



RESPONSE TO SUBMISSIONS

Interest rate risk in the banking book for
authorised deposit-taking institutions

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Executive summary

Interest rate risk in the banking book (IRRBB) is the risk of loss in earnings or a fall in the value of banking book items as a consequence of movements in interest rates. This risk arises primarily from loans, deposits, liquid assets and tradeable instruments used to hedge banking book exposures. Banks and other authorised deposit-taking institutions (ADIs) need to manage this risk as part of their business and where necessary, hold capital to cover potential losses.

In February 2018, APRA released a discussion paper that proposed a number of revisions to the capital framework for ADIs to implement the increased capital requirements for 'unquestionably strong' and to incorporate amendments from the recently finalised Basel III reforms.¹ That paper set out APRA's proposals on the revised credit risk, operational risk, IRRBB and market risk frameworks, the adoption of a capital floor and proposals for a simplified framework for smaller, less complex ADIs. The proposals for IRRBB were high-level and directional.

This response paper and accompanying draft prudential standard progress the proposed revisions to the IRRBB prudential framework, including responding to the main issues raised in submissions to the February 2018 consultation, as well as commencing a detailed consultation on other amendments to strengthen the IRRBB prudential framework. APRA intends to consult on proposed changes to reporting and disclosure requirements and a revised prudential practice guide for IRRBB in 2020.

APRA is proposing changes to both the capital calculation and the risk management requirements. While only IRB ADIs are subject to a capital requirement for IRRBB and therefore will be impacted by changes to the capital calculation, all ADIs will be impacted by changes to the risk management requirements. The key proposals are to:

- standardise aspects of the internal modelling approach including placing constraints on the repricing assumptions an ADI can use for non-maturity deposits according to whether or not it is a core deposit and the calculations for optionality risk;
- remove the basis risk capital add-on; and
- extend the application of risk management requirements to all ADIs. Standardised ADIs will not be subject to an IRRBB capital charge unless APRA determines otherwise.

These proposals are designed to both reduce volatility over time and variation between IRB ADIs in the calculation of their IRRBB capital charge and to incorporate changes from the

¹ APRA, *Revisions to the capital framework for authorised deposit-taking institutions* (Discussion Paper, February 2018)
<<http://apra.gov.au/sites/default/files/Revisions%2520to%2520the%2520capital%2520framework%2520for%2520ADIs.pdf>>.

Basel Committee on Banking Supervision's (Basel Committee) IRRBB standard released in April 2016.

APRA does not expect these proposals to increase materially the long-run industry average of the IRRBB capital charge. However, capital requirements for individual ADIs may vary from current levels. Depending on the current modelling approach used by IRB ADIs, increases in their IRRBB capital charge are expected to result from the proposals to:

- require the use of a 97.5th percentile expected shortfall measure instead of a 99th percentile confidence interval using a value at risk methodology;
- for IRB ADIs that currently use relative shocks in their IRRBB models, require the use of absolute shocks; and
- place constraints on the duration that an ADI can apply to non-maturity deposits according to whether or not it is a core deposit.

APRA will likely include IRRBB as part of a future quantitative impact study.

APRA is proposing to align the implementation of the risk-based capital framework with the Basel Committee's internationally agreed implementation date of 1 January 2022.

Therefore, APRA is proposing that the revised APS 117 will also commence on 1 January 2022.

Glossary

April 2016 Basel standard	Basel Committee on Banking Supervision's <i>Interest rate risk in the banking book</i> standard issued in April 2016
ADI	Authorised deposit-taking institution
APRA	Australian Prudential Regulation Authority
APS 117	<i>Prudential Standard APS 117 Capital Adequacy: Interest Rate Risk in the Banking Book</i>
Basel III framework	<p>A series of reforms to the Basel capital framework that commenced with the Basel Committee on Banking Supervision's <i>Basel III: A global regulatory framework for more resilient banks and banking systems</i> (December 2010, revised June 2011) and includes the following reforms:</p> <ul style="list-style-type: none"> • <i>Basel III: Finalising post-crisis reforms</i> (December 2017) which includes revisions to the frameworks for credit risk, credit valuation risk and operational risk, and introduces a floor on risk-weighted assets using the standardised approaches and a non-risk-based minimum leverage requirement; • <i>Minimum capital requirements for market risk</i> (January 2019); and • <i>Interest rate risk in the banking book</i> (April 2016)
Basel Committee	Basel Committee on Banking Supervision
Calculation date	The date with reference to which an ADI's IRRBB capital charge is calculated, such that the exposures and observations of interest rates used in the calculation are recorded at the close of business on that day
Foreign ADI	As defined in section 5 of the <i>Banking Act 1959</i>
IRB ADI	An ADI that has been granted approval from APRA to adopt the internal ratings-based approach for determining its capital adequacy requirements for credit risk
IRRBB	Interest rate risk in the banking book
IRRBB capital charge	The regulatory capital that an ADI is required to hold against its exposures to IRRBB calculated in accordance with APS 117
Optionality risk	The risk of loss in earnings or value due to cash flows varying from what an ADI had assumed, caused either by customers exercising stand-alone or embedded options differently from how the ADI had assumed they would, or by caps, floors and similar adjustments to interest rates or payments
Standardised ADI	An ADI which has not been approved by APRA to use the IRB approach to credit risk

Chapter 1 - Introduction

1.1 Background

Interest rate risk in the banking book (IRRBB) is the risk of loss in earnings or a fall in the value of banking book items as a consequence of movements in interest rates. The risk arises primarily from loans, deposits, liquid assets and tradeable instruments used to hedge banking book exposures. *Prudential Standard APS 117 Capital Adequacy: Interest Rate Risk in the Banking Book* (APS 117) sets out the requirements for the management and measurement of IRRBB for ADIs using the internal ratings-based (IRB) approach to credit risk (IRB ADIs), including the determination of an IRRBB capital charge.²

In April 2016, the Basel Committee on Banking Supervision (Basel Committee) released an IRRBB standard (April 2016 Basel standard) as part of the package of reforms developed in response to the global financial crisis, referred to as Basel III.³ Both the Basel II and Basel III frameworks for IRRBB impose a regulatory capital requirement for IRRBB through the supervisory review process, rather than as a minimum capital requirement.⁴

The main revisions in the Basel III framework for IRRBB are:

- quantitative disclosure requirements — disclosure of the results of expanded standardised IRRBB calculations using both net interest income at risk and economic value of equity measures under six prescribed interest rate shock scenarios;
- qualitative disclosure requirements — for example, various model assumptions and the bank's overall IRRBB objectives and management approach;
- an updated standardised calculation for IRRBB;
- more granular risk management requirements; and
- a lower threshold to identify banks as outliers with greater expectations of supervisory activity undertaken when a bank is identified as an outlier.

