MAS NOTICE 637 (AMENDMENT) 2022

Issued on: 28 July 2022

RISK BASED CAPITAL ADEQUACY REQUIREMENTS FOR BANKS INCORPORATED IN SINGAPORE

Introduction

1 This document reflects amendments made to MAS Notice 637 to –

(a) implement the revised Pillar 3 disclosure requirements for interest rate risk in the banking book ("IRRBB") published by the Basel Committee on Banking Supervision;

(b) implement a -100bps interest rate floor on the post-shock interest rates under the standardised interest rate shock scenarios set out in Annex 10C of MAS Notice 637;

(c) provide additional clarity on the application of interest rate floors, interest rate caps, and pass-through rates when computing IRRBB under the standardised interest rate shock scenarios; and

(d) implement various other technical revisions.

2 For presentational purposes, the amendments in this document are compared with the version of MAS Notice 637 issued on 14 September 2012, as last revised on 2 December 2021 (the "Original Notice").

3 This document shall be interpreted as follows:

(a) Text which is coloured and struck through represent deletions;

(b) Text which is coloured and underlined represent insertions;

(c) Text which is highlighted in yellow are annotations to describe changes, and will not appear in the published untracked version of MAS Notice 637. For instance, where amendments have been made to a selected paragraph of an Annex, only that paragraph will be reflected in this document, prefaced with the following explanatory text in yellow highlights:

[Amendments to paragraph xx];

(d) Any inserted portions are inserted in numerical or alphabetical order (as appropriate) with the existing text in the Original Notice;

(e) Portions of the Original Notice which are not reflected in this document are unchanged.

4 The amendments reflected in this document shall take effect from 1 January 2023.

5 In the event of discrepancies between the amendments in this document and the published version of MAS Notice 637 revised on 28 July 2022 (with effect from 1 January 2023), the published versions of MAS Notice 637 shall prevail. This document is to be used for reference only.

Amendments to Part II: Definitions

Amendments to the following definitions in Annex 2A

automatic interest rate option	means an option arising from a standalone instrument such as an exchange-traded or OTC option contract, or explicitly embedded within the contractual terms of an instrument such as a capped rate loan where the option holder may be reasonably expected to exercise the option if it is in ~~their~~ the option holder's financial interest to do so; [MAS Notice 637 (Amendment No. 2) 2018] [MAS Notice 637 (Amendment) 2022]
ΔEVE	means change in economic value of equity under an interest rate stress or shock scenario, calculated by subtracting the economic value of equity under the interest rate stress or shock scenario from the economic value of equity under the current interest rates; [MAS Notice 637 (Amendment No. 2) 2018] [MAS Notice 637 (Amendment) 2022]
ΔNII	means change in net interest income under an interest rate stress or shock scenario, calculated by subtracting the net interest income under the interest rate stress or shock scenario from the net interest income under the current interest rates; [MAS Notice 637 (Amendment No. 2) 2018] [MAS Notice 637 (Amendment) 2022]
SA(IR)	means the standardised approach for calculating IRRBB as set out in Annex 10B ~~or, if the reference is to any regulatory requirement of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements~~; [MAS Notice 637 (Amendment No. 2) 2018] [MAS Notice 637 (Amendment) 2022]
the Board	means – (a) in relation to a banking group entity, the board of directors, or a designated committee of the board of directors, of the banking group entity; and (b) in all other cases, ~~means~~ the board of directors, or a designated committee of the board of directors, of the Reporting Bank; [MAS Notice 637 (Amendment No. 2) 2014] [MAS Notice 637 (Amendment) 2022]

uncompensated prepayments	means any prepayment of a loan, or any part of it, for which the economic cost is not charged to the ~~borrower~~ obligor;

[MAS Notice 637 (Amendment No. 2) 2018]
[MAS Notice 637 (Amendment) 2022]

Amendments to Part VII: Credit Risk

Annex 7O

STANDARDISED APPROACH FOR COUNTERPARTY CREDIT RISK (SA-CCR)

Amendments to paragraph 3.17A

3.17A A Reporting Bank shall seek approval from the Authority for the specification and value of λ_j. The Reporting Bank shall apply the same value of λ_j when calculating the supervisory delta adjustment for all interest rate options in the same currency.

[MAS Notice 637 (Amendment No. 3) 2021]
[MAS Notice 637 (Amendment) 2022]

Amendments to Part X: Supervisory Review Process

Annex 10A

SPECIFIC ISSUES IN ICAAP FOR MAIN RISK CATEGORIES AND TOPICS

Amendments to Section 5 of Annex 10A

Section 5: Interest Rate Risk in the Banking Book

[MAS Notice 637 (Amendment No. 2) 2018 (Replacement of this Section in its entirety)]

5.1 IRRBB is the risk to ~~the~~a Reporting Bank's capital and earnings arising from adverse movements in interest rates that affect the Reporting Bank's banking book positions.

[MAS Notice 637 (Amendment) 2022]

5.2 [Deleted by MAS Notice 637 (Amendment) 2022]~~There are three main types of IRRBB that may potentially change the value or earnings of interest rate-sensitive assets, liabilities and off-balance sheet items in a way, or at a time, that can adversely affect the Reporting Bank's financial condition –~~

~~(a) gap risk, which describes the risk arising from the term structure of banking book instruments, and the timing of interest rate changes;~~

~~(b) basis risk, which describes the risk arising from relative changes in interest rates for banking book instruments that have similar tenors but are priced using different interest rate indices; and~~

~~(c) option risk, which describes the risk arising from option derivative positions or from optionalities embedded in a Reporting Bank's assets, liabilities and off-balance sheet items in the banking book, where the Reporting Bank or counterparty can alter the level and timing of their cash flows. Option risk can be further characterised into automatic option risk and behavioural option risk.~~

5.3 A Reporting Bank shall identify its sources of IRRBB[717A]~~, IRRBB exposures~~ and take appropriate steps to measure, monitor and control IRRBB[717B].

[MAS Notice 637 (Amendment) 2022]

5.4 A Reporting Bank shall –

(a) identify any IRRBB inherent in the products held or offered by it, and the activities carried out by it; and

(b) ensure that ~~such products and activities are subject to~~ there are adequate procedures and controls to measure, monitor and control the IRRBB inherent in such products and activities.

[MAS Notice 637 (Amendment) 2022]

5.5 A Reporting Bank shall –

(a) ensure that its internal policies require the approval of significant hedging or risk management strategies to be obtained before being implemented;

(b) ensure that the approval of its significant hedging or risk management strategies is obtained in accordance with its internal policies;

(c) conduct a pre-acquisition review of all products and activities that are new to it to ensure that it understands the IRRBB associated with such products and activities;

(d) subject such products and activities to a predetermined test phase before fully rolling out the product or commencing the activity;

(e) put in place adequate operational procedures and risk control systems to measure, monitor and control IRRBB prior to introducing a new product, hedging or risk-taking strategy; and

[717A] There are 3 main types of IRRBB that may potentially change the value or earnings of interest rate-sensitive assets, liabilities and off-balance sheet items in a way, or at a time, that can adversely affect a Reporting Bank's financial condition –
(a) gap risk, which describes the risk arising from the term structure of banking book instruments, and the timing of interest rate changes;
(b) basis risk, which describes the risk arising from relative changes in interest rates for banking book instruments that have similar tenors but are priced using different interest rate indices; and
(c) option risk, which describes the risk arising from option derivative positions or from optionalities embedded in the Reporting Bank's assets, liabilities and off-balance sheet items in the banking book, where the Reporting Bank or its counterparty can alter the level and timing of their cash flows. Option risk can be further characterised into automatic option risk and behavioural option risk.

[MAS Notice 637 (Amendment) 2022]

[717B] A Reporting Bank should also monitor and assess CSRBB in its interest rate risk management framework. CSRBB refers to any kind of asset or liability spread risk of instruments with credit risk that is not explained by IRRBB or by the expected credit or jump to default risk.

[MAS Notice 637 (Amendment) 2022]

(f) ensure that the management of ~~its~~ IRRBB is integrated within its broader risk management framework and aligned with its business planning and budgeting activities.

[MAS Notice 637 (Amendment) 2022]

5.6 [Deleted by MAS Notice 637 (Amendment) 2022]~~CSRBB refers to any kind of asset or liability spread risk of instruments with credit risk that is not explained by IRRBB or by the expected credit or jump to default risk. A Reporting Bank should monitor and assess CSRBB in their interest rate risk management framework.~~

IRRBB Management Framework and Risk Appetite

5.7 A Reporting Bank shall –

(a) have in place an adequate IRRBB management framework to effectively manage IRRBB; and

(b) ensure that the framework is reviewed and evaluated for its effectiveness by an independent party on a regular basis.

[MAS Notice 637 (Amendment) 2022]

5.8 ~~Notwithstanding~~Despite paragraph 5.9 of this Annex, a Reporting Bank shall ensure that the Board is responsible for oversight of –

(a) the IRRBB management framework referred to in paragraph 5.7 of this Annex; and

(b) the Reporting Bank's risk appetite for IRRBB[717C].

[MAS Notice 637 (Amendment) 2022]

5.9 The Board may delegate the task of developing IRRBB policies and practices to the senior management of the Reporting Bank or an asset and liability management committee ("ALCO") (collectively referred to in this Section as "delegates").

5.10 Where the Board has made a delegation under paragraph 5.9 of this Annex, the Reporting Bank shall do the following: ~~—~~

[717C] A Reporting Bank should have clearly defined risk appetite statements (i.e. a written articulation of the aggregated level and types of IRRBB exposures that the Reporting Bank will accept, or avoid, in order to achieve its business objectives) that are approved by the Board and implemented through comprehensive risk appetite frameworks (i.e. policies and procedures for limiting and controlling IRRBB). A Reporting Bank should articulate its risk appetite for IRRBB in terms of the risk to both economic value and earnings. A Reporting Bank should ensure that its risk appetite frameworks –
(a) delineate delegated powers, lines of responsibility and accountability over IRRBB management decisions; and
(b) clearly define authorised instruments, hedging strategies and risk-taking opportunities.
[MAS Notice 637 (Amendment) 2022]

(a) where the task for developing IRRBB policies and practices is delegated to an ALCO, ensure that the ALCO meets regularly and includes representatives from each major department connected to IRRBB[~~718~~717D];

(b) ensure that the Board clearly identifies the delegates for managing IRRBB and oversees the adequate separation of responsibilities in key elements of the risk management process to avoid potential conflicts of interest;

(c) ensure that the delegates have clear lines of authority over the units responsible for establishing and managing IRRBB positions and that there is a clear communication channel to convey the delegates' directives to these units;

(d) ensure that the Board puts in place an organisational structure that enables the delegates to carry out their responsibilities effectively and facilitates effective decision-making and good governance~~. The Board should encourage discussions between its members and the delegates, as well as between the delegates and others in the Reporting Bank, regarding the IRRBB management process~~[717E].

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

5.11 For the purposes of paragraph 5.8 of this Annex, a Reporting Bank shall do the following:~~—~~

(a) ensure that the Board –

(i) understands the nature and the level of the Reporting Bank's IRRBB exposure;

(ii) approves broad business strategies and overall policies with respect to IRRBB; and

(iii) provides clear guidance regarding the acceptable level of IRRBB, given the Reporting Bank's business strategies;

(b) ensure that the Board is responsible for ensuring that senior management has the capability and skills to understand IRRBB, and that adequate resources are devoted to IRRBB management;

(c) ensure that the Board oversees the steps taken to identify, measure, monitor and control IRRBB and ensure that they are consistent with the approved strategies and policies of the Reporting Bank;

[~~718~~717D] For example, this includes a department which is –
(a) responsible for the risk identification, measurement, monitoring or control of IRRBB; or
(b) responsible for risk-taking functions that contribute to the Reporting Bank's IRRBB.
[MAS Notice 637 (Amendment) 2022]

[717E] The Board should encourage discussions between its members and the delegates, as well as between the delegates and personnel in units responsible for establishing and managing IRRBB positions in the Reporting Bank, regarding the IRRBB management process.
[MAS Notice 637 (Amendment) 2022]

(d) ensure that the Board or, where the Board has made a delegation under paragraph 5.9 of this Annex, the delegates, establishes the following:~~—~~

(i) appropriate limits on IRRBB, including the definition of specific procedures and approvals necessary for exceptions, and ensuring compliance with those limits;

(ii) adequate systems and standards for measuring IRRBB;

(iii) standards for measuring IRRBB, valuing positions and assessing performance, including procedures for updating interest rate shock and stress scenarios and key underlying assumptions driving the Reporting Bank's IRRBB analysis;

(iv) a comprehensive IRRBB reporting and review process;~~ and~~

(v) effective internal controls and management information system;

(e) ensure that the Board or, where the Board has made a delegation under paragraph 5.9 of this Annex, the delegates, oversees the approval, implementation and review of IRRBB management policies, procedures and limits~~. The Reporting Bank should inform the Board regularly (at least semi-annually) on the level and trend of the Reporting Bank's IRRBB exposures~~;

(f) where the Board has made a delegation under paragraph 5.9 of this Annex, ensure that the Board regularly reviews timely information that is sufficiently detailed to allow it to understand and assess the performance of the delegates in monitoring and controlling IRRBB in compliance with policies approved by the Board. The Reporting Bank shall carry out such reviews more frequently when the Reporting Bank runs significant IRRBB exposures or has positions in complex IRRBB instruments;

(g) ensure that the Board understands the implications of the Reporting Bank's IRRBB strategies, including the potential linkages with, and impact on, market, liquidity, credit and operational risks;

(h) ensure that more than one member of the Board has sufficient technical knowledge to be able to question and challenge any report concerning IRRBB that is presented to the Board;

(i) have IRRBB identification, measurement, monitoring and control functions with clearly defined responsibilities that are sufficiently independent from risk-taking functions of the Reporting Bank and that report IRRBB exposures directly to the Board or its delegates[717F];

[717F] The Reporting Bank should inform the Board regularly (at least semi-annually) on the level and trend of the Reporting Bank's IRRBB exposures.

[MAS Notice 637 (Amendment) 2022]

(j) ensure that its risk management and strategic planning areas communicate regularly to facilitate evaluations of risk arising from future business.

