RESERVE BANK
OF NEW ZEALAND
TE PŪTEA MATUA

Setting an output floor for the IRB approach

FSO Committee 7th November 2018

Purpose

- Previous FSO paper (#7752196) outlined different options for setting an output floor on IRB banks' risk-weighted assets, linked to standardised outcomes.
- The paper recommended a combination of a higher IRB scalar and an output floor as a better approach to addressing the disparity between IRB and standardised outcomes than using an output floor alone.
- FSO asked for a report back with further discussion on the rationale for increasing the IRB scalar.

Risk weighted assets calculation

IRB	$k_{IRB} = 1.06 \times f(PD, LGD, EAD, R, M)$
Standardised	$k_{standardised} = \text{risk weight} \times \text{exposure amount}$

IRB: Capital requirement determined by banks' estimates of probability of default (PD), loss given default (LGD), exposure at default (EAD), maturity (M), and regulatory correlation factor (R)

Standardised: Capital requirement is a combination of prescribed risk weight for each type of counterparty and exposure amount

What is the IRB scalar?

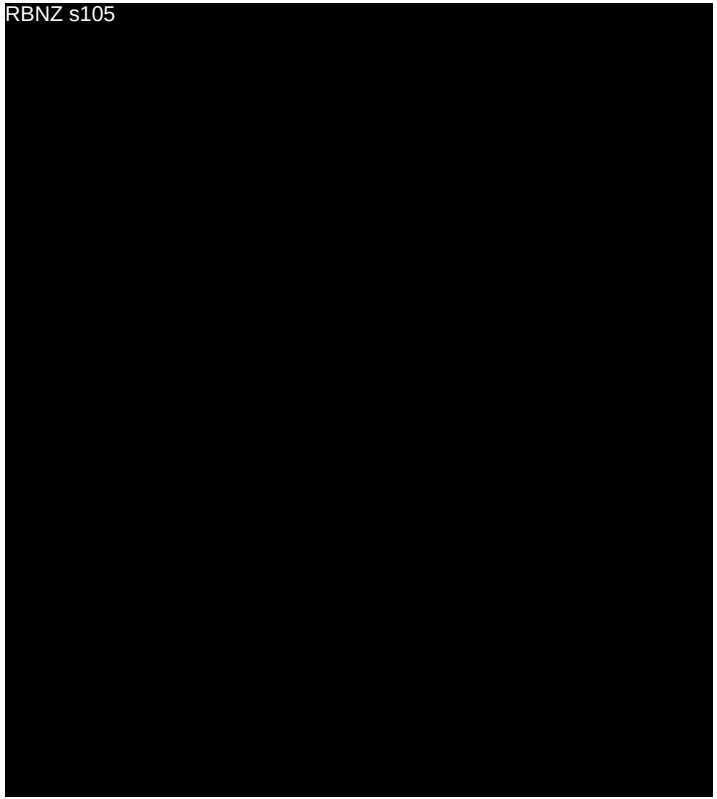
$$k_{IRB} = \mathbf{1.06} \times f(PD, LGD, EAD, R, M)$$

- It was not known where banks' final IRB numbers would land vis-à-vis Basel I or the new standardised approach when Basel II was being introduced. The Basel Committee included a scaling factor for all exposures subject to IRB, which gave supervisors a level of comfort about the capital impact of the new framework.
- Basel II finalised the scalar at 1.06, and this has been unchanged since 2006. We also set the scalar at 1.06 in New Zealand.
- The scalar applies equally across all IRB exposures. This means it increases overall capital from the IRB approach while fully preserving IRB's risk differentiation (relative capital amounts are unchanged, within and across asset classes and banks).