In February 2018, APRA released the discussion paper *Revisions to the capital framework for authorised deposit-taking institutions*, which outlined high-level directional proposals for the IRRBB framework amongst other revisions to the capital framework for ADIs.⁵ The IRRBB

² In the current version of APS 117, IRRBB capital charge is referred to as 'IRRBB capital requirement'.

³ Basel Committee on Banking Supervision, *Interest rate risk in the banking book* (standard, April 2016) <<https://www.bis.org/bcbs/publ/d368.htm>>.

⁴ Basel Committee on Banking Supervisions, *Principles for the management and supervision of interest rate risk* (guidelines, July 2004) <<https://www.bis.org/publ/bcbs108.htm>>.

⁵ APRA, *Revisions to the capital framework for authorised deposit-taking institutions* (Discussion Paper, February 2018)

proposals were designed to reduce unnecessary volatility over time and variation between IRB ADIs in the calculation of their IRRBB capital charge and incorporate changes from the April 2016 Basel standard. The proposals included:

- retaining a minimum capital requirement for IRB ADIs, noting that how this is implemented may change as a result of the proposals outlined in the discussion paper *Improving the transparency, comparability and flexibility of the ADI capital framework*;⁶
- requiring the use of standardised basis and optionality risk calculations and standardising the duration assumptions for the non-interest bearing deposits portfolio;
- requiring IRB ADIs to calculate their IRRBB capital charge based on the average of more frequent (e.g. monthly or weekly) calculations over the quarter;
- revising reporting requirements to standardise certain repricing assumptions in *Reporting Standard ARS 117.0 Repricing analysis (ARS 117.0)*, and requiring IRB ADIs and larger, standardised ADIs to report to APRA the outcomes of their IRRBB calculations based on the Basel Committee's standardised framework; and
- revising disclosure requirements to require IRB ADIs to disclose:
 - their IRRBB calculations based on both net interest income and economic value of equity measures under the six prescribed interest rate shock scenarios;
 - their IRRBB calculations based on the Basel Committee's standardised framework;
 - various model assumptions; and
 - specified qualitative information about their IRRBB objectives and management approach.

1.2 Submissions received

APRA received seven submissions from ADIs and industry associations in response to the proposed IRRBB revisions set out in the February 2018 discussion paper. Respondents broadly supported APRA's proposal to maintain the internal modelling approach used to calculate the IRRBB capital charge, but raised some concerns in relation to standardising various aspects of the internal modelling approach.

<https://www.apra.gov.au/sites/default/files/Revisions%2520to%2520the%2520capital%2520framework%2520for%2520ADIs.pdf>.

⁶ APRA, *Improving the transparency, comparability and flexibility of the ADI capital framework*, (Discussion paper, August 2018) <<https://www.apra.gov.au/improving-transparency-comparability-and-flexibility-adi-capital-framework>>.

1.3 Structure of paper

This response paper sets out APRA's proposals in relation to the prudential framework for IRRBB, including the main issues raised in submissions, and APRA's response to those issues. In addition to the proposals consulted on in February 2018, APRA intends to make a number of other amendments to APS 117. These amendments reflect APRA's implementation of the April 2016 Basel standard as well as other changes to strengthen the framework. The proposals in this paper impact all ADIs, including standardised ADIs and foreign ADIs who are not currently subject to the requirements set out in APS 117.

Chapter 2 sets out the main issues raised in submissions, and APRA's response to those issues. As the previous consultation was focused on the regulatory capital calculation, this chapter is most relevant for IRB ADIs and ADIs that are considering IRB accreditation.

Chapter 3 sets out detailed proposals for the standardisation of the IRRBB capital charge calculation, elaborating on the proposals consulted on in the February 2018 discussion paper. This chapter is most relevant for IRB ADIs and ADIs that are considering IRB accreditation.

Chapter 4 outlines the proposals for the risk management requirements for IRRBB, including the proposal to also apply those requirements to standardised ADIs and foreign ADIs who are not currently subject to the requirements under APS 117. This chapter is relevant for all ADIs.

APRA does not expect the proposals in Chapters 2 and 3 to increase materially the long-run industry average of the IRRBB capital charge. However, capital requirements for individual ADIs may vary from current levels. Depending on the current modelling approach used by IRB ADIs, increases in their IRRBB capital charge are expected to result from the proposals to:

- require the use of a 97.5th percentile expected shortfall measure instead of a 99th percentile confidence interval using a value at risk methodology;
- for IRB ADIs that currently use relative shocks in their IRRBB models, require the use of absolute shocks; and
- place constraints on the duration that an ADI can apply to non-maturity deposits according to whether or not it is a core deposit.

APRA's proposed changes to reporting and disclosure requirements and a revised prudential practice guide for IRRBB will be consulted on in 2020.

1.4 Draft prudential standards

Industry feedback has been considered in drafting the revised APS 117. A draft version of APS 117 accompanies this paper.

APRA welcomes submissions on the draft standard which is available at:

<https://www.apra.gov.au/consultations-revisions-capital-framework-authorized-deposit-taking-institutions>.

Chapter 2 - IRRBB capital charge

This chapter sets out APRA's response to submissions on the determination of regulatory capital for IRRBB and is most relevant for IRB ADIs and ADIs that are considering IRB accreditation.

2.1 Frequency of capital calculation

Currently under APS 117, the IRRBB capital charge for IRB ADIs is calculated as at the last day of each quarter. The use of quarterly calculations and modelling restrictions, such as the day of the week that a model is run on, has resulted in significant volatility in IRB ADIs' capital charge at certain quarter-ends. APRA proposed requiring IRB ADIs to calculate their IRRBB capital charge based on the average of more frequent (e.g. monthly or weekly) calculations over the quarter.

