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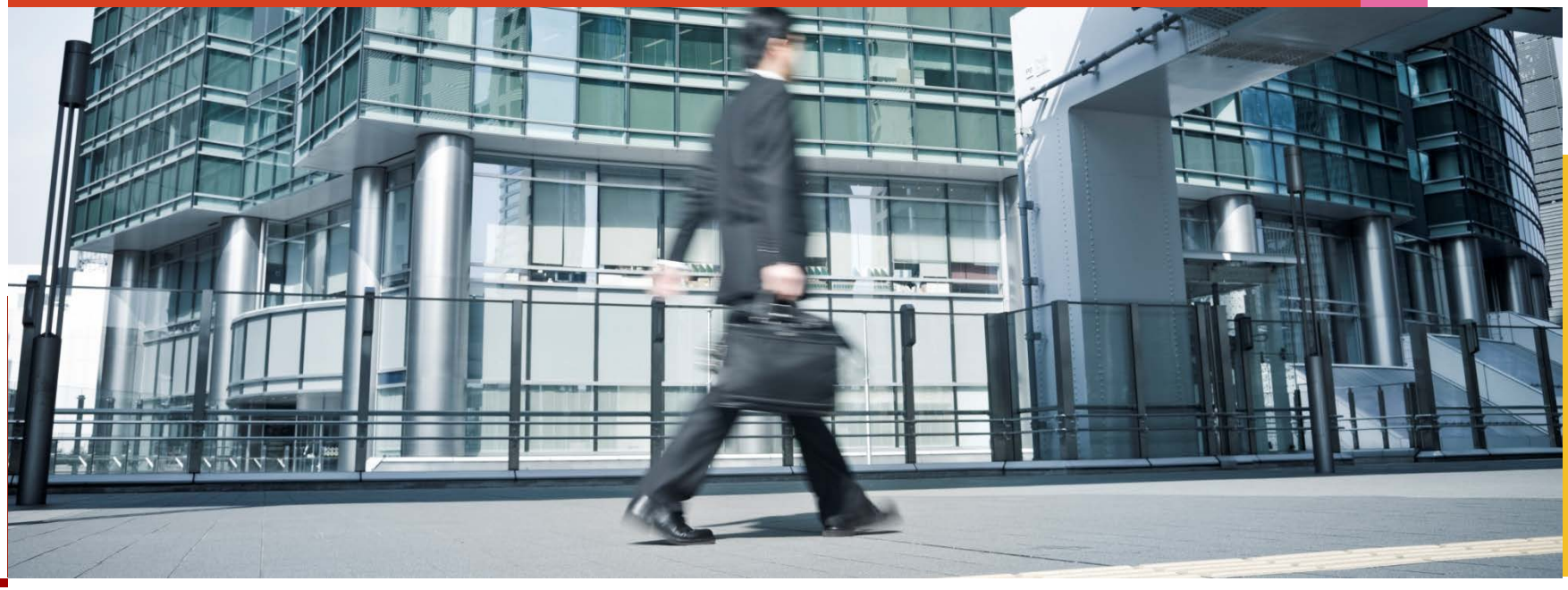
International comparability of the capital ratios of New Zealand's major banks



New Zealand Bankers' Association

October 2017

pwc

Karen Scott-Howman
Chief Executive Officer
New Zealand Bankers' Association
PO Box 3043
Wellington 6140

20 October 2017

Dear Madam,

International comparability of the capital ratios of New Zealand's major banks

We are pleased to enclose our study of the capital ratios of the New Zealand major banks which we have carried out in accordance with your instructions and our letter of engagement dated 21 April 2017.

We are grateful for the assistance and support of NZBA during the project and for the contribution of the four major New Zealand banks (ANZ Bank New Zealand, ASB Bank, Bank of New Zealand and Westpac New Zealand) who provided the data and analysis necessary for this review.

Yours faithfully,

Chris Cooper
Partner

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Executive summary

Background and objective of this study

In March 2017, the Reserve Bank of New Zealand (RBNZ) announced that it would undertake a review of its capital framework in light of international and domestic developments and their experience with the current regime. The announcement made reference to the 2014 Financial System Inquiry in Australia which recommended setting capital ratios for Australian banks so that they are "unquestionably strong", with the top quartile of internationally active banks given as a guide.

The RBNZ acknowledges that comparing New Zealand banks against international peers is not a straightforward task given the need to understand and allow for the idiosyncrasies and relative conservatism of New Zealand's approach to the Basel framework and the impact this has on the headline capital ratios of New Zealand banks compared to peer country banks.

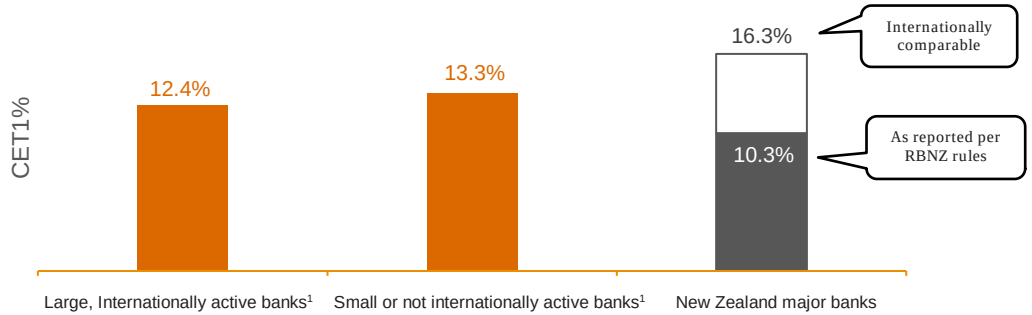
This study has been commissioned by the New Zealand Bankers' Association to provide context to the RBNZ's industry consultation process. Importantly, the study does not make recommendations on the appropriateness of New Zealand's current or future capital settings, which are the responsibility of the RBNZ.

The objective of this study is to compare the capital ratios of the four major New Zealand banks to peer banks in other countries on a like-for-like basis, by adjusting for "national discretions" applied in the capital calculation. It is a complex problem for a number of reasons:

- varied national discretions exercised in implementing the Basel framework in different jurisdictions, including New Zealand;
- the determination of an appropriate international peer group;
- the different measures of capital adequacy that can be used; and
- the fact that capital ratios are in a constant state of flux and the relative position of New Zealand banks will therefore change over time.

Findings

This study concludes that the New Zealand major banks are well capitalised relative to banks in many other overseas jurisdictions. An upward adjustment of approximately 6% is reasonable in order to restate the Common Equity Tier 1 (CET1) ratios of the NZ major banks to an internationally comparable basis. The impact of these adjustments and the comparison against groups of overseas peer banks is shown below:



This study also concludes that the development of a supervisor-approved reporting template to quantify the main variations arising from the RBNZ's implementation of the Basel framework would improve investor understanding of the relative strength of New Zealand's major banks. This could be particularly beneficial in times of market stress, when banks may face restricted access to debt markets and increased funding costs.

[1]Source: Basel Committee, *Basel III Monitoring Report*, September 2017 (median CET1 as at 31 December 2016). Large banks are those with Tier 1 capital of more than €3bn and include the parent groups of the New Zealand major banks. The New Zealand major banks would fall into the lower end of this cohort if they were included separately. See Section 2.2 for further details.

Contents

1 Introduction

1.1 Overview of capital adequacy

Bank capital underpins the stability of the financial system. It provides a buffer against losses, and so directly impacts the willingness of customers, counterparties and investors to deal with an institution, and the price at which they do so. For example, it impacts the cost at which banks can raise debt in financial markets, and the price and availability of credit in the economy.

Published capital ratios form an important (but not exclusive) source for customers, counterparties, trade partners, rating agencies and investors to form a view of the capital strength of a country's banks and financial system as a whole.

1.2 Setting of minimum capital levels

Although not a Basel Committee member, New Zealand's capital adequacy rules are based on the internationally agreed Basel framework, which sets minimum standards for internationally-active banks. The Basel Committee affords domestic supervisors significant flexibility in how they implement the framework, to ensure that it is appropriate for local conditions. Supervisors may use this flexibility for a host of reasons, including: systemic risks, levels of credit concentration or legal uncertainty which may vary significantly between banks and across different countries.

The Basel framework sets out specific areas where domestic supervisors can choose how minimum standards are met ("national discretions"). Beyond this, national regulators are also free to impose more conservative requirements wherever they consider it appropriate. These national variations can be explicitly set out in published local rules, or embedded within the regulatory approval of advanced risk-weighted asset (RWA) models.

Supervisors may use one or both of the following approaches when tailoring the Basel framework for national implementation:

- A "Pillar 1" approach: discretions are applied directly to capital and/or RWAs. This impacts the calculation of the headline capital adequacy ratios, and also increases the absolute size of buffers and triggers which are part of the Basel III framework (e.g. capital conservation buffers and loss absorption triggers).

- A "Pillar 2" approach: supervisors set target capital ratios above those defined by Basel. There are many further permutations, for example 'hard' or 'soft' floors, or those that are applied to individual banks or at national level (and which may in turn be publically disclosed or confidential).

These two approaches are interdependent, and typically a greater loading into Pillar 1 reduces the need for regulatory overlays which could be applied under Pillar 2 (and vice versa).

The consequence of this flexibility is that published headline capital adequacy ratios (even those reported as "fully loaded Basel III") are not necessarily comparable between banks in different jurisdictions without some degree of adjustment. This creates a challenge for investors to determine the 'real' relative capital strength of an individual bank, and the banking system as a whole. Investors, rating agencies and customers also consider factors such as systemic and concentration risk when assessing financial strength, and make their own adjustments to normalise data. While a Pillar 1 approach is typically regarded as being a more targeted supervisory approach, if the "loadings" are not well understood by investors there is a risk that they under-estimate the capital strength of a bank where risks are already captured within Pillar 1 measures.

This potential disadvantage was acknowledged in the Final Report of the Australian Government's "Financial System Inquiry" (December 2014), which noted that the variation in implementation approach "inhibits the relative

strength of Australian banks from being accurately assessed against banks from other jurisdictions". To address this issue, the FSI recommended that APRA "develop a reporting template for Australian authorised deposit-taking institution capital ratios that is transparent against the minimum Basel capital framework". While not yet implemented, such a supervisor-developed reporting template is likely to assist in benchmarking capital levels against peer banks. While public disclosures, such as "Pillar 3" reports, provide visibility over some of these variations, others are less obvious, and particularly those arising from supervisory overlays applied in the modelling of RWAs. This study similarly recommends the development of a common reporting template for the New Zealand major banks, to assist investors make informed decisions when assessing banks' financial strength.

1.3 Measures of capital strength

Under the Basel framework, bank capital adequacy is measured using four ratios:

- CET1: Common Equity Tier 1 capital relative to risk-weighted assets (RWAs);
- Tier 1: Comprised of CET1 and Additional Tier 1 capital relative to RWAs;
- Total capital: The sum of Tier 1 and Tier 2 capital relative to RWAs; and
- Leverage ratio: Tier 1 capital relative to exposures (non-risk-based).

This study focusses primarily on the CET1 ratio, and uses capital data from New Zealand and international peer banks as at their most recent half year or year-end balance date, so that they are comparable points in the capital generation and dividend cycle. The New Zealand major banks do not publish leverage ratios and so the relative international positioning using this measure has not been directly assessed in this study.

1.4 Identifying areas of variation

There is a significant volume of published materials which explain the implementation of the Basel framework in individual jurisdictions. To identify national variations this study examined materials from the following sources:

- The rules and guidance published by individual supervisors;
- Publications issued under the Basel Committee for Banking Supervision's (BCBS's) Regulatory Consistency Assessment Programme (RCAP), including:
  - Individual jurisdiction assessments; and
  - Thematic reviews;
- Previous capital comparative studies (ABA, APRA); and
- Individual bank disclosures (primarily financial statements, Pillar 3 reports and investor presentations).

This research was predominately carried out by PwC's regulatory specialists in Australia. Assistance was provided by PwC New Zealand and specialists from other members of the PwC international network.

Section 3 provides a summary of the material areas of variation which have been used as the basis for adjustment in this study. This study only considers items which would alter the calculation of Pillar 1 ratios and which therefore impact the comparability of published ratios.

1.5 Limitations of this study

Despite the wealth of published materials, it is not feasible to determine a definitive catalogue of variations in the application of the Basel framework.

The most challenging area in which to identify national variation is regarding the calculation of RWAs, particularly for banks permitted by their supervisor to utilise their own risk measures for calculating capital (the 'advanced' or 'IRB' banks). The objective of this study is to adjust for variations in risk-weighting which arise due to differences in supervisory approach rather than underlying risk profile. Given that model approval is a matter for individual supervisors, is granted on a bank-by-bank basis, and that precise model parameters are not published, there are inherent limitations in the following areas:

- Adjusting overseas bank RWAs to an internationally comparable basis; and
- Estimating RWAs for New Zealand banks as if they were approved by an overseas regulator.

The variation in accounting standards adopted in individual jurisdictions is a further source of complexity in relation to the calculation of capital, albeit there has been significant convergence in recent years.

Notwithstanding that it is impossible to categorically re-state all banks' capital ratios to a global harmonised basis, the fact remains that investors do make judgements regarding the financial strength of banks, and attempt to moderate for local variations. This study accepts the inherent limitations, and by stating the assumptions and judgements made, seeks to promote greater understanding of the relative strength of the New Zealand banking system.

1.6 PwC's role

Approach

This study has been prepared by PwC Australia, with assistance from PwC New Zealand and PwC offices in other overseas locations. In compiling this study, PwC issued instructions and data templates, via the NZBA, to the participating banks, conducted analytical review over the data produced and through the NZBA, challenged individual banks to ensure that as far as possible the adjustments have been prepared fairly and reasonably and on a consistent basis. The study has compared the banks' results to externally reported information such as Pillar 3 reports, analyst reports and other relevant national and international information. This study is not an audit.

References to PwC refer to PwC Australia, unless specified otherwise. The views expressed in the report are those of PwC Australia.

Use of this study

This report has been prepared for the purpose of supporting the NZBA in preparing its response to the RBNZ in relation to the review of New Zealand's banking capital framework. This report must not be used for any other purpose.

Declaration of interests

Members of the PwC network operate across all financial services sectors, and work with a high proportion of global and domestic financial institutions. The nature of PwC's business requires the highest levels of objectivity and independence, and this study has sought to reflect those standards.

The Australian and New Zealand member firms of the PwC network provide advice to all the New Zealand banks discussed in this report and their Australian parent banks. PwC New Zealand is the external auditor of the NZBA, the RBNZ and two of the New Zealand major banks. PwC Australia is the external auditor of those banks' Australian parents.

2 Data used for international comparisons

2.1 Overall considerations

Comparisons of capital ratios of banks in different countries is inherently challenging because of variations in the way national regulators have implemented their capital frameworks. This study therefore places greater weight on locations where there is evidence of how the Basel framework has been implemented.

In this regard, the Basel Committee on Banking Supervision (BCBS) has established a comprehensive Regulatory Consistency Assessment Programme (RCAP) to monitor and assess the adoption and implementation of its standards, while encouraging a predictable and transparent regulatory environment for internationally active banks. Data from BCBS itself and/or from banks that are from one of the 26 member countries of the BCBS is therefore considered to be the most reliable source of information.

2.2 BCBS Monitoring Reports

The transposition of Basel regulatory standards into domestic regulations is monitored on a semi-annual basis based on information provided by each member jurisdiction of the BCBS. Fully phased in Basel III capital ratios are published on a quarterly basis using a consistent definition of regulatory capital. This therefore provides a consistent view of the numerator that is to the maximum extent possible, internationally comparable.

The Monitoring Report dated September 2017 has the following cohorts:

- **Cohort 1; BCBS Group 1 banks** – Large and internationally active banks. This cohort comprises 105 banks that have Tier 1 capital of more than €3 billion and are internationally active (a sub-set of which is a cohort of 30 Global Systemically Important Banks).
- **Cohort 2; BCBS Group 2 banks** –This cohort comprises 95 smaller or not internationally active banks that also supply quarterly data to the BCBS.

The following table is an extract from the September 2017 Monitoring Report, relating to capital positions as at 31 December 2016.

Fully phased-in Basel III CET1, Tier 1 and total capital ratios

In per cent — Table C.2

	Group 1 banks			Of which: G-SIBs			Group 2 banks		
	CET1	Tier 1	Total	CET1	Tier 1	Total	CET1	Tier 1	Total
Max	29.6	29.6	34.3	18.6	21.3	26.4	46.9	57.6	57.6
75th percentile	14.4	15.2	18.1	13.4	15.4	18.5	18.5	18.7	20.7
Median	12.4	13.4	14.7	12.3	13.9	16.2	13.3	13.5	14.9
25th percentile	11.0	12.1	13.5	11.5	12.5	13.9	11.3	11.4	12.7
Min	8.2	8.8	10.1	9.7	11.0	12.1	6.9	7.3	8.8
Weighted average	12.3	13.4	15.3	12.3	13.5	15.4	13.4	13.9	15.6

Source: Basel Committee on Banking Supervision.

The New Zealand major banks would fall within the lower end of the Group 1 banks, and not far above the Group 2 banks. Therefore the study concluded that it would be reasonable to compare against both cohorts.

2.3 Comparison against individual banks

While the data provided in the BCBS Monitoring Report is based on a consistent view of the numerator, it does not take account of any national discretions applied to the denominator (RWAs). For a more accurate like-for-like comparison, it is necessary to take account of not only the national discretions that are applied in New Zealand but also those that are applied in overseas jurisdictions (see Section 3).