Output floor dilemma

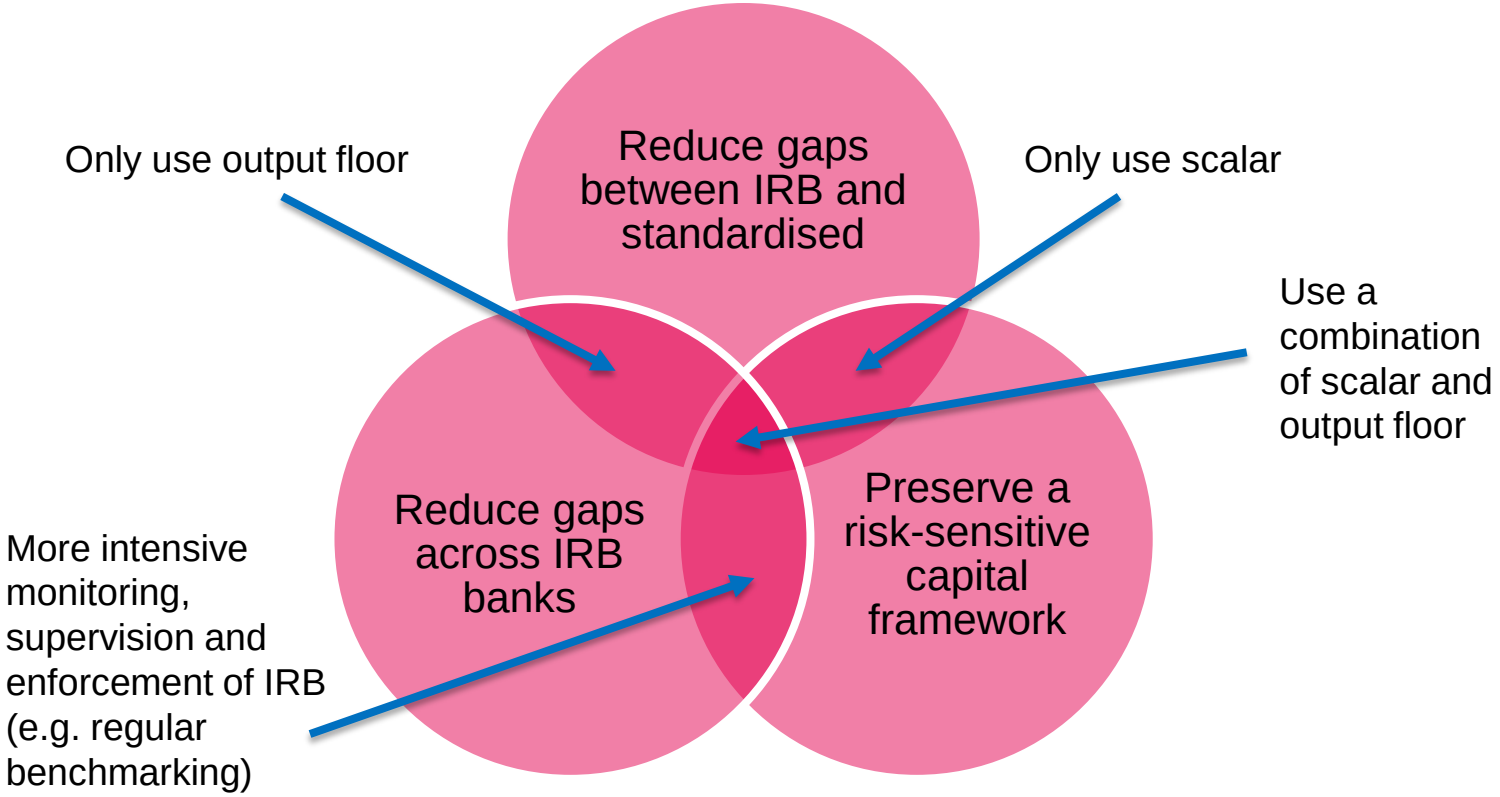
We want to prevent unacceptably low IRB outcomes	FSO made an in principle decision to impose a floor on RWA produced by the IRB approach, so that total RWA cannot be below X% of the RWA that IRB banks would calculate if they instead used the standardised approach. A review principle is that *"where there are multiple methods for determining capital requirements, outcomes should not vary unduly between methods".*
We also want to retain a risk sensitive framework	FSO decided to retain the IRB approach because of the improved risk differentiation it offers, compared to the standardised approach. Another review principle is that *"capital requirements should be set in relation to the risk of bank exposures"*.
But the standardised approach is not very risk sensitive in practice	The problem we face is that the current standardised approach to which we would tie an output floor has, in practice, very rudimentary risk differentiation when compared to the IRB approach. Based on the QIS estimates, 94% of the four IRB banks' credit exposures would be slotted into three risk weight buckets (35%, 40%, 100%). In effect, the standardised approach is a quasi-leverage ratio.