Comments Received

Several respondents supported APRA's intention to move to an average calculation rather than a point-in-time calculation, suggesting that a monthly frequency is more appropriate than a weekly frequency. One respondent submitted that requiring the calculation of the IRRBB capital charge more frequently than monthly could be onerous, costly and of limited benefit.

APRA's response

Since the introduction of APS 117, APRA has observed that modelling capabilities for IRRBB have improved and ADIs are now able to calculate their capital charge on a more frequent basis, having done so for internal reporting purposes. To reduce the volatility in IRB ADIs' IRRBB capital charge, APRA considers that averaging IRRBB calculations across the past three month-ends is appropriate. APRA proposes that the greater of IRRBB measured as at the end of the quarter and the average of the past three month-end measurements over the quarter be used to determine the IRRBB capital charge. To determine the total proposed IRRBB capital charge, that amount is added to:

- the embedded gain or loss at quarter end, which is the gain or loss arising from past movements in interest rates that have not been recognised in accounts; and
- any additional optionality risk capital charge (see section 3.8.2).

As per the current APS 117, APRA proposes to retain a floor of zero for the IRRBB capital charge so that embedded gains cannot generate a negative IRRBB capital charge.

APRA may also require an IRB ADI to hold additional capital for risks not adequately captured in the ADI's internal model.

2.2 Standardising assumptions and modelling approach: repricing and yield curve risks

Under the current IRRBB framework, IRB ADIs choose their own modelling assumptions for the duration of certain portfolios such as the at-call non-interest bearing deposits and low-interest transaction accounts portfolios. APRA has observed that this approach has resulted in unnecessary variability in the IRRBB capital charge amongst IRB ADIs, despite those ADIs having similar products with similar underlying IRRBB risks. To reduce this unnecessary variability, APRA proposed requiring the use of standardised duration assumptions for the non-interest bearing deposit portfolio.

APRA requested feedback on whether standardising those assumptions would significantly reduce the benefit of using an internal model to determine an ADI's IRRBB capital charge.

Comments Received

Respondents expressed mixed views, with some supporting standardisation of the duration assumption for non-interest bearing deposit portfolios and others contending that the internal model can more accurately determine the appropriate duration, which may differ between ADIs.

Respondents supported the continued use of internal modelling for IRRBB capital charge calculations. A number of respondents suggested that standardising assumptions would reduce the benefits of internal modelling and increase inconsistency between internal risk management practices and the method used to calculate the IRRBB capital charge if the standardisation does not reflect the different ways interest rate risk can be managed across the banking system. One respondent asserted that a standardised approach is ultimately more expensive to the extent that it prevents the underlying risk from being appropriately measured and managed. Another respondent commented that standardised assumptions are suitable for disclosure purposes but not for the capital calculation.

APRA's response

APRA remains of the view that there are benefits to risk sensitivity and risk management from retaining a modelling approach for the calculation of regulatory capital. While acknowledging that standardising or constraining assumptions may create inconsistency between internal management practices and the method used to calculate the IRRBB capital charge, APRA considers that the standardisation of some assumptions and parts of the modelling approach will constrain unnecessary variability currently in the IRRBB capital charge amongst IRB ADIs. This aims to improve consistency for items that generate material variability between IRB ADIs while allowing for variability that results from differences in asset and liability management or longstanding practice. Standardisation only for disclosure purposes would not achieve this objective.

APS 117 has been drafted to prescribe methods and estimates for particular aspects of the IRRBB capital charge calculation. It also allows ADIs to use their own methods and estimates where none is prescribed, it does not exceed the default profile or an alternative treatment is permitted. Further detail on the proposed standardisation is outlined in Chapter 3.

2.3 Standardising measurement of optionality and basis risks

Under the current IRRBB framework, in addition to the repricing and yield curve risk calculation, an ADI is required to calculate basis and optionality risk add-ons, using its own methods, so long as the outcome is consistent with (or more conservative than) the level of severity defined in APS 117: a 99th percentile outcome over a one-year holding period. To reduce the resulting variation in IRRBB capital charges for similar IRRBB risks, APRA proposed to require the use of standardised basis and optionality risk calculations.

Comments received

Some respondents agreed that it would be reasonable to standardise basis and optionality calculations and requested further details.

APRA's response

For simplicity and consistency with the Basel III framework which removed specific basis risk calculations from its earnings risk measure, APRA is now proposing to remove the basis risk add-on from the IRRBB capital charge calculation. APRA also considers that basis risk is more likely to result in positive profit variation rather than a negative profit variation under interest rate regimes more akin to historic norms. However, APRA proposes to still capture particular sources of basis risk as part of the IRRBB capital charge calculation (see section 3.7).

For optionality risk, APRA proposes to require the use of standardised optionality risk calculations similar to the approach in the April 2016 Basel standard (see section 3.8.1).

2.4 Other issues raised in submissions

2.4.1 Economic value and earnings measures

Under the Basel III framework, the standardised IRRBB risk measure is based on economic value. However, banks must also assess their IRRBB exposures using both economic value and earnings-based measures.

Comments received

Some respondents asserted that the IRRBB capital charge should reflect the economic risks that individual ADIs are exposed to and focus on economic value of equity measures.

APRA's response

APRA proposes to retain the current approach, consistent with Basel, which requires the IRRBB capital charge to be calculated based on economic value. An ADI's internal model must measure the maximum potential change in the economic value of the banking book, as a consequence of changes in interest rates and related risk factors, together with potential changes in customer behaviour. For this purpose, economic value will continue to be used to estimate the fair value of banking book items. Additionally, APRA proposes to retain the requirement that ADIs must consider both economic value and earnings measures in managing and monitoring their IRRBB.

2.4.2 Earnings Offset

Under the current APS 117, an earnings offset is calculated as part of estimating the impact of changes to the economic value of the banking book. The earnings offset adjusts for the fact that after an increase in interest rates, which typically pushes economic values lower, the earnings on net assets in the following year generally increase, thus providing a partial offset to any losses to economic value.

Comments received

One respondent requested that the earnings offset be retained for the economic value of equity calculation and that APRA consider extending the duration of the earnings offset beyond the current one-year maturity. That would allow ADIs to assume an earnings offset with a duration that matches the ADI's investment term of capital.

