

LIQUIDITY REGULATION: *lessons from New Zealand*

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This paper examines the effects of the new liquidity ratios implemented in New Zealand with effect from 1 April 2010. It finds that the introduction of new rules designed to force banks to reduce their exposure to funding risk has been associated with greater use of retail funding and a lengthening in the maturity of funding. Both of these results are consistent with expectations.¹ An earlier version of this paper was presented to the 2012 Australian Centre for Financial Studies' Melbourne Money and Finance Conference.

The adoption of an internationally standardised set of rules on bank liquidity is one of the innovations in the package of international regulatory rules known as Basel III.² The Reserve Bank of New Zealand (RBNZ), the New Zealand regulator, was on record as having been concerned about New Zealand banks' exposure to liquidity and funding risks sometime prior to the global financial crisis (GFC),³ and a program of work was already in place before the period during September and October of 2008 when funding pressures in international markets became particularly severe. This resulted in a set of ratios being designed during 2008 and 2009, to which the New Zealand banks have had to adhere since 1 April 2010.

The RBNZ's concerns were that New Zealand banks were unable to cover their loan portfolios from deposits, and that they were particularly dependent on relatively short-term wholesale funding, especially relatively short-term non-resident funding. This meant that the banks were particularly exposed to disruption in wholesale markets internationally, an issue which has been recognised by the rating agencies in their reviews of both New Zealand and Australian banks.

The ratios adopted by the RBNZ are a mismatch ratio, which broadly resembles the liquidity coverage ratio specified under Basel III, and a core funding ratio, which broadly resembles the net stable funding ratio.⁴ The mismatch ratio focuses on liquid asset holdings in the short run, and is focused essentially on liquidity risk, whereas the core funding ratio has a longer time horizon, and is targeted at funding risk, defined as whether or not a bank can sustainably fund itself at stable interest costs which will preserve profitability.⁵ The required figure under the core funding ratio was initially set at 65 per cent, but this was increased to

70 per cent as at 1 July 2011, and is set to increase to 75 per cent from 1 January 2013. No data have yet been published on what ratios individual banks are achieving, although the RBNZ has stated that banks have been achieving these ratios comfortably.⁶

Against this background, this paper reports on a number of questions as to what the practical outcomes might be from the RBNZ's new rules. Our key focus is on the core funding ratio and banks' funding risk. We investigate whether New Zealand banks have changed the structure of their funding in response to the new ratios (in terms of lengthening maturities and emphasising retail rather than wholesale funding), and we look at potential implications in terms of the cost of funding. We also consider whether there might have been any impact from the new rules in terms of banks' willingness to lend, an issue which has been raised internationally as a criticism of Basel III (although the limited extent of economic cyclicality in New Zealand since the rules came into effect limits the conclusions we can draw on this question).

Data and method

The primary data source used for this analysis is the RBNZ's data table SSR (Aggregate Standard Statistical Return (SSR) — registered banks) Part B1, which reports funding in a total of 10 maturity categories according to a number of classifications: funding in New Zealand dollars relative to funding in foreign currencies; funding from residents relative to funding from non-residents; and for New Zealand dollar funding only, a distinction between retail and wholesale funding. To simplify the analysis, we aggregate the data into three maturity categories: up to 90 days; 90 days to one year; and more than one

year. Whether deposits are for more or less than one year is of particular importance because the time horizon for the core funding ratio is one year.

The current RBNZ data series commences at December 2004, and this is the starting point for our analysis. We look at the average (mean) figures for two periods, from December 2004 through to July 2007, as the period prior to the GFC, and then at the post-GFC period, which we define as being from January 2010 through to April 2012 (the latest date for which data were available when this paper was being written). We specify July 2007 as the last month prior to the GFC, as effects on bank liquidity and funding began to be observed during August 2007.⁷ We then treat the period from August 2007 through to December 2009 as a period during which the banks were adjusting their portfolios in response to both the shocks experienced during the GFC and the imposition of the RBNZ's new rules. Even though the new rules did not come into effect until April 2010, the banks had had time to prepare themselves for their introduction and had positioned themselves accordingly in advance.

Data are analysed as a percentage of the total funding in the relative classification, so that effects of changes in overall funding do not confound the effects we are looking for. Due to their small size, samples are unlikely to conform to a normal distribution, meaning that the *t*-test is not an appropriate method to compare them. We therefore use the Mann-Whitney test, which should be more robust to outliers than the *t*-test, to explore the statistical significance of apparent differences.

Results

We look first at the mix of funding between wholesale and retail, with this data available for New Zealand dollar funding only. These results are reported in Table 1 and changes in the maturities of funding are reported in Table 2.

TABLE 1: The retail/wholesale mix

	12/04 – 07/07	01/10 – 04/12	Significance of difference (<i>p</i> -value)
Retail funding	57.57%	66.74%	0.000
Wholesale funding	42.43%	33.26%	0.000

TABLE 2: Maturities of retail and wholesale NZD funding

		12/04 – 07/07	01/10 – 04/12	Significance of difference (<i>p</i> -value)
Retail	Less than 90 days	79.21%	67.58%	0.000
	90 days to 1 year	18.63%	27.72%	0.000
	More than 1 year	2.17%	4.70%	0.000
Wholesale	Less than 90 days	75.31%	76.59%	0.157
	90 days to 1 year	16.26%	8.89%	0.000
	More than 1 year	8.44%	14.53%	0.000

The switch from wholesale to retail funding is sizeable and to be expected in terms of the incentives under the new rules. This is because retail deposits will generally conform with what is defined as non-market funding, and are therefore allowed to be mostly counted as retained for the purposes of calculating both the mismatch ratio and the core funding ratio.

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The lengthening of maturities in retail funding is also consistent with the incentives given to banks in terms of the mismatch ratio — the lengthening of maturities will reduce the amount of scaling back that has to be applied to these deposits as non-market funding. Yet another possible reason for the increase in retail funding might be the disappearance of some of the other vehicles into which such deposits might have flowed following the failure of many New Zealand finance companies since 2006.

The increase in wholesale funding for more than one year is consistent with the requirements under the core funding ratio, particularly as this has largely been matched by a reduction in funding for 90 days to one year. The lack of any significant change in shorter-term wholesale funding indicates that this may be driven by supply — banks have not been able to change counterparty behaviour with this category of funding.

Our next focus is on non-resident funding, which is predominantly wholesale,⁸ firstly looking at whether

TABLE 3: Breakdown of non-resident funding

		12/04 – 07/07	01/10 – 04/12	Significance of difference (p-value)
Non-resident funding by currency	New Zealand dollars	39.86%	30.20%	0.000
	Foreign currency	60.14%	69.80%	0.000
New Zealand dollar funding, by maturity	Less than 90 days	68.86%	75.52%	0.000
	90 days to 1 year	19.93%	18.37%	0.012
	More than 1 year	11.21%	6.11%	0.000
Foreign currency funding, by maturity	Less than 90 days	69.49%	44.55%	0.000
	90 days to 1 year	17.98%	18.08%	0.689
	More than 1 year	12.53%	37.37%	0.000

TABLE 4: Trend in maturity of total funding

	12/04 – 07/07	01/10 – 04/12	Significance of difference (p-value)
Less than 90 days	76.36%	64.23%	0.000
90 days to 1 year	17.26%	20.15%	0.000
More than 1 year	6.39%	15.62%	0.000

this has changed as a proportion of total funding, and then at its composition. Comparing our two periods, we find that the proportion of non-resident funding increased slightly, although the effect is not statistically significant. A review of the trend suggests that the proportion of non-resident funding to total funding has fallen since June 2010, but not yet by enough or for long enough to show a statistically significant effect.