[MAS Notice 637 (Amendment) 2022]

5.12 For the purposes of paragraph 5.7 of this Annex, a Reporting Bank shall do the following as part of its IRRBB management process: ~~—~~

(a) implement adequate internal controls that promote effective and efficient operations, reliable financial and regulatory reporting, and compliance with relevant laws, regulations and internal policies of the Reporting Bank;

~~[MAS Notice 637 (Amendment No. 2) 2020]~~

(b) with regard to IRRBB control policies and procedures, implement appropriate approval processes, exposure limits, reviews and other mechanisms designed to provide a reasonable assurance that risk management objectives are being achieved;

(c) ensure that evaluations and reviews of the Reporting Bank's internal control system and risk management processes, including that personnel comply with established policies and procedures, are conducted on a regular basis by individuals who, or units which, are independent of the functions that they are assigned to evaluate and review;

(d) ensure that the evaluations and reviews done pursuant to sub-paragraph (c) address any significant change, including any change in market conditions, personnel, technology and structures of compliance with exposure limits, which may affect the effectiveness of controls and that there are appropriate escalation procedures for any exceeded limits;

(e) where revisions or enhancements to internal controls are warranted, ensure that an internal review mechanism is in place to ensure that such revisions or enhancements to internal controls are implemented in a timely manner;

(f) ensure that its IRRBB identification, measurement, monitoring and control processes are reviewed by an independent auditing function ~~(such as an internal or external auditor)~~[717G] on a regular basis;

(g) where a written report has been produced in respect of a review under sub-paragraph (f), by the internal or external auditors or other equivalent external parties ~~(such as consultants)~~[718] which conducted the review, make the written report available to the Authority.

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

717G For example, an internal or external auditor.

[MAS Notice 637 (Amendment) 2022]

718 For example, consultants.

[MAS Notice 637 (Amendment) 2022]

5.13 [Deleted by MAS Notice 637 (Amendment) 2022]~~A Reporting Bank should have clearly defined risk appetite statements[718A] that are approved by the Board and implemented through comprehensive risk appetite frameworks[718B].~~

5.14 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank should articulate its risk appetite for IRRBB in terms of the risk to both economic value and earnings.~~

5.15 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank should ensure that the risk appetite framework referred to in paragraph 5.13 of this Annex –~~

~~(a) delineates delegated powers, lines of responsibility and accountability over IRRBB management decisions; and~~

~~(b) clearly defines authorised instruments, hedging strategies and risk-taking opportunities.~~

5.16 ~~The~~ A Reporting Bank shall ensure that all IRRBB policies are periodically reviewed[718C].

[MAS Notice 637 (Amendment) 2022]

5.17 A Reporting Bank shall implement policy limits set by the Board that target maintaining IRRBB exposures that are consistent with the Reporting Bank's risk appetite.

5.18 For the purposes of paragraph 5.17 of this Annex, ~~the~~a Reporting Bank shall do the following: ~~—~~

(a) before implementing the policy limits set by the Board, ensure that such limits are consistent with the Reporting Bank's overall approach for measuring IRRBB;

(b) apply aggregate risk limits, clearly articulating the amount of IRRBB acceptable to the Board, on a consolidated basis and, as appropriate, at the level of individual banking group entities[718CA]~~affiliates~~. ~~Limits may be associated with specific scenarios of changes in interest rates or term structures, such as an increase or decrease of a particular size or a change in shape.~~ The Reporting Bank shall ensure that the interest rate movements used in developing these limits ~~shall~~ represent meaningful shock and stress situations, taking into account historical interest rate volatility and the time required by management to mitigate those risk exposures;

718A [Deleted by MAS Notice 637 (Amendment) 2022]~~A risk appetite statement is a written articulation of the aggregated level and types of IRRBB exposures that a Reporting Bank will accept, or avoid, in order to achieve its business objectives.~~

718B [Deleted by MAS Notice 637 (Amendment) 2022]~~A risk appetite framework refers to policies and procedures for limiting and controlling IRRBB.~~

718C A Reporting Bank should review its IRRBB policies at least annually, and revise its IRRBB policies as needed.

718CA A Reporting Bank may associate limits with specific scenarios of changes in interest rates or term structures, such as an increase or decrease in interest rates of a particular magnitude or a change in shape of the term structure.

[MAS Notice 637 (Amendment) 2022]

(c) ensure that policy limits to be implemented are appropriate to the nature, size, complexity and capital adequacy of the Reporting Bank, as well as its ability to measure and manage its risks[718CB]. ~~Depending on the nature of the Reporting Bank's activities and business model, the Reporting Bank may also identify sub-limits for individual business units, portfolios, instrument types or specific instruments.~~ The Reporting Bank shall ensure that the level of detail of risk limits reflects the characteristics of the Reporting Bank's holdings, including the various sources of the Reporting Bank's IRRBB exposures~~. A Reporting Bank with significant exposures to gap risk, basis risk or positions with explicit or embedded options should establish risk tolerances appropriate for these risks~~[718CC];

(d) ensure that the Board or its delegates, as the case may be, approve major hedging or risk-taking initiatives in advance of implementation[718CD]. ~~The Reporting Bank should develop a dedicated set of risk limits to monitor the evolution of hedging strategies that rely on instruments such as derivatives, and to control mark-to-market risks in instruments that are accounted for at market value. The Reporting Bank should assess proposals to use new instrument types or new strategies (including hedging) to ensure that the resources required to establish sound and effective IRRBB management of the product or activity have been identified, that the proposed activities are in line with the Reporting Bank's overall risk appetite, and procedures to identify, measure, monitor and control the risks of the proposed product or activity have been established.~~ The Reporting Bank shall ensure that positions related to internal risk transfers between ~~the~~its banking book and ~~the~~ trading book are properly documented;

(e) put in place systems to ensure that positions that exceed, or are likely to exceed, limits defined by the Board or its delegates are escalated to the Board or the delegates without delay and receive prompt management attention. The Reporting Bank shall ensure that there is a clear policy on who will be informed, how the communication will take place and the actions which will be taken in response to an exception[718D].

[MAS Notice 637 (Amendment) 2022]

[718CB] Depending on the nature of the Reporting Bank's activities and business model, the Reporting Bank may also identify sub-limits for individual business units, portfolios, instrument types or specific instruments.

[MAS Notice 637 (Amendment) 2022]

[718CC] Where the Reporting Bank has significant exposures to gap risk, basis risk or positions with explicit or embedded options, the Reporting Bank should establish risk tolerances appropriate for these risks.

[MAS Notice 637 (Amendment) 2022]

[718CD] The Reporting Bank should develop a dedicated set of risk limits to monitor the evolution of hedging strategies that rely on instruments such as derivatives, and to control mark-to-market risks in instruments that are accounted for at market value. The Reporting Bank should assess proposals to use new instrument types or new strategies (including hedging) to ensure that the resources required to establish sound and effective IRRBB management of the product or activity have been identified, that the proposed activities are in line with the Reporting Bank's overall risk appetite, and procedures to identify, measure, monitor and control the risks of the proposed product or activity have been established.

[MAS Notice 637 (Amendment) 2022]

[718D] ~~A~~The Reporting Bank may set limits that are absolute in the sense that they should never be exceeded or in a manner where, under specific circumstances, breaches of such limits are tolerated for a predetermined short period of time.

[MAS Notice 637 (Amendment) 2022]

IRRBB Measurement

5.19 Except where paragraph 5.20 of this Annex applies, a Reporting Bank shall –

(a) have in place its own IMS to measure its IRRBB;

(b) adopt the SA(IR) wholly as its IMS; or

(c) adopt the SA(IR) in part as its IMS, and have in place its own IMS to measure its IRRBB in the parts where the SA(IR) is not adopted.

5.20 The Authority may, as it considers necessary, require a Reporting Bank to adopt the SA(IR), wholly or in part, as its IMS. Where the Authority requires a Reporting Bank to adopt the SA(IR) in part as its IMS, the Reporting Bank shall have in place its own IMS to measure its IRRBB in the parts where the SA(IR) is not adopted.

5.21 A Reporting Bank shall capture all material sources of IRRBB and assess the effect of market changes on the scope of its activities through its IMS.

5.22 [Deleted by MAS Notice 637 (Amendment) 2022]~~A Reporting Bank should ensure that its IRRBB policy takes into account the impact of an interest rate shock on its economic value, as well as the Reporting Bank's ability to generate stable earnings sufficient to maintain its normal business operations. A Reporting Bank should pay attention to the complementary nature of economic value and earnings-based measures in their risk and internal capital assessments, in particular in terms of –~~

~~(a) outcomes, where economic value measures compute a change in the net present value of the Reporting Bank's assets, liabilities and off-balance sheet items subject to specific interest rate shock and stress scenarios, while earnings-based measures focus on changes to future profitability within a given time horizon eventually affecting future levels of the Reporting Bank's own equity capital;~~

~~(b) assessment horizons, where economic value measures reflect changes in value over the remaining life of the Reporting Bank's assets, liabilities and off-balance sheet items, that is, until all positions have run off, while earnings-based measures cover only the short to medium term, and therefore do not fully capture those risks that will continue to impact profit and loss accounts beyond the period of estimation; and~~

~~(c) future business or production, where economic value measures consider the net present value of repricing cash flows of instruments on the Reporting Bank's balance sheet or accounted for as an off-balance sheet item (that is, a run-off view). In addition to a run-off view, earnings measures may assume rollover of maturing items (that is, a constant balance sheet view), or assess the scenario-consistent impact on the~~

~~Reporting Bank's future earnings inclusive of future business (that is, a dynamic view[718E]), or both.~~

5.23 A Reporting Bank shall measure its IRRBB by assessing the potential impact of interest rate shock and stress scenarios on its economic value and earnings[718F].

5.24 For the purposes of paragraph 5.23 of this Annex, a Reporting Bank shall ensure that its IMS ~~for IRRBB~~ is able to calculate the impact on its economic value and earnings ~~of multiple scenarios,~~ based on the following scenarios: ~~–~~

(a) interest rate shock scenarios selected by the Reporting Bank addressing the Reporting Bank's risk profile, according to its ICAAP[718FA];

(b) historical and hypothetical interest rate stress scenarios, which tend to be more severe than shock scenarios;

(c) the ~~six~~ 6 standardised interest rate shock scenarios set out in Annex 10C;

(d) any additional interest rate shock scenarios required by the Authority.

[MAS Notice 637 (Amendment) 2022]

5.25 For the purposes of paragraph 5.23 of this Annex, the Reporting Bank shall ~~carry out the following~~ –

718E [Deleted by MAS Notice 637 (Amendment) 2022]~~A dynamic view can be useful for business planning and budgeting purposes. However, dynamic approaches are dependent on key variables and assumptions that are extremely difficult to project with accuracy over an extended period and can potentially hide certain key underlying risk exposures.~~

718F While ~~the~~ economic value and earnings-based measures share certain commonalities, it is important to manage IRRBB through both measures. If a Reporting Bank solely minimises its economic value risk by matching the repricing of its assets with liabilities beyond the short term, it could run the risk of earnings volatility. A Reporting Bank should ensure that its IRRBB policy takes into account the impact of an interest rate shock on its economic value, as well as its ability to generate stable earnings sufficient to maintain its normal business operations. A Reporting Bank should pay attention to the complementary nature of economic value and earnings-based measures in its risk and internal capital assessments, in particular in terms of –

(a) outcomes, where economic value measures compute a change in the net present value of the Reporting Bank's assets, liabilities and off-balance sheet items subject to specific interest rate shock and stress scenarios, while earnings-based measures focus on changes to future profitability within a given time horizon eventually affecting future levels of the Reporting Bank's own equity capital;

(b) assessment horizons, where economic value measures reflect changes in value over the remaining life of the Reporting Bank's assets, liabilities and off-balance sheet items, that is, until all positions have run off, while earnings-based measures cover only the short to medium term, and therefore do not fully capture risks that will continue to impact profit and loss accounts beyond the period of estimation; and

(c) future business or production, where economic value measures consider the net present value of repricing cash flows of instruments on the Reporting Bank's balance sheet or accounted for as an off-balance sheet item (i.e. a run-off view). In addition to a run-off view, earnings measures may assume rollover of maturing items (i.e. a constant balance sheet view), or assess the scenario-consistent impact on the Reporting Bank's future earnings inclusive of future business (i.e. a dynamic view), or both. A dynamic view can be useful for business planning and budgeting purposes. However, dynamic approaches are dependent on key variables and assumptions that are extremely difficult to project with accuracy over an extended period and can potentially hide certain key underlying risk exposures.

[MAS Notice 637 (Amendment) 2022]

718FA A Reporting Bank should observe the guidelines in Section 1 of Annex 10D in the selection process for its internal interest rate shock and stress scenarios.

[MAS Notice 637 (Amendment) 2022]

(a) measure its vulnerability to loss under stressful market conditions~~, which should include conditions under which key business assumptions and parameters break down~~[718FB], and consider those results when establishing and reviewing ~~their~~its policies and limits for IRRBB;

(b) develop and implement an effective stress testing framework for IRRBB as part of its broader risk management and governance processes which shall feed into the decision-making process at the appropriate management level, including strategic decisions~~ (for example, business and capital planning decisions)~~[718FC] of the Board or its delegates;

(c) ensure that IRRBB stress testing is considered in its ICAAP, and is rigorous, forward-looking and identifies events of severe changes in market conditions which could adversely impact the Reporting Bank's capital or earnings, including through changes in the behaviour of its customer base;

(d) develop a stress testing framework for IRRBB that includes clearly defined objectives, scenarios tailored to the Reporting Bank's businesses and risks, well-documented assumptions and sound methodologies, and is commensurate with the Reporting Bank's nature, size and complexity as well as business activities and overall risk profile;

(e) use the framework to assess the potential impact of the scenarios on the Reporting Bank's financial condition, enable ongoing and effective review processes for stress tests and recommend actions based on the stress test results; and

(f) ensure that IRRBB stress tests are used in the communication of risks, within the Reporting Bank, with the Authority, and with the market through appropriate disclosures.