APRA's response

No change is proposed for the earnings offset. Since the offset is intended to reflect changes to interest earnings over the one-year holding period, the offset is constructed as a notional liability with a series of level principal payments spaced evenly over one year and adding to the book value of the banking book at the calculation date. However, this aspect of the model places no constraints on what period ADIs use for 'investment term of capital' in their internal management of IRRBB.

Chapter 3 - Amendments to the IRRBB model requirements

This chapter sets out the proposals regarding the standardisation of aspects of the internal model methodology for determining the IRRBB capital charge, including elaborating on the proposals consulted on in the February 2018 discussion paper. The aim of these proposals is to reduce the unnecessary variability of the IRRBB capital charge amongst IRB ADIs resulting from the differing approaches taken for similar products with similar underlying IRRBB risks. These requirements do not impact standardised ADIs, who are not subject to an IRRBB capital charge unless APRA determines otherwise.

Under the current framework, IRRBB is divided into three main components: repricing and yield curve risk, basis risk and optionality risk. APRA proposes to integrate these components as far as practical into a single calculation, rather than having separate calculations for each, and remove the add-on for basis risk. The proposed methodology also captures particular sources of spread risk and continues to allow for diversification between risk types (i.e. repricing and yield curve risks, spread risks and the most common optionality risks) in most situations.

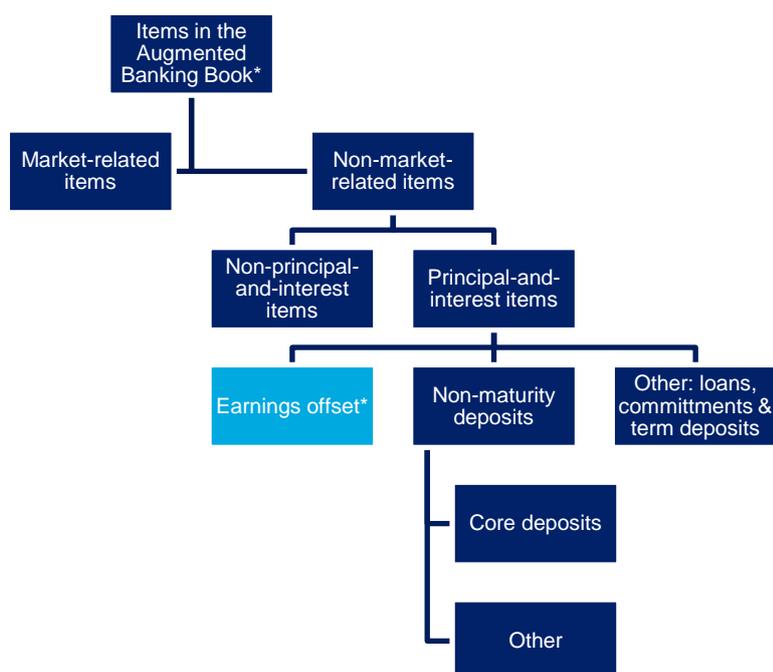
3.1 Classification of banking book items

Figure 1 depicts the proposed split of categories, which are subject to the proposed constraints set out in the draft standard. APRA proposes to divide the banking book into two broad categories:

- market-related banking book items, mostly comprising an ADI's liquid asset portfolio and any other securities (excluding those issued by the ADI). Derivatives fall in this category, except those that are effective hedges of non-market-related items, which are classified as non-market-related banking book items; and
- non-market-related banking book items, mostly comprising loans, term deposits, commitments created by transactions with customers and debt, Additional Tier 1 (AT 1) and Tier 2 capital issued by an ADI. Non-market-related items are further split by their principal-and-interest characteristics. Items which have both principal-and-interest components include:
 - the earnings offset (refer to section 2.4.2);
 - non-maturity deposits which includes core deposits (refer to section 3.2.1); and
 - other items which includes terms deposits, loans and commitments (refer to section 3.2.2).

APRA proposes to allow an ADI to split an item or a portfolio into parts belonging to different categories, subject to APRA's approval. For example, an ADI would be able to treat the stable non-interest bearing parts of accounts, such as bonus saver accounts which pay interest in some months and not others, as core deposits and apply a non-zero duration.

Figure 1: Categorisation of banking book items



*The augmented banking book is the banking book together with the earnings offset. The banking book comprises all other items in the figure except for the earnings offset. Refer to section 2.4.2 for a description of the earnings offset.

3.2 Repricing profile and assumptions for non-market-related items

This section sets out APRA’s proposals on repricing profiles and assumptions for non-market-related items. APRA proposes that an ADI must choose repricing profiles or cash flow profiles for non-market-related items, subject to specific constraints. These profiles are projections of notional cash flows which, for most non-market-related items, are split into principal and interest cash flows; each notional principal cash flow represents either a payment or an opportunity for the interest rate on the principal to change. For each currency to which an ADI has material exposures, the ADI must choose a single wholesale curve (non-market-related curve (NMR curve)) to use for the discounting of all notional cash flows.

An ADI’s repricing assumptions form part of the ADI’s internal model and must be clearly documented, conceptually sound, reasonable and, except where compelling reasons are provided to do otherwise, consistent with historical experience. APRA will continue to review the appropriateness of repricing assumptions used by ADIs and may determine that an ADI must use different assumptions for the purpose of determining its IRRBB capital charge.

3.2.1 Non-maturity deposits

In measuring IRRBB, APS 117 currently requires ADIs to make repricing assumptions for banking book items that do not have a contractually defined repricing date. APRA has observed that the repricing assumptions applied to deposits with no specified maturity (e.g. transactional accounts) differ considerably between IRB ADIs, despite the accounts arguably

having similar characteristics. This leads to unnecessary variability in the IRRBB capital charge amongst IRB ADIs, and differences in the types of accounts each ADI chooses to model with long durations.

To reduce this unnecessary variability in the IRRBB capital charge, APRA proposes to limit the assumed duration that an ADI can apply to non-maturity deposits according to whether or not it is a core deposit. Draft APS 117 defines non-maturity deposits as deposits that have no specified maturity date and can be withdrawn at any time without notice. For a non-maturity deposit to be eligible to be treated as a core deposit, the account would:

- be either a stable deposit or an operational deposit as defined under *Prudential Standard APS 210 Liquidity*; and
- pay an interest rate that is managed by the ADI, is generally materially below wholesale market rates for overnight lending and does not usually change in response to movements in wholesale market rates.

