
Bank funding – the change in composition and pricing

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Historically the Official Cash Rate (OCR) has been a good proxy for the cost of funding for banks. However, the global financial crisis of 2007-2009 and regulatory changes have had a significant impact on this relationship. The move towards banks seeking more stable sources of funding like retail deposits and long-term wholesale debt has changed the composition of funding. The price of these more stable sources of funding has also increased, driven by competition for funds and deterioration in funding market conditions. Thus, the cost of funding for banks has increased significantly relative to the OCR. We illustrate this by calculating a notional marginal funding cost indicator. These higher funding costs have been directly passed on to higher mortgage rates.

1 Introduction

Many households take great interest in mortgage interest rates, with debt servicing costs often a key component of weekly outgoings. An important determinant of mortgage rates, or indeed any lending rate for households or businesses, is a bank's cost of funding. While other variables, such as the cost of equity, profit margins and the risks associated with lending will also have a bearing on the interest rates customers are charged, the cost of funds will be major factor.

The Reserve Bank's key monetary policy instrument is the Official Cash Rate (OCR), but ultimately the Bank is interested in lending rates faced by households and businesses. It is these rates (along with those paid to depositors) that influence economic activity and inflation. While the OCR has an influence on the cost of funds lenders face, changes in the relationship between the OCR and lending rates have occurred in recent years which have had implications for monetary policy. Since the global financial crisis began to bite in 2008, there have been significant shifts in the way banks fund themselves, while the relative costs of accessing funds both domestically and from offshore have also changed dramatically.

This article focuses on the changing composition of bank funding, the costs of funding and their impact on lending rates. Section 2 highlights the changed relationship between mortgage rates and short-term wholesale rates. Section 3 looks at the composition of

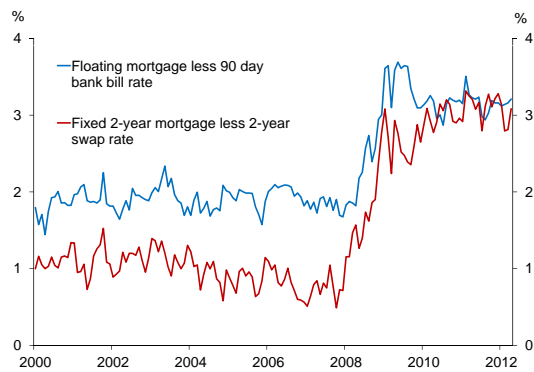
bank funding and how it has evolved since the global financial crisis. Section 4 looks at the cost of funding from various sources. In section 5 we introduce a notional marginal funding cost indicator that captures a weighted average of funding costs. Our conclusions are highlighted in section 6.

2. The changed relationship between mortgage rates and short-term wholesale rates

Figure 1 shows the relationship between mortgage rates and short-term wholesale rates since 2000. Prior to 2008, there was a steady relationship between the floating mortgage rate faced by new borrowers and the 90-day bank bill rate, with the difference fluctuating in a tight range. The same can be said for the difference between the 2-year fixed rate mortgage rate faced by new borrowers and the 2-year swap rate. Prior to the global financial crisis, which intensified during 2008, these domestic wholesale rates were a good indicator of a typical bank's cost of funds.

¹ The author would like to thank to Leo Krippner, Bernard Hodgetts and Michael Reddell for their helpful comments.

Figure 1
Mortgage rates less short-term wholesale rates



Source: RBNZ

From about 2008, the difference between mortgage rates and short-term wholesale rates steadily increased, and over the last couple of years the difference has settled at a higher level.

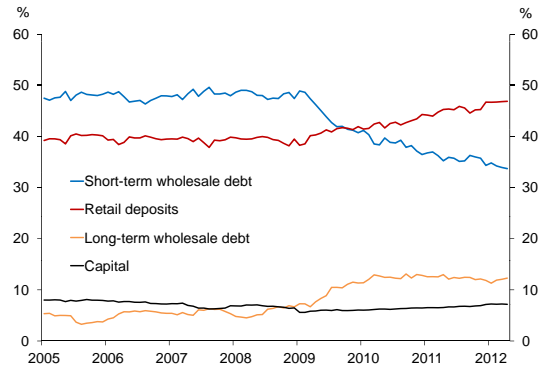
A casual observer might conclude that mortgage rates have increased relative to wholesale rates and that the banks' profit margins have also increased. However, the reality is that the composition and cost of bank funding has changed. It is no longer appropriate to proxy bank funding costs by a simple observation of the 90-day bank bill rate (for a floating mortgage) or the 2-year swap rate (for a 2-year fixed rate mortgage).

