

MEMORANDUM FOR FSO
FROM Financial Policy
DATE 2 May 2018
SUBJECT 2017 PwC (NZ) study
FOR YOUR Information

We recommend FSO:

- a) **Note** In 2017 the NZBA published a PwC-prepared global comparative study of bank capital ratios that included the four major New Zealand banks. They conclude that actual NZ ratios would be about 600bp higher than currently reported, if calculated on an internationally comparable basis.
- b) **Note** based on our analysis of their report, we are not convinced that the 600 basis point assessment is a reasonable point estimate, although agree it is directionally correct (i.e. we believe we are relatively more conservative, by not by that much).
- c) **Note** In our view the most significant weakness of the PwC (NZ) study is PwC's failure to distinguish between regulator constraints that reflect systemic risks not captured in bank models, and regulator conservatism. Only the latter (and ideally differences due to modelling techniques and accounting treatments) should have been unwound to arrive at internationally comparable CET1 ratios for NZ banks.
- d) **Note** the PwC results provide another data point for us to consider in the Capital Review. We will consider it alongside other relevant information, such as the findings of empirical and theoretical work on optimal capital, including insights from stressed events overseas; and the stress testing exercises.

Introduction

1. In 2017, the NZBA published a PwC-prepared global comparative study of bank capital ratios that included the four major New Zealand banks - the "PwC (NZ) study". Soon after receiving the PwC report, FSO Committee was presented with an overview paper on our initial impressions, as the report was about to be made public. At that stage, we had read the report and had a

number of questions, but hadn't had the time to discuss the exercise with the participants and to understand the process.¹ FP was asked by Governors to report back to FSO once we have had a chance to assess the findings of the PwC (NZ) study, and in particular as they may pertain to the Capital Review.

2. We met with each of the 4 participating banks, with PwC to discuss the New Zealand exercise, and with APRA to discuss the earlier PwC-led Australian exercise (which fed into the 'unquestionably strong' debate).
3. Our overall conclusion is that:
 - these sorts of cross-country comparisons are extremely difficult to do, and rely heavily on the methodological approach;
 - PwC conclude that NZ banks are relatively well capitalised compared to foreign banks, and that doesn't surprise us (although S&P's cross-country measure puts us more in the middle of the pack);
 - while recognising the difficulties of such exercises, our analysis identifies a number of issues – in the nature of omissions or asymmetric treatment, attributing conservatism to New Zealand incorrectly and so on – that have the effect of increasing the reported difference between NZ banks and foreign banks capital ratios;
 - multiple methods to assess relative conservatism provide a number of reference points, but in our view a more systematic and objective framework is already available (the S&P RAC analysis);
 - however, the overarching question of what is the right level of capital for New Zealand, and the appropriate risk tolerance to embed in the capital regime, is left unanswered by all such studies (including the RAC).

The PwC finding

4. PwC attempted to adjust NZ CET1 capital ratios for the large four banks to "an internationally comparable basis" and compared the results to the capital ratios of various samples of foreign banks (including banks covered by the Basel III Monitoring report).
5. PwC estimated that NZ ratios would be about 600bp higher than currently reported, following their adjustments to an internationally comparable basis. Depending on the sample of foreign banks, this would put the big four banks' CET1 ratios above, or well above, the median of foreign banks.

¹ FSO paper "International comparison of capital ratios #7304174. The full PwC report can be found at #7304485.

Comments on the PwC work

6. As noted in the original paper to FSO Committee, exercises of this nature are difficult and fraught with myriad of challenges. The policy stance of a regulator is difficult to ascertain from standards and published material; for example, many regulators around the world are deliberately opaque and manage capital overlays behind the scenes, often by way of a 'side-letter', over and above pillar 2 adjustments.
7. PwC has documented its approach in reasonable detail and was willing to provide further information about its approach when asked. To a significant extent, the results of the study follow from choices and assumptions made and documented by PwC.
8. For the most part, the study implicitly assumes that the capital requirement for a particular loan should be the same regardless of which country the bank or borrower operate in. Country- or bank-specific risk factors such as an unusual concentration of lending in one portfolio, or higher sensitivity of creditworthiness to the state of the economy, are generally not taken into account.
9. Relatedly, the study ignored "pillar 2" adjustments. These are adjustments that individual countries make to the regulatory minimum requirements for one or more banks, to reflect additional risks that are not captured in banks' models or in the Basel standards. These requirements introduce an additional element of conservatism, in a similar (but not identical) way to increases in risk weighted assets under the NZ framework.
10. We note that pillar 2 adjustments seem to be important in the Nordic countries in particular, where modelled risk weights are often low but capital is supplemented by additional pillar 2 requirements. PwC declined to take account of these adjustments because "public disclosures do not contain the granularity required to accurately restate [the relevant banks] to more normalised capital ratios". Some tentative exploratory analysis of our own suggests that if Swedish rules applied consistently to NZ banks, at least one NZ bank would still have a lower capital ratios than at least one Swedish bank.
11. We also note that PwC did not take into account higher minimum capital (CET1) ratios in Singapore (6.5%) or Switzerland (8%).
12. In the comparison to median ratios in the Basel III Monitoring report, no changes were made to the risk weighted asset values reported by countries other than New Zealand. That is, PwC implicitly assumes that New Zealand risk weighted asset values require correction to bring them to "an internationally comparable basis" but that risk weighted asset values in other countries do not. In contrast, changes were made (by the Basel Committee) to the definition of capital for both New Zealand and other countries to bring them to a common basis.

