Regulatory impact assessment of the review of bank capital adequacy requirements for housing loans (stage one).

May 2013

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Introduction

1. On 26 March 2013 the Reserve Bank issued a consultation paper: "Review of bank capital adequacy requirements for housing loans (stage one)". On 8 May 2013 the Reserve Bank announced the outcome of stage one of the review. This document contains a regulatory impact assessment of stage one. Further information about the review is available on the Reserve Bank's website.[1]

Background and status quo

2. Locally incorporated banks are subject to capital requirements set by the Reserve Bank. A bank's capital requirement can be expressed in the form of a risk-weight as a percentage of the bank's exposure (or as a percentage of the balance of the loan). Higher risk-weights mean more capital.

3. The Reserve Bank's capital requirements are built on internationally recognised regulatory standards developed by the Basel Committee on Banking Supervision (the Basel Committee). The Reserve Bank's general approach is to adopt the Basel Committee standards but to adapt them to fit New Zealand conditions as necessary.

4. Since 2008, the Reserve Bank's capital requirements have been based on the Basel Committee's standard known as Basel II.[2] The Basel II framework was finalised by the Basel Committee in June 2004.

5. Under Basel II, the precise calculation of risk-weights for a bank depends on which one of two broad approaches to calculating capital it uses. Under the default approach, a set of risk-weights are prescribed corresponding to broad categories of loan (corporate, housing and so on). This is known as the "standardised approach". The alternative approach, subject to accreditation by the Reserve Bank, is to adopt the "internal models" approach. Currently, the four largest locally-incorporated New Zealand banks use the internal models approach.

6. Under the internal models approach, banks' own models – which must be approved for use by the Reserve Bank – are used to estimate the value of certain risk parameters that feed into an equation (the Basel equation), which in turn generates the appropriate risk-weight.[3]

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[1] See this link: http://www.rbnz.govt.nz/finstab/banking/5190364.html.

[2] The Basel III requirements that took effect for New Zealand banks from 1 January 2013 complemented, rather than replace the Basel II regime. Ultimately, banks' capital requirements are expressed in the form of a capital ratio (capital divided by risk-weighted assets). Basel III reforms were primarily about the ratio itself (increasing it) and the numerator of the ratio (what counts as capital). Basel II reforms were primarily about how to measure the denominator (risk-weighted assets).

[3] More detail about the Basel II regime, the Basel equation, the Reserve Bank's modelling of housing risk and our views on the parameters of the Basel equation is available in: Hoskin, K and Irvine S (2009) 'Quality of bank capital in New Zealand', Reserve Bank of New Zealand Bulletin, 72(3), pp. 5-16, http://www.rbnz.govt.nz/research/bulletin/2007_2011/2009sep72_3hoskinirvine.pdf.

7. The Basel II equation for housing exposures (housing loans) includes a correlation factor that captures the balance between systemic risk (i.e., that associated with general economic conditions) and idiosyncratic risk (i.e., that associated with the particular circumstances of the borrower). More systemic risk means that losses on loans are likely to be clustered together (or more likely to occur at around the same time) in response to deterioration in general economic conditions. A higher correlation is associated with more systemic risk relative to idiosyncratic risk. The Basel II correlation factor for housing is 15 percent.

8. The Reserve Bank has held the view since the inception of the Basel II regime in New Zealand that the correlation factor for housing is too low. For the initial implementation of Basel II we chose not to depart from the international standard by changing the correlation factor. This is because the Basel II standard was relatively new and was being embedded by banks and regulators alike. Also, unlike for other parameters in the Basel equation, such as probability of default (PD) and loss given default (LGD), internal model banks do not estimate the correlation factors using their models. Rather the correlation factor is a fixed number (or percentage) in the Basel II framework.

9. Therefore, for the initial implementation of Basel II the Reserve Bank incorporated the Basel figure of 15 percent into its capital adequacy requirements. However, because of our concerns the Reserve Bank compensated for the low correlation factor by requiring an additional margin on bank estimates of PD and LGD.