As figure 1 shows, the period of adjustment to this relationship was 2008-2009, a time of significant financial market turmoil. This provides a clue as to why the relationship has changed and whether or not it is reasonable to view it as temporary or permanent. A closer look at how banks fund themselves and the change in the regulatory environment over recent years provides some answers.

3 Bank funding composition

In practice, banks have a diverse funding base but it can be broken down into some key components – capital, deposits, short-term wholesale debt (defined as debt maturing within one year) and long-term wholesale debt (defined as debt maturing beyond one year). The composition of bank funding over time is illustrated in figure 2, with the data sourced from the Reserve Bank's monthly Standard Statistical Return.

Figure 2
New Zealand banks' funding composition



Source: RBNZ

Banks must meet regulatory capital ratios. While equity or capital represents a source of funding, capital ratios tend to be fairly stable over time and make up a small proportion of total funding. The cost of capital may have an impact on lending rates. However, in this paper we are interested in the more variable sources of funding and in the rest of the paper we ignore the capital component.

Before the global financial crisis, short-term wholesale debt was the largest source of bank funding, making up about half of total funding in the five years leading up to the financial crisis. Historically, the majority of short-term wholesale funding (around two-thirds) had a residual maturity of between two and 90 days. Most of this short term debt was issued offshore, primarily in the US commercial paper (CP) market.

The ratio of short-term wholesale debt funding to total funding has been declining steadily over recent years. At the beginning of 2009, short-term wholesale debt funding made up around 49 percent of the total and by the end of April 2012 the ratio had declined to 34 percent. Short-term wholesale debt funding has been replaced with retail deposits and long-term wholesale debt funding. Retail deposits and long-term wholesale debt funding are both considered "stickier" and more stable sources of funding. There are a few reasons for this shift towards more stable sources.

Firstly, the global financial crisis highlighted the vulnerability banks face when relying heavily on short-term wholesale markets as a source of funds. Under normal

market conditions, banks had been able to easily roll over short term debt in the highly liquid US CP market. But during the global financial crisis, market conditions became extremely illiquid. This saw funding markets become essentially frozen with the cost of rolling over short-term debt, even for very short periods, becoming prohibitive – a situation that had not been experienced before in recent history. This turn of events led banks globally to reassess the funding risks posed by considerable heavy reliance on short-term debt markets and the inherent rollover requirements.

Secondly, market pressures were another source of motivation for banks to consider more stable sources of funding. Investors, rating agencies, and banks quickly became attuned to the merits of a more stable funding base. Banks needed to find more stable sources of funding to earn the confidence and support of investors.

Thirdly, regulatory pressures also compelled banks to adopt more stable sources of funding. Following consultations with the banks during 2008, in June 2009, the Reserve Bank announced the introduction of a minimum core funding ratio of 65 percent in April 2010, with an eventual target of 75 percent. The core funding ratio (set out in the Reserve Bank’s liquidity policy document BS13), is defined as the ratio of the banks’ core funding to their loans and advances. Core funding includes tier one capital, the majority of retail deposits, all wholesale funding with a residual maturity of more than one year and half of wholesale debt funding with a residual maturity of between six months and one year (for bank debt issued with an original maturity of at least two years).

All of these three factors have encouraged banks to seek more stable sources of funding, and this has seen a rising ratio of retail deposits and long-term wholesale debt within the funding mix since 2008.

The current largest source of funding is through retail deposits, with this component making up 47 percent of total funding as at the end of April 2012. Retail deposits include on-call cheque, transactions, savings and term deposit accounts. Of the \$171 billion of retail funding for New Zealand banks as at the end of April 2012, about 43 percent were on-call funds. Approximately 52 percent of deposits had residual maturities of between two days and

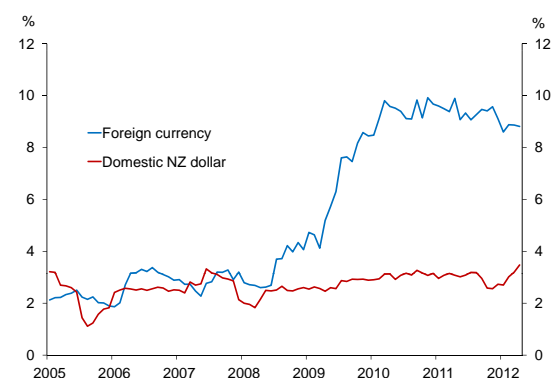
one year, while only 5 percent of bank retail deposits were for residual maturities exceeding one year. In other words, almost all retail deposits have short terms, with 95 percent maturing within a year. Despite the short contractual maturity structure, in practice bank customers tend to retain a high proportion of funds with the bank when they ‘mature’, a feature that contributes to their ‘stickiness’.