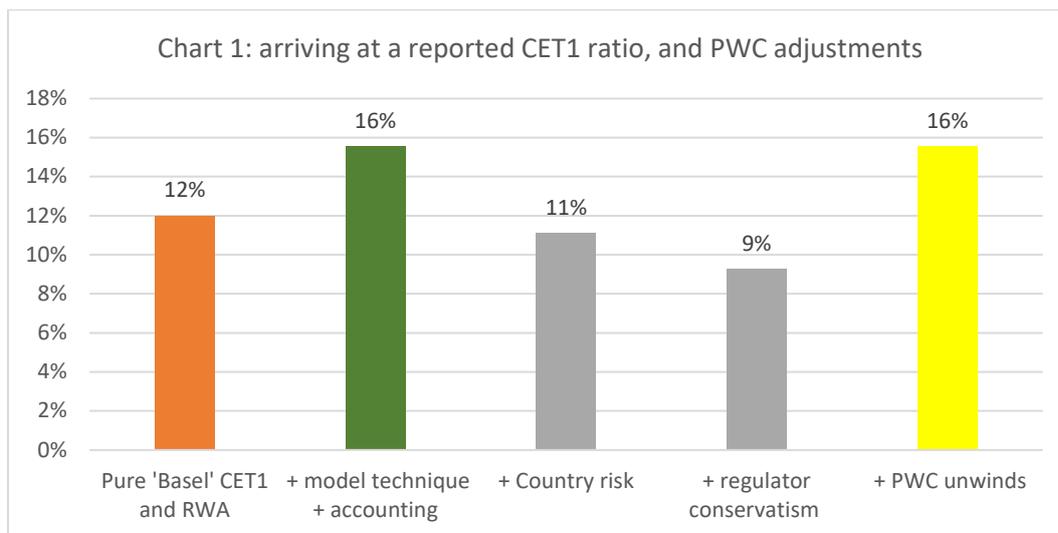
13. In the comparisons of New Zealand banks to the largest 100 banks and to banks in nine comparable countries, we are reasonably confident that comprehensive adjustments were made to NZ bank ratios but we are less sure that comprehensive adjustments were made to ratios of the 100 other banks. PwC used a limited range of sources to work out how to make adjustments in the case of non-NZ banks and, in particular, did not consult bank regulators outside New Zealand. Spot checks (we looked at Hong Kong and South African banks) suggest that at least some significant differences were missed by PwC.
14. The choice of nine comparable countries was made on the basis of GDP information which appears to us to be incomplete (e.g. Greece does not appear even though its GDP would be in the range selected by PwC) and using a questionable index of economic freedom that excludes countries such as Belgium and Israel. Australia is not listed as a comparable country because its GDP is too high, despite the similarity of banking sectors in New Zealand and Australia.
15. In the restatement of NZ banks' ratios to ratios that would apply if calculated under the rules of other countries, the comparison countries were not the nine countries identified as comparable to New Zealand at an earlier stage, and the countries used are in a number of cases very unlike New Zealand in terms of scale and industry structure (United States and Japan, for example). In addition, we are not confident that the adjustments made to NZ banks reflected all the differences between the capital frameworks in NZ and the countries in question.
16. For example, in the comparison of NZ banks' ratios under US rules to the ratios of US banks, PwC ignored the "standardised floor" that the US imposes on capital requirements. That is, in the United States the minimum capital requirement is the greater of the requirement using the IRB approach and the requirement using a standardised approach. If New Zealand banks were subject to a similar requirement, it is possible that their minimum capital requirement would increase (and their actual capital ratio would decrease).

Arriving at a reported CET1 ratio

17. It may be helpful to have in mind a stylised framework for the transformation of a balance sheet into a CET1 capital ratio. Such a framework will be used later in the paper to illustrate and analyse PwC's findings.
18. For simplicity, assume all the relevant bank risks are credit risks captured on the balance sheet (i.e. there are no off-balance sheet exposures, no operational risk and no market risk).
19. All the values in the chart below are hypothetical, and for illustrative purposes only.

20. Several steps are involved in transforming a bank's balance sheet into a CET1 ratio:

Step 1: Starting with shareholder equity, apply the Basel III deductions, the Basel III definitions, and any BIS-published guidance, to arrive at CET1 capital. Starting with balance sheet assets, apply Basel IRB rules and guidance to calculate RWA. Dividing CET1 by RWA gives rise to the CET1 ratio that is labelled "pure 'Basel' CET1 and RWA" in Chart 1 (see below).