APRA proposes to constrain the assumed duration of each type of core deposit by requiring that the assumed principal payments should be at least 20 per cent overnight, with the remainder spread evenly or tapered over a period not exceeding five years. For all non-maturity deposits that do not meet the criteria for core deposits, APRA proposes that they be given an overnight repricing profile, except where APRA approves an alternative treatment. An example of affected accounts might be deeming accounts. If a particular type of affected account formed a material part of the deposit book of an ADI, the ADI may seek APRA approval to model it using an alternative treatment.

3.2.2 Other non-market-related items

APRA proposes that an ADI must classify the repricing profiles for non-market-related items other than non-maturity deposits as either contractual or behavioural. Key proposed constraints on repricing profiles are:

- for other deposits (e.g. term deposits), contractual profiles must be used;
- for loans and commitments, behavioural profiles must be used unless the contractual profile is not expected to be significantly different, or there is insufficient data on which to base a behavioural profile;
- the notional principal cash flows must sum to the principal outstanding; and
- the economic value of an item at inception must equal the principal or book value.

APRA proposes to prescribe the repricing date as the earliest date at which an ADI has the right to change the interest rate, the rate is contractually required to be reset in line with an external benchmark or the component will be paid based on contractually-scheduled dates or behavioural assumptions chosen by the ADI. Changes to a repricing profile typically occur through the exercise of options by customers, or holders of debt or AT 1 or Tier 2 capital instruments, varying from expected assumptions. An ADI is required to determine which behavioural assumptions to use, based on appropriate analysis; this includes determining prepayment rate assumptions for fixed rate loans. An ADI should assume no prepayment in cases where a customer would be charged the full economic break cost.

3.3 Non-linear derivatives

Where an ADI uses non-linear derivatives (such as swaptions, caps or floors) in effective hedge relationships to non-market-related banking book items, APRA proposes that the ADI must use a method that has been approved by APRA to measure its IRRBB on those derivatives.

3.4 Market-related banking book items

APRA proposes that IRRBB for market-related items be measured in a similar way to that used for traded market risk. That is, using multiple yield curves and other risk factors chosen by the ADI and employing full revaluation, or sensitivity-based approximations approved by APRA, to estimate post-shock economic values. This automatically incorporates elements such as single-currency basis risk and spread risk into the calculation rather than needing a separate calculation. These elements are discussed below.

3.5 Estimation method: holding period and constraints on rate models

Currently under APS 117, the IRRBB capital charge is calculated based on an assumption of a one-year holding period and a 99th percentile confidence interval using a Value at Risk (VaR) methodology and recent six-year observation period. APRA has observed that ADIs are using approaches which are consistently dependent on modelling losses using shorter holding periods and scaling up the result – in this respect the model output can be highly sensitive. Additionally, the benign period of financial market activity, low interest rates and ADIs' current internal models using a six-year observation history have restrained the size of shocks applied to interest rate factors, particularly for credit spread and single-currency basis for which ADIs have shown a growing appetite.

Under APRA's proposal, the major part of an ADI's IRRBB capital charge will be an estimate, based on a partly APRA-prescribed method, of the potential severe adverse loss of economic value from changes in interest rates and customer behaviour. The proposed approach models approximately 2,000 different interest rate scenarios and in each one chooses the behavioural repricing profile from three alternatives (short, medium and long duration), that gives the most adverse outcome. The estimate is formed as the average loss from the fifty worst scenarios.

APRA is proposing to mandate a number of constraints within the estimation method. While APRA acknowledges that this could increase the difference between the regulatory capital model and the ADI's internal model used for economic capital and risk management, standardisation within the estimation method is intended to remove unnecessary variability between ADIs.

Depending on the current modelling approach used by an IRB ADI, APRA expects that the following proposed constraints will have the most material impact on the IRRBB capital charge:

- using a 97.5th percentile expected shortfall (ES) measure instead of a 99th percentile confidence interval using a VaR methodology. This constraint reflects better practice in market risk modelling consistent with changes in the Basel Committee’s recently updated market risk framework;⁷ and
- using absolute rather than relative shocks. It is noted that most IRB ADIs already use absolute interest rate shocks in measuring IRRBB and will not have to make changes in this respect. The use of relative shock models can produce inappropriate results when interest rates get close to zero. In light of the current low interest rates, APRA considers it appropriate to require the use of absolute interest rate shocks.

In draft APS 117, APRA is also proposing to mandate:

- using an eight-year observation period, ending no earlier than three months before the calculation date;⁸
- using a one-year holding period;
- using five business day overlapping holding periods at daily rests, with scaling up of rate shocks to a one-year equivalent by the square root of 50. The scaling is applied to interest rate movements rather than to profit and loss;
- historical simulation as the method used in the internal model in estimating the 97.5th percentile ES. It is noted that most IRB ADIs currently use historical simulation;
- zeroing the mean of shocks applied to risk factors from the observation period to remove the implicit assumption that recent trends will continue;
- no cap or floor to be placed on the shock applied to an interest rate or the post-shock interest rate; and
- for market-related items, a full revaluation approach, or a sensitivity-based method that has been approved by APRA, is required, in which all general market risk factors are shocked (i.e. cash flows and discount rates may differ), whereas for non-market related items the discount rates are the only market factors to be shocked (i.e. the notional cash flows will be the same).

APRA has observed differences between ADIs as to whether, in risk calculations, yield curves are ‘bootstrapped’ before or after applying rate shocks. Draft APS 117 proposes to allow ADIs to choose their own approach, but treats that approach as part of the model such that any material change to the approach used would require APRA approval.

⁷ Basel Committee on Banking Supervision, *Minimum capital requirements for market risk* (Standard, January 2019) <<https://www.bis.org/bcbs/publ/d457.htm>>.

⁸ The date with reference to which an ADI’s IRRBB capital charge is calculated, such that exposures and observations of interest rates used in the calculation are recorded at the close of business on that day.

3.6 Treatment of the liquid assets portfolio

Under APRA's current framework, ADIs have the choice of how their liquid assets portfolio is distributed between the banking book and the trading book. As a result, ADIs may have a liquid assets portfolio in the trading book, the banking book or in both. Exposures (assets and associated hedges) in the trading book are subject to the market risk capital requirements under *Prudential Standard APS 116 Capital Adequacy: Market Risk* and those in the banking book are subject to APS 117.

