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BANK**

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Issues Paper:

Review of the Capital Adequacy Framework for locally incorporated banks

May 2017



## Submission contact details

The Reserve Bank invites submissions on this Issues Paper by 5pm on 9 June 2017. Please note the disclosure on the publication of submissions below.

Address submissions and enquiries to:

*(Email)*

[capitalreview@rbnz.govt.nz](mailto:capitalreview@rbnz.govt.nz)

*(Hard copy)*

Ian Woolford  
Manager, Financial Policy  
Prudential Supervision Department  
Reserve Bank of New Zealand  
PO Box 2498  
Wellington 6140

## Publication of submissions

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## Summary

The Reserve Bank is undertaking a comprehensive review of the capital adequacy framework applying to locally incorporated registered banks over 2017/18. The aim of the review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into account how the current framework has operated and international developments in bank capital requirements.

The Capital Review will focus on the three key components of the current framework:

- The definition of eligible capital instruments
- The measurement of risk
- The minimum capital ratios and buffers

The purpose of this *Issues Paper* is to provide stakeholders with an outline of the areas of the capital adequacy framework that the Reserve Bank intends to cover in the Capital Review, and invite stakeholders to provide initial feedback on the intended scope of the review, and issues that might warrant particular attention. As feedback is received and decisions are made, some of these issues might fall away or be given a lower priority. Detailed consultation documents on policy proposals and options for each of the three components will be released later in 2017, with a view to concluding the review by the first quarter of 2018.

### **Basis and framework for capital regulation**

The Reserve Bank has powers under the Reserve Bank Act 1989 to impose capital requirements on registered banks. The Reserve Bank exercises these powers to promote the maintenance of a sound and efficient financial system, and to avoid significant damage to the financial system that could result from the failure of a registered bank.

The capital adequacy framework for locally incorporated registered banks is set out mainly in documents BS2A and BS2B of the Reserve Bank's Banking Supervision Handbook. The framework is based on, but not identical to, an international set of standards produced by the Basel Committee on Banking Supervision.

The framework imposes minimum capital ratios. These are ratios of eligible capital to loans and other exposures. Exposures are adjusted (risk-weighted) so that more capital is required to meet the minimum requirement if the bank has riskier exposures.

The high-level policy options raised in this *Issues Paper* have the potential to result in reasonably significant changes to the New Zealand capital framework. It is expected, however, that any changes are likely to occur within a Basel-like framework, consistent with the principles below.

## Review principles

Through the review the Reserve Bank will have regard to six high-level principles:

1. Capital must readily absorb losses before losses are imposed on creditors and depositors.
2. Capital requirements should be set in relation to the risk of bank exposures.
3. Where there are multiple methods for determining capital requirements, outcomes should not vary unduly between methods.
4. Capital requirements of New Zealand banks should be conservative relative to those of international peers, reflecting the risks inherent in the New Zealand financial system and the Reserve Bank's regulatory approach.
5. The capital framework should be practical to administer, minimise unnecessary complexity and compliance costs, and take into consideration relationships with foreign-owned banks' home country regulators.
6. The capital framework should be transparent to enable effective market discipline.

## Numerator (definition of eligible capital)

Capital is one component of a bank's funding. There are three tiers of recognised capital:

- Common Equity Tier 1 (CET1), which among other items includes ordinary undated shares issued by the bank, retained earnings, and certain reserves
- Additional Tier 1 (AT1), which includes some preference shares and perpetual convertible instruments
- Tier 2, which includes some long-dated, fixed term convertible instruments.

The function of capital is to absorb losses and prevent default on obligations to creditors (including depositors) or costs to taxpayers. To serve this function well the capital must be available permanently, so that it cannot be withdrawn in anticipation of losses, and there must not be impediments to running it down (without triggering a default) when there are losses.

Regulators and purchasers of capital instruments often view the tiers of capital through different lenses. CET1 is generally considered by regulators to be the highest quality form of capital because it is perpetual and absorbs losses freely. However, it is likely to be the hardest kind of capital to raise if the bank is in financial distress. It has also been suggested, by the International Monetary Fund (IMF) among others that banks prefer to avoid issuing new ordinary shares because it dilutes the interests of existing shareholders.

Convertible instruments that are eligible AT1 and Tier 2 capital are considered by regulators to be of lower quality, but might currently be attractive for banks to issue because of tax advantages or because they do not interfere – in ordinary times – with control of the bank by existing shareholders. These instruments are intended to absorb losses automatically in the event of financial stress.

A significant disadvantage of AT1 and Tier 2 instruments is that there is uncertainty about how they will work *in practice*. They are complex operationally, and interact with other non-prudential requirements (such as the tax regime) in potentially unclear ways. Moreover, there is a concern that governments could feel obligated to compensate holders for any losses; this would undermine one of the abovementioned purposes of capital, which is to prevent costs to taxpayers when a bank is under financial stress.

The amount of capital that is recognised should take account of any limitations on the loss-absorbency of the capital item. A particular concern is that loss absorption may trigger tax liabilities which will reduce the amount which is available to meet obligations to creditors. In some cases it is difficult to determine how much the tax liability would be. There are also concerns that, in order to qualify as capital and minimise any tax impost, capital instruments have been made more complex, increasing the possibility of unintended side effects. Because of this complexity, convertible AT1 and Tier 2 instruments have proved difficult to administer in practice.

As part of the review we plan to further analyse and consult on:

- Which instruments should be accepted as regulatory capital, in addition to common equity. For example we will consider the eligibility of:
  - preference shares;
  - contingent instruments that write off but do not convert into shares; and
  - other contingent convertible instruments.
- Which instruments or other balance sheet items should not be accepted as regulatory capital or should be deducted to determine regulatory capital.
- How we should measure the components of capital, including:
  - how best to incorporate reported reserves and other components of shareholder equity; and
  - how best to incorporate potential tax liabilities and other potential offsets.
- What contractual terms should be required or proscribed for contingent convertible instruments, to the extent that those instruments continue to be accepted as regulatory capital.
- What process should be used to ensure contingent convertible capital instruments comply with the capital framework.

### **Denominator (measurement of risk-weighted exposures)**

Under the capital adequacy framework banks have to measure exposures to credit risk, operational risk, and market risk. The amount of each exposure is adjusted for riskiness.

For all three kinds of risk banks can use “standardised” methods to calculate risk-weighted exposures. For credit and operational risk, banks may instead use their own internal models in conjunction with Reserve Bank regulations to calculate risk-weighted exposures, if the Reserve Bank approves their models. The four largest locally incorporated banks are approved to use internal models. The internal models approach consists of the internal ratings based (IRB) approach to credit risk and the advanced modelling (AMA) approaches to operational risk.

The internal models approach has posed challenges to regulators around the world because of its complexity and the burden it puts on supervisory resources. It has posed particular challenges to the Reserve Bank’s supervisory model, which has stressed the role of self- and market discipline with relatively less emphasis on supervisory discipline.

Concerns have been raised about banks’ ability to objectively determine credit and operational risk, using their approved internal models. The Reserve Bank’s own experience is that it has been difficult to determine whether differences in capital requirements are due to differences in models or differences in the level of underlying risk of exposures. International work suggests that different banks determine significantly different capital requirements for the same underlying exposures to sovereigns, banks, and large corporations, and similar problems have been encountered in the modelling of retail loan portfolios to a lesser extent.

There are also concerns about the gap between capital outcomes using the standardised approaches and outcomes using the internal models approaches. There has been a tendency for outcomes for banks using internal models to drift below those for banks using the standardised approaches, and it is not clear that this is justified by differences in underlying risk or the ability to differentiate risk.

The Basel Committee on Banking Supervision (BCBS) has proposed the complete removal of the internal models approaches for operational risk. It has also proposed limitations on the use of internal models for credit risk, including the complete exclusion of some portfolios from the internal models approaches, and floors on model parameters and outputs. As well, the BCBS has consulted on new standardised approaches that are more sensitive to risk than the current ones.

As part of the review we plan to further analyse and consult on:

- Whether the availability of the IRB approach should be limited and whether there should be limits on model inputs or outputs. Consideration of possibilities will include, for example:
  - partial application of IRB, such as the BCBS’s proposal to prevent use of IRB for exposures to externally rated banks and large corporations;
  - use of IRB for only some inputs, such as the BCBS’s proposal to standardise estimates of loss given default for some portfolios;
  - floors under model inputs, such as higher minimum probabilities of default for some exposures; and

- floors under model outputs such as risk weight floors.
- Whether or not the AMA approach should be available, and if not (as the BCBS has proposed) whether banks which currently use AMA should nevertheless be required to maintain prescribed standards of operational risk management and measurement.
- Whether the standardised approaches should / could be made more risk-sensitive, including consideration of the proposed new BCBS standards.
- Whether there should be reporting of standardised capital calculations by banks using the IRB or AMA approaches, to highlight gaps in outcomes under the different approaches.
- Whether our current approach to market risk remains appropriate and if not, what should replace our current approach.

### **Ratios (minimum requirements and capital buffers)**

The capital adequacy framework imposes minimum ratios, calculated for the entire banking group of a registered bank, of:

- CET1 to risk-weighted assets
- Tier 1 capital (CET1 + AT1) to risk-weighted assets
- Total capital (CET1 + AT1 + Tier 2) to risk-weighted assets

If capital fell below these minimums it would be regarded as a serious breach of a bank's Conditions of Registration.

The framework also requires that banks hold additional 'buffers' of CET1. If a bank's buffers fall below the requirements this is not a breach of registration conditions but the bank faces restrictions on the distribution of earnings.

The effective capital ratios of New Zealand banks (which are above the minimum requirements) are, in the Reserve Bank's view, at about the median of ratios for banks in comparable countries. Other countries, including Australia, have been moving to increase their effective capital ratios. As a result, where New Zealand banks' capital ratios might once have been seen as conservative, they are considered less so now.

Other countries have increased effective minimum capital ratios by, for example, pushing up average risk weights and introducing additional capital requirements for systemically important banks (SIBs). Some countries also make supervisory adjustments outside the capital standards that New Zealand's BS2A and BS2B are based on, such as adjustments to reflect lack of diversification.

Other countries have also looked to buttress minimum capital requirements with:

- minimum leverage ratios, which are ratios of capital to an un-weighted measure of exposures; and
- requirements for a minimum amount of total loss absorbing capacity (TLAC) (TLAC is funding with terms which allow it to be extinguished before the interests of other creditors in a crisis, and is similar in some ways to AT1 and Tier 2 capital).

In New Zealand minimum capital requirements are applied to, and calculated for, the entire banking group of a registered bank. There is also a requirement to calculate and publish a 'solo' ratio for the bank itself (and sometimes some closely connected entities), but no minimum solo ratio is imposed.

