RESERVE BANK
OF NEW ZEALAND

Regulatory impact assessment of Basel III capital requirements in New Zealand.

September 2012

EXECUTIVE SUMMARY

The existing minimum capital requirements for New Zealand banks, set by the Reserve Bank, are based on the international standards developed by the Basel Committee known as Basel II. In light of the global financial crisis (GFC), the Basel Committee concluded that the Basel II standards were inadequate. This was because the GFC showed that many banks had insufficient capital to absorb losses. In December 2010 the Basel Committee published new capital adequacy standards known as Basel III that incorporates the lessons of the GFC.

This document summarises the Reserve Bank's analysis of the Basel III standards. The key part of the document describes our assessment of the costs and benefits of the increased capital ratio requirements of Basel III. The international 'benchmark' cost benefit analysis is the 'Long-term economic impact report' (LEI) produced by the Bank of International Settlements in August 2010. This report sets out a cost-benefit framework that has provided a starting point for other cost-benefit analyses, including our own. We have modified some of the inputs to take account of New Zealand circumstances.

The key benefit of higher capital ratios is the reduced probability that there will be a financial crisis. We have also taken into account that higher capital ratios will increase the New Zealand Inland Revenue share of foreign banks' global tax payments and reduce expected government payments to foreigners in a bank bailout scenario.

On the cost side, we have allowed for the possibility that bank lending rates may increase in the short-term as banks seek to maintain their return on capital. However we have assumed this effect will be temporary (i.e. it will reduce to zero after 10 years).

Our cost-benefit analysis shows that moving to Basel III capital ratios is justified. In particular, it shows that the 'optimal' tier one capital ratio is about 13 percent (where the marginal benefits of additional capital equal the marginal costs in our model). This result is similar to other studies. While 13 percent is higher than the Basel III minimum, the marginal benefits of increasing capital decline as capital levels rise and increasing capital beyond the Basel III minimums would deliver only relatively modest benefits. Moreover, as modelling in this area is subject to considerable uncertainty (for instance the measurement of banking crises costs is not precise) any 'optimal' capital ratio outcome should not be interpreted literally.

This paper also considers the strengthened criteria for classification as regulatory capital within Basel III (i.e. the focus in Basel III on the so-called "quality of capital", which we plan to adopt). Finally, transitional arrangements for the implementation of Basel III are considered. Given New Zealand banks are in a relatively good position to meet the Basel III requirements, we consider there are net benefits from early adoption. However, we plan to permit a relatively lengthy phase-out of non-qualifying capital instruments (although not as lengthy as envisaged by the Basel Committee).

INTRODUCTION

1. The document contains a regulatory impact assessment of the Basel III capital requirements of the Reserve Bank. The Reserve Bank's website contains further information about the implementation of Basel III capital requirements in New Zealand.[1]

STATUS QUO AND PROBLEM DEFINITION

2. Capital serves as a buffer against a bank's unexpected losses and as a basis for its medium term growth. Bank failures can have negative impacts over and above losses for the creditors and shareholders of banks. Banks are usually the major providers of financial intermediation services and they play a central role in transferring funds between parties through their position in payments systems. The failure of a major bank would have the immediate effect of reducing the availability of credit within the economy, would limit people's access to funds, could put other banks into difficulty, and could lead to a system-wide crisis. System-wide bank crises can have disastrous real and financial effects for an economy. As a result, regulators set minimum capital requirements that take account of the wider adverse externalities that could arise from the failure of a bank, which the bank itself may not take into account.

3. The existing minimum capital requirements for New Zealand banks are set by the Reserve Bank, and are based on the international standard for regulatory capital requirements developed by the Basel Committee known as Basel II. In light of the global financial crisis (GFC) the Basel Committee concluded that the Basel II standards were inadequate because many banks were shown to have too little capital to absorb losses. This inadequacy contributed to weaknesses in the banking sectors of a number of countries that were in turn transmitted to the rest of the financial system and the real economy resulting in a massive contraction of liquidity and credit availability. In several countries the public sector had to step in with injections of liquidity, capital support and guarantees of an unprecedented scale, exposing taxpayers to large losses. In response to the perceived inadequacies of the Basel II framework, the Basel Committee published new capital adequacy standards – known as Basel III – that incorporate the lessons of the GFC.

4. New Zealand banks did not suffer major losses as a result of the GFC. This was partly the result of the Reserve Bank's conservative approach to the adoption of Basel II and partly because New Zealand banks were not exposed to the types of assets that caused massive losses in the GFC. Nevertheless, the lessons of the GFC are relevant to New Zealand, and many aspects of the Basel III standards are more conservative than the Reserve Bank's existing requirements. It is therefore important that proper consideration be given to whether or not to align with the Basel III standards in order to buffer the New Zealand financial system for future crises.