[MAS Notice 637 (Amendment) 2022]

5.26 [Deleted by MAS Notice 637 (Amendment) 2022]~~A Reporting Bank should have in place a selection process for its internal interest rate shock and stress scenarios by doing the following –~~

~~(a) have in place a stress testing framework for IRRBB which ensures that the opinions of the various experts on IRRBB in the Reporting Bank are taken into account. The identification of relevant shock and stress scenarios for IRRBB, the application of sound modelling approaches and the appropriate use of the stress testing results require the collaboration of different experts~~~~[718G]~~~~ within a Reporting Bank;~~

[718FB] These should include conditions under which key business assumptions and parameters break down.
[MAS Notice 637 (Amendment) 2022]

[718FC] For example, business and capital planning decisions.
[MAS Notice 637 (Amendment) 2022]

[718G] [Deleted by MAS Notice 637 (Amendment) 2022]~~This could include for example, traders, the treasury department, the finance department, the ALCO, the risk management and risk control departments and the Reporting Bank's economists.~~

~~(b) determine, by currency, a range of potential interest rate movements against which the Reporting Bank will measure its IRRBB exposures, and ensure that risk is measured under a reasonable range of potential interest rate scenarios, including some containing severe stress elements. In developing the scenarios, the Reporting Bank should consider a variety of factors, such as the shape and level of the current term structure of interest rates and the historical and implied volatility of interest rates. In low interest rate environments, the Reporting Bank should also consider negative interest rate scenarios and the possibility of asymmetrical effects of negative interest rates on their assets and liabilities;~~

~~(c) consider the nature and sources of its IRRBB exposures, the time it would need to take action to reduce or unwind unfavourable IRRBB exposures, and its capability and willingness to withstand accounting losses in order to reposition its risk profile. The Reporting Bank should select scenarios that provide meaningful estimates of risk and include a range of shocks that is sufficiently wide to allow the Board or its delegates, as the case may be, to understand the risks inherent in the Reporting Bank's products and activities. When developing interest rate shock and stress scenarios for IRRBB, the Reporting Bank should –~~

~~(i) have scenarios which are sufficiently wide-ranging to identify parallel and non-parallel gap risk, basis risk and option risk. In many cases, static interest rate shocks may be insufficient to assess IRRBB exposure adequately. A Reporting Bank should ensure that the scenarios are both severe and plausible, in light of the existing level of interest rates and the interest rate cycle;~~

~~(ii) give special consideration to instruments or markets where concentrations exist, because those positions may be more difficult to liquidate or offset in a stressful market environment;~~

~~(iii) assess the possible interaction of IRRBB with its related risks, as well as other risks (for example, credit risk and liquidity risk);~~

~~(iv) assess the effect of adverse changes in the spreads of new assets and liabilities which are replacing those assets and liabilities maturing over the horizon of the forecast on their NII;~~

~~(v) where the Reporting Bank has significant option risk, include scenarios that capture the exercise of such options. For example, a Reporting Bank that has products with sold caps or floors should include scenarios that assess how the risk positions would change should those caps or floors move into the money. Given that the market value of options fluctuates with changes in the volatility of interest rates, a Reporting Bank should develop interest rate assumptions to measure its IRRBB exposures to changes in interest rate volatilities; and~~

~~(vi) specify the assumptions used in building its interest rate shock and stress scenarios such as the term structure of interest rates that will be incorporated and the basis relationship between yield curves and~~

~~between rate indices. The Reporting Bank should also estimate how interest rates that are administered or managed (for example, prime rates or retail deposit rates, as opposed to those that are purely market-driven) might change, and should document how these assumptions are derived;~~

~~(d) incorporate into forward-looking scenarios –~~

~~(i) changes in portfolio composition due to factors under the control of the Reporting Bank (for example, its acquisition and production plans), as well as external factors (for example, changing competitive, legal or tax environments);~~

~~(ii) the introduction of new products where only limited historical data are available; and~~

~~(iii) new market information and new emerging risks that are not necessarily covered by historical stress episodes;~~

~~(e) perform qualitative and quantitative reverse stress tests[718H] in order to –~~

~~(i) identify interest rate scenarios that could severely threaten the Reporting Bank's capital and earnings; and~~

~~(ii) reveal vulnerabilities arising from its hedging strategies and the potential behavioural reactions of its customers.~~

5.27 In measuring IRRBB, a Reporting Bank shall ensure that its key behavioural and modelling assumptions are fully understood, conceptually sound and reasonable, consistent with historical experience, and documented[718HA].

[MAS Notice 637 (Amendment) 2022]

5.28 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank should ensure that all behavioural and modelling assumptions in measuring IRRBB are rigorously tested and aligned with the Reporting Bank's business strategies.~~

5.29 A Reporting Bank shall –

718H [Deleted by MAS Notice 637 (Amendment) 2022]~~Refer to Principle 9 of "Principles of sound stress testing practices and supervision" issued by the BCBS in May 2009.~~

718HA A Reporting Bank should ensure that all behavioural and modelling assumptions in measuring IRRBB are rigorously tested and aligned with the Reporting Bank's business strategies. A Reporting Bank should also note that both economic value and earnings-based measures of IRRBB can be significantly impacted by the following assumptions made by the Reporting Bank for the purposes of risk quantification:
(a) expectations for the exercise of interest rate options (explicit and embedded) by both the Reporting Bank and its customers under specific interest rate shock and stress scenarios;
(b) treatment of balances and interest flows arising from non-maturity deposits;
(c) treatment of own equity in economic value measures;
(d) the implications of accounting practices for IRRBB.

[MAS Notice 637 (Amendment) 2022]

(a) when assessing its IRRBB exposure, make judgments and assumptions~~[718I]~~ about how an instrument's actual maturity or repricing behaviour may vary from the instrument's respective contractual terms because of behavioural optionalities, for the following products:~~—~~

(i) fixed rate loans subject to prepayment risk[718IA];

(ii) fixed rate loan commitments[718J];

(iii) term deposits subject to early redemption risk[718JA];

(iv) NMDs[718JB];

(v) any other product that the Reporting Bank considers relevant;

(b) assess exposures in each currency since yield curves vary from currency to currency and a Reporting Bank with positions denominated in different currencies may be exposed to IRRBB in each of those currencies. Where a Reporting Bank uses its own IMS pursuant to paragraph 5.19(a) or ~~5.19~~(c) of this Annex, a Reporting Bank with the necessary skills and sophistication, and with material multicurrency exposures, may choose to include, in its own IMS, methods to aggregate its IRRBB in different currencies using assumptions about the correlation between interest rates in different currencies;

718I [Deleted by MAS Notice 637 (Amendment) 2022]~~Both economic value and earnings-based measures of IRRBB can be significantly impacted by a number of assumptions made for the purposes of risk quantification, namely –~~
~~(a) expectations for the exercise of interest rate options (explicit and embedded) by both the Reporting Bank and its customers under specific interest rate shock and stress scenarios;~~
~~(b) treatment of balances and interest flows arising from non-maturity deposits (NMDs);~~
~~(c) treatment of own equity in economic value measures; and~~
~~(d) the implications of accounting practices for IRRBB.~~

718IA For fixed rate loans subject to prepayment risk, a Reporting Bank should –
(a) understand the nature of prepayment risk for its portfolios and make reasonable and prudent estimates of the expected prepayments; and
(b) document the assumptions underlying the estimates, including assumptions of how prepayment penalties or other contractual features affect the embedded optionality effect.
[MAS Notice 637 (Amendment) 2022]

718J For fixed rate loan commitments, a Reporting Bank may sell options to retail customers (for example, prospective mortgage buyers or renewers) whereby, for a limited period, the customers can choose to draw down a loan at a committed rate. Unlike loan commitments to corporates, where drawdowns strongly reflect characteristics of automatic interest rate options, mortgage commitments (that is, pipelines) to retail customers are impacted by other drivers.

718JA An example of a term deposit subject to early redemption risk is one where a Reporting Bank attracts deposits with a contractual maturity term or with step-up clauses that enable the depositor at different time periods to modify the speed of redemption. For term deposits subject to early redemption risk, a Reporting Bank should document whether a term deposit is deemed to be subject to redemption penalties or other contractual features that preserve the cash flow profile of the instrument.
[MAS Notice 637 (Amendment) 2022]

718JB Behavioural assumptions for deposits that have no specific repricing date can be a major determinant of IRRBB exposures under the economic value and earnings-based measures. A Reporting Bank should document, monitor and regularly update key assumptions for NMD balances and behaviour used in its IMS. To determine the appropriate assumptions for its NMDs, the Reporting Bank should analyse its depositor base in order to identify the proportion of core deposits (i.e. NMDs which are unlikely to reprice even under significant changes in interest rate environment). A Reporting Bank should vary assumptions according to depositor characteristics (e.g. retail or wholesale) and account characteristics (e.g. transactional or non-transactional).
[MAS Notice 637 (Amendment) 2022]

(c) consider the materiality of the impact of behavioural optionalities within floating rate loans~~. For example, the Reporting Bank should consider the potential impact of the behaviour of prepayments arising from embedded caps and floors on the Reporting Bank's EVE~~[718JC];

(d) where a Reporting Bank uses its own IMS pursuant to paragraph 5.19(a) or ~~5.19~~(c) of this Annex, test the appropriateness of key behavioural assumptions[718JD], and document all changes to the assumptions of key parameters~~ (for example, by comparing the economic value of equity measured under its own IMS, with the SA(IR) set out in Annex 10B). A Reporting Bank should periodically perform sensitivity analyses with reference to both economic value and earnings-based measures for key assumptions to monitor their impact on measured IRRBB~~[718JE]; and

(e) ensure that the most significant assumptions underlying the system are documented and clearly understood by the Board or its delegates[718JF]~~. The Reporting Bank should ensure that such documentation includes descriptions on how those assumptions could potentially affect the Reporting Bank's hedging strategies. A Reporting Bank should review significant measurement assumptions at least annually and more frequently during rapidly changing market conditions, as market conditions, competitive environments and strategies change over time. For example, if the competitive market has changed such that consumers now have lower transaction costs available to them for refinancing their residential mortgages, the Reporting Bank should consider that prepayments may become more sensitive to smaller reductions in interest rates~~.

[MAS Notice 637 (Amendment) 2022]

5.30 [Deleted by MAS Notice 637 (Amendment) 2022]~~Where the product is a fixed rate loan subject to prepayment risk mentioned in paragraph 5.29(a)(i) of this Annex, a Reporting Bank should –~~

~~(a) understand the nature of prepayment risk for its portfolios and make reasonable and prudent estimates of the expected prepayments; and~~

[718JC] For example, the Reporting Bank should consider the potential impact of the behavior of prepayments arising from embedded interest rate caps and floors on the Reporting Bank's EVE.

[MAS Notice 637 (Amendment) 2022]

[718JD] For example, by comparing the economic value of equity measured under its own IMS, with the economic value of equity measured under the SA(IR) set out in Annex 10B.

[MAS Notice 637 (Amendment) 2022]

[718JE] The Reporting Bank should periodically perform sensitivity analyses with reference to both economic value and earnings-based measures for key assumptions to monitor their impact on measured IRRBB.

[MAS Notice 637 (Amendment) 2022]

[718JF] The Reporting Bank should ensure that such documentation includes descriptions on how those assumptions could potentially affect the Reporting Bank's hedging strategies. The Reporting Bank should review significant measurement assumptions at least annually and more frequently during rapidly changing market conditions, as market conditions, competitive environments and strategies change over time. For example, if the competitive market has changed such that consumers now have lower transaction costs available to them for refinancing their residential mortgages, the Reporting Bank should consider that prepayments may become more sensitive to smaller reductions in interest rates.

[MAS Notice 637 (Amendment) 2022]

~~(b) document the assumptions underlying the estimates. This should include assumptions of how prepayment penalties or other contractual features affect the embedded optionality effect.~~

5.31 A Reporting Bank shall assess the expected average prepayment speed of a product that is a fixed rate loan subject to prepayment risk ~~mentioned in paragraph 5.29(a)(i) of this Annex~~ under each interest rate shock and stress scenario.

[MAS Notice 637 (Amendment) 2022]

5.32 [Deleted by MAS Notice 637 (Amendment) 2022]~~Where the product is a term deposit subject to early redemption risk[718K] referred to in paragraph 5.29(a)(iii) of this Annex, a Reporting Bank should document the classification scheme, whether a term deposit is deemed to be subject to redemption penalties or to other contractual features that preserve the cash flow profile of the instrument.~~

5.33 [Deleted by MAS Notice 637 (Amendment) 2022]~~Where the product is an NMD referred to in paragraph 5.29(a)(iv) of this Annex, a Reporting Bank should document, monitor and regularly update key assumptions[718L] for NMD balances and behaviour used in its IMS. To determine the appropriate assumptions for its NMDs, a Reporting Bank should analyse its depositor base in order to identify the proportion of core deposits (that is, NMDs which are unlikely to reprice even under significant changes in interest rate environment). Assumptions should vary according to depositor characteristics (for example, retail or wholesale) and account characteristics (for example, transactional or non-transactional).~~

5.34 A Reporting Bank shall carefully consider how the exercise of embedded behavioural options will vary under ~~–~~

~~(a)~~ interest rate shock and stress scenarios~~;~~ and

~~(b)~~ any other applicable dimension[718LA],

in respect of the following products: ~~set out in column (A) of Table 10A-1 and any other product with behavioural options.~~

(a) fixed rate loans subject to prepayment risk;

(b) fixed rate loan commitments;

(c) term deposits subject to early redemption risk;

(d) NMDs; and

718K [Deleted by MAS Notice 637 (Amendment) 2022]~~An example of a term deposit subject to early redemption risk is one where the Reporting Bank attracts deposits with a contractual maturity term or with step up clauses that enable the depositor at different time periods to modify the speed of redemption.~~

718L [Deleted by MAS Notice 637 (Amendment) 2022]~~Behavioural assumptions for deposits that have no specific repricing date can be a major determinant of IRRBB exposures under the economic value and earnings-based measures.~~

718LA The other applicable dimensions in respect of the products set out in paragraph 5.34(a) to (e) of this Annex may include the dimensions set out in column (B) of Table 10D-1 in Annex 10D.

[MAS Notice 637 (Amendment) 2022]

(e) any other product with embedded behavioural options.