How to reduce the gap?



- The current IRB approach delivers around 75% of standardised outcome, on average.
- RBNZ s105
- Only using the output floor to reduce the gap between IRB and standardised outcomes would require a very high calibration (e.g. 90%+).
- But at this level of calibration, all IRB banks' marginal capital requirements are effectively determined by the standardised approach, since it is the binding constraint.
- This is inconsistent with the principle that the framework should be risk sensitive, given the known limitations of the current standardised approach.

How do the objectives and tools interact?

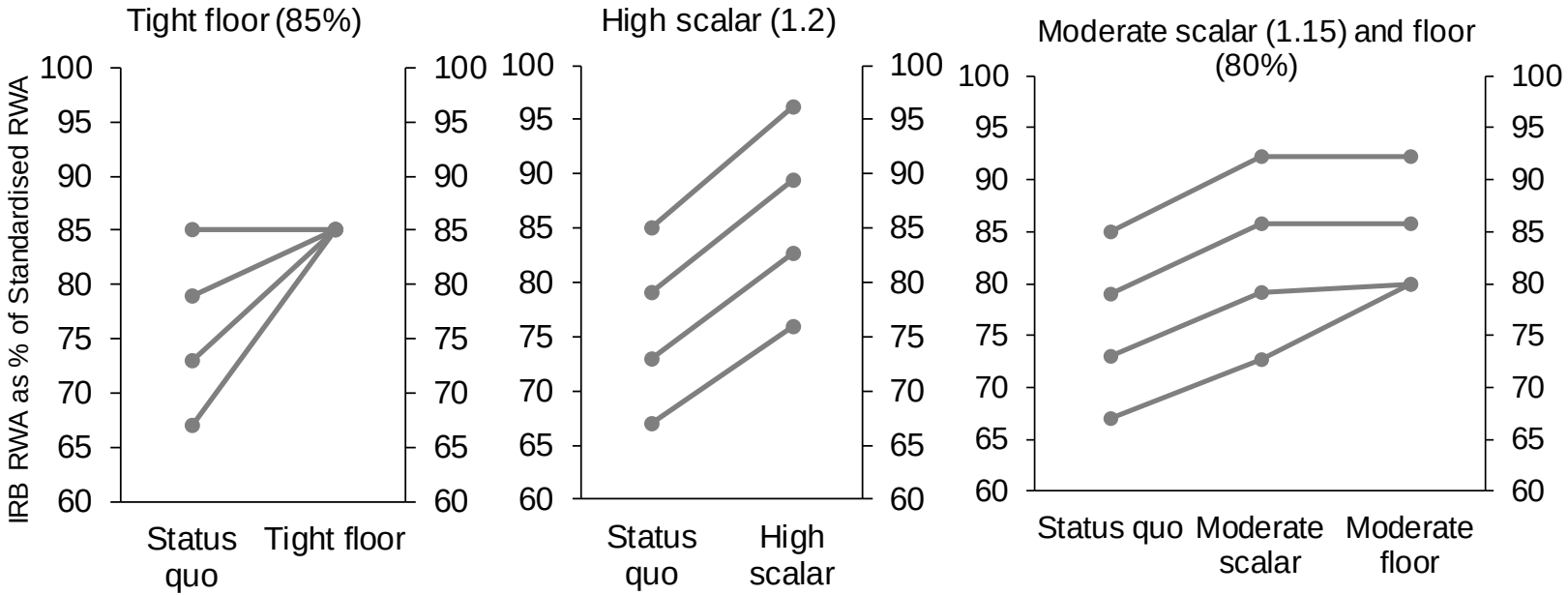


Scalar and floor combined

- A combination of a more moderately calibrated scalar and output floor is a better way of achieving the desired outcome than relying only on one tool or the other to reduce the gap to standardised.
- Increasing the scalar from today's 1.06 could do most of the heavy lifting in terms of reducing the gap between average IRB and standardised outcomes, while fully preserving the risk differentiation of the IRB approach.
- The output floor would then serve as a backstop to raise the RWA of any outlier banks, if that is still needed once a higher scalar is applied.

Example calibration

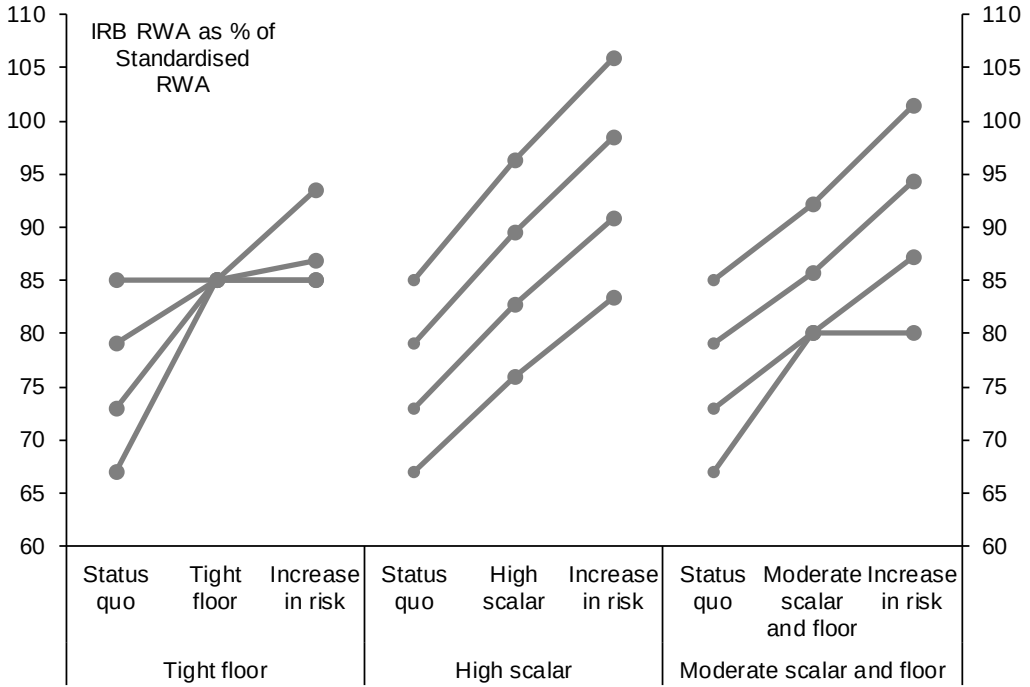
- Each of these example calibrations delivers the same average outcome (IRB at ~85% of standardised RWA), but with different implications for the relative outcomes of each bank.



Why use the scalar

- Since for most IRB banks the output floor would not be the binding constraint, marginal capital requirements are still determined by the IRB approach (calibrated higher with the scalar). This means that changes in underlying risks will still be reflected in IRB banks' RWAs, to the extent that the IRB models pick up this change in risk.
- If we only use the output floor, so that it is the binding constraint on IRB banks' capital, the risk insensitivity of the standardised approach means that total RWAs would be less likely to respond to a change in underlying risks.

Extra slide: How would each option respond to an increase in underlying risk?



- e.g. what happens if more high DTI mortgage lending increases banks' underlying risks by 10%?
- Assume RWA calculated by IRB models grows by 10%, since IRB is risk-sensitive.
- Under a "tight floor" option, the output floor to standardised is the binding constraint, so RWA of most banks does not respond to increased underlying risk.
- Under the other two options, RWA increases for most banks because the IRB outcome (with higher scalar applied) is the binding capital requirement.