Within retail deposits, since 2007 there has been a slight increase in the ratio of term deposits, at the expense of on-call funding. And since 2008, within the retail term deposit mix there has been a slight increase towards terms of more than one year. This is likely to reflect the positive shape of New Zealand’s yield curve since the global financial crisis, which has encouraged investors to achieve the term premium on offer.

Long-term wholesale funding can be split into domestic debt issues and foreign currency debt issues, as illustrated in figure 3.

Domestic long-term wholesale debt issues have historically been a small and relatively stable component of total funding, with a ratio of 3.5 percent as at the end of April 2012. Foreign currency long term wholesale debt issues became a much larger component of total funding after the global financial crisis, with a ratio of 9 percent as at the end of April.

Figure 3
Long term wholesale funding
(ratio to total funding)



Source: RBNZ

Increased foreign currency debt does not expose banks to extra risks like currency volatility because the debt is always fully hedged. The cost of issuing foreign

currency debt and hedging the exposure is greater than issuing domestic debt, as we highlight in the next section, but cost is a secondary issue for banks.

There is a limited pool of savings in New Zealand and therefore a limited appetite for local investors to consider investing in long-term wholesale bank debt. Banks that seek longer term debt issues are effectively forced to attract overseas investors and this usually means issuing in foreign currency. A widening of the investor pool by seeking overseas funding enables the banks to diversify funding risk.

The introduction of covered bonds has helped banks attract overseas investors. Covered bonds are debt securities backed by the cash flows from a specific pool of mortgages or other loans. They differ from standard bonds in that investors have specific recourse to the assets that secure (“cover”) the bonds in the event of default, as well as retaining a claim on the residual assets of the issuer. Investors in covered bonds are more risk averse than investors who hold unsecured debt. Therefore, the issuance of covered bonds has helped banks attract a wide pool of investors that would not have otherwise considered investing in New Zealand bank debt.²

The other benefit of covered bonds is that banks can typically issue longer term maturities, say between five to 10 years. This helps extend the term funding for banks. Unsecured debt issues are more typically for a three to five year maturity. The shift towards foreign currency long term debt funding has not only helped banks to secure more stable sources of funds but has also helped them extend the term of funding and, at the same time, diversify their investor base.

4 Cost of funding

The cost of funding is a key driver of lending rates. In this section we ignore any changes to the cost of equity, which might have affected lending rates. Capital makes up a small proportion of total funding and our focus in this

paper is the cost of funding driven by deposit rates and wholesale funding rates.

The behaviour of deposit rates and wholesale funding rates has changed over recent years. The onset of the global financial crisis drove a significant deterioration in liquidity, resulting in higher and more volatile interest rates in wholesale debt markets. Deposit rates were less affected during that time. As the sense of crisis dissipated, volatility reduced but the cost of more stable sources of funding remained elevated. The previous section highlighted the changing composition of bank funding over recent years. This compositional shift has had an additional significant impact on the overall cost of funding. In this section we explore these forces on pricing.

From a Reserve Bank perspective, our focus is more on the cost of funding relative to the OCR rather than the absolute cost of funding itself. The Reserve Bank can influence the absolute cost of new funding by changing the OCR. But the Bank has little control over, say, the spread between deposit rates and the OCR, or the spread between long-term wholesale bank debt rates and the OCR. These spreads are important determinants of lending rates. To control lending rates, the Reserve Bank must take account of these spreads when setting the OCR.

Unless otherwise noted, the rest of this article uses the term “cost of funding” to represent the relative cost of bank funding to the OCR (or some other short-term interest rate) rather than the absolute cost of funding itself.

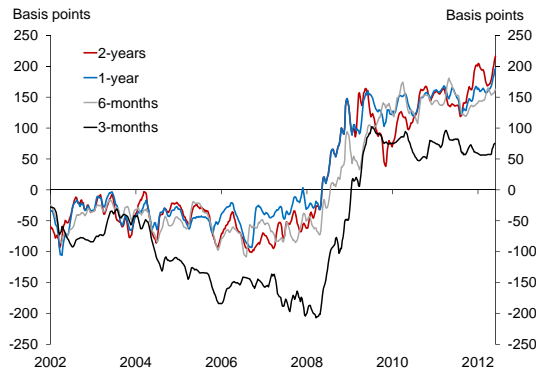
Deposits

As noted in section 3, deposits are now the largest source of funding for local banks. We also noted that “on-call” funds make up a little under half of total deposits, with the rest spread over various terms, but mainly short-terms (less than one year).