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[1] See this link: http://www.rbnz.govt.nz/finstab/banking/4572979.html

OBJECTIVES

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

6.   Like most bank regulators, one of the principal ways the Reserve Bank undertakes prudential supervision is by setting the minimum level and quality of capital that banks must hold. The challenge for the Reserve Bank is determining an appropriate amount of capital that should be held against unexpected losses.

REGULATORY IMPACT ANALYSIS

Section One: Introduction

7.   The capital adequacy component of the Basel III framework comprises four main components:

- Minimum capital ratio requirements, which are set out in Table One (overleaf).
- Requirements designed to improve the 'quality' of capital. These include more conservative tests to recognise instruments for capital purposes and to strengthen the 'loss absorbency' characteristics of recognised capital instruments.
- A minimum leverage ratio.
- A set of dates by which the above requirements are to apply in part and in full.

8.   Basel III also strengthens the rules for the calculation of risk weighted assets, primarily in the area of counterparty credit risk. The Reserve Bank has yet to consult on this aspect of Basel III and it is not included in this cost-benefit analysis (although we are confident it would not alter our conclusions).

Table One: Basel III capital ratio requirements and buffers
(as a percentage of risk weighted assets)

	Common equity	Tier 1 capital	Total capital
Existing minimum ratios	-	4.0%	8.0%
New minimum ratios	4.5%	6.0%	8.0%
Conservation buffer	2.5%		
New minimum ratio plus conservation buffer	7.0%	8.5%	10.5%
Countercyclical buffer range[2]	0-2.5%[3]		

Section Two: Options and outline of analysis

9.   From a New Zealand regulatory impact perspective the critical set of measures are the minimum capital ratios. The key options available to the Reserve Bank are to retain the *status quo*, adopt the Basel III ratios, or adopt higher ratios. However, the primary purpose of the analysis in this paper is to determine whether the Basel III ratios are justified. This paper explains our methodology for assessing the economic impact of higher capital adequacy ratios, and sets out key results from the analysis.

10.   With respect to capital 'quality' issues, the Reserve Bank's capital framework is already relatively conservative so this component of the framework should not add significantly to the overall impact of the new requirements. To the extent that the measures to improve the 'loss absorbency' of capital instruments make them more 'equity-like',[4] and therefore potentially add to banks funding costs, then these impacts can be analysed in the same cost-benefit framework that is used to assess changes in the headline tier one capital ratio. This matter is discussed further in Section Four.

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[2] The Reserve Bank is proposing to put in place the Basel III countercyclical buffer framework. This framework does not itself impose any additional capital requirements. However, does provide for potential future increases in capital requirements in response to macro-prudential factors. The analysis underpinning any such increase will be undertaken at the relevant time and is therefore not included in this analysis.

[3] While the countercyclical buffer is indicatively expected to vary between 0 and 2.5% of risk-weighted assets, no formal limit will be set on the maximum size of the buffer (i.e. the size of the buffer will be determined according to circumstances).

[4] The Basel III 'loss absorbency' standard requires that the contractual terms of capital instruments will allow them at the option of the regulatory authority to be written-off or converted to ordinary shares in the event that a bank is unable to support itself in the private market in the absence of such conversions.

11. New Zealand does not have a leverage ratio requirement, and will not be adopting the minimum leverage ratio component of the framework. As no change is being made to the *status quo* (there is no minimum leverage ratio requirement), no regulatory impact assessment is required for this decision.

12. Table Two sets out the transitional arrangements under the Basel III framework, and the respective Reserve Bank timetable for implementation in New Zealand. The Basel framework allows for implementation over a period of time, but specifies end-dates for compliance. The modelling underpinning the assessment of the costs and benefits of implementing Basel III is properly focused on the steady-state costs and benefits, and therefore did not include any potential transitional costs and benefits. However Section Five discusses the considerations the Bank took into account when assessing implementation timeframes.

Table Two: Transitional arrangements

	Basel III	**Reserve Bank**
Minimum capital ratio requirements	Phase in from 1 January 2013 to 1 January 2015.	Implement in full from 1 January 2013.
Capital conservation buffer	Phase in from 1 January 2016 to 1 January 2019.	Implement in full from 1 January 2014.
Non-qualifying capital instruments	Phase out from 1 January 2013 to 1 January 2022.	Phase out from 1 January 2014 to 1 January 2018.