[MAS Notice 637 (Amendment) 2022]

5.35 [Deleted by MAS Notice 637 (Amendment) 2022]~~In respect of the products set out in column (A) of Table 10A-1, the other dimensions referred to under paragraph 5.34(b) may include the dimensions set out in column (B) of Table 10A-1.~~

[Table 10A-1 deleted by MAS Notice 637 (Amendment) 2022]~~**Table 10A-1 – Dimensions influencing the exercise of embedded behavioural options**~~

~~(A) Product~~	~~(B) Dimensions influencing the exercise of the embedded behavioural options~~
~~**Fixed rate loans subject to prepayment risk**~~	~~Loan size, loan-to-value (LTV) ratio, borrower characteristics, contractual interest rates, seasoning, geographical location, original and remaining maturity, other historical factors, and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices.~~
~~**Fixed rate loan commitments**~~	~~Borrower characteristics, geographical location (including competitive environment and local premium conventions), customer relationship with the Reporting Bank as evidenced by cross-products, remaining maturity of the commitment, seasoning and remaining term of the mortgage.~~
~~**Term deposits subject to early redemption risk**~~	~~Deposit size, depositor characteristics, funding channel (for example, direct or brokered deposit), contractual interest rates, seasonal factors, geographical location and competitive environment, remaining maturity, other historical factors and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices.~~
~~**Non-maturity deposits (NMDs)**~~	~~Responsiveness of product rates to changes in market interest rates, current level of interest rates, spread between the Reporting Bank's offer rate and market rate, competition from other firms, the Reporting Bank's geographical location and demographic and other relevant characteristics of its customer base.~~

~~[MAS Notice 637 (Amendment No. 2) 2020]~~

5.36 A Reporting Bank shall ensure that any measurement system and model used for the calculation of IRRBB[718LB] –

(a) is based on accurate data; and

(b) is subject to appropriate documentation, testing and controls to give assurance on the accuracy of the calculation.

[718LB] A Reporting Bank should also observe the guidelines set out in paragraph 2.2 of Annex 10D.
[MAS Notice 637 (Amendment) 2022]

[MAS Notice 637 (Amendment) 2022]

5.37 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank should do the following –~~

~~(a) for accurate and timely measurement of IRRBB for effective risk management and control, ensure that its risk measurement system is able to identify and quantify the major sources of IRRBB exposure. The Reporting Bank should select the most appropriate form of measurement system by considering the mix of its business lines and the risk characteristics of its activities;~~

~~(b) rely on more than one measure of risk, given that risk management systems tend to vary in how they capture the components of IRRBB. The Reporting Bank should use a variety of methodologies to quantify their IRRBB exposures under both the economic value and earnings-based measures, ranging from simple calculations based on static simulations using current holdings to more sophisticated dynamic modelling techniques that reflect potential future business activities;~~

~~(c) ensure that its management information system allows it to retrieve accurate IRRBB information in a timely manner and captures interest rate risk data on all the Reporting Bank's material IRRBB exposures. The Reporting Bank should also ensure that there is sufficient documentation of the major data sources used in the Reporting Bank's risk measurement process;~~

~~(d) use data inputs that are automated as much as possible to reduce administrative errors. The Reporting Bank should periodically review and test the data mapping against an approved model version, and should monitor the type of data extracts and set appropriate controls;~~

~~(e) ensure that, where cash flows are slotted into different time buckets (for example, for gap analyses) or assigned to different vertex points to reflect the different tenors of the interest rate curve, the slotting criteria is stable over time to allow for a meaningful comparison of risk figures over different periods.~~

5.38 A Reporting Bank shall ensure that its IMS –

(a) is able to calculate economic value and earnings-based measures of IRRBB, as well as other measures of IRRBB prescribed by the Authority, based on the interest rate shock and stress scenarios set out in paragraph 5.24 of this Annex; and

(b) is sufficiently flexible to incorporate any constraints imposed by the Authority on the Reporting Bank's internal risk parameter estimates.

5.39 A Reporting Bank shall ensure that its models used to measure IRRBB are comprehensive and covered by governance processes for model risk management, including a validation function that is independent of the development process[718LC]. ~~The Reporting Bank should –~~

~~(a) ensure that the validation of IRRBB measurement methods and assessment of corresponding model risk is included in a formal policy process that is reviewed and approved by the Board or its delegates. The Reporting Bank should specify the management roles and designate the parties responsible for the development, implementation and use of models in the policy. In addition, the Reporting Bank should specify and integrate, within the governance processes for model risk management, the model oversight responsibilities and policies including the development of initial and ongoing validation procedures, evaluation of results, approval, version control, exception, escalation, modification and decommission processes;~~

~~(b) have in place an effective IRRBB validation framework, which should include three core elements, namely –~~

~~(i) evaluation of conceptual and methodological soundness, including developmental evidence;~~

~~(ii) ongoing model monitoring, including process verification and benchmarking; and~~

~~(iii) outcomes analysis, including backtesting of key internal parameters (for example, stability of deposits, prepayments, early redemptions, pricing of instruments);~~

~~(c) address the expected initial and ongoing model validation activities, establish in the policy set out in sub-paragraph (a) a hierarchical process for determining model risk soundness based on both quantitative and qualitative dimensions such as size, impact, past performance and familiarity with the modelling technique employed;~~

~~(d) ensure that model risk management for IRRBB measures follows a holistic approach that begins with motivation, development and implementation by model owners and users. The Reporting Bank should ensure that the process for determining model inputs, assumptions, modelling methodologies and outputs is reviewed and validated independently of the development of IRRBB models, prior to the model receiving authorisation for usage. The Reporting Bank should present the review and validation results and any recommendations on model usage to the Board or its delegates for approval, and upon approval, subject the model to ongoing review, process verification and validation at a frequency that is consistent with the level of model risk determined and approved by the Reporting Bank;~~

~~(e) ensure that the ongoing validation process establishes a set of exception trigger events that obligate the model reviewers to notify the Board or its~~

[718LC] A Reporting Bank should also observe the guidelines set out in paragraph 2.3 of Annex 10D.
[MAS Notice 637 (Amendment) 2022]

~~delegates in a timely fashion, in order to determine any corrective actions or restrictions on model usage. The Reporting Bank should designate clear version control authorisations, where appropriate, to model owners. With the passage of time and due to observations and new information gained over time, the Reporting Bank may modify or decommission an approved model. The Reporting Bank should have in place policies for model transition, including change and version control authorisations and documentation;~~

~~(f) include in the validation process model inputs or assumptions which may be sourced from IRRBB models developed by third-party vendors, related modelling processes or sub-models (both in-house and vendor-sourced). The Reporting Bank should document and explain model specification choices as part of the validation process;~~

~~(g) where a Reporting Bank purchases IRRBB models, ensure adequate documentation of its use of those models, including any specific customisation. If vendors provide input for market data, behavioural assumptions or model settings, the Reporting Bank should have a process in place to determine if those inputs are reasonable for its business and the risk characteristics of its activities; and~~

~~(h) ensure that its IA review the model risk management process as part of its annual risk assessment and audit plans, where such audit activity should not duplicate model risk management processes, but should review the integrity and effectiveness of the risk management system and the model risk management process.~~

[MAS Notice 637 (Amendment) 2022]

5.40 A Reporting Bank shall ensure that the measurement outcomes of IRRBB and hedging strategies are reported to the Board or its delegates on a regular basis, at relevant levels of aggregation, by consolidation level and currency[718LD]. ~~The Reporting Bank should –~~

~~(a) report risk measures to the Board or its delegates regularly, and should compare current exposure with policy limits. In particular, the Reporting Bank should report the results of the periodic model reviews and audits as well as comparisons of past forecasts or risk estimates with actual results to inform the Board or its delegates of potential modelling shortcomings on a regular basis. The Reporting Bank should clearly identify portfolios that may be subject to significant mark-to-market movements within the Reporting Bank's management information system and subject such portfolios to oversight in line with any other portfolios exposed to market risk;~~

~~(b) ensure that the reports prepared for the Board or its delegates, as the case may be, include the following –~~

[718LD] A Reporting Bank should also observe the guidelines set out in paragraph 2.4 of Annex 10D.
[MAS Notice 637 (Amendment) 2022]

~~(i) summaries of the Reporting Bank's aggregate IRRBB exposures, and explanatory text that highlights the assets, liabilities, cash flows, and strategies that are driving the level and direction of IRRBB;~~

~~(ii) reports demonstrating the Reporting Bank's compliance with policies and limits;~~

~~(iii) key modelling assumptions such as NMD characteristics, prepayments on fixed rate loans and currency aggregation;~~

~~(iv) results of stress tests, including assessment of sensitivity to key assumptions and parameters;~~

~~(v) summaries of the reviews of IRRBB policies, procedures and adequacy of the measurement systems, including any findings of internal and external auditors, or other equivalent external parties (such as consultants); and~~

~~(c) ensure that reports detailing its IRRBB exposures are provided to the Board or its delegates, as the case may be, on a timely basis and reviewed regularly. The Reporting Bank should ensure that such IRRBB reports provide aggregate information as well as sufficient supporting detail to enable the Board or its delegates, as the case may be, to assess the sensitivity of the Reporting Bank to changes in market conditions, with particular reference to portfolios that may potentially be subject to significant mark-to-market movements. The Board or its delegates, as the case may be, should review the Reporting Bank's IRRBB management policies and procedures in light of the reports, to ensure that they remain appropriate and sound. The Board or its delegates, as the case may be, should also ensure that analysis and risk management activities related to IRRBB are conducted by competent staff with technical knowledge and experience, consistent with the nature and scope of the Reporting Bank's activities.~~

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

Internal Assessment of Capital Adequacy for IRRBB

5.41 A Reporting Bank shall –

(a) evaluate its capital adequacy for IRRBB[718LE], which must be in line with its risk appetite, as part of its ICAAP approved by the Board;

(b) ensure that it has adequate capital and earnings that are commensurate with its level of short-term and long-term IRRBB exposures; and

(c) consider the potential risk that such exposures mentioned in sub-paragraph (b) may pose to its future financial performance.

[718LE] A Reporting Bank should also observe the guidelines set out in paragraphs 3.1 and 3.2 of Annex 10D.
[MAS Notice 637 (Amendment) 2022]

5.42 [Deleted by MAS Notice 637 (Amendment) 2022]~~For the purposes of evaluating its capital adequacy for IRRBB, a Reporting Bank should take the following into account –~~

~~(a) the size and tenor of internal limits on IRRBB exposures, and whether these limits are reached at the point of capital calculation;~~

~~(b) the effectiveness and expected cost of hedging open positions that are intended to take advantage of internal expectations of the future level of interest rates;~~

~~(c) the sensitivity of the internal measures of IRRBB to key modelling assumptions[718M];~~

~~(d) the impact of interest rate shock and stress scenarios set out in paragraph 5.24 of this Annex on positions priced off different interest rate indices;~~

~~(e) the impact on economic value and NII of mismatched positions in different currencies;~~

~~(f) the impact of embedded losses;~~

~~(g) the distribution of capital relative to risks across different entities in the banking group, in addition to overall Group level capital adequacy;~~

~~(h) the drivers of the underlying risk;~~

~~(i) the circumstances under which the risk might crystallise.~~

5.43 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank should –~~

~~(a) ensure that the contribution of IRRBB to its overall internal capital assessment is based on the Reporting Bank's IMS outputs, taking account of key assumptions and risk limits. The Reporting Bank should also ensure that the overall level of capital is commensurate with its actual measured level of risk (including for IRRBB) and its risk appetite, and is duly documented in its ICAAP report;~~

~~(b) develop its own methodologies for capital allocation, based on its risk appetite. In determining the appropriate level of capital, a Reporting Bank should consider both the amount and the quality of capital needed;~~

~~(c) consider its capital adequacy for IRRBB in relation to the risks to economic value, given that such risks are embedded in the Reporting Bank's assets, liabilities and off-balance sheet items. For risks to future earnings, given the possibility that future earnings may be lower than expected, a~~

718M [Deleted by MAS Notice 637 (Amendment) 2022]~~This includes the impact of key assumptions on ΔEVE such as the inclusion or exclusion of commercial margins, the Reporting Bank's actual equity allocation profile, the stability of NMDs and prepayment optionality.~~

~~Reporting Bank should consider capital buffers. The Reporting Bank should consider –~~

~~(i) the ΔEVE under a variety of interest rate shock and stress scenarios. Where the Reporting Bank's EVE is significantly sensitive to interest rate shock and stress scenarios, the Reporting Bank should assess the impact on its capital adequacy arising from financial instruments held at market value, and the potential impact in the case where banking book positions held at historical cost become subject to market valuation; and~~

~~(ii) the strength and stability of the earnings stream and the level of income needed to generate and maintain normal business operations. Where the Reporting Bank has a high level of IRRBB exposures, that could under a plausible range of market scenarios, result in the Reporting Bank reporting losses or curtailing normal dividend distribution and business operations, the Reporting Bank should ensure that it has sufficient capital to withstand the adverse impact of such events until it can implement mitigating actions such as reducing IRRBB exposures or increasing capital; and~~

~~(d) ensure that its evaluation of its capital adequacy for IRRBB as part of its ICAAP flows through to assessments of capital associated with business lines.~~

5.44 A Reporting Bank shall inform the Authority whenever there is any significant change to the Reporting Bank's IMS ~~on IRRBB measurement~~ or any policy change to its IRRBB management under its ICAAP.

[MAS Notice 637 (Amendment) 2022]

5.45 A Reporting Bank shall include in its ICAAP report the outputs of its IMS, including the Reporting Bank's IRRBB exposures for EVE and NII using the interest rate shock scenarios set out in paragraph 5.24 of this Annex.

Supervisory Review

5.46 For the ~~purpose~~purposes of the Authority's supervisory review[718N], the Authority may require ~~from~~that a Reporting Bank provide any or all of the following information relating to the Reporting Bank's IRRBB and the Reporting Bank shall provide that information:~~–~~

(a) the modelling of NMDs ~~for~~ under the Reporting Bank's IMS ~~purposes~~ and the sensitivity of ~~a~~the Reporting Bank's economic value and earnings to changes in NMD assumptions;

(b) the impact of assumptions used regarding products with behavioural options;

[718N] In its supervisory review, the Authority would consider the matters listed under paragraphs ~~80 to 85~~31.74 to 31.79 of the "SRP 31 – ~~Standards –~~Interest ~~R~~rate ~~R~~risk in the ~~B~~banking ~~B~~book" issued by the BCBS in ~~April 2016~~December 2019.

[MAS Notice 637 (Amendment) 2022]

(c) the treatment of own equity in internal calculations and the extent to which this impacts the ΔEVE number disclosed under Part XI of this Notice;

(d) repricing gaps of cash flows associated with ~~their~~its interest rate-sensitive assets, liabilities and off-balance sheet items (by significant currencies);

(e) exposures to automatic interest rate options;

(f) the types of yield curve used for IMS purposes;

(g) the level of ΔEVE if calculated using the SA(IR) set out in Annex 10B;

(h) economic value and earnings-based measures for interest rate shock and stress scenarios in addition to those prescribed in Annex 10C (including results based on the Reporting Bank's internally developed or other interest rate shock or stress scenarios).