Figure 4 illustrates, for various maturities, the spread between retail deposit rates and wholesale interest rates for the four major local banks. For three and six month wholesale rates we use 90-day and 180-day bank bills and for the one and two year rates we use swap rates.

² The Reserve Bank imposes a regulatory limit to the issuance of covered bonds by New Zealand banks 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.

Figure 4
Spreads between term deposits and wholesale rates
(Average of 4 major banks, 4-week moving average)



Source: interest.co.nz, RBNZ

From the start of our dataset in 2002 until 2008, the cost of term deposits for banks was cheaper compared to funding in wholesale markets. For example, between 2002 and 2007, a six-month term deposit at a bank was around 50 basis points lower than the 6-month bank bill rate. A structural break occurred during the global financial crisis (GFC) and banks are now funding retail term deposits at a spread of around 150-200 basis points above bank bill and swap rates. Spreads for term deposits from the six-month tenor out to five years have largely followed a similar track.

What caused the structural break in the series? The reasons are largely the same as those behind the changing composition of bank funding. Banks can no longer rely on short-term wholesale debt as a source of cheap funding, in a post GFC world, given market and regulatory pressures. The demand for more stable sources of funding has pushed up their cost. Banks must now offer higher retail term deposit rates to attract this desired, more stable source of funding.

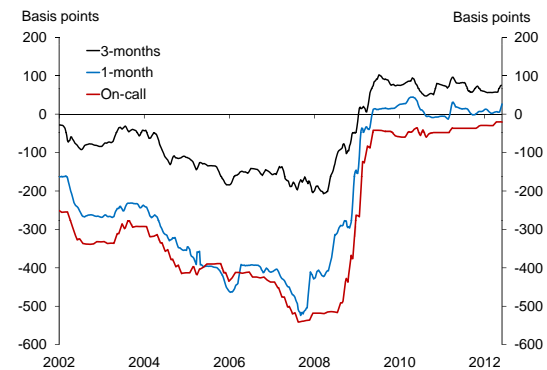
The pricing indicators reveal that banks have a preference for longer-maturity term deposits compared to very short-term tenors. In Figure 4 above, the spread between deposits and wholesale rates at the three-month tenor was the lowest compared to longer tenors. This is the case both before and after the GFC. In other words, banks do not seem willing to “pay up” for three month term deposits, reflecting their short tenor and, no

doubt, administrative costs for marginal gain in duration of funding.

When we look at even shorter tenors, spreads between retail rates and wholesale rates are even lower, as illustrated in figure 5. Just prior to the GFC, banks were offering highly unattractive rates for one month term deposits, some 500 basis points below the comparable one month bank bill rate.

Compared to term deposit rates, banks have not tended to “pay-up” for on-call deposits.³ We currently estimate that the average rate paid by banks for on-call deposits remains slightly below the official cash rate. It is worth noting that over the last couple of years, we have seen banks offer more inducements to attract on-call money, by offering attractive bonus interest rates. These typically come with conditions attached (such as high rates only earned when no withdrawals are made during a month).

Figure 5
Spreads between term deposits, the on-call rate and wholesale rates
(Average of 4 major banks, 4-week moving average)



Source: interest.co.nz, RBNZ

³ The Reserve Bank’s surveyed series of the on-call rate was discontinued in 2009. In this analysis we have estimated the on-call rate from 2009 onwards. There is now a proliferation of on-call accounts, ranging from zero interest cheque accounts to transaction accounts paying a small interest rate to savings accounts that offer very attractive bonus interest rates. Given this, it is difficult to measure an overall weighted average on-call deposit rate.

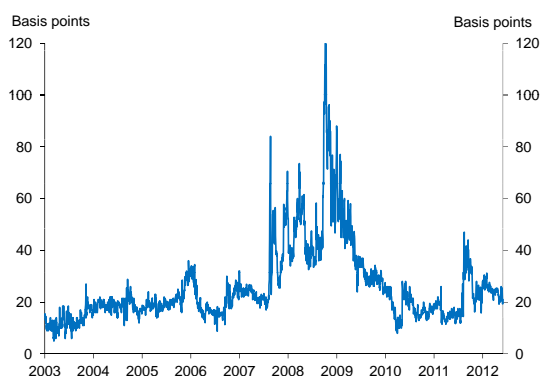
Short-term wholesale debt costs

The absolute cost of bank funding in short-term wholesale markets can be proxied by one month or three month bank bill rates. The relative cost of short term funding to the OCR can then be determined by the spread between the bank bill rate and the overnight indexed swap (OIS) rate over the same term, which provides an indication of the expected future level of the OCR. The three month OIS rate, for example, measures the expected OCR rate over the next three months.