APRA proposes no change to the current treatment of the liquid assets portfolio. However, APRA is proposing to include a provision in APS 117 restricting ADIs from materially changing the portfolio's classification between the banking book and the trading book without APRA approval. A material change would result from a change in either total volumes or types of liquid assets and hedges allocated between the trading and banking books. APRA is also open to views on standardising the treatment for this portfolio, for example, requiring the liquid assets portfolio to be in the trading book or alternatively, requiring the liquid assets portfolio to be in the banking book.

3.6.1 Spread risk in the banking book

Spread risk is the risk that interest rates in an economy may not move in parallel with one another, reflecting the possibility that the interest rate that determines the value of an asset or liability may change despite no credit risk migration taking place. Spread risk can have particularly large financial effects in the liquid asset portfolio where bonds whose value is determined from a government or semi-government yield curve are hedged using an interest rate swap. It does not include the risk that the creditworthiness of an asset changes (i.e. the risk of migration), which is covered under APRA's credit risk framework.

Basel III framework

While the Basel III framework makes no adjustment for spread risk, which it calls Credit Spread Risk in the Banking Book (CSRBB), it requires banks to monitor and assess the spread risk in identifying, monitoring and controlling IRRBB. The Basel III framework defines CSRBB as any kind of asset and liability spread risk of credit-risky instruments not explained by IRRBB or by the expected credit/jump-to-default risk.

APRA's proposal

APRA currently requires ADIs to reflect all banking book exposures to material spread risk in the calculation of the IRRBB capital charge in their internal models. Consistent with the Basel III framework, APRA proposes to maintain this requirement. Most banking book items subject to spread risk will be classified as market-related items and have their risk measured through a 'full revaluation' approach similar to the approach for trading book items under APS 116, rather than an approach based on repricing profiles. This will involve modelling multiple yield curves per currency and will better capture spread risk on floating rate notes.

3.7 Basis risk

APRA is proposing to remove the basis risk add-on, which measures potential variation in margins with respect to reference rates, from the IRRBB capital calculation. There are other risks that are often regarded as basis risk, including spread risk and single-currency basis risk. Although some ADIs already capture these risks in their internal models, some of these risks are not explicitly captured by the current APS 117. Accordingly, as ADIs can have large stand-alone exposures to these risks, APRA considers it appropriate to capture these risks in the IRRBB capital charge, even if the process enables diversification of these exposures against other components of IRRBB. While most sources of basis risk will be captured by APRA's proposed methodology, APRA proposes that ADIs will be required to, at a minimum, capture:

- single-currency basis risk arising from market-related banking book items, using as many yield curves as necessary to reflect the interest rate risk; and
- proprietary positions in cross-currency basis swaps, any explicit exposures to cross-currency basis risk and other risk factors from instruments unless there is an effective hedge relationship which neutralises the exposures.

This proposal is designed to align valuation and risk for market-related banking book items. APRA seeks feedback on the challenges of building models for single-currency basis risk and cross-currency basis risk.

3.8 Optionality

3.8.1 Capturing the main sources of optionality

Basel III framework

The Basel III framework establishes standardised calculations for the measurement of some, but not all, types of optionality risk. It requires recognition of the optionality risk of automatic interest rate options, and prescribes behavioural shocks for fixed rate loans with prepayment risk and term deposits with early redemption risk.

Under the Basel III framework's standardised calculation, a bank must calculate an add-on to its IRRBB measure for changes in value of automatic interest rate options and embedded automatic interest rate options. This includes caps, floors and swaptions.

For fixed rate loans with prepayment risk and term deposits with early redemption risk, Basel III prescribes scalars for altering conditional prepayment rates and term deposit redemption rates under each interest rate scenario. These scalars estimate the likely behavioural changes in the exercise of options in each scenario.

APRA's proposals

APRA proposes to prescribe the approach for capturing the main sources of optionality risk. The proposed method for measuring IRRBB captures optionality risk arising from changes

in value of most automatic interest rate options and embedded automatic interest rate options by requiring the full revaluation of market-related items.

APRA's proposal follows the Basel Committee's approach of specifying scalars to be applied to behavioural assumptions. APRA's proposed approach for ADIs is to use two additional internal models in which specified scalars are applied to the ADI's own behavioural repricing assumptions for fixed rate assets, rate locks and core deposits.⁹ The models respectively shorten and lengthen the net duration of the banking book and are called the 'Short' and 'Long' banking book models accordingly.

The application of scalars to these products reflects the product offering of Australian ADIs, which, for example, have a larger proportion of variable rate home loans than banks in other jurisdictions. The proposed scalars to be applied are set out in Table 1 and are of similar magnitude to the behavioural shocks in the Basel III framework. The scalars for fixed rate assets are proposed to only apply to items where the full economic break cost would not be charged to the customer.

Table 1: Behavioural optionality factors

Banking book model	Short	Long
Prepayment modification factor	1.2	0.8
Drawdown modification factor	0.8	1.2
Withdrawal factor	0	0.1

3.8.2 Additional optionality risk add-on

APRA proposes that an ADI must review, on an annual basis, all other exposures to optionality risk and determine whether the potential loss from such sources is material. Examples of other exposures to optionality risk are caps on variable loan interest rates, floors (including zero) on variable deposit interest rates and term deposits for which the early withdrawal penalty is less than the economic break cost. If the potential loss is material, APRA proposes to require the ADI to extend its internal model to include a capital charge for those losses, which should be modelled using a 97.5 per cent ES measure over a one-year period. An ADI must also assess whether new products or variations of existing products introduce material additional optionality risk.

APRA also proposes that as part of the independent review of the IRRBB management framework, an ADI would assess the materiality of exposures to sources of optionality risk that are not captured in its internal model.

⁹ Rate locks are guarantees by banks that a customer may draw down a loan up to a particular limit at a particular rate and before an expiry date.