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

5.47 A Reporting Bank that has been identified as an outlier Reporting Bank by the Authority in accordance with paragraph 5.48 of this Annex ~~shall~~will be subject to further review by the Authority on the Reporting Bank's management of IRRBB and adequacy of capital relative to the Reporting Bank's IRRBB exposures.

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

5.48 For the ~~purpose~~purposes of ~~determining if a Reporting Bank is~~ paragraph 5.47 of this Annex, an outlier Reporting Bank~~, the Authority will compare the~~ is a Reporting ~~Bank's~~Bank whose maximum ΔEVE ~~calculated in accordance with paragraph 5.49 of this Annex, under~~across the ~~six~~ 6 interest rate shock scenarios set out in Annex 10C, ~~with~~calculated in accordance with paragraph 5.49 of this Annex, is more than 15% of the Reporting Bank's Tier 1 capital.

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

5.49 For the purposes of paragraph 5.48 of this Annex, disclosure in Table 11-43A and reporting in Schedule 5G of Annex 12E, a~~A~~ Reporting Bank shall ~~compute and report to the Authority~~calculate its ΔEVE under each of the 6 interest rate shock scenarios set out in Annex 10C on the following bases:~~—~~

(a) exclude its own equity ~~from the computation of the exposure level~~;

(b) include all cash flows arising from all interest rate-sensitive assets~~[7180]~~~~,~~ (i.e. assets which are not deducted from CET 1 Capital, and which exclude fixed

[7180] [Deleted by MAS Notice 637 (Amendment) 2022]~~Interest rate-sensitive assets are assets which are not deducted from CET1 capital and which exclude (i) fixed assets such as real estate or intangible assets and (ii) equity exposures in the banking book.~~

assets[718OA] and equity exposures in its banking book), liabilities and off-balance sheet items in ~~the~~ its banking book, calculated in ~~the computation of their exposure~~accordance with paragraph 5.49A of this Annex;

(c) subject to paragraph 5.49B of this Annex, discount cash flows using –

(i) a risk-free rate; or

(ii) where the Reporting Bank has included commercial margins and other spread components in its cash flows, a risk-free rate including such commercial margins and other spread components~~.~~;

~~The Reporting Bank shall ensure that the risk-free rate used for discounting purposes is representative of a risk-free zero coupon rate[718P];~~

(d) ~~calculate ΔEVE with the assumption of~~ assume a run-off balance sheet~~,~~ (i.e. where existing banking book positions amortise and are not replaced by any new business).

[MAS Notice 637 (Amendment) 2022]

5.49A For the purposes of calculating cash flows pursuant to paragraph 5.49(b) of this Annex –

(a) in the case of instruments that reference market interest rates and have embedded automatic interest rate caps or embedded automatic interest rate floors, a Reporting Bank that does not adopt the methodology set out in paragraph 2.13 of Annex 10B as part of its IMS shall –

(i) apply the automatic interest rate caps or automatic interest rate floors in line with the contractual terms of each instrument; and

(ii) ensure that each interest rate applied pursuant to sub-paragraph (a)(i) is subject to the interest rate floor specified in paragraph 7 of Annex 10C;

(b) in the case of instruments that reference interest rates that are administered or managed by a Reporting Bank, the Reporting Bank –

(i) may apply interest rate caps, interest rate floors, and assumptions on how such interest rates might change in response to interest rate shocks, provided that these interest rate caps, interest rate floors and assumptions are approved by the Board or its delegates, and are clearly documented;

(ii) where the Reporting Bank adopts the approach set out in sub-paragraph (b)(i), the Reporting Bank shall ensure that each interest

[718OA] For example, real estate or intangible assets.

[MAS Notice 637 (Amendment) 2022]

[718P] [Deleted by MAS Notice 637 (Amendment) 2022]~~An example of an acceptable yield curve is a secured interest rate swap curve.~~

rate applied pursuant to sub-paragraph (b)(i) is subject to the interest rate floor specified in paragraph 7 of Annex 10C; and

(iii) where the Reporting Bank does not adopt the approach in sub-paragraph (b)(i), the Reporting Bank shall apply the interest rate floor specified in paragraph 7 of Annex 10C; and

(c) in the case of all other instruments, a Reporting Bank shall apply the interest rate floor specified in paragraph 7 of Annex 10C. To avoid doubt, the Reporting Bank shall not apply any other interest rate cap or interest rate floor on the post-shock interest rates used to calculate cash flows.

[MAS Notice 637 (Amendment) 2022]

5.49B For the purposes of discounting cash flows pursuant to paragraph 5.49(c) of this Annex, the Reporting Bank shall –

(a) ensure that the risk-free rate used for discounting purposes is representative of a risk-free zero coupon rate[718PA]; and

(b) apply the interest rate floor specified in paragraph 7 of Annex 10C. To avoid doubt, the Reporting Bank shall not apply any other cap or floor to the post-shock interest rates that are used to discount cash flows.

[MAS Notice 637 (Amendment) 2022]

5.49C For the purposes of disclosure in Table 11-43A and reporting in Schedule 5G of Annex 12E, a Reporting Bank shall calculate its ΔNII under the interest rate shock scenarios set out in paragraph 2(a) and (b) of Annex 10C on the following bases:

(a) include cash flows (including commercial margins and other spread components) arising from all interest rate-sensitive assets (i.e. assets which are not deducted from CET1 Capital and which exclude fixed assets[718PB] and equity exposures in its banking book), liabilities and off-balance sheet items in its banking book, calculated in accordance with paragraph 5.49D of this Annex;

(b) assume a constant balance sheet (i.e. where maturing or repricing cash flows are replaced by new cash flows with identical features with regard to the amount, repricing period and spread components);

(c) subtract NII over the next 12-month period under the interest rate shock scenarios set out in paragraph 2(a) and (b) of Annex 10C from NII over the next 12-month period under the current interest rates.

[MAS Notice 637 (Amendment) 2022]

718PA An example of an acceptable yield curve is a secured interest rate swap curve.
[MAS Notice 637 (Amendment) 2022]

718PB For example, real estate or intangible assets.
[MAS Notice 637 (Amendment) 2022]

5.49D For the purposes of calculating cash flows pursuant to paragraph 5.49C(a) of this Annex –

(a) in the case of instruments that reference market interest rates and have embedded automatic interest rate caps or embedded automatic interest rate floors, a Reporting Bank shall –

(i) apply the automatic interest rate caps or automatic interest rate floors in line with the contractual terms of each instrument; and

(ii) ensure that each interest rate applied pursuant to sub-paragraph (a)(i) is subject to the interest rate floor specified in paragraph 7 of Annex 10C;

(b) in the case of instruments that reference interest rates that are administered or managed by a Reporting Bank, the Reporting Bank –

(i) may apply interest rate caps, interest rate floors, and assumptions on how such interest rates might change in response to interest rate shocks, provided that these interest rate caps, interest rate floors and assumptions are approved by the Board or its delegates, and are clearly documented;

(ii) where the Reporting Bank adopts the approach set out in sub-paragraph (b)(i), the Reporting Bank shall ensure that each interest rate applied pursuant to sub-paragraph (b)(i) is subject to the interest rate floor specified in paragraph 7 of Annex 10C; and

(iii) where the Reporting Bank does not adopt the approach in sub-paragraph (b)(i), the Reporting Bank shall apply the interest rate floor specified in paragraph 7 of Annex 10C; and

(c) in the case of all other instruments, a Reporting Bank shall apply the interest rate floor specified in paragraph 7 of Annex 10C. To avoid doubt, the Reporting Bank shall not apply any other interest rate cap or interest rate floor on the post-shock interest rates used to calculate cash flows.

[MAS Notice 637 (Amendment) 2022]

5.50 Where the Authority is of the view that a Reporting Bank's management of IRRBB is inadequate or that the Reporting Bank has excessive IRRBB[718Q] relative to its capital or earnings, or its general risk profile, the Authority may require the Reporting Bank to take one or more of the following actions, within a specified time frame[718R]: ~~—~~

(a) reduce its IRRBB exposures[718RA] ~~(for example, by hedging)~~;

[718Q] In making this determination, the Authority may consider other factors than the outlier threshold set out in paragraph 5.48 of this Annex. This could include the case where a Reporting Bank's shocked ΔNII is such that the Reporting Bank may not have sufficient income to maintain its normal business conditions.

[718R] In imposing this time frame, the Authority may consider factors such as the prevailing financial and economic conditions, as well as the causes that led to a Reporting Bank's IRRBB exceeding the supervisory threshold.

[718RA] For example, by hedging.

[MAS Notice 637 (Amendment) 2022]

(b) raise additional capital;

(c) set constraints on the internal risk parameters related to IRRBB used by the Reporting Bank;

(d) improve its IRRBB management framework.

[MAS Notice 637 (Amendment) 2022]

5.51 Where the Authority determines that a Reporting Bank's IMS is deficient in its measurement of IRRBB, the Authority may require the Reporting Bank to improve its IMS or use the SA(IR) set out in Annex 10B to compute its ΔEVE.

5.52 [Deleted by MAS Notice 637 (Amendment) 2022]~~For further guidance, a Reporting Bank should refer to "Standards – Interest rate risk in the banking book" issued by the BCBS in April 2016, and any other relevant publications issued by the BCBS and the Authority in this area.~~

Annex 10B

STANDARDISED APPROACH FOR INTEREST RATE RISK IN THE BANKING BOOK (SA(IR))

[MAS Notice 637 (Amendment No. 2) 2018 (Insertion of this Annex)]

Amendments to Annex 10B

Section 1: Overview

1.1 A Reporting Bank shall carry out the following steps to measure its IRRBB under SA(IR), based solely on the EVE:~~—~~

(a) Step 1: Allocate interest rate-sensitive positions in the banking book set out in paragraph 2.2 of this Annex to one of the following ~~three~~ 3 categories:~~—~~

(i) amenable to standardisation;

(ii) less amenable to standardisation; or

(iii) not amenable to standardisation~~.~~;

(b) Step 2: Slot cash flows arising from interest rate-sensitive positions in the banking book set out in paragraph 2.2 of this Annex that are amenable to standardisation based on their repricing maturities using the approach set out in paragraphs 2.8 to 2.12 of this Annex. The Reporting Bank shall exclude cash flows arising from positions less amenable to standardisation from this step. The Reporting Bank shall ignore the optionality of positions with embedded automatic interest rate options for the purposes of slotting of notional repricing cash flows[723] (i.e. the Reporting Bank shall ensure that a position in an embedded automatic interest rate option is stripped out from the process of slotting notional repricing cash flows set out in this sub-paragraph, and is treated together with other automatic interest rate options as set out in sub-paragraph (c)). The Reporting Bank shall slot cash flows arising from positions that are not amenable to standardisation using the approaches set out in paragraphs 3.1 to 3.7 of this Annex for NMDs and paragraphs 4.1 to 4.14 of this Annex for behavioural options respectively~~.~~;

(c) Step 3: Determine the ΔEVE for the relevant interest rate scenarios for each currency, where ΔEVE is measured per currency for all ~~six~~ 6 interest rate scenarios in accordance with paragraphs 6.1 and 6.2 of this Annex. In doing so, the Reporting Bank shall include the add-ons for changes in the value of automatic interest rate options (whether explicit or embedded), calculated using the approach in paragraphs 5.1 to 5.5 of this Annex, under each interest rate scenario on a per currency basis~~.~~;

723 [Deleted by MAS Notice 637 (Amendment) 2022]~~The embedded automatic interest rate option is stripped out from the process of slotting notional repricing cash flows set out in paragraph 1.1(b) of this Annex and treated together with other automatic interest rate options as set out in paragraph 1.1(c) of this Annex.~~

(d) Step 4: Calculate the ΔEVE under SA(IR) as the maximum of the worst aggregated reductions to EVE across the ~~six~~ 6 supervisory interest rate shocks as set out in paragraph 6.3 of this Annex.

[MAS Notice 637 (Amendment) 2022]

Section 2: Components of SA(IR)

Cash Flow Bucketing

2.1 A Reporting Bank shall project all future notional repricing cash flows arising from the interest rate-sensitive positions~~[724]~~ in the banking book onto –

(a) the time buckets as set out in Table 10B-1 according to their repricing dates; or

(b) the time bucket midpoints as set out in Table 10B-1, ~~retaining the notional repricing cash flows' maturity. Where time bucket midpoints are used, the Reporting Bank shall split~~by splitting the notional repricing cash flows between ~~two~~ 2 adjacent time bucket midpoints while retaining the notional repricing cash flows' weighted average maturity (weighted by the magnitude of the cash flows in each time bucket midpoint)[725].

[MAS Notice 637 (Amendment) 2022]

2.2 ~~The~~For the purposes of paragraph 2.1 of this Annex, interest rate-sensitive positions in the banking book ~~mentioned in paragraph 2.1 of this Annex are –~~are –

(a) assets, excluding assets which are deducted from CET1 ~~capital~~Capital, fixed assets ~~such as real estate or intangible assets~~[725A], and equity exposures in the banking book;

(b) liabilities, including all non-remunerated deposits; and

(c) off-balance sheet items.

To avoid doubt, a Reporting Bank shall exclude CET1 Capital from interest rate-sensitive positions.

[MAS Notice 637 (Amendment) 2022]

[724] [Deleted by MAS Notice 637 (Amendment) 2022]~~For the avoidance of doubt, CET1 Capital is excluded.~~

[725] For example, for a notional repricing cash flow of $100 with a maturity of 3Y, a Reporting Bank must split the cash flow ~~is to be split~~ into the adjacent time bucket midpoints of 2.5Y and 3.5Y~~, while retaining the dollar-weighted average maturity of the notional repricing cash flow~~. An amount of $50 is to be allocated to the time bucket midpoint of 2.5Y and the remaining $50 to the time bucket midpoint of 3.5Y, to retain the weighted average maturity of 3Y.

[MAS Notice 637 (Amendment) 2022]

[725A] For example, real estate or intangible assets.