Figure 6 shows the spread between the three month bank bill and OIS rates, as a proxy for the cost of raising short term wholesale funds relative to the cash rate. Between 2003 and mid-2007, the spread traded in a fairly tight range, averaging 19 basis points.

From mid-2007, as the global financial crisis got under way, the spread became much more volatile and exploded upwards, reaching a peak of around 120 basis points in October 2008. Between mid-2007 and the end of 2008, the spread averaged 49 basis points. Since mid-2009, the spread has settled back down towards a more normal level, helped by the significant injection of liquidity by the major central banks. More recently, there was a mini-spike up in late 2011, as the European debt crisis intensified, with heightened risk of a Greece sovereign debt default at that point. But very easy global liquidity conditions have helped contain the spread at a modest level through 2012.

Figure 6
Spread between 3-month bank bill and OIS rate
(basis points)



Source: RBNZ

Long-term wholesale costs

Indicative trends in long-term wholesale debt funding costs can be gleaned from a number of indicators. A number of previously issued bank bonds trade on the secondary market. Although this market is not particularly liquid, trends in the pricing of these bonds – based on either actual trades or indicative pricing provided by market makers – are useful proxies for long-term wholesale funding costs.

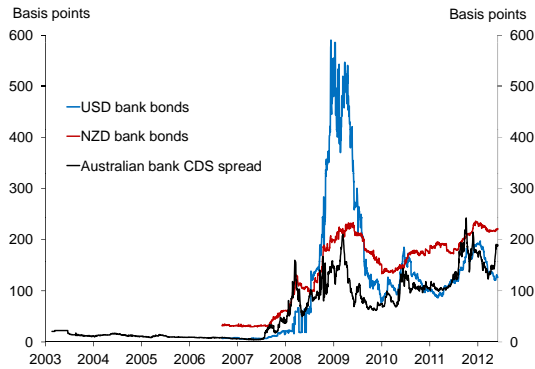
We constructed time series of yields of bank issued debt traded in the secondary market, focusing on maturities within 3-7 years, to provide trends in long-term wholesale funding costs. We split the sample into domestically issued bonds and those issued in US dollars and show the series on a spread-to-swap basis. These time series are illustrated in Figure 7.

In that figure we've included another indicator. With New Zealand's four largest banks owned by Australian parents, trading in the parents' credit default swap (CDS) spreads can be another useful indicator of trends in funding costs. Credit default swaps are widely traded derivatives. A buyer of a five year CDS contract in a bank (or other entity) makes a periodic payment to the seller of the contract in return for the promise of compensation should that bank (or other entity) "default" over the next five years. They can be useful as hedging instruments and the quoted CDS "spread" is a useful proxy for the cost of long-term debt for the bank or entity to which the contract refers.

In Figure 7 we include the average CDS spread for the four major Australian banks as one of our indicators of long-term wholesale debt funding costs.

Our analysis suggests that the cost for banks of issuing long-term debt was low and stable over the period from 2003 until the GFC began to hit from mid 2007. After Lehman Brothers filed for bankruptcy in 2008, implied long-term funding costs of USD-issued debt rose markedly. Domestically issued debt and CDS pricing was also significantly affected at that time, albeit less so.

Figure 7
Indicators of long-term wholesale debt funding secondary rates
(basis points)



Source: RBNZ, Bloomberg

At the time of writing, these indicators of long-term funding costs remained high by historical standards. Note that these indicators do not reflect actual funding costs but are indicative in nature. That is, they are a notional proxy for the cost of borrowing at a given point in time. The issuance of long-term debt tends to be infrequent and in large, lumpy amounts. Banks often have the ability to sit out periods of disruption in markets, such as in late 2008 during the GFC (when term funding needs were partly met through recourse to the Reserve Bank’s Term Auction Facility) and in late 2011 during the European debt crisis. No local bank actually issued USD bank debt around the time of the Lehmans’ bankruptcy when the notional cost of term funds spiked up significantly.

In practice, actual funding costs (sometimes referred to as the ‘landed cost of funds’) tend to be higher than the levels shown in figure 7 at times when the banks are issuing debt. New issues are typically dealt at a premium, say 10-25 basis points, to the secondary market to attract investors. Paying brokerage for domestic issues and dealers’ margins also adds to the cost of issuing long-term bank debt.