Comparisons can be made between New Zealand's major banks and those in other countries by either:

- translating all banks (New Zealand and those in the overseas peer group) to an internationally equivalent basis (see Section 4), or
- making the comparison on a country by country basis by applying the national discretions of, say the UK to the New Zealand bank ratios and then comparing the resulting ratios to UK advanced banks (see Section 6).

The following cohorts have been selected for the purpose of the analysis in Section 4.

- **Cohort 3; Large international banks** – larger banks are considered to be appropriate peers because they are likely to be well-resourced and sophisticated in their management of risk and able to report reliable capital ratios on an Advanced basis. Data sourced from Bloomberg was used to identify the world's 100 largest banks by total asset size.
- **Cohort 4; Australian major banks** – Australian major banks are an appropriate peer group that is worthy of particular consideration given the work that APRA has done in recent years on the relative strength of its banks on an internationally comparable basis, with the objective of developing rules that will ensure their banks are "unquestionably strong". It also seems reasonable to compare the capital strength of the New Zealand major banks against their respective parent entities. The published capital ratios of the Australian banks (reported and internationally comparable) incorporate their New Zealand subsidiaries.
- **Cohort 5; Banks in countries that could be considered comparable to New Zealand** – the basis of selection of the banks in this cohort is explained in the following section.

2.4 Comparable countries to New Zealand

New Zealand is a relatively small but well-regulated and open economy with an exposure to soft commodity exports. In order to find countries that could be considered similar to New Zealand, the following factors were considered:

- GDP of between US$100 billion and US$1 trillion (as per *International Monetary Fund* 2017 data).
- Export oriented economies with an export/GDP ratio above 20% (*United Nations Trading and Development*).
- Economies that are exposed to commodities price risk: countries have been selected based on their industry specialisation correlation with New Zealand (sourced from *United Nations Trading and Development* data).
- Countries that have implemented Basel III.
- Economies that are classified as "free" or "mostly free" in the Index of Economic Freedom 2017, sourced from *Heritage Organisation*.

Based on these criteria 9 countries have been identified which could be considered similar to New Zealand, as shown in the table below. Banks in those countries with total assets of greater than USD $10bn have been selected for comparison with the New Zealand major banks (see Appendix D). Section 5.3 of this report summarises the capital adequacy ratios for the banks in these countries and compares them to New Zealand's major banks.

Country	GDP (US$m)	Comments
Malaysia	922,057	Trade specialisation not correlated
Netherlands	907,619	✓ **Considered to be a comparable country**
Philippines	878,980	Economy considered only moderately free
South Africa	761,926	Economy considered only moderately free
Colombia	720,151	Exports represent only 15% of GDP
United Arab Emirates	693,765	UAE has not adopted Basel III
Belgium	529,289	Economy considered only moderately free
Sweden	522,849	✓ **Considered to be a comparable country**
Singapore	514,837	✓ **Considered to be a comparable country**
Switzerland	514,162	✓ **Considered to be a comparable country**
Kazakhstan	472,563	Economy considered only moderately free
Romania	470,312	Economy considered only moderately free
Chile	455,941	Chile has not adopted Basel III
Hong Kong	449,589	Trade specialisation not correlated
Austria	432,424	✓ **Considered to be a comparable country**
Peru	429,711	Economy considered only moderately free
Norway	377,100	✓ **Considered to be a comparable country**
Czech Republic	368,659	Trade specialisation not correlated
Qatar	347,887	Trade specialisation not correlated

Country	GDP (US$m)	Comments
Ireland	343,682	✓ **Considered to be a comparable country**
Israel	316,120	Economy considered only moderately free
Portugal	310,651	Economy considered only moderately free
Kuwait	309,640	Economy considered only moderately free
Morocco	300,556	Economy considered only moderately free
Hungary	284,266	Economy considered only moderately free
Denmark	284,040	✓ **Considered to be a comparable country**
Bahamas	278,415	No similar sized banks found
Finland	239,662	✓ **Considered to be a comparable country**
Oman	189,582	Economy considered only moderately free
New Zealand	186,476	**Focus of this study**
Dominican Republic	174,180	Economy considered only moderately free
Azerbaijan	167,431	Economy considered only moderately free
Bulgaria	152,079	Economy considered only moderately free
Guatemala	138,987	Economy considered only moderately free
Ghana	131,498	Economy considered only moderately free
Serbia	107,131	Economy considered only moderately free
Panama	100,512	Economy considered only moderately free

3 Variations in Basel implementation

3.1 Identifying variations in Basel implementation

This study leverages publically available information to identify variations in the Basel framework, which impact the comparability of capital ratios of banks in different countries.

Regulatory Consistency Assessment Programme (RCAP)

Firstly, this study has looked to those countries where the Basel Committee has conducted RCAP jurisdictional assessments of risk-based capital standards, to review the extent to which domestic regulations in each member jurisdiction are aligned with the minimum regulatory standards agreed by the Committee. Nineteen such assessments have been conducted, covering all 27 Basel member jurisdictions and an estimated 90% of the world's banking assets.
New Zealand is not a Basel member state, and therefore no RCAP has been conducted. However the New Zealand capital rules are similar in many regards to Australia and therefore the Australian RCAP is particularly useful, as noted below.

This study has particularly examined the RCAPs for the jurisdictions listed in Section 3.2, analysing the areas of sub and super-equivalence identified. These RCAPs cover seventeen jurisdictions, which are host to 80 of the world's 100 largest banks. Within these jurisdictions, individual bank disclosures and supervisory rules have been examined, to understand the nature of variations in further detail. The purpose of this research was to identify a list of material implementation variations relevant to a large proportion of the world's banking assets, and to then compare New Zealand's Basel implementation approach in these areas, and assess their significance based on the nature of the New Zealand banks' balance sheets.

APRA international comparability study

In addition this study utilised findings from the PwC study, *International comparability of capital ratios of Australia's major banks* dated August 2014, and APRA's *International capital comparison study*, published in July 2015. In their report, APRA have assessed and identified what it considers to be the material adjustments required to Australian banks' capital ratios to be internationally comparable, covering areas of sub and super-equivalence.

This study assessed these Australian variations to determine if they are applicable to New Zealand.

3.2 Summary of variations

The table below summarises the findings from this research. It shows the RCAP outcome for each country, and summarises the number of significant variations in each jurisdiction which have been considered in this study.

	Country	Assessment date	Assessment grade	No. of top 100 banks	Less conservative	More conservative
	New Zealand	n/a	n/a	0	0	12
	Australia	Mar 2014	Compliant	4	1	9
	UK[1]	Dec 2014	Materially non-compliant	5	0	3
	European Union[2]	Dec 2014	Materially non-compliant	24	3	1
	Singapore	Mar 2013	Compliant	3	0	1
	United States[3]	Dec 2014	Largely compliant	10	0	1
	Canada	Jun 2014	Compliant	6	0	0
	Switzerland	Jun 2013	Compliant	2	0	0
	Japan	Oct 2012/ Dec 2016	Compliant	7	0	0
	China	Sep 2013	Compliant	17	0	0
			Total	**80**		

[1] The European Union RCAP included the United Kingdom, however this study has identified two further areas of conservatism in the UK compared to the rest of the EU.

[2] See Section 6 for further explanation of EU RCAP findings.

[3] Refers to US advanced approaches. See below for further explanation.

The variations identified have been used as the basis for making the following adjustments:

- To adjust New Zealand banks to the 'international comparable' benchmark based on data submitted by participant banks;
- As far as possible, to estimate adjustments to other jurisdiction banks, to re-state them to an international comparable basis, based on publicly available information; and
- To estimate the capital ratios of New Zealand bank's if measured using the rules of selected jurisdictions.

The impact of making these adjustments on published capital ratios is detailed in Sections 4–6. Detailed explanations of the methodologies used for making adjustments, including a comparison of treatments adopted in New Zealand compared to the Basel framework, and the variations emerging from assessments of jurisdictional RCAPs, are contained in Appendices B and E.

3.3 Analysis of variations

The result of this analysis has been to establish an 'internationally comparable' benchmark, being the most common practices adopted across the world's banking system, and the material areas of variation in the application of the Basel framework which impact New Zealand banks. The table below summarises the main areas where variability in Pillar 1 supervisory treatment has been observed, and has a material impact on the international comparability of New Zealand banks' capital ratios. For each area, it defines the 'international comparable' treatment adopted in this study, and identifies those countries which have adopted an approach which has been assessed as being an 'outlier' to this typical practice, whether more or less conservative. Where regulatory treatment differs, the UK has been split out from the EU.

International comparable treatment	Less conservative	More conservative
Capital base and deductions		
Deferred tax asset (DTA) The Basel framework permits DTAs below a threshold to be risk-weighted, with amounts above deducted from CET1; a more conservative treatment is to require full deduction of DTAs from CET1.		
Revaluation reserve Recognition of revaluation reserve as CET1 is permitted in the Basel framework; a more conservative treatment is to recognise these reserves in Additional Tier 1 capital rather than CET1.		
Capitalised expenses The Basel framework permits capitalised expenses and some investments (e.g. financial institutions, funds management and insurance subsidiaries) below a threshold to be risk-weighted, with amounts above deducted from CET1; a more conservative treatment is to require full deduction from CET1.		
Foreseeable dividend The Basel framework requires dividends to be deducted only when formally declared; a more conservative treatment is to deduct foreseeable or expected future dividends from CET1.		
Credit risk: IRB risk-weighted assets		
Farm lending Farm lending exposures are not differentiated from other corporate exposures in the Basel framework. A more conservative approach is to require specific supervisory overlays to risk estimates for farm lending.		
Portfolios thresholds The Basel framework permits preferential risk-weighting for specified portfolios (retail and corporate SME, QRRE). Thresholds for 'preferential' portfolio treatments are expressed in Euros in the Basel framework and are typically included in local rules as the local currency equivalent. Some countries adopt more conservative settings, or else do not recognise these portfolios (the US does not use the corporate SME classification). The EU extends the preferential treatment for corporate SMEs beyond that specified in the Basel text.		

International comparable treatment	Less conservative	More conservative
Specialised lending Many jurisdictions allow bank-determined PD and LGD estimates to be used for specialised lending RWAs, in line with the Basel framework. While not a departure from Basel, mandating the use of supervisory slotting will result in more conservative risk weights than if own estimates are permitted.		
The Basel framework intends that the scaling factor (1.06) is applied to all IRB portfolios (including specialised lending supervisory slotting exposures). Not requiring this is less conservative than the Basel framework.		
Unsecured non retail loss given default (LGD) Banks accredited to use the AIRB approach use LGD parameters with an approximate average of 45%. Adopting higher LGDs or mandating floors results in a more conservative treatment.		
Undrawn non retail credit conversion factors (CCF) Banks accredited to use AIRB appear internationally to use an average conversion factor of 50%[1]. Adopting higher factors or mandating floors is a more conservative treatment than commonly used.		
Sovereign exposures Exposures to local government are treated as 'sovereign' exposures (where meeting Basel Committee criteria). The New Zealand treatment is to include local government obligors in the 'bank' portfolio, which is marginally more conservative.		
The Basel framework does not impose explicit LGD floors on sovereign exposures. Setting higher LGDs is more conservative (UK). Permitting use of standardised is potentially less conservative (EU).		
Secured residential lending The Basel framework defines a LGD floor of 10 per cent and a correlation factor of 0.15 in the RWA formula. Setting higher floors or correlation factors results in more conservative outcomes.		 

[1] As noted in APRA's international comparability study - see Section 4.3 for further discussion of the approach adopted in this study.

International comparable treatment	Less conservative	More conservative
Credit risk: standardised risk-weighted assets		
Unsecured retail lending The Basel framework applies a 75% risk weight to the standardised retail portfolio. Setting a higher risk weight is a more conservative treatment.		
Market risk: risk-weighted assets		
Traded market risk Most internationally active banks are permitted by supervisors to use internal model approaches for traded market risk. Mandating use of standardised approaches will likely result in higher RWAs and is a more conservative treatment.		
Interest rate risk in the banking book (IRRBB) The Basel framework does not require IRRBB to be included in Pillar 1 RWAs. Doing so will result in higher RWAs and a lower capital ratio.		

3.4 US implementation and comparability

In the United States, the Basel framework advanced approaches have been implemented for the largest 15 “core banks”, representing approximately 75% of US banking assets. These banks are subject to a permanent capital floor referenced to the US standardised approach. Since January 2015 this standardised approach has been based on the Basel II standardised credit risk, with no capital requirement for operational or CVA risk. Accordingly, the standardised approach may be more or less conservative than advanced measures, depending on the risk profile of the individual bank.

The floor is implemented as follows: under the US rule in order to determine its minimum risk-based capital requirements, an advanced bank must determine its minimum risk-based capital requirements by calculating the three risk-based capital ratios (CET1, Tier 1 and Total capital) using total risk-weighted assets under the standardised approach and, separately, total risk-weighted assets under the advanced approaches. The lower ratio for each risk-based capital requirement is the ratio the banking organisation must use to determine its compliance with the minimum capital requirement.

US advanced banks calculate and disclose capital ratios under both measures, taking the lower ratio as their ‘official’ regulatory measure. The US RCAP assessed Basel implementation under both approaches, and highlighted areas of super and sub equivalence for the advanced approach compared to the Basel framework. This study has used bank’s advanced ratios as the basis for international comparability.

4 Adjustments required for international comparability

4.1 Impact of adjustments

This study concludes that, after making adjustments to re-state New Zealand's major banks to an internationally comparable basis, there is an uplift in CET1 ratios of about 6% and total capital ratios of over 7% by comparison to those ratios reported using RBNZ requirements.

This is driven mainly by reductions in credit risk IRB risk-weighted assets. Minimal adjustments have been made to the capital base, consequently, the adjustment which would be required to the leverage ratio to re-state it to an internationally comparable basis would also be negligible.

The majority of the 'internationally comparable' uplift to the CET1 and total capital measures arises in three areas; farm lending, residential mortgages and specialised lending. Adjustments in three further areas – non-retail loss given default (LGD) estimates, credit conversion factors (CCF) and market risk RWAs – contribute most of the remaining uplift.

Collectively these adjustments also reduce the banks' own estimate of expected loss, which in turn increases the capital base and so further improves the capital ratio.

The rationale for each major adjustment is summarised later in this section.

The following table shows the impact of each adjustment on CET1 and Total capital ratios, and is presented on a weighted average basis across the four participant banks.

Description[1]	CET1 ratio %	Total capital ratio %
Capital ratios under RBNZ rules	**10.3%**	**13.2%**
Secured residential lending	1.9%	2.5%
Farm lending	1.4%	1.7%
Specialised lending	0.6%	0.7%
Non retail portfolio (LGD/CCF adjustments)	0.6%	0.7%
Market risk	0.5%	0.6%
Currency threshold adjustments	0.3%	0.4%
Deferred tax asset	0.2%	0.3%
Other	0.5%	0.5%
Internationally comparable CET1 ratios	**16.3%**	**20.6%**

[1] Refer to Section 4.3, Appendices A, B and E for detailed analysis and basis for adjustments made.

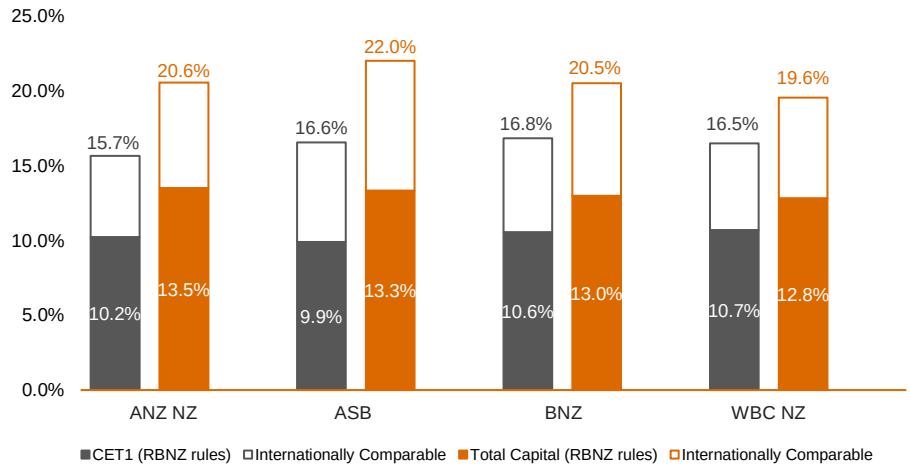
4.2 Impact on individual banks

Whilst there is an uplift in the capital ratio for all the banks when measured on an internationally comparable basis, the quantum of the uplift varies from bank to bank. The benefit is dependent on the individual bank's own particular circumstances including starting capital position, asset mix, risk profile, supervisory approvals and modelling approaches.

For example where a bank has smaller farm, specialised or residential portfolios (as a proportion of their total lending books), they achieve a smaller 'uplift' than others. There are differences in the modelling parameters each bank uses depending on approaches agreed with the RBNZ. The study noted that in the areas of material adjustment, when the banks re-calculated RWAs without supervisory overlays, they typically converged to similar average RWAs for the portfolios impacted.

Capital data at 31 March 2017 has been used, with the exception of ASB Bank which has used December 2016 data. This corresponds to the most recent half year results at the time the analysis was prepared, so that the banks are at comparable points in the capital generation and dividend cycle.