Chapter 4 - Amendments to risk management requirements

Currently, APS 117 only applies to IRB ADIs. In recent years, some mid-tier ADIs have implemented strategies that introduce uncapitalised interest rate risk into their operations. While APRA does not propose to extend a capital requirement to these ADIs, APRA does propose to extend the application of risk management requirements within APS 117 to all ADIs, so that each ADI must have a framework for managing IRRBB (including spread risk). APRA acknowledges that IRRBB is generally managed by a small team within an ADI and for smaller ADIs, this involves making the risk visible to management and some hedging rather than using advanced modelling techniques to quantify the risk and using more complicated hedging strategies. APRA, therefore, expects these frameworks would be commensurate with the level and complexity of each ADI's IRRBB exposures.

This chapter outlines proposed amendments to the risk management requirements for IRRBB. While APRA proposes to retain the majority of the current requirements in APS 117, APRA also proposes a number of amendments to implement the risk management requirements set out in the April 2016 Basel standard.

4.1 Responsibilities of the Board and senior management for the IRRBB management framework

Basel III framework

Under the Basel III framework, the Board is responsible for the oversight of the IRRBB management framework and setting the IRRBB risk appetite in terms of risk both to economic value and earnings. The policy limits set by the Board should be consistent with the bank's overall approach for measuring IRRBB and the level of detail in policy limits should be appropriate to the nature, size, complexity and capital adequacy of the bank as well as its ability to measure and monitor its risks.

Further, the Board must be informed on a regular basis, at least semi-annually, of the level and trend of IRRBB exposures.

APRA's proposal

Draft APS 117 complements *Prudential Standard CPS 220 Risk Management* (CPS 220) with specific risk management requirements for IRRBB.

While APRA acknowledges that the Board does not have direct day-to-day responsibility for the management and monitoring of IRRBB, it needs to establish a clear risk appetite and strategy. Under CPS 220, the Board of an ADI must set the risk appetite while senior management must monitor and manage all material risks. Consistent with the April 2016 Basel standard, APRA proposes to broaden APS 117 to require an ADI to articulate its risk appetite in terms of both risk to economic value and earnings and to set limits for both these

measures. APRA expects the level of detail of these limits would be appropriate to the nature, scale and complexity of operations of the ADI.

While APS 117 requires that the Board, or Board Committee, is informed of the most significant assumptions, APRA proposes to also require an ADI's Board to approve the ADI's maturity profile assumed for shareholders' equity given that it has a major impact on the ADI's risk profile. An ADI must specify the scope of any power it has to make interest rate exposures materially vary from its approved maturity profile. APRA also proposes to require senior management to approve significant hedging, risk-taking or risk management initiatives before they are undertaken.

APRA further proposes that the Board oversees, rather than approves, the ADI's IRRBB management framework. In respect of the IRRBB management framework, APRA proposes that an ADI's IRRBB management framework must clearly assign accountabilities for monitoring its exposures against limits, approving the variation of limits and responding to and escalating any breaches of IRRBB limits.

Draft APS 117 also requires that the Board or Board Committee review IRRBB management reporting at least semi-annually, consistent with the Basel III framework.

4.2 New products

Basel III framework

The Basel III framework requires that significant hedging or risk management initiatives be approved prior to a bank's implementation as well as there being adequate operational procedures and risk controls system in place.

APRA's proposal

Consistent with the Basel III framework, APRA proposes to introduce a new requirement that ADIs must assess and understand new products, instrument types and activities prior to their implementation. In doing so, an ADI must have developed adequate procedures and risk controls systems.

4.3 IRRBB measurement system

Basel III framework

Basel III provides that key behavioural and modelling assumptions used in measuring IRRBB should be fully understood by the Board or alternatively senior management, be conceptually sound and documented and consistent with historical experience. All significant assumptions, including key behavioural assumptions, must be documented and reviewed at least annually. Further, banks must periodically perform sensitivity analyses for key assumptions for economic value and earnings measures.

APRA's proposals

Draft APS 117 has been drafted to align with the additional requirements in the April 2016 Basel standard. These are:

- the system must capture reliable and accurate data about exposures in a timely fashion, and the effectiveness and accuracy of this process must be periodically tested;
- the Board or Board Committee must be informed of the most significant assumptions of the measurement system and how they affect any significant hedging strategies that the ADI undertakes;
- ADIs must periodically review the assumptions made by the system and the materiality of any IRRBB not captured by the system; and
- IRB ADIs must perform periodical sensitivity testing of key assumptions, including behavioural assumptions.

APRA proposes to revise its documentation requirements for the IRRBB measurement system to explicitly require the documentation of data sources and capture methods, calculation method and assumptions, including behavioural and other assumptions about the timing of cash flows and the rationale for the calculation method and all assumptions.

For IRB ADIs, APRA proposes to specify that some of the economic value exposure limits in its IRRBB management framework must be related to its approved IRRBB model.

4.4 Internal reporting

Basel III framework

The Basel III framework requires banks to report measurement outcomes and hedging strategies to the Board on a regular basis, at relevant levels of aggregation. It sets out what should, at a minimum, be included in the reports. These include summaries of aggregate IRRBB exposures and assets, liabilities and cash flows and strategies that are driving the level and direction of IRRBB, key modelling assumptions, comparisons of past forecasts or risk estimates with actual results, results of stress tests, including sensitivity to key assumptions and parameters and summaries of reviews.

APRA's proposal

APRA proposes to substantially retain the internal management reporting requirements in APS 117, which align with expectations in the Basel III framework. As noted above, APRA proposes to require that the Board or Board Committee review IRRBB management reports on at least a semi-annual basis.

4.5 Stress testing

Basel III framework

The Basel III framework provides more extensive guidance on the development of interest rate shock scenarios. It provides that the measurement of IRRBB should involve an appropriate range of interest rate shocks and stress scenarios, including internally selected interest rate shock scenarios addressing the risk profile according to the Internal Capital Adequacy Assessment Process, historical and hypothetical interest rates stress scenarios

and six prescribed interest rate shock scenarios as well as covering all material sources of IRRBB.

The Basel III framework also states that stress testing for IRRBB should be commensurate with the size, complexity, business activities and overall risk profile of banks. The framework should clearly define objectives, scenarios tailored to businesses and risks, well documented assumptions and sound methodologies.

APRA's proposals

APRA proposes to require that stress testing for IRRBB consider the impact on both economic value and earnings measures of sudden changes in interest rates as well as covering the following scenarios, which include the scenarios prescribed in the April 2016 Basel standard:

- scenarios that are tailored to the ADI's business and risks;
- scenarios involving changes in the level, slope and shape of interest rate curves and changes in customer behaviour; and
- multiple stress scenarios, with some based on historical events and others being hypothetical and forward-looking.

In line with the April 2016 Basel standard, APRA also proposes that the stress testing program must have clearly defined objectives, well documented assumptions and sound methodologies.

APRA also expects that a standardised ADI and an IRB ADI's stress testing and scenario analysis for IRRBB would meet the requirements in *Prudential Standard APS 110 Capital Adequacy*. Under CPS 220, APRA requires the stress testing program of an ADI to be commensurate with the size, business mix and complexity of the ADI. That is, an ADI's stress testing program for IRRBB is commensurate with the nature and level of its IRRBB exposure.

4.6 Independent management function

Basel III framework

Under the Basel III framework, banks must have clearly defined responsibilities for functions that are responsible for identifying, measuring, monitoring and controlling IRRBB. These functions must be sufficiently independent from risk-taking functions and report IRRBB exposures directly to the Board.

APRA's proposals

APS 117 currently sets out the requirements to have an independent IRRBB risk management function, including that it be a specialist function. APRA proposes to remove this requirement as recognition that the function that oversees IRRBB may also cover aspects of funding or liquidity, and for standardised or foreign ADIs, a small number of suitably qualified personnel may cover all risks.

4.7 Independent review of the IRRBB management framework

Basel III framework

Under the Basel III framework, banks are required to regularly review their internal control systems and risk management processes, including ensuring that personnel comply with established policies and procedures and there are appropriate escalation procedures for any exceeded limits. These reviews must be conducted by individuals or units that are independent of the function they are assigned to review. The report is also required to be made available to supervisory authorities.

APRA's proposals

APRA proposes to retain the current approach, which requires the IRRBB management framework to be subject to effective and comprehensive independent review. For IRB ADIs, APRA proposes to retain the required frequency for this review of at least once every three years. For standardised and foreign ADIs, APRA proposes that the scope and frequency of these reviews will be commensurate with the nature, scale and complexity of their exposures to IRRBB. APRA also proposes to require that the report be provided to APRA within three months of completion and the results be reported to the Board or Board Committee.

4.8 Identifying outliers

Basel III framework

To identify outlier banks, the Basel III framework introduced a lower threshold than Basel II. The Basel III test compares the maximum change in economic value of equity under the six prescribed interest rate shocks to 15 per cent of the bank's Tier 1 capital. It also requires that any other test used to identify outlier banks should be at least as stringent. Under the Basel III framework, banks identified as outliers must be subject to supervisory review. The potential supervisory or regulatory capital consequences for a bank identified as an outlier are that it may be required to either reduce its IRRBB exposures (typically by hedging), hold additional capital, be subject to constraints on interest risk parameters, or improve its risk management framework.

APRA's proposals

APRA's current criteria for identifying outliers is 20 per cent of Tier 1 based on 200 basis point parallel shocks. APRA proposes to adopt the Basel test for identifying outlier ADIs. APRA will consider a standardised ADI or a IRB ADI to be an outlier where the maximum change in economic value of equity under the six interest rate scenarios prescribed in the April 2016 Basel standard exceeds 15 per cent of its Tier 1 capital. APRA proposes that the test applies to all standardised and IRB ADIs but will estimate this for smaller standardised ADIs based on data collected under a revised ARS 117.0.

Where an ADI is determined to be an outlier, APRA will be able to require an ADI to decrease its level of IRRBB or increase its capital if the capital held is not commensurate with its risk profile. For a standardised ADI, this means that APRA may require it to hold capital for IRRBB.

Chapter 5 - Consultation and next steps

5.1 Request for submissions and cost-benefit analysis information

APRA invites written submissions on the proposals set out in this response paper and the accompanying draft standard. Written submissions should be sent to ADIpolicy@apra.gov.au by 6 December 2019 and addressed to:

General Manager, Policy Development
Policy and Advice Division
Australian Prudential Regulation Authority

Important disclosure notice – publication of submissions

All information in submissions will be made available to the public on the APRA website unless a respondent expressly requests that all or part of the submission is to remain in confidence.

Automatically generated confidentiality statements in emails do not suffice for this purpose.

Respondents who would like part of their submission to remain in confidence should provide this information marked as confidential in a separate attachment.

Submissions may be the subject of a request for access made under the *Freedom of Information Act 1982* (FOIA).

APRA will determine such requests, if any, in accordance with the provisions of the FOIA. Information in the submission about any APRA-regulated entity that is not in the public domain and that is identified as confidential will be protected by section 56 of the *Australian Prudential Regulation Authority Act 1998* and will therefore be exempt from production under the FOIA.

APRA asks that all stakeholders use this consultation opportunity to provide information on the compliance impact of the proposals, and any other substantive costs associated with the changes. Compliance costs are defined as direct costs to businesses of performing activities associated with complying with government regulation. Specifically, information is sought on any changes to compliance costs incurred by businesses as a result of APRA's proposals.

Consistent with the Government's approach, APRA will use the methodology behind the Commonwealth Regulatory Burden Measure to assess compliance costs. This tool is designed to capture the relevant costs in a structured way, including a separate assessment of upfront costs and ongoing costs. It is available at <https://rbm.obpr.gov.au/>.

APRA requests that respondents use this methodology to estimate costs to ensure the data supplied to APRA can be aggregated and used in an industry-wide assessment. When submitting their costs assessment to APRA, respondents should include any assumptions

made and, where relevant, any limitations inherent in their assessment. Feedback should address the additional costs incurred as a result of complying with APRA's requirements, not activities that institutions would undertake due to foreign regulatory requirements or in their ordinary course of business.

5.2 Next steps

APRA is proposing to align the implementation of the risk-based capital framework, including the revised APS 117, with the Basel Committee's internationally-agreed implementation date of 1 January 2022.

In 2020, APRA expects to consult on revised guidance set out in *Prudential Practice Guide APG 117 Interest Rate Risk in the Banking Book (Advanced ADI)*, revised reporting requirements in ARS 117.0 and ARS 117.1 and revised disclosure requirements in *Prudential Standard APS 330 Public Disclosure* (APS 330). APRA intends to publicly consult on revised IRRBB disclosure requirements as part of the broader package of amendments to APS 330.



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