Problem definition and motivation

Introduction

10. There are three aspects to the problem:

    i.   The housing loan losses in the New Zealand market are more highly correlated than assumed by the Basel equation.

    ii.   The Basel equation makes no provision for correlation to change with the systemic risk inherent in a bank's portfolio of housing loans.

    iii. The Reserve Bank considers the existing arrangements to address the above issues are inadequate, as they only address the problem indirectly via calibration of other parameters and these calibrations are unlikely to be sufficient.

11. If economic conditions change for the worse, especially in view of the current state of the housing market, there is a risk that many of those borrowers most exposed to adverse changes in general economic conditions could come under pressure at the same time. In turn, this would have a corresponding impact on the quality of banks' housing loan portfolios. This is an important motivation for ensuring the balance between systemic and idiosyncratic risk (i.e. correlation) within banks' housing portfolios is measured appropriately.

The Basel equation

12. We consider the Basel equation gives too much weight to idiosyncratic risk (i.e., that associated with the particular circumstances of the borrower) compared to systemic risk (i.e., that associated with general economic conditions).

13. Generally speaking, borrowers with high loan-to-value (LVR) loans are more exposed to systemic risk and the losses on such loans are more highly correlated than those on low LVR loans. For low LVR loans a combination of systemic and idiosyncratic events may be needed to induce a default.

14. Our views about the Basel equation housing correlation factor are based on the following:[4]

- The way that the Basel equation correlation factor was determined does not take account of New Zealand conditions and may not be suitably calibrated to downturn conditions (especially given the experience of the global financial crisis).
- The Basel equation correlation factor is fixed across all housing loans notwithstanding the fact that some categories of loans are more vulnerable to systemic risk than others.
- Our assessment of the relevant literature, which implies: (a) that the correlation factor may not be sufficiently attuned to times of market stress; (b) there is some empirical support for a correlation factor of around 20-25 percent for loans with an LVR of 80 percent or more; and (c) application of the same correlation factor globally is unlikely to appropriately differentiate the relative risk profiles in different regions.
- The findings of our own modelling that correlation should on average be significantly above 15 percent and should differ with LVR.
- Bank data received on loss rates by LVR category that suggests higher LVR loans may be subject to more systemic risk.

Existing arrangements

15. As banks' models and estimates have evolved it has become unclear whether the estimates still encompass a sufficient margin for correlation risk. For example:

- The experience of the global financial crisis suggests our requirement for bank models to incorporate economic downturn scenarios calibrated to a 30 percent fall in house prices may not be sufficiently conservative. This means that calibration of banks' LGD estimates may not be sufficiently conservative.
- The PD estimates of some internal models banks have fallen materially in recent years.

16. We will examine these issues further in the second stage of the housing review. Nevertheless we consider that given Basel II is now well embedded, it is better to adjust the correlation factor directly rather than relying on the calibration of other parameters to address correlation issues.

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[4] A fuller description of our literature review and modelling work is set out in the consultation paper: "Review of bank capital adequacy requirements for housing loans (stage one)" available on the Reserve Bank's website here: http://www.rbnz.govt.nz/finstab/banking/5190364.html.

Objectives

17. The Reserve Bank's objectives on bank supervision are set out in section 68 of the Reserve Bank of New Zealand Act 1989 (the Act). In accordance with this section, the Reserve Bank registers and supervises banks for the purposes of promoting the maintenance of a sound and efficient financial system, and avoiding significant damage to the financial system that could result from the failure of a registered bank.

18. Like most bank regulators, one of the principal ways the Reserve Bank undertakes prudential supervision is by setting the minimum level and quality of capital that banks must hold.

19. The objective of the review of bank capital adequacy requirements for housing loans is to ensure that banks' capital requirements for housing loans properly reflect risk in the sector. The objective of the first stage of the review is to ensure that the housing correlation factor(s) included in our capital adequacy requirements properly reflect risk in the New Zealand housing market.