Step 2: acknowledge that a variety of accounting treatments for elements of shareholder equity are available, and will be used to boost CET1 wherever possible.

Step 3: acknowledge that a variety of risk modelling techniques are available, and will be used to reduce RWA wherever possible. The result of applying accounting discretion and modelling techniques is a CET1 ratio that is bespoke to the bank and devoid of regulator influence (this CET1 ratio is indicated by "+ model technique + accounting")

Step 4: impose any RBNZ's constraints on the bank's CET1 calculation and IRB model outputs that are intended to reflect systemic risk (including unique country risks) not captured in the bank's modelled risk-weight outputs (this CET1 ratio is indicated by "+ country risk").

Step 5: impose any RBNZ's constraints on the bank's CET1 calculation and IRB model to reflect policy conservatism (these constraints are unrelated to economic risks and are simply a policy stance). The CET1 ratio that results is

the reported regulatory CET1 capital ratio (labelled “+ regulator conservatism” in the chart below).

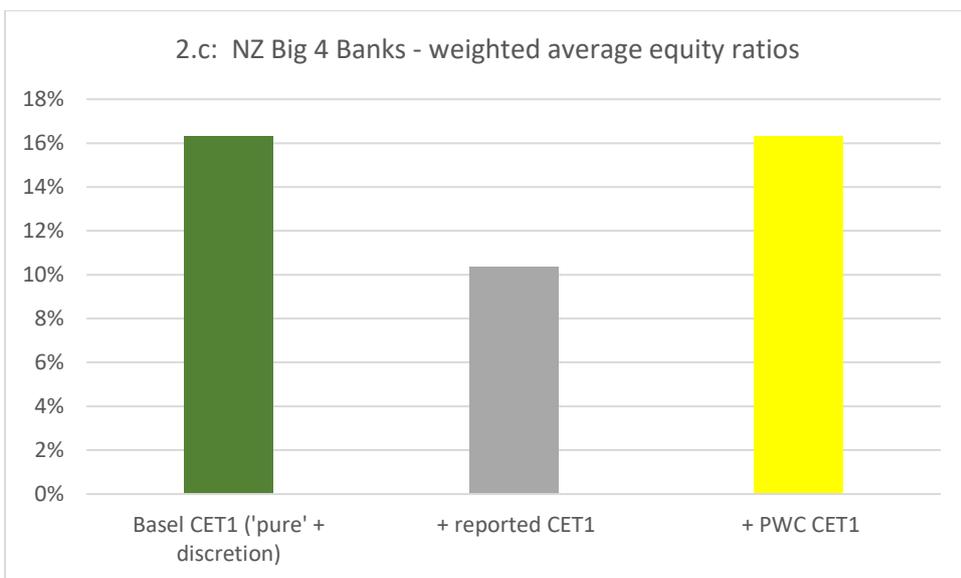
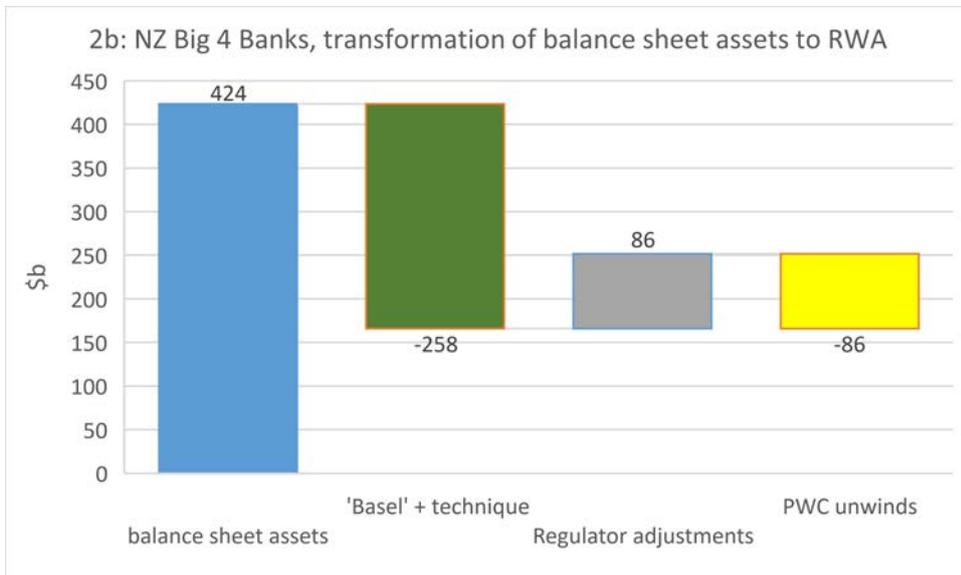
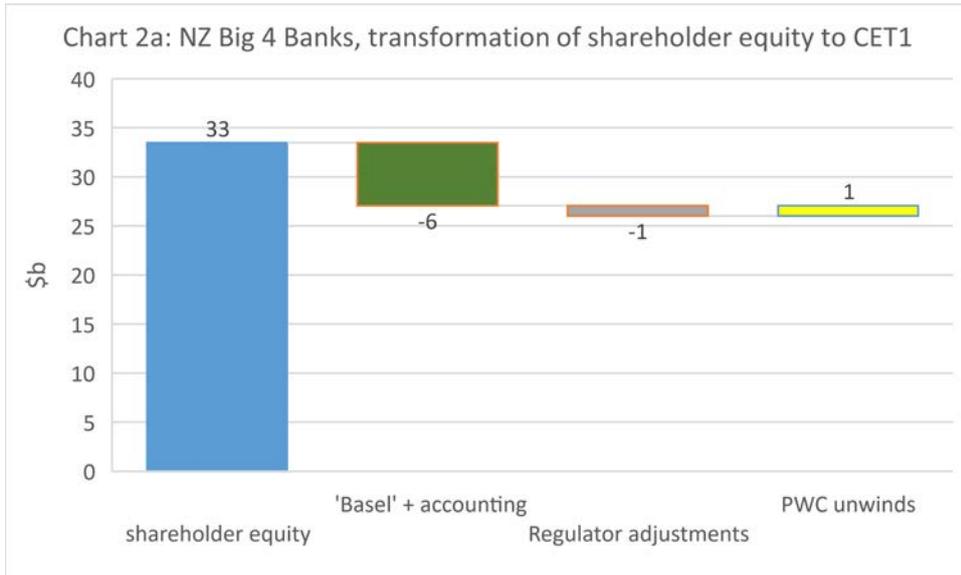
21. For completeness, the CET1 ratio that would arise if PwC produced an “internationally comparable” CET1 ratio for the hypothetical bank is also included in the chart (“PwC unwinds”). This ratio follows from PwC unwinding all regulator adjustments, even those designed to reflect country risks, and not correcting for accounting discretions and modelling techniques.