[MAS Notice 637 (Amendment) 2022]

2.3 For the purposes of this Annex –

(a) "time bucket" means any one of the time ~~bucket~~buckets set out in Table 10B-1;

(b) "time bucket midpoint" means any one of the time bucket midpoints set out in Table 10B-1;

(c) "notional repricing cash flow" means –

(i) repayment of principal or part of it, at any time;

(ii) any repricing of principal where repricing is said to occur at the earliest date at which the Reporting Bank or its counterparty is entitled to unilaterally change the interest rate, or at which the rate on a floating rate instrument changes automatically in response to a change in an external benchmark; or

(iii) any interest payment on a tranche of principal that has not yet been repaid or repriced; and

(d) "repricing date" means the date of each repayment, repricing or interest payment.

[MAS Notice 637 (Amendment) 2022]

2.4 A Reporting Bank may choose whether to deduct commercial margins and other spread components from the notional repricing cash flows, using a prudent and transparent methodology.

2.5 Where a Reporting Bank has chosen not to deduct commercial margins and other spread components of interest payments from the notional repricing cash flows, the Reporting Bank shall slot the commercial margins and other spread components of interest payments on a tranche of principal that has not yet been repaid and which do not reprice until their contractual maturity, irrespective of whether the non-amortised principal has been repriced or not.

Table 10B-1 – Maturity schedule with 19 time buckets for notional repricing cash flows repricing at t^{CF}

Short-term rates			Medium-term rates			Long-term rates		
k	**Time bucket (M: months, Y: years)**	**Time bucket midpoint (years)**	**k**	**Time bucket (M: months, Y: years)**	**Time bucket midpoint (years)**	**k**	**Time bucket (M: months, Y: years)**	**Time bucket midpoint (years)**
1	Overnight	0.0028	9	$2Y< t^{CF} \leq 3Y$	2.5	14	$7Y< t^{CF} \leq 8Y$	7.5
2	$Overnight< t^{CF} \leq 1M$	0.0417	10	$3Y< t^{CF} \leq 4Y$	3.5	15	$8Y< t^{CF} \leq 9Y$	8.5
3	$1M< t^{CF} \leq 3M$	0.1667	11	$4Y< t^{CF} \leq 5Y$	4.5	16	$9Y< t^{CF} \leq 10Y$	9.5
4	$3M< t^{CF} \leq 6M$	0.375	12	$5Y< t^{CF} \leq 6Y$	5.5	17	$10Y< t^{CF} \leq 15Y$	12.5
5	$6M< t^{CF} \leq 9M$	0.625	13	$6Y< t^{CF} \leq 7Y$	6.5	18	$15Y< t^{CF} \leq 20Y$	17.5
6	$9M< t^{CF} \leq 1Y$	0.875				19	$t^{CF} >20Y$	25
7	$1Y< t^{CF} \leq 1.5Y$	1.25						
8	$1.5Y< t^{CF} \leq 2Y$	1.75						

Process for Slotting and Decomposing Banking Book Instruments

2.6 Paragraphs 2.8 to 2.14 of this Annex set out the process for slotting and decomposing banking book instruments for –

(a) fixed rate positions or floating rate positions that are amenable to standardisation, including positions with embedded automatic interest rate options~~[726]~~;

(b) positions that are less amenable to standardisation; and

(c) positions that are not amenable to standardisation.

[MAS Notice 637 (Amendment) 2022]

2.7 For the purposes of this Annex –

(a) "fixed rate positions" mean positions which generate cash flows that are certain till the point of contractual maturity[727]; and

(b) "floating rate positions" mean positions which generate cash flows that are not predictable past the next repricing date other than that the present value would be reset to par.

[MAS Notice 637 (Amendment) 2022]

726 [Deleted by MAS Notice 637 (Amendment) 2022]~~Positions amenable to standardisation would also include positions with embedded automatic interest rate options.~~

727 ~~Examples are~~For example, fixed rate loans without embedded prepayment options, term deposits without redemption risk ~~and~~ or other amortising products such as mortgage loans.

[MAS Notice 637 (Amendment) 2022]

Process for Positions that are Amenable to Standardisation

2.8 The Reporting Bank shall –

(a) in respect of fixed rate positions, allocate repricing cash flows either to time buckets or time bucket midpoints based on contractual maturity of such cash flows; and

(b) in respect of floating rate positions, treat such positions as a series of coupon payments until the next repricing and a par notional cash flow at the time bucket or time bucket midpoints closest to the next reset date, with no additional slotting of notional repricing cash flows to later time buckets or time bucket midpoints (other than the spread component which is not repriced).

2.9 Where a Reporting Bank allocates repricing cash flows based on time bucket midpoints for fixed rate positions, the Reporting Bank shall allocate, all coupon cash flows and periodic or final principal repayments to the ~~two~~ 2 adjacent time bucket midpoints closest to the contractual maturity.

[MAS Notice 637 (Amendment) 2022]

2.10 Where a Reporting Bank allocates repricing cash flows based on time buckets midpoints for floating rate positions, the Reporting Bank shall allocate all coupon and notional repricing cash flows to the ~~two~~ 2 adjacent time bucket midpoints closest to the next reset date.

[MAS Notice 637 (Amendment) 2022]

2.11 A Reporting Bank shall ignore the optionality (whether sold or bought) arising from positions with embedded automatic interest rate options for the purposes of slotting notional repricing cash flows[728] under paragraph 2.8 of this Annex, and shall treat the stripped-out embedded automatic interest rate options as if they are explicit automatic interest rate options.

2.12 A Reporting Bank may, with the Authority's approval, categorise other positions as being amenable to standardisation and ignore any optionality associated with such positions if the Reporting Bank can demonstrate that such optionality is of immaterial consequence.

Process for Positions that are Less Amenable to Standardisation[729]

[728] For example, a Reporting Bank must treat a floating rate mortgage loan or debt security with ~~a~~ embedded interest rate caps and/or floors ~~shall be treated~~ as if there were no interest rate cap and/or floor (i.e.~~;~~ ~~hence, it shall be treated~~ as if it was a fixed rate loan until the next repricing date, where it would be fully repriced ~~at the next reset date~~), and slot its full outstanding balance ~~slotted~~ into the corresponding time band. Similarly, a Reporting Bank must treat a callable bond issued by a Reporting Bank at a fixed yield ~~shall be treated~~ as if it matured at its longest contractual term, ignoring the call option.

[MAS Notice 637 (Amendment No. 2) 2020]
[MAS Notice 637 (Amendment) 2022]

[729] For positions that are less amenable to standardisation, a common feature is optionality that makes the timing of notional repricing cash flows uncertain. Such optionality introduces a non-linearity, which suggests that delta-equivalent approximations are imprecise for large interest rate shock scenarios.

2.13 A Reporting Bank shall use the methodology provided in paragraphs 5.1 to 5.5 of this Annex to treat explicit automatic interest rate options~~[730]~~ and embedded automatic interest rate options that are separated or stripped out from the Reporting Bank's assets or liabilities.

[MAS Notice 637 (Amendment) 2022]

Process for Positions that are Not Amenable to Standardisation

2.14 A Reporting Bank shall use the methodology provided in paragraphs 3.1 to 4.14 of this Annex for positions not amenable to standardisation. Positions not amenable to standardisation include –

(a) NMDs;

(b) fixed rate loans subject to prepayment risk; and

(c) term deposits subject to early redemption risk.

Section 3: Treatment of NMDs

3.1 A Reporting Bank shall carry out the following steps in the order set out below for the treatment of NMDs:~~—~~

(a) segment its NMDs according to the nature of the deposit and depositor in accordance with paragraph 3.2 of this Annex;

(b) identify, for each NMD category, the core and non-core deposits in accordance with paragraphs 3.3 and 3.4 of this Annex, up to the caps on proportion of core deposits specified in Table 10B-2;

(c) determine an appropriate cash flow slotting for each NMD category in accordance with paragraphs 3.5 to 3.7 of this Annex and the average maturity limits specified in Table 10B-2.

[MAS Notice 637 (Amendment) 2022]

NMD Categories

3.2 A Reporting Bank shall –

(a) segment NMDs into ~~the~~ –

(i) retail (transactional) NMDs;

(ii) retail (non-transactional) NMDs; and

730 [Deleted by MAS Notice 637 (Amendment) 2022]~~An example of a product with embedded automatic interest rate options is a floating rate mortgage loan with embedded caps and/or floors. Notional repricing cash flows for these loans are treated as fixed rate loans until the next repricing date, thereby ignoring the option, which is treated like a separate automatic interest rate option.~~

(iii) wholesale NMD~~s~~~~categories set out in Table 10B-2~~;

(b) treat deposits placed with it by ~~a natural person~~an individual as retail deposits, and subject to sub-paragraph (c), deposits from legal entities, sole proprietorships or partnerships as wholesale deposits;

(c) treat deposits made by small business customers~~[731]~~ ~~and managed as retail exposures~~ as retail deposits;

(d) where regular transactions are carried out of the account of ~~a~~an individual or small business customer ~~and managed as retail exposure~~, classify such retail deposits as being held in a transactional account[732]; and

(e) classify all other retail deposits as being held in a non-transactional account.

[MAS Notice 637 (Amendment) 2022]

3.2A A Reporting Bank may further segment its retail (transactional) NMDs referred to in paragraph 3.2(a)(i) of this Annex into retail (transactional, remunerated) NMDs and retail (transactional, non-remunerated) NMDs, subject to the Authority's approval.

[MAS Notice 637 (Amendment) 2022]

3.2B For the purposes of paragraph 3.2(c) and (d) of this Annex and subject to paragraph 3.2C of this Annex, "small business customer" means any customer or group of customers –

(a) that is a small business;

(b) that the Reporting Bank does not have any exposure to, or that the Reporting Bank has exposures of not more than S$2 million;

(c) where the funding provided by the customer or group of customers is not more than S$2 million; and

(d) where the exposures to the customer or group of customers are managed by the Reporting Bank as retail exposures, or where the Reporting Bank does not have any exposure to the customer or group of customers, the

731 [Deleted by MAS Notice 637 (Amendment) 2022] ~~"Small business customers" are defined in line with the definition of loans extended to small businesses in footnote 124 of Part VII that are managed as retail exposures and are generally considered as having similar interest rate risk characteristics to retail accounts provided the total aggregated liabilities raised from one small business customer is less than S$2 million (on a consolidated basis where applicable). Where a Reporting Bank does not have any exposure to a small business customer that would enable it to use the definition under footnote 124 of Part VII, the Reporting Bank may include such a deposit in this category provided that the total aggregated liabilities raised from the customer is less than S$2 million (on a consolidated basis where applicable) and the deposit is managed as a retail deposit. This means that the Reporting Bank treats such deposits in its internal risk management systems consistently over time and in the same manner as other retail deposits, and that the deposits are not individually managed in a way comparable to larger corporate deposits.~~

~~[MAS Notice 637 (Amendment No. 2) 2020]~~

732 Examples of transactional retail deposits are ones where salaries are automatically credited or ~~when~~ where the deposit is non-interest bearing. ~~For non-interest bearing deposits, a Reporting Bank may introduce a specific category for non-remunerated deposits, subject to the Authority's approval.~~

[MAS Notice 637 (Amendment) 2022]

funding provided by the customer or group of customers is managed by the Reporting Bank as retail deposits.

[MAS Notice 637 (Amendment) 2022]

3.2C For the purposes of the definition of "small business customer" in paragraph 3.2B of this Annex –

(a) in determining the total exposures to, or total funding provided by, a group of customers, the Reporting Bank shall ensure that the basis of aggregation of a group of customers follows the basis of aggregation set out in footnote 124;

(b) an exposure is managed by the Reporting Bank as a retail exposure if the exposure is originated in the same manner as other retail exposures, and is managed by the Reporting Bank as part of a pool of similar exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures; and

(c) a funding is managed by the Reporting Bank as retail deposits if the funding is originated in the same manner as other retail deposits, and is managed by the Reporting Bank as part of a pool of similar deposits in its internal risk management systems consistently over time and in the same manner as other retail deposits.

[MAS Notice 637 (Amendment) 2022]

Separation of NMDs

3.3 A Reporting Bank shall distinguish between the stable and non-stable parts of each NMD category using observed volume changes over the past 10 years. The stable NMD portion refers to the portion that is found to remain undrawn with a high degree of likelihood.

3.4 A Reporting Bank shall estimate its level of core deposits based on the proportion of stable NMDs which are unlikely to reprice even under significant changes in the interest rate environment and subject to the cap as shown in Table 10B-2 for each NMD category. The Reporting Bank shall estimate its level of non-core ~~NMDs~~deposits as the remainder of NMDs not treated as core deposits.

[MAS Notice 637 (Amendment) 2022]

Cash Flow Slotting

3.5 A Reporting Bank shall slot NMDs into the appropriate time bucket or time bucket midpoint.

3.6 A Reporting Bank shall treat the non-core deposits mentioned in paragraph 3.4 of this Annex as overnight deposits and accordingly slot such non-core deposits into the overnight time bucket or overnight time bucket midpoint.

3.7 A Reporting Bank shall determine the appropriate cash flow slotting procedure for each category of core deposits, up to the maximum average maturity for each category as specified in Table 10B-2.

Table 10B-2: Caps on Core Deposits and Average Maturity by Category

NMD category	Cap on proportion of core deposits (%)	Cap on average maturity of core deposits (years)
Retail ~~/~~ & Transactional	90	5
Retail ~~/~~ & Non-transactional	70	4.5
Wholesale	50	4

[MAS Notice 637 (Amendment) 2022]

Section 4: Treatment of Positions with Behavioural Options other than NMDs

4.1 The treatment set out in paragraphs 4.2 to 4.14 of this Annex applies only to behavioural options related to retail customers. In the case where a wholesale customer has a behavioural option that may change the pattern of notional repricing cash flows, a Reporting Bank shall use the methodology provided in paragraph 5.5 of this Annex.

Positions with Behavioural Options other than NMDs

4.2 [Deleted by MAS Notice 637 (Amendment) 2022]~~In the case of fixed rate loans subject to prepayments and term deposits subject to early redemption risk, the customer has an option, which, if exercised, will alter the timing of a Reporting Bank's cash flows. The customer's exercise of the option is, among other factors, influenced by changes in interest rates. In the case of a fixed rate loan, the customer has an option to repay the loan early, that is to prepay; and for a fixed-term deposit, the customer may have the option to withdraw the deposit before the scheduled date.~~

4.3 A Reporting Bank shall calculate the optionality of positions with behavioural options other than NMDs[732A]~~.~~, by using the formula A x B, where –

(a) A is the baseline estimate of loan prepayments and early withdrawal of fixed-term deposits given the prevailing term structure of interest rates; and

(b) B is the scenario-dependent scalar that reflects the likely behavioural changes in the exercise of the options.