As part of the review we plan to further analyse and consult on:

- Whether the current minimum capital ratios are sufficiently conservative.
- What the appropriate mix of capital quality is (as reflected in the three separate minimum ratio requirements and the buffer requirements).
- What the appropriate balance is between hard minimum ratio requirements and buffers.
- Whether or not specific add-ons for systemically important banks are justified.
- Whether or not there should be add-ons for concentration risk.
- Whether a total loss absorbing capacity (TLAC) regime would be useful, or whether other approaches might serve as an alternative to a TLAC regime.
- Whether a leverage ratio should be reported, and whether a minimum level should be required.
- Whether the current solo ratio disclosure requirement should be retained or strengthened.

The three components of the review – the numerator, the denominator, and the overall ratio – are all interrelated and will ultimately need to be considered in combination, to ensure that final policy decisions are internally consistent.

### **Efficiency and stability**

In setting capital requirements the Reserve Bank recognises the need to balance the benefits of higher capital against the costs.

It is expected that a higher level of capital would reduce the probability and severity of bank failures and would smooth out credit cycles.

But banks typically argue that capital is a costly source of funding and that if they had to seek more of it they would need to pass on costs to customers, leading to reduced investment and growth.

There has been debate about the extent to which these costs reduce national welfare.

In one view the capital levels of banks are inefficiently low because of implicit government guarantees of creditors or other incentives. Raising the minimum capital requirement restores efficiency by reversing the implicit subsidy to bank shareholders, and in this way improves overall welfare. A growing number of academics, most notably Anat Admati from Stanford University and Martin Hellwig from the Max Planck Institute for Research on Collective Goods (as well as some regulators) have argued that the costs to society as a whole of higher capital are very low and that capital requirements should be much higher than they are now. These authors are associated with the “big equity” view and are distinguished by the extent to which they see significant increases in capital as being possible without net negative economic impacts.

Empirical studies have attempted to quantify the costs and benefits of increasing capital requirements, and to determine the optimal capital ratio which has the greatest net benefit. In the more mainstream studies the Reserve Bank has considered so far a typical optimal ratio is about 14%, but estimates do vary widely (the range is roughly 5-17%). The Reserve Bank will continue to review and assess these studies, but also welcomes the views of submitters on this issue.

At this early stage of the review the Reserve Bank has not yet formed a view on the final calibration of capital requirements, but it is likely that the Reserve Bank will take into account the studies it has seen, as well as empirical evidence.

The six principles which will guide the review (as articulated above) will help to ensure a balanced outcome by ensuring that the benefits of capital are realised in practice, that capital requirements are appropriately conservative (commensurate with the risk of individual exposures and New Zealand’s circumstances), and relatively simple.

## Introduction

1. New Zealand registered banks are required to maintain minimum levels of capital in relation to the risks of their businesses. 'Capital' refers to the types of bank funding that are available to absorb financial losses that banks incur in their lending, operational and trading activities, without necessarily imposing losses on depositors or other general creditors.<sup>1</sup>
2. Minimum capital requirements help to promote the maintenance of a sound financial system and, by reducing the probability or extent of bank failures, also help to protect the financial system from the wider costs that can arise from the failure of financial institutions.
3. It is implicit that the regulatory capital requirement should be as much as or more than the capital the bank would maintain if left to its own devices. This could be for one of two reasons:
  - the bank maintains the privately optimal level of capital, but because an individual bank does not fully take account of the social costs of rapid deleveraging or bank failures, this level is lower than the social optimum; or
  - the bank might maintain less capital than is privately optimal, say because there is some 'irrational exuberance' in a boom.
4. The capital requirements are designed so that the amount of capital needed varies in proportion to the level of risk that a bank chooses to take on in its business.
5. Sections 74 and 78 of the Reserve Bank Act 1989 and banks' Conditions of Registration, subject locally incorporated banks to the Reserve Bank's Capital Adequacy Framework. The details of the framework are set out mainly in the documents BS2A (Standardised Approach) and BS2B (Internal Models Based Approach) in the Reserve Bank's Banking Supervision Handbook. BS2A and BS2B are largely based on a set of international standards published by the Basel Committee on Banking Supervision (BCBS), known as Basel II and Basel III. The minimum capital requirements embody the first of three "pillars" of a wider Basel Capital Framework. The second pillar is supervisory review and the third is market discipline.<sup>2</sup> New Zealand is not a member of the BCBS and is not obliged to adopt its standards, so although New Zealand's framework resembles the Basel II and Basel III frameworks in many respects, there are differences.
6. Further information on the Reserve Bank's adoption of the Basel standards is available in several *Bulletin* articles,<sup>3</sup> and on the Reserve Bank's website.<sup>4</sup>

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<sup>1</sup> Capital is not the same as assets which the bank holds as cash or balances with the central bank and does not lend out (sometimes referred to as reserves). Capital is a component of banks' funding. Once received this funding, just like debt funding, can be lent out to customers. Reserves come from funding, whether debt or capital, that is not lent out to customers after it is received.

<sup>2</sup> The BCBS's three pillar framework is not to be confused with the Reserve Bank's own (and older) three pillar framework: self-discipline, market discipline, and regulatory discipline.

7. As outlined in a recent speech<sup>5</sup> the Reserve Bank is undertaking a comprehensive review of the capital adequacy framework applying to locally-incorporated registered banks. The aim of the review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into account how the current framework has operated since its adoption and international developments in capital requirements.
8. The Reserve Bank will have regard to six high-level principles:
  1. Capital must readily absorb losses before losses are imposed on creditors and depositors.
  2. Capital requirements should be set in relation to the risk of bank exposures.
  3. Where there are multiple methods for determining capital requirements, outcomes should not vary unduly between methods.
  4. Capital requirements of New Zealand banks should be conservative relative to those of international peers, reflecting the risks inherent in the New Zealand financial system and the Reserve Bank's regulatory approach.
  5. The capital framework should be practical to administer, minimise unnecessary complexity and compliance costs, and take into consideration relationships with foreign-owned banks' home country regulators.
  6. The capital framework should be transparent to enable effective market discipline.
9. The rest of this document is structured in four parts. The first three parts broadly reflect the way that regulatory capital is calculated. Minimum capital requirements are expressed as ratios of recognised capital (the numerator) to a risk-adjusted measure of loans and other exposures (the denominator). The first part of this document addresses the numerator, the second the denominator, and the third the ratios themselves. Although we have divided up the issues in this way, we recognise that there are important links between components and these links will be taken into account over the course of the review. The fourth part of the document discusses the balance between the stability and efficiency of the financial system.

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<sup>3</sup> See:

Yeh, Twaddle and Frith (2005), Basel II - A new capital framework, <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2005/2005sep68-3yehtwaddlefrith.pdf>;  
 Hoskin and Irvine (2009) Quality of bank capital in New Zealand, <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2009/2009sep72-3hoskinirvine.pdf>; and  
 Barker (2015), The Reserve Bank's application of the Basel III capital requirements for banks, <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2015/2015may78-5.pdf>.

<sup>4</sup> Reserve Bank of New Zealand (as at 20 March 2017), Information relating to the capital adequacy framework in New Zealand, <http://www.rbnz.govt.nz/regulation-and-supervision/banks/prudential-requirements/information-relating-to-the-capital-adequacy-framework-in-new-zealand>.

<sup>5</sup> Spencer (2017), Review of bank capital requirements, <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Speeches/2017/Review-of-bank-capital-requirements.pdf>.

## Numerator (definition of eligible capital)

### Introduction

10. Like other businesses, banks fund their activities using a combination of equity and debt. Equity and equity-like funding is an important source of stability for a bank because it absorbs losses and therefore reduces the risks borne by creditors or, in some cases, the State. Bank “capital” refers to funding sources that rank first in line to absorb bank losses. Bank losses may be absorbed by, for example, running down shareholder equity capital, swapping a debt obligation for shares, or writing off a liability.
11. When it comes to establishing a capital base there are several options available. The obvious one for most banks is to issue shares, granting shareholders the right to receive dividends in exchange for purchasing the shares. Earnings that are not distributed to owners can accumulate and thus form additional capital. Banks can also sign contracts with creditors which allow, when circumstances dictate, for debt to be extinguished or exchanged for ordinary shares. ‘Contingent convertible capital instruments’, in the context of banks, are hybrid instruments which convert to ordinary shares or write off (effectively convert to nothing) on the occurrence of a specific trigger event (not at the investor’s or the bank’s discretion).<sup>6</sup>
12. A term often used in relation to bank capital is “quality”. ‘Quality’ implies a ranking of capital items: an item of capital is of high quality if there is a very high degree of certainty that it will absorb losses without triggering default, in a very wide range of circumstances and over a long time.<sup>7</sup>
13. Ordinary share capital and retained earnings are typically seen as being capital of the highest quality. Ordinary shares remain on issue in perpetuity, unless they are repurchased voluntarily by the bank or the bank ceases operation, and shareholder equity (which includes ordinary shares, retained earnings, and reserves) is what remains after all other claims against the bank have been paid. Contingent convertible capital instruments are of a lesser quality because, for example, they may be time-limited or could create additional liabilities for the bank when they absorb losses (for example, due to tax liabilities arising when an obligation is written off).

### Overview of the current framework and policy intent

14. Apart from the level of capital required, a key issue in bank capital regulation is which financial arrangements provide the required degree of permanence and unrestricted

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<sup>6</sup> More generally, hybrid instruments are securities that have features of both debt and equity. For example, the instrument may have a repayable principal which can be converted into shares at the investor’s discretion. Preference shares, subordinated debt and contingent convertible capital instruments are all examples of hybrid securities.

<sup>7</sup> A regulator sees the instrument as high quality. In contrast, a holder of an instrument is likely to see it as *low* quality if it will absorb losses without triggering default.

loss absorbency and thus constitute acceptable "regulatory capital". A second issue is how the level of regulatory capital is to be measured.

*What qualifies as capital*

15. In order to fulfil its role, the capital of a bank must be such that:
  - The capital can be reduced, at the relevant time, without any restriction, to absorb losses without triggering a default on obligations (we refer to this generally as 'loss absorbency'); and
  - the capital is permanently available to the bank so that it will not be withdrawn in anticipation of likely losses.
16. Loss absorbency would be restricted if, for example, the bank was required to repay capital investors or make compulsory distributions (e.g. cumulative dividends). Capital would not be permanently available if, for example, it was established by a time-limited contract.
17. In line with international practice, there are three types of bank regulatory capital in New Zealand: common equity tier 1 capital; additional tier 1 capital; and tier 2 capital.
18. Common equity tier 1 capital (CET1) is made up of issued shares and various measures of retained earnings. This has implicitly been considered to be the highest quality bank capital and the Reserve Bank sets a minimum amount that banks must maintain.
19. Additional tier 1 capital (AT1) includes some hybrid instruments and preference shares. AT1 instruments must provide subordinate and unsecured funding and must be, in a sense, perpetual.<sup>8,9</sup> The Reserve Bank sets a minimum amount of Tier 1 capital (CET1 + AT1) that banks must maintain.
20. Tier 2 capital includes contracts that are subordinate and unsecured, but have a long-dated fixed term (and thus aren't perpetual). Some convertible instruments qualify as Tier 2 capital. The Reserve Bank sets a minimum total capital requirement (CET1 + AT1 + Tier 2) for banks.
21. Currently AT1 and Tier 2 instruments can be sold to retail or wholesale investors and denominated in New Zealand dollars or a foreign currency. Instruments can be governed by New Zealand law or foreign law if it is a "satisfactory equivalent" for New Zealand law.

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<sup>8</sup> While AT1 instruments technically have no contractual maturity date, the current frameworks allow AT1 instruments to be callable (by the bank) after a minimum of 5 years.

<sup>9</sup> Hybrid instruments entered explicitly into our capital framework under as part of the introduction of Basel III. Prior to Basel III the Reserve Bank had been wary of allowing hybrid instruments to contribute to regulatory capital.

### *Measuring capital*

22. While banks are required to calculate capital on a stand-alone and group basis, the basis for the regulatory capital minimums is the registered bank's banking group (i.e. the group defined for the purposes of bank registration). Currently the regulatory banking group is, at a minimum, the group of entities which consolidate for financial reporting purposes. This is consistent with the way risk-weighted assets are measured (see the discussion of the denominator in the next part of this document).
23. There are rules which limit the recognition of minority interests when capital is issued by members of the group other than the registered bank (for example to third parties who hold shares in a bank subsidiary). This is to recognise that minority interest holders would bear losses only in respect of the group entities they have an interest in.
24. When measuring capital, certain balance sheet items are currently excluded or deducted from CET1, AT1, and Tier 2 capital. This is because there are concerns that, without adjustment, the headline values would overstate the losses that could be absorbed. For example:
  - Some accumulated reserves, put aside to pay for specific anticipated future costs, are excluded from CET1 because they are effectively committed and would not be available to absorb wider losses.
  - A deduction equal to the value of goodwill is made from CET1 because goodwill is difficult to measure reliably and might evaporate when a bank is in distress.
  - If the conversion or write-off of an AT1 or Tier 2 instrument would create a tax liability for the bank, less would be available at the time to absorb losses. The current policy is to deduct any potential tax liability from the face value of the instrument from the date it is issued.

### **Issues in the current framework**

#### *Common equity*

25. There is no debate internationally or in the literature that common equity in principle provides the highest quality capital available to banks.
26. Where concerns are expressed about common equity, they tend to relate to the dynamics of raising *new* equity when a bank is in financial distress.
27. These are arguably concerns about the timing and amount of capital (which could be addressed if the bank simply had more equity before it was in distress), rather than concerns about common equity *per se*. In any case, the claim is that circumstances may be such that the market is effectively closed to the bank, or the terms on which new shares can be issued may be highly unattractive to existing shareholders. In both cases, it may be that no new shares will be issued just when high-quality capital

is needed most.<sup>10</sup> This concern about the dynamic limitations of common equity (and banks' view that common equity funding is relatively expensive) has led to the interest in, and conditional support for, contingent convertible capital instruments in various jurisdictions. It should be noted however that there are examples of distressed banks successfully raising new share capital.

28. A second area of potential concern in the context of common equity is the loss absorbing quality of reserves and other accumulated earnings. Depending on the accounting standards prevailing at the time and whether those standards can be interpreted flexibly, the loss absorbing ability of reserves may vary from one bank to another even if their reported capital is the same.

An issue for the review is the extent to which amounts other than paid-up share capital, such as reserves, should be recognised in regulatory capital, or alternatively should be excluded or deducted.

#### *Convertible capital instruments*

29. Contingent convertible capital instruments include appropriately configured perpetual debt, term debt and preference shares which become loss absorbing when a pre-specified trigger event occurs (the event usually implies the bank is in, or is approaching financial distress).<sup>11</sup>
30. One of the key benefits attributed to convertible instruments is that they can in theory boost common equity at a time when other avenues (for example offering new shares to the market) cease to be available or are unattractive to existing shareholders. As such, in theory, convertible instruments may provide a useful complement to common equity. By defining an appropriately conservative trigger, there is potential for convertible instruments to act as an absorbent buffer *before* a bank breaches its minimum capital requirements (there is a further discussion about buffers in the next section of this *Issues Paper*).
31. A second potential benefit of convertible instruments that lead to the issuance of new shares relates to management and shareholder self-discipline. At the time they are issued convertible instruments do not dilute existing shareholders' control. However the possibility of conversion brings the threat of dilution and this is thought to provide a useful discipline on bank managers and shareholders.<sup>12</sup>
32. In contrast, instruments which become loss-absorbing only by writing off may have disadvantages in terms of bank management and shareholder incentives. They provide a buffer for mistakes – protecting shareholder capital from losses – and thus

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<sup>10</sup> IMF (2011), IMF Staff Discussion Note "Contingent Capital: Economic Rationale and Design Features" by Ceyla Pazarbasioglu, Jianping Zhou, Vanessa Le Lesle and Michael Moore. 25<sup>th</sup> January 2011

<sup>11</sup> Note that conversion cannot be at the option of the holders of the instrument, if it is to qualify as capital.

<sup>12</sup> IMF (2011), *Op Cit*.

managers and shareholders may have incentives to take more risks than they otherwise would.

33. Issuing convertible instruments can be relatively attractive to banks because, in some cases, they receive more favourable tax treatment than ordinary shares. For example, New Zealand banks may reduce their tax expenses by issuing AT1 or Tier 2 convertibles to Australian residents.<sup>13</sup> Conversely, in the absence of tax advantages these instruments might be unattractive for banks. In the US for example, it has been argued that the requirement to account for convertible instruments as equity from the moment they are issued has prevented the market from developing.<sup>14</sup>
34. There is uncertainty about the likelihood that AT1 debt and Tier 2 instruments will actually absorb losses when a bank gets into difficulty. Potential problems may reduce the ability of convertible instruments to perform as hoped. For example, depending on the definition of the trigger event, the instrument may be destabilising for the bank rather than stabilising if market participants can influence the likelihood of the trigger occurring and can profit if the trigger event occurs.<sup>15,16</sup> The issuance of new shares prompted by a trigger event when the bank remains viable may have signalling effects that harm the bank and have a contagion effect.<sup>17</sup>
35. There are also concerns about whether the AT1 capital provided will be timely (or too late to ensure survival of the bank) and what value will actually be delivered by AT1 and Tier 2 capital when needed (that is, whether the value will be reduced by new claims that arise as a result of the conversion). For example, if the trigger definition relies on historical accounting values or regulator discretion and this delays activation of the trigger, the write off or conversion may be too late to ensure that the bank remains a going concern.
36. Internationally there are cases where convertible instruments have successfully absorbed losses in a failing bank.<sup>18</sup> However, we have not found many examples of Basel III-compliant convertible instruments being used to provide loss absorbing capacity before the bank is at the point of failure.
37. In any case, there are concerns that governments will come under pressure to bail out holders of convertible instruments, particularly if the holders are retail investors or superannuation funds, thereby negating the loss-absorbing purpose of capital. A

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<sup>13</sup> The Reserve Bank notes that the tax treatment of some cross-border transactions is currently under review by Inland Revenue, in response to the OECD's Base Erosion and Profit Shifting project.

<sup>14</sup> Flannery (2013), Contingent Capital Instruments for Large Financial Instruments: a review of the literature.

<sup>15</sup> BIS (2013), Bank of International Settlements Quarterly Review September 2013 pg. 43-55.

<sup>16</sup> IMF (2011), *Op Cit*.

<sup>17</sup> *Ibid*.

<sup>18</sup> See for example World Bank Group (2016), Bank resolution and "bail-in" in the EU: Selected case studies pre- and post-BRRD", <http://pubdocs.worldbank.org/en/120651482806846750/FinSAC-BRRD-and-Bail-In-CaseStudies.pdf>.

recent, high profile case – Monte dei Paschi in Italy – highlights the significant political pressures which can be brought to bear.

38. In New Zealand there has been no conversion at all of Basel-compliant AT1 and Tier 2 instruments, because banks have not been in financial difficulty, so there is even less certainty about the practical effects of conversion in New Zealand's particular legal and institutional environments. In the Reserve Bank's view these instruments should be regarded as essentially untested in the New Zealand environment.
39. One concern about value at the time of loss absorption is that the bank will incur a tax liability because of the change in the nature of the instrument (for example, where write off occurs). New Zealand's current framework requires the value of recognised capital to be reduced ('haircut') in such cases. However, this can be difficult to do precisely because it is not always possible to quantify the tax liabilities that would arise. The cross-border nature of many AT1 and Tier 2 contracts adds to this potential measurement difficulty.

The review will consider which instruments should qualify as AT1 or Tier 2 regulatory capital and, for instruments that qualify, how much of their value should be recognised in regulatory capital.

40. On a general but important note, establishing that a particular contract has the desired level of permanence and unrestricted access is time consuming and resource intensive for both the regulator and the issuing bank. In the Reserve Bank's experience, convertible instruments that meet the requirements for recognition as AT1 or Tier 2 capital are legally complex and opaque. This complexity makes it more difficult to determine how the instrument will perform in practice and increases the probability of unintended effects. It is reasonable to ask whether or not this complexity arises because of the regulatory framework itself, and indeed whether or not AT1 and Tier 2 instruments are merely creatures of regulation that would not exist in an unregulated market.
41. The current process for issuing AT1 and Tier 2 capital is covered by BS16 in the Banking Supervision Handbook. BS16 requires banks to receive non-objection notices from the Reserve Bank before including a particular instrument in their regulatory capital. Non-objection notices are issued once the Reserve Bank has concluded that the bank has undertaken sufficient due diligence to satisfy itself that the instrument is compliant with the capital framework.
42. The non-objection process was introduced because of concerns that banks were counting non-compliant instruments as capital. In practice, the process has posed some challenges. The desire for timely non-objection, combined with Reserve Bank reliance on the information provided in the application by the bank, means that non-objection does not involve a full consideration by the Reserve Bank of all aspects of the relevant instrument. Moreover, a non-objection does not provide an assurance to banks that their instruments are compliant, only that the Reserve Bank has not

identified non-compliance at the time of the application. Although this has been clear in the relevant regulations, there is some risk that the non-objection will be relied upon too heavily by banks or third parties.

The review will consider what processes should be used to ensure capital instruments are compliant with the regulatory framework.

### **Policy options to be further analysed**

43. We plan to consider and consult on:

- Which instruments should be accepted as regulatory capital, in addition to common equity. For example we will consider the eligibility of:
  - preference shares;
  - contingent instruments that write off but do not convert into shares; and
  - other contingent convertible instruments.
- Which instruments or other balance sheet items should *not* be accepted as regulatory capital or should be deducted to determine regulatory capital.
- How we should measure the components of capital, including:
  - how best to incorporate reported reserves and other components of shareholder equity; and
  - how best to incorporate potential tax liabilities and other potential offsets.
- What contractual terms should be required or proscribed for contingent convertible instruments, to the extent that those instruments continue to be accepted as regulatory capital.
- What process should be used to ensure contingent convertible capital instruments comply with the capital framework.

## Denominator (measurement of risk-weighted exposures)

### Overview of the current framework and policy intent

#### *The Reserve Bank's capital adequacy framework*

44. The Reserve Bank has adopted most elements of the Basel capital adequacy framework for measuring banks' risk weighted exposures (the denominator of the capital ratios). Banks' minimum capital requirements cover their exposures to credit risk, operational risk and market risk (which in New Zealand includes interest rate risk in the banking book). A summary of the requirements is provided in the appendix to this document. Credit and operational risk requirements are mostly based on the Basel II standards from 2006, while the market risk requirements are based loosely on the Basel Market Risk Amendment of 1996 and have not been updated to reflect more recent versions of the Basel standards.
45. For all three risk types, a standardised measurement method is available. For credit and operational risk the Reserve Bank's framework also allows banks to apply to be accredited to use their own internal risk models to determine their capital requirements, allowing them to take more account of their individual risk profiles.

#### *Use of internal models*

46. Basel II introduced the use of banks' internal models for credit and operational risk measurement. At the time it was anticipated that internally modelled approaches would create incentives for banks to improve the sophistication and quality of their risk management systems and processes.<sup>19</sup> Working alongside an intensive supervisory review process, the greater use of internal models would improve both regulators' and banks' understanding of the risks in banks' businesses. The enhanced risk sensitivity that internal models could offer, compared to more prescriptive standardised approaches, could also lead to a more efficient alignment of banks' regulatory capital requirements with their underlying risk profiles.<sup>20</sup>
47. In adopting the internal models approaches the Reserve Bank has sought to ensure that the level of an accredited bank's capital remains appropriately conservative given the risks the bank faces. In a number of areas this has meant the imposition of minimum calibrations on risk parameters, the use of capital output floors<sup>21</sup>, and limitations on the use of some aspects of the Basel framework.

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<sup>19</sup> See, for example, Basel Committee on Banking Supervision (2004), Consensus achieved on Basel II proposals (Press Release of 11 May 2004), [www.bis.org/press/p040511.htm](http://www.bis.org/press/p040511.htm), which notes that the Committee intended to provide "incentives to adopt the advanced risk-sensitive approaches of the new framework". See also Tarullo (2008), *Banking on Basel: The Future of International Financial Regulation*, Peterson Institute for International Economics, at p.175.

<sup>20</sup> Internationally, it was argued that the improved risk sensitivity of capital requirements would reduce banks' incentives to arbitrage discrepancies between regulatory capital requirements and true economic risk for different types of investments. For example, see Basel Committee on Banking Supervision (1999), *A New Capital Adequacy Framework: Consultative paper issued by the Basel Committee on Banking Supervision*, <http://www.bis.org/publ/bcbs50.pdf>, at paragraph 7.

<sup>21</sup> For example, the Reserve Bank has imposed minimum levels of capital for operational risk on the

### *Risk coverage*

48. For the purposes of calculating the capital ratio, risk-weighted exposures are measured for the consolidated registered banking group as well as, in certain cases, associated entities outside the banking group. A group-wide approach to the calculation recognises that losses may arise anywhere in the group, and that a bank may support entities beyond its contractual obligations in order to protect itself from reputational risks. It also recognises that social costs may arise from the distress of entities connected to the bank, in addition to the bank itself.
49. The minimum capital requirements (Basel Pillar 1) cover a bank's credit, operational and market risk exposures as measured by the relevant sections of the capital adequacy framework. The Reserve Bank has not actively used Basel Pillar 2 capital requirements (the Supervisory Review Process) to address the credit, operational or market risks not explicitly captured in the Basel Pillar 1 framework (e.g. credit concentration risk).

## **Experience with the current framework and international developments**

### *Basel Committee changes and Reserve Bank experience*

#### Credit risk

50. One of the principles of the review is that capital requirements should reflect risk. This argues for an approach which allows all relevant risk factors to be taken into account. But it only makes sense to do this if they can *reliably* be taken into account. If there is too much subjectivity, then the increased risk sensitivity is spurious.<sup>22</sup> One of the main challenges of the internal models approaches is banks' ability to model credit risk accurately and objectively, particularly given the limited data histories available.<sup>23</sup>
51. The BCBS asked banks around the world to assess the credit risk of named sovereigns, banks, and large corporations, using their approved internal capital models. Results published in 2013 showed significant variation between the absolute ratings assigned to the same entities by different banks' models.<sup>24</sup> A reasonable conclusion is that although some of the surveyed banks' models might have objectively assessed risk, other banks' models have not.
52. Consistent with the results of the rating exercise, the Basel Committee has proposed limitations on the use of internal models, so that they would no longer be used at all

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internal models banks.

<sup>22</sup> We do not mean to imply that risks should be ignored when they cannot be reliably measured. Rather, a conservative (high) estimate of risk should be used when there is uncertainty about accuracy.

<sup>23</sup> This concern has been longstanding and the subject of debate since the development of the framework, for instance see Basel Committee on Banking Supervision (2005), *Studies on the Validation of Internal Rating Systems*, [http://www.bis.org/publ/bcbs\\_wp14.pdf](http://www.bis.org/publ/bcbs_wp14.pdf) and Tarullo (2008), *Op cit*.

<sup>24</sup> Basel Committee on Banking Supervision (2013), *Regulatory Consistency Assessment Programme (RCAP): Analysis of risk-weighted assets for credit risk in the banking book*, [www.bis.org/publ/bcbs256.pdf](http://www.bis.org/publ/bcbs256.pdf).

for exposures to banks or large corporates or for some specialised lending. Instead the standardised approach would have to be used for exposures to banks or large corporates, and standardised or 'slotting' approaches would have to be used for specialised lending.<sup>25</sup> The Committee has also proposed other limitations on the use of internal models, including the use of regulator-prescribed risk parameters for some corporate exposures and floors on other parameters.<sup>26</sup>

53. Another Basel Committee study was conducted on SME and retail lending (including residential mortgage lending). The study noted some differences between banks in some aspects of risk rating but did not draw strong conclusions about the on-going use of internal models for these sorts of exposures. It did, however, recommend clarifying some definitions and providing more guidance to banks to ensure greater consistency in, and empirical justification of, risk estimates.<sup>27</sup>
54. The Reserve Bank's experience, having administered an internal models regime for about a decade, is that it has been difficult to assess whether differences in risk-weight outcomes are due to underlying risk or to subjective choices about model design and implementation. We have launched a benchmarking project which is designed to compare the residential mortgage and rural lending models of the banks that are approved to use internal credit risk models, but progress to develop truly comparable rating exercises has so far proved difficult.
55. The difficulty in determining whether differences in risk weights for different banks are due to underlying differences in risk or just differences in implementation is more of a concern because of banks' economic incentives and New Zealand's wider bank supervision framework.
56. If the regulatory capital requirement exceeds the privately optimal level for a bank then there is an economic incentive for the bank to design its models to minimise regulatory requirements rather than to improve the measurement of risk in a balanced way. It could be easier for banks to act on this incentive with a relatively un-intrusive approach to bank supervision. New Zealand's approach is relatively un-intrusive. The Reserve Bank places its emphasis on promoting incentives for strong self- and market discipline, with relatively less emphasis on regulatory discipline.<sup>28</sup>

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<sup>25</sup> 'Specialised lending', in broad terms, covers loans to finance an asset where the repayment of the loan is dependent mainly on the income generated by the asset. Under the slotting approach a bank must classify exposures into four categories of risk, each of which has a prescribed (not modelled) risk weight.

<sup>26</sup> Basel Committee on Banking Supervision (2016a), Consultative Document: Reducing variation in credit risk-weighted assets – constraints on the use of internal model approaches, [www.bis.org/bcbs/publ/d362.pdf](http://www.bis.org/bcbs/publ/d362.pdf).

<sup>27</sup> Basel Committee on Banking Supervision (2016b), Regulatory consistency assessment programme (RCAP) – Analysis of risk-weighted assets for credit risk in the banking book, [www.bis.org/bcbs/publ/d363.pdf](http://www.bis.org/bcbs/publ/d363.pdf).

<sup>28</sup> See Fiennes (2016), New Zealand's evolving approach to prudential supervision, <http://www.rbnz.govt.nz/research-and-publications/speeches/2016/speech2016-09-01>, for a recent speech describing the Reserve Bank's supervisory framework.

57. The Basel framework is predicated on a more hands-on and resource-intensive supervisory relationship that is common in other countries.<sup>29</sup> Without such an intrusive approach, the Reserve Bank is at an informational disadvantage when monitoring and assessing banks' internal models and assessing risks that fall under Basel's Pillar 2. The Reserve Bank relies heavily on banks' attestations about their identification of risks that would be directly monitored through the Supervisory Review Process in more conventional applications of the Basel framework, and about their general compliance with capital regulation.

The review will consider the extent to which the IRB approach should be available to banks, as well as whether the inputs or outputs of IRB models should be constrained. The review will consider how well the resulting framework would fit with economic incentives and the broader regulatory framework.

58. More generally, the Basel Committee has been concerned about the divergence in capital outcomes between the standardised and internal model approaches. The Reserve Bank's own experience is that internal model outcomes have been drifting further below standardised outcomes over time, in spite of recalibrations and regulatory "overlays" we have required, and that it is not at all clear that the downwards drift is due to declines in relative underlying risk.
59. A principle of the capital review is that capital requirements should not depend unduly on the measurement approach that is used.
60. There can be some justifiable differences. In theory, capital requirements might be higher when uncertainty about the level of risk is the reason the standardised approach is used; to the extent that a bank has richer and more precise systems for measuring risk and this is the reason it is accredited to use internal models, uncertainty about the level of risk is reduced and a lower risk weight might be justified.
61. But when the differences between the standardised and internal model approaches become large, and particularly when there is subjectivity in the assessment of risk, it becomes difficult to justify the gap.
62. To address concerns about the gap, the Basel Committee has proposed a new standardised approach which would be more risk sensitive than the current one (more types of exposure and more variation within some types)<sup>30</sup>, and has also

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<sup>29</sup> Even with a more intrusive approach and a significant commitment of resources, overseas regulators have faced challenges to implement the internal models approaches effectively. The European Central Bank is dedicating approximately a hundred staff for four years to get more consistent outcomes across 68 banks it supervises. See European Central Bank (2017), Targeted Review of Internal Models, <https://www.bankingsupervision.europa.eu/about/ssmexplained/html/trim.en.html>. Some members of the US Federal Reserve Board have expressed doubt that the internal models approaches have achieved their aim because they are so complex, and advocate discarding them. See, e.g., Daniel Tarullo (2014), *Rethinking the Aims of Prudential Regulation*, <https://www.federalreserve.gov/newsevents/speech/tarullo20140508a.htm>

<sup>30</sup> Basel Committee on Banking Supervision (2015a), Second consultative document (Standards):

discussed limitations on internal model inputs (e.g. higher minimum ‘probability of default’ parameters)<sup>31</sup> and a revised output floor (e.g. risk weights should not differ from standardised weights by more than some margin).<sup>32</sup>

A key issue for the review will be the relativity of capital requirements under the IRB and standardised approaches.

63. The complexity and opacity of the internal models based approaches has potentially undermined the effectiveness of market discipline. Banks in New Zealand are not required to publicly disclose the details of their internal models or to provide much information about the underlying characteristics of their exposures.<sup>33</sup> It is therefore difficult for external parties to assess how risk-adjusted measures of exposures have been generated and whether or not they are reasonable.

The review will consider whether banks which use the internal models approach should be required to disclose information that is more easily comparable across banks.

64. A known limitation of the internal models approach is that it assumes credit portfolios are perfectly diversified.<sup>34</sup> This leads to an understatement of risk weights when portfolios are small or when a small number of individual exposures dominate a portfolio. Such an understatement is left to be addressed through Basel Pillar 2. There is some further discussion of this issue in the next section of this report (concerning the capital ratio).
65. Finally, there are parts of our credit risk standards that are unclear or inconsistent. A parallel but separate process to rewrite the Banking Supervision Handbook has already begun. This is not generally intended to change policy but rather to clarify it. In cases where policy changes are also required and are of a minor nature, they are likely to happen separately from the main capital review.

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Revisions to the Standardised Approach for credit risk, <http://www.bis.org/bcbs/publ/d347.htm>. Note that New Zealand’s standardised approach is arguably more sensitive to risk in some areas than the current Basel standardised approach.

<sup>31</sup> Basel Committee on Banking Supervision (2016a), *Op. Cit.*

<sup>32</sup> Basel Committee on Banking Supervision (2014b), Consultative Document (Standards): Capital Floors: the design of a framework based on standardised approaches, [www.bis.org/bcbs/publ/d306.pdf](http://www.bis.org/bcbs/publ/d306.pdf). Many countries (not including New Zealand) continue to apply a transitional floor on overall capital requirements, tied to the outcome that would be generated using the Basel I calculation.

<sup>33</sup> Banks using internal models are required to publish information about: the amount of exposures by asset class (residential mortgages, other retail exposures, corporate exposures, and so on); the amount of residential mortgage exposures by loan-to-value ratio; the amount of specialised lending exposures which are risk-weighted using the “slotting” approach; and some limited information about the use of risk-mitigation techniques such as holding collateral and obtaining guarantees.

<sup>34</sup> The internal models approach assumes, broadly speaking, that returns on an individual bank loan vary because of: a systematic factor, such as the general state of the economy; and an idiosyncratic factor that reflects borrower-specific characteristics. The approach also assumes that portfolios of loans are large and diversified enough that none of the variation in portfolio returns is due to idiosyncratic factors (their effect in aggregate is known with certainty and there is therefore no risk associated with them).

### Operational risk

66. The Basel Committee has proposed to drop the internal models approach (“advanced measurement approaches” or AMA) for calculating operational risk, and to replace it with a revised standardised approach. The framework for operational risk modelling was not as well developed as the framework for credit risk modelling at the time Basel II was introduced. The Basel Committee had hoped that a clear best-practice framework would evolve over time, but was ultimately disappointed.<sup>35</sup>
67. A concern raised by industry about the move to a blanket standardised approach is that it will weaken the incentives to have strong internal operational risk management processes.<sup>36</sup> However, it is possible to have requirements for good internal process which are separate from the (standardised) capital requirements. The Australian Prudential Regulation Authority (APRA) has previously talked about such a separation, albeit in a different context. In a letter to banks, APRA said that it might be possible in some cases for internal models banks to use the standardised approach for operational risk, but that banks in this situation would nevertheless be required to demonstrate advanced operational risk management practices.<sup>37</sup>
68. In its approach to operational risk models, the Reserve Bank has focussed on the overall capital outcomes of the models rather than requiring changes to the detailed design or calibration of models (in contrast to its approach for credit risk models). Consistent with this approach, the Reserve Bank has imposed floors on the total capital requirement for operational risk for all banks using the internal models approach.

### Market risk

69. The Basel Committee has released revised market risk standards for both standardised and internal modelling approaches.<sup>38</sup> New Zealand’s current approach – we permit only a standardised approach which is somewhat similar to an old Basel Committee standard – is markedly different from the new Basel standards.

### Changes to standards in general

70. As the discussion in previous paragraphs indicates, there have been significant changes to some global capital standards, and the Basel Committee has proposed further significant changes.

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<sup>35</sup> Basel Committee on Banking Supervision (2016c), Consultative Document: Standardised Measurement Approach for operational risk, <http://www.bis.org/bcbs/publ/d355.pdf>, from paragraph 5.

<sup>36</sup> See, for example, the Institute of International Finance submission on the recent Basel Committee proposal, [www.iif.com/publication/regulatory-comment-letter/iifgfma-response-bcbs-sma-operational-risk](http://www.iif.com/publication/regulatory-comment-letter/iifgfma-response-bcbs-sma-operational-risk).

<sup>37</sup> Australian Prudential Regulation Authority (2015), International Ratings-Based (IRB) Approach to Credit Risk: Accreditation Process (Letter to Approved Deposit-taking Institutions), [www.apra.gov.au/adi/Publications/Documents/20151216LetterADIsStagedDecoupled.pdf](http://www.apra.gov.au/adi/Publications/Documents/20151216LetterADIsStagedDecoupled.pdf).

<sup>38</sup> Basel Committee on Banking Supervision (2016d), Standards: Minimum capital requirements for market risk, [www.bis.org/bcbs/publ/d352.pdf](http://www.bis.org/bcbs/publ/d352.pdf).

71. New Zealand has not picked up some of the more recent changes to the international standards, such as new standards for market risk, and has not yet taken a position on the broader changes proposed to the internal models and standardised approaches to credit risk, or the replacement of AMA with a new standardised approach to operational risk.
72. There can be advantages in adopting international standards. For example, there can be readier acceptance of the standards by international investors and rating agencies, the burden of standards development is shared, cross-border banking groups have similar rules to deal with in all countries that they operate in, and they can improve co-operation between multiple regulators of internationally active banks. But there can also be disadvantages – even international standards can be flawed, and they might not suit New Zealand’s particular circumstances (for instance, the Basel framework contains a lot of detailed rules for situations that are currently immaterial for New Zealand banks).

A key issue for the review will be whether we should adopt revised Basel capital standards and, if so, what modifications should be made to reflect New Zealand’s circumstances.

#### *Outcomes of Australia’s Financial System Inquiry (FSI)*

73. Australia conducted an inquiry into its financial system and published a final report at the end of 2014.<sup>39</sup>
74. The FSI made recommendations that Australian banks should have enough capital to be “unquestionably strong” and that there should be more “competitive neutrality of the system for determining risk weights”.
75. In response to both of those recommendations and expectations about the Basel Committee’s work programme, the Australian Prudential Regulation Authority mandated that the average risk weight for residential mortgages, across the banks using the internal models approach to credit risk, should rise to 25 percent.<sup>40</sup>
76. Australian authorities are expected to make further changes as part of their on-going response to the FSI recommendations.
77. The Reserve Bank regards the Australian capital requirements as an influential benchmark.

#### **Policy options to be further analysed**

78. We plan to consider and consult on:

<sup>39</sup> The Australian Government the Treasury (2014), Financial System Inquiry: Final Report, [http://fsi.gov.au/files/2014/12/FSI\\_Final\\_Report\\_Consolidated20141210.pdf](http://fsi.gov.au/files/2014/12/FSI_Final_Report_Consolidated20141210.pdf).

<sup>40</sup> Australian Prudential Regulation Authority (2016), APRA reaffirms revised mortgage risk weight target (media release), [http://www.apra.gov.au/MediaReleases/Pages/16\\_23.aspx](http://www.apra.gov.au/MediaReleases/Pages/16_23.aspx).

- Whether the availability of the IRB approach should be limited and whether there should be limits on model inputs or outputs. Consideration of possibilities will include, for example:
  - partial application of IRB, such as the BCBS's proposal to prevent use of IRB for exposures to externally rated banks and large corporations;
  - use of IRB for only some inputs, such as the BCBS's proposal to standardise estimates of loss given default for some portfolios;
  - floors under model inputs, such as higher minimum probabilities of default for some exposures; and
  - floors under model outputs such as risk weight floors.
- Whether or not the AMA approach should be available, and if not (as the BCBS has proposed) whether banks which currently use AMA should nevertheless be required to maintain prescribed standards of operational risk management and measurement.
- Whether the standardised approaches should / could be made more risk-sensitive, including consideration of the proposed new BCBS standards.
- Whether there should be reporting of standardised capital calculations by banks using the IRB or AMA approaches, to highlight gaps in outcomes under the different approaches.
- Whether our current approach to market risk remains appropriate and if not, what should replace our current approach.

## Ratios (minimum requirements and capital buffers)

### Overview of the current framework and policy intent

79. We have three minimum capital ratios.
- CET1 must be at least 4.5 percent of risk-weighted exposures.
  - Total Tier 1 capital (CET1 + AT1 capital) must be at least 6.0 percent of risk-weighted exposures.
  - Total capital (Total Tier 1 capital + Tier 2) must be at least 8.0 percent of risk-weighted exposures.
80. The minimum ratios are calculated for the registered banking group which includes the registered bank and certain associated entities, but we do also require disclosure of a 'solo' ratio which is for the registered bank alone.<sup>41</sup>
81. It is a breach of a bank's conditions of registration if it fails to maintain any of the three minimum ratios.
82. In addition to these minimum ratios there is also a conservation buffer requirement. Banks must have additional CET1 (above minimum ratios) equal to 2.5 percent of risk-weighted exposures. This raises the *effective* minimum ratios to 7 percent, 8.5 percent and 10.5 percent respectively. If the bank's buffer falls below 2.5 percent, then the bank's Conditions of Registration restrict its ability to pay dividends or make other distributions. Because of this restriction, a portion of any earnings will be retained and this can help to restore the buffer.
83. A second buffer, the counter-cyclical capital buffer, is also in place and is included in the Reserve Bank's Memorandum of Understanding with the Minister of Finance on macroprudential policy.<sup>42</sup> This size of this buffer can be changed over time in response to cyclical pressures. It is currently set to zero, but if it were higher it is expected that it would work in a similar way to the conservation buffer.
84. The minimum ratios are set in a way that is intended to balance the reduced risk of banking crises (failures or periods of significant credit rationing) against the potential for economic inefficiencies resulting from higher borrowing costs.

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<sup>41</sup> This is a slight simplification. The solo ratio is calculated for the registered bank and certain other entities which are tightly coupled to the registered bank. For more detail see Reserve Bank of New Zealand (2015), Capital Adequacy Framework: (Internal Models Based Approach), <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/banking-supervision-handbook/BS2B-Capital-adequacy-framework-internal-models-based-approach-oct-2015.pdf>, at section 1.5.

<sup>42</sup> Reserve Bank of New Zealand (2013), Memorandum of Understanding between the Minister of Finance and the Governor of the Reserve Bank of New Zealand, <http://www.rbnz.govt.nz/financial-stability/macro-prudential-policy/mou-between-minister-of-finance-and-governor-of-rbnz>.

## Experience with the current framework and international developments

### *Effective capital ratios*

85. One of the principles of the capital review is that the regulatory capital ratios of New Zealand banks should be seen as conservative relative to those of their international peers, to reflect New Zealand's current reliance on bank-intermediated funding, New Zealand's exposure to international shocks, the concentration of our banking sector, the concentration of banks' portfolios, and a regulatory approach that puts less weight on active supervision and relatively more weight on high level safety buffers such as regulatory capital.
86. New Zealand has always incorporated a degree of conservatism into its standards, particularly through risk weightings for credit risks. For instance, in the IRB approach to credit risk New Zealand has introduced minimum Loss Given Default requirements<sup>43</sup> for farm lending and residential mortgages, and the prescribed correlations<sup>44</sup> for residential mortgages are higher than internationally, with the effect of raising risk weights above the levels they would otherwise be.
87. In spite of these conservative 'overlays', the effective capital ratios of New Zealand's banks are only in the middle of the pack of ratios for banks in developed countries we compare ourselves with. On a headline basis our capital ratios look lower because we take a more conservative position than other countries in the denominator, but after adjusting to get a more like-for-like comparison, ratios are around the median.<sup>45, 46,</sup>  
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88. New Zealand banks' capital ratios are towards the lower end of the range suggested as optimal by the literature.<sup>48</sup> Cost benefit analysis undertaken before the

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<sup>43</sup> Loss given default (LGD) is the expected loss, as a percentage of the total exposure, if the borrower defaults, assuming that there is a relatively severe economic downturn at the time.

<sup>44</sup> The correlation is a parameter which is used in the capital equations under the internal models approach. It represents the strength of the relationship between the performance of the loan and a risk factor which is often (but simplistically) taken to be the general state of the economy.

<sup>45</sup> Our observations here are based particularly on comparisons of CET1 or variants on CET1.

<sup>46</sup> By imposing our own additional restrictions on the denominator our banks might appear to be more thinly capitalised than those elsewhere, because observers focus on the headline ratio more than the way its components are determined. Imposing conservatism in ways other than restrictions on the denominator may help to improve international comparability of New Zealand banks' capital levels. For instance, there could be changes to the minimum capital ratios themselves, more use of "pillar 2" adjustments, or floors set against the standardised approach.

<sup>47</sup> In coming to the view that New Zealand banks' ratios are close to the median, we have taken into account a number of pieces of information. In particular: (1) We have relied on international comparisons undertaken by the Australian Prudential Regulation Authority and our own knowledge of differences between the New Zealand and Australian frameworks. These suggest that New Zealand banks' capital ratios should be adjusted upwards by at least 1-2 percentage points to achieve a like-for-like comparison with international ratios. (2) Using a set of proprietary ratios produced by Standard & Poor's we conclude that New Zealand banks have ratios which are close to the median (in the context of the largest international banks) before adjusting for diversification, but somewhat lower after taking into account diversification.

<sup>48</sup> For example, see Brooke *et al.* (2015), Measuring the macroeconomic costs and benefits of higher UK bank capital requirements (Bank of England Financial Stability Paper No. 35),

introduction of Basel III suggested an optimal ratio of 5½ –17 percent, with a central estimate of about 14 percent.<sup>49</sup> We think that if anything the central estimate would be higher now, but in any case cost-benefit analyses of this kind require many assumptions and should not be relied upon too much.

89. Other countries have been moving to increase their ratios. In particular, Australia has made it a goal to have “unquestionably strong” capital ratios for its banks, and has said it would regard a place in the top quartile of international ratios as being an indicator of such strength.
90. Other countries have also introduced a range of additional capital (or similar) requirements, which are discussed in following paragraphs.

The review will consider whether the capital ratios of New Zealand banks remain appropriately conservative.

#### *Supplementary capital requirements*

91. Internationally there has been a move to introduce additional capital requirements for systemically important banks (SIBs). From 2019 all identified global systemically important banks (G-SIBs) will have to meet an additional capital requirement.<sup>50</sup> Some countries, including Australia<sup>51</sup>, also have a capital add-on for *domestic* systemically important banks (D-SIBs). New Zealand’s banking sector is dominated by four large Australian-owned banks and Kiwibank. None of these are G-SIBs but it is likely that they are systemically important in New Zealand.
92. One rationale for regulatory capital requirements is that they increase the amount of capital that banks hold to a level which takes into account the social costs of bank failures or other distress events. These social costs that would not otherwise be internalised by banks are likely to be proportionately larger for banks that have significant market share. This could be a reason to impose additional capital requirements on G-SIBs or D-SIBs.
93. In the New Zealand context, the open bank resolution framework (OBR) is designed to reduce some of the social costs associated with bank distress events, such as disruption to the payment system if a bank is in trouble. This could be an argument against D-SIB add-ons or an argument for making them smaller.<sup>52</sup>

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[http://www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs\\_paper35.pdf](http://www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper35.pdf), at page 10.

<sup>49</sup> Reserve Bank of New Zealand (2012), Regulatory impact assessment of Basel III capital requirements in New Zealand, <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/policy/4932427.pdf>, at paragraph 38 (note also paragraph 50).

<sup>50</sup> Basel Committee on Banking Supervision (2013), Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement, <https://www.bis.org/publ/bcbs255.pdf>.

<sup>51</sup> Australian Prudential Regulation Authority (2013), Information Paper: Domestic systemically important banks in Australia, <http://www.apra.gov.au/adi/Publications/Documents/Information-Paper-Domestic-systemically-important-banks-in-Australia-December-2013.pdf>.

<sup>52</sup> It is also an argument for having generally lower capital requirements than would be justified if there was no OBR framework.

94. There has also been a move internationally to introduce a total loss absorbing capacity (TLAC) regime for a small number of very large financial institutions.<sup>53</sup> Under the Financial Stability Board's TLAC regime a certain proportion of a bank's funding has to be capable of being 'bailed in'<sup>54</sup> in the resolution of the bank, effectively preserving assets for other creditors such as unsecured depositors. In this respect, TLAC is somewhat similar to Tier 2 capital and might be seen as boosting capital adequacy, even though it does not necessarily meet the definition of regulatory capital. Banks will be able to use existing regulatory capital other than buffer capital<sup>55</sup> to meet TLAC requirements, but at current ratios this is unlikely to be enough and they will need to issue more TLAC-compliant instruments.
95. It is expected that some countries will choose to implement TLAC more widely, and not just for the very largest banks. Australia in particular is working on a domestic TLAC regime even though none of the domestically headquartered banks operating in Australia are large enough to have to comply with the Financial Stability Board's TLAC regime (this was another recommendation of Australia's FSI).
96. New Zealand does not have a TLAC regime. However, New Zealand does have the Open Bank Resolution (OBR), which is designed to partially bail in *all* creditors<sup>56</sup> if a bank failure has to be resolved. OBR could reduce the need for a TLAC regime, or complicate a TLAC regime.

The review will look at the advantages and disadvantages of SIB add-ons and TLAC regimes.

#### *Use of buffers*

97. As discussed above, the minimum capital ratios are hard requirements. Dipping below the minimum ratios is a serious breach of a bank's Conditions of Registration and would be expected to provoke a severe supervisory response. In effect, this produces a 'cliff edge' effect in which a bank can go quite suddenly from normal operation to a crisis footing.
98. The conservation and counter-cyclical buffers, in contrast, are intended to be softer requirements; breaches trigger automatic limitations on dividends and other distributions that are designed to restore capital over time. We do not mean to say that a breach of buffer requirements is not a serious matter, and depending on the circumstances it could be quite disruptive to a bank (e.g. if there are convertible AT1

<sup>53</sup> Financial Stability Board (2015), Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution: Total Loss-absorbing Capacity (TLAC) Term Sheet, <http://www.fsb.org/wp-content/uploads/TLAC-Principles-and-Term-Sheet-for-publication-final.pdf>.

<sup>54</sup> Essentially, the holders of bailed-in capital are expected to bear losses before ordinary creditors and to not be compensated for these losses by, for example, a state-funded bail-out.

<sup>55</sup> By "buffer capital" we mean capital that is used to meet conservation and counter-cyclical capital buffer requirements.

<sup>56</sup> Unsecured claims, including any residual claims of secured creditors, would be reduced (given a "haircut") to ensure the bank can continue operating.

instruments on issue), but we would expect it to be less disruptive than a breach of a minimum capital ratio.

New Zealand currently makes limited use of buffers and the review will consider whether they should be given a greater role.

99. Other countries have made use of counter-cyclical capital buffers. Sweden, Norway, and Hong Kong currently have non-zero buffers.<sup>57</sup>
100. As noted above, a counter-cyclical capital buffer is part of New Zealand's regulatory framework, but it is currently set at zero.
101. In the lead up to a review of the Reserve Bank's macro-prudential framework in 2018, there will be further consideration of the role of the counter-cyclical buffer. This is not a direct part of the capital review, but the capital review will take into account any resulting changes. For instance, if the Bank decided to use the counter-cyclical buffer more frequently, that could alter the Bank's view on the appropriate level of the conservation buffer.

#### *Leverage ratio*

102. The minimum capital ratios are all based on risk-weighted exposure values. As part of the introduction of Basel III many other countries are introducing a leverage ratio that is based on an unweighted measure of banks' exposures.<sup>58</sup>
103. The leverage ratio is usually set at a level that prevents it being a binding constraint in ordinary cases and so the risk-weighted ratio applies normally. But the leverage ratio *is* a binding constraint when capital requirements generated by the risk-weighted requirement are unusually low (the implication being that such a low requirement could be the result of an unusual portfolio, model error, or even deliberate manipulation of risk weights).
104. Some researchers have found that a leverage ratio is a better predictor than a risk-weighted ratio of bank survival in a crisis, and also a better predictor of whether a bank will continue lending normally in times of stress.<sup>59</sup> A tentative hypothesis that could be investigated further is that a leverage ratio, if set appropriately high, provides a higher degree of protection for a banking system than a risk-weighted ratio.

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<sup>57</sup> Bank for International Settlements (2017), Countercyclical capital buffer, <http://www.bis.org/bcbs/ccyb/>.

<sup>58</sup> Basel Committee on Banking Supervision (2014a), Basel III leverage ratio framework and disclosure requirements, <http://www.bis.org/publ/bcbs270.pdf>.

<sup>59</sup> See for example Bank of England (2014), The Financial Policy Committee's review of the leverage ratio, [http://www.bankofengland.co.uk/financialstability/Documents/fpc/fs\\_lrr.pdf](http://www.bankofengland.co.uk/financialstability/Documents/fpc/fs_lrr.pdf), from bottom of p13, which considers ratios for a sample of large European, United States and Asian banks. It should be noted that most of the risk-weighted ratios in studies of this kind that the Reserve Bank has seen are calculated on a Basel I basis, and therefore the conclusions are not necessarily applicable to the more risk-sensitive Basel II and III ratios.

105. Another argument for a leverage ratio is that it is easier for people to understand and therefore is more likely to encourage market discipline.<sup>60</sup> It is certainly easier to understand that for every dollar of lending the bank can lose x cents before it starts defaulting on its obligations, than to grasp the details of risk-weighting. However, such a statement only tells part of the story, because it does not recognise that some banks have chosen to take on riskier exposures than others.
106. New Zealand did not adopt a minimum leverage ratio as part of Basel III because of our preference for measures of capital adequacy that differentiate between the riskiness of different banks' exposures, but we have continued to monitor international developments.
107. Approximate calculations suggest that large New Zealand banks would have an average leverage ratio of about 6 percent. This is enough to meet the minimum Basel leverage requirement of 3 percent, but would be closer to the higher minimum ratios that some countries have chosen to impose.
108. An alternative to a minimum leverage ratio would be to amend the risk-weighted approach to deal with some of its weaknesses. Another alternative would be to require disclosure of a Basel-consistent leverage ratio alongside risk-rated ratios, but not to set a minimum leverage ratio requirement.

The review will assess whether disclosure of a leverage ratio, or a minimum leverage ratio requirement, would improve the capital framework.

#### *Diversification and small banks*

109. Under our current framework, most small banks have significantly higher capital ratios than large banks. Our understanding is that for these small banks a higher ratio is necessary to maintain a credit rating that they judge satisfactory. The higher ratio requirement might be due to some risk premium for small size, or it could reflect an expectation that in New Zealand the largest banks would receive support from their foreign parents in some cases of distress.<sup>61</sup>
110. To the extent that there are greater risks associated with being small, such as less scope for diversification, our current framework does not pick this up. One possibility would be to consider whether there should be some sort of adjustment to reflect lack of diversification (i.e. risk concentration).

<sup>60</sup> For example Finansinspektionen (2015), Leverage ratio requirement for Swedish banks, [http://www.fi.se/contentassets/c64073973ad44a0989a2307c385eca09/bruttosoliditet\\_eng\\_20150123ny.pdf](http://www.fi.se/contentassets/c64073973ad44a0989a2307c385eca09/bruttosoliditet_eng_20150123ny.pdf), at page 37.

<sup>61</sup> New Zealand's framework does not take parental support into account. The Reserve Bank considers it important for New Zealand banking groups to be seen as strong on a standalone basis. In recent times the Australian Prudential Regulation Authority has placed restrictions on the support that Australian banks can provide to New Zealand subsidiaries. There are also other reasons that implicit parental support could be eroded, especially in a period of financial stress.

111. The Basel framework acknowledges concentration risk but does not give any specific guidance about how to deal with it. However, there was some theoretical work done during the design of the Basel II framework<sup>62</sup> and some European countries have implemented quantitative methods to adjust capital for concentration risk as part of their Basel Pillar 2 capital requirements.<sup>63</sup> As part of its supervisory activities the Reserve Bank requires banks to assess concentration risks. The Reserve Bank monitors these assessments and stands ready to respond if it is concerned about capital adequacy, but does not currently impose a formulaic additional capital requirement.

The review will consider the role of add-ons for concentration risk.

#### *Quality of capital*

112. The first principle of the review implies that capital should be available and effective in both normal times and crises. For that purpose there is an implicit ranking of types of capital from highest quality (e.g. ordinary undated shares) to lowest quality (e.g. longer-term debt that can be written off without penalty if the bank is in distress).
113. The Reserve Bank recognises a wide range of instruments and other items as capital (see the ‘Numerator’ section of this document) but restricts the mix of quality by having three capital ratios. The appropriate mix of quality has not been reviewed since the introduction of Basel III.

The review will consider the appropriate mix of different types of capital.

#### *Lack of a minimum solo ratio requirement*

114. As noted earlier in this paper, New Zealand’s capital ratio requirements apply to the registered banking group of the registered bank. This brings in a broad range of risks faced by the bank and allows corresponding capital to be recognised. A group basis for the calculation assumes that capital can move freely around the group and that, in terms of the protection it provides, it doesn’t matter which group entity’s balance sheet the capital sits on.<sup>64</sup> The group ratio requirement could be supplemented by imposing a “solo” ratio requirement to make sure that there is sufficient capital in the registered bank itself or in other subsets of the banking group. New Zealand currently requires the calculation and disclosure of a solo ratio. This ratio is monitored by the Reserve Bank and we stand ready to take supervisory action if the

<sup>62</sup> See for example Gordy and Lütkebohmert (2007), Granularity adjustment for Basel II, Deutsche Bundesbank Discussion Paper Series 2 (Banking and Financial Studies) No. 01/2007.

<sup>63</sup> European Banking Authority (2014), Report on the peer review of the EBA Guidelines on the management of concentration risk under the supervisory review process, <https://www.eba.europa.eu/documents/10180/534414/EBA+Report+on+the+peer+review+of+the+GLs+on+credit+concentration+risk.pdf>.

<sup>64</sup> This is a slight simplification; there are limitations on recognition of some capital because it is unlikely to be available throughout the group.

ratio moves to levels that cause concern, but there is not currently a minimum solo ratio prescribed in the capital standards.

The review will consider whether the existing requirement to disclose a “solo” ratio should be retained or strengthened.

### **Policy options to be further analysed**

115. We plan to consider and consult on:

- Whether the current minimum capital ratios are sufficiently conservative.
- What the appropriate mix of capital quality is (as reflected in the three separate minimum ratio requirements and the buffer requirements).
- What the appropriate balance is between hard minimum ratio requirements and buffers.
- Whether or not specific add-ons for systemically important banks are justified.
- Whether or not there should be add-ons for concentration risk.
- Whether a total loss absorbing capacity (TLAC) regime would be useful, or whether other approaches might serve as an alternative to a TLAC regime.
- Whether a leverage ratio should be reported, and whether a minimum level should be required.
- Whether the current solo ratio disclosure requirement should be retained or strengthened.

## Efficiency and stability

116. In undertaking the review of capital requirements, the Reserve Bank is conscious of potential trade-offs between the soundness of the financial system and economic efficiency.

### Higher levels of capital contribute to soundness...

117. At lower levels of capital it would not take as much of an unexpected loss to make a bank insolvent. Banks could also become more sensitive to smaller losses, sharply reining in lending and repaying debt to restore the already-thin capital buffer.
118. Bank failure and sharp de-leveraging are costly. There are the direct losses of depositors and other creditors (or the financial costs to government if there is a bailout). In the case of a systemic crisis, there can also be wider costs resulting from the temporarily restricted availability of credit, disruption to payments systems, and consequent reductions of economic activity.
119. At higher levels of capital, these costs are reduced. Bank failure is less likely and if there is a failure fewer of the costs will be borne by creditors or government.

### But capital might also be costly...

120. Banks argue that capital is a more expensive form of funding than debt, and that if they had to seek more capital they would need to pass on the costs to bank customers. In turn, this would reduce investment and economic activity. Some earlier work on optimal capital ratios made this assumption even while acknowledging that the assumption did not always hold.<sup>65</sup>
121. The Modigliani-Miller theorems in finance imply that there is *no* increase in a bank's overall funding costs, because equity holders are willing to accept a lower rate of return when the bank has less debt. But the theorems are weakened if investors think there is an implicit government guarantee of obligations to bank creditors or if there is preferential tax treatment of debt, and might also be affected by the degree of competition in the banking sector.
122. It is mostly accepted that funding costs are modestly higher when the capital ratio is higher, at least in the short term. Debate centres on the incidence of those higher costs, i.e. whether they are mostly private costs (a transfer from bank owners to other parties) or social costs (net reductions in national welfare).
123. Some argue that social costs are so small that minimum capital ratios should be much higher than they are today.<sup>66</sup> These proponents of 'big equity' emphasise that

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<sup>65</sup> Basel Committee on Banking Supervision (2010), An assessment of the long-term economic impact of stronger capital and liquidity requirements, <http://www.bis.org/publ/bcbs173.pdf>, at page 22.

<sup>66</sup> See for example Admati *et al.* (2013), Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive, <https://www.gsb.stanford.edu/faculty-research/working->

governments subsidise lending because they implicitly guarantee banks' obligations to creditors or provide other incentives that allow banks to obtain cheap debt funding. This is the reason that banks are able to choose much higher debt-to-equity ratios than other businesses. Increasing capital requirements removes the subsidy. This makes bank shareholders worse off but because the subsidies are inefficient, society as a whole is better off. In a competitive market, there are no other costs (other than the loss of subsidies) to bank shareholders.

### **Complexity of capital regulation**

124. The complexity of capital requirements, as well as their stringency, can affect stability and efficiency.
125. A degree of complexity may be desirable so that the rules can be applied sensibly in a wide range of situations. For instance, one of the principles of the review is that capital requirements should relate to the level of risk the bank faces.
126. But rules that are very complex can be difficult to administer. Unnecessary time and resources can be taken up interpreting and implementing the rules. It might also be more difficult to police adherence to the rules, which could lead to them being ineffective in practice. Moreover, complexity can also lead to opacity, making it hard to see the true nature of instruments or exposures, and sorts of risk that they pose.

### **Determining overall capital settings**

127. A common approach to setting capital requirements in the past has been to attempt to identify the costs and benefits of increased capital separately, and then to combine costs and benefits to determine the optimal capital ratio.
128. In international studies the costs are typically modestly higher interest rates for bank customers and modestly reduced economic growth. Approaches to the measurement of costs vary, but it is common to see a mix of some or all of the following steps:<sup>67</sup>
  - use share market data and capital levels to derive the effect of higher capital requirements on the cost of bank capital;
  - use accounting models or market data to derive the effect of the higher cost of capital on interest rates for bank capital; and
  - use simple or comprehensive macroeconomic models to derive the effect of higher interest rates on the growth of gross domestic product.
129. In international studies the benefits of higher capital requirements are usually the avoidance of banking crises and consequently fewer economic recessions. It is

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[papers/fallacies-irrelevant-facts-myths-discussion-capital-regulation-why.](#)

<sup>67</sup> There are many studies, but as well-known examples see:

Basel Committee on Banking Supervision (2010), *Op Cit.*;

Miles, Yang and Marcheggiano (2012), "Optimal Bank Capital", *Economic Journal* (March 2012).

common to estimate the effects of capital on the probability of banking crises, as well as the cost of a banking crisis if it does occur (lost GDP), using historical data directly or models calibrated using historical data.<sup>68</sup>

130. In a previous New Zealand analysis, the Reserve Bank also included the costs of potential government bail-outs and the costs or benefits of changes in tax payments.<sup>69</sup> In the international studies these are implicitly treated as internal transfers and disregarded except to the extent that they affect overall economic activity. In New Zealand's case, it is more difficult to ignore such transfers because of many of them are external, to or from foreign shareholders and creditors.
131. As discussed earlier in this paper (see *Effective capital ratios* on page 30) a typical optimal capital estimate in the international studies the Reserve Bank has considered so far is about 14%, but estimates vary considerably between studies. The range of estimates is common in studies of this kind: results of modelling are always highly dependent on assumptions made by the researcher or the particular data chosen to estimate costs and benefits.
132. The results of these studies are also influenced by the way they take into account the effects of inefficient implicit subsidies which higher capital requirements might reduce.
133. We welcome the views of submitters on the empirical evidence regarding optimal capital.

#### *The Reserve Bank's approach*

134. As the review is in its early stages the Reserve Bank has not yet formed a view on the final calibration of capital requirements. However, in broad terms our aim is to agree a capital regime that maintains a very high level of confidence in the solvency of the banking system, while avoiding unnecessary economic inefficiency.
135. It is likely that we will rely somewhat on quantitative cost-benefit studies of the type we have seen already, but we will take into account those studies' limitations. It is likely that the Reserve Bank will also use the big equity argument as a theoretical benchmark, but one that should be considered cautiously and in the light of empirical evidence.
136. In its decision-making, the Bank will use the six principles outlined in the introduction to this paper to achieve a good balance between costs and benefits. In particular, the principles are consistent with a capital adequacy framework in which:

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<sup>68</sup> Again, as examples see Basel Committee on Banking Supervision (2010) or Miles, Yang and Marcheggiano (2012), *Ibid*.

<sup>69</sup> Reserve Bank of New Zealand (2012), *Op Cit*.

- capital does what it should in practice, so that the benefits of capital will be realised (see for example the first principle that capital must readily absorb losses);
  - capital requirements are commensurate with, and not higher or lower than warranted by, the risk of bank exposures and New Zealand's circumstances (the second and fourth principles);
  - requirements are only as complex as is required (fifth principle).
137. We will be undertaking further analysis before making recommendations in future consultation documents.

## Seeking your views

The Reserve Bank invites submissions on the issues discussed in this document. In particular, we seek your views on the following questions.

**Question 1:** For each of the three sections (numerator, denominator, ratio), are there any important topics relating to capital adequacy that we have left out entirely?

**Question 2:** For each of the three sections (numerator, denominator, ratio), have any important and relevant issues been omitted from the topics that have been discussed?

**Question 3:** Do you have any information (e.g. empirical data) that is relevant to the issues discussed in the paper?

**Question 4:** Are there particular areas of the review that should be prioritised?

## Appendix: Capital ratio calculation

### Background

BS2 is the part of the Reserve Bank's Banking Supervision Handbook which deals with Capital Adequacy. Registered banks are required to comply with BS2. Banks may use the standardised approaches to calculate capital requirements (see BS2A) or, if approved by the Reserve Bank, the internal models approaches (see BS2B).

### Capital requirements

*Part 3 of BS2A, Part 3 of BS2B, and banks' Conditions of Registration*

Banks are required to hold capital as a hedge against credit risk, operational risk, and market risk. Banks with close ties to insurance, funds management, or securitisation vehicles may also be required to hold capital as a hedge against the risks involved in those activities.

There are minimum capital ratios, measured as the amount of capital divided by risk weighted assets.

Form of capital	Minimum ratio
Common equity tier 1 (CET1)	4.5%
CET 1 + Additional tier 1 (AT1)	6%
CET1 + AT1 + Tier 2	8%

A bank is in breach of its conditions of registration if its capital ratios fall below the minimum.

In addition to meeting all the minimum requirements, the bank should also maintain an additional "conservation buffer" of 2.5% CET1. Otherwise the bank has to limit distributions and prepare a capital plan.

Minimum ratios and the conservation buffer are prescribed in banks' conditions of registration.

BS2 defines and prescribes the calculation of capital and risk weighted assets.

### Capital

*Part 2 of BS2A and Part 2 of BS2B*

Capital is defined, in summary, as common equity (Common equity tier 1 capital), plus certain instruments and other items with the characteristics of common equity (Additional tier 1 capital), plus certain long-term debt instruments (Tier 2 capital).

Although there are some broad similarities, capital is not the same as shareholder equity under generally accepted accounting standards. Items in one may be excluded from the other. There are also certain amounts which must be deducted from regulatory capital.

### *Risk-weighted assets*

Banks calculate risk weighted-assets using one of two approaches: the standardised approach, which is described in BS2A, or the internal-models-based approach, which is described in BS2B.

### Standardised approach

#### *Parts 4, 9, and 10 of BS2A*

**Capital for credit risk** is calculated by multiplying the value of exposures by a risk weight.

For drawn amounts of loans, the exposure is the amount owing. For undrawn amounts, including commitments, exposure is a prescribed portion of the undrawn amount. Exposure to derivative transactions is the sum of the current exposure and a prescribed future exposure.

The risk weight depends on the characteristics of the obligor or the exposure.

There are special rules for exposures to central counterparties, such as clearing houses.

There is an additional aggregate charge for exposures to derivative transactions, called the credit valuation adjustment.

Exposures or risk weights may sometimes be reduced if there is a netting agreement, collateral, a guarantee, or a credit derivative in place. Netting, which is only allowed for loans and deposits, or for repo-style transactions or over-the-counter derivatives transactions covered by netting agreements, reduces exposures. Collateral, which can only be certain financial collateral, either reduces exposures or risk weights. Credit guarantees and credit derivatives reduce risk weights.

**Capital for operational risk** is calculated as a portion of loan balances and gross income from operating activities not connected to the bank's lending business (e.g. gross fees from trading operations).

**Capital for market risk** is calculated for exposures to interest rate, exchange rate, and equity price movements.

For interest rate risk, assets and liabilities which are exposed to interest rate risk are put into categories by duration. Exposures are partially netted to reflect natural but imperfect hedges, and multiplied by a risk weight to get the capital requirement. Capital requirements are calculated separately for each currency. The total capital requirement is the greater of: the sum of positive exposures; and the absolute value of the sum of negative exposures.

For exchange rate risk, the capital amount is 8% of the absolute value of net financial assets denominated in a foreign currency. Exchange rate risk is calculated separately for each currency then added to find the total capital requirement.

For equity price risk, the capital amount is 8% of the absolute value of net equity exposures. Equity risk is calculated separately for each currency then added to find the total capital requirement.

#### Internal-models-based approach

*Subparts 4A-4B, 7, and 8 of BS2B*

**Capital for credit risk** is calculated using an equation. For each exposure the bank estimates a probability of default, a loss given default, and an exposure at default, using its own models (which have previously been approved by the Reserve Bank). These parameters are used in the equation.

There are several similar capital equations. The bank decides which equation to use based on the nature of the exposure.

Capital requirements for individual exposures are added to find the total capital requirement.

There are some hard limits on equation parameters. For instance, the loss-given default-parameter for residential mortgages is prescribed, and the loss-given-default parameter for farm lending exposures must be greater than or equal to a specified minimum.

Exposure at default for undrawn exposures is a portion of the undrawn amount, and with some exceptions the bank may use its own models to determine what portion to use. For derivatives, exposure at default is the sum of current exposure and a prescribed future exposure.

Exposures or risk weights may sometimes be reduced if there is a netting agreement, collateral, a guarantee, or a credit derivative in place. As in the standardised approach netting is only allowed for loans and deposits, or for repo-style transactions or over-the-counter derivatives transactions covered by netting agreements. Netting reduces exposures. Collateral of any kind is implicitly able to be recognised in internal models that determine loss given default. Credit guarantees and credit derivatives may reduce probability of default or loss given default estimates, according to how they are incorporated in a bank's internal models.

As in the standardised approach, there are different capital requirements for exposures to central counterparties, and there is an additional credit valuation adjustment for exposures to derivatives.

BS2B allows two internal-models-based approaches, the advanced internal-models-based approach (AIRB) and the foundation internal-models-based approach (FIRB). The

description above relates to AIRB. No New Zealand bank is currently accredited to use FIRB and the Reserve Bank has said that it will remove the option.

**Capital for operational risk** is calculated using a combination of internal loss data, external loss data, and the results of scenario modelling to estimate the distribution of losses. The data and scenarios must take into account losses in seven broad categories of operational risk. The bank has freedom to decide how much emphasis to give to each source of loss estimates.

The bank must hold capital which is sufficient to cover a loss at the 99.9<sup>th</sup> percentile of the estimated loss distribution. The capital must be equal to the sum of expected and unexpected losses unless the Reserve Bank has agreed that it can be only the unexpected losses.

The capital requirement may be reduced by up to 20% if there is insurance for operational risks.

**Capital for market risk** is calculated using the standardised approach.

#### *Funds management and securitisation*

##### *Part 6 of BS2A and Part 5 of BS2B*

Capital requirements are increased if the bank has close ties to funds management or securitisation vehicles.

The bank must consolidate a funds management or securitisation entity with the banking group for the purposes of calculating regulatory capital requirements if: the entity is consolidated for accounting purposes; the entity is a covered bond SPV; the bank provides unquantifiable credit enhancements to the entity and is associated with the entity; or the bank is associated with the entity and they are insufficiently separated.

Where the bank has securitised its assets and the issued securities have a shorter life than the assets, the bank must consolidate the assets.

If the bank provides credit enhancements to an associated funds management or securitisation entity and is not required to consolidate the entity, it will be required to reduce reported capital (either directly or by recognising expenses) by the amount of the enhancement.

#### *Insurance*

##### *Part 7 of BS2A and Part 6 of BS2B*

Capital requirements are increased if the bank has close ties to insurance businesses. The bank must reduce reported capital (either directly or by recognising expenses) by the amount of any credit enhancement to a member of an affiliated insurance group, and by the

entire amount of any funding exposures to an affiliated insurance group that is not sufficiently separated from the bank.

### **Operational and modelling requirements**

#### *Subpart 4C of BS2B*

Banks that use the internal-models-based approach must meet standards for documentation, data collection, design and operation of credit rating systems, model design and independent validation, use of models, stress-testing capability, audit, and resourcing.