Regulatory impact analysis

Development of options

20. In the areas of housing loan risk the Reserve Bank's assessment of the Basel equation, and of the models of internal model banks, draws on the Bank's own model of residential mortgage loan losses (the model). The model is designed to investigate major loss events in residential housing loan portfolios.[5]

21. This model was used to generate two alternative sets of housing correlation factors as shown in Table 1 below. The different alternatives are generated using different model input assumptions.

Table 1: Housing correlation factors

LVR of the loan	Status quo	Option One	Option Two
Under 80%	15%	15%	15%
80-89%	15%	20%	23%
90% and over	15%	21%	25%

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[5] As noted above, a fuller description of our modelling work is set out in the consultation paper. In addition, more detail about the Reserve Bank's modelling of housing risk and our views on the parameters of the Basel equation is available in: Hoskin, K and Irvine S (2009) 'Quality of bank capital in New Zealand', Reserve Bank of New Zealand Bulletin, 72(3), pp. 5-16, http://www.rbnz.govt.nz/research/bulletin/2007_2011/2009sep72_3hoskinirvine.pdf.

22. The first alternative (Option One) incorporates a fall in house prices of 30 percent and an initial interest rate (prior to the interest rate shocks generated by the model) of 7 percent. Option One is also consistent with a 40 percent fall in house prices and an initial interest rate of 7 percent. The model implies no material change in correlation for high LVR loans results from assuming a 40 percent reduction in house prices rather than a 30 percent fall. This is because a fall in house prices of 30 percent would reduce owners' equity in most high LVR loans to nil and so a 40 percent fall would have no additional material effect on the correlation.

23. The second alternative (Option Two) incorporates a 30 percent fall in house prices and an initial interest rate of 6 percent.

24. More information about the model and how the alternative housing correlation factors were determined is set out in the consultation paper.

25. Our preferred option is Option One. This option is consistent with our assessment of the literature, the findings of our modelling (i.e., correlation is above 15 percent on average and varies with LVR), and evidence from the global financial crisis (GFC) that a house price fall of 40 percent is plausible and can happen. On balance we consider a starting interest rate of 6 percent (as per Option Two) does not need to be incorporated. Although this would better reflect the current low interest rate environment, a starting interest rate of 7 percent is a better fit with long-term lending rates.

26. Our model assumes all mortgages are floating rather than fixed rate, whereas in fact short-term fixed rates do account for a significant minority of housing loans in New Zealand. We expect fixed term mortgage rates would exhibit lower correlation than floating rate mortgages. While the exclusion of short-term fixed rate mortgages from the model would, in our view, have only a relatively minor effect on the calculated correlation factors, this effect was a (minor) factor in our preference for Option One.

Impact on regulatory capital

27. The estimated regulatory capital impact of the options is shown in Table 2 below. These estimates take account of information provided by internal models banks in response to the consultation paper. The estimates shown are as at 31 December 2012 and relate to internal models banks only (standardised banks are not affected).

Table 2: Regulatory capital impact

	Status quo	Option One	Option Two
Estimated average percentage increase in regulatory capital for housing loans (simple average across affected banks).	-	12%	21%
Estimated average percentage increase in total regulatory capital.	-	3%	6%
Estimated average risk weight for housing.	29%	33%	36%
Estimated average risk weight for high LVR (80%+) housing loans (simple average across banks).	54%	73%	85%
Estimated average Tier 1 capital ratio.[6]	11.6%	11.2%	10.9%

Costs and benefits

28. The potential costs of the preferred option mainly relate to potential increases in lending costs. These increases in lending costs could flow through to impact on house prices. Our approach to measuring these potential costs is discussed below.

<u>Bank lending</u>

29. There is no direct relationship between regulatory capital requirements and the price of lending (the mortgage interest rate). A bank's own cost of funds (debt and equity), their assessment of the riskiness of the loan/sector, and their competitive positioning are the most important factors that determine the pricing of any loan facility.