[MAS Notice 637 (Amendment) 2022]

4.4 [Deleted by MAS Notice 637 (Amendment) 2022]~~In paragraph 4.3 of this Annex, "optionality of positions with behavioural options other than NMDs" means the amount ascertained by the formula A x B, where –~~

[732A] In the case of fixed rate loans subject to prepayments and term deposits subject to early redemption risk, the customer has the option to repay the fixed rate loan early or to withdraw the term deposits before maturity, which, if exercised, will alter the timing of a Reporting Bank's cash flows. The customer's exercise of the option is, among other factors, influenced by changes in interest rates.
[MAS Notice 637 (Amendment) 2022]

~~(a) A is the baseline estimate of loan prepayments and early withdrawal of fixed term deposits given the prevailing term structure of interest rates; and~~

~~(b) B is the scenario-dependent scalar that reflects the likely behavioural changes in the exercise of the options.~~

4.5 A Reporting Bank shall –

(a) determine the value of A referred to in paragraph ~~4.4(a)~~4.3(a) of this Annex; and

(b) where the Reporting Bank adopts the SA(IR) under paragraph 5.19(b) of Annex 10A, obtain the Authority's prior approval of the value of A.

Fixed Rate Loans Subject to Prepayment Risk

4.6 [Deleted by MAS Notice 637 (Amendment) 2022]~~Any prepayments, or any part thereof, for which the economic cost is not charged to the borrower, is referred to as uncompensated prepayment.~~

4.7 For any loan product where the economic cost of prepayments is never charged, or charged only for prepayments above a certain threshold, a Reporting Bank shall use the steps set out in paragraphs 4.8 to 4.10 of this Annex to assign notional repricing cash flows.

4.8 A Reporting Bank shall compute the CPR for each portfolio ~~as –~~ *p* of homogeneous prepayment-exposed loans denominated in currency *c* under an interest rate shock scenario *i* as set out in Table 10B-3 as either –

(a) $CPR_{i,c}^{p} = \min(1, \gamma_i \cdot CPR_{0,c}^{p})$;

(b) $CPR(k)_{i,c}^{p} = \min(1, \gamma_i \cdot CPR(k)_{0,c}^{p})$; or

(c) $CPR(t_k)_{i,c}^{p} = \min(1, \gamma_i \cdot CPR(t_k)_{0,c}^{p})$~~,~~

where –

(~~a~~i) ~~$CPR_{i,c}^{p}$ is the CPR for a portfolio p of homogenous prepayment-exposed loans denominated in currency c under an interest rate shock scenario i as set out in Table 10B-3~~$CPR_{i,c}^{p}$ is a constant CPR, while $CPR(k)_{i,c}^{p}$ and $CPR(t_k)_{i,c}^{p}$ refer to the CPR for time bucket k and time bucket midpoint t_k~~,~~ respectively where the CPR varies over the life of each loan in the portfolio;

(~~b~~ii) $CPR_{0,c}^{p}$ is ~~the~~ a constant baseline CPR~~[733]~~, while $CPR(k)_{0,c}^{p}$ and $CPR(t_k)_{i,c}^{p}$ refer to the CPR for time bucket k and time bucket midpoint t_k, respectively

733 [Deleted by MAS Notice 637 (Amendment) 2022]~~Alternatively, the baseline CPR may also vary over the life of each loan in the portfolio. In that case, it is denoted as $CPR(k)_{0,c}^{p}$ for each time bucket *k* or $CPR(t_k)_{0,c}^{p}$ for each time bucket midpoint t_k.~~

under the ~~current interest rate yield curve of the portfolio p of homogenous prepayment-exposed loans denominated in currency c. The Reporting Bank shall determine $CPR^{p}_{0,c}$ based on the~~ prevailing term structure of interest rates; and

(~~c~~iii) γ_i is a multiplier applied for scenario i as given in Table 10B-3.

[MAS Notice 637 (Amendment) 2022]

Table 10B-3: CPRs under the Shock Scenarios

Scenario number (i)	Interest rate shock scenarios	γ_i (scenario multiplier)
1	Parallel up	0.8
2	Parallel down	1.2
3	Steepener	0.8
4	Flattener	1.2
5	Short rate up	0.8
6	Short rate down	1.2

4.9 A Reporting Bank shall reflect the prepayments on ~~the~~ its fixed rate loans in ~~the~~its relevant cash flows (~~for example~~i.e. scheduled payments on the loans, prepayments and interest payments~~[734]~~), by separating such payments into scheduled payments adjusted for prepayment and uncompensated prepayments as follows~~—~~:

(a) where time buckets are used –

(i) $CF^{p}_{i,c}(k) = CF^{S}_{i,c}(k) + CPR^{p}_{i,c} \cdot N^{p}_{i,c}(k-1)$; or

(ii) $CF^{p}_{i,c}(k) = CF^{S}_{i,c}(k) + CPR(k)^{p}_{i,c} \cdot N^{p}_{i,c}(k-1)$;

(b) where time bucket midpoints are used –

(i) $CF^{p}_{i,c}(t_k) = CF^{S}_{i,c}(t_k) + CPR^{p}_{i,c} \cdot N^{p}_{i,c}(t_{k-1})$~~,~~; or

(ii) $CF^{p}_{i,c}(t_k) = CF^{S}_{i,c}(t_k) + CPR(t_k)^{p}_{i,c} \cdot N^{p}_{i,c}(t_{k-1})$,

where –

(i) $CF^{p}_{i,c}(k)$ and $CF^{p}_{i,c}(t_k)$ refer~~s~~ to the notional repricing cashflows arising from a portfolio p of ~~homogenous~~homogeneous prepayment-exposed loans denominated in currency c under an interest rate shock scenario i as set out in Table 10B-3;

(ii) $CF^{S}_{i,c}(k)$ and $CF^{S}_{i,c}(t_k)$ refer~~s~~ to the scheduled interest and principal repayment for each interest rate shock scenario i and currency c, adjusted to take into account prepayments;

734 [Deleted by MAS Notice 637 (Amendment) 2022]~~The Reporting Bank may separate such payments into scheduled payments adjusted for prepayment and uncompensated prepayments.~~

(iii) k and tk refer~~s~~ to the time bucket and time bucket midpoint respectively, that the scheduled interest and principal repayment ~~is~~are slotted into;

(iv) $N^p_{i,c}(k-1)$ and $N^p_{i,c}(t_{k-1})$ denote~~s~~ the notional outstanding of portfolio p at time bucket k-1 and time bucket midpoint tk-1 respectively, for each interest rate scenario i and currency c; and

(v) ~~The~~the base cash flows (that is given the current interest rate yield curve and base CPR) are given by i=0.

[MAS Notice 637 (Amendment) 2022]

4.10 Where a Reporting Bank has in place annual limits on uncompensated prepayments, it shall apply these annual limits in the relevant cash flows referred to in paragraph 4.9 of this Annex.

Term Deposits Subject to Early Redemption Risk

4.11 A Reporting Bank shall treat term deposits as being subject to early redemption risk, subject to paragraph 4.12 of this Annex.

4.12 A Reporting Bank may treat term deposits as fixed rate liabilities and slot the notional repricing cash flows of such deposits into the time buckets or time bucket midpoints up to their corresponding contractual maturity dates if the Reporting Bank can show to the satisfaction of the Authority that –

(a) the depositor has no legal right to withdraw the deposit; or

(b) an early withdrawal results in a significant penalty that at least compensates for the loss of interest between the date of withdrawal and the contractual maturity date and the economic cost of breaking the contract[735].

4.13 A Reporting Bank shall compute the TDRR for each portfolio as –

$$TDRR^p_{i,c} = \min\left(1, u_i \cdot TDRR^p_{0,c}\right)$$

where –

(a) $TDRR^p_{i,c}$ is the TDRR that is applicable to each ~~homogenous~~homogeneous portfolio p of term deposits in currency c for each interest rate shock scenario i set out in Table 10B-4;

(b) $TDRR^p_{0,c}$ is the baseline TDRR under the current interest rate yield curve that is applicable to each ~~homogenous~~homogeneous portfolio p of term deposits in currency c and is to be determined by the Reporting Bank; and

[735] However, penalties often do not reflect such an economic calculation but are instead based on a simpler formula such as a percentage of accrued interest. In such cases, there is potential for changes to profit or loss arising from differences between the penalty charged and the actual economic cost of early withdrawal.

(c) u_i is the scalar multiplier applied for interest rate shock scenario i as given in Table 10B-4.

[MAS Notice 637 (Amendment) 2022]

Table 10B-4: TDRR Scalars under the Shock Scenarios

Scenario number (i)	Interest rate shock scenarios	u_i (Scalar multiplier)
1	Parallel up	1.2
2	Parallel down	0.8
3	Steepener	0.8
4	Flattener	1.2
5	Short rate up	1.2
6	Short rate down	0.8

4.14 A Reporting Bank shall calculate the notional repricing cash flows for term deposits which are expected to be redeemed early under any interest rate shock scenario *i* in accordance with the formula below, and slot such cash flows into the overnight time bucket (k=1) or time bucket midpoint (t_1) as follows –

(a) where time buckets are used –

$CF_{i,c}^{p}(1) = TD_{0,c}^{p} \cdot TDRR_{i,c}^{p}$; or

(b) where time bucket midpoints are used –

$CF_{i,c}^{p}(t_1) = TD_{0,c}^{p} \cdot TDRR_{i,c}^{p}$

where –

(i) $CF_{i,c}^{p}(1)$ refers to the notional repricing cashflows arising from each ~~homogenous~~homogeneous portfolio p of term deposits in currency c for each interest rate shock scenario i set out in Table 10B-4, which are expected to be redeemed early and slotted into the overnight time bucket;

(ii) $CF_{i,c}^{p}(t_1)$ refers to the notional repricing cashflows arising from each ~~homogenous~~homogeneous portfolio p of term deposits in currency c for each interest rate shock scenario i set out in Table 10B-4, which are expected to be redeemed early and slotted into the overnight time bucket midpoint; and

(iii) $TD_{0,c}^{p}$ refers to the outstanding amount of term deposits for portfolio p and currency c.

[MAS Notice 637 (Amendment) 2022]

Section 5: Automatic Interest Rate Options

5.1 A Reporting Bank shall calculate an add-on for sold automatic interest rate options, whether explicit or embedded[736]. A Reporting Bank may calculate an add-on for all bought automatic interest rate options or only for bought automatic interest rate options used for hedging sold automatic interest rate options.

5.2 For the purposes of paragraph 5.1 of this Annex, a Reporting Bank shall calculate the add-on based on the following –

(a) for each sold automatic option *o* in currency *c*, the value change denoted $\Delta FVAO_{i,c}^{o}$ is calculated for each interest rate shock scenario *i*. The value change is given by –

(i) an estimate of the value of the option to the option holder, given –

(A) a yield curve in currency *c* under the interest rate shock scenario *i*; and

(B) a relative increase in the implicit volatility of 25%~~;~~,

minus

(ii) the value of the sold option to the option holder, given the yield curve in currency c at the valuation date;

(b) for each bought automatic interest rate option q in currency c, the Reporting Bank shall determine the change in value of the option, $\Delta FVAO_{i,c}^{q}$, between interest rate shock scenario i and the current interest rate term structure combined with a relative increase in the implicit volatility of 25%;

(c) the Reporting Bank's total measure for automatic interest rate option risk, $KAO_{i,c}$, under interest rate shock scenario *i* in currency *c* is calculated as –

$$KAO_{i,c} = \sum_{o=1}^{n_c} \Delta FVAO_{i,c}^{o} - \sum_{q=1}^{m_c} \Delta FVAO_{i,c}^{q}$$

where n_c ~~(m_c)~~ is the number of sold ~~(bought)~~ options in currency *c*, and m_c is the number of bought options in currency *c*.

[MAS Notice 637 (Amendment) 2022]

736 The most important interest rate options that are likely to occur in the banking book are caps and floors, which are often embedded in banking products. Swaptions, such as prepayment options on non-retail products, may also be treated as automatic interest rate options as, in cases where such options are held by sophisticated financial market counterparties, the option holder will almost certainly exercise the option if it is in ~~their~~ the holder's financial interest to do so.

[MAS Notice 637 (Amendment) 2022]

5.3 For the purposes of paragraph~~s~~ 5.2(a) and ~~5.2~~(b) of this Annex, the Reporting Bank shall –

(a) calculate the value of the option to the option holder based on an internally-selected methodology; and

(b) where the Reporting Bank adopts the SA(IR) under paragraph 5.19(b) of Annex 10A, obtain the Authority's prior approval of the methodology.

[MAS Notice 637 (Amendment) 2022]

5.4 Where a Reporting Bank calculates an add-on only for bought automatic interest rate options that are used for hedging sold automatic interest rate options, the Reporting Bank shall, in respect of remaining bought interest rate options, add any change in market value that is reflected in regulatory capital to the total automatic interest rate option risk measure $KAO_{i,c}$.

5.5 For the purposes of paragraphs 5.2 to 5.4 of this Annex, the Reporting Bank shall treat any behavioural option positions with wholesale customers that may change the pattern of notional repricing cash flows as embedded automatic interest rate options[737]. A Reporting Bank may treat wholesale term deposits as fixed rate liabilities and slot their notional repricing cashflows into the time buckets or time bucket midpoints up to their corresponding contractual maturity dates if the Reporting Bank can demonstrate to the satisfaction of the Authority that –

(a) the depositor has no legal right to withdraw the deposit; or

(b) an early withdrawal results in a significant penalty that at least compensates for the loss of interest between the date of withdrawal and the contractual maturity date and the economic cost of breaking the contract[~~735~~737A].

[MAS Notice 637 (Amendment) 2022]

Section 6: Calculation of the Standardised EVE Measure

6.1 A Reporting Bank shall calculate the loss in economic value of equity, $\Delta EVE_{i,c}$ under scenario *i* and currency *c* for each currency with material exposures, that is, currencies that account for more than 5% of its banking book assets or liabilities, as follows:~~–~~

(a) slot all notional repricing cash flows into their respective time buckets $k \in \{1,2,\ldots,K\}$ or time bucket midpoints $t_k, k \in \{1,2,\ldots,K\}$ for each scenario i. Within a given time bucket k or time bucket midpoint t_k, the Reporting

737 An example of such an option would be a puttable fixed coupon bond issued by the Reporting Bank in the wholesale market, for which the owner has the right to sell the bond back to the Reporting Bank at a fixed price at any time.