Results for the composition of non-resident funding are reported in Table 3. Non-resident funding in foreign currencies is now significantly more important than previously, but it is not clear why this might be a consequence of the new liquidity rules. It is more likely to be attributable to the diminished importance of the Eurokiwi and Kauri bond markets, with New Zealand interest rates no longer offering such outstanding opportunities to investors. It is interesting in this regard to note that the maturities of non-resident New Zealand dollar funding appear to have shortened, which is the opposite of what we would expect (although this may reflect the diminished importance of this funding channel).

By contrast, we can see a significant lengthening in the maturities of non-resident funding in foreign currencies. We expect this to be comprised almost wholly of wholesale (market) funding, for which banks seek longer maturities (more than one year) so that it can be included for calculation of the core funding ratio. This trend is also consistent with banks both looking to comply with the new rules and reducing their own risk exposure, with this funding class having been identified as particularly at risk during the problem period in late 2008, following the failure of Lehman Brothers.

We have not examined funding in foreign exchange by New Zealand residents. This funding is very limited, accounting for only approximately 2 per cent of total funding as at April 2012, and its composition by maturity has not changed, with it almost all being for 90 days or less.

A further area that we can examine from the SSR Part B data is the maturity mix of banks' funding as

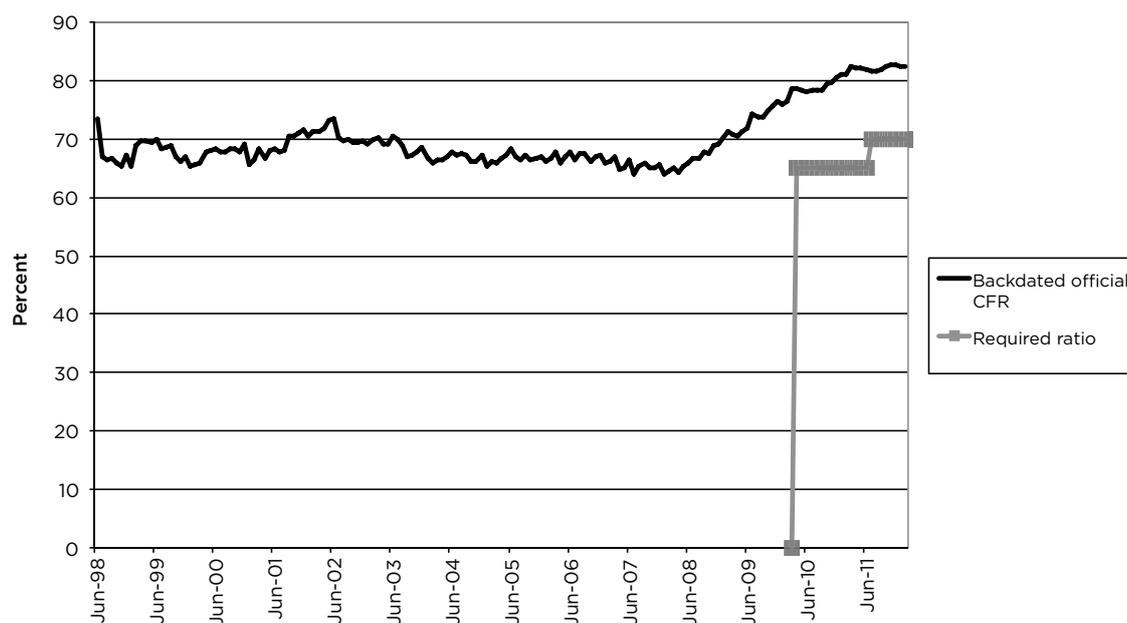
a whole. Results are reported in Table 4, which shows a reduction in shorter-term funding and an increase in longer-term funding. Again, this is consistent with our expectations.