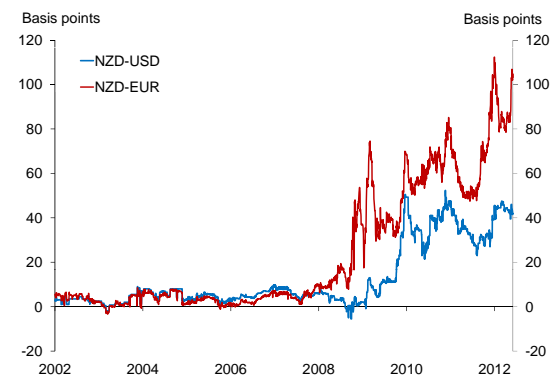
A rising, and now substantial cost, for overseas debt issues is the cost of hedging cashflows back into New Zealand dollars so that banks avoid taking on any undesired currency exposure. At the same time as banks issue debt in an overseas currency they enter cross-currency basis swap agreements for the same tenor which

eliminates any currency risk.⁴ For example, a bank issuing 5-year debt in euros would, at the same time, enter into 5-year cross currency basis swap agreements. Typically, this would involve an agreement to convert euro exposure into US dollars and another agreement to convert US dollar exposure into New Zealand dollars. Obviously, for debt issued in US dollars, only one cross currency basis swap agreement is needed.

There is an active market for long-dated cross currency swaps and the price faced by New Zealand banks to hedge their foreign currency debt at issuance can be illustrated by Figure 8.

It shows, for example, that if a bank issues five-year debt in Euros and wants to fully hedge all the cashflows over the period (including repayment of principal), then another 100 basis points is effectively added to the “landed cost” of that debt. This cost of hedging currency exposure has increased tremendously over recent years. Prior to the GFC the cost of hedging was low.⁵

Figure 8
5-year cross-currency basis swaps
(basis points)



Source: Bloomberg

⁴ A cross-currency basis swap agreement is a contract in which one party borrows one currency from another party and simultaneously lends the same value, at current spot rates, of a second currency to that party. During the contract, floating rates of the two currencies are exchanged and one party will, in addition, pay a fixed spread or the so-called “basis”, a constant figure which is determined at the start of the contract and the price of which is determined by the supply and demand for the two currencies.

⁵ The Reserve Bank’s *Financial Stability Report*, May 2012 (page 12) has a discussion of developments in basis swap markets and why the cost of hedging has increased.

Figure 8 is only indicative of trends and significantly understates the actual cost of hedging, as other transaction costs are involved.⁶

5 Calculation of an indicative marginal funding cost indicator

The previous sections have looked at some of the key components that make up the overall cost of bank funding. In this section we put it all together to produce an overall measure of funding costs. Rather than a measure of average funding costs, we are most interested in an indicative “marginal” funding cost indicator, as this is likely to have a major bearing on bank pricing behaviour. A bank pricing its loans would typically put more weight on its marginal funding costs than average funding costs. By marginal, what we have in mind is some sort of “smoothed” cost – not necessarily reflecting the last dollar raised – for example, the average cost of raising funds over the last few months. This is an important concept in determining the weights when aggregating funding sources.

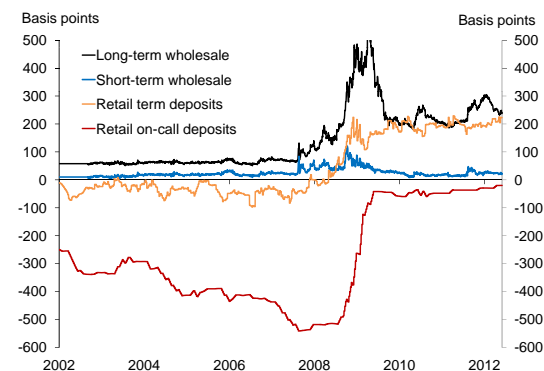
Before we describe our aggregate funding cost indicator, it is interesting to compare the different sources and their costs of funding. To make them comparable, we measure their cost relative to the OCR.⁷ Figure 9 illustrates the various components.

The short-term wholesale debt cost indicator is the same as mentioned above – the three month bank bill rate less the three month OIS rate. Despite the spike up and increased volatility during the GFC, compared to the other two funding sources, short-term wholesale debt funding costs appear more stable. As at the end of May, the cost of raising short-term wholesale debt was about 20 basis points above the expected OCR rate.

For retail funding, because of their substantial difference in pricing, we illustrate on-call deposits and term deposits separately. As the weights between these two sources don’t change a great deal we use constant weights of 40 percent for on-call deposits and 60 percent for term deposits in our calculations for our overall funding cost indicator. As most of the term deposits are for short terms, we use the six month term deposit rate in our calculations. Recognising the changed regulatory landscape, with deposits a more sought after source of funding, from 2009 we have added a 30 basis points spread to our term deposit rate series. This recognises that the six month term is not always the best rate offered, with investors tending to flock to the best short term rate.

Retail deposits used to be the cheapest source of funding until early 2009, before the regulatory changes encouraged banks to move to more stable sources of funding, increasing their relative price. At the end of May we estimated that retail deposits cost about 120 basis points in excess of the expected OCR, reflecting on-call rates that were about 20 basis points below the OCR and a term deposit funding spread of 220 basis points.

Figure 9
Indicative marginal funding costs relative to OCR
(basis points)



Source: RBNZ

The long-term wholesale debt funding cost indicator combines the domestic and US dollar long term funding cost indicators. Prior to early 2009 we use an equal weight, reflecting similar proportions of total funding from these two sources. From early 2009, we assume that more than 80 percent of long-term wholesale funding is done in the offshore US dollar market. This reflects the limited ability

⁶ Issuing debt in euros, for example, involves other transaction costs such as swapping 6-month cashflows into 3-month cashflows (currently around 20 basis points), extra costs taking into account the convexity of different yield curves and the “crossing the spread” throughout the required layers of transactions. The cost of hedging recent European debt issues has been closer to 150 basis points once these are taken into account.

⁷ Strictly speaking, we use the 3-month OIS rate in most of our calculations, which measures market expectations of the OCR in 3-months time.

of banks to issue long-term domestic debt in New Zealand because of the limited pool of investors. Data limitations mean that we don't include the euro market. Historically, only a small proportion of debt was raised in that market, but it has become a more important source, particularly since the introduction of covered bonds. Going forward we would look to include debt raised in Europe for our funding cost indicators.

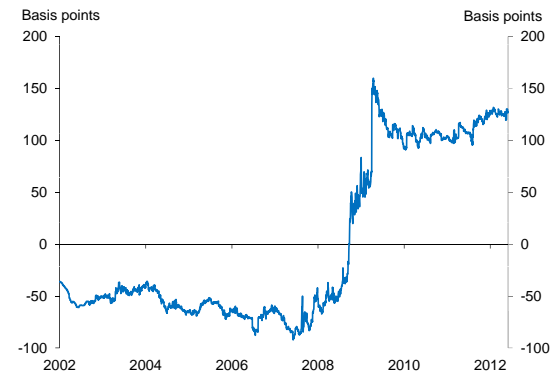
To generate the marginal cost of funding indicator for long-term debt we use our secondary market spread-to-swap series, and add estimates for the cost of hedging and new-issuer premiums. To make it comparable to the OCR, we add the short-term wholesale cost indicator.

As at the end of May, we estimate that the cost of issuing long term debt in the domestic market and US market was about 240 basis points over the OCR – the most costly form of funding for banks.

Putting together these three main sources of bank funding, we can create an overall indicative measure of marginal funding costs relative to the OCR. A key judgment in creating the series is what weights to apply to the various sources of funding. As the funding mix was relatively stable prior to the regulatory changes on the core funding ratio, we use the average funding mix for the period through to March 2009. From that date on, we assume that banks anticipated the regulatory changes proposed and upped their funding mix towards more stable sources. Thus for retail deposits, the assumed funding mix increases from 42 percent in the early period to 60 percent from March 2009 and increases from 6 percent to 20 percent for long-term wholesale funding (in the USD market rather than the constrained domestic market). For short-term wholesale debt, the funding mix reduces from 52 percent in the earlier period to 20 percent.

Figure 10 shows the weighted indicative marginal funding cost indicator relative to the OCR. It shows that before late 2008, banks could fund at a rate below the OCR. Our estimates suggest that from 2002 until Lehman Brothers filed for bankruptcy, banks could fund at an average rate of 60 basis points below the OCR. The GFC was a game changer and, combined with new regulations for banks to seek more stable sources of funding, funding costs rose markedly to a new level.

Figure 10
Indicative marginal funding costs relative to OCR
(basis points)



Source: RBNZ

Our model suggests that from mid 2009 until May 2012, indicative marginal funding costs have averaged 110 basis points above the OCR, or an increase of 170 basis points from the pre-GFC days. Focusing on the recent period, funding costs have increased from about the third quarter last year as the European debt crisis developed. As access to long-term debt in offshore markets has become more difficult and expensive, banks have competed for retail deposits, putting upward pressure on their funding margins. Our estimate as at the end of May for overall indicative marginal funding costs was about 130 basis points over the OCR.