The following graph shows the impact of adjustments for each bank, on CET1 and total capital.



4.3 Analysis of material adjustments

As noted above, there are six areas which account for the significant majority of the uplift. For these areas, the variation between the New Zealand capital rules and what this study has defined as 'internationally comparable', is summarised below.

NZ treatment	Adjustment made for international comparison	Analysis of impact
Residential mortgages		
• Stepped LGD based on loan to value ratio (LVR) and loan purpose • Stepped correlation factor based on LVR and loan purpose • Supervisory overlay to probability of default (PD)	• Apply flat 15% LGD factor as a proxy for the 10% LGD floor permitted by Basel • Basel defined correlation factor • Remove supervisory overlay to PD	• The impact of these adjustments is that the average risk weight for the residential mortgage portfolio reduces from 28% to 15% across the major banks. • The resultant risk weight is considered to be a reasonable internationally comparable outcome based on published information about typical mortgage risk weights in other countries. • The current risk-weighting using RBNZ rules represents $30bn of additional RWAs relative to the internationally comparable benchmark, which equates to approximately $3bn of additional capital held across the major banks.
Farm lending		
• Stepped LGD based on loan to value ratio (LVR) • Maturity floor of 2.5 years • No firm-size adjustment permitted	• Use bank own estimate LGDs (consistent with non-farm corporates) • Remove maturity floor • Apply Basel-defined firm size adjustment	• This study has removed the farm lending specific overlays which currently increase the RWAs on farm lending exposures compared to equivalent non-farm corporate exposures. • The current RBNZ treatment represents $22bn of additional RWAs relative to the international benchmark, which equates to approximately $2.2bn of additional capital held across the major banks. • The impact of adjustments made in this study is that the average risk weight across the major banks on farm lending exposures reduces from 92% to 49%. This is considered to be comparable to the RWAs which could be expected for non-farm corporate exposures of a similar risk profile.
Specialised lending		
Mandated supervisory slotting.	Re-calculate RWAs using bank own PD and LGD estimates, using the high-volatility commercial real estate (HVCRE) RWA formula defined by Basel	• This study has recalculated RWAs for the specialised lending portfolio using the Basel HVCRE risk weight function. This is more conservative than the corporate risk weight function, reflecting the conservative bias adopted through this report. • This adjustment reduces the average risk weight from 93% to 57%. The current slotting approach required by the RBNZ represents $10bn of additional RWAs, which equates to approximately $1bn of capital held across the major banks. • An alternative approach would be to use the Basel defined corporate RWA function as the basis for the adjustment (which assumes lower correlation and therefore lower risk than the HVCRE curve). This would increase the benefit calculated in this study by $4.7bn RWAs, and results in further increase of 40bps to the internationally comparable CET1 ratio (to 16.7%).
Non retail unsecured LGD		
• Bank own-modelled LGDs which have been approved for capital purposes typically have a floor of 60%.	• Adopt a 45% cap for non-retail LGD	• The RBNZ has not required the NZ major banks to implement a floor in their LGD models, however the models are consistent with those of their Australian parent banks, which were accredited by APRA with an implicit floor of 60%. • The LGD models of the NZ major banks are therefore more conservative than those which are commonly used in overseas jurisdictions, where LGDs of 45% appear to be more commonly used. For example, APRA note in their "International capital comparison study" that the average LGD for unsecured bank and corporate obligors is approximately 45%. • This study has used bank's own estimates of LGD, with a 45% cap applied across corporate and bank LGDs. This has the effect of setting unsecured LGDs at 45%, while potentially assigning lower LGDs for partially secured exposures, consistent with the Basel framework.

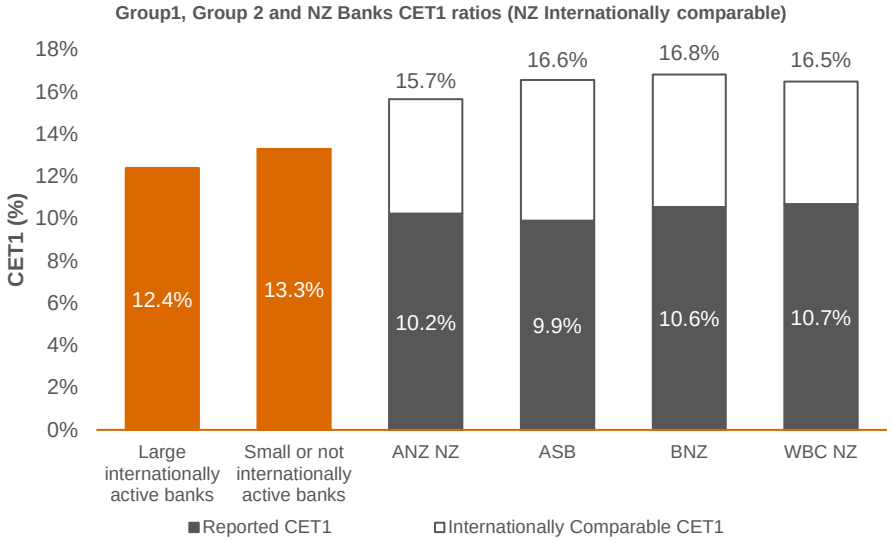
NZ treatment	Adjustment made for international comparison	Analysis of impact
Non-retail credit conversion factors (CCF)		
• Bank own-modelled EADs which have been approved for capital purposes typically have a CCF of 90% – 100%.	• Adopt a 75% CCF for non-retail exposures	• The RBNZ has not required the NZ major banks to implement a floor in their EAD models, however as with LGD models, the EAD models are consistent with those of their Australian parent banks which were accredited by APRA. • As a result, the CCFs adopted by NZ major banks are more conservative than those commonly used overseas. For example, APRA note in their "International capital comparison study" that the average conversion factor applied by global banks to undrawn commitments is approximately 50%. This study has adopted a 75% CCF to the non-retail portfolios, the same approach used by APRA, and so still retaining some conservatism.
Market risk		
• A standardised approach is used to calculate RWAs for traded and non-traded market risk.	• Re-calculate RWAs for traded market risk using an internal (i.e. VaR) based model. RWAs for non-traded interest rate risk have been eliminated, given they are not required under Basel Pilar 1 rules.	• The standardised approach adopted by the RBNZ is more conservative than the internal model approach permitted for traded market risk in almost all other major jurisdictions. • There is significant volatility in traded and non-traded market risk RWAs calculated using the standardised approach, driven by whether certain positions meet narrow offset or netting criteria at any given time. The resulting benefit, when restating to an internationally comparable basis, can also vary significantly, and is dependent on a bank's specific point-in-time position.

5 Comparative analysis

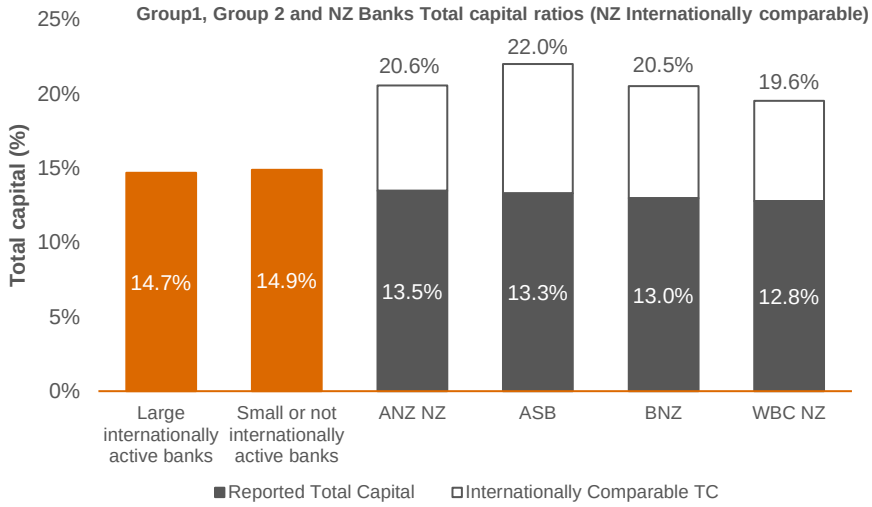
5.1 Comparison to Basel data

As noted in Section 2.2, the BCBS collects and reports data in respect of large internationally active banks (Group 1 banks), and smaller or not internationally active banks (Group 2 banks). On an unadjusted basis, the capital ratios of the New Zealand major banks rank below the median of the Group 1 and Group 2 banks[1] which are analysed in the Basel Committee monitoring report, using both the CET1 and Total capital measures. However, when the ratios are adjusted to an internationally comparable basis, the New Zealand banks are in excess of the median for both cohorts using these capital measures.

CET1 ratios



Total capital ratios



The conclusion from looking at these different measures of capital is that the comparative position of New Zealand banks to international banks is similar whichever measure is used (CET1 or Total capital). This study has therefore focussed on CET1 for further detailed analysis.

[1] Source: BCBS *Basel III Monitoring* Report (September 2017; capital data as at 31 December 2016). New Zealand major banks as at 31 March 2017 (except ASB Bank as at 31 December 2016).

5.2 Largest 100 banks

To permit more granular analysis, this study has collected capital data at individual bank level, including the largest 100 international banks (see Section 2). Where practical to do so, this study has estimated the adjustments required to move banks in other jurisdictions to the chosen internationally comparable benchmark. Examples of adjustments made are:

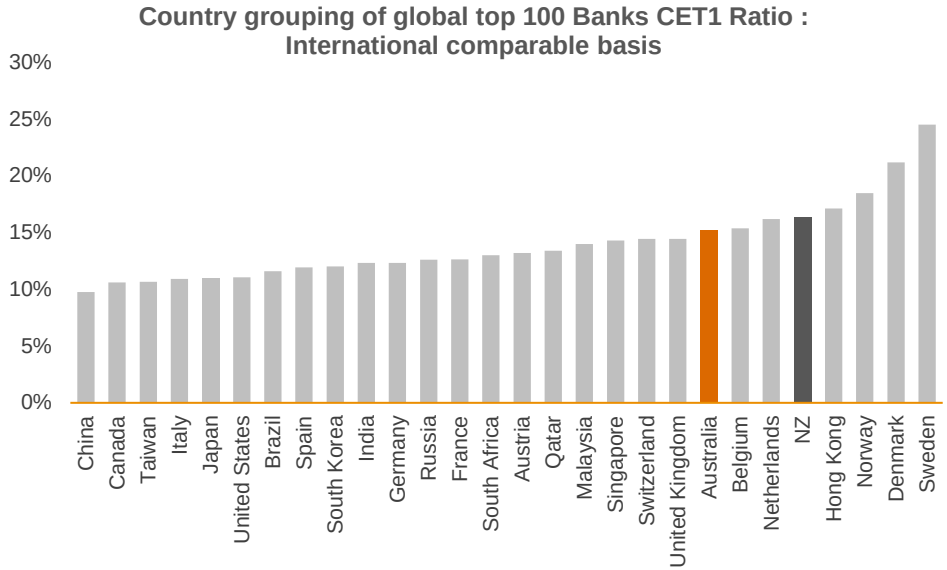
- foreseeable dividends (European Union);
- specialised lending (UK and Singapore);
- sovereign LGD floor (UK); and
- Australian bank self-calculated international comparability differences (consistent with the approach adopted by APRA).

As noted in Section 6.10, it has not been possible to adjust US banks for the super-equivalence regarding exposures to SME corporates under US advanced rules which would be likely to improve the relative positioning of US banks.

Also, as noted in Section 6.4, it has not been possible to adjust EU banks for the sub-equivalence regarding exposures to SME corporates and sovereign exposures which would be likely to worsen the relative positioning of EU banks.

Capital data from all banks is at the latest year or half year end which had been published as at 31 July 2017.

A full analysis of the 100 banks, together with the adjustments made, is contained in Appendix D. The graph below shows the average CET1 ratio by country, using a simple average of the international comparable ratios of the banks in each country.



Comparison to Australian banks

The RBNZ's announcement of a review of the capital framework made reference to the 2014 Financial System Inquiry (FSI) in Australia which recommended setting capital ratios for Australian banks so that they are "unquestionably strong", with the top quartile of internationally active banks given as a guide.

APRA released an Information Paper in July 2017 outlining their conclusions with respect to the quantum and timing of capital increases that will be required for Australian ADIs to achieve 'unquestionably strong' capital ratios. The analysis draws on international comparisons, as suggested by the FSI, as well as other information that allows capital strength to be viewed from different perspectives. In its assessment, APRA has focussed on the appropriate calibration of Common Equity Tier 1 (CET1) capital requirements, recognising

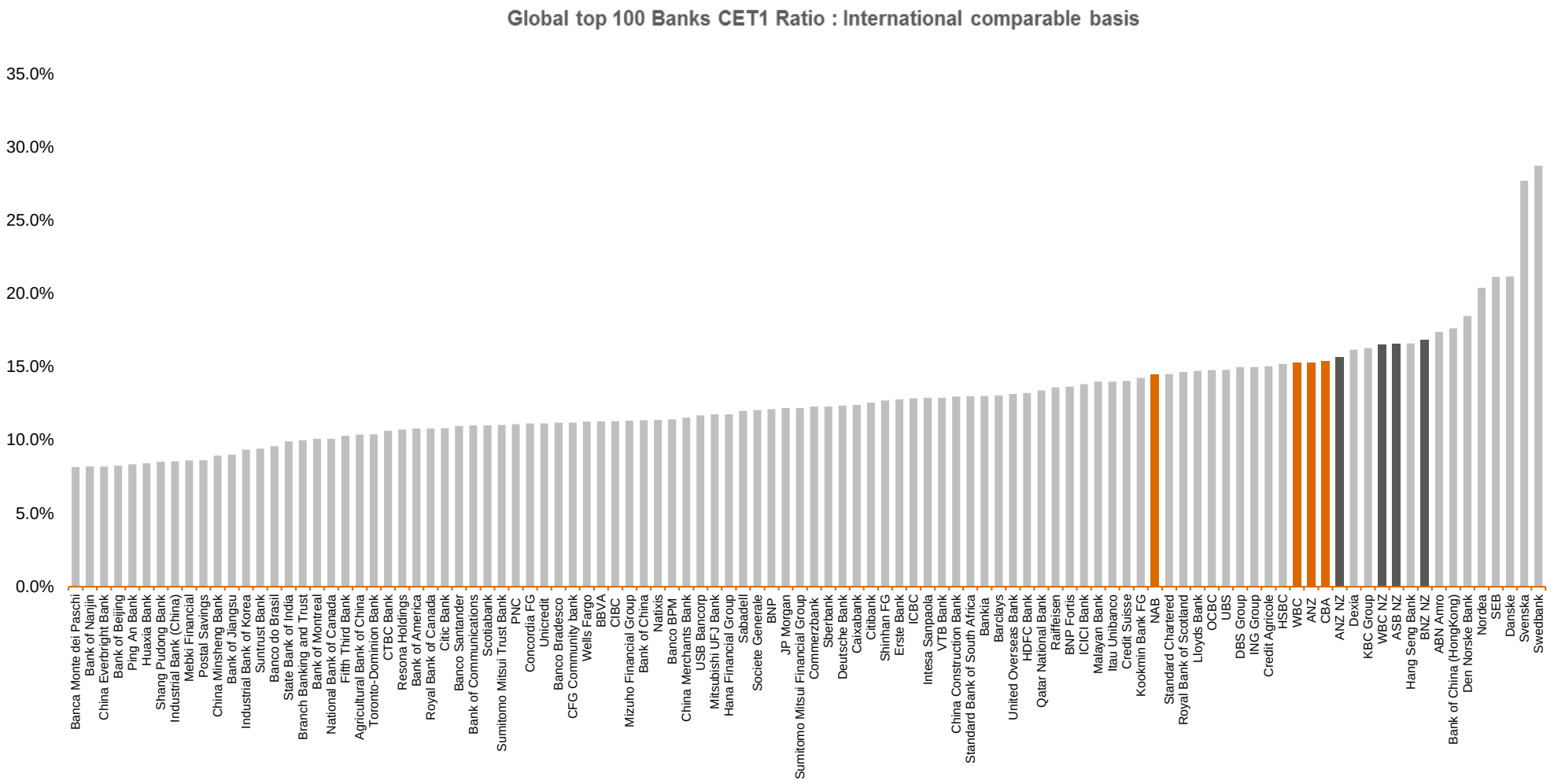
that CET1 is the highest quality capital and therefore most likely to engender confidence in an ADI's financial strength.

APRA concluded that the average CET1 ratio of Australian advanced banks would need to increase by about 100 basis points from their level as at 31 December 2016 (to a ratio of 10.5% under APRA's current rules) to achieve capital ratios that would be consistent with the goal of 'unquestionably strong'. This study has compared the capital ratios of the New Zealand major banks against their Australian parent banks and as illustrated in the graph above, concludes that the average adjusted NZ ratios are higher by about 100 basis points on an internationally adjusted basis. Comparison to Australian banks on an 'APRA basis' is summarised in section 6.2.

Comparison to Nordic banks

As can be seen from the graph above, after these adjustments, some banks notably in the Nordic region, report higher capital ratios than the New Zealand majors. However the capital ratios of Nordic banks are not directly comparable because there is a marked difference in approach to the application of the Basel framework in those countries. Risk weights for Nordic banks are significantly lower in certain material portfolios by comparison to international norms, however minimum capital ratios are set at a higher level in these countries to ensure that there is sufficient capital. This "Pillar 2" approach results in higher reported capital ratios. This is discussed further in Sections 5.3 and 7.