30. Theory tells us that as bank capital increases, the bank itself is perceived as less risky. This in turn pushes down the cost of debt and equity, offsetting any increase in the overall cost of capital arising from equity (which is expensive relative to debt) accounting for a greater share of overall funding.[7]

31. However in practice, at least in the short-run, banks may be able to maintain their existing rate of return on equity with this effect being larger and existing for longer to the extent the banking market is not competitive. Moreover banks generally regard regulatory capital requirements as a factor that influences the cost of capital and so

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[6] Note the estimated impact on the Tier 1 capital ratio assumes banks take no action to raise additional capital. In practice, at least over the medium term, we expect banks may raise additional capital to maintain their capital ratios at around the existing level.

[7] Under the Modigliani-Miller hypothesis, as the share of a bank's assets financed by capital (as distinct from deposits and other debt instruments) rises, the market should, over time, perceive the bank as becoming less risky due to the fall in leverage. If this occurs, the market's required rate of return on equity would fall.

changes in those requirements – at least when they reflect regulatory perceptions of risk not shared by banks – can influence pricing.

32. With this in mind, we have modelled the impact on pricing of the preferred option (Option One). Within our model we have made the following assumptions:

   i.   The current return on debt and equity is 6 percent and 18 percent respectively.[8]

   ii. In the short term, banks increase lending rates by half the amount required to maintain the current return on equity. In the longer term the banking market is sufficiently efficient such that there is no material lasting impact on lending rates compared to the status quo.[9]

   iii. The increase in lending rates is allocated either across the entire housing portfolio or to just high LVR loans.

33. Based on the above assumptions we expect lending rates could increase by approximately 4-6 basis points in the short-term to the extent banks allocate additional capital across the entire housing portfolio. If the additional risk is allocated only to high LVR loans, then we expect lending rates for these loans could increase by approximately 20-30 basis points.

34. Changing the above assumptions so that the return on equity is higher, the return on debt is lower, or the banks have more ability to maintain current return on equity would lead to a higher increase in lending rates. Conversely, altering the assumptions in the opposite direction would lower the increase in lending rates.

35. The impact on lending rates could also be higher than we have modelled if banks undertake a reassessment of risk or lending practices in response to the announcement of the new requirements, over and above the direct effect of the increase in capital requirements (i.e. if the new policy has a 'signalling effect').

36. We also note that while any increase in lending rates that arises from a genuine reassessment of risk may result in a cost to borrowers, it is not a cost to the wider economy. The true cost of the risk does not change just because it has been recognised.

House prices

37. In theory an increase in regulatory capital could flow through to an increase in lending costs that in turn increases the cost of purchasing a house. Over the medium term this could reduce demand for housing and place some downward pressure on house prices. However, in practice we expect any direct impact of the increased capital requirements on house prices to be small given the relatively small expected increase in lending costs discussed above. The impact may be more noticeable if banks allocate any increase in pricing to high LVR loans only, or the policy has a signalling effect.

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[8] These figures represent the average cost of debt and average return on equity (12 month running total) over the period March 1996 to September 2012, as calculated from the General Disclosure Statements of the internal models banks.

[9] This is consistent with the approach we took in assessing the impact of implementing Basel III capital requirements in New Zealand (see "Regulatory impact assessment of Basel III capital adequacy requirements in New Zealand", September 2012; available on the Reserve Bank's website here: http://www.rbnz.govt.nz/finstab/banking/4572979.html).

<u>Direct benefits of the preferred option</u>

38. The benefit of the preferred option is that capital requirements for housing loans properly reflect risk in the sector. More accurate measurement of risk helps ensure that: banks are adequately capitalised (reducing the risk of failure); banks make better risk-return decisions; and that risk disclosure is improved.

<u>Conclusion</u>

39. Overall we conclude the benefits of the preferred option (principally that capital requirements properly reflect risk) outweigh any costs, especially given that any such costs are likely to be mainly in the form of better recognition of risks that already exist in our view.

Consultation

40. The Reserve Bank announced a public consultation on 26 March 2013 through a press release and by making the consultation paper available on its website. On 26 March 2013 all locally-incorporated registered banks were notified in writing of the consultation. The key concerns raised in submissions and the Reserve Bank's response are summarised in the table below.