Figure 11, overleaf, shows the absolute level of our indicative marginal funding cost indicator against the OCR itself. It clearly shows how indicative funding costs tracked below the OCR prior to late 2008 and now track well above the OCR.

The implications for lending rates are clear. Figure 1 showed how lending rates had jumped up relative to wholesale interest rates from around 2008. This upward shift in the margin between lending rates and wholesale interest rates can be explained by the rising cost of funding relative to the OCR, as illustrated in Figure 12. This shows the relative stability between the floating mortgage rate and the 90-day bank bill rate in the pre-2008 period, matching the relative stability in our marginal funding spread indicator. Both series rose during 2008-2009 and have both since stabilised.

Figure 11
Indicative marginal funding cost indicator and
OCR
(percent)

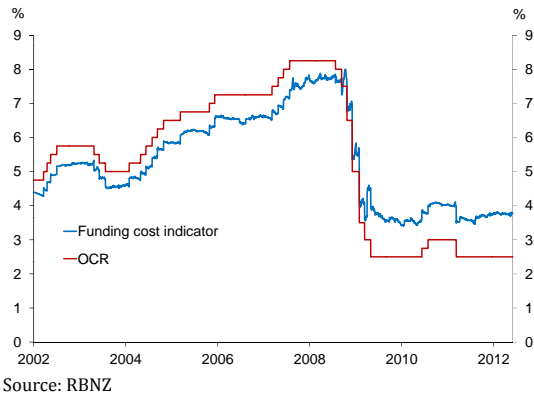
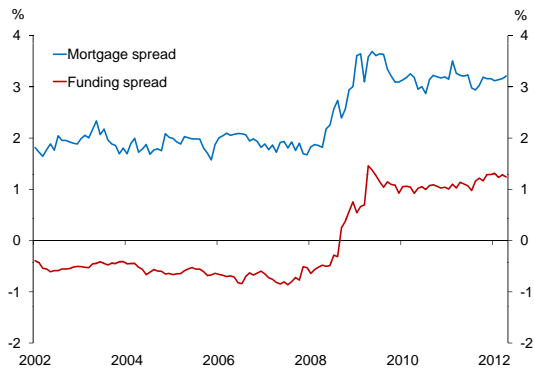


Figure 12
Mortgage spread and funding spread
(percent)



* Mortgage spread is floating mortgage rate less 90-day bank bill. Funding spread is our marginal funding cost indicator less OCR
 Source: RBNZ

6 Conclusion

The OCR is an important driver of the cost of funding for banks. Before the global financial crisis began to bite in 2008, there was a relatively stable relationship between the OCR and overall bank funding costs. This implied a relatively stable relationship between the OCR and floating mortgage rates.

The period of 2008-2009 was a game changer. Banks learned first hand about the vulnerability created by relying

too much on short-term wholesale funding markets. In addition, markets reassessed the risk of investing in banks and regulators around the world, including the Reserve Bank, took action to encourage banks to seek more stable sources of funding.

Since that time banks have reduced their reliance on short-term wholesale funding markets and increased their exposure to long-term funding sources and retail deposits as part of the total funding composition. This trend has created a stronger, less vulnerable, financial systems, but it has come at a cost. Competition for retail deposits has driven up their cost and longer-term debt is more expensive to source, owing to the term premium as well as the deterioration in market conditions.

During 2008-2009 there appeared to be a 'step-up' in funding costs relative to the OCR. Since then, this funding spread appears to have stabilised again, at the higher level. We demonstrated this by calculating a notional marginal funding cost indicator based on historical data. This does not represent the true cost for banks. Bank funding is a highly technical and intensive process and our model is relatively simple. Our calculations should be seen in that light, as indicative of the trends in funding costs, than a true and accurate measure of actual bank funding costs.

We showed that relative to the pre GFC era, bank funding costs relative to the OCR have increased in the order of 170 basis points. This extra cost of funding has fed directly into mortgage rates. It is important to note, however, that in implementing monetary policy, the Reserve Bank has attempted to take the higher funding costs into account. Thus the OCR over this period has been lower than would have been the case if previous interest rate relationships had persisted.

The relationship between the OCR, funding costs and mortgage rates is an ongoing topic for research by the Reserve Bank. The Bank continues to monitor funding markets and interest rate relationships which are a key input into the monetary policy setting process.