PwC’s “internationally comparable” CET1 ratio for NZ banks

22. PwC worked backwards from the reported regulatory CET1 and RWA values of NZ’s four large banks.
23. PwC unwound both types of RBNZ constraints, making no distinction between constraints that reflect economic risks not captured in the banks reported CET1 or RWA values, and RBNZ policy conservatism (i.e. constraints that are unrelated to economic risks).
24. The PwC adjustments for RBNZ policies were, in theory, based on relative values – given all jurisdictions potentially impose constraints on banks’ CET1 and RWA values, how far did the RBNZ policies depart from international norms? It was this relative difference between RBNZ and other regulators that PwC tried to unwind.
25. In deciding which RBNZ policies to unwind, and what scale of adjustment to make, PwC needed a benchmark for policies applying in foreign jurisdictions. Sometimes PwC was able to simply use the Basel standards (e.g. what to deduct from shareholder equity to arrive at CET1). But where there is discretion and/or ambiguity in the Basel standards, PwC had to make assumptions about foreign jurisdiction practices. These assumptions mean PwC’s results are conditional – the results are sensitive to the assumptions made about foreign jurisdictions.
26. PwC concluded that the weighted average “internationally comparable” CET1 ratio for the NZ banks was 600 bps higher than the weighted average reported CET1 ratio (16.3% versus 10.3% respectively).
27. PwC’s adjustments primarily related to the RWA calculations (see Charts 2a to 2c below). Aggregate shareholder equity of \$33bn became a reported CET1 value of \$26bn and, after PwC unwinds, the “internationally comparable” CET1 value became \$27bn. Aggregate balance sheet assets of

\$424bn became a reported RWA value of \$256bn (\$424bn less \$258bn plus \$86bn) and, after PWC unwinds, \$161bn.

28. PwC's adjustments to the NZ banks' reported CET1 and RWA values are outlined in detail in Appendix 1.



29. Once PwC had calculated “internationally comparable” CET1 ratios for the large four NZ banks, these ratios were compared with CET1 ratios of foreign banks. In some cases the foreign bank CET1 ratios were simply the CET1 ratios reported by the foreign bank, with no further adjustment by PwC. In this case PwC assumed that all the differences between the foreign regime and RBNZ-policies were adequately captured in the adjustments used to produce the NZ banks’ “internationally comparable” CET1 ratios (i.e. PwC assumed only the RBNZ departed from “international norms”).
30. In other cases, PwC made further adjustments to the CET1 and RWA values reported by foreign banks, unwinding policies that were imposed in the foreign regime, but not in NZ nor, in PwC’s view, typically anywhere else.
31. Thus foreign regimes played an important role in PwC’s analysis:
- Where the RBNZ imposed constraints, PwC had to estimate how much these constraints differed from those imposed in foreign regimes.
 - Where foreign regimes imposed constraints that the RBNZ or other regulators did not, PwC adjusted foreign bank reported ratios in order to unwind the foreign regulator intervention.