The following table shows the relative positioning of the New Zealand major banks (and their Australian parents) compared to each of the individual 100 largest banks. All banks have been re-stated to a best estimate of international comparability[1].



[1] Most Nordic banks benefit from low Pillar 1 risk-weightings for mortgage lending. Refer to Sections 5.3 and 7 for discussion of Nordic bank risk weights.

5.3 Peer country analysis

This study has identified 9 countries which can be regarded as comparable to New Zealand, based on the characteristics set out in Section 2. The average CET1 ratio of banks with assets over US $10bn in these countries is summarised below, with a comparison to New Zealand. As far as possible, adjustments have been made to re-state these banks to an internationally comparable basis. Appendix D provides further detail regarding the reported CET1 ratios, and the adjustments made.

Country	No. of banks	Weighted Average CET1
Austria	2	13.1%
Ireland	2	14.0%
Singapore	3	14.4%
Switzerland	10	14.6%
Netherlands	2	15.8%
New Zealand	**4**	**16.3%**
Norway	7	17.6%
Finland	2	20.0%
Denmark	5	20.3%
Sweden	6	23.7%

The search for countries that are similar to New Zealand has resulted in the identification of an unusual cohort of banks against which to compare. Apart from Singapore, the list is dominated by European countries, including the four Nordic countries of Sweden, Denmark, Finland and Norway. The average CET1 ratios of Nordic banks is significantly higher than the global median, however as noted earlier, and as analysed further in Section 7, this is largely driven by relatively low credit risk weights - particularly for mortgages – that are reported by banks in these countries (and also by banks in the Netherlands). This means that the reported Pillar 1 capital ratios of the banks in these countries are most likely higher than they would be on an internationally comparable basis. This conclusion is acknowledged by the Swedish Central Bank in a memorandum that was written as a basis for the meeting of the Financial Stability Council in June 2015: Capital Requirements for the major Swedish banks – the Riksbank's view, 3 March 2015. Public disclosures do not contain the granularity required to accurately re-state these banks to more normalised capital ratios.

Supervisors in these countries appear to have adopted a Pillar 2 driven approach, with substantial supervisory buffers applied to ensure that overall capital levels are set appropriately for national conditions. However this difference in approach means that these jurisdictions are more likely to report higher capital ratios than would be reported if a Pillar 1 approach were adopted. For example Sweden has much lower risk weights for mortgage lending, but applies a Pillar 2 capital buffer incorporating a 25% risk weight, the quantum of which is typically disclosed in Pillar 3 reporting. This means that Swedish banks report significantly higher capital ratios, but also have much higher supervisory target ratios. New Zealand and Australia on the other hand adopt a predominately Pillar 1 approach where regulatory overlays are applied to risk-weightings, which means that their reported capital ratios are much lower.

To illustrate the impact, a bank that applies a Pillar 1 mortgage risk-weighting of 5% would report a capital ratio that is 5 times higher than if the same bank were required to apply a Pillar 1 risk weight of 25%, if all other risks were ignored. As noted in Section 1, the Australian Financial System Inquiry recommended that APRA develop a reporting template for Australian Authorised deposit-taking institutions that is transparent against the minimum Basel Capital framework to assist benchmarking against peer banks.

6 Jurisdiction specific comparisons

6.1 Jurisdiction specific differences

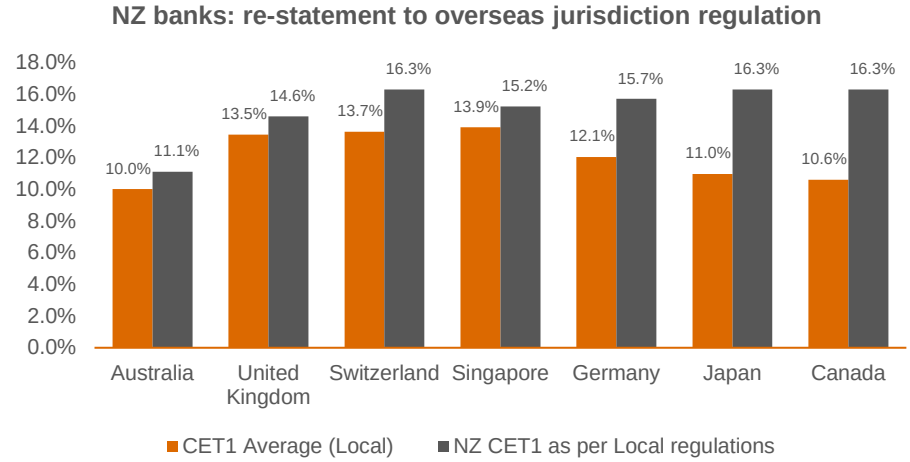
The research undertaken in this study has identified a range of supervisory practices, which have been used to inform the adjustment required to both New Zealand and overseas banks to an 'internationally comparable' basis.

The accuracy of this exercise is limited by the depth of publically available information regarding:

- detailed approaches adopted by supervisors particularly regarding bank-modelled RWAs; and
- the granularity of capital disclosures made by overseas banks from which to estimate the required adjustments.

An alternative view of the relative capital strength of New Zealand's banks can be obtained by estimating the capital ratios which these banks would be likely to report if they were subject to supervision in overseas jurisdictions. The advantage of this approach is that participant banks are able to calculate revised RWAs at the required level of granularity. However the limitation regarding the depth of understanding of supervisory practices in these jurisdictions remains. The models used by NZ banks would not necessarily be the same if they were accredited by a different overseas regulator.

This part of the study estimates the adjustment required to RWAs and the capital base which would be expected if the New Zealand banks were regulated in these jurisdictions, and compares them to the unadjusted fully-implemented Basel III CET1 ratios disclosed by the major banks in those countries. As illustrated in the following graph, this study concludes that in all countries examined, the New Zealand banks would have higher CET1 ratios than the average of the main domestic banks in each jurisdiction.



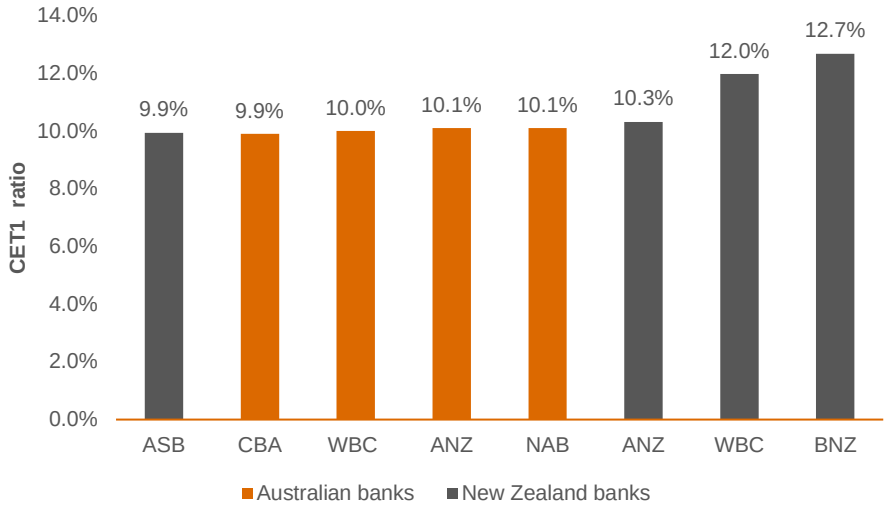
Note: The country average CET1 used to plot the graph above is calculated as a simple average of CET1 of major banks in the particular countries. The individual banks used in this comparison are shown in the following sections.

6.2 Australia

Australia shares many of the areas of conservatism adopted in New Zealand. Consequently several adjustments for international comparability have not been made (e.g. specialised lending). There are however several remaining variations in treatment, and the RBNZ ratios of the NZ banks have been adjusted as follows:

- Adjustments where APRA rules are more conservative compared to NZ:
  - capital deductions for equity investments
  - capital deductions for intangible assets.
- Adjustments where APRA rules are less conservative compared to NZ:
  - Farm lending
  - While both jurisdictions are super-equivalent with regards to residential lending, an adjustment has been applied to the New Zealand banks to re-state to the Australian average (25%).
- Market risk adjustments have been applied to permit use of internal modelling for traded market risk (consistent with APRA), and to recalculate IRBB using APRA's approach (APS 117) rather than the RBNZ's standardised approach. Depending on the bank's risk profile, this may be either an increase or decrease in market risk RWAs across trading and banking book.

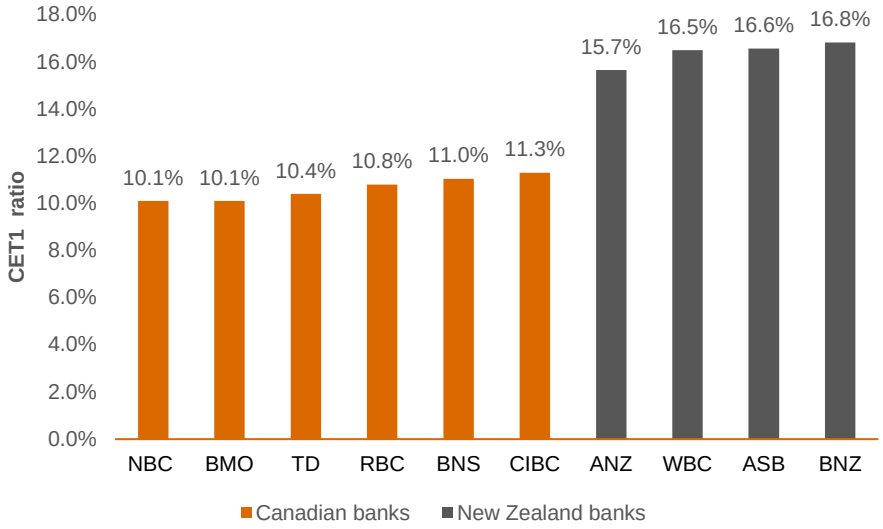
The Australian major banks' reported ratios include those of their New Zealand subsidiaries restated to APRA regulatory requirements.



6.3 Canada

No material departures from Basel III in the Canadian capital rules have been identified.

When comparing to banks in Canada, account needs to be taken of structural differences in Lenders Mortgage Insurance (LMI). Mortgages may be insured with the Canada Mortgage and Housing Association, which is fully guaranteed by the Canadian government, and are afforded the lower sovereign risk weight. The Canadian regulator also allows lower risk weights where exposures are covered by comprehensive private sector mortgage insurance with a backstop guarantee provided by the Canadian government. In New Zealand, LMI is not taken into account by IRB banks when modelling risk weights for residential mortgages. Given that a substantial number of Canadian mortgages are insured, it follows that the capital ratios for Canadian banks are not directly comparable to those of the New Zealand's banks. This is a structural difference which is not appropriate to adjust for in this comparative study.



6.4 Germany

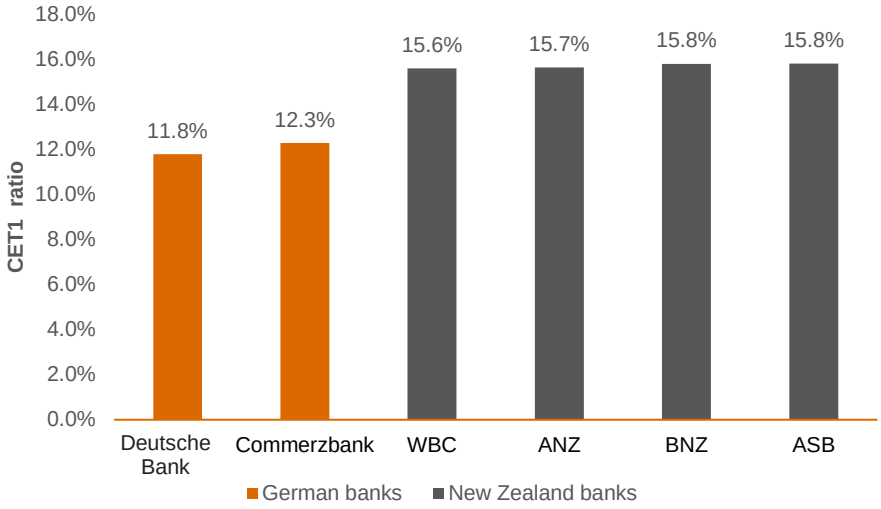
Identified material departures from Basel III in the German capital rules are as follows:

- Deduct foreseeable dividends from the capital base (EU treatment more conservative than Basel).

As discussed in Section 3.2, the European Union RCAP identified two areas which contributed to the "materially non-compliant" assessment which have not been adjusted for in this study, and if made would further improve the position of the NZ banks in comparison:

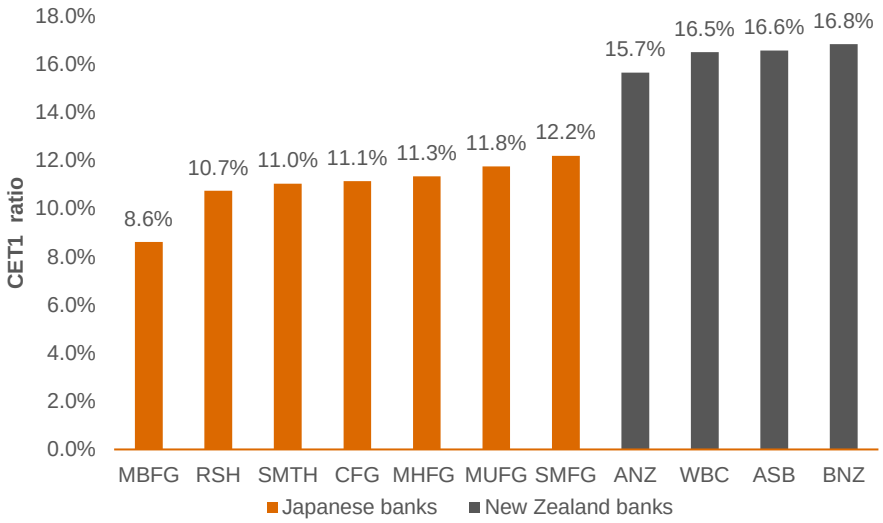
- capital requirements for credit risk on exposures to SMEs are reduced by applying a multiplication factor of 0.7619.

- the use of the standardised approach by IRB banks for sovereign exposures typically results in a 0% risk weight, but would be subject to a small positive risk weight under advanced IRB approaches.



6.5 Japan

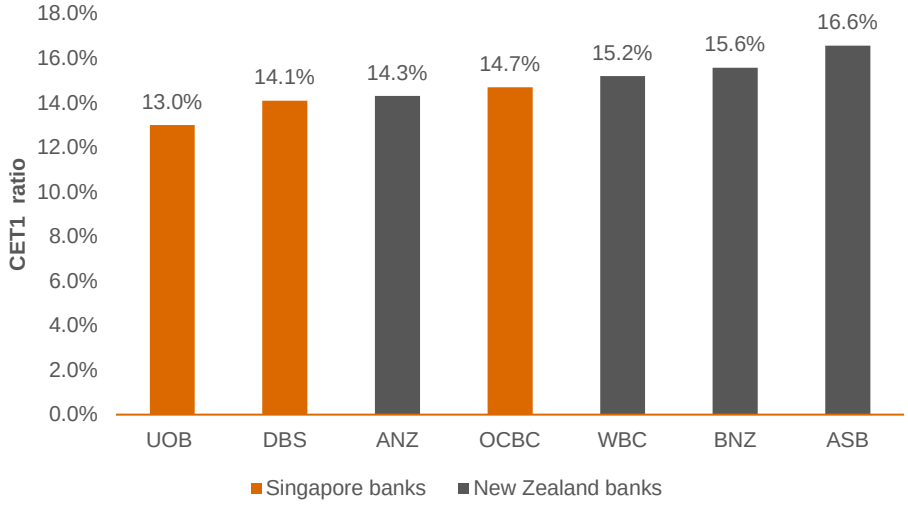
No material departures from Basel III in the Japanese capital rules have been identified.



6.6 Singapore

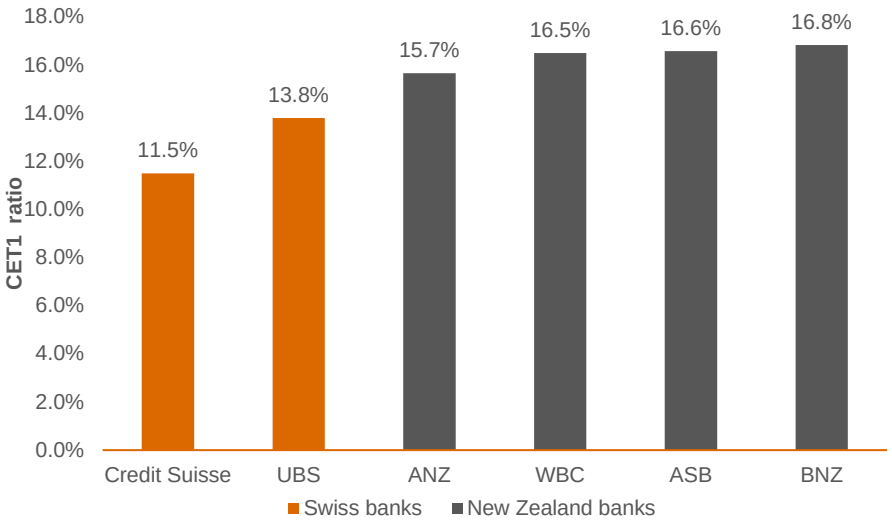
Identified material departures from Basel III in the Singapore capital rules are as follows:

- Mandatory use of slotting for specialised lending (conservative).