Concern	Summary of submissions	Reserve Bank's response
Process issues	Some submitters considered the consultation period of three weeks was too short, including because other Reserve Bank consultations were taking place at the same time. Also some submitters were concerned about the staged approach to the review of housing and considered it would be more efficient to undertake the review in a single stage. Some banks noted it would be difficult to embed the proposed changes to capital adequacy requirements in a short period of time and requested that sufficient time be allowed for any such changes to be made.	The Reserve Bank acknowledges all of the issues noted above. In response, the Reserve Bank plans: • A longer consultation period for stage two of the housing review. • A reasonable implementation timetable, with the changes arising from stage one taking effect from 30 September 2013. • An in-principle alignment of stage one and two implementation (i.e. to the extent possible, we plan that any changes arising from stage two will also take effect from 30 September 2013).
Debt servicing ratio (DSR) impacts on systemic risk.	Some submitters noted that in considering systemic risk the Reserve Bank should take into account DSR as well as LVR.	The Reserve Bank agrees that DSR is also an appropriate measure of systemic risk. Our modelling suggests that correlation increases with systemic risk as measured by both LVR and DSR. At this stage we do not plan to prescribe different correlations for different DSR categories, mainly because there is no consistent measure of DSR in place across the internal models banks. However, the correlation factors we developed do take into account the most likely distribution of DSR within each LVR category.

Concern	Summary of submissions	Reserve Bank's response
	Some banks expressed a view that stage two of the review should incorporate a reduction in capital requirements for housing loans either to offset the increase in capital requirements in stage one, or because of the Reserve Bank's conservative capital adequacy requirements.	Stage two of the review will consider the overall calibration of bank capital requirements for housing loans. However, the Reserve Bank does not expect that this stage will result in any reduction in capital requirements to offset stage one, nor any other reduction in the overall level of capital requirements for housing loans.
The relativity between standardised and internal models banks	Some submitters expressed concern that the housing review will cause capital requirements for internal models banks to increase towards those for standardised banks (i.e., that the 'gap' is closing). These submitters considered the gap should be maintained so that the incentive to invest in risk models, systems and controls is maintained.	Internal models banks are generally better placed than standardised banks to measure risk and accordingly their capital adequacy requirements are more risk sensitive. This is an advantage for internal models banks. A balance still needs to be struck on the degree of capital reduction (below that of standardised bank requirements) to reflect greater risk sensitivity. The Reserve Bank does not accept the proposition that the 'gap' between internal models and standardised banks cannot narrow – the key issue is the adequacy of capital, not the relativities between these two types of banks. Moreover, as banks are required to maintain systems and controls that are adequate for their operations, the Reserve Bank would be concerned if internal models banks reduced investment in risk management and controls simply because the gap in regulatory capital requirements between standardised and internal models banks changed.

41. A full summary of submissions and the Reserve Bank's response is available on the Reserve Bank's website.

Conclusions and recommendations

42. After taking into account the submissions received and how the concerns raised could be addressed, the Reserve Bank has decided to implement the preferred option. In particular the following new housing correlation factors will apply to internal models banks:

	Current	New
Correlation for LVR under 80%	15%	15%
Correlation for LVR 80-89%	15%	20%
Correlation for LVR 90% and over	15%	21%

Implementation

43. Internal models banks are required through conditions of registration to comply with all the requirements set out in the Reserve Bank of New Zealand document: "Capital Adequacy Framework (Internal Models Based Approach)" (BS2B). A new version of this document, dated May 2013, includes the new correlation factors for housing loans as set out above. The May 2013 version of BS2B requires that the new correlation factors take effect from 30 September 2013. The internal models banks conditions of registration will be updated to incorporate the May 2013 version of BS2B early in May 2013.

Monitoring, evaluation and review

44. The new policy now being implemented arose from a review of the Reserve Bank's implementation of Basel II in 2008. However, the new policy itself will be assessed consistent with the regulatory impact analysis requirements in section 162AB(1)(b) of the Act.