Further analysis

There are a number of further issues that arise from our analysis. Although we have seen New Zealand banks extend the maturity of their funding, we don't know how well they are achieving compliance with the new ratios. To what extent could the switch to longer-term funding reflect a switch in the shape of the yield curve, which has made longer term deposits more attractive for less sophisticated retail investors? To what extent could banks' improved funding profile be a reflection of their reaction to the funding pressures they experienced in 2008, rather than a response to the rules now being applied to them? It would be good to be able to examine comparable data for the Australian banking sector, where changes would be only in response to funding and rating agency pressures, with no current need to respond to regulation.

The only information seen so far on banks' adherence to the ratios is through the comments made in the

FIGURE 1: Core funding ratio trend for New Zealand banks



RBNZ's six-monthly *Financial Stability Report*. Data reported in these reports show that banks have been increasing their core funding ratios, above the required minima, as can be seen in Figure 1. The problems with this, however, are that reporting is infrequent and we don't know how each individual bank sits relative to the required ratios, with the RBNZ not yet having required banks to report these in their quarterly disclosure statements.

Another way to explore the effects of the change would be to look at loan-to-deposit ratios, as a number of comments in the immediate aftermath of the worst of the GFC suggested that banks with loan-to-deposit ratios in excess of one were at greater risk. One of the problems in discussing such ratios is in terms of what is to be included in deposits, as practices between banks are not necessarily all the same. Moreover, the RBNZ does not report a single, clear figure for loans by New Zealand banks, and therefore we have examined the trend in the ratio of total non-M3 claims in New Zealand dollars to total retail deposits. The results are shown in Table 5.

The ratio has clearly improved, but it remains much higher than is regarded as optimal. We should note, however, that our measure is unlikely to generate the same numbers as might be reported as loan-to-deposit ratios for banks individually.⁹

Another issue is the complaint raised internationally that the new liquidity rules may put pressure on banks to reduce their lending. Examination of the data shows that New Zealand banks have reduced lending growth very significantly since the end of 2008, but it is not immediately obvious as to whether this is attributable to the GFC or to pressures on bank liquidity.

A cursory examination of the data suggests that the slowdown in lending may be a demand effect, with banks apparently showing a willingness to compete for new lending, to the extent that their lending margin relative to cost of funds appears to be shrinking.¹⁰

Comparisons between the New Zealand and Australian experience could help us to better decompose the relative effects.

Another issue identified is that the switch towards more retail and longer-term funding started in early 2009, which was about the same time as the yield curve moved from being negatively to positively sloping. This may account for some of the switch from short-term to longer-term deposits by retail investors, who were previously deterred from investing in longer-term deposits by lower headline interest rates and who may look only at headline interest rates without appreciating the economic meaning of the yield curve. Wholesale depositors should not be impacted in the same way, however, and the increase

TABLE 5: Trend in ratio of NZD claims to retail deposits

12/04 – 07/07 (Mean)	01/10 – 04/12 (Mean)	Significance of difference (p-value)
208.47%	190.78%	0.000

in wholesale deposits at longer maturities is likely to be a reflection of banks specifically targeting longer-term funding as they sought to reduce risk and prepare themselves for the new rules.

Summary and conclusion

The conclusion we have drawn from this analysis is that, generally, the new liquidity rules have put pressure on banks to change the structure of their funding, resulting in increased use of retail funding and funding for longer maturities. Our analysis has had to be limited to aggregate data provided by the RBNZ. It is likely that, at some future date, when the RBNZ starts to report the relevant detail, it might be possible to look at how individual banks have responded. We also still need to justify our conclusion that the changed funding structure is a consequence of the new liquidity rules, rather than being a reaction to the risky position banks found themselves in during the GFC. This may be best tested by comparing New Zealand banks with those in Australia, to look at the extent to which they have changed their funding structure (noting that Australian banks are not required to comply with liquidity rules until 2015).

The relationship between New Zealand banks and their Australian parents also matters, in that funding raised by parent banks may be passed through to New Zealand, although the New Zealand subsidiaries are often seeking funding in their own names. Once both countries have liquidity rules to comply with, particular attention may be applied to the maturity of intra-group funding.