737A However, penalties often do not reflect such an economic calculation but are instead based on a simpler formula such as a percentage of accrued interest. In such cases, there is potential for changes to profit or loss arising from differences between the penalty charged and the actual economic cost of early withdrawal. [MAS Notice 637 (Amendment) 2022]

Bank shall net[738] all positive and negative notional repricing cash flows to form a single long or short position, with the netted parts removed from the calculation. This process applied across all time buckets or time bucket midpoints leads to a set of notional repricing cash flows $CF_{i,c}(k)$ or $CF_{i,c}(t_k), k \in \{1,2,\dots,K\}$[739];

(b) weigh the net notional repricing cash flows in each time bucket k or time bucket midpoints t_k calculated in sub-paragraph (a) ~~above~~ by $DF_{i,c}(t_k)$ a continuously compounded discount factor –

$$DF_{i,c}(t_k) = \exp(-R_{i,c}(t_k) \cdot t_k)$$

Where –

(i) $R_{i,c}(t_k)$ is the post-shock risk-free rate or risk-free rate including commercial margins and other spreads (only if the Reporting Bank has included commercial margins and other spread components in its cash flows) in currency c under interest rate shock scenario i as set out in Annex 10C; and

(ii) t_k is the midpoint of time bucket k~~.~~;

(c) sum the risk-weighted net positions computed in sub-paragraph (b) ~~above~~ to determine $EVE_{i,c}^{nao}$, the EVE in currency *c* under scenario *i* (excluding automatic interest rate positions) –

(i) where time buckets are used –

$EVE_{i,c}^{nao} = \sum_{k=1}^{K} \mathrm{CF}_{i,c}(k) \cdot DF_{i,c}(t_k)$; or

(ii) where time bucket midpoints are used –

$EVE_{i,c}^{nao} = \sum_{k=1}^{K} \mathrm{CF}_{i,c}(t_k) \cdot DF_{i,c}(t_k)$;

(d) obtain the ΔEVE in currency c associated with scenario i by subtracting $EVE_{i,c}^{nao}$ from the EVE under the current interest rate term structure $EVE_{0,c}^{nao}$ and by adding the total measure for automatic interest rate risk $KAO_{i,c}$, as follows: ~~–~~

(i) where time buckets are used –

$\Delta EVE_{i,c} = \sum_{k=1}^{K} \mathrm{CF}_{0,c}(k) \cdot DF_{0,c}(t_k) - \sum_{k=1}^{K} \mathrm{CF}_{i,c}(k) \cdot DF_{i,c}(t_k) + KAO_{i,c}$; or

---

738 Intra-bucket mismatch risk arises as notional repricing cash flows with different maturity dates, but falling within the same time bucket or time bucket midpoint, are assumed to match perfectly. This is mitigated by the high number of time buckets available.

739 Depending on the approach the Reporting Bank takes for NMDs, prepayments and products with other embedded behavioural options, the notional repricing cash flows may vary by scenario *i* (scenario-dependent cash flow products).

[MAS Notice 637 (Amendment) 2022]

(ii) where time bucket midpoints are used –

$$\Delta EVE_{i,c} = \sum_{k=1}^{K} \mathrm{CF}_{0,c}(t_k) \cdot DF_{0,c}(t_k) - \sum_{k=1}^{K} \mathrm{CF}_{i,c}(t_k) \cdot DF_{i,c}(t_k) + KAO_{i,c}\cancel{;}.$$

[MAS Notice 637 (Amendment) 2022]

6.2 A Reporting Bank shall ensure that the risk-free rate used for discounting purposes is representative of a risk-free zero coupon rate[740].

6.3 A Reporting Bank shall compute the standardised EVE risk measure by aggregating the EVE losses $\Delta EVE_{i,c} > 0$ under a given interest rate scenario *i*, and taking the maximum loss across all interest rate shock scenarios –

$$\text{Standardised EVE risk measure} = \max_{i\in\{1,2,\ldots,6\}} \left\{ \max\left(0; \sum_{c:\Delta \mathrm{EVE}_{i,c}>0} \underbrace{\Delta \mathrm{EVE}_{i,c}}_{loss\ in\ currency\ c}\right)\right\}$$

740 An example of an acceptable yield curve is a secured interest rate swap curve.

Annex 10C

STANDARDISED INTEREST RATE SHOCK SCENARIOS

[MAS Notice 637 (Amendment No. 2) 2018 (Insertion of this Annex)]

Amendments to Annex 10C

1 A Reporting Bank shall apply the interest rate shock scenarios –

(a) as set out in paragraph~~s~~ 2(a) to (f) of this Annex to calculate parallel and non-parallel gap risks for EVE; and

(b) as set out in paragraph~~s~~ 2(a) and (b) of this Annex for the calculation of NII,

in respect of each currency for which the Reporting Bank has material positions (i.e. currencies that account for more than 5% of the Reporting Bank's banking book assets or liabilities)~~[741]~~.

[MAS Notice 637 (Amendment) 2022]

2 The interest rate shock scenarios referred to in paragraph 1 of this Annex are –

(a) parallel shock up;

(b) parallel shock down;

(c) steepener shock (short rates down and long rates up);

(d) flattener shock (short rates up and long rates down);

(e) short rates shock up; and

(f) short rates shock down.

3 The instantaneous interest rate shocks, $\bar{R}_{shocktype,c}$ to the risk-free rate for each shock type (parallel, short and long) and for each currency *c,* are provided in Table 10C-1 and given in basis points.

Table 10C-1: Specified Size of Interest Rate Shocks $\bar{R}_{shocktype,c}$

	Argentina Peso (ARL)	Australian Dollar (AUD)	Brazilian Real (BRL)	Canadian Dollar (CAD)	Swiss Franc (CHF)	Chinese Yuan (CNY)	Euro (EUR)
Parallel	400	300	400	200	100	250	200
Short	500	450	500	300	150	300	250
Long	300	200	300	150	100	150	100

741 [Deleted by MAS Notice 637 (Amendment) 2022]~~Currencies that account for more than 5% of its banking book assets or liabilities.~~

	British Pound (GBP)	Hong Kong Dollar (HKD)	Indonesian Rupiah (IDR)	Indian Rupee (INR)	Japanese Yen (JPY)	Korean Won (KRW)	Mexican Peso (MXN)
Parallel	250	200	400	400	100	300	400
Short	300	250	500	500	100	400	500
Long	150	100	~~350~~300	300	100	200	300

	Russian Ruble (RUB)	Saudi Riyal (SAR)	Swedish Krona (SEK)	Singapore Dollar (SGD)	Turkish Lira (TRY)	United States Dollar (USD)	South African Rand (ZAR)
Parallel	400	200	200	150	400	200	400
Short	500	300	300	200	500	300	500
Long	300	150	150	100	300	150	300

[MAS Notice 637 (Amendment) 2022]

4 For currencies not specified in Table 10C-1, a Reporting Bank shall use the following steps to derive their instantaneous interest rate shocks:~~—~~

(a) Step 1: generate a 16-year time series of daily interest rates for the currencies not available in Table 10C-1 from the year 2000 (3 January 2000) to the year 2015 (31 December 2015), or based on such other historical period that is approved by the Authority. The Reporting Bank shall determine the average local percentile of the rate series by calculating the average rate across all daily rates in time buckets 3M, 6M, 1Y, 2Y, 5Y, 7Y, 10Y, 15Y and 20Y;~~.~~

(b) Step 2: apply the baseline global interest rate shock parameters specified in Table 10C-2 to the average long-term rates derived in sub-paragraph (a) to obtain the interest rate shocks by currency for the parallel, short and long segments of the yield curve;~~.~~

Table 10C-2: Baseline global interest rate shock parameters

Parallel	60%
Short	85%
Long	40%

(c) Step 3: apply the following caps and floors to the interest rate shocks derived in sub-paragraph (b) ~~above~~ to obtain the final set of instantaneous interest rate shocks, $\bar{R}_{shocktype,c}$ for each shock type (parallel, short and long) and for each currency c:~~—~~

(i) parallel – floor of 100bps, ~~Cap~~cap of 400bps;

(ii) short – floor of 100bps, ~~Cap~~cap of 500bps; ~~and~~

(iii) long – floor of 100bps, ~~Cap~~cap of 300bps.

[MAS Notice 637 (Amendment) 2022]

5 A Reporting Bank shall maintain relevant documents and proper audit trails for the derivation of instantaneous shock rates for currencies not specified in Table 10C-1 to facilitate reviews by the Authority.

6 Subject to paragraph 7 of this Annex, a Reporting Bank shall calculate the interest rate shocks and apply such shocks to each of the ~~six~~ 6 interest rate shock scenarios referred to in paragraph 2 of this Annex as follows: ~~—~~

(a) parallel shock for currency c, $\Delta R_{parallel,c}(t_k)$, that refers to a constant parallel shock up or down across all time buckets –

$$\Delta R_{parallel,c}(t_k) = \pm \bar{R}_{parallel,c}$$

where –

(i) $\bar{R}_{parallel,c}$ refers to the instantaneous interest rate shock for currency c and the parallel shock type specified in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4~~(c)(i)~~ of this Annex; and

(ii) t_k refers to the midpoint (in time) of the kth bucket;

(b) short rate shock for currency *c*, $\Delta R_{short,c}(t_k)$, that refers to a shock up or down that is greatest at the shortest tenor midpoint –

$$\Delta R_{short,c}(t_k) = \pm \bar{R}_{short,c} \cdot S_{short}(t_k) = \pm \bar{R}_{short,c} \cdot e^{\frac{-t_k}{x}}$$

where –

(i) $\bar{R}_{short,c}$ refers to the instantaneous interest rate shock for currency c and the short shock type computed in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4~~(c)(ii)~~ of this Annex; and

(ii) $S_{short}(t_k)$ refers to the shaping scalar and is defined as $(e^{\frac{-t_k}{x}})$, where x = 4, and e refers to the exponential function. The shaping scalar diminishes towards zero at the tenor of the longest point in the term structure[742,743];

(c) long rate shock for currency *c*[744], $\Delta R_{long,c}(t_k)$, that refers to a shock up or down that is greatest at the longest tenor midpoint –

$$\Delta R_{long,c}(t_k) = \pm \bar{R}_{long,c} \cdot S_{long}(t_k) = \pm \bar{R}_{long,c} \cdot (1 - e^{\frac{-t_k}{x}})$$

742 The value of x in the denominator of the function $e^{\frac{-t_k}{x}}$ controls the rate of decay of the shock.

743 t_k is the midpoint (in time) of the k[th] bucket. There are 19 buckets in the standardised framework, but the analysis may be generalised to any number of buckets.

744 The long rate shock is only used for ~~the~~ computing the steepener and flattener shocks set out in paragraph 6(d) of this Annex.

[MAS Notice 637 (Amendment) 2022]

where –

(i) $\bar{R}_{long,c}$ refers to the instantaneous interest rate shock for currency c and the long shock type computed in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4~~(c)(iii)~~ of this Annex; and

(ii) $S_{long}(t_k)$ is related to the shaping scalar referred to in sub-paragraph (b)(ii) via the following relationship: $S_{long}(t_k) = 1 - S_{short}(t_k)$;

(d) steepener shock, $\Delta R_{steepener,c}(t_k)$, and flattener shock, $\Delta R_{flattener,c}(t_k)$, for currency *c* that involves rotations to the term structure of the interest rates where both the long and short rates are shocked to derive the steepener and flattener interest rate scenarios respectively. ~~The~~ A Reporting Bank shall obtain the shift in interest rates at each tenor midpoint ~~is obtained~~ by applying the following formulas to those shocks[745] –

$$\Delta R_{steepener,c}(t_k) = -0.65 \cdot |\Delta R_{short,c}(t_k)| + 0.9 \cdot |\Delta R_{long,c}(t_k)|$$

$$\Delta R_{flattener,c}(t_k) = +0.8 \cdot |\Delta R_{short,c}(t_k)| - 0.6 \cdot |\Delta R_{long,c}(t_k)|$$

where –

(i) $\Delta R_{short,c}(t_k)$ refers to the short rate shock for currency c computed in sub-paragraph (b); and

(ii) $\Delta R_{long,c}(t_k)$ refers to the long rate shock for currency c computed in sub-paragraph (c).

[MAS Notice 637 (Amendment) 2022]

7 ~~For the avoidance of doubt, where the post-shock interest rates under the six interest rate shock scenarios set out in paragraph 2 of this Annex is negative, a Reporting Bank shall not floor such post-shock interest rates at zero or any negative lower bound.~~A Reporting Bank shall, subsequent to the application of the 6 interest rate shock scenarios set out in paragraph 2 of this Annex, floor all post-shock interest rates (excluding commercial margins and other spread components) at -100bps.

[MAS Notice 637 (Amendment) 2022]

745 [Deleted by MAS Notice 637 (Amendment) 2022]~~In all cases,~~ $\cancel{\Delta R_{short,c}(t_1)}$ ~~and~~ $\cancel{\Delta R_{long,c}(t_1)}$ ~~cannot exceed 500 basis points, and~~ $\cancel{\Delta R_{short,c}(t_k)}$ ~~and~~ $\cancel{\Delta R_{long,c}(t_k)}$ ~~cannot exceed 300 basis points.~~

Insertion of Annex 10D

Annex 10D

GUIDELINES ON IRRBB

[MAS Notice 637 (Amendment) 2022 (Insertion of this Annex)]

Section 1: Selection Process for a Reporting Bank's Internal Interest Rate Shock and Stress Scenarios

1.1 A Reporting Bank should have in place a selection process for its internal interest rate shock and stress scenarios by doing the following:

(a) have in place a stress testing framework for IRRBB which ensures that the opinions of the various experts on IRRBB in the Reporting Bank are taken into account. The identification of relevant shock and stress scenarios for IRRBB, the application of sound modelling approaches and the appropriate use of the stress testing results require the collaboration of different experts (e.g. traders, the treasury department, the finance department, the ALCO, the risk management and risk control departments and the Reporting Bank's economists) within the Reporting Bank;

(b) determine, by currency, a range of potential interest rate movements against which the Reporting Bank will measure its IRRBB exposures, and ensure that risk is measured under a reasonable range of potential interest rate scenarios, including some containing severe stress elements. In developing the scenarios, the Reporting Bