

# EXTERNAL REVIEW OF THE RESERVE BANK OF NEW ZEALAND'S CAPITAL PROPOSALS

DR JAMES CUMMINGS  
OF MACQUARIE UNIVERSITY, AUSTRALIA

AUGUST 2019

This review was funded by the Reserve Bank of New Zealand (contract reference LEX748). The author gratefully acknowledges discussions with Geoff Bascand, Roger Beaumont, Matthew Brunton, Antony Buick-Constable, Paddy Davies, Richard Downing, Ashley Dunstan, Toby Fiennes, Susan Guthrie, Paula Hontalba, Noemi Javier, Charles Lilly, David McLean, Kieran Murray, Adrian Orr, Maisie Prior, Jim Reardon, Graham Scott, Walter Shea, Mark Weenink and Ian Woolford. Address correspondence to Dr James Cummings, Department of Applied Finance, Macquarie Business School, Macquarie University NSW 2109; telephone +61 2 9850 1169; fax +61 2 9850 9956; email [james.cummings@mq.edu.au](mailto:james.cummings@mq.edu.au).

## Contents

Executive summary.....	1
1. Introduction.....	5
2. New Zealand’s characteristics .....	5
2.1 Banking industry structure.....	5
2.2 Regulatory philosophy .....	6
2.3 Foundation for bank capital regulation.....	7
2.4 Overview of the current regulatory capital framework.....	7
3. Problems motivating the capital review.....	8
3.1 Review principles.....	9
3.2 Numerator (definition of eligible capital) .....	9
3.3 Denominator (measurement of risk-weighted exposures).....	10
3.4 Ratios (minimum requirements and capital buffers) .....	11
3.5 Efficiency and stability .....	11
3.6 Feedback from industry and the public.....	12
3.7 Summary .....	12
4. Definition of regulatory capital.....	13
4.1 Regulatory philosophy and bank resolution regime .....	13
4.2 International capital standards .....	13
4.3 Trans-Tasman context.....	14
4.4 Proposals for reform .....	15
4.5 Feedback from industry and the public.....	16
4.6 Response to submissions.....	16
4.7 Summary and recommendation .....	17
5. Risk-sensitivity of capital requirements.....	18
5.1 Problems with the use of internal models .....	18
5.2 Changes to international capital standards.....	19
5.3 Proposals for reform .....	19
5.4 Feedback from industry participants.....	20
5.5 Response to submissions.....	21
5.6 Summary and recommendation .....	22
6. Amount of regulatory capital .....	23
6.1 Risk-appetite framework.....	23
6.2 Reducing the incidence and severity of banking crises .....	23
6.3 Impact on bank funding costs .....	24
6.4 Optimal capital studies.....	25
6.5 Domestic circumstances.....	26
6.6 Prudential capital buffers .....	27
6.7 Identification of systemically important banks.....	27
6.8 Proposals for reform .....	28
6.9 Feedback from industry and the public.....	29
6.10 Summary and recommendation .....	30
7. Conclusion .....	32
References.....	33
Appendix 1. Terms of reference .....	38
Appendix 2. Biographical details.....	45

## Executive summary

The Reserve Bank of New Zealand began a review of the capital framework applying to locally incorporated banks in 2017. The purpose of the review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into consideration the country's experience with its existing framework and international developments in bank capital requirements. This report describes my review of the analysis and advice underpinning the Reserve Bank's capital proposals.

The main proposals made by the Reserve Bank include proposals to:

### *Definition of regulatory capital*

- Accept perpetual non-redeemable preference shares as additional tier 1 capital.
- Accept long-term redeemable preference shares and long-term subordinated debt as tier 2 capital.
- Remove the Basel III contractual loss-absorption features from the definition of capital.
- Explore the possibility of including a tier 1 capital instrument able to be issued by banks structured as mutual societies.

### *Measurement of risk*

- Retain the internal ratings-based (IRB) approach to credit risk as part of the capital framework for qualifying banks.
- Require IRB banks to use the standardised approach for any credit exposures in the sovereign and bank categories.
- Require IRB banks to report risk-weighted assets (RWA) calculated using the standardised approach alongside those calculated using the IRB approach (dual reporting).
- Constrain the RWA for credit risk calculated using the IRB approach by an output floor. This floor will be a proportion of the corresponding RWA calculated using the standardised approach.
- Adopt the Basel III standardised approach to operational risk for all banks.

### *Minimum capital ratios and buffers*

- Increase RWA for the four IRB-accredited banks to approximately 90 per cent of the level calculated under the standardised approach.
- Set a tier 1 capital requirement of 16 per cent of RWA for banks assessed to be systemically important and 15 per cent of RWA for other banks (comprising a minimum requirement of 6 per cent and a prudential capital buffer of 9-10 per cent).
- Assign 1.5 percentage points of the proposed prudential capital buffer requirements to a countercyclical component, which could be temporarily reduced to 0 per cent during periods of exceptional stress.
- Implement a staged transition to the revised framework over five years.

These proposals are based on sensible analysis and advice in the New Zealand-specific context. The analysis portrays the risks inherent in New Zealand's financial system and the Reserve Bank's regulatory philosophy. For example, the proposal to remove the contractual loss-absorption features from the definition of capital instruments is based on analysis of the incentive-compatibility and legal problems that reduce the appeal of the features in the New Zealand-context.

The analysis and advice also portray the insights from relevant research studies, international developments in bank capital requirements and feedback from industry and the public. For example, the proposals to place more stringent constraints on the use of IRB models take account of empirical evidence about the extent of inconsistent modelling practices between banks, recent changes to the international capital standards and feedback from industry participants about the impact of the IRB approach on banking competition.

The analytical approaches used by the Reserve Bank appropriately capture the relationship between bank capital and financial system soundness and efficiency. The proposal to increase the capital ratio requirements for New Zealand banks is based on empirical evidence about the amount of capital required to absorb losses in banking crises, portfolio risk modelling for the New Zealand banking system and analysis of the impact of the proposed requirements on lending rates and economic output. The proposals to expand the roles of prudential capital buffers are based on empirical evidence about the tendency of banks to manage their discretionary capital buffers in a pro-cyclical fashion.

The Reserve Bank has considered an appropriate range of information and consulted with its stakeholders throughout the capital review.

Based on my review of the analysis and advice underpinning the Reserve Bank's capital proposals, I make recommendations on three specific issues:

*1. Contractual loss-absorption features*

The proposal by the Reserve Bank to remove the contractual loss-absorption features from the definition of non-common equity capital instruments is reasonable, taking account of the uncertainty about the way in which the features can be used to recapitalise unlisted banks that are wholly owned subsidiaries of foreign parent banks. However, the proposal places greater reliance on the powers of a statutory manager to restructure the claims of preference shareholders and subordinated debtholders if a bank's common equity capital base falls below minimum regulatory requirements. There may be limited sources of new equity available to a statutory manager to support the restructuring of a failed bank.

I recommend that the Reserve Bank continue to monitor the performance of the Basel III loss-absorption features in other countries and assess whether the mechanisms can be adapted to suit New Zealand's circumstances. The monitoring should take account of the experience of the contractual loss-absorption features in countries with a significant presence of foreign-owned and unlisted banks. The contractual features that incorporate conversion to common equity may become feasible in New Zealand, if one or more of the large banks opts to list its common equity on a public stock exchange.

*2. IRB approach to credit risk*

Research commissioned by the Bank for International Settlements (2013a; 2016) identifies shortcomings in the modelling practices of IRB banks that contribute to unwarranted variability in the calculation of RWA for credit risk between banks. However, the research literature provides little guidance to prudential regulators about the extent to which internal models provide more accurate estimates of the capital required to support credit portfolios in an economic downturn than the Basel standardised model. This gap in the literature can be addressed using data made available by the proposed dual reporting of RWA using both the IRB and standardised approaches to credit risk.

Using the data provided by the banks through the dual reporting process, I recommend that the Reserve Bank investigate the extent to which the RWA amounts calculated using internal models provide a more accurate prediction of unexpected credit losses for IRB banks than those calculated using the standardised model. If the credit risk differentiation properties of the IRB approach cannot be supported empirically following the implementation of dual reporting, the Reserve Bank may wish to reconsider its policy of retaining the IRB approach as part of the capital framework.

### 3. *Impact of the proposals on bank funding costs*

The estimates derived by the Reserve Bank of the impact of higher capital requirements on bank funding costs are overstated. The Reserve Bank estimated that a one percentage point increase in the unweighted tier 1 capital ratio from current levels will lead to an increase of 6 basis points in banks' overall funding costs (Reserve Bank of New Zealand, 2019b: 37). The calculation by the Reserve Bank assumes that a representative equity risk premium for banks is 11.7 per cent above the cost of debt and that returns to shareholders in the form of dividends and capital gains are taxed at the same rate as interest receipts at the personal level.

However, the four large New Zealand banks can raise additional equity financing either by sourcing the equity through their Australian parent banks or by listing their equity on the New Zealand bourse. Based on data for equity returns and consensus analyst forecasts of earnings per share and dividends per share over the 1993-2017 period, Cummings and Nguyen (2019) estimate that the average equity risk premium for the Australian parent banks is about 6.7 per cent above the bank bill interest rate. This estimate is substantially lower than that used by the Reserve Bank. Furthermore, Dimson, Marsh and Staunton (2019) report that the long-run average equity risk premium for the New Zealand market is *not* larger than that for the Australian market. A lower equity risk premium will reduce the impact of increased equity financing on bank funding costs.

The cost of increased equity financing will be further reduced to the extent that returns to shareholders in the form of dividends and capital gains are taxed less heavily than interest receipts at the personal level. A cost-effective response of the four large New Zealand banks will be to raise additional equity financing by listing their common shares in New Zealand. The Australian parent banks need not relinquish their controlling stakes in the banks for the listings to occur. The raising of the additional equity financing in the New Zealand market will reduce the risk for the Australian parent banks that they potentially violate limits set by the Australian regulator on exposures to related parties. This response will allow the large New Zealand banks to distribute a substantially greater amount of imputation credits to New Zealand resident taxpayers. The value that investors attribute to the imputation credits for reducing their personal taxation liabilities will reduce the impact of increased equity financing on bank funding costs.

In its formal cost-benefit analysis of the capital proposals, I recommend that the Reserve Bank validate the parameters that it uses to estimate the impact of the proposed higher capital requirements on bank funding costs. The parameters used to capture the values of the equity risk premium and debt tax shield for banks should reflect market-based estimates that are relevant to the New Zealand banking industry.

## **1. Introduction**

The Reserve Bank of New Zealand (RBNZ) began a comprehensive review of the capital adequacy framework applying to locally incorporated banks in 2017. The purpose of the review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into consideration the country's experience with its existing framework and international developments in bank capital requirements.

In December 2018, the Reserve Bank published a consultation paper on proposed higher capital requirements for New Zealand banks. This was the fourth consultation paper published during the capital review. In the consultation paper, the main proposal was to increase the tier 1 capital requirement to 16 per cent of risk-weighted assets (RWA) for systemically important banks and to 15 per cent of RWA for other banks.<sup>1</sup> The current requirement is 8.5 per cent of RWA. The Reserve Bank received 161 submissions from the banking industry and the public and published a summary of the submissions on 1 July 2019. The Reserve Bank will respond to the issues raised in the submissions when it announces its final decisions in November 2019.

As part of the next stage of the capital review, the Reserve Bank announced that it would commission three external experts to independently review the Reserve Bank's analysis and advice underpinning the capital proposals. The external experts' mandate is to examine whether all relevant considerations have been identified in the review. The external experts are to take account of the objectives of the capital review, the domestic context, the research literature, the international debate and policy developments relating to the role of capital in supporting the soundness and efficiency of the financial system. The terms of reference for the external experts' reports are provided in appendix 1. My biographical details are provided in appendix 2.

## **2. New Zealand's characteristics**

### **2.1 Banking industry structure**

In a speech delivered to the New Zealand Bankers' Association (NZBA) on 7 March 2017, the RBNZ Deputy Governor, Grant Spencer, described domestic considerations that would be relevant to the review of the capital framework (see Spencer, 2007a). First, New Zealand's exports are concentrated in a small number of commodity-based sectors which can be subject to considerable price volatility. Bank exposures to commodity export industries are a key risk in the domestic system. Residential mortgage exposures are also a major source of risk given the system's heavy exposure to housing and the potential for house prices to become overvalued.

---

<sup>1</sup> A systemically important financial institution is defined as a financial institution whose distress or disorderly failure, because of its size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity.

Second, New Zealand is net debtor country, having run current account deficits continuously over the past forty years. About half of the country's gross external debt is issued by the New Zealand banking system which then on-lends to businesses and households. This reliance on external funding represents a significant vulnerability of the New Zealand system.

Third, New Zealand's financial system is less diversified relative to other countries. Financial intermediation is concentrated in a few large institutions and capital markets play a relatively minor role.

Fourth, ratings agency assessments of the large New Zealand banks are heavily influenced by expectations of support from their Australian parent banks. Under that Standard and Poor's regime, this factor lifts the ratings of the large New Zealand banks by an average of 4 notches from BBB+ on a standalone basis to AA-, the rating applied to the Australian parents. While the implicit support of the parent banks is valuable for the New Zealand system, it also represents a potential vulnerability.

## **2.2 Regulatory philosophy**

The New Zealand prudential framework seeks to reinforce incentives for banks and their creditors to understand and manage the risks they take. In a speech to the KangaNews New Zealand Debt Capital Markets Summit in Auckland on 2 Auckland 2017, Spencer (2017b) explained that the Reserve Bank's supervisory approach is based on three pillars: self-discipline, market discipline and regulatory discipline.

The self-discipline pillar aims to support institutions' internal risk management and governance. The primary responsibility for prudent risk management lies with the directors and senior management of banks. Providing boards and management with clearly defined incentives to act prudently is the highest priority of the regulatory framework.

The market discipline pillar seeks to reinforce incentives for prudent behaviour by requiring the disclosure of financial and risk-related information by banks and through the Reserve Bank's own publications (such as the *Financial Stability Review*). The aim is to increase market participants' understanding of the risks in the individual institutions and the wider financial system, enabling investors to differentiate between institutions and thereby exert market discipline on those institutions.

The third pillar of regulatory discipline involves the application of prudential standards intended to reduce various aspects of risk in the banks, for example by way of minimum capital and liquidity requirements. The Reserve Bank prefers to be less prescriptive than regulators in other jurisdictions, and instead rely on setting higher, more conservative buffers or limits on a narrower set of key metrics. A less activist approach to regulatory discipline is consistent with its emphasis on self-discipline and market discipline. Those disciplines can be eroded if institutions feel that the responsibility for risk management has been taken over by the regulator. The Reserve Bank considers that a less prescriptive approach is also less likely to impose excessive compliance and efficiency costs on industry participants.



## **2.3 Foundation for bank 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 mitigate against significant damage to the financial system that could result from the failure of a registered bank.

The capital adequacy framework for locally incorporated banks is set out in documents BS2A (Standardised Approach) and BS2B (Internal Models Based Approach) of the Reserve Bank's Banking Supervision Handbook. BS2A and BS2B are largely based on the set of international standards published by the Basel Committee on Banking Supervision (BCBS), known as Basel II and Basel III. However, New Zealand is not a member of the BCBS and is not obliged to adopt its standards. Although New Zealand's framework resembles the Basel II and Basel III capital frameworks, there are some differences.

## **2.4 Overview of the current regulatory capital framework**

The New Zealand 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 requirements if the bank has riskier exposures.

Capital is recognised in three tiers:

- common equity tier 1 (CET1) capital – includes ordinary shares, retained earnings and reserves;
- additional tier 1 (AT1) capital – includes preference shares and perpetual convertible securities; and
- tier 2 (T2) capital – includes long-term convertible securities.

For non-common equity instruments to qualify as capital under the Basel III rules, the instruments must contain loss-absorption features; in the form of contractual triggers for conversion to common equity or write off.

Under the capital adequacy framework banks are required to measure exposures to credit risk, operational risk and market risk. The amount of each exposure is adjusted for its 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 within restrictions set by the Reserve Bank to calculate risk-weighted exposures, if the Reserve Bank approves the models. The internal models approach consists of the internal ratings-based (IRB) approach to credit risk and the advanced modelling approach (AMA) to operational risk.

The capital adequacy framework imposes three minimum ratios:

- CET1 capital must be at least 4.5 per cent of risk-weighted exposures;
- tier 1 capital (CET1 plus AT1) must be at least 6.0 per cent of risk-weighted exposures; and
- total capital (CET1 plus AT1 plus T2) must be at least 8.0 per cent of risk-weighted exposures.

The minimum ratios are calculated for the registered banking group which includes the registered bank and associated entities. There is also a requirement to calculate and publish a solo ratio for the registered bank, but no minimum solo ratio is imposed.

It is a breach of a bank's conditions of registration if it fails to maintain any of the three minimum ratios.

In addition to the minimum ratios there is a conservation buffer requirement. Banks must have additional CET1 capital above minimum ratios equal to 2.5 per cent of risk-weighted exposures. This raises the *effective* minimum ratios to 7 per cent, 8.5 per cent and 10.5 per cent respectively. If a bank's buffer falls below 2.5 per cent, the conditions of registration restrict its ability to pay dividends or make other distributions.

A second buffer, the counter-cyclical capital buffer, is incorporated in the framework. The size of this buffer can be changed over time in response to cyclical pressures. It is currently set to zero, but if it were raised to a higher level it would be expected to work in a similar way to the conservation buffer.

### **3. Problems motivating the capital review**

The Reserve Bank began a review of the capital adequacy framework applying to locally incorporated banks. The aim of the capital review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking account of the country's experience with its existing framework and international developments in bank capital requirements.

The Reserve Bank announced that the capital review would focus on three components of the existing framework (Spencer, 2017a):

- the definition of eligible capital instruments;
- the measurement of risk; and
- the minimum capital ratios and buffers.

The Reserve Bank published an Issues Paper on 1 May 2017 to provide stakeholders with an outline of the areas of the capital adequacy framework the Reserve Bank intended to cover in the capital review and invite stakeholders to provide initial feedback on the potential scope of the review (see RBNZ, 2017a).

### 3.1 Review principles

The Reserve Bank established six high-level principles for the capital review (Spencer, 2017a; RBNZ, 2017a):

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.

### 3.2 Numerator (definition of eligible capital)

The function of capital is to absorb losses and prevent default on obligations to creditors, including depositors, or costs to taxpayers. From the perspective of a prudential regulator, CET1 capital is the highest quality form of capital because it is perpetual and absorbs losses freely. In this respect, AT1 and T2 capital are lower quality forms of capital. From the perspective of a bank however, AT1 and T2 capital may be attractive to issue because they provide a tax shield or because they do not interfere – in ordinary times – with control of the bank by existing shareholders.

A disadvantage of AT1 and T2 instruments is that there is uncertainty about the extent to which they will absorb losses when a bank gets into difficulty. The issuance of new shares prompted by a trigger event may have a signalling effect that damages the bank and results in market contagion. Furthermore, governments could feel obligated to intervene to protect holders from losses; and this would undermine one of the purposes of capital, which is to minimise costs to taxpayers when a bank becomes financially distressed.

As part of the review, the Reserve Bank indicated that it planned to further analyse and consult on (RBNZ, 2017a):

- which instruments should qualify as regulatory capital, in addition to common equity;
- which instruments or other balance sheet items should *not* qualify as regulatory capital or should be deducted to determine regulatory capital;
- how the components of capital should be measured;
- what contractual terms should be required for contingent convertible instruments, to the extent that these instruments continue to qualify as regulatory capital; and

- what process should be used to ensure contingent convertible capital instruments comply with the capital framework.

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

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

Basel Committee-member countries have expressed concerns about banks’ ability to objectively measure credit and operational risk, using their approved internal models (Bank for International Settlements, 2013b). The Reserve Bank’s experience is that it has been difficult to reconcile whether differences in capital requirements are due to differences in models or differences in the levels of underlying risk exposures.

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

The BCBS proposed the complete removal of the internal models approach for operational risk. It also proposed limitations on the use of internal models for credit risk, including the exclusion of some portfolios from the internal models approach and floors on model parameters and outputs. Additionally, the BCBS consulted on new standardised approaches that are more sensitive to risk than current ones.

As part of the review, the Reserve Bank indicated that it planned to further analyse and consult on (RBNZ, 2017a):

- whether the availability of the IRB approach to credit risk should be limited and whether there should be limits on model inputs or outputs;
- whether the AMA to operational risk should be available;
- whether the standardised approaches should 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 approach or AMA, to highlight gaps in outcomes under the different approaches; and
- whether the existing approach to market risk remains appropriate.

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

The actual capital ratios of New Zealand banks are, in the Reserve Bank's view, close to the median of ratios for banks in comparable countries (RBNZ, 2017a). Other countries, including Australia, have been moving to increase their actual capital ratios. Spencer (2017a) argued that it had become less clear whether New Zealand's historical position on bank capital was being maintained relative to Australia and other countries.

Other countries have increased capital requirements by, for example, increasing average risk weights and introducing additional capital requirements for systemically important banks. Some countries also make supervisory adjustments to required capital ratios, such as adjustments to reflect lack of diversification.

Other countries have sought to buttress minimum capital requirements with:

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

As part of the review, the Reserve Bank indicated that it planned to further analyse and consult on (RBNZ, 2017a):

- whether the current minimum capital ratios are sufficiently conservative;
- the appropriate mix of capital quality;
- the appropriate balance between hard minimum ratio requirements and buffers;
- whether specific add-ons for systemically important banks are justified;
- whether there should be add-ons for concentration risk;
- whether a TLAC regime would be useful;
- whether a leverage ratio should be reported and whether a minimum level should be required; and
- whether the existing solo ratio disclosure requirement should be retained or strengthened.

The Reserve Bank acknowledged that the three components of the review are interrelated and will ultimately need to be considered in combination, to ensure that final policy decisions are internally consistent (Spencer, 2017a; RBNZ, 2017a).

### **3.5 Efficiency and stability**

In setting capital requirements, the Reserve Bank recognises that it needs to balance the benefits of higher capital against the costs (Spencer, 2017a; RBNZ, 2017a).

The Reserve Bank expects that a higher level of capital will reduce the probability and severity of bank failures and will assist in smoothing out credit cycles.

Using capital has a direct cost for banks, because the holders of the capital instruments need to be remunerated. In the context of debt tax shields and implicit subsidies, capital may be more costly for banks than other sources of funding such as retail deposits or wholesale debt (Miles, Yang and Marcheggiano, 2013).

The Reserve Bank intended that its six high-level principles for the review would help achieve a balanced policy outcome, by ensuring that the benefits of capital would be realised in practice, that capital requirements would be suitably conservative (commensurate with the risks of individual exposures and New Zealand's circumstances) and would be relatively simple.

### **3.6 Feedback from industry and the public**

The Reserve Bank invited readers of the first consultation paper to indicate whether the list of topics to be considered by the review was complete and whether the Reserve Bank had identified the main issues to be addressed for each topic.

The Reserve Bank received twenty submissions from industry participants and members of the public and published a summary of the submissions on 19 October 2017 (RBNZ, 2017c). The Reserve Bank undertook to respond to the points raised in submissions as part of the detailed consultations.

### **3.7 Summary**

The Reserve Bank began a review of the capital adequacy framework applying to locally incorporated banks in 2017. The Reserve Bank established six-high level principles for the review, which reflect the structure of New Zealand's banking industry and the Reserve Bank's regulatory philosophy. The Reserve Bank announced that the capital review would focus on three components of its existing framework: the definition of regulatory capital, the measurement of risk and the level of minimum capital requirements. The Reserve Bank identified a range of weaknesses in its existing framework, based on the country's experience with its existing framework and international developments in bank capital requirements. The Reserve Bank invited feedback from industry participants and the public about the scope of the review and undertook to respond to the issues raised in submissions as part of the detailed consultations.

## **4. Definition of regulatory capital**

The Reserve Bank published an Issues Paper on 14 July 2017 to seek feedback about what types of financial instruments should qualify as bank capital (RBNZ, 2017c). In New Zealand, relevant context is provided by the Reserve Bank's regulatory philosophy and bank resolution regime, international standards published by the Basel Committee and the trans-Tasman nature of New Zealand banking.

### **4.1 Regulatory philosophy and bank resolution regime**

An important context for New Zealand's bank capital regulations is the regulatory philosophy applied by the Reserve Bank. This has led to a regulatory regime with a number of unique features relative to other jurisdictions, including: a narrower range of regulatory requirements; an emphasis on self-discipline that assigns ultimate responsibility for risk management to directors and senior management; and an emphasis on the role of market discipline from depositors, investors, rating agencies and other market participants in contributing to the soundness of a financial institution.

The capital framework is designed to minimise, as far as possible, perverse incentives (moral hazard) that can result from a more intrusive approach to regulation and supervision. Emphasising this focus on mitigating moral hazard has been the absence of a permanent deposit insurance scheme. Instead, all banks with retail deposits over NZ\$1 billion are required to abide by New Zealand's Open Bank Resolution (OBR) policy (see *Open Bank Resolution Pre-positioning Requirements Policy, Document BS17*, September 2013). This policy is designed to ensure a distressed bank remains 'open-for-business' – thus minimising disruption to the payments system and bank customers' access to liquidity – while regulator-appointed managers determine the bank's future. Banks are not subject to on-site inspections or other resource-intensive regulatory assessments.

### **4.2 International capital standards**

Though not a member of the Basel Committee, New Zealand is heavily dependent on international credit markets. To maintain international confidence in its banking sector, New Zealand has primarily based its regulations on the Basel Committee standards but has implemented modifications, reflecting the country's circumstances and the goal of having a relatively conservative regime. Where there are modified local requirements, the Reserve Bank has sought to maintain the confidence of foreign lenders by providing a clear rationale for the requirements.

The 2007-2009 financial crisis demonstrated that banks in several countries were not maintaining enough loss-absorbing capital for the risks they were taking (Demirgüç-Kunt, Detragiache and Merrouche, 2013; Miles, Yang and Marcheggiano, 2013). Although banking regulators were equipped with tools to intervene to resolve failing banks and to seek to contain contagious effects for the financial system, they were in many cases slow to respond. The regulators were unable to prevent contagion and, when they eventually intervened, they

committed substantial taxpayer funds to support distressed banks (Flannery and Giacomini, 2015).

The experience of the financial crisis stimulated an interest among regulators and financial economists in debt instruments that might automatically replenish shareholder equity when a bank's solvency position deteriorates (Calomiris and Herring, 2013; Chen, Glasserman, Nouri and Pelger, 2017). The idea behind such instruments is that they would address the difficulty of a bank in raising common equity when its financial condition has deteriorated and mitigate against any tardiness in the regulator's response. The debt obligation would be extinguished when the solvency position of the bank fell below a pre-defined level and investors would be compensated for the debt write off by receiving newly issued shares (an outcome known as conversion).

Hybrid debt-equity financial instruments, which qualified as capital under the pre-Basel III regime, did not absorb losses as expected. Therefore, the reform agenda in the post-financial crisis period included redefining the type of non-common equity instruments that would qualify as capital. For non-common equity instruments to qualify as capital under the Basel III rules, the instruments must contain loss-absorption features; in the form of standardised contractual triggers for conversion to common equity or write off. These contractual trigger mechanisms became a part of the New Zealand bank capital regime in 2013, as a result of New Zealand adopting most aspects of Basel III. However, the contractual trigger mechanisms may to some degree be redundant in the New Zealand context, given the inclusion of non-common equity capital instruments in the bank resolution regime. The bank resolution regime provides an option to allocate losses to the creditors of a failed bank. If a bank is placed into statutory management, the claims of capital providers and other subordinated creditors will be fully frozen and will not be available for payment unless senior creditors are paid in full.

### **4.3 Trans-Tasman context**

The extent to which the contractual trigger mechanisms contribute towards the efficient resolution of a distressed bank can be expected to be impacted by the ownership structure of the bank. The ownership structure of the bank will influence the steps taken by the bank to mitigate against the contractual triggers being activated and the value of the consideration offered to security holders with the conversion of the instruments. In this respect, the New Zealand banking industry is dominated by four large banks that are locally incorporated subsidiaries of Australian-incorporated banking parents.<sup>2</sup> Actions that may potentially be taken by the Australian banking parents in relation to the contractual triggers that bind the New Zealand subsidiaries create a large degree of uncertainty for the outcome of any resolution process in New Zealand.

---

<sup>2</sup> Between them, the four large banks account for almost ninety per cent of aggregate bank assets in New Zealand.



Almost ninety per cent of the additional tier 1 capital issued in New Zealand by the four large banks has been issued to parent entities (or a branch of the parent entity). The equity value of the subsidiary cannot be established by reference to listed equity prices (the subsidiary banks are not currently listed). Hence the equity value of the subsidiary is uncertain and subject to potential dispute. This uncertainty may create an opportunity for an Australian parent bank to manipulate the loss-absorption triggers for capital instruments they have acquired from a New Zealand subsidiary.

The four large banks are subject to Australian and New Zealand bank capital regulations – financial instruments issued by them potentially qualify as capital both for the New Zealand bank and for the Australian parent.

The Australian regulator’s requirements of the Australian parent banks flow through to the terms and conditions of the instruments issued by their New Zealand subsidiary banks and these may be problematic in the New Zealand context (RBNZ, 2017b). An example is the requirement that, to be recognised as capital for the Australian parent, contingent debt issued by the New Zealand subsidiary must, if it offers conversion, convert into listed ordinary shares (the New Zealand subsidiaries do not currently list their ordinary shares).

As well as the Australian parent banks playing a large role as purchasers of the contingent debt and preference shares issued by the four large New Zealand banks, the parent banks have been included in instruments sold to external investors as the issuers of new shares when compensation is required for debt write off. If a conversion trigger is activated, the common equity of the New Zealand bank is replenished via a coordination agreement between the New Zealand bank and its Australian parent bank. However, the coordination agreement is covered by Australian law and the recapitalisation of the New Zealand bank can potentially be disrupted by actions taken through the Australian courts. These arrangements introduce legal uncertainty, that weighs against the reliability of the instruments for absorbing bank losses.

#### **4.4 Proposals for reform**

The Reserve Bank argued that reforms to the types of instruments that can qualify as capital would result in a range of benefits: reduced complexity in the capital regime; greater certainty as to the loss-absorbing quality of regulatory capital; a more level playing field; and a reduced risk of regulatory arbitrage. The Reserve Bank’s preferred set of reforms comprised the following:

- Include a clear definition of ‘preference share’ in the regulations and have specific regulatory requirements for preference shares.
- Recognise only non-contingent preference shares as capital (that is, do not accept as capital preference shares that are triggered to write off or convert to ordinary shares).

- Recognise only non-redeemable preference shares as capital.
- Limit tier 1 capital to common equity and appropriately configured preference shares.
- Only accept non-contingent subordinated debt as tier 2 capital.

#### **4.5 Feedback from industry and the public**

The Reserve Bank received seventeen submissions from industry and the public and published its response to submissions on 19 December 2017 (RBNZ, 2017d).

A common theme among the submissions was opposition to the proposal to cease recognising contingent convertible debt as capital. Banks were concerned about the potential impact of this proposal on funding options at the parent group level, local financial markets, the cost of capital, the self-reliance of New Zealand banks and foreign investor confidence in New Zealand banks.

Several of the smaller banks indicated that they would prefer new instruments to be included in the regime, rather than the proposal to remove contingent convertible debt. Banks structured as mutual societies requested that a mutual society tier 1 instrument be included in the regime.

Another theme was opposition to the proposal that, in order to qualify as tier 1 capital, perpetual preference shares must be non-redeemable. Industry participants expressed concern about a lack of investor appetite for such instruments. There was also scepticism that banks could be prevented from designing structures that would provide an optional call feature for 'non-redeemable' preference shares.

#### **4.6 Response to submissions**

After considering the feedback provided in submissions, the Reserve Bank made in-principle decisions with respect to key aspects of the definition of capital. The Reserve Bank made decisions that:

- Tier 1 capital will consist of common equity and perpetual non-redeemable preference shares (not contingent convertible debt).
- Tier 2 capital will consist of long-term redeemable preference shares and long-term subordinated debt (not contingent convertible debt).
- The Reserve Bank will explore the possibility of including a tier 1 capital instrument able to be issued by banks structured as mutual societies.

In its response to submissions, the Reserve Bank maintained its view that contingent debt should not be a part of the capital regime and that only common equity and preference shares that are non-redeemable (and have no contingent triggers) should qualify as tier 1 capital.

However, the Reserve Bank accepted that redeemable preference shares provide ‘gone-concern’ capital and thus warrant consideration as tier 2 capital.

The Reserve Bank also indicated that it would consider including a bespoke tier 1 instrument for banks structured as mutual societies.

#### **4.7 Summary and recommendation**

In reviewing its policies on the definition of regulatory capital, the Reserve Bank has taken account of its regulatory philosophy and bank resolution regime, its experience with the contractual loss-absorption features for non-common equity instruments under the Basel III rules, the ownership structure of the four large New Zealand banks and feedback provided by banking industry participants. The decisions made by the Reserve Bank reflect its confidence in the powers of a statutory manager to impose losses on the uninsured creditors of a failed bank, incentive-compatibility and legal problems associated with contractual bail-in mechanisms involving foreign parent banks and impediments faced by smaller banks in accessing the capital markets.

The decision by the Reserve Bank to remove the contractual loss-absorption mechanisms from non-common equity capital instruments is reasonable, taking account of the uncertainty about the way in which the mechanisms can be used to recapitalise unlisted banks that are wholly owned subsidiaries of foreign parent banks. However, the decision by the Reserve Bank places greater reliance on the powers of a statutory manager to restructure the claims of preference shareholders and subordinated debtholders if a bank’s common equity capital base falls below minimum regulatory requirements. There may be limited sources of new equity available to a statutory manager to support the restructuring of a failed bank.

To address this concern, the Reserve Bank should continue to monitor the performance of the contractual loss-absorption mechanisms in other countries and consider whether the mechanisms can be adapted to suit New Zealand’s circumstances. The monitoring should take account of the experience of the contractual loss-absorption triggers in countries with a significant presence of foreign-owned and unlisted banks. As far as historical data allow, the monitoring should compare the performance of the contractual loss-absorption features included in the Basel III framework with the statutory loss-absorption features included in countries’ bank resolution frameworks. The contractual mechanisms that incorporate conversion to common equity may become feasible in New Zealand, if one or more of the large banks opts to list its common equity on a public stock exchange.

## **5. Risk-sensitivity of capital requirements**

In a consultation paper published on 19 December 2017 (RBNZ, 2017e), the Reserve Bank provided evidence about problems with the calculation of the banks' risk exposures and options for responding to the problems.

### **5.1 Problems with the use of internal models**

Statistical data for Australia and New Zealand suggest that minimum capital requirements decreased significantly after banks were permitted to use their internal models for parts of the capital calculation (Australian Prudential Regulation Authority, APRA, 2014: 72-82; RBNZ, 2017e: 13-15).<sup>3</sup> The capital concessions provided to IRB banks under the Basel II framework, to incentivise banks to enhance their risk management capabilities, are likely to have been excessively generous and placed non-IRB banks at a competitive disadvantage.

International studies suggest that internal models outcomes are inconsistent (Bank for International Settlements, 2013a; 2016; European Banking Authority, 2019). Different banks often come up with similar rankings of risk, but the absolute levels of risk are substantially different even for the same obligors. The evidence is clearest for exposures to governments, banks and large corporations, but there is also evidence of problems for other portfolios such as residential mortgages and small and medium-sized enterprise (SME) lending.

The international evidence does not necessarily reflect the implementation of the IRB approach in New Zealand. However, international studies demonstrate that it is difficult for supervisors to verify that the results of banks' internal models accurately reflect risk. To evaluate the reliability of the modelling outputs, the Reserve Bank has run hypothetical portfolio exercises where banks have been required to generate risk weights for common obligors. However, this approach is less suitable for the retail and SME portfolios where New Zealand banks are heavily weighted.

It is also difficult for external investors to assess the appropriateness of outcomes from banks' internal models. Banks in New Zealand are required to report risk weights by asset class but are not required to break down the risk weights by standardised risk measures (such as the security coverage ratio) to allow greater comparison between banks. The banks are not required to publicly disclose the inputs or documentation for their internal models.

There are incentives for banks to manipulate their models to produce lower capital requirements and the findings of international studies suggest that banks have acted on these incentives (Mariathan and Merrouche, 2014; Plosser and Santos, 2014).

---

<sup>3</sup> The four large New Zealand banks have been accredited to use their own internal models for calculating the capital required for credit risk exposures and operational risk exposures.

## **5.2 Changes to international capital standards**

The Basel Committee on Banking Supervision finalised the Basel III framework in December 2017 (Bank for International Settlements, 2017). The new framework constrains the outputs of internal models and imposes an overall floor – based on the risk assessed under the standardised approach – on the average risk weight, to prevent it from varying too much from a common level.

The Basel framework makes the standardised approach more sensitive to risk by introducing new asset classes for specialised lending, commercial and residential real estate and land and property development.

The changes made by the Basel Committee are intended to address the shortcomings of banks' internal modelling and to achieve greater alignment between the IRB and standardised approaches.

The Basel Committee has also made changes to the operational risk capital requirements. The existing internal model and standardised approaches are replaced by a new standardised approach, which uses banks' revenue streams as a key indicator of operational risk but also allows some banks to take account of their previous experience of losses due to operational risk. The internal models approach is to be removed because a consensus about how to model operational risk has not been reached.

In 2019 the Basel Committee finalised changes to the market risk capital requirements (see Bank for International Settlements, 2019). There are new internal models and standardised approaches that aim to address shortcomings in the market risk framework identified during the 2007-2009 financial crisis. The Basel Committee has also proposed a simplified standardised approach for smaller institutions with conventional banking operations.

## **5.3 Proposals for reform**

The Reserve Bank initially favoured extending the Basel Committee's proposals so that the IRB approach would no longer be available for any exposure that is externally rated.

The Reserve Bank expected that it would calibrate the proposed capital floor at a level that is appropriate for New Zealand.

The Reserve Bank also proposed a requirement that standardised risk weights be reported alongside IRB risk weights, to make it easier for external observers to identify unusually high or low model results.

For the standardised approach to credit risk, the Reserve Bank proposed to retain its existing requirements. New Zealand's current approach is relatively risk sensitive and, therefore, the new Basel approach would deliver a less substantial benefit if it were to be introduced. New Zealand's approach is more conservative for exposures that are common in New Zealand.

For operational risk, the Reserve Bank proposed to adopt the Basel approach. This approach would be simpler to administer and would increase conservatism and transparency.

For market risk, the Reserve Bank proposed to retain existing requirements. The Reserve Bank acknowledged that the existing standard could be modernised in some areas, but it regarded replacing the market risk requirements as a lower priority than other work relating to capital requirements.

#### **5.4 Feedback from industry participants**

The Reserve Bank received nine submissions from industry participants and published its response to submissions on 6 July 2018 (RBNZ, 2018).

Most submissions were in favour of harmonising New Zealand's capital framework with the newly revised Basel III standards or with APRA's framework (to the extent that APRA departs from Basel III). The advantages of harmonisation identified in submissions included administrative efficiencies for banks and regulators and the potential for a greater understanding of the New Zealand framework among market participants including ratings agencies and investors.

Submissions varied widely as to the benefits of allowing risk modelling in the capital regime. The IRB banks emphasised the potential benefits of permitting models. For example, allowing banks to distinguish between low-risk and high-risk credit exposures within an asset class means there is no capital penalty for investing in low-risk assets. Some submissions argued that allowing banks to use models to calculate RWA encourages them to invest in better risk management systems. Other submissions argued that being allowed to model RWA provides the four large banks with an unjustified competitive advantage. These submissions claimed that the major retail credit portfolios of the four large banks are unlikely to be materially different in terms of risk from those held by the standardised banks, but the four large banks are permitted to allocate less capital to support the portfolios than standardised banks because the IRB models produce lower RWA values. Some submissions argued that the IRB approach introduces unnecessary complexity and opacity into the capital framework.

Views about the proposal to require IRB banks to report RWA for credit risk using both the IRB approach and the standardised approach were mixed. Some standardised banks supported the policy (although these banks were generally unconvinced about the value of retaining internal modelling in the framework). Banks that opposed the proposal argued that it would be confusing for third parties to interpret two reported capital ratios (one using the modelled RWA and another using the standardised RWA), that it would be burdensome to explain the differences between the two calculations and that it would be costly to produce the additional information.

On the issue of output floors, the IRB banks raised concerns about international harmonisation and the appropriate level of the floor. Some banks supported following the

Basel standards and thus applying the floor at the total portfolio level. Some banks supported following Basel and APRA standards when setting the percentage of the standardised risk weight that will be used to anchor the model RWA.

The IRB banks preferred more limited constraints on their modelling as opposed to the complete replacement of modelled outputs with standardised risk weights for externally rated exposures.

Views about the standardised approach to credit risk were mixed, with some of the smaller banks favouring the new Basel framework. Two banks sought changes to the treatment of unrated corporate exposures, arguing that the current blanket 100 per cent risk weight penalises less risky exposures. Another bank argued that the current approach to residential mortgages should be revised to incorporate other known drivers of risk.

Most submissions supported adopting the Basel standardised approach to operational risk, but some banks had reservations about the Basel adjustment for the historical loss experience of banks, suggesting that it will be likely to be a poor predictor of future losses.

Most industry participants supported retaining the current framework for market risk. The submissions generally expressed the view that, because New Zealand banks have mostly conventional business models, with profits reliant on lending-related income rather than trading-related income, the level of market risk is low and there is little justification for augmenting the current standardised approach.

## **5.5 Response to submissions**

After considering the feedback provided in submissions the Reserve Bank made five in-principle decisions (RBNZ, 2018; RNBZ, 2019a):

- The capital framework will continue to allow qualifying banks to use internal models to calculate RWA for credit risk (the IRB approach).
- The IRB approach will not be permitted for any credit exposures in the sovereign and bank (including public sector entities) categories.
- The RWA for credit risk calculated using the IRB approach will be constrained by an output floor. This floor will be a proportion of the corresponding RWA calculated using the standardised approach.
- All banks will calculate RWA for operational risk using the Basel Committee's standardised approach.
- IRB banks will be required to report RWA using both the IRB approach and the standardised approach (dual reporting).

The Reserve Bank holds the view that there are potentially net benefits in allowing qualified banks to model RWA for credit risk. However, it continues to believe that credit risk models need to be further constrained in view of New Zealand's experience with the IRB framework. This view is consistent with the view about internal models held by the Basel Committee and many overseas regulators.

The decisions in relation to externally rated exposures, the output floor and operational risk measurement are steps to impose greater constraints on internal models, create a more level playing field among IRB banks and between IRB banks and standardised banks and promote confidence in the IRB framework. The Reserve Bank argues that dual reporting will bring improvements in transparency and market discipline, in the case of banks accredited to calculate RWA using their own models.

## **5.6 Summary and recommendation**

In reviewing its policies on the calculation of risk-weighted assets, the Reserve Bank has taken account of problems associated with the use of internal models, recent changes to the international capital standards that place greater restrictions on IRB modelling practices and feedback provided by banking industry participants. The decisions made by the Reserve Bank reflect industry concerns about inconsistencies between IRB banks in the application of their models, the adverse impact of capital concessions to IRB banks on industry competition and evidence about the potentially damaging incentives for banks to manipulate model outcomes.

The Basel Committee's research identifies shortcomings in the modelling practices of IRB banks that contribute to unwarranted variability in the calculation of RWA for credit risk between IRB banks (Bank for International Settlements, 2013a; 2016). However, previous research does not benchmark the risk differentiation properties of the IRB approach against those of the standardised approach. In particular, the research literature provides little guidance to prudential regulators about the extent to which internal models provide more accurate estimates of the capital required to support credit portfolios in an economic downturn than the Basel standardised model. This gap in the literature can be addressed using data made available by the proposed dual reporting of RWA using both the IRB and standardised approaches to credit risk.

Using the data provided by the banks through the dual reporting process, the Reserve Bank should investigate the extent to which the RWA amounts calculated using internal models provide a more accurate prediction of unexpected credit losses for IRB banks than those calculated using the standardised model. If the credit risk differentiation properties of the IRB approach cannot be supported empirically following the implementation of dual reporting, the Reserve Bank may wish to reconsider its policy of retaining the IRB approach as part of the capital framework. If the IRB approach were to be removed from the capital framework, banks could be expected to continue to utilise their proprietary credit risk models, but only to the extent that the models are valuable to the banks for loan pricing and loan portfolio allocation decisions.



## **6. Amount of regulatory capital**

The fourth consultation paper, which was released on 14 December 2018 and revised on 25 January 2019, sought public views on a proposal to increase the minimum level of regulatory capital in the banking industry (RBNZ, 2019a).

### **6.1 Risk-appetite framework**

In the consultation paper the Reserve Bank outlined the risk appetite framework that it used to arrive at its proposed capital requirements. The framework aims to meet two policy goals (RBNZ, 2019b: 11-6): (i) to ensure that the banking industry has the confidence of depositors and other creditors even when it is subject to extreme shocks (promote soundness); and (ii) to further improve soundness to the extent that there is no adverse impact on expected economic output (promote efficiency).

The Reserve Bank has specified that it wants enough capital in the banking system to cover losses that are so large that they might occur only very infrequently (for example, once in every 200 years). The Reserve Bank believes that this objective is reasonable and consistent with its legislated responsibility to maintain financial system soundness (RBNZ, 2019b: 16-20).

### **6.2 Reducing the incidence and severity of banking crises**

The main benefit of better capitalised banks is a reduced probability of a banking crisis and its associated impact on economic output.<sup>4</sup> Banking crises are shown to generate substantial economic costs. Historical evidence suggests that, in any given country, banking crises occur on average once every 20 to 25 years (Bank for International Settlements, 2010: 8-9). That is, the annual probability of a crisis is of the order of 4 to 5 per cent. Based on a survey of comparable studies by the Basel Committee on Banking Supervision, the median cumulative output cost of a banking crisis is 19 per cent of pre-crisis gross domestic product (GDP) if growth recovers to its pre-crisis trend; or 158 per cent of pre-crisis GDP if the crisis has a permanent effect (Bank for International Settlements, 2010: 11).

Laeven and Valencia (2018) compile a list of systemic banking crises over the period 1970-2017 (comprising 151 banking crises).<sup>5</sup> They find that crises in high-income countries tend to last longer and be associated with larger output losses and increases in public debt than those in low and middle-income countries. The larger output losses can be explained by the presence of larger and deeper financial systems, making a banking crisis more disruptive. The

---

<sup>4</sup> Another benefit reflects a reduction in the amplitude of fluctuations in economic output during non-crisis periods (Bank for International Settlements, 2010: 18-20).

<sup>5</sup> Laeven and Valencia identify a banking crisis as systemic if two conditions are met: (i) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system and/or bank liquidations) and (ii) significant banking policy intervention measures in response to significant losses in the banking system.

larger increases in public debt are related to the larger output losses and a greater capacity of high-income countries to use fiscal stimulus during banking crises.

Dagher, Dell’Ariccia, Laeven, Ratnovski and Tong (2016) measure the benefits of bank capital against the benchmark of how much capital would have been needed to avoid imposing losses on bank creditors or resorting to public recapitalisations in past banking crises. They find that capital in the range of 15-23 percent of risk-weighted assets would have been enough to absorb losses in most past banking crises (at least in advanced economies). Further capital increases would have had only marginal effects on preventing additional crises, suggesting that this level of loss-absorption capacity is, on average, appropriate for advanced economies.

### **6.3 Impact on bank funding costs**

In the frictionless and tax-free world considered by Modigliani and Miller (1958), the proportion of equity capital included in a firm’s capital structure has no effect on the overall cost of funding the firm. The MM theorem states that, absent additional considerations such as those involving interest tax shields and financial distress costs, an increase in the proportion of equity financing simply changes how risk is allocated among the various investors in the company (that is, the holders of debt, equity and any hybrid instruments issued by the company). The total risk to which all investors are exposed does not change and is determined by the risk that is inherent in the company’s asset returns. In a market in which risk is priced correctly, an increase in the proportion of equity financing lowers the returns demanded by both equity-holders and debtholders in a way that leaves the total funding costs of the company the same.

In practice, there are reasons why the MM predictions may not hold exactly for banks.<sup>6</sup> First, an increase in equity financing may mean that banks forgo some of the tax advantage associated with debt financing (Schepens, 2016). Banks can deduct interest payments as an expense to set against their corporate tax payments.<sup>7</sup> Second, an increase in equity financing may limit the extent to which banks can take advantage of subsidised funding sources. Deposit guarantees, unless they are charged at an actuarially fair rate, may provide banks with an incentive to substitute equity finance with deposit finance (Demirgüç-Kunt and Huizinga, 2004). To the extent that investor expectations of government support are embedded in the credit spreads on banks’ wholesale debt, the cost of that type of debt will also fall relative to equity (Ueda and Weder di Mauro, 2013; Cummings and Guo, 2019). If equity investors anticipate that government support for the banking industry reduces the probability of them being wiped out in disaster states, they may be less perturbed about any

---

<sup>6</sup> There is also an argument that the MM theorem does not apply to banks, because customers value the services that come bundled with deposits in addition to the returns they provide (DeAngelo and Stulz, 2015). These services include ready access to cash through ATMs and transaction services from online accounts, bank transfers and credit and debit cards. However, to the extent that the market for deposits is competitive, the value of the additional services will be appropriated by investors rather than by banks themselves.

<sup>7</sup> This effect can be reduced if returns to equity investors in the form of dividends and capital gains are taxed less heavily than interest receipts at the personal level.

tail risk taken on by banks (Gandhi and Lustig, 2015). These distortions can be expected to weaken the pricing response in both debt and equity markets to changes in equity financing by banks.

However, the distortions created by tax considerations and bank funding subsidies do not completely nullify the mechanism underlying the MM result: Increasing the required proportion of equity financing, relative to debt financing, should reduce the returns demanded by equity-holders because the reduced leverage reduces the volatility and thus the systematic risk of the equity returns (Miller, 1995; Brealey, 2006). Based on regression analysis of the relationship between equity betas and book value-based leverage levels for United Kingdom banks, Miles, Yang and Marcheggiano (2013) find that the MM theorem effect is between 45 per cent and 75 per cent as large as it would be if the MM theorem held exactly. For Swiss banks, Junge and Kugler (2013) report similar findings.

Studies examining the pre-Basel III implementation period suggest that the long-run costs of stricter capital requirements for banks are small, even if there are substantial departures from the MM predictions and extra tax paid by banks is lost to the economy. The findings of Miles, Yang and Marcheggiano (2013) suggest that the long-run impact on bank funding costs will be about 2-7 basis points for each one percentage point increase in the unweighted tier 1 capital ratio, that is, the ratio of tier 1 capital to unweighted assets.<sup>8</sup>

The long-run increase in banks' funding costs, resulting from higher capital requirements, may have a materially detrimental impact for economic output if banks pass on the additional costs to borrowers and the government does not seek to neutralise the impact of the higher borrowing costs.

#### **6.4 Optimal capital studies**

Studies conducted after the 2007-2009 financial crisis have compared the economic costs and benefits of higher capital requirements under a range of modelling assumptions (Bank for International Settlements, 2010; Miles, Yang and Marcheggiano, 2013; Brooke, Bush, Edwards, Ellis, Francis, Harimohan, Neiss and Siegert, 2015; Federal Reserve Bank of Minneapolis, 2016; Firestone, Lorenc and Ranish, 2017). These studies find that the amount of equity capital that is likely to be desirable for banks to use is substantially higher than the baseline requirements agreed under the Basel III framework.

In the United Kingdom, Miles, Yang and Marcheggiano (2013) find that even substantially higher capital requirements are likely to result in a small long-run impact on the borrowing costs faced by bank customers. However, higher capital requirements could create very large benefits by reducing the probability of systemic banking crises. Miles, Yang and Marcheggiano's results suggest that the amount of equity funding that is likely to be desirable

---

<sup>8</sup> The lower end of the range suggested by Miles, Yang and Marcheggiano's analysis corresponds to no tax effect and an MM effect of 75 per cent. The upper end of the range corresponds to a tax effect and an MM effect of 45 per cent.

for banks is around 20 per cent of RWA (where the average risk weight, RWA to total assets, was anticipated to be approximately 50 per cent under the Basel III regime).

In the United States, Firestone, Lorenc and Ranish (2017) provide estimates of optimal capital levels under a variety of assumptions about the cost of financial crises and the extent to which lending rates could rise in response to higher levels of bank capital. When using a low estimate of the benefits and a high estimate of the costs of capital, their results suggest an optimal tier 1 capital ratio of around 13 per cent of RWA (in a market where the average risk weight is approximately 66 per cent of total assets). When using higher estimates of the benefits of capital, their results suggest an optimal tier 1 capital ratio above 25 per cent of RWA.

## **6.5 Domestic circumstances**

To understand the relationship between regulatory capital and the probability of a banking crisis in New Zealand, the Reserve Bank conducted portfolio risk modelling (RBNZ, 2019a: 22-4; 2019b: 20-32). The analysis used an asymptotic single risk factor (ASRF) model to evaluate the level of tier 1 capital that can be expected to be adequate to maintain the viability of the banking system in the event of a severe shock. The analysis focused on the range of losses that could potentially materialise from the aggregate portfolio of loans outstanding in the New Zealand banking system. Based on a range of input values for the probability of default (PD), loss given default (LGD) and asset correlation ( $\rho$ ), the results of the risk analysis suggest that tier 1 capital of 16 per cent of RWA would be enough to cover credit-related losses in extreme conditions.

Recent stress tests have demonstrated that New Zealand banks can continue to meet existing capital standards during a severe economic downturn (RBNZ, 2019a: 24-5). During a 2017 stress test, the capital ratios of major banks decreased to around 125 basis points above minimum requirements (Lilly, 2018). However, the stress test results are sensitive to the assumptions made with respect to the scale and timing of credit losses and to the ability of banks to generate earnings in stressed conditions.

The Reserve Bank used the methodology of Firestone, Lorenc and Ranish (2017) to estimate the impact of increases in capital on bank funding costs and domestic economic output (RBNZ, 2019b: 36-40). The results suggest that a one percentage point increase in the unweighted tier 1 capital ratio will result in an increase of 6 basis points in the overall cost of funding banks' assets; and that the increase of 6 basis points in banks' funding costs will lead to a reduction of 8 basis points in potential economic output. The Reserve Bank assessed the sensitivity of the predicted impact on economic output to changes in the relation between the tier 1 capital ratio and bank funding costs and to changes in the relation between bank funding costs and economic output.

The results of the Reserve Bank's modelling suggest that a tier 1 capital ratio of 16 per cent of RWA would meet its soundness objective (RBNZ, 2019a: 29). The analysis that it undertook to support its risk appetite statement indicates that there would be little capacity to

increase stability further without some negative impact on expected economic output (RBNZ, 2019b: 40-5).

## **6.6 Prudential capital buffers**

Following the financial crisis of 2007-2009, a major focus of regulatory reform has been to address the pro-cyclical effects of bank capital requirements. During cyclical downturns, losses erode banks' capital, while risk-based capital requirements such as those under the Basel II framework become more onerous (Estrella, 2004; Repullo and Suarez, 2013). The risk of a credit crunch transpiring in these circumstances is increased if banks respond to greater perceived risk by tightening credit and building up their capital buffers above levels required by regulators. Consistent with this prediction, Ayuso, Pérez and Saurina (2004), Stolz and Wedow (2011), and Shim (2013) find that the actual capital buffers of banks exhibit negative co-movement with the economic cycle.<sup>9</sup> However, it is unclear whether risks increase during downturns. To the contrary, Rajan (1994) and Crockett (2002) argue that portfolio risks increase during upturns.<sup>10</sup> Favourable conditions associated with an economic expansion could lead to excessive increases in lending and a relaxation of lending standards.

Based on quarterly data for thirty banks operating in Australia from the September quarter 2003 to the June quarter 2015, Cummings and Durrani (2019) find evidence of a significantly negative relationship between the internally targeted capital buffers of banks and the current state of the economic cycle. This finding supports the view that the capital conservation buffer and countercyclical capital buffer under the Basel III rules are sensible reforms to address the tendency of banks to manage their capital buffers in a pro-cyclical fashion.

## **6.7 Identification of systemically important banks**

The Reserve Bank has consulted on a framework for identifying systemically important banks (RBNZ, 2019c). The consultation paper complements the proposed new capital adequacy framework, as described in the RBNZ (2019a) consultation paper. The method proposed for identifying D-SIBs aligns with the international practice recommended by the Basel Committee. The method uses an indicator-based approach across four dimensions: size, interconnectedness, substitutability and complexity of banks.

The indicators that measure the four dimensions of systemic importance should reflect the nature of the domestic financial system and economy. For example, substitutability measures the extent to which the services a bank provides can be replaced by another bank in a timely manner in the event of a bank failure. In New Zealand, the business models of banks are

---

<sup>9</sup> In Europe, Jokipii and Milne (2008) find that capital buffers of large banks, and of commercial and savings banks, co-move negatively with the economic cycle. However, the capital buffers of small banks and co-operative banks co-move positively with the cycle. Their results for small banks are likely to be caused by capital market frictions. Small banks find it relatively costly to raise new equity capital while co-operative banks are unable to make such issues at all. These banks are thus reliant on retained earnings as a protection against insolvency and this can explain their preference for building up capital during economic upturns.

<sup>10</sup> See also Borio, Furfine and Lowe (2001).

predominantly centred on lending and deposit-taking. Therefore, the Reserve Bank has proposed that loans to households and non-financial businesses and total deposits be used as the main indicators of substitutability.

Given that the agricultural industry plays a vital role for New Zealand (representing more than 5 per cent of GDP and more than 50 per cent of export revenue), the Reserve Bank has proposed that loans provided to the agricultural sector be used as an additional indicator of substitutability.

Regardless of the indicators selected, the four large Australian-owned banks (ANZ Bank New Zealand, Bank of New Zealand, ASB Bank and Westpac New Zealand) are dominant across all four categories of systemic importance.

## **6.8 Proposals for reform**

In the fourth consultation paper published during the capital review, the Reserve Bank proposed to (RBNZ, 2019a):

- Limit the extent to which capital requirements differ between the IRB approach and the standardised approach, by re-calibrating the IRB approach and applying a floor linked to the standardised requirement.
- Raise RWA for the four IRB-accredited banks to approximately 90 per cent of the level calculated under the standardised approach.
- Set a tier 1 capital requirement of 16 per cent of RWA for banks assessed to be systemically important and 15 per cent of RWA for other banks (comprising a minimum requirement of 6 per cent and a prudential capital buffer of 9-10 per cent).
- Assign 1.5 percentage points of the proposed prudential capital buffer requirements to a countercyclical component, which could be temporarily reduced to 0 per cent during periods of exceptional stress.
- Assign 1 percentage point of the proposed capital buffer requirement to a D-SIB buffer, to be applied to banks assessed to be systemically important.
- Set a total capital requirement of 18 per cent of RWA for systemically important banks and 17 per cent of RWA for other banks, of which 2 percentage points can be met with tier 2 gone-concern capital.
- Implement a staged transition of the different components of the revised framework over five years.

## 6.9 Feedback from industry and the public

The Reserve Bank received 161 submissions from industry and members of the public in response to the proposed new capital adequacy requirements and published a summary of submissions on 1 July 2019 (RBNZ, 2019d). The Reserve Bank received four submissions from industry in response to the proposed framework for identifying D-SIBs and published a summary of those submissions on 8 August 2019 (RBNZ, 2019e).

Industry and the public generally indicated they support the Reserve Bank's objective of promoting a stable financial system, recognising the economic and social benefits of mitigating against banking crises. They understand that higher bank capital can reduce the probability of crises occurring. They also realise that higher capital requirements can lead to higher borrowing costs for individuals and businesses and some doubt whether the benefits of a safer banking system justify the increased costs.

Those lodging submissions responded to the proposed higher capital requirements for banks in different ways. Many submissions, particularly from the general public, expressed support for the proposals. Some submissions argued that the fiscal risks associated with potential bank bailouts are reduced and that depositors are better protected with higher capital. Some submissions expressed concern that the proposals would require banks in New Zealand to have levels of capital substantially above those in other countries and that the Reserve Bank's stress tests suggest that the New Zealand banking system is already sufficiently well-capitalised to withstand extreme economic conditions. Several submissions provided estimates of the economic impacts of the proposals, including the impact on borrowing costs. Some industry participants expressed concern about the impact of higher capital requirements on specific sectors of the economy, particularly the agricultural and small business sectors.

There was widespread support for the Reserve Bank's proposal to reduce the gap in capital requirements between banks using the IRB approach to credit risk and banks using the standardised approach to credit risk. However, some industry participants, including the four large banks, argued that the proposals go too far and will reduce incentives to invest in risk management systems.

Although there was widespread support for higher capital requirements, including among most banks, several industry participants argued that the requirements should be able to be met with more non-common equity capital. Many industry participants would prefer contingent convertible debt instruments to be permitted as a substitute for meeting part of the proposed equity capital requirements.

Many industry participants requested that the proposed timeline for banks to transition to any new requirements be extended beyond five years.

Submissions in response to the proposed framework for identifying systemically important banks were generally supportive of the proposed indicator-based methodology.

## 6.10 Summary and recommendation

In reviewing the regulatory capital ratio requirements for New Zealand-incorporated banks, the Reserve Bank has taken account of the costs of banking crises, the impact on bank funding costs, research studies on the optimal amount of capital for banks, the structure of the domestic banking industry and the role of prudential capital buffers in promoting financial stability. The proposals made by the Reserve Bank reflect empirical evidence about the amount of capital required to absorb losses in banking crises, predictions of the impact on lending rates and economic output and the tendency of banks to manage their capital buffers in a pro-cyclical fashion. The Reserve Bank will take account of the views of banking industry participants when it responds to their submissions in late-2019.

The estimates derived by the Reserve Bank of the impact of higher capital requirements on bank funding costs are overstated. The Reserve Bank estimated that a one percentage point increase in the unweighted tier 1 capital ratio from current levels will lead to an increase of 6 basis points in banks' overall funding costs (RBNZ, 2019b: 37). The calculation by the Reserve Bank assumes that a representative equity risk premium for banks is 11.7 per cent above the cost of debt and that returns to shareholders in the form of dividends and capital gains are taxed at the same rate as interest receipts at the personal level.

However, the four large New Zealand banks can raise additional equity financing either by sourcing the equity through their Australian parent banks or by listing their equity on the New Zealand bourse. Based on data for equity returns and consensus analyst forecasts of earnings per share and dividends per share over the 1993-2017 period, Cummings and Nguyen (2019) estimate that the equity risk premium for the four Australian parent banks is about 6.7 per cent above the bank bill interest rate. This estimate is substantially lower than that used by the Reserve Bank. Furthermore, Dimson, Marsh and Staunton (2019) report that the long-run average equity risk premium for the New Zealand market is *not* larger than that for the Australian market. A lower equity risk premium will reduce the impact of increased equity financing on bank funding costs.

The cost of increased equity financing will be further reduced to the extent that returns to shareholders in the form of dividends and capital gains are taxed less heavily than interest receipts at the personal level. A cost-effective response of the four large New Zealand banks will be to raise additional equity financing by listing their common shares in New Zealand. The Australian parent banks need not relinquish their controlling stakes in the banks for the listings to occur. The raising of the additional equity financing in the New Zealand market will reduce the risk for the Australian parent banks that they potentially violate limits set by the Australian regulator on exposures to related parties.<sup>11, 12</sup> This response will allow the New Zealand banks to distribute a substantially greater amount of imputation credits to New

---

<sup>11</sup> In July 2018, the Australian regulator consulted on a proposal to set more restrictive limits on exposures to related parties of the Australian banks (see APRA, 2018).

<sup>12</sup> A drawback for the Australian parent banks, however, is that the amount of capital issued by the New Zealand subsidiary banks to third parties that may be included in regulatory capital at the parent group level will be subject to the minority interest restrictions set by the Australian regulator.



Zealand resident taxpayers. The value that investors attribute to the imputation credits for reducing their personal taxation liabilities will reduce the impact of increased equity financing on bank funding costs.

The cost advantage to banks of responding to higher capital requirements by marketing their common shares to domestic resident taxpayers is demonstrated in the Australian market. Most of the dividends paid by the four major Australian banks in recent years have been fully franked at the statutory corporate tax rate of 30 per cent and Australian resident taxpayers have been entitled to use the franking credits to reduce their personal taxation liability or claim any excess as a refund. Cummings and Wright (2016) estimate that the franking credits distributed by Australian banks are worth about 50 per cent of their face value on average to bank shareholders. The value that investors have attributed to the franking credits has reduced the impact of higher capital requirements under the Basel III framework on bank funding costs.

The Australian study by Cummings and Nguyen (2019) takes account of the empirical evidence in relation to the equity risk premium for banks and the value of imputation tax credits distributed to equity investors. The findings of the study suggest that a one percentage point increase in the unweighted tier 1 capital ratio will result in an increase of about 4 basis points in banks' overall funding costs.<sup>13</sup> The impact on banks' funding costs of higher equity capital requirements estimated by Cummings and Nguyen in Australia is similar to that estimated by Miles, Yang and Marcheggiano (2013) in the United Kingdom. Although the MM theorem effect is generally weaker than reported by Miles, Yang and Marcheggiano in the United Kingdom, the cost impact of equity financing for banks in Australia is reduced by the local taxation arrangements with respect to dividend income.

If the proposed higher capital requirements have a smaller impact on bank funding costs than estimated by the Reserve Bank, the share of the cost that banks pass on to their customers in the form of higher interest rates on loans can be expected to be smaller. In this case, efficiency may be enhanced by increasing capital requirements above the level that meets the soundness objective (RBNZ, 2019b: 40-45). In its formal cost-benefit analysis, the Reserve Bank should validate the parameters that it uses to estimate the impact of the proposed higher capital requirements on bank funding costs. The parameters used to capture the values of the equity risk premium and debt tax shield for banks should reflect market-based estimates that are relevant to the New Zealand banking industry.

---

<sup>13</sup> At current average risk-weightings for the major Australian banks, the findings of Cummings and Nguyen (2019) suggest that a one percentage point increase in the tier 1 risk-based capital ratio will result in an increase of about 2 basis points in the banks' overall funding costs.

## 7. Conclusion

The Reserve Bank began a review of the capital framework applying to locally incorporated banks in 2017. The purpose of the review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into consideration the country's experience with its existing framework and international developments in bank capital requirements. This report describes my review of the analysis and advice underpinning the Reserve Bank's capital proposals.

The proposals are based on sensible analysis and advice in the New Zealand-specific context. The analysis represents the risks inherent in New Zealand's financial system and the Reserve Bank's regulatory philosophy. The analysis and advice also represent insights from relevant research studies, international developments in bank capital requirements and feedback from industry and the public. The analytical approaches used by the Reserve Bank appropriately capture the relationship between bank capital and financial system soundness and efficiency.

I make recommendations on three specific issues:

1. The Reserve Bank should continue to monitor the performance of the Basel III loss-absorption features in other countries and assess whether the mechanisms can be adapted to suit New Zealand's circumstances. The monitoring should take account of the experience of the contractual loss-absorption features in countries with a significant presence of foreign-owned and unlisted banks. The contractual features that incorporate conversion to common equity may become feasible in New Zealand, if one or more of the large banks opts to list its common equity on a public stock exchange.
2. Using the data provided by the banks through the proposed dual reporting process, the Reserve Bank should investigate the extent to which the RWA amounts calculated using internal models provide a more accurate prediction of unexpected credit losses for IRB banks than those calculated using the standardised model. If the credit risk differentiation properties of the IRB approach cannot be supported empirically following the implementation of dual reporting, the Reserve Bank may wish to reconsider its policy of retaining the IRB approach as part of the capital framework.
3. In its formal cost-benefit analysis of the capital proposals, the Reserve Bank should validate the parameters that it uses to estimate the impact of the proposed higher capital requirements on bank funding costs. The parameters used to capture the values of the equity risk premium and debt tax shield for banks should reflect market-based estimates that are relevant to the New Zealand banking industry.

## References

Australian Prudential Regulation Authority (2014), *Financial System Inquiry: Submission*, 31 March.

Australian Prudential Regulation Authority (2018), 'Revisions to the related entities framework for ADIs', APRA Discussion Paper, July.

Ayuso, J., Pérez, D. and Saurina, J. (2004), 'Are capital buffers pro-cyclical? Evidence from Spanish panel data', *Journal of Financial Intermediation*, 13 (2), 249-64.

Bank for International Settlements (2010), *An Assessment of the Long-term Economic Impact of Stronger Capital and Liquidity Requirements*, Basel: Basel Committee on Banking Supervision.

Bank for International Settlements (2013a), *Regulatory Consistency Assessment Programme (RCAP): Analysis of risk-weighted assets for credit risk in the banking book*, Basel: Basel Committee on Banking Supervision.

Bank for International Settlements (2013b), 'The regulatory framework: Balancing risk sensitivity, simplicity and comparability', Basel Committee on Banking Supervision Discussion Paper, February.

Bank for International Settlements (2016), *Regulatory Consistency Assessment Programme (RCAP): Analysis of risk-weighted assets for credit risk in the banking book*, Basel: Basel Committee on Banking Supervision.

Bank for International Settlements (2017), *Basel III: Finalising post-crisis reforms*, Basel: Basel Committee on Banking Supervision.

Bank for International Settlements (2019), *Minimum capital requirements for market risk*, Basel: Basel Committee on Banking Supervision.

Borio, C., Furfine, C. and Lowe, P. (2001), 'Procyclicality of the financial system and financial stability: Issues and policy options', Bank for International Settlements Papers No. 1, 1-57.

Brealey, R. (2006), 'Basel II: The route ahead or cul-de-sac?', *Journal of Applied Corporate Finance*, 18 (4), 34-43.

Brooke, M., Bush, O., Edwards, R., Ellis, J., Francis, B., Harimohan, R., Neiss, K. and Siegart, C. (2015), 'Measuring the macroeconomic costs and benefits of higher UK bank capital requirements', Bank of England Financial Stability Paper No. 35, December.

- Calomiris, C. and Herring, R. (2013), 'How to design a contingent convertible debt requirement that helps solve our too-big-to-fail problem', *Journal of Applied Corporate Finance*, 25 (2), 39-62.
- Chen, N., Glasserman, P., Nouri, B. and Pelger, M. (2017), 'Contingent capital, tail risk, and debt-induced collapse', *Review of Financial Studies*, 30 (11), 3921-69.
- Crockett, A. (2002), 'Market discipline and financial stability', *Journal of Banking and Finance*, 26 (5), 977-87.
- Cummings, J.R. and Durrani, K.J. (2019), 'Regulatory capital and internal capital targets: An examination of the Australian banking industry', working paper, Macquarie University, March.
- Cummings, J.R. and Guo, Y. (2019), 'Do the Basel III capital reforms reduce the implicit subsidy of systemically important banks? Australian evidence', working paper, Macquarie University, April.
- Cummings, J.R. and Nguyen, L. (2019), 'Impact of the Basel III capital reforms on bank funding costs: Australian evidence', working paper, Macquarie University, June.
- Cummings, J.R. and Wright, S. (2016), 'Effect of higher capital requirements on the funding costs of Australian banks', *Australian Economic Review*, 49 (1), 44-53.
- Dagher, J., Dell'Ariccia, G., Laeven, L., Ratnovski, L. and Tong, H. (2016), 'Benefits and costs of bank capital', IMF Staff Discussion Note No. 16/04, 3 March.
- DeAngelo, H. and Stulz, R.M. (2015), 'Liquid-claim production, risk management, and bank capital structure: Why high leverage is optimal for banks', *Journal of Financial Economics*, 116 (2), 219-36.
- Demirgüç-Kunt, A., Detragiache, E. and Merrouche, O. (2013), 'Bank capital: Lessons from the financial crisis', *Journal of Money, Credit and Banking*, 45 (6), 1147-64.
- Demirgüç-Kunt, A. and Huizinga, H. (2004), 'Market discipline and deposit insurance', *Journal of Monetary Economics*, 51 (2), 375-99.
- Dimson, E., Marsh, P. and Staunton M. (2019), 'Summary Edition: Credit Suisse Global Investment Returns Yearbook', Credit Suisse Research Institute, February.
- Estrella, A. (2004), 'The cyclical behavior of optimal bank capital', *Journal of Banking and Finance*, 28 (6), 1469-98.
- European Banking Authority (2019), 'Results from the 2018 low and high default portfolios exercise', EBA Report, 10 January.

Federal Reserve Bank of Minneapolis (2016), *The Minneapolis Plan to End Too Big to Fail*, December.

Firestone, S., Lorenc, A. and Ranish, B. (2017), 'An empirical economic assessment of the costs and benefits of bank capital in the US', Finance and Economics Discussion Series 2017-034, Board of Governors of the Federal Reserve System, 31 March.

Flannery, M.J. and Giacomini, E. (2015), 'Maintaining adequate bank capital: An empirical analysis of the supervision of European banks', *Journal of Banking and Finance*, 59, 236-49.

Gandhi, P. and Lustig, H. (2015), 'Size anomalies in U.S. bank stock returns', *Journal of Finance*, 70 (2), 733-68.

Jokipii, T. and Milne, A. (2008), 'The cyclical behaviour of European bank capital buffers', *Journal of Banking and Finance*, 32 (8), 1440-51.

Junge, G. and Kugler, P. (2013), 'Quantifying the impact of higher capital requirements on the Swiss economy', *Swiss Journal of Economics and Statistics*, 149 (3), 313-56.

Laeven, L. and Valencia, F. (2018), 'Systemic banking crises revisited', IMF Working Paper No. WP/18/206, September.

Lilly, C. (2018), 'Outcomes from the 2017 stress test of major banks', *Reserve Bank of New Zealand Bulletin*, 81 (9), 1-13.

Mariathasan, M. and Merrouche, O. (2014), 'The manipulation of basel risk-weights', *Journal of Financial Intermediation*, 23 (3), 300-21.

Miles, D., Yang, J. and Marcheggiano, G. (2013), 'Optimal bank capital', *Economic Journal*, 123 (567), 1-37.

Miller, M.H. (1995), 'Do the M & M propositions apply to banks?', *Journal of Banking and Finance*, 19 (3-4), 483-9.

Modigliani, F. and Miller, M.H. (1958), 'The cost of capital, corporation finance and the theory of investment', *American Economic Review*, 48 (3), 261-97.

Plosser, M.C. and Santos, J.A.C. (2014), 'Banks' incentives and the quality of internal risk models', Federal Reserve Bank of New York Staff Report No. 704, December.

Rajan, R.G. (1994), 'Why bank credit policies fluctuate: A theory and some evidence', *Quarterly Journal of Economics*, 109 (2), 399-441.

Repullo, R. and Suarez, J. (2013), 'The procyclical effects of bank capital regulation', *Review of Financial Studies*, 26 (2), 452-90.

Reserve Bank of New Zealand (2017a), 'Review of the Capital Adequacy Framework for locally incorporated banks', Issues Paper, May.

Reserve Bank of New Zealand (2017b), 'What should qualify as bank capital? Issues and options', Capital Review Paper 2, July.

Reserve Bank of New Zealand (2017c), 'Review of capital requirements for New Zealand incorporated banks: Summary of submissions on first (overview) consultation paper', 19 October.

Reserve Bank of New Zealand (2017d), 'What should qualify as bank capital? Response to submissions', Capital Review Paper 2 (Part II), December.

Reserve Bank of New Zealand (2017e), 'Review of the capital adequacy requirements for locally incorporated banks: Calculation of risk weighted assets', Consultation Paper, December.

Reserve Bank of New Zealand (2018), 'The calculation of risk weighted assets: Response to submissions', July.

Reserve Bank of New Zealand (2019a), 'How much capital is enough?', Capital Review Paper 4, January.

Reserve Bank of New Zealand (2019b), 'An outline of the analysis supporting the risk appetite framework', Capital Review Background Paper, April.

Reserve Bank of New Zealand (2019c), 'A framework for identifying domestic systemically important banks', Consultation Paper, April.

Reserve Bank of New Zealand (2019d), 'Capital Review Paper 4: How much capital is enough? Summary of submissions', July.

Reserve Bank of New Zealand (2019e), 'A framework for identifying domestic systemically important banks: Summary of submissions', August.

Schepens, G. (2016), 'Taxes and bank capital structure', *Journal of Financial Economics*, 120 (3), 585-600.

Shim, J. (2013), 'Bank capital buffer and portfolio risk: The influence of business cycle and revenue diversification', *Journal of Banking and Finance*, 37 (3), 761-72.

Spencer, G. (2017a), 'Review of bank capital requirements', A speech delivered to the New Zealand Bankers' Association in Auckland, Reserve Bank of New Zealand, 7 March.

Spencer, G. (2017b), 'Banking regulation: Where to from here?', A speech delivered to KangaNews New Zealand Debt Capital Markets Summit in Auckland, Reserve Bank of New Zealand, 2 August.

Stolz, S. and Wedow, M. (2011), 'Banks' regulatory capital buffer and the business cycle: Evidence for Germany', *Journal of Financial Stability*, 7 (2), 98-110.

Ueda, K. and Weder di Mauro, B. (2013), 'Quantifying structural subsidy values for systemically important financial institutions', *Journal of Banking and Finance*, 37 (10), 3830-42.

## **Appendix 1**

### **Terms of reference**

#### **Purpose**

The Reserve Bank began a review of the capital adequacy framework applying to locally incorporated registered banks in 2017. The aim of the Capital Review is to identify the most appropriate framework for setting capital requirements for New Zealand banks, taking into account how the current framework operates and international developments in bank capital requirements.

In December 2018, the Reserve Bank published a consultation paper seeking feedback on proposed higher capital requirements for New Zealand incorporated banks. This was the fourth consultation paper published during the Capital Review. In the proposal, the central change from existing regulations is an increase in the Tier 1 capital requirement to 16 percent of Risk-Weighted Assets for banks deemed Domestic Systemically Important Banks (D-SIBs) and 15 percent for all other banks. The current requirement is 8.5 percent.

Public submissions close on 17 May 2019 and will be published on the Reserve Bank website in June, alongside a summary of the submissions.

As part of the next stage of the Capital Review, the Reserve Bank is commissioning External Expert Reports to independently review the Reserve Bank's analysis and advice underpinning the Capital Review proposals.

The External Experts will look at whether all relevant considerations have been identified. The External Experts will take into account the objectives of the Capital Review, as well as the domestic context, the available literature, the international debate, and policy developments globally, relating to the role of bank capital in supporting the soundness and efficiency of the financial system.

The External Experts' Reports will be part of the suite of information considered in the final decision-making process of the Capital Review. The External Experts' Reports will sit alongside the range of papers prepared by the Reserve Bank during the Capital Review, submissions from industry and the public on proposed changes to the system, any additional analysis and advice completed during the course of the Capital Review, as well as other internal review processes.

The Reserve Bank will generally publish all relevant supporting material (such as the External Experts' Reports) alongside final decisions in the Capital Review, scheduled for September 2019.

The External Experts Reports are to review the analysis and work of the Reserve Bank, and not that of individual staff members.



## Context

Since 1 January 2013, New Zealand incorporated registered banks have been required to comply with the following minimum capital ratios, which are calculated as the amount of capital that must be held in relation to risk-weighted exposures (including market and operation risk):

- A Common Equity Tier 1 capital ratio of 4.5%;
- A Tier 1 capital ratio of 6%;
- A total capital ratio of 8%.

Additionally, since 1 January 2014, a bank that does not maintain a common equity buffer ratio of 2.5% above these minimum ratios has faced restrictions on the distributions it can make.

The Reserve Bank is undertaking a comprehensive review of the capital adequacy framework applying to New Zealand incorporated registered banks. The Capital Review aims to apply an appropriate approach to setting capital requirements for New Zealand banks, taking into account how the current framework has operated and international developments in bank capital requirements. The purpose of the External Experts' Reports is to provide an external perspective on the Reserve Bank's analysis and methodology underpinning the Reserve Bank's capital proposals.

The Capital Review has been carried out within the context of New Zealand as a small open economy, with external imbalances and an economic and financial system that is disproportionately subject to external economic and financial shocks and changes in offshore sentiment:

- The New Zealand banking sector is dominated by four New Zealand incorporated banks that operate as wholly-owned subsidiaries of their Australian-owned parents, which cover around 85% of the banking system.
- The banking system obtains a sizeable share of its funding from offshore wholesale markets.
- Much of New Zealand's private debt is concentrated in the household and agricultural sectors, and has been steadily climbing over recent decades.
- New Zealand households have high debt levels, with household debt around 160% of nominal disposal income. Household debt is concentrated in housing loans from banks.

The Reserve Bank's current supervisory approach is non-intrusive and seeks to enhance self-discipline and market discipline where possible. Likewise, the New Zealand approach to supervisory review is light-handed. Where necessary, the Reserve Bank does use tools that directly constrain market choices, for example, through governance and incorporation requirements or restrictions on high loan to value ratios. This relatively non-intrusive

approach is complemented by simple-yet-conservative prudential requirements. As part of the current proposals in the Capital Review, the Reserve Bank's supervisory approach would grow in intensity if a bank's capital ratio fell below 16%. The precise details of how this would work will be developed during the next stages of the Capital Review. The External Experts are asked to focus on the role of capital, given the overall prudential regime operating in New Zealand.

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

The Reserve Bank has designed and calibrated a risk appetite framework that, in conjunction with other information, contributed to its analysis of the appropriate level of capital for banks operating in New Zealand. This process has been underpinned by an evolving picture of the significant and sometimes long-lasting economic and social costs of financial system crises, and the Reserve Bank's conclusion, drawn from international research and analysis, that society is risk averse in the face of these risks.

The risk appetite framework is centred on the concept of ensuring that systemically important banks can survive large unexpected losses – i.e. losses that have a likelihood of occurring only once in every 200 years. This is a higher degree of risk aversion than is implicitly built into the New Zealand system at the moment, reflecting the Reserve Bank's judgement that the economic and social impacts of financial crises are large and more wide ranging than previously realised.

Minimum capital requirements help to promote the maintenance of a sound financial system and, by reducing the probability of bank failures, also help to protect the financial system from the wider costs that can arise from bank failures.

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 of bank failures, and would smooth out credit cycles. Banks typically argue that capital is a costly source of funding and that if they had to operate with a higher level of capital they would seek to preserve their returns on capital by passing these higher costs on to customers, leading to reduced investment and economic growth.

### **Capital Review Principles**

The Reserve Bank began a review of the capital adequacy framework applying to New Zealand incorporated registered banks in 2017.

The Reserve Bank has had regard to six high-level principles through the Capital Review:

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.

These principles have underpinned the analysis, advice and decisions made during the Capital Review so far.

### **Scope of Work**

The External Experts Report will cover:

- Is the problem that the Capital Review seeking to address well specified?
- Has the Reserve Bank adopted an appropriate approach to evaluate and address the problem? For example, is the range of information considered, and the analytical approach appropriate?
- Do the inputs and cited pieces of evidence used by the Reserve Bank in its approach appropriately capture the relationship between bank capital and financial system soundness and efficiency?
- Has the analysis and advice taken into account all relevant matters, including the costs and benefits of the different options?<sup>14</sup>
- Have the issues raised in submissions been assessed fairly and adequately? The External Experts will only consider the Reserve Bank's assessment of issues raised in the submissions on the first three consultation papers.<sup>15</sup>
- Have the key risks been adequately considered across the proposals in the Capital Review?
- Was the advice and analysis underpinning the Capital Review reasonable in the New Zealand-specific context?

---

<sup>14</sup> A full assessment of costs and benefits will be carried out in a Regulatory Impact Statement (RIS) as part of final decisions in the Capital Review. The material published during the Capital Review so far has included an overview of a range of costs and benefits, with the consultation papers seeking further input about costs and benefits from affected parties, and the public more widely. This information will be considered as part of the final RIS.

<sup>15</sup> Submissions on the fourth consultation paper close on 17 May and will be considered by the Reserve Bank during the next stages of the Capital Review. The Reserve Bank has not yet assessed or responded to the issues raised in the consultation that closes on 17 May.

The Capital Review has generated internal analysis covering a wide range of issues. This analysis has formed the basis of four public consultation papers and a much larger number of internal reports. This analysis has covered all aspects of the capital requirements, including the definition of capital (“the numerator”), the calculation of risk-weighted assets (“the denominator”) and the capital ratio itself.

The Report should cover all aspects of the review that the External Reviewers consider relevant, however, the Reserve Bank is particularly interested in the following two topics:

- the definition of what qualifies as regulatory capital in the New Zealand system, and
- the overall calibration of capital requirements, including the assessment of costs and benefits.

The Reserve Bank has made background information relating to the proposals publicly available on its website:

<https://www.rbnz.govt.nz/regulation-and-supervision/banks/consultations-and-policyinitiatives/active-policy-development/review-of-the-capital-adequacy-framework-registeredbanks>

### **Out of Scope**

The Reserve Bank is not seeking information from the External Experts that covers:

- Undertaking new modelling exercises focused on estimating the impacts of alternative capital proposals. However, reviewers should identify whether there are developments in modelling, or other analytical exercises, that have not been appropriately considered during the Capital Review.
- An assessment of other prudential regulation tools, such as deposit insurance or the Reserve Bank’s approach to supervision.

These topics are important but the Reserve Bank is not seeking information from the External Experts on these topics:

- For the first point, the External Experts are asked to focus on whether the overall approach taken was reasonable given the range of different sources of evidence drawn on during the Capital Review, not whether the exact capital ratio is “right” or whether alternative model specifications would generate a different number. The External Experts should also consider whether other relevant information or analysis has been overlooked.
- For the second point, Phase 2 of the Reserve Bank Act Review is considering these issues. Phase 2 is a wide-ranging review of the financial policy provisions of the Reserve Bank of New Zealand Act that provide the legislative basis for prudential regulation and supervision. Phase 2 of the Reserve Bank Act Review will also

consider broader governance arrangements for the Reserve Bank. Work on Phase 2 is being led by a joint review team of Reserve Bank and Treasury staff.<sup>16</sup>

Any lack of clarity about the scope should be clarified with the Reserve Bank as soon as possible.

### **Deliverable**

Each reviewer will complete their own independent report, to be provided for the consideration of the Reserve Bank Governor and Deputy Governor, and the Reserve Bank Board. The reports will be an input into final decisions made in the Capital Review.

Each reviewer should provide an independent view and produce their own report. The Reserve Bank will not attempt to consolidate the reports – each Expert's Report will be considered as a separate stand-alone report.

The Reserve Bank will publish the External Experts' Reports prepared by each Expert (but not draft reports) alongside final decisions in the Capital Review.

### **Proposed Contract**

The Reserve Bank intends to use a New Zealand Government Model (Services) Contract (GMC) for contracting with each External Expert. The GMC reflects the New Zealand Government's default terms and conditions of contract. The GMC is in two parts – GMC Form 2 SERVICES (2<sup>nd</sup> edition) and GMC Form 2 SERVICES – Schedule 2 (2<sup>nd</sup> edition). These are available at

<https://www.procurement.govt.nz/procurement/templates/#government-model-contracttemplates>

Reviewers will be asked to declare any possible conflicts of interest, and how these will be managed, prior to commencing their contract.

### **Consultation**

It is not expected that the External Experts will carry out extensive consultation as part of their work. Any external consultation should be agreed in advance with the Reserve Bank.

### **Timing**

The final reports should be provided to the Reserve Bank by 12 August 2019. A draft report be provided by 15 July 2019.

A detailed timetable is provided on the next page.

---

<sup>16</sup> <https://treasury.govt.nz/news-and-events/reviews-consultation/reviewing-reserve-bank-act/phase-2-reserve-bank-act-review>

Action	Indicative date
Appointment of External Experts announced publicly	20 May 2019
External Experts travel to NZ	Late May/early June
External Experts prepare draft reports. RBNZ officials available for discussions as needed.	During June 2019
Draft reports provided to RBNZ	15 July 2019
RBNZ provides any comments on draft reports. This will not include drafting suggestions from the RBNZ or any responses to emerging conclusions. RBNZ comments at this stage will focus on identifying areas where the RBNZ would like more information.	22 July 2019
Final report to RBNZ	12 August 2019
Reports considered alongside final decision-making process	August 2019
External Experts' Reports published alongside final Capital Review decisions	September 2019

## **Appendix 2**

### **Biographical details**

#### **Dr James Cummings**

Dr James Cummings is a senior lecturer in finance in the Department of Applied Finance at Macquarie University. Prior to joining Macquarie University, Dr Cummings was a principal researcher at the Australian Prudential Regulation Authority from 2009-2013. He holds a Bachelor of Arts (Demography) from Macquarie University and a Master of Commerce (Finance with Economics and International Business) and a Doctor of Philosophy (Finance) from the University of Sydney.

Dr Cummings' research expertise is in the area of financial markets and institutions. His recent research focuses on bank capital regulation and the approach taken by banks in managing their capital positions. Dr Cummings also researches on a range of topics including pension funds, illiquid investments and futures markets. His research is published in leading scholarly journals including the *Journal of Banking and Finance*, *Accounting and Finance*, *Economic Record* and the *Journal of Futures Markets*. He has presented his research at international conferences including meetings of the Financial Management Association International, Asian Finance Association and the International Finance and Banking Society.