6.7 Switzerland

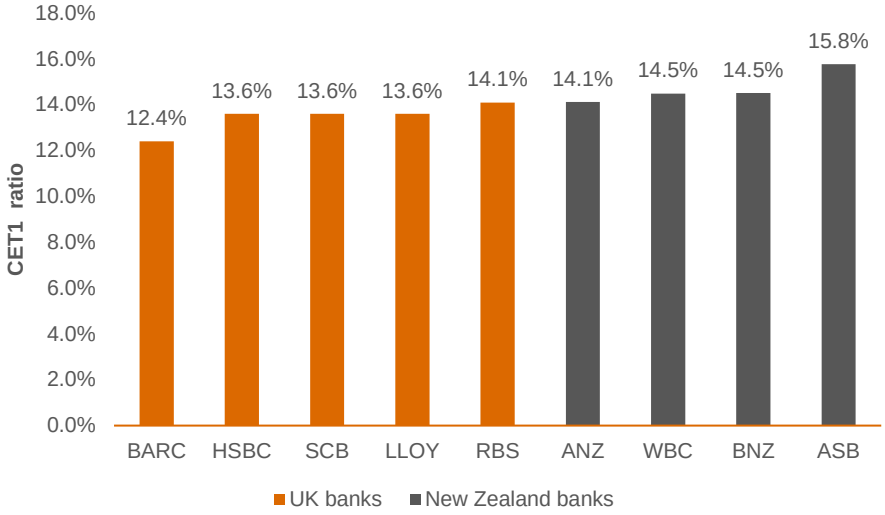
No material departures from Basel III in the Swiss capital rules have been identified.



6.8 United Kingdom

Identified material departures from Basel III in the UK capital rules are as follows:

- Deduct foreseeable dividends from the capital base (conservative);
- Mandatory use of slotting for IPRE (conservative); and
- Apply a 45 per cent LGD floor to sovereign exposures (conservative).



6.9 The United States

The United States has adopted advanced approaches for the 15 largest "core banks", subject to a standardised floor. Both advanced and standardised ratios are disclosed. This study addresses international comparability of the advanced capital rules in the US. The analysis in this section of the report has used data from the public disclosures of 4 core banks (JP Morgan, Citigroup, Wells Fargo and Bank of America).

SME corporate: While the US RCAP identifies several areas of super-equivalence relative to Basel framework (see Appendix E), only one item has been assessed as being likely to have a material impact on published 'advanced' ratios: US rules do not permit the use of the Basel framework concessional correlation adjustment applicable to SMEs, resulting in higher RWAs for these exposures.

This study has attempted to estimate the adjustment required to restate overseas banks to an international comparable basis. However unlike other adjustments made in this report (e.g. UK, Singapore super equivalence), public disclosures do not contain sufficient granularity to approximate the adjustment required to US bank RWAs if the Basel SME risk-weighting approach were applied. However the NZ banks have provided data to adjust RWAs to a US comparable basis (i.e. without the preferential SME risk-weighting).

Residential mortgages: While not identified in the US RCAP as super equivalent, the average risk weight applied to US bank residential mortgage portfolios are significantly higher than international averages, and are higher than those calculated by the NZ major banks under RBNZ rules. This could indicate super equivalence in the way US mortgage risk weights are calculated. However further review of Pillar 3 disclosures indicates that across the majority of exposures, the average US mortgage risk weight is not materially higher than the international benchmark. For example, around 80% of exposures are in higher credit quality bands and have an average risk weight of approximately 16-17%. However there is a significant proportion (around 20%) of exposures that are in lower quality bands, and have risk weights of 100 – 300%, contributing to the average portfolio level risk weight in excess of 30%. This apparent concentration of higher risk loans retained on US bank balance sheets could be a result of selling qualifying residential mortgage loans to government-sponsored entities (GSEs) such as the Federal Home Loan Mortgage Corporation (FHLMC) and Federal National Mortgage Association (FNMA).

The composition of NZ bank portfolios varies significantly to that in the US, with minimal exposures in these higher risk categories. While this could in part be due to more conservative PDs for equivalent risk among US banks, it is likely that the relatively high average US risk weight for mortgages is driven by underlying risk profile rather than material super equivalence in supervisory treatment.

Even if risk weights for US mortgages were more conservative than the international benchmark, this is unlikely to materially impact published ratios. For example, a 5% reduction in the average mortgage risk weight would increase advanced CET1 ratios by approximately 10 bps across the 4 US banks examined.

Given the difficulty in re-stating NZ banks to a US basis and vice versa, a range of scenarios have been analysed, which are summarised in the table below:

- NZ bank SME adjustment: the NZ bank RWAs have been adjusted to remove the concessionary SME corporate treatment adopted by Basel and the RBNZ.
- NZ bank SME and mortgage adjustment: the NZ bank RWAs have also been adjusted to reflect the possibility that US mortgages could be treated more conservatively than the international average, by applying a 25% average risk as a proxy for the risk weight which could apply to NZ mortgages under US supervision. While this risk weight is still below the US average, this is considered reasonable given the higher credit quality among NZ banks.

Calculation approach	CET1 ratio%
US banks (4 core banks)	
Disclosed standardised ratios	12.5%
Disclosed advanced ratios	12.3%
New Zealand banks (all ratios advanced)	
Disclosed RBNZ ratios	10.3%
International comparable ratios (per this study)	16.3%
with SME adjustment	15.4%
with SME and mortgage adjustment	13.5%

In all of the scenarios above, the NZ major banks appear well capitalised by comparison to the large US banks.

7 Comparative risk weights

This study has identified five main areas relating to credit risk IRB RWAs, which have contributed a significant proportion of the 'uplift' to the New Zealand banks CET1 ratios, when restating to an internationally comparable basis. The objective of this section is to test the reasonableness of the adjustments made, by comparing the adjusted risk weights to risk weights in other jurisdictions using publically available information.

7.1 Residential mortgages

There is considerable international variability in residential mortgage risk weights. The BCBS 2016 RCAP review of variability in IRB risk weights reported risk weights in a range of 5.2% through to 80% with a median risk weight of 17%, and a mean of 24.1%. The EBA in their Fourth Report on the consistency of risk-weighted assets (11 June 2014) published the average risk weights across member countries. Further analysis of bank Pillar 3 disclosures indicates that risk weights at the extreme ends of this range are typically attributable to factors such as:

- **Loss experience:** for example the USA due to non-recourse lending has significantly higher risk weights arising from systemically higher LGDs. By comparison, many of the Nordic and Scandinavian countries have low default experience resulting in risk weights at the lowest end of the spectrum, for example Norway 9%, Denmark 12% and Sweden 5%.
- **Government support included in risk weight:** As discussed earlier in this report, there are structural aspects of the Canadian market including government guarantees, giving rise to risk weights which are low by international standards. The uninsured portfolio tends to have a risk weight 3-5% above the insured component.
- **Regulator targets:** Some regulators, including the RBNZ have applied overlays or floors to advanced bank risk weights as a macro-prudential tool, to address concerns such as house price 'bubbles', low interest rates and bank portfolio concentration to residential secured lending. For example the Hong Kong Monetary Authority has set a 15% risk weight floor, while in Australia APRA has set a target 25% average risk weight for performing loans.
- Sweden applies supervisory overlays in Pillar 2 calibrated on a target risk weight of 25%. Being a Pillar 2 approach, it does not serve to reduce published Pillar 1 ratios.

The table below compares international mortgage risk weights from published sources.

Country	Mortgage RW	Source / comment
RCAP 2016 Median	17%	Source: BCBS 2016 RCAP IRB risk weights
Ireland	45%	EBA. Driven by loss experience.
USA	36%	Source: PwC analysis - average of 5 advanced banks.
Czech Republic	26%	Source: EBA
Australia	24%	The average of the 4 advanced banks (non-adjusted). APRA targeting 25% mortgage RW.
Portugal	22%	Source: EBA
Poland	18%	Source: EBA
Spain	17%	Source: EBA
France	16%	Source: EBA
Germany	16%	Source: EBA
Luxembourg	16%	Source: EBA
Hong Kong	15%	The Hong Kong Monetary Authority has set a 15% risk weight floor.

Country	Mortgage RW	Source / comment
Italy	15%	Source: EBA
Denmark	12%	Source: EBA
Singapore	12%	Source: PwC analysis - average mortgage risk weight of the 3 largest banks.
United Kingdom	11%	Source: EBA
Belgium	10%	Source: EBA
Netherlands	10%	Source: EBA
Finland	10%	Source: EBA
Norway	9%	Source: EBA
Canada	7%	Source: PwC analysis. Note that Canada has a government insurance scheme that acts to lower the average risk weight.
Sweden	5%	Source: EBA. Sweden apply a 25% risk weight target when setting Pillar 2 buffers.

By comparison, the reported NZ bank risk weights under RBNZ rules are well above the mean of the BCBS RCAP survey and high compared to most comparative countries. After adjusting the risk weights, the rates are at or slightly below the RCAP median of 17%.

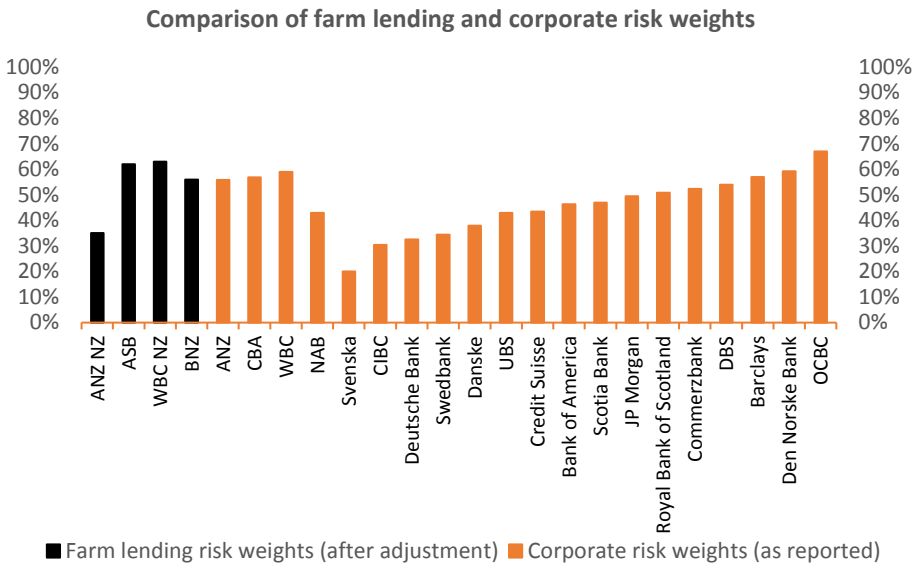
	Reported mortgage risk weight (RBNZ)	Adjusted mortgage risk weight (internationally comparable)
ANZ	23%	14%
ASB	29%	15%
WBC	31%	17%
BNZ	32%	14%

This study has applied the pure Basel framework using bank own modeled PDs and LGDs, and in doing so has reversed the areas of super equivalence applied by the RBNZ as part of their supervisory approach. The outcome has been an adjusted average risk weight across the New Zealand major banks of 15%. This appears reasonable given the range of risk weights noted above. The only countries with materially higher risk weights are either those with a history of significant loss or, in the case of Australia, as a result of supervisor overlays, the impact of which has been adjusted for elsewhere in this report. Given the lack of default and loss experience in New Zealand, the banks own modelled results appear reasonable.

7.2 Farm Lending

As with residential mortgages, this study has also calculated risk weights for farm lending exposures using bank own modelled risk estimates, and applying the Basel framework IRB formula. The effect is to reverse the specific farm lending supervisory overlays applied by the RBNZ to reflect the banking sectors concentration to the sector. The impact is to reduce the risk weight on farm lending exposures from 92% using RBNZ rules, to 49% when adjusted and treated as for any other corporate exposure of an equivalent risk profile.

Validating the reasonableness of this risk weight is challenging. No international bank appears to specifically disclose farm lending exposures, and so a direct comparison of farm lending risk weights is not available across jurisdictions. Given that the objective of this study is to treat farm exposures as for equivalent corporates, one approach is to compare the adjusted risk weights to corporate risk weights. The chart below compares the NZ major bank farm lending portfolios (as reported under RBNZ rules and adjusted) to corporate risk weights reported overseas. This demonstrates that compared to other jurisdictions (who treat farm lending as any other corporate exposure) the NZ major bank adjusted farm lending risk weights remain within a reasonable range.



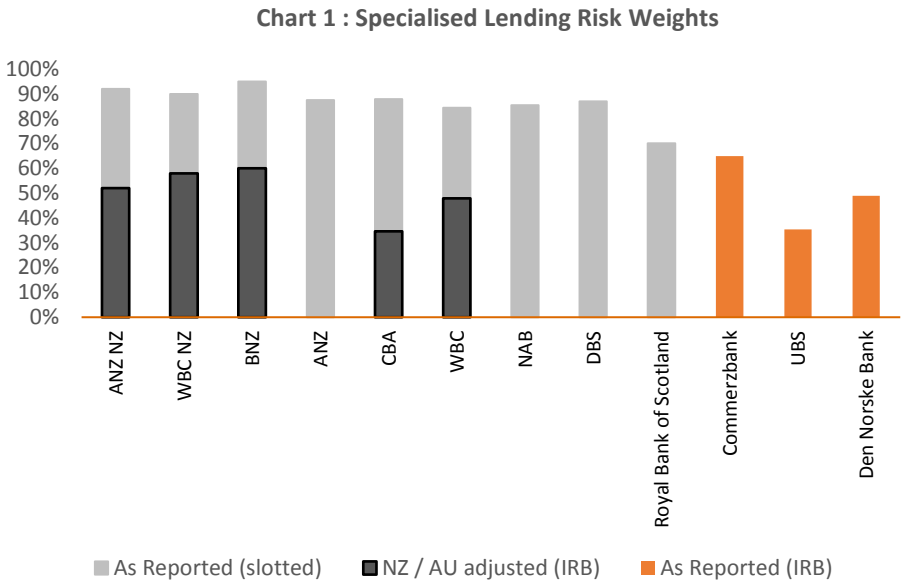
7.3 Specialised Lending

The Basel framework sets out two approaches for specialised lending, subject to supervisory approval; either banks use their own estimates of PD, LGD and EAD or apply the 'supervisory slotting' approach. In general most comparable jurisdictions permit the internal models approach, while Australia, New Zealand, Singapore and the UK require the use of a slotted approach. The rationale is that low loss history does not support reliable modelling of risk estimates for specialised lending. This is reinforced in the BCBS's 2016 review of both standardised and internal models approach where the slotted approach is recommended[1].

For international comparability the approach adopted in this study is to recalculate RWAs using bank own estimates of PD and LGD for exposures in the specialised lending portfolio. This has the impact of reducing the average risk weight on the specialised lending portfolio from 93% when applying supervisory slotting, to 57% when using the advanced approach (however utilising the 'high-volatility commercial real estate' (HVCRE) risk weight function). Assessing the reasonableness of this outcome is also challenging, given the lack of separate public disclosure for specialised lending exposures treated under the own modelled approach. Banks typically include the specialised lending portfolio within the corporate portfolio, unless treated under the slotting approach.

Chart 1 shows the specialised lending risk weights of three of New Zealand's major banks (ASB Bank's portfolio is immaterial and so not included) compared to other jurisdictions that adopt either slotted or internal models approach. The Australian major banks adjust specialised lending from a slotted approach to own estimates in their international comparability disclosures. Two of the four Australian major banks (CBA and WBC) disclose these adjustments in sufficient granularity to allow an estimate to be made of the adjusted risk weight using the IRB approach.

[1] BCBS Reducing variation in the credit risk-weighted asset – constraints on the use of the internal model approach, March 2016, page 2



While there is limited public data available, the adjusted risk weights of the New Zealand major banks appear reasonable compared to those of other banks who adopt own modelling for their specialised lending portfolios.

7.4 Non-retail unsecured LGD

Other than in the FIRB approach, the Basel framework does not specify an unsecured LGD. However the BCBS RCAP[2] identifies Corporate LGD modelling as a material driver of risk weight variability across jurisdictions. The use of an unsecured corporate LGD above 45% can result in materially higher risk weights relative to other international banks.

In the absence of bank models, the use of the FIRB 45% LGD as a proxy can be supported under both the BCBS directions and international practice. For consistency with comparison cohorts, the FIRB LGD of 45% has been applied to Non-Retail Unsecured LGDs to act as a basis for international comparison.

Pillar 3 reports do not specifically disclose the unsecured LGDs. However, the 2013 RCAP review provides some relevant insights to LGD. The table below highlights the results of the survey. Whilst corporate assets are a mix of secured and unsecured the following table provides some perspective of possible outcomes.

Asset Class[3]	RCAP 2013 Mean LGD	RCAP 2013 LGD Range
Sovereign	30%	5% to 45%
Bank	30%	17% to 49%
Corporate	36%	18% to 45%

The 2013 RCAP implies that unsecured non-retail LGDs are typically below 45% and therefore the 45% LGD used in the NZ study is probably a conservative assumption.