Section Three: Assessment of the impact of the minimum capital ratios

13. There were three steps in the Reserve Bank's assessment of the impact of the minimum ratios:

   a) The first was a comprehensive review of the relevant literature, with a particular focus on critically assessing the key models that have been used to assess the impact of the capital components of Basel III internationally.

   b) The second was to build an analytical cost-benefit model (named TUATARA), which draws on the features of the relevant international models, and applies them to the New Zealand context, including by calibrating the model to suit New Zealand circumstances.

   c) The third step was to assess the outputs of the model, as well as their robustness to changes to the key cost and benefit drivers.

a)   Literature review and assessment

The benchmark LEI report

14.   The international 'benchmark' cost-benefit analysis is the 'Long Run Economic Impact Report' (LEI) produced by the Basel Committee on Banking Supervision (BCBS).[5] This report sets out a cost-benefit framework that provided a starting point for other cost-benefit analyses including our own.

15.   The LEI model calculates the benefits of higher capital by estimating the expected fall in the probability of a financial crisis from an increase in capital held by the banking system. This number is then multiplied by an estimate of the cost of a crisis to generate the expected benefit to the economy. To illustrate by way of example, assume that with an average capital ratio of seven percent the probability of a crisis was four percent, but this fell to three percent when the average capital ratio was increased to eight percent. If the average cost of a crisis was twenty percent of GDP, then the expected benefit from the one percentage point higher capital would be 0.2 percent of GDP (20 percent times 0.01). In the model, the size of this marginal benefit falls with the addition of more capital as a result of diminishing returns.

16.   The LEI model used two estimates of the cost of crisis based on studies in the relevant literature. The first estimate, a cost of about 20 percent of GDP, assumes that the loss of output in a crisis is a one-off event.[6] The second estimate, a cost of about 60 percent of GDP, allows for the possibility that a financial crisis will permanently depress economic output and the GDP impact reflects the present value of this scarring effect.

17.   On the cost side, the LEI model assumed that banks have a cost of capital that is fixed at 15 percent and that the banks can maintain this return when capital is increased by increasing lending rates. In the model, an increase in lending rates (calculated to be 13 basis points per one percentage point increase in the capital ratio) in turn reduces economic activity (calculated as 0.09 percent per one percentage point increase in the capital ratio). This fall in economic activity is the ongoing marginal cost of higher capital.

18.   In the model, a capital ratio can be said to be optimal where the marginal GDP costs and benefits lines intersect. In the case of the LEI model this is about 10 percent assuming a 20 percent of GDP cost of crisis, and 13 percent with a 60 percent loss assumption.

Assessment

19.   The Reserve Bank's cost-benefit analysis follows the basic structure of the LEI model, but makes a number of substantial changes, which are described in the following sections.

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[5] BCBS (2010) "An assessment of the long-term economic impact of stronger capital and liquidity requirements".

[6] The LEI model measures cost in terms of the discounted cumulative loss of output over the course of a crisis.

Relationship between the amount of capital and the probability of a crisis

20. The LEI model uses direct empirical estimates of the relationship between the probability of crises and capital. The empirical analysis was necessarily based on fragmentary evidence and we did not think that it was sufficiently robust, nor provided sufficient flexibility to underpin a New Zealand cost-benefit analysis. Our judgement is that the model's assumption of a four percent chance of an acute financial crisis, given a banking system with a seven percent capital ratio, is far too pessimistic for New Zealand conditions.

21. We also assessed two structural models produced by the Bank of England. These models generated a relationship between default rates and capital using an underlying loss distribution and a default trigger point.[7] Two Bank of England studies that used this technique were examined.

22. The first uses information on bank share price volatility to generate the underlying loss function.[8] This was not useful to us: using share prices to generate expected default rates requires a number of strong assumptions and the results can be subject to wide bounds of uncertainty. Moreover, as New Zealand banks typically do not have share market listings this approach is of limited use.

23. In the second study a credit loss distribution function was generated from 200 years of GDP data from a range of countries.[9] Again this analysis relied on strong assumptions to get a relationship between capital and marginal default rates, and we were not convinced that the data set – and consequent calibration implications – was appropriate for the modern New Zealand banking system.

24. The approach we took at the Reserve Bank was to construct a loan-loss distribution using our existing capital standards (specifically, the corporate capital equation in the Basel II internal rating based model).[10] This provided us with a starting point for generating a loss function. However the equation embeds a view of the world that is too optimistic when assessing the likelihood of acute events. Underlying asset values are assumed to be normally distributed and consequently individual defaults are assumed to be less correlated than they might be in a crisis. We adapted the model take account of the possibility of more highly correlated losses (in practice this was achieved

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[7] A loss distribution provides, for a given period of time, the probabilities associated each loss size. Adding up the total of all probabilities gives 100%.

[8] See Bank of England Financial Stability Report June 2010.

[9] See Miles D., Yang J., Marcheggiano G.(2011)"Optimal bank capital" BOE External MPC Unit Discussion Paper No.31.

[10] The Basel II model determines the amount of capital a bank should hold to meet unexpected losses with a probability of 0.999 over one year. In this context 0.999 can be thought of as the probability a crisis will be avoided. Therefore, using the Basel II equation the relationship between additional capital and the probability a crisis will be avoided can be established. The full document that lays out our advanced internal ratings based models can be found here: http://www.rbnz.govt.nz/finstab/banking/regulation/3272068.pdf

by increasing the correlation coefficient in the corporate capital equation).[11] These calibrations were judgement-based and drew on our stress testing work with housing and farm loan portfolios. The effect of this change was to increase the probability of a crisis with an eight percent capital ratio to 1 percent which is ten times bigger than the Basel internal rating based outcome, and more realistic in our view. Our starting point about the probability of a crisis is however substantially more optimistic than the LEI and BOE assumptions noted in paragraph 20 above.

25.   Our structural model was calibrated so a banking crisis was assumed to occur when a credit shock was sufficient to reduce bank's capital ratios to below 2 percent (as opposed to the 4 percent assumed by the BOE).

Cost of crises

26.   The Bank did not attempt to generate its own data with respect to the likely cost of banking crises in New Zealand but we carefully examined the empirical work that provided the basis for the inputs into the LEI and other models. Our view is that the cost estimates tend to be on the high side. We are sceptical about the 'permanent scar' theory that financial crises will permanently depress economic output, which in turn generates the high cost-of-crises estimates. Also, we note that some estimates of financial crises costs tended to conflate the costs of underlying real events (which are not strongly affected by the amount of bank capital) with the costs originating from the financial system distress. Accordingly, we used the lower range of estimates assuming costs of between 10 and 20 percent of GDP depending on the implied size of the crisis.

Cost of capital

27.   The key assumption in the LEI report, and in many other studies of the cost of increasing bank capital, is that the cost of capital is a fixed number and that banks can achieve their 'required rate of return' by increasing lending rates. This view is not consistent with the theoretical propositions that financial markets are, at least over time, reasonably efficient and that the required returns by equity investors and creditors (including depositors) will fall when capital is increased reflecting the lower risk of their respective investments. In the long run, the market for bank capital and loan markets will be reasonably efficient and moderate increases in bank capital should have little if any permanent impact on lending margins.[12]

28.   In the shorter run, however, we allow for the possibility that banks will be able to push lending margins up and that this will impose a cost to the economy along the lines set out in the LEI report.

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[11] The Reserve Bank's capital adequacy standards also incorporate adjustments to the Basel II framework models (for instance we have made modifications to correlation assumptions with respect to banks' farm lending exposures).

[12] Miles D., Yang J., Marcheggiano G.(2011) provides useful empirical support for the well accepted theoretical proposition that banks' required rates of return should not be invariant to their capital ratio (and had the LEI study incorporated this proposition, its estimated cost of crisis would be lower).

29. Our benchmark assumption is that margins will be initially pushed up by half the amount assumed by the LEI report and that the excess loan margins are bid away over 10 years. This roughly translates into an assumption, in present value terms, that the lending margin increase is 15 percent of that assumed in the LEI report. To the extent that the New Zealand banking market is less competitive than that implied in our benchmark numbers then there could either be a larger increase in margins and/or those higher margins could be sustained for longer. It would be appropriate then to use a higher ratio (that is, a higher portion of lending margin increase assumed by the LEI report) as an input into the cost-benefit analysis. A figure of 30 percent was used to test the sensitivity of the results to the competitiveness assumption (see analysis in Table Five below).

30. We have also taken account of a further cost that is relevant in the New Zealand context. The LEI report and other cost-benefit analyses implicitly assume a closed economy, where the owners of capital have the same nationality as the bank borrowers. From a welfare perspective, increased payments from borrowers to bank share holders are a transfer not a welfare cost. This is not the situation in New Zealand at present where the great bulk of bank owners are foreign and additional interest payments are therefore a welfare cost. Our model takes account of this additional cost, although we recognise that it will not necessarily always be the case that New Zealand banks are predominately foreign owned.

b) TUATARA - additional enhancements to the benchmark model

31. TUATARA (the model the Bank used to assess the costs and benefits of Basel III) takes into account the following factors in the assessment of the benefits of higher capital, in addition to those discussed above.

Increased share of foreign banks global tax payments

32. It is assumed that higher capital will shift income from a foreign tax jurisdiction (in practice Australia) to the New Zealand tax base generating a net benefit of about $25 million a year.

Reduced expected government payments to foreigners in bank bailouts

33. The model factors in the option of public support, such that a bank is bailed out and losses to foreign depositors are made good by the New Zealand government. Reducing the likelihood of bailouts generates a welfare gain to New Zealand from lower expected transfers to foreigners. Note that TUATARA does not take account of the pressure that the funding of the bailout of all depositors and the possible recapitalisation of banks might place on government borrowing rates. Depending on the government's fiscal position at the onset of the crisis, reducing this potential pressure could add materially to the benefits of higher capital.

Applying a risk adjustment to GDP impacts and fiscal savings

34. The LEI and other cost-benefit analyses place the same weight on the dollar value of costs and benefits. We doubt that this symmetrical treatment is appropriate when the benefits accrue though the reduction in the probability of deep economic downturns. If society and government are risk averse, then increased capital can be seen as a form of insurance that society is prepared to purchase even when the premium exceeds the expected dollar payouts. This is because of the risk-reducing impact of those 'payouts' (the LEI study recognises this is an effect that could be recognised, and if it were, the benefits of higher bank capital ratios would increase).

35. To account for this effect, we have multiplied the expected dollar benefits of the GDP and fiscal savings by a factor that is intended to proxy society's risk aversion. The factor varies from just over one for small expected shocks, to more than two for the large shocks that enhanced capital ratios are designed to provide protection against. The ratios were calculated using an expected utility model that assumes a relatively high degree of risk aversion reflecting society's wish to reduce the risk of socially and economically disruptive events.[13] The higher ratios are also consistent with the revealed preference in the New Zealand life insurance market, which covers low probability but high impact events. Average premiums are over twice expected payouts to policyholders. (Note that the references to 'risk adjusted' benefits below refer to the benefits of higher capital taking account of society's risk aversion.)

c) **Key outputs**

36. The key outputs from TUATARA are presented in Table Three below. The table can be read as follows. Take the row (with bold figures) starting on the left hand column with a 10 percent tier one capital ratio. The next figure of $6,200 million shows the risk adjusted present value of the expected benefits of higher GDP when the capital ratio is increased from 9 to 10 percent. Similarly, columns to the right show the risk adjusted present value of savings of fiscal transfers to foreigners and the net value of tax transfers from foreign tax jurisdictions ($1,100 million and $500 million respectively). The key feature that these three benefit columns illustrate is the diminishing returns from each incremental increase in capital, reflecting the shape of the loss distribution curve and the implied distribution of crisis events. The larger the crisis the less frequent its occurrence.

37. On the cost side, the $25 billion figure is the present value of the costs to New Zealand if banks can indeed permanently increase lending rates by 13 basis points when capital is increased from 9 to 10 percent, which is in line with the LEI report assumption. The $3,750 million in the next column is the present value of costs using our 15 percent benchmark cost increase.

38. The net risk-adjusted benefits, which capture the information in Table Three, are illustrated in Figure One. It shows that the optimal capital ratio where the marginal

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[13] See Barro R.J.(2009) "Rare disasters, Asset Prices, and Welfare Costs" AER 99(1) for an expected utility analysis of high impact, low probability events.

benefit equals the marginal cost is about 13 percent. Figure Two provides more information about the cost and benefit outputs that drive the results in Figure One. The red and purple lines represent the costs and benefits under our central scenario.

Table Three

Key TUATARA outputs

Capital ratio Tier one	Marginal GPD PV r.a. $m	Marginal Fiscal PV r.a. $m	Tax PV $m		Costs 100% overcharge PV $m	Costs 15% overcharge PV $m
4	39,200	9,400	500		25,000	3,700
5	35,100	5,900	500		25,000	3,700
6	27,300	4,600	500		25,000	3,700
7	18,200	3,600	500		25,000	3,700
8	12,600	2,600	500		25,000	3,700
9	9,400	1,800	500		25,000	3,700
10	**7,200**	**1,100**	**500**		**25,000**	**3,700**
11	5,800	900	500		25,000	3,700
12	4,300	800	500		25,000	3,700
13	3,300	700	500		25,000	3,700
14	2,500	600	500		25,000	3,700

39.   While the 'optimal' capital ratio is of obvious interest, the more important lessons are captured in Table Four below, which shows the present value of the net benefits over ranges of capital. A clear finding is that there are very substantial net benefits from moving from a fragile banking system to a somewhat safer one.

Figure One: Tuatara – marginal net benefits per percentage point of capital
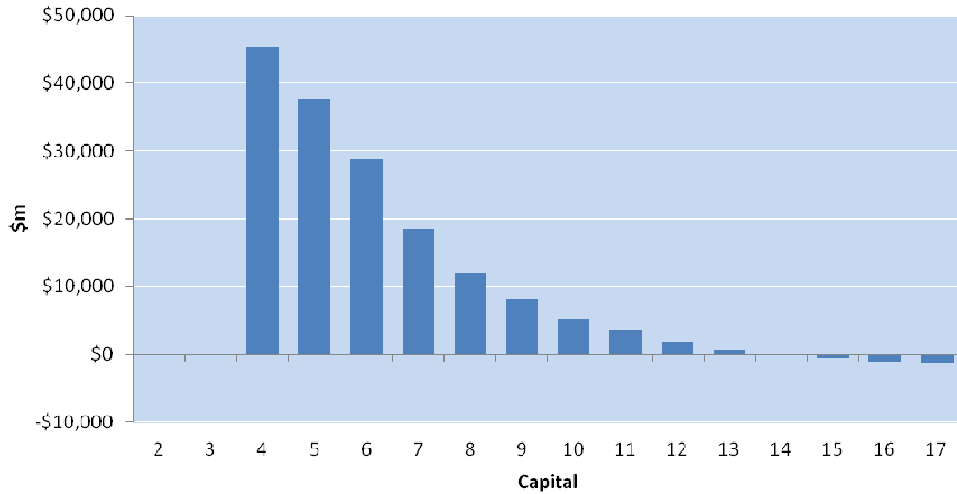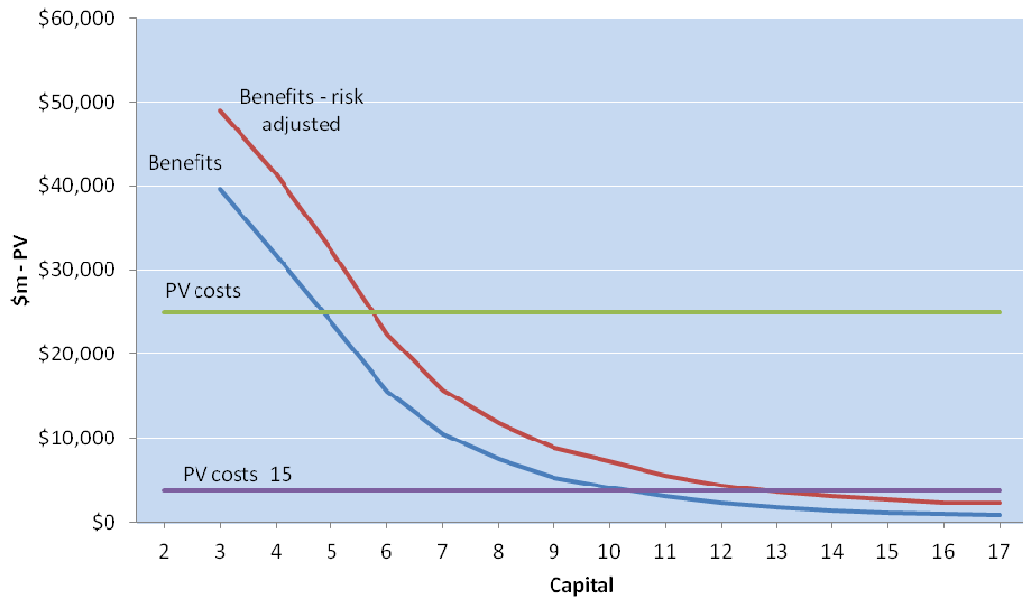

Figure Two: Tuatara - marginal costs and benefits per percentage point of capital

40.   The move in the capital ratio from 7 to 10 percent can be thought of as capturing the impact of Basel III levels of capital (see Table One in the introduction). The net benefits here are still also large but thereafter they tail off materially. While there may still be diminishing marginal benefits from having yet higher capital the biggest gains will have already been made.

Table Four: Impact of capital on welfare

Increase in capital ratio	NPV of net benefits $m risk adjusted
5 to 7 percent	47,300
7 to 10 percent	25,100
10 to 13 percent	6,200

Sensitivity to different assumption

41.   Table Five shows the optimal capital ratio when key inputs are changed.

Table Five: Sensitivity analysis

	Optimal capital ratio %
Benchmark	13
Lending rates increase according to LEI assumption (i.e. cost of capital is fixed).	5.5
Lending rates increase by 30% of LEI assumption (benchmark assumption is 15%).	10
GDP Loss given crisis: 10% (benchmark assumption 10-20%).	10.5
GDP Loss given crisis: 40%.	17
Basel correlation coefficents (–a 'thin tail' compared to the benchmark assumption of a 'fat tail').	9

Comparison with some other cost-benefit outputs

42.   Table Six compares the TUATARA optimal capital estimate with those produced by some of the other cost-benefit analyses. Our result is similar to the LEI and BOE staff results but the key drivers are different. Both of these studies assumed that the cost of capital was fixed, and hence more expensive, but also that the financial system was very fragile and the expected benefits to reducing crises correspondingly high. The BOE-Miles study also assumed that financial systems were fragile but assumed that the marginal cost of capital was similar to the cost assumed in our benchmark input.

Table Six: Optimal capital ratio estimates (percent)

RBNZ	13
BOE (Miles et al)	19 or 40-45
BOE (staff)	13
BIS LEI (20% - Loss Given Crisis)	9
BIS LEI (60% - Loss Given Crisis)	15

Conclusions and recommendations

43.   We caution against taking the numerical results from the model too literally, given the uncertainties inherent in a cost-benefit study involving the incidence and impact of financial crises. Nevertheless the proposition that there are net gains from requiring registered banks to hold capital commensurate with that required under Basel III is compelling.

44.   As with any form of modelling, there are risks to our central estimate but the balance of these risks appear to lie on the upside (that is, it is likely the risks in this assessment are that the optimal level of capital is higher than our benchmark estimate). On the cost side for example, we have not made any allowance for the possibility that any interest rate increases would be offset by countervailing monetary policy action. Also, if at some future point more New Zealand banks were locally owned then the cost of interest rate increases would be lower. On the benefit side, there is always the risk that the world will not be as well behaved as we have assumed in our modelling of credit losses and that the enormous cost of crisis assumptions that drive some of the other models are closer to the mark than our own, more cautious, judgements. Taking account of the possible effects of crisis bailout costs on government funding costs would also increase the optimal capital ratio. This does not lead us to require ever increasing levels of capital however, as the introduction of the Open Bank Resolution policy will reduce the probability of a bailout and reduce this effect.[14]

45.   On the downside, the critical risk is that the market for bank loans is much less competitive that we have assumed. At an extreme, the LEI assumption would hold and banks would permanently be able to maintain their post-crisis target returns on capital.

46.   If that were the case, then capital at Basel III levels would be too expensive and the optimal policy response would be to push for much lower capital ratios than banks currently have. We do not accept that this is a plausible outcome. We do not believe that there is any credible theoretical and empirical support for the proposition that the

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[14] See Hoskin and Woolford for an overview of the Open Bank Resolution policy
http://www.rbnz.govt.nz/research/search/article.asp?id=4202

bank capital and loan markets are fundamentally inefficient and that the laws of supply and demand for risk do not apply at all to the sector. This may not preclude the possibility, however, that the impact on interest rates over the shorter term may be somewhat higher than assumed in our benchmark outcome.

47. In addition to the analytical work described above we also put some weight on the significant reputational risks to New Zealand and to the banks if New Zealand was seen to be non-compliant with the most core elements of the Basel III capital framework. A New Zealand regulator decision not to adopt the core capital framework that is the international standard would raise questions about the credibility of the regulatory framework and potentially adversely impact on banks' funding.

Section Four: Analysis of the costs of benefits of improving the 'quality' of capital

48. To our knowledge no formal cost-benefit analysis of the 'quality' improvement measures in Basel III has been produced by the regulatory or academic communities. All of the cost-benefit models are designed to assess the costs and benefits of equity capital. However, we think that the impact of most of the measures can be captured within the TUATARA framework. With respect to measures that reduce the measured level of capital (for example, by requiring further deductions from capital) these will have the same effect as requiring an equivalent amount of additional capital through a capital ratio requirement increase. These measures will have only a small impact in New Zealand relative to other countries (as our capital standards are already relatively more conservative than many other countries whose banks are facing material capital building to meet Basel III standards). As such, we have not specifically allowed for them in the TUATARA modelling.

49. With respect to measures to increase the loss absorbency of Tier Two capital instruments the impact could, in principle, be roughly captured within the model. On the benefit side the value of Tier Two capital could be assessed as a (relatively high) proportion of the benefits of equity capital. The cost side could be assessed by looking at the increase in cost of issuance over the risk free rate in comparison to the cost of equity capital.

50. However as Tier Two capital is now more closely equivalent to Tier One capital, we believe it is appropriate to take most of it into account when comparing the Basel III requirements with the TUATARA optimal capital outputs. If Tier Two capital was equivalent from a risk reduction perspective to, for instance, 80 percent of Tier One capital, then the Basel III 10.5 percent minimum capital ratio requirement shown in Table One above would equate to a Tier One requirement of 10.1 percent. Adding an operating margin of say 1 percent equates to an effective requirement of 11.1 percent compare to the TUATRA optimum of around 13 per cent.

Section Five: Implementation timetable

51.   While our cost-benefit analysis has focussed on the permanent impact of requiring higher capital ratios, we also reviewed the following two reports that focussed on the timing of the implementation of the minimum capital requirements. These reports are:

- The Interim Report of the Macroeconomic Assessment Group, August 2010 (the MAG report); and

- The Cumulative impact Report by the International institute of Finance, September 2011 (the IFF report).[15]

52.   We did not find the MAG report to be very helpful on timing issues because it substantially relied on macroeconomic models that do not have developed financial sector components. These models are not able to answer the key question of how different implementation time paths could alleviate capital market stresses.

53.   The IIF report agreed that in the long run it is appropriate to assume that the market will tend to an efficient outcome with required rates of return adjusting to the lower risk environment. However it focused its analysis on transition paths, which can be very different depending on the assumptions made about the capacity of the capital markets to absorb shocks to the demand for capital over the short run.

54.   Because the IIF analysis addressed the full array of Basel capital and liquidity measures, as well as some national measures, it was difficult to disentangle the effect of the Basel III capital measures from other changes, and so we did not make use of their analytical framework.

55.   Moreover, in our view, capital supply issues are not pressing in New Zealand because banks in New Zealand are already compliant or close to compliant with the key ratios. Thus there was no reason to forgo the net benefits of higher capital ratios for the period of a long transition path envisaged by the Basel Committee. We also believe that in a still unsettled external financial environment there is value in New Zealand being perceived as a conservative regulatory environment through its early compliance with the new ratios.

56.   The one exception is the relatively long grandfathering period for existing capital instruments that will not met the Basel III criteria. Banks have suggested that a rapid phase-out would put pressure on their ability to fund their replacement requirements in the New Zealand domestic market, which may provide a more cost effective source of funds for the new instruments than offshore markets. The phase out of existing instruments from 1 January 2014 to 1 January 2018 will substantially lessen demand pressures in this market.

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[15] The IFF report is represented as the global financial services assessment of the impact of an array of policy responses to the global financial crises.

CONSULTATION

57.   In November 2011, the Reserve Bank issued a consultation paper on the implementation of Basel III in New Zealand. This consultation paper set out the Reserve Bank's proposals for implementing the core Basel III capital measures relating to capital ratios, the definition of capital and the leverage ratio.

58.   In March 2012, the Reserve Bank issued a consultation paper on further elements of Basel III capital adequacy requirements in New Zealand. This paper set out the Reserve Bank's proposals for further elements of the framework: the operation of the conservation buffer; the countercyclical buffer; and minimum requirements to ensure that all classes of capital instruments fully absorb losses at the point of non-viability ("loss absorbency"). The paper also proposed transitional arrangements.

59.   Most submissions agreed with our proposal to adopt the Basel III minimum ratios and the conservation buffer. However a small number questioned whether the new ratios were necessary, given for instance the lack of bank failures in New Zealand. The Reserve Bank does not accept that a lack of recent bank failures in New Zealand is a sufficient reason not to adopt the Basel III ratios. Our cost-benefit analysis took into account the probability of a bank failure, which although is very low, can result in substantial costs within the banking sector and the wider economy.

60.   Many of the submissions received argued that the Reserve Bank's Basel III requirements to improve the quality of capital and the transitional arrangements should align more closely with the standards proposed by the Australian Prudential Regulation Authority (APRA) for Australian banks. Our approach to Basel III implementation is guided by a set of principles that includes a principle to coordinate with APRA. While this is an important principle, it is not the only principle and we also intend to adapt the Basel III standards as necessary to ensure a suitable fit for New Zealand conditions. Also, where the Basel III standards are less conservative than our existing standards, our prior is to retain our existing standards. However we took into account concerns raised in submissions and concluded that, on balance, more alignment with APRA was appropriate in some areas.

61.   Overall, we are adopting almost all of the Basel III standards and in doing so are generally well aligned with APRA's proposals in most areas. The two most notable departures from the Basel standard and from APRA's requirements are:

- Our intention not to impose a minimum 'one-size-fits-all' leverage ratio.
- Earlier implementation of the conservation and countercyclical buffer.

62.   These departures are discussed within the Regulatory Impact Analysis above.

IMPLEMENTATION

63.   The Reserve Bank's Basel III policy will be implemented through amended conditions of registration for registered banks. The amendments will include requirements to comply with an updated Banking Supervision Handbook that includes detailed capital adequacy requirements consistent with our Basel III policy.

64.   Some transitional arrangements apply as outlined in Table Two above.

MONITORING, EVALUATION AND REVIEW

65.   The policy will be reviewed consistent with the regulatory impact analysis requirements in section 162AB(1)(b) of the Act. Our Basel III conclusions were made in the context of ongoing instability in international financial markets and plans by some other jurisdictions to adopt more conservative capital ratio requirements. We have not ruled out revisiting our conclusions at a later time if the net benefits of more conservative capital ratios become more compelling although we have no plans to move beyond the Basel III minimum requirements at this point.

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