Bank involvement in PwC’s (NZ) study

32. We discussed the process used in the PwC (NZ) study with the four large banks, and PwC. For the foreign bank analysis PwC appears to have done most of the analysis, drawing on Basel compliance reports prepared for Basel Committee members, foreign bank capital (“Pillar 3”) reports and local PwC insights.
33. In general terms, it is our understanding that the banks and PwC met, discussed and agreed which RBNZ policies would be unwound in the study. Once the list of areas to be addressed was agreed, banks individually estimated what their CET1 and RWA would be once the RBNZ policies were unwound. The banks then had a series of meetings where they shared results, compared methods, and agreed on estimated impacts of unwinding RBNZ policies in the case of each bank.
34. Following discussion with PwC, we believe their analysis of foreign banks to have been somewhat partial. For example, while PwC can confirm they “downloaded” Pillar 3 disclosure reports from each of the top 100 global banks they can’t recall whether each report was read. PwC also cannot explain why, in areas where Hong Kong and South African regulators, for example, impose

higher bespoke requirements than Basel III (and these were not mirrored in NZ) PwC made no adjustment in the reported CET1 ratios for Hong Kong and South African banks.

35. Other than PwC's recommendation to set aside the results for Nordic countries, it appears that the NZ banks had no input into the foreign bank analysis in the PwC (NZ) study.

Our analysis of the PwC (NZ) study

36. We have undertaken the following analysis of the PwC (NZ) study:

- compared the PwC (NZ) study with two similar reports done for Australia (by PwC in 2014 and APRA in 2015);
- reviewed some of the many judgements and calculations used in the PwC (NZ) study, including "spot-checking" by looking closely at the regimes imposed on a selection of foreign banks used by PwC as comparators for New Zealand banks;
- sense-checked, using our own data and analysis, PwC's conclusions about the impact on New Zealand bank capital ratios of RBNZ policies that depart from Basel III (for example, the impact of LGD floors on farm lending); and
- discussed the PwC (NZ) study and our analysis with PwC, the NZBA and the four major New Zealand banks.

37. The PwC (NZ) study reflects an interest in relative capital levels that is evident in other countries. One of the recommendations of the 2014 Australian Financial Sector Inquiry (FSI), for example, was that capital requirements be set so that Australian banks are "unquestionably strong" and "unquestionably strong" was subsequently interpreted to mean Australian banks having capital ratios in the top quartile of banks internationally.

38. In a 2015 study APRA recalculated the major Australian's banks' CET1 ratios on an "internationally comparable" basis. APRA is now considering, as one option, making the calculation and reporting of "internationally comparable" CET1 ratios mandatory alongside the current reporting of regulatory CET1 ratios (consultation paper expected in 2Q 2018).

39. To be useful, comparative analysis has to be meaningful, and that necessitates asking the right question – which, in our view, is whether the banking sector has adequate capital given bank-specific and country-specific risks. We're of the view that any internationally comparable CET1 ratio must exclude, as far as possible, impacts from modelling techniques and accounting discretion, and leave in regulator overlays that reflect estimates of

systemic country risk that are not adequately captured in banks' own risk models (APRA's study does not appear to have done either of these things).

40. It is important to point out that PwC's approach in the NZ study departs from APRA's approach in that APRA did not adjust foreign bank CET1 and RWA data when assessing the relative capital position of the major Australian banks. APRA also arrived at a lower weighted average "internationally comparable" CET1 ratio for the large Australian banks than PwC (Australia) who did a similar report to the PwC (NZ) study for Australia in 2014 (a detailed report on the APRA and PwC Australia studies has been done by FP and can be provided on request).
41. In our view, a more systematic and objective assessment of the relative capital positions of NZ banks is provided by the ratings agencies (for example, S&P's Risk Adjusted Capital Framework or RAC). A comparison of NZ banks RAC results was done by FP and presented to FSO in December 2016. FP conclusion of this work was that, "through the lens of S&P's RAC New Zealand banks are only moderately well capitalised relative to their international peers. After taking into account the estimated effects of diversification and concentration risks, the average New Zealand bank's S&P capital ratio is in the 29th percentile."

Issues that arise with PwC's analysis

Issue 1: no recognition of country risks

42. The nature of the PwC analysis is that it abstracts away from the systemic risk a given country faces. PwC, in effect, assumed that the systemic risks not captured in bank-models are the same for all countries. This is not a criticism of PwC, rather it reflects the inherent limitation of using such studies to determine the 'right' amount of capital for local conditions.
43. It is important that regulator constraints, used to ensure CET1 and RWA measures reflect unique country risks, are retained in the capital ratios used for comparison purposes. The need to reflect country risk in capital settings is accepted in the Basel standards. The standards introduce capital *minimum* requirements, and acknowledge that regulators may need to impose higher capital requirements because of risks specific to their country.

Issue 2: no recognition of the impact of model techniques and accounting discretion

44. PwC did not unwind differences in modelling techniques or accounting treatments between NZ banks and their overseas peers.

45. One option for removing the impact of modelling techniques, for example, would have been to recalculate RWA assuming the NZ banks were standardised banks, and compare the CET1 ratio result with foreign standardised banks.