[2] BCBS RCAP July 2013, page 32

[3] BCBS RCAP July 2013, Table 4, page 53

7.5 Non-retail undrawn EAD Credit Conversion Factor (CCF)

The April 2016 BCBS RCAP noted the average CCF for corporate undrawn lending limits with non-zero CCF is 55%[4]. In 2015 the BCBS also consulted on Revisions to the Standardised Approach for Credit Risk Approach in which a 75% CCF for off balance sheet commitments was recommended. Initial consultation on the advanced approach revisions included off-balance sheet CCFs for corporates to be equal to {50% of the off-balance sheet exposure multiplied by standardised CCF of 75%}[5]. In the absence of an EAD haircut, a CCF of 75% for undrawn limits seems conservative.

Direct comparison between banks is restricted due to minimal reporting of CCFs in Pillar 3 reports, however the 2016 BCBS RCAP report presented data on this topic. The following table demonstrates that, of the 27 banks in the study, an average corporate CCF of 59% and when the BCBS excluded banks with a 100% CCFs the average was 55%[6].

Asset Class	AIRB RCAP 2016 Average[7]	NZ Reported CCF	Adjusted CCF
Sovereign	59%		
Bank	64%		
Corporate[8]	59%		
Combined Non-Retail		100%	75%

The RCAP study supports, at a minimum, the substitution of a 75% CCF in the NZ study. Arguably the 75% rate is conservative relative to international practice but in its defence it does align to the proposed CCFs in the BCBS 2015 internal models consultation.

7.6 Conclusion

After making adjustments to IRB credit risk RWAs, the resulting reductions in portfolio risk weights appear reasonable relative to overseas banks which have adopted the Basel framework.

[4] BCBS, RCAP, April 2016, page 29

[5] BCBS Reducing variation in the credit risk weighted asset – constraints on the use of the internal model approach, March 2016, page 6.

[6] BCBS, RCAP, April 2016 page 29.

[7] BCBS, RCAP, April 2016, page 29.

[8] Corporate assets represented 56% of the total undrawn limits for IRB banks in the survey. See Table 6 page 29 of BCBS RCAP report.

Appendix A: Detailed analysis of differences

Table A1 – Summary of CET1 adjustments

	Ref	ANZ 31/03/2017	ASB 31/12/2016	BNZ 31/03/2017	WBC 31/03/2017	Weighted Average
CET1 (RBNZ)		**10.2%**	**9.9%[1]**	**10.6%**	**10.7%**	**10.3%**
Deferred tax asset	NZ1	0.0%	0.3%	0.4%	0.4%	0.3%
Revaluation reserve	NZ2	0.0%	0.1%	0.0%	0.0%	0.0%
Farm lending	NZ3	1.2%	1.6%	1.8%	0.9%	1.4%
Currency threshold adjustments	NZ4	0.2%	0.5%	0.2%	0.4%	0.3%
Specialised lending	NZ5	0.9%	0.0%	0.7%	0.7%	0.6%
Unsecured non-retail LGD	NZ6	0.7%	0.1%	0.4%	0.2%	0.4%
Undrawn non-retail EAD	NZ7	0.1%	0.2%	0.2%	0.3%	0.2%
Local government reclassification	NZ8	0.0%	0.0%	0.0%	0.0%	0.0%
Secured residential lending	NZ9	1.3%	2.7%	1.9%	2.4%	1.9%
Market risk	NZ10	0.8%	0.7%	0.4%	0.0%	0.5%
Retail exposures	NZ11	0.0%	0.3%	0.0%	0.0%	0.1%
Adjustment for expected loss		0.3%	0.2%	0.3%	0.5%	0.3%
Total adjustment		5.4%	6.7%	6.3%	5.8%	6.0%
Internationally comparable CET1 ratio		**15.7%**	**16.6%**	**16.8%**	**16.5%**	**16.3%**

[1] As restated in ASB Bank March 2017 Disclosure Statement

Note: When expressed in capital ratio terms, the cumulative impact of all adjustments exceeds the sum of each individual adjustment when calculated on a stand-alone basis. The difference between the cumulative and 'sum of the parts' impact has been allocated to each item above, in proportion to the stand-alone benefit. Table A2 below shows the actual stand-alone CET1 and RWA of each individual adjustment.

Table A2 – Summary of CET1 adjustments (in NZ$ millions)

Capital and RWA values have been rounded to the nearest $ million.

		ANZ		ASB		BNZ		WBC	
		31/03/2017		31/12/2016		31/03/2017		31/03/2017	
	Ref	Capital	RWA	Capital	RWA	Capital	RWA	Capital	RWA
CET1 (RBNZ)		**8,689**	**84,947**	**5,270**	**53,245**	**6,294**	**59,643**	**5,765**	**53,908**
Deferred tax asset	NZ1	-	-	123	-	182	-	171	-
Revaluation reserve	NZ2	-	-	25	-	-	-	-	-
Farm lending	NZ3	-	(6,688)	-	(5,446)	-	(6,524)	-	(3,055)
Currency threshold adjustments	NZ4	-	(1,307)	-	(1,945)	-	(667)	-	(1,431)
Specialised lending	NZ5	-	(4,695)	-	-	-	(2,756)	-	(2,416)
Unsecured non-retail LGD	NZ6	-	(3,916)	-	(438)	-	(1,672)	-	(871)
Undrawn non-retail EAD	NZ7	-	(798)	-	(581)	-	(811)	-	(963)
Local government reclassification	NZ8	-	(54)	-	(3)	-	109	-	(17)
Secured residential lending	NZ9	-	(6,824)	-	(8,318)	-	(6,672)	-	(7,694)
Market risk	NZ10	-	(4,190)	-	(2,407)	-	(1,425)	-	(184)
Retail exposures	NZ11	-	-	-	(1,033)	-	-	-	-
Adjustment for expected loss		152	-	63	-	126	-	214	-
Total adjustment		152	(28,473)	211	(20,172)	308	(20,418)	385	(16,631)
Internationally comparable CET1 / RWA		**8,841**	**56,474**	**5,481**	**33,073**	**6,602**	**39,225**	**6,150**	**37,277**

Table A3 – Overseas jurisdiction specific CET1 adjustments (in NZ$ millions)

Capital and RWA values have been rounded to the nearest $ million.

	ANZ 31/03/2017			ASB 31/12/2016			BNZ 31/03/2017			WBC 31/03/2017			Weighted Average
	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%
Internationally comparable	**15.7%**	**8,841**	**56,474**	**16.6%**	**5,481**	**33,073**	**16.8%**	**6,602**	**39,225**	**16.5%**	**6,150**	**37,277**	**16.3%**
UK restatement													
Total adjustments (UK)		(87)	5,499		(251)	90		(462)	3,063		(441)	2,129	
CET1 UK	**14.1%**	**8,754**	**61,974**	**15.8%**	**5,230**	**33,163**	**14.5%**	**6,140**	**42,288**	**14.5%**	**5,709**	**39,406**	**14.6%**
Singapore restatement													
Total adjustments (SG)		(90)	4,695		-	-		(62)	2,756		(114)	2,416	
CET1 Singapore	**14.3%**	**8,751**	**61,170**	**16.6%**	**5,481**	**33,073**	**15.6%**	**6,540**	**41,981**	**15.2%**	**6,036**	**39,693**	**15.2%**
Germany restatement													
Total adjustments (DE)		-	-		(250)	-		(400)	-		(330)	-	
CET1 Germany	**14.3%**	**8,751**	**61,170**	**15.8%**	**5,231**	**33,073**	**14.6%**	**6,140**	**41,981**	**14.4%**	**5,706**	**39,693**	**14.7%**

	ANZ 31/03/2017			ASB 31/12/2016			BNZ 31/03/2017			WBC 31/03/2017			Weighted Average
	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%	Capital	RWA	CET1%
CET1 (RBNZ)	**10.2%**	**8,689**	**84,947**	**9.9%**	**5,270**	**53,245**	**10.6%**	**6,294**	**59,643**	**10.7%**	**5,765**	**53,908**	**10.3%**
Australia restatement													
Total adjustments (AU)		(880)	(9,264)		(153)	(1,759)		45	(9,643)		(11)	(5,872)	
CET1 AU	**10.3%**	**7,809**	**75,683**	**9.9%**	**5,117**	**51,486**	**12.7%**	**6,339**	**50,000**	**12.0%**	**5,754**	**48,036**	**11.1%**

Table A4 – Summary of Total capital adjustments (in NZ$ millions)

Capital and RWA values have been rounded to the nearest $ million.

	ANZ 31/03/2017			ASB 31/12/2016			BNZ 31/03/2017			WBC 31/03/2017			Weighted Average
	TC %	Capital	RWA	TC %	Capital	RWA	TC %	Capital	RWA	TC %	Capital	RWA	TC %
Total capital (RBNZ)	**13.8%**	**11,701**	**84,947**	**13.7%**	**7,316**	**53,245**	**13.3%**	**7,927**	**59,643**	**12.8%**	**6,903**	**53,908**	**13.4%**
Capital instruments subject to phase-out		(234)			(220)			(181)			-		
Total capital Basel III fully phased-in (RBNZ)	**13.5%**	**11,467**	**84,947**	**13.3%**	**7,096**	**53,245**	**13.0%**	**7,746**	**59,643**	**12.8%**	**6,903**	**53,908**	**13.2%**
International comparable adjustments		152	(28,473)		186	(20,172)		308	(20,418)		385	(16,631)	
Total capital (internationally comparable)	**20.6%**	**11,619**	**56,474**	**22.0%**	**7,282**	**33,073**	**20.5%**	**8,054**	**39,225**	**19.6%**	**7,288**	**37,277**	**20.6%**

Appendix B: Analysis of RBNZ treatments

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
Capital deductions				
NZ1	Deferred tax asset	Basel III para 69: Deferred tax assets (DTAs) that rely on future profitability of the bank to be realised are to be deducted in the calculation of Common Equity Tier 1. Deferred tax assets may be netted with associated deferred tax liabilities (DTLs) only if the DTAs and DTLs relate to taxes levied by the same taxation authority and offsetting is permitted by the relevant taxation authority. Where these DTAs relate to temporary differences (eg allowance for credit losses) the amount to be deducted is set out in the "threshold deductions" section below. All other such assets, eg those relating to operating losses, such as the carry forward of unused tax losses, or unused tax credits, are to be deducted in full net of deferred tax liabilities as described above. The DTLs permitted to be netted against DTAs must exclude amounts that have been netted against the deduction of goodwill, intangibles and defined benefit pension assets, and must be allocated on a pro rata basis between DTAs subject to the threshold deduction treatment and DTAs that are to be deducted in full.	The RBNZ did not adopt the threshold deduction approach for deferred tax assets for temporary differences. Instead these exposures must be deducted in full from CET1 capital. RBNZ does not permit netting of DTL against DTA arising from the carry forward of unused tax losses or tax credits, but Basel allows netting.	DTAs which meet Basel threshold treatment have been added back to CET1, and risk-weighted at 0%.
NZ2	Revaluation reserve	Basel II para 52: Common Equity Tier 1 capital consists of the sum of the following elements: • Accumulated other comprehensive income and other disclosed reserves	Basel requires all other reserves to be included in CET1. RBNZ requires revaluation reserves of tangible fixed assets, foreign currency translation reserves and reserves arising from revaluation of security holdings be included in Tier 2 capital.	Reclassify asset revaluation reserves classified by the banks in Tier 2 capital to CET1.
n/a	Goodwill and other intangibles	Basel III para 67: Goodwill and all other intangibles must be deducted in the calculation of Common Equity Tier 1, including any goodwill included in the valuation of significant investments in the capital of banking, financial and insurance entities that are outside the scope of regulatory consolidation. With the exception of mortgage servicing rights, the full amount is to be deducted net of any associated deferred tax liability which would be extinguished if the intangible assets become impaired or derecognised under the relevant accounting standards. The amount to be deducted in respect of mortgage servicing rights is set out in the threshold deductions section below.	Basel requires exposures classified as intangible assets amounts to be deducted in full net of any associated deferred tax liability, with the exception of mortgage servicing rights which are to be deducted based on set threshold deductions. RBNZ requires the full of intangible assets to be deducted net of any associated deferred tax liability.	No adjustment applicable to NZ major banks

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
n/a	Credit enhancements provided to affiliated insurance groups and associated funds management and securitisation vehicles	No requirement	RBNZ requires the full amount of credit enhancements where the credit enhancement has not been expensed under certain circumstances to affiliated insurance groups, associated funds management and securitisation vehicles to be deducted from CET1 capital.	No participant banks had any credit enhancements provided that has not been expensed to affiliated insurance groups and associated funds management and securitisation vehicles in these certain circumstances – no adjustment made for this item.
n/a	Funding provided to affiliated insurance groups and associated funds management and securitisation vehicles	No requirement	RBNZ requires the full amount of funding provided under certain circumstances to affiliated insurance groups, associated funds management and securitisation vehicles to be deducted from CET1 capital.	No participant banks had any funding provided to affiliated insurance groups and associated funds management and securitisation vehicles in these certain circumstances – no adjustment made for this item.
n/a	Advances of a capital nature provided to connected persons	No requirement	For any fair value gains and losses relating to financial instruments for which a fair value cannot be reliably be calculated, except that a fair value loss that has arisen from credit impairment on a loan and that has been recognised in retained earnings must in all cases be deducted from CET1 capital.	No participant banks hold any financial instruments where the fair value cannot be reliably calculated – no adjustment made for this item.
n/a	Holdings of own shares	Basel III para 78: All of a bank's investments in its own common shares, whether held directly or indirectly, will be deducted in the calculation of Common Equity Tier 1 (unless already derecognised under the relevant accounting standards). In addition, any own stock which the bank could be contractually obliged to purchase should be deducted in the calculation of Common Equity Tier 1. The treatment described will apply irrespective of the location of the exposure in the banking book or the trading book. In addition: • Gross long positions may be deducted net of short positions in the same underlying exposure only if the short positions involve no counterparty risk. • Banks should look through holdings of index securities to deduct exposures to own shares. However, gross long positions in own shares resulting from holdings of index securities may be netted against short position in own shares resulting from short positions in the same underlying index. In such cases the short positions may involve counterparty risk (which will be subject to the relevant counterparty credit risk charge).	The RBNZ does not have any requirements in respect of deduction of gross long positions net of short positions and look through holdings of index securities.	No participant banks have holdings of their own shares – no adjustment made for this item.

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
		This deduction is necessary to avoid the double counting of a bank's own capital. Certain accounting regimes do not permit the recognition of treasury stock and so this deduction is only relevant where recognition on the balance sheet is permitted. The treatment seeks to remove the double counting that arises from direct holdings, indirect holdings via index funds and potential future holdings as a result of contractual obligations to purchase own shares. Following the same approach outlined above, banks must deduct investments in their own Additional Tier 1 in the calculation of their Additional Tier 1 capital and must deduct investments in their own Tier 2 in the calculation of their Tier 2 capital.		
n/a	Market value of securities holdings	No requirement	For any unrealised revaluation losses on securities holdings where the book value of the securities exceeds the market value but the resulting unrealised loss has not been incorporated into the accounts, the full value of the difference should be deducted from CET1 capital.	No participant banks have any of such securities holdings – no adjustment made for this item.
n/a	Reverse mortgages	No requirement	RBNZ requires deduction from CET1 capital of the amount to which the loan value of a reverse residential mortgage loan exceeds the value of the security for the loan that is residential property	No participant banks have reverse mortgages loans where the value exceeds the value of the security – no adjustment made for this item.
n/a	Insignificant holdings of financial institution capital	Basel III para 80: The regulatory adjustment described in this section applies to investments in the capital of banking, financial and insurance entities that are outside the scope of regulatory consolidation and where the bank does not own more than 10% of the issued common share capital of the entity. In addition: • Investments include direct, indirect and synthetic holdings of capital instruments. For example, banks should look through holdings of index securities to determine their underlying holdings of capital. • Holdings in both the banking book and trading book are to be included. Capital includes common stock and all other types of cash and synthetic capital instruments (eg subordinated debt). It is the net long position that is to be included (ie the gross long position net of short positions in the same underlying exposure where the maturity of the short position either matches the maturity of the long position or has a residual maturity of at least one year). • Underwriting positions held for five working days or less can be excluded. Underwriting positions held for longer than five working days must be included. • If the capital instrument of the entity in which the bank has invested does not meet the criteria for Common Equity Tier 1, Additional Tier 1, or Tier 2 capital of the	RBNZ does not specify netting rules for holdings in both the banking book and trading book.	No participant banks have insignificant holdings of financial institution capital – no adjustment made for this item.

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
		bank, the capital is to be considered common shares for the purposes of this regulatory adjustment. • National discretion applies to allow banks, with prior supervisory approval, to exclude temporarily certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution.		
n/a	Significant holdings of financial institution capital	Basel III para 86: Investments included above that are common shares will be subject to the threshold treatment described in the next section.	RBNZ did not apply the threshold deduction approach. Instead the full amount of the investment is deducted.	No participant banks have significant holdings of financial institution capital – no adjustment made for this item.
Credit risk RWAs – standardised				
NZ11	Retail exposures – risk weight 100%	Basel II para 69: Claims that qualify under the criteria listed in paragraph 70 may be considered as retail claims for regulatory capital purposes and included in a regulatory retail portfolio. Exposures included in such a portfolio may be risk-weighted at 75%, except as provided in paragraph 75 for past due loans.	Basel requires retail exposures to apply a 75% risk weight. RBNZ requires all retail exposures (excluding residential mortgage loans) to apply a 100% risk weight.	Reduce risk-weighting to 75% on relevant portfolios subject to the standardised approach.
n/a	Retail mortgage risk – risk weight > 35%	Basel II para 72: Lending fully secured by mortgages on residential property that is or will be occupied by the borrower, or that is rented, will be risk-weighted at 35%. In applying the 35% weight, the supervisory authorities should satisfy themselves, according to their national arrangements for the provision of housing finance, that this concessionary weight is applied restrictively for residential purposes and in accordance with strict prudential criteria, such as the existence of substantial margin of additional security over the amount of the loan based on strict valuation rules. Supervisors should increase the standard risk weight where they judge the criteria are not met.	Basel requires retail mortgage lending to be risk-weighted at 35%. RBNZ prescribes risk weights by different levels of LVR distinguishing between non property-investment residential mortgage loans and property-investment residential mortgage loans, and if there is lenders mortgage insurance. RBNZ's minimum risk weights are 35% or higher.	Immaterial or no impact for New Zealand major banks
Credit risk RWAs: AIRB				
NZ3	Farm lending	There are no specific Basel requirements for farm lending.	Basel II does not specify any specific treatment for farm lending exposures. For farm lending exposures within the corporate asset class, RBNZ requires: • Own estimates of LGD must be greater than or equal to minimum LGDs that correspond to different levels of LVRs • The firm-size adjustment for small-medium sized entities for	Participants banks calculated the impact on RWA for farm lending exposures by: • Removing the minimum LGD requirements • Applying the firm-size adjustment of $50 million • Removing the minimum effective maturity period of 2.5 years

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
			firms with consolidated turnover of less than $50 million must not be applied • The effective maturity period for each facility is subject to a minimum of 2.5 years	
NZ4	Currency threshold adjustments	Basel II para 232, 234, 273: 232. The exposure must be one of a large pool of exposures, which are managed by the bank on a pooled basis. Supervisors may choose to set a minimum number of exposures within a pool for exposures in that pool to be treated as retail. • Small business exposures below €1 million may be treated as retail exposures if the bank treats such exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures. This requires that such an exposure be originated in a similar manner to other retail exposures. Furthermore, it must not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or pool of exposures with similar risk characteristics for purposes of risk assessment and quantification. However, this does not preclude retail exposures from being treated individually at some stages of the risk management process. The fact that an exposure is rated individually does not by itself deny the eligibility as a retail exposure. 234. All of the following criteria must be satisfied for a sub- portfolio to be treated as a qualifying revolving retail exposure (QRRE). These criteria must be applied at a sub-portfolio level consistent with the bank's segmentation of its retail activities generally. Segmentation at the national or country level (or below) should be the general rule. a The exposures are revolving, unsecured, and uncommitted (both contractually and in practice). In this context, revolving exposures are defined as those where customers' outstanding balances are permitted to fluctuate based on their decisions to borrow and repay, up to a limit established by the bank. b The exposures are to individuals. c The maximum exposure to a single individual in the sub- portfolio is €100,000 or less. d Because the asset correlation assumptions for the QRRE risk weight function are markedly below those for the other retail risk weight function at lower PD values, banks must demonstrate that the use of the QRRE risk weight function is constrained to portfolios that have exhibited low volatility of loss rates, relative to their average level of loss rates, especially within the low PD bands. Supervisors will review the relative volatility of loss rates across the QRRE subportfolios, as well as the aggregate QRRE portfolio, and intend to share information on the typical characteristics of QRRE loss rates across jurisdictions. e Data on loss rates for the sub-portfolio must be retained in order to allow	For small business exposures, Basel II set a threshold of €1 million to be included in the retail portfolio. RBNZ converted this threshold to New Zealand Dollars on a 1:1 basis (effectively setting a lower threshold). For retail revolving exposures, Basel II sets the maximum exposure to a single individual in the qualifying revolving retail sub-portfolio at €100,000. RBNZ converted this threshold to New Zealand Dollars on a 1:1 basis (effectively setting a lower threshold). However, RBNZ has not allowed exposures to be included in a qualifying revolving retail portfolio. Such (otherwise qualifying) exposures fall into the other retail portfolio (or possibly the corporate portfolio), which results in a higher capital requirement. The Basel II firm size adjustment for small and medium-sized entities that are risk-weighted on the corporate curve cuts out for firms with a turnover above €50 million. RBNZ converts this threshold to New Zealand Dollars on a 1:1 basis (effectively setting a lower threshold).	Participant banks calculated the risk-weighted asset impact: • if the current retail threshold was increased to NZ$1.6 million from NZ$1 million • if the current retail revolving exposure asset class classification was allowed and the threshold was increased to NZ$160,000 from NZ$100,000 • if the SME turnover threshold was increased to NZ$80 million from NZ$50 million

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
		analysis of the volatility of loss rates. f The supervisor must concur that treatment as a qualifying revolving retail exposure is consistent with the underlying risk characteristics of the sub-portfolio. 273. Under the IRB approach for corporate credits, banks will be permitted to separately distinguish exposures to SME borrowers (defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than €50 million) from those to large firms. A firm-size adjustment (i.e. 0.04 x (1 – (S – 5)/45)) is made to the corporate risk weight formula for exposures to SME borrowers. S is expressed as total annual sales in millions of euros with values of S falling in the range of equal to or less than €50 million or greater than or equal to €5 million. Reported sales of less than €5 million will be treated as if they were equivalent to €5 million for the purposes of the firm-size adjustment for SME borrowers.		
NZ5	Specialised lending	Basel II para 215 and 275: 215. Under the IRB approach, banks must categorise banking- book exposures into broad classes of assets with different underlying risk characteristics, subject to the definitions set out below. The classes of assets are (a) corporate, (b) sovereign, (c) bank, (d) retail, and (e) equity. Within the corporate asset class, five sub-classes of specialised lending are separately identified. Within the retail asset class, three sub classes are separately identified. Within the corporate and retail asset classes, a distinct treatment for purchased receivables may also apply provided certain conditions are met. 275. Banks that do not meet the requirements for the estimation of PD under the corporate IRB approach will be required to map their internal grades to five supervisory categories, each of which is associated with a specific risk weight.	RBNZ took a decision to not allow any internal modelling of specialised lending (SL) risk parameters and to prescribe the more conservative slotting approach for all SL sub-asset classes.	The difference between the RWA calculated using the supervisory slotting methodology and the RWA calculated using participant banks risk estimates was deducted from the regulatory RWA. The following modelling assumptions were used : • Current internally calculated PD, LGD and EAD. • RWAs were calculated using the Basel framework defined HVCRE curve, which is more conservative than the standard corporate RWA function. It is noted that the supervisory slotting approach is a method defined by the Basel Framework, and so arguably not a departure. However given the widespread use of internal modelling overseas, it has been adjusted for the purposes of comparability.

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
NZ6	Unsecured non retail LGD	Basel II para 468: A bank must estimate an LGD for each facility that aims to reflect economic downturn conditions where necessary to capture the relevant risks. This LGD cannot be less than the long-run default-weighted average loss rate given default calculated based on the average economic loss of all observed defaults within the data source for that type of facility. In addition, a bank must take into account the potential for the LGD of the facility to be higher than the default-weighted average during a period when credit losses are substantially higher than average. For certain types of exposures, loss severities may not exhibit such cyclical variability and LGD estimates may not differ materially (or possibly at all) from the long-run default-weighted average. However, for other exposures, this cyclical variability in loss severities may be important and banks will need to incorporate it into their LGD estimates. For this purpose, banks may use averages of loss severities observed during periods of high credit losses, forecasts based on appropriately conservative assumptions, or other similar methods. Appropriate estimates of LGD during periods of high credit losses might be formed using either internal and/or external data. Supervisors will continue to monitor and encourage the development of appropriate approaches to this issue.	RBNZ published rules permit the use of own estimate LGDs in line with the Basel framework. However LGDs under RBNZ approved models typically result in higher LGDs than international norm, and are consistent with those used by APRA regulated parent banks.	Participant banks calculated the RWA impact of a LGD ceiling at 45% for non-retail lending.
NZ7	EAD: Non retail CCF	Basel II para 316: Banks which meet the minimum requirements for use of their own estimates of EAD (see paragraphs 474 to 478) will be allowed to use their own internal estimates of CCFs across different product types provided the exposure is not subject to a CCF of 100% in the foundation approach (see paragraph 311).	RBNZ published rules permit the use of own estimate EADs in line with the Basel framework. However LGDs under RBNZ approved models typically result in higher EADs than international norm, and are consistent with those used by APRA regulated parent banks	Participant banks calculated the RWA impact of reducing CCF on non-retail undrawn exposures to 75%.
NZ8	Local government	Basel II para 57, 58: 57. Claims on domestic PSEs will be risk-weighted at national discretion, according to either option 1 (Sovereign) or option 2 for claims on banks. When option 2 is selected, it is to be applied without the use of the preferential treatment for short-term claims. 58. Subject to national discretion, claims on certain domestic PSEs may also be treated as claims on the sovereigns in whose jurisdictions the PSEs are established. Where this discretion is exercised, other national supervisors may allow their banks to risk weight claims on such PSEs in the same manner.	Basel II allows discretion for risk-weighting public sector entities to either Sovereign or Bank asset class. RBNZ requires public sector entities (local authorities as defined for the purposes of the Local Government (Rating) Act 2002 to be included in Bank asset class.	Participant banks calculated the RWA impact of reclassifying public sector entities to Sovereign asset class from Bank asset class.

Ref	Description	Basel framework treatment	RBNZ treatment	Approach taken in this study
NZ9	Secured residential lending	Basel II para 266, 328: 266. Owing to the potential for very long-run cycles in house prices which short-term data may not adequately capture, during this transition period, LGDs for retail exposures secured by residential properties cannot be set below 10% for any sub-segment of exposures to which the formula in paragraph 328 is applied. During the transition period the Committee will review the potential need for continuation of this floor. 328. For exposures defined in paragraph 231 that are not in default and are secured or partly secured by residential mortgages, risk weights will be assigned based on the following formula: Correlation (R) = 0.15 Capital requirement (K) = LGD × N[(1 – R)^-0.5 × G(PD) + (R/(1 – R))^0.5 × G(0.999)] – PD x LGD Risk-weighted assets = K x 12.5 x EAD The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD (described in paragraph 468) and the bank's best estimate of expected loss (described in paragraph 471). The risk-weighted asset amount for the defaulted exposure is the product of K, 12.5, and the EAD.	Basel II prescribes a 10% floor for LGD and 0.15 correlation factor for exposures secured by residential mortgages that must be applied at the sub segment of exposures to which the risk weight asset formula is applied. RBNZ prescribes minimum LGD and correlation factor by different levels of LVR distinguishing between non property-investment residential mortgage loans and property-investment residential mortgage loans. RBNZ's minimum LGD requirements are 10% or higher, and correlation factor are 0.15 or higher. In addition, the RBNZ may require banks to apply the TUI model to calibrate their PD estimates.	Participant banks calculated the RWA impact of: • Applying a flat 15% LGD factor as a proxy for the 10% LGD floor permitted by Basel. • Using the Basel defined correlation factor. • Removing supervisory overlays to PDs where applied.
Market risk				
NZ10	Market risk	Basel II para 718: 718(Lxx). The use of an internal model will be conditional upon the explicit approval of the bank's supervisory authority. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions intend to work co-operatively to ensure an efficient approval process.	Basel has market risk standards for both standardised and internal modelling approaches. The RBNZ has a standardised approach based loosely on the Basel Market Risk Amendment of 1996 to calculating exposures to interest rate, exchange price and equity price movements, and are markedly different from the current Basel standards.	Participant banks calculated the impact of: • Re-calculating RWAs for traded market risk using an internal (i.e. VaR) based model. • Eliminating RWAs for non-traded interest rate risk.

Appendix C: Comparative data: NZ banks compared to top 100 international banks

Top 100 banks by asset size, and the 4 New Zealand major banks, ranked from lowest to highest by internationally comparable CET1 ratios.

Rank	Bank	Country	Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%
1	Banca Monte dei Paschi	Italy	31/12/2016	159,176.3	8.2%			8.2%
2	Bank of Nanjin	China	31/12/2016	163,220.5	8.2%			8.2%
3	China Everbright Bank	China	31/12/2016	600,061.0	8.2%			8.2%
4	Bank of Beijing	China	31/12/2016	316,165.4	8.3%			8.3%
5	Ping An Bank	China	31/12/2016	437,099.4	8.4%			8.4%
6	Huaxia Bank	China	31/12/2016	348,821.5	8.4%			8.4%
7	Shang Pudong Bank	China	31/12/2016	856,354.4	8.5%			8.5%
8	Industrial Bank (China)	China	31/12/2016	905,718.7	8.6%			8.6%
9	Mebki Financial	Japan	31/03/2017	144,860.8	8.6%			8.6%
10	Postal Savings	China	31/12/2016	1,191,063.3	8.6%			8.6%
11	China Minsheng Bank	China	31/12/2016	866,088.0	9.0%			9.0%
12	Bank of Jiangsu	China	31/12/2016	230,311.5	9.0%			9.0%
13	Industrial Bank of Korea	South Korea	31/12/2016	230,348.9	9.4%			9.4%
14	Suntrust Bank	United States	31/12/2016	205,642.0	9.4%			9.4%
15	Banco do Brasil	Brazil	31/12/2016	448,194.2	9.6%			9.6%
16	State Bank of India	India	31/03/2017	531,130.0	9.9%			9.9%
17	Branch Banking and Trust	United States	31/12/2016	220,501.0	10.0%			10.0%
18	Bank of Montreal	Canada	31/10/2016	526,582.4	10.1%			10.1%

Rank	Bank	Country	Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%
19	National Bank of Canada	Canada	31/10/2016	175,067.7	10.1%			10.1%
20	Fifth Third Bank	United States	31/12/2016	140,200.0	10.3%			10.3%
21	Agricultural Bank of China	China	31/12/2016	2,955,098.3	10.4%			10.4%
22	Toronto-Dominion Bank	Canada	31/10/2016	916,956.0	10.4%			10.4%
23	CTBC Bank	Taiwan	31/12/2016	161,721.4	10.7%			10.7%
24	Resona Holdings	Japan	31/03/2017	435,326.0	10.7%			10.7%
25	Bank of America	United States	31/12/2016	2,247,701.0	10.8%			10.8%
26	Royal Bank of Canada	Canada	31/10/2016	881,065.7	10.8%			10.8%
27	Citic Bank	China	31/12/2016	836,318.2	10.8%			10.8%
28	Banco Santander	Spain	31/12/2016	1,446,187.4	10.6%	0.4%		11.0%
29	Bank of Communications	China	31/12/2016	1,269,877.7	11.0%			11.0%
30	Scotiabank	Canada	31/10/2016	675,050.1	11.0%			11.0%
31	Sumitomo Mitsui Trust Bank	Japan	31/03/2017	588,031.0	11.0%			11.0%
32	PNC	United States	31/12/2016	370,944.0	11.1%			11.1%
33	Concordia FG	Japan	31/03/2017	168,358.0	11.1%			11.1%
34	Unicredit	Italy	31/12/2016	942,496.6	11.2%			11.2%
35	Banco Bradesco	Brazil	31/12/2016	380,115.3	11.2%			11.2%
36	CFG Community Bank	United States	31/12/2016	150,285.0	11.2%			11.2%
37	Wells Fargo	United States	31/12/2016	1,951,564.0	11.3%			11.3%
38	BBVA	Spain	31/12/2016	769,320.7	10.9%	0.4%		11.3%
39	CIBC	Canada	31/10/2016	387,161.0	11.3%			11.3%
40	Mizuho Financial Group	Japan	31/03/2017	1,801,353.0	11.3%			11.3%
41	Bank of China	China	31/12/2016	2,750,603.1	11.4%			11.4%
42	Natixis	France	31/12/2016	556,732.9	10.4%	1.0%		11.4%
43	Banco BPM	Italy	31/12/2016	182,002.3	11.4%			11.4%

Rank	Bank	Country	Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%
44	China Merchants Bank	China	31/12/2016	872,495.3	11.5%			11.5%
45	USB Bancorp	United States	31/12/2016	449,522.0	11.7%			11.7%
46	Mitsubishi UFJ Bank	Japan	31/03/2017	2,724,799.6	11.8%			11.8%
47	Hana Financial Group	South Korea	31/12/2016	306,841.5	11.8%			11.8%
48	Sabadell	Spain	31/12/2016	234,363.8	12.0%			12.0%
49	Societe Generale	France	31/12/2016	1,498,863.7	11.5%	0.5%		12.0%
50	BNP	France	31/12/2016	2,190,568.7	11.5%	0.6%		12.1%
51	JP Morgan	United States	31/12/2016	2,546,290.1	12.2%			12.2%
52	Sumitomo Mitsui Financial Group	Japan	31/03/2017	1,776,943.9	12.2%			12.2%
53	Commerzbank	Germany	31/12/2016	524,427.9	12.3%			12.3%
54	Sberbank	Russia	31/12/2016	438,023.1	12.3%			12.3%
55	Deutsche Bank	Germany	31/12/2016	1,673,819.5	11.8%	0.6%		12.4%
56	Caixabank	Spain	31/12/2016	396,074.6	12.4%			12.4%
57	Citibank	United States	31/12/2016	1,821,635.0	12.6%			12.6%
58	Shinhan FG	South Korea	31/12/2016	362,318.5	12.7%			12.7%
59	Erste Bank	Austria	31/12/2016	238,327.4	12.8%			12.8%
60	ICBC	China	31/12/2016	3,621,166.6	12.9%			12.9%
61	Intesa Sanpaola	Italy	31/12/2016	791,004.6	12.9%			12.9%
62	VTB Bank	Russia	31/12/2016	221,312.2	12.9%			12.9%
63	China Construction Bank	China	31/12/2016	3,154,472.9	13.0%			13.0%
64	Standard Bank of South Africa	South Africa	31/12/2016	142,291.6	13.0%			13.0%
65	Bankia	Spain	31/12/2016	196,775.6	13.0%			13.0%
66	Barclays	United Kingdom	31/12/2016	1,509,794.6	12.4%	0.5%	0.1%	13.1%
67	United Overseas Bank	Singapore	31/12/2016	245,291.4	13.0%		0.2%	13.2%
68	HDFC Bank	India	31/03/2017	137,571.6	13.2%			13.2%

Rank	Bank	Country	Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%
69	Qatar National Bank	Qatar	31/12/2016	204,036.9	13.4%			13.4%
70	Raiffeisen	Austria	31/12/2016	148,141.7	13.6%			13.6%
71	BNP Fortis	Belgium	31/12/2016	314,079.1	13.6%			13.6%
72	ICICI Bank	India	31/03/2017	152,016.9	13.8%			13.8%
73	Malayan Bank	Malaysia	31/12/2016	168,450.1	14.0%			14.0%
74	Itau Unibanco	Brazil	31/12/2016	423,136.8	14.0%			14.0%
75	Credit Suisse	Switzerland	31/12/2016	814,176.4	13.5%	0.5%		14.0%
76	Kookmin Bank FG	South Korea	31/12/2016	340,752.3	14.3%			14.3%
77	NAB	Australia	31/03/2017	604,207.5	10.1%		4.4%	14.5%
78	Standard Chartered	United Kingdom	31/12/2016	646,692.0	13.6%	0.1%	0.8%	14.5%
79	Royal Bank of Scotland	United Kingdom	31/12/2016	982,383.5	14.1%		0.6%	14.7%
80	Lloyds Bank	United Kingdom	31/12/2016	1,025,203.1	13.6%	0.7%	0.4%	14.7%
81	OCBC	Singapore	31/12/2016	305,731.8	14.7%		0.1%	14.8%
82	UBS	Switzerland	31/12/2016	909,699.0	13.8%	1.0%		14.8%
83	DBS Group	Singapore	31/12/2016	343,946.7	14.1%		0.9%	15.0%
84	ING Group	Netherlands	31/12/2016	946,486.6	14.2%	0.8%		15.0%
85	Credit Agricole	France	31/12/2016	1,658,141.9	12.1%	2.9%		15.0%
86	HSBC	United Kingdom	31/12/2016	2,416,467.0	13.6%	1.1%	0.5%	15.2%
87	WBC	Australia	31/03/2017	642,258.6	10.0%		5.3%	15.3%
88	ANZ	Australia	31/03/2017	685,472.3	10.1%		5.2%	15.3%
89	CBA	Australia	31/12/2016	701,289.6	9.9%		5.5%	15.4%
90	ANZ NZ	New Zealand	31/03/2017	116,915.4	10.2%		5.4%	15.7%
91	Dexia	Belgium	31/12/2016	224,409.6	16.2%	0.0%		16.2%
92	KBC Group	Belgium	31/12/2016	307,317.3	15.8%	0.5%		16.3%
93	WBC NZ	New Zealand	31/03/2017	62,883.3	10.7%		5.8%	16.5%

Rank	Bank	Country	Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%
94	ASB Bank	New Zealand	31/12/2016	58,119.8	9.9%		6.7%	16.6%
95	Hang Seng Bank	Hong Kong	31/12/2016	177,619.3	16.6%			16.6%
96	BNZ NZ	New Zealand	31/03/2017	67,425.4	10.6%		6.3%	16.8%
97	ABN Amro	Netherlands	31/12/2016	446,918.5	17.0%	0.4%		17.4%
98	Bank of China (HongKong)	Hong Kong	31/12/2016	300,207.8	17.6%			17.6%
99	Den Norske Bank	Norway	31/12/2016	334,796.8	17.6%	0.9%		18.5%
100	Nordea	Sweden	31/12/2016	695,595.9	18.4%	2.0%		20.4%
101	SEB	Sweden	31/12/2016	327,653.3	18.8%	2.3%		21.1%
102	Danske	Denmark	31/12/2016	509,678.5	16.2%	5.0%		21.2%
103	Svenska	Sweden	31/12/2016	327,213.1	25.1%	2.6%		27.7%
104	Swedbank	Sweden	31/12/2016	278,600.8	25.0%	3.7%		28.7%

Explanation for adjustments made in Appendices C and D:

Dividend adjustment:

- Add back 'foreseeable dividend' if it has been deducted in published CET1 ratio (European banks).

Other adjustments:

- Australian banks: as per self-reported international comparability disclosures
- New Zealand banks: Adjustments as per Section 4 of this report.
- Singapore banks: Estimated benefit if exposures treated under supervisory slotting were re-calculated using a corporate risk weight equivalent to NZ internationally adjusted specialised lending exposures (42%).

UK banks: Estimated benefit if: (i) exposures treated under supervisory slotting were re-calculated using a corporate risk weight equivalent to NZ internationally adjusted specialised lending exposures (42%) and (ii) sovereign exposures subject to 45% LGD floor were re-calculated using average sovereign risk weight reported by NZ major banks (4%).

Appendix D: Comparative data: Banks in comparable countries to New Zealand

Bank	Country	Latest Reporting Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%	Weighted Average
Erste Bank	Austria	31/12/2016	238,327.4	12.8%			12.8%	Austria 13.1%
Raiffeisen Bank	Austria	31/12/2016	148,141.7	13.6%			13.6%	
Spar Nord Bank	Denmark	31/12/2016	11,266.3	14.0%	1.3%		15.4%	Denmark 20.3%
Jyske	Denmark	31/12/2016	82,013.4	16.5%	0.3%		16.8%	
Sydbank	Denmark	31/12/2016	19,784.5	16.1%	1.2%		17.3%	
Nykredit	Denmark	31/12/2016	27,650.6	18.8%			18.8%	
Danske	Denmark	31/12/2016	509,678.5	16.2%	5.0%		21.2%	
OP Cooperative	Finland	31/12/2016	145,513.4	19.9%			19.9%	Finland 20.0%
Aktia Bank OYJ	Finland	31/12/2016	10,467.0	19.5%	2.0%		21.5%	
Bank of Ireland	Ireland	31/12/2016	129,864.2	12.3%	0.0%		12.3%	Ireland 14.0%
Allied Irish Banks	Ireland	31/12/2016	100,852.5	15.3%	0.9%		16.2%	
ING Group	Netherlands	31/12/2016	946,486.6	14.2%	0.8%		15.0%	Netherlands 15.8%
ABN AMRO	Netherlands	31/12/2016	446,918.5	17.0%	0.4%		17.4%	
Sparebank 1 SMN	Norway	31/12/2016	16,567.2	14.9%			14.9%	Norway 17.6%
Santander Consumer Bank	Norway	31/12/2016	16,552.3	15.1%			15.1%	
SpareBank 1 SR	Norway	31/12/2016	23,348.4	14.7%	0.5%		15.2%	
DNB Boligkreditt	Norway	31/12/2016	80,982.7	16.0%			16.0%	
Sparebank 1 Oestlandet	Norway	31/12/2016	11,740.8	16.9%			16.9%	
Sparebank 1 Nord	Norway	31/12/2016	10,786.0	15.0%	2.1%		17.1%	
Den Norske Bank	Norway	31/12/2016	334,796.8	17.6%	0.9%		18.5%	

Bank	Country	Latest Reporting Date	Total Assets (USD m)	Reported CET1% (unadjusted)	Dividend adjustments	Other adjustments	Internationally Comparable CET1%	Weighted Average
United Overseas Bank	Singapore	31/12/2016	245,291.4	13.0%		0.2%	13.2%	Singapore 14.4%
OCBC	Singapore	31/12/2016	305,731.8	14.7%		0.1%	14.8%	
DBS SG	Singapore	31/12/2016	343,946.7	14.1%		0.9%	15.0%	
Nordea	Sweden	31/12/2016	695,595.9	18.4%	2.0%		20.4%	Sweden 23.7%
Skandinaviska Enskilda	Sweden	31/12/2016	327,653.3	18.8%	2.3%		21.1%	
Lansforsakringar Bank	Sweden	31/12/2016	30,369.0	21.2%	0.0%		21.2%	
Svenska	Sweden	31/12/2016	327,213.1	25.1%	2.6%		27.7%	
Swedbank	Sweden	31/12/2016	278,600.8	25.0%	3.7%		28.7%	
SBAB Bank	Sweden	31/12/2016	45,004.3	32.2%	1.6%		33.8%	
Julius Baer	Switzerland	31/12/2016	94,580.4	10.6%	1.3%		11.9%	Switzerland 14.6%
Banque Cantonale De Genev	Switzerland	31/12/2016	21,031.0	12.6%			12.6%	
UBS	Switzerland	31/12/2016	909,699.0	13.8%	1.0%		14.8%	
Credit Suisse	Switzerland	31/12/2016	814,176.4	13.5%	0.5%		14.0%	
Luzerner Kantonalbank	Switzerland	31/12/2016	35,879.4	14.9%			14.9%	
Raiffeisen Schweiz	Switzerland	31/12/2016	214,893.5	15.2%			15.2%	
Banque Cantonale Vaudoise	Switzerland	31/12/2016	43,339.6	16.8%			16.8%	
Thurgauer Kantonalbank	Switzerland	31/12/2016	21,260.8	18.0%			18.0%	
Basler Kantonalbank	Switzerland	31/12/2016	37,861.1	18.2%			18.2%	
EFG International	Switzerland	31/12/2016	41,603.0	18.2%			18.2%	

Appendix E: Jurisdiction specific adjustments

Jurisdictions which have been used for comparison purposes have had RCAP Reports completed. This Appendix summarises the findings from those RCAPs for two purposes: (i) findings where a jurisdiction has not fully applied the Basel Framework (and so RBNZ may be more conservative if they have fully applied the Framework) and (ii) areas where that jurisdiction has been identified as being more conservative than the Basel Framework (and where RBNZ may be less conservative than that jurisdiction if they have applied the Basel minimum).

Country / Area	Finding	PwC comment
Canada – less conservative than Basel		
Inclusion of Preference Share Capital	Does not require preferred shares (accounted as liabilities & incl. in Additional Tier 1) to include the automatic conversion trigger at the capital ratio of 5.125 per cent of risk-weighted assets (as required by Basel).	Does not impact calculation of disclosed capital ratios. No adjustment made.
Canada – more conservative than Basel		
Definition of capital and transitional arrangements	Office of the Superintendent of Financial Institutions (OSFI) expects all banking institutions to attain target capital ratios equal to or greater than the 2019 capital ratios from 2013.	Does not impact calculation of disclosed capital ratios. No adjustment made.
	The Canadian Capital Adequacy Requirements (CAR) Guideline requires that any discretionary repurchases of common shares are subject to the prior approval of the Superintendent.	Does not impact calculation of disclosed capital ratios. No adjustment made.
	Paragraphs 16 and 29 of the CAR Guideline require that amendments to the terms and conditions of additional Tier 1 and Tier 2 instruments are subject to the prior approval of the Superintendent.	Does not impact calculation of disclosed capital ratios. Not applicable to CET1. No adjustment made.
Counterparty credit risk (Annex 4)	OSFI's expectation that banks will provide documented justification for their use of two different pricing models, in the case where the pricing model used to calculate counterparty credit risk exposure is different to the pricing model used to calculate market risk over a short horizon.	Qualitative requirement. Does not impact calculation of disclosed capital ratios. No adjustment made.
	OSFI's expectation that banks will provide documented justification for their choice of calibration methods, when two different calibration methods are used for different parameters within the effective expected positive exposure model.	Qualitative requirement. Does not impact calculation of disclosed capital ratios. No adjustment made.
Market risk	OSFI does not allow banks using the Standardised Approach to include unrated securities in the "qualifying" category for the computation of interest rate risk.	Negligible
	OSFI does not fully implement the futures-related arbitrage strategies that attract lower market risk capital charges.	Immaterial or not relevant for NZ banks. No adjustment made.

Country / Area	Finding	PwC comment
Switzerland – less conservative than Basel		
Overall	The RCAP process identified 10 "negative deviations" from the Basel text for the "International Approach", which had not yet been rectified by amendments to the Swiss rules at the time of the assessment. The RCAP measured the cumulative average impact of these items on CET1 as 5bps. We consider this immaterial for this exercise.	Negligible
Switzerland – more conservative than Basel	**None noted**	
European Union – more conservative than Basel		
Credit risk: IRB	Basel allows risk weight for short-term, self-liquidating letters of credit with unrated banks to be lower than the risk weight of the bank's sovereign of incorporation; the Capital Requirements Regulation (CRR) does not include a similar provision.	Negligible
European Union – less conservative than Basel		
Credit risk: IRB (SME)	Exposures to SMEs: As noted in the previous discussion of the credit risk standardised approach, under the transitional provisions in the CRR, capital requirements for credit risk on exposures to SMEs, both in the EU and abroad and under both the standardised and IRB approaches, are multiplied by a factor of 0.7619. This is a material deviation that EU authorities noted was introduced in response to local economic conditions. It is scheduled to be reviewed by 2017.	Material. Impractical to adjust EU banks to reverse this sub-equivalence: public disclosures do not contain sufficient granularity.
Credit risk: IRB (sovereign)	Material deviations from the Basel framework revolve around the exclusion of some significant exposures from the IRB framework……the exclusions cover a variety of exposures including sovereigns, Member State central banks and regional governments, local authorities, administrative bodies, public sector entities, intragroup exposures, and equity exposures incurred under legislative programmes to promote specified sectors of the economy. Most of these exposures are eligible for zero risk weight under the standardised approach, whereas they would typically be subject to a small positive risk weight under the advanced IRB approach. Data for the sample banks indicate that the impact on the CET1 ratios of four banks would be significant while that for one would be moderate	Material. Impractical to adjust EU banks to reverse this sub-equivalence: public disclosures do not contain sufficient granularity.
Singapore – less conservative than Basel		
Credit risk: Standardised Approach – Expanded list of eligible financial collateral	Structured deposits inclusion in the list of eligible financial collateral deemed inappropriate since the structured deposits are not comparable to deposits treated as "cash" and have higher risk.	Only impacts 2 per cent of the deposits in Singapore. Applicable to standardised approach. Negligible impact for NZ majors. No further adjustment necessary for NZ major bank ratios to compare to Singapore.
Credit risk: Internal Ratings-Based Approach – Definition of Retail Exposures (PM)	Allows some exposures to individuals ineligible for retail exposure treatment to be risk-weighted at 100 per cent rather than being considered corporate exposures category under the IRB Approach. Also does not restrict the residential mortgage treatment of retail exposures only to exposures to individuals that are owner-occupiers of the property.	Determined as potentially material in Singapore (some banks noted an increase in ratio, others a decrease). No further adjustment necessary for NZ major bank ratios to compare to Singapore.

Country / Area	Finding	PwC comment
Singapore – more conservative than Basel		
Definition of capital and transitional arrangements	Explicit CET1 capital adequacy requirement, to be set at 6.5 per cent (as compared to the Basel III minimum of 4.5 per cent)	Does not impact calculation of disclosed capital ratios. No adjustment applicable for this report.
	Tier 1 capital adequacy requirement increased from the Basel III minimum of 6 per cent to 8 per cent.	As above.

Appendix F: Glossary

ABCP	Asset-backed commercial paper
ADC	Acquisition, development and construction
AT1	Additional Tier 1 capital
Advanced banks	Banks which have been accredited to use their own models for calculating risk-weighted assets
AIRB (or Advanced IRB)	Advanced internal ratings-based approach
AMA	Advanced measurement approaches
APRA	Australian Prudential Regulation Authority
Basel Framework	Basel Framework includes Basel II, Basel 2.5 and Basel III and refers a number of documents. Refer to the BCBS' Regulatory Consistency Assessment Programme (RCAP), Assessment of Basel III regulations – Canada June 2014, Annex 3: List of capital standards under the Basel Framework used for assessment.
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCF	Credit conversion factor
CET1	Common Equity Tier 1
CRR	Capital Requirements Regulation
D-SIB	Domestic systemically important bank
DTAs	Deferred tax assets
EAD	Exposure at default
EL	Expected loss
FIRB (or Foundation IRB)	Foundation internal ratings-based approach
FSI	Financial System Inquiry (in Australia)
G-SIB	Global systemically important bank
HVCRE	High-volatility commercial real estate
Internationally comparable CET1	Measurement using Basel Framework rules and allowing for national regulatory treatments which would impact on how those rules are implemented in that jurisdiction by comparison to international norms
IRB	Internal Ratings-Based approach
IRRBB	Interest rate risk in the banking book
LGD	Loss-given-default
LVR	Loan to value ratio
MSR	Mortgage servicing rights
NIF	Note issuance facility
PD	Probability of default
PSE	Public sector entity
QRRE	Qualifying revolving retail exposures
RCAP	Regulatory Consistency Assessment Programme
RUF	Revolving underwriting facility
RWAs	Risk-weighted assets
SL	Specialised lending
SME	Small and medium-sized entity
TC	Total capital

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