balances held in transaction accounts, saving accounts and term deposits, which are held by both households and businesses. New Zealand's poor track record of saving – especially households – means that deposits typically meet only around 60% of a retail bank's funding needs. For the remainder, they are able to access a large international pool of funds, through two distinct channels: the *short-term* and *long-term wholesale markets*.

From intuition and experience, we can make a few statements about the availability of each source of funding (see *Figure 1*):

- While there will always be a minimum amount sitting in transaction accounts, it takes a significant increase in interest rates to increase the total pool of retail deposits, at least in the short term (and it may be cannibalised from other assets such as shares). That means the supply curve is steeply positive, or *price inelastic*.
- Short-term wholesale markets are highly standardised, making them very deep and liquid. New Zealand banks' funding needs are too small to influence the world price, so as long as they meet the criteria for entry to the market (such as a high credit rating) they can borrow effectively unlimited amounts at a generic bank rate. The supply curve is essentially flat, or *perfectly price elastic*.
- Long-term wholesale funding is less standardised and liquid. Borrowing tends to be through bond sales or private placements, and borrower-specific factors such as credit ratings or the lender's level of exposure play a greater role in the price paid. The supply curve is upward-sloping, but less so than for retail deposits.

Figure 1: Indicative supply curves for bank funding



A bank can minimise its total funding costs by arbitraging between these sources – that is, by bidding up each source for as long as each additional dollar is cheaper than the next-best alternative. As a result, the prices of each source are determined jointly, and will be roughly similar in equilibrium. This means that simply looking at the current market price won't tell us whether a funding source is 'cheap' or 'expensive'. Rather, it depends on the shape of the supply curve for each extra dollar.

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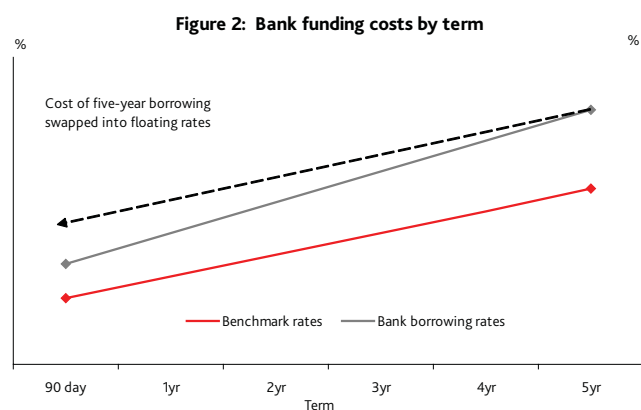
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Minimising funding costs is a major goal, but not the only one. Banks also have an eye towards balancing their assets (loans) with their liabilities (funding). For instance, using short-term funding to make home loans where the interest rate may be fixed for several years, and the principal may not be fully repaid for 25 years, can leave a bank exposed to two types of mismatch.

The first is *interest rate risk*: if short-term funding rates rise above the fixed rates on their existing loans, they will end up running at a loss.¹ This risk is relatively easy to hedge, by using swaps to convert the interest payments on their funding from floating to fixed rates. But the funding itself remains short-term, and needs to be replaced frequently. This *rollover risk* can't be hedged away; it's up to the banks to keep it to acceptable levels, by spreading the maturities of both their funding and lending. Rollover risk played an important part in the crisis, and we'll return to it later.

Counting the cost

First, we need to clarify what we mean by the 'cost' of funding. For one, we can't directly compare interest rates when they apply to different terms. Interest rate curves are typically upward-sloping, so that a three-month borrowing rate is lower than a five-year rate (*Figure 2*). But that doesn't tell us whether short-term borrowing is 'cheaper', because that lower rate only applies to the next three months. There's no guarantee that it will remain the cheaper option at every point over the next five years (indeed, market efficiency argues that it almost certainly won't). To get around this, we measure the cost as the margin paid over an appropriate benchmark rate – the gap between the grey and red lines in *Figure 2*.