Issue 3: weaknesses in the treatment of RBNZ departures

46. We have not asked banks for the estimates of the impacts of RBNZ policies, provided to the PwC study, so our analysis of the accuracy of PwC's adjustments is based on limited information at this point. However based on the information provided when we talked to banks recently, we know that the adjustments made to PD for mortgages for example, varied between the banks:

- RBNZ s105 used the probability of default (PD) estimates for mortgages that come out of their current approved models minus the RBNZ-constraints;
- RBNZ s105 used an unapproved model for PD estimates for mortgages. It is unclear exactly which model they used, but it is not a version of their currently approved RBNZ s105 model and the model is not used for regulatory capital calculations or provisioning; and
- RBNZ s105 removed the 1.25% minimum PD overlay that was imposed several years ago on the mortgage PD models of all banks. RBNZ s105 did not initially remove the PD overlay - it appears to have occurred after the other banks reviewed RBNZ s105 adjusted RWA outputs.

47. This variation in treatment may be due to the banks simply aiming to apply the unconstrained PD estimates produced by their models (i.e. what they would have arrived at had there been no regulatory overlay). However, this would only be consistent with an "internationally comparable basis" if foreign regulators typically simply accept whatever the banks give them for PD. However it is not clear to us that such a policy constitutes an international norm (as required for the PwC approach).

48. In any case, this variation does indicate that the PwC exercise permitted some discretion for how the banks approached the task of unwinding RBNZ-policies from their RWA calculation.

49. The dairy benchmarking exercise provides another avenue for assessing PwC's assessment of the impact of RBNZ regulatory overlays. PwC reported that 140 bps of the overall 600bps uplift to the weighted average CET1 ratio was due to allowing RWA to reflect the modelled LGD's in farm lending. Currently the models are constrained by a loan maturity floor, the linking of LGDs to loan to value ratios and not permitting banks to adjust risk weights for firm size. In effect, unwinding RBNZ-policies amounted to permitting banks to treat farm lending as non-farm corporate lending.

50. PwC's adjustment had the impact of reducing the average risk weight associated with farm lending from 92% to 49%. The Reserve Bank's own analysis from the dairy lending benchmarking exercise suggests the impact of removing the LGD floor on farm lending is to reduce the average risk weight on farm lending from 102% to 72%. This suggests the banks' may have estimated a larger than realistic impact from the floor, but we cannot be sure at this stage.

Issue 4: weaknesses in the treatment of foreign regimes

51. PwC's conclusion that "New Zealand banks are well capitalised relative to banks in many other overseas jurisdictions" was dependent on PwC's views about foreign regulations. The foreign regime aspect of PwC's work is not particularly compelling.

52. As described earlier, PwC used information about foreign regimes in two ways:

- where Basel III allows discretion or is ambiguous, and PwC suspected RBNZ policies departed from international norms, foreign regimes were used to establish an "international norm" against which RBNZ policies were compared and unwound. For example, PwC assumed that the "international norm" was to impose an LGD floor on mortgages of 15%, contrasted to the RBNZ floor of 20%. When calculating the internationally comparable ratio for NZ banks, the RWA was calculated using the 15% LGD assumption (not 20%).
- In order to assess how "well-capitalised" NZ banks were, PwC had to contrast the internationally comparable CET1 ratio calculated for NZ banks with foreign banks' CET1 ratios. For the comparison to be meaningful, the foreign banks' CET1 ratios had to be internationally comparable too, which means if the foreign regime departed from international norms, these departures had to be unwound by PwC.

53. If PwC omitted relevant information about foreign regimes, or made errors in this area, it would mean the internationally comparable ratio calculated for NZ banks would be wrong (PwC would wrongly unwind RBNZ policies or adjust by the wrong amount) and/or the comparisons of NZ banks and foreign banks would be misleading (in other words, if errors were made, the foreign bank CET1 ratios used by PwC as comparators would not be "internationally comparable").

54. PwC took four distinct approaches when ranking the four NZ banks (using their internationally comparable CET1 ratios) against foreign banks:

55. Firstly, PwC did a comparison with banks included in the twice-yearly Basel III Monitoring Report (a quantitative impact study known as “Basel QIS”). PwC concluded that, with a weighted average internationally comparable CET1 ratio of 16.3%, the large four New Zealand banks were “in excess of the median” of both internationally active banks, and smaller, not internationally-active, banks included in the Basel QIS. This was a noticeably less positive result compared to the PwC (Australia) report prepared in 2014 (where Australia’s major banks were found to be in the top quartile).

56. Secondly, PwC collected data on CET1 capital and RWAs, at an individual bank level, for the top 100 banks globally (based on bank assets) and in some cases adjusted it to arrive at “internationally comparable” CET1 ratios for the foreign banks.

- Data for the top 100 banks was used by PwC in two ways:
 - The simple average CET1 ratio was calculated in each jurisdiction and compared to the simple average internationally comparable CET1 ratio calculated by PwC for the large four New Zealand banks. New Zealand was assessed as having an average capital ratio between the fourth and fifth highest of the 30 countries assessed (between Hong Kong and the Netherlands respectively).
 - PwC ranked all the top 100 banks by their CET1 ratio, contrasted this with the large four New Zealand banks’ internationally comparable CET1 ratios, and concluded from this analysis that the large four New Zealand banks had higher CET1 ratios than all but the most capitalised 11 banks (out of the top 100 global banks).
- As the adjustments made to the top 100 banks reported CET1 ratios were relatively few, it appears that, to a large degree, PwC assumed that the requirements of all 30 jurisdictions (home to the top 100 banks) were adequately captured in the adjustments already incorporated in the internationally comparable CET1 ratios for the large New Zealand banks. Our preliminary research suggests further adjustments to the foreign banks reported CET1 ratios might have been justified.
- For example, there is a large gap between the size of the adjustments made for the non-Australian banks (+110bps on average) compared to the Australian banks (+510 bps on average). The PwC (NZ) study reported that the Australian adjustments reflected a comprehensive analysis similar to that done by APRA. We wonder what the results would have been had a similarly comprehensive analysis had been

done countries other than Australia (i.e. would the adjustments to the other top 100 banks' ratios been far higher and the relative position of NZ bank's reduced).

- The issue can be illustrated by the South African bank Standard Bank of South Africa (SBSA). PWC made no adjustments to SBSA's reported CET1 ratio. However South Africa has a conservative definition of CET1 capital - dividends cannot be paid out of CET1 capital.² In practice the dividend treatment means SBSA deducts all unappropriated profit (as well as other deductions) from shareholder equity when calculating CET1 capital. Including 2016's unappropriated profit, which unwinds South Africa's conservative deductions policy, would have increased SBSA's 2016 reported CET1 ratio by 90 bps (the impact of the deduction was 110 bps in 2017).³
- As well, South Africa's RCAP study showed that the regulator imposes conservative overlays within the model approval process (i.e. unconstrained model outputs are not the norm in South Africa).

"The Basel framework provides that a bank must add to its estimates a margin of conservatism that is related to the likely range of errors in estimation of PDs, LGDs and EADs. Where only limited data are available, or where underwriting standards or rating systems have changed, the bank must add a greater margin of conservatism in its estimate of PD. For LGD estimation in the case of retail exposures, the Basel framework requires banks to be more conservative in estimations when there are fewer data... The above requirements to apply a margin of conservatism are not explicit in the South African Regulations. **The SARB responded that any conservatism required to be designed in the model are addressed during the model review process. The SARB will generally not approve of any model that does not comply with the minimum requirements, without any conservative overlays. The SARB also provided evidence of cases where it had required banks to incorporate conservatism in estimations as part of its supervisory review process.**" (emphasis added)⁴

² Basel requires only that local accounting policies be applied when deciding what constitutes retained earnings (and can therefore be included in capital) and what constitutes a dividend.

³ When conservative deductions are reversed, the item must be added to RWA with a risk weight of 100%.

⁴ Source: Basel Committee (2015) Regulatory Consistency Assessment Programme, Assessment of Basel III risk-based capital regulations – South Africa.

- Similarly, PwC made no adjustments to Hang Seng Bank - or the other top 100 bank from Hong Kong, Bank of China (HK) - despite the 2015 RCAP report for Hong Kong identifying several areas where the Hong Kong Monetary Authority's (HKMA) rules depart from the RBNZ's and are stricter than Basel III's minimum standards.⁵
- Unlike Basel III the HKMA requires banks to deduct retained earnings attributable to fair value gains from the revaluation of land and buildings from CET1 capital (these earnings can be reported in Tier 2 capital but are subject to a 55% haircut). As well, again unlike Basel III and the RBNZ, the HKMA imposes a "regulatory reserve" on authorised institutions and retained earnings earmarked for this reserve must be deducted from CET1 capital (the earnings can be recognised at least partially in Tier 2 capital). In 2017 these two policies had the effect of reducing Hang Seng Bank's reported CET1 capital by 25%.⁶ As well, as in New Zealand, deferred tax assets are deducted in full from CET1 capital in Hong Kong (banks cannot utilise Basel III thresholds). PwC added back deferred tax assets for NZ banks but not those subject to HKMA rules.

57. Thirdly, PwC collected capital data, again at an individual bank level, on 39 banks holding assets in excess of US\$10bn and operating in 9 jurisdictions assessed by PwC as being "comparable countries to New Zealand".

- The countries deemed comparable to New Zealand were Austria, Denmark, Finland, Ireland, Netherlands, Norway, Singapore, Sweden and Switzerland. Individual bank ratios, and weighted average CET1 ratios for each country, were calculated on PwC's internationally comparable basis.
- New Zealand's weighted average internationally comparable CET1 ratio was assessed as being exceeded only by the four Nordic countries – i.e. PwC concluded that the New Zealand banks ranked above Austria, Ireland, Netherlands, Singapore and Switzerland. PwC qualified the finding saying the Nordic ratios are "not directly comparable because there is a marked difference in approach to the application of the Basel framework in those countries", thus implying

⁵ BIS (2015) Regulatory Consistency Assessment Programme (RCAP) – Assessment of Basel III risk-based capital regulations – Hong Kong SAR March 2015.

⁶ Hang Seng Bank reports these two deductions as "national specific regulatory adjustments applied to CET1 capital".

that the New Zealand banks are the most capitalised of all banks domiciled in “comparable countries to New Zealand”.

- While these countries were deemed by PWC to be comparable to New Zealand, in many cases the foreign banks *domiciled in those countries* had little in common with New Zealand’s big four banks. For example, included in the sample were multinational G-SIBs ING (headquartered in the Netherlands) and UBS (headquartered in Switzerland). As they operate with a very different business model to New Zealand’s large banks (for example, they have significant portfolios of global assets), it seems unlikely that these G-SIBs are useful comparators for New Zealand banks.
- We disagree with PWC’s conclusion that comparisons could not be made with the Nordic banks. The relatively unconstrained risk weight outputs from Nordic bank models can be used to transform NZ bank balance sheets into RWA, placing NZ and Nordic banks on the same footing, and the resulting CET1 ratios can then be compared. RBNZ s105

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RBNZ s105

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58. Fourthly, similar to our ^{RBNZ s105} analysis above, PwC assessed the capital positions of New Zealand banks assuming they were subject to a foreign jurisdiction. PwC recalculated the CET1 ratios for the large four New Zealand banks using the rules applying in 7 different foreign jurisdictions – Australia, Canada, Germany, Japan, Singapore, Switzerland and the UK. PwC then compared the results for the New Zealand banks with banks in those jurisdictions (within each regime, all banks with assets over US\$10bn were used as comparators).

- PwC concluded from this exercise that the simple average CET1 ratio of the large four New Zealand banks, calculated as per the foreign jurisdiction, would have exceeded the simple average CET1 ratio of the major banks domiciled in every one of the 7 jurisdictions used for comparison purposes.
- It is possible, or even likely given the complexity of such exercises, that PwC may have omitted relevant aspects of the foreign regimes when recalculating the NZ bank's CET1 ratios in this exercise – for example, PwC may not have been as strict as the PRA when requiring NZ banks to deduct “foreseeable dividends” from shareholder equity.
- In our discussions with PwC on this point, they acknowledged the difficulties they faced in this exercise.

“The accuracy of this exercise is limited by the depth of publically available information regarding: [i] detailed approaches adopted by supervisors particularly regarding bank-modelled RWAs; and [ii] the granularity of capital disclosures made by overseas banks from which to estimate the required adjustments.”

Issue 5: potential impact of “Pillar 2” not assessed

59. PwC's analysis stopped at the point the relative “internationally comparable” ratios of NZ banks were contrasted with those of foreign banks. However one further step could have been taken, and would have been potentially useful.

60. In some overseas jurisdictions regulators impose risk-specific CET1 requirements that apply on bank-by-bank basis (“Pillar 2” capital requirements). When recalculating a NZ bank's CET1 ratio as if it was subject to a foreign regime, a reasonable question to have asked would be: would the NZ bank meet the minimum CET1 requirements in the foreign jurisdiction, given the full suite of requirements imposed by the foreign regulator? This question would reveal insights into the relative conservatism of regimes, recognising all the tools available to regulators (i.e. acknowledging Pillar 2).

61.

RBNZ s105

62. This point also applies to regimes that apply higher overall minimum CET1 capital requirements, instead of (or in addition to) Pillar 2, such as Singapore and Switzerland. If subject to these regimes, would the NZ banks comply or be subject to dividend restrictions?

63. It is important to note that the relative conservatism principle underpinning the Capital Review relates to relative capital *requirements* – i.e. regime settings - not relative bank capital ratios. For policy-setting purposes, comparing capital *regimes* is a sensible step, whereas comparing actual capital ratios has the potential to be misleading. This is because many factors – not just regulatory capital minimums - feed into a bank’s decision about how much capital to hold. Hence a bank may hold capital well above what is required of it by the regulator – meaning the actual level of capital reveals very little about the regime applying to the bank.

“Capital Review Principles, 4...*Capital requirements* of New Zealand banks should be conservative relative to those of international peers, reflecting the risks inherent in the New Zealand financial system and the Reserve Bank's regulatory approach.” [emphasis added]

Conclusions

64. Our overall conclusion is that:

- these sorts of cross-country comparisons are extremely difficult to do, and rely heavily on the methodological approach;
- PwC conclude that we are conservative relative to our peers, and that doesn’t surprise us (although S&P’s cross-country measure puts us more in the middle of the pack);
- while recognising the difficulties of such exercises, our analysis suggests a bias in the PwC exercise towards overstating the relative degree of conservatism;
- even after correcting for these biases, there may well continue to be a degree of reported conservatism, such that while we do not have much confidence in the 600 basis point figure they reach, we would accept the overall assessment that we are likely to be more conservative than many of our peers;
- multiple methods to assess relative conservatism provide a number of reference points, but in our view a more systematic and objective framework is already available (the S&P RAC analysis);

- however, the overarching question of what is the right level of capital for New Zealand and our situation and risk tolerance is left unanswered by all such studies (including the RAC).