There are other questions that we have not been able to answer satisfactorily. We have seen an increase in banks' cost of funds relative to benchmarks, which is commonly attributed to the more aggressive pursuit of retail funding, but we cannot be wholly sure of this explanation. If this is a correct explanation, we can expect to see interest rates increase more sharply when we get an economic upturn that pushes up lending volumes. However, our ability to explore this is limited by the New Zealand economy having been consistently weak since the onset of the GFC. We need to see a more varied set of economic conditions before we can properly understand the effects of the new rules. In the meantime we note a discussion of some of the relevant issues by Wong (2012).

An alternative partial explanation for some of the increase in average funding costs relative to the benchmarks might lie in the very significant reductions in benchmark interest rates since the onset of the GFC. Banks which were previously raising some portion of their funding at rates significantly lower than benchmark would no longer be able to do so, because of the zero lower bound on funding costs.

It would also be good to look at New Zealand and Australian banks alongside each other. Australian banks have been aggressive in their pursuit of retail deposits in response to funding pressures and rating agency criticisms, but they have not had the additional pressure of regulation to drive them to change the structure of their funding. A further research agenda beckons. ■

Notes

1. Acknowledgement: this paper builds on work by Jinyue Shi, reflected in turn in a paper by Jinyue Shi and David Tripe, presented at the 2012 New Zealand Finance Colloquium in Auckland and the IFABS conference in Valencia. This paper has been assisted by feedback received at those conferences. Helpful feedback on this version of the paper was received from Rod Maddock and participants at the 17th Melbourne Money and Finance Conference, 2012.
2. See Basel Committee on Banking Supervision (2010).
3. Concern was recorded, for example, in the November 2006 issue of their *Financial Stability Review* (p. 9).
4. For more detail on these ratios and how they are calculated, see Hoskin, Nield and Richardson (2009) and Richardson (2010).
5. This is a slightly broader definition of funding risk than that adopted by the CBA in its annual report. See Commonwealth Bank of Australia (2011), p. 43.
6. See the May 2012 *Financial Stability Review*. Detail is reported in Figure 1.
7. See, for example, the discussion by Brunnermeier (2009), while Nield (2008) reports signs of stress in New Zealand from around this time as well.
8. A majority of it comes from associates and financial institutions.
9. The author's analyses for individual banks suggests that significantly lower numbers prevail. As at 31 March 2012, the ratio of net loans to retail deposits for six major banks with retail business (collectively) stood at 141.3 per cent.
10. This is based on data from the RBNZ's data Table HC10.

References

- Basel Committee on Banking Supervision 2010, *Basel III: international framework for liquidity risk measurement, standards and monitoring*, Bank for International Settlements, December.
- Brunnermeier, M. 2009, 'Deciphering the 2007-08 liquidity and credit crunch', *Journal of Economic Perspectives*, vol. 23, pp. 77-100.
- Commonwealth Bank of Australia (CBA) 2011, *Annual report*, Sydney, CBA.
- Hoskin, K., Nield, I. and Richardson, J. 2009, 'The Reserve Bank's new liquidity policy for banks', *Reserve Bank of New Zealand Bulletin*, vol. 72, no. 4, pp. 5-18.
- Nield, I. 2008, 'Liquidity management and liquidity facilities at the Reserve Bank', *Reserve Bank of New Zealand Bulletin*, vol. 71, no. 4, pp. 5-17.
- Reserve Bank of New Zealand (RBNZ) various issues, *Financial Stability Report*, Wellington, RBNZ.
- Richardson, J. 2010, 'The Reserve Bank of New Zealand's new liquidity policy for banks', *JASSA, The Finsia Journal of Applied Finance*, issue 3, pp. 39-45.
- Wong, J. 2012, 'Bank funding — the change in composition and pricing', *Reserve Bank of New Zealand Bulletin*, vol. 75, no. 2, pp. 15-24.