For short-term funding the obvious benchmark is the Official Cash Rate (OCR), the rate that applies to the Reserve Bank's overnight facilities. Banks can deposit funds overnight at the OCR, or borrow at 50bp above the OCR under certain conditions. The lending facility is very rarely used, but since it represents a 'last resort' source of funds, the OCR holds a powerful sway over short-term market interest rates. For practical purposes, an alternative benchmark is the 90-day *bank bill rate*, an inter-bank lending rate that is strongly influenced by the OCR.

For longer-term funding the usual benchmark is the *swap rate*. A swap is a derivative contract where two parties agree to exchange fixed-rate and floating-rate interest payments against a notional principal amount. The floating rate is the bank bill

rate, and the fixed rate (which is the 'swap rate') is set as the expected average of the floating rate over the life of the swap. For simplicity, we can think of swap rates as very long-term market forecasts of the OCR.

What makes the OCR and swap rates good benchmarks is that they don't represent borrowing rates: banks can't fund their day-to-day business through the RBNZ, and a swap is not a form of loan (the 'principal' never changes hands). That means they're not directly affected by factors such as changes in the demand for borrowing or the credit risk premium.

As an example, let's say that banks can borrow in international wholesale markets for three months at 20 basis points above the bank bill rate, or for five years at 50bps above the swap rate. Conveniently, if a bank borrowed for a five-year term then 'swapped' the interest payments, the effective cost would be 50bp above the bill rate (the dotted line in *Figure 2*), making it directly comparable with the cost of short-term funding.

On this metric, long-term funding is still more expensive, but that's due to the premium paid for a more stable source of funding. Put another way, short-term funding is cheaper but is more exposed to rollover risk. Note that this reasoning still holds even when the interest rate curve is downward-sloping, as has often been the case in New Zealand – long-term funding is still usually more expensive, relative to the benchmark rates.

Before the crisis: as long as the music keeps playing...

Blame for the GFC is still being dished out thick and fast, but there is no doubt that it was the product of what came before it. A long stretch of relative stability in the global economy (the so-called 'Great Moderation'), coupled with low official interest rates and a belief that central banks would always bail out financial markets in case of trouble, led to a remarkably carefree attitude to risk. Hungry for higher yields, investors rushed into riskier assets and even dreamed up new ones, demanding very little compensation for doing so.²

New Zealand's banks didn't directly engage in this scramble for yield, but they did benefit from a vast pool of global capital that was available at very low cost. Of course, by 'low cost' we mean relative to benchmark rates; even when raising funds from overseas, our banks are ultimately borrowing in NZ dollars and therefore pay NZ interest rates.

That said, the cost was still remarkably low from around 2003 to mid-2007. For NZ banks, short-term money was available from offshore for as little as 10bp over the bank bill rate. Longer-term funding was also cheap – around 30bp over the five-year swap rate – but in such a seemingly benign environment there was little concern for rollover risk, and banks around the world were happy to become more reliant on short-term funding. For NZ banks, the consequences were:

¹ This was one of the factors that brought down the US Savings and Loan industry in the 1980s.

² The phrase "search for yield" was already in widespread use by 2003, though it dates back at least to the 1990s, which suggests that loose monetary policy worldwide in response to the 2001 slowdown wasn't the only culprit.

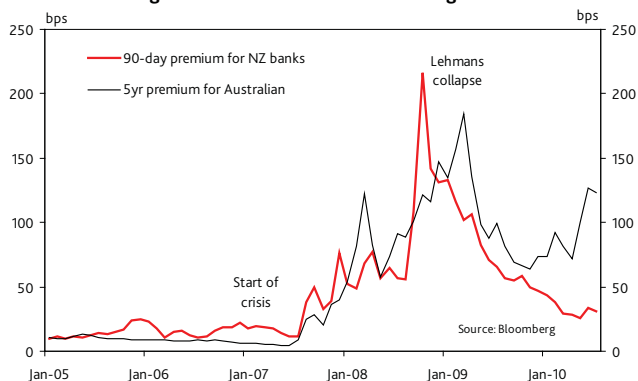
- At a time when demand for credit was outstripping income growth (and hence growth in the deposit base), a growing share of funding came from short-term wholesale markets.
- With short-term wholesale money as the marginal source of funding, banks faced a supply curve for funds that was essentially flat (at a small margin over the OCR).
- There was no incentive to pay more for retail deposits, so these rates closely tracked short-term wholesale rates (and hence the OCR as well).

Contrary to much of the commentary at the time, the OCR was not rendered impotent by banks' access to this global pool of 'easy money'. In fact, the RBNZ had quite fine control over the price of short-term wholesale money that was increasingly becoming the banks' marginal source of funding. That said, the flat supply curve for funds meant that rising demand for credit had less impact on interest rates than usual, pushing more of the burden of adjustment onto the OCR – a shift that perhaps wasn't apparent at the time.

The crisis: when the music stopped

The first clear warning of what was to come was in June 2007, when Bear Stearns was forced to bail out two of its hedge funds that were heavily exposed to subprime mortgages. Other stories of losses on subprime lending soon emerged, sparking a growing mistrust among banks as to who was exposed to what. Wholesale funding markets tightened; the cost of short-term funding rose by around 50bps, and would probably have gone further if central banks hadn't acted to provide easier access to cash (Figure 3).

Figure 3: Indicative wholesale funding costs



Note: the five-year series is only available for the Australian parents of the major NZ banks, and refers to US dollar funding; it excludes the cost of converting into local currency.

The pressures on funding markets continued to build through 2008, peaking in September after the collapse of Lehman Bros, AIG and several other institutions, and initial mop-up efforts by US authorities that were less than convincing. At worst, funding couldn't be found for terms of anything more than a few days. Short-term markets started to open up again by October, albeit at much higher prices than before the crisis. Term funding markets took longer to prise open, and by the end of 2008 many governments felt obligated to provide temporary guarantees on wholesale borrowing, in an effort to reassure lenders.

Today, funding costs have eased from their peaks but are well above the rock-bottom levels seen just before the GFC, especially for long-term funding. They have also become much more volatile, reflecting a sense that global markets are no longer in a position to absorb specific shocks, such as Greece's recent sovereign debt woes.

Even though short-term money markets were freed up relatively early, and the cost is now comparable with pre-crisis levels, banks have voluntarily reduced their reliance on this potentially unstable market – nobody wants to be seen as the next Northern Rock.³ Instead, banks have been willing to pay up for more stable sources of funding, namely retail deposits and long-term wholesale funding. This has driven up the price of these sources of funds, relative to pre-GFC conditions.

It's difficult to say whether today's conditions constitute 'the new normal', as some have suggested. Banks around the world have already returned to profitability, and lenders are likely to become more adventurous over time. We expect that long-term funding costs will ease over coming years, though not back to pre-crisis levels (which were abnormal in their own way). If that seems hard to believe right now, remember that the 'easy money' era that fuelled the GFC also emerged in seemingly unlikely circumstances, following the dot-com bust in 2000 and some major corporate failures in 2001-02.

However, there is one aspect of the crisis can be considered permanent. New and upcoming bank regulations are likely to entrench some of the changes that the banking sector made voluntarily during the crisis – and the RBNZ, as New Zealand's banking regulator, has led the charge.

Dear prudence

The RBNZ has long been concerned about NZ banks' unusually high reliance on short-term wholesale funding – mostly from overseas – which, as the GFC has demonstrated, could leave them exposed to rollover risk during a time of financial market stress. In October 2008 it unveiled a 'prudential liquidity' policy to address these concerns. At the nub of the new policy are two requirements:

Liquid assets: Banks must hold enough liquid assets to be able to meet all anticipated (net) outflows over a one-week or a one-month period. 'Liquid assets' consists firstly of cash, then a range of debt securities with varying penalty weights (a broader range of securities are eligible for the one-month test).

Core funding: Banks must ensure that a minimum proportion of their lending is funded from 'core' sources, which are seen as more stable. Core funding consists of retail deposits, long-term (more than one year) wholesale funding, and regulatory capital. The minimum ratio was set at 65% of lending in April 2010, and the RBNZ aims to increase it to 75% over the next few years.

³ Infamous as the first bank 'run' in the UK in over a century, Northern Rock was shut out of the wholesale markets that provided 70% of its funding long before the queues started to form outside its branches.

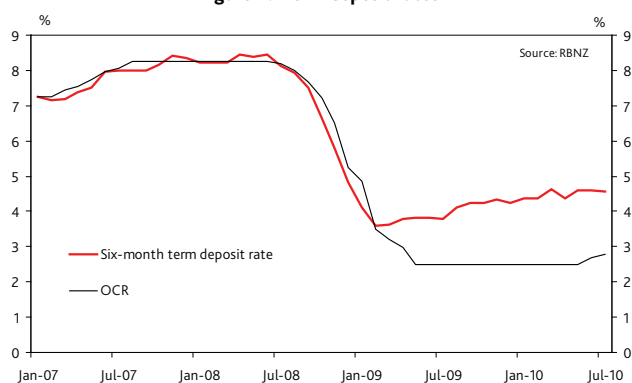
It's the latter that we think will prove to be far more significant. To understand why, let's flip the core funding ratio around: it effectively caps the share of funding that banks can draw from 'non-core' sources, namely short-term wholesale markets. And since this market has tended to be the marginal source of banks' funding growth in recent times, the new policy will have major implications for how banks operate over coming years.

Limiting the amount of short-term funding they can use means that banks will have to look to retail deposits and/or long-term wholesale markets for each additional dollar of funding – so they no longer face a flat supply curve for funds, but an upward-sloping one. As demand for credit rises, banks will have to pay more to secure retail and long-term wholesale funding – arbitraging between the two sources until their costs are comparable.

(To be more precise, the core funding ratio limits the growth rate of short-term funding, tying it to the growth rate of other funding sources. If we assume that the total pool of retail deposits grows in line with nominal GDP, this gives us a 'natural' rate of credit growth: if demand for credit is rising relative to GDP, then banks will have to bid up for the additional funding, driving up interest rates.)

We've already seen the impact of this policy through the transition period.⁴ Before, retail deposits were priced against the next-cheapest alternative, which was short-term wholesale funding; hence term deposit rates tended to track the OCR closely (*Figure 4*). Once short-term funding was constrained, banks progressively bid up for retail deposits until the price became more comparable with long-term funding.

Figure 4: Term deposit rates



Note that this is not meant to be an 'onshoring' policy, despite being obviously targeted at the short-term funding that largely comes from overseas. It would be unrealistic to force banks to rely more on domestic funding, since it's very difficult to expand the total pool of funds quickly. For instance, around half of term deposits come from retirees who draw on the interest for their regular income; higher interest rates won't spur them to save substantially more. In practice, the policy has instead

led to a shift from short-term to long-term wholesale, with no discernible change in the share from offshore. New Zealand's banks will be just as exposed to the vagaries of global markets – probably even more so, since long-term interest rates are influenced less by central bank policy and more by expectations and sentiment.

Note, also, that while the RBNZ has led the world with this policy, it won't be alone. The Basel Committee on Banking Supervision, which sets the globally accepted standards for bank capital, is currently developing liquidity and core funding rules that are likely to be applied in most developed countries – although full implementation has been delayed until 2018. Meanwhile, some countries are forging ahead with their own versions. Australian and UK regulators are both drafting 'liquid asset' rules, and the UK's proposed bank tax actually serves a crude price-based version of a core funding rule (since the tax is charged on liabilities, and is lower for long-term funding). That suggests the world will be increasingly competing for long-term wholesale funds in coming years, which could make life interesting for New Zealand's banks as relatively small players in the global market.

Summary

The GFC and the regulatory response will clearly have long-lasting implications for interest rate markets in New Zealand. Yet it's easy to overstate how much the 'new normal' might differ from the old one – particularly as many seem to have come to regard the easy-money era before the crisis as 'normal'.

In subsequent articles, we address which of these changes will be significant – and which won't be. So far we have focused mainly on the supply of funds; in the next article we expand the framework by considering the interaction with demand, and draw out some implications for lending rates, monetary policy and economic activity.

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⁴ All of the retail banks were compliant as at October 2009, the date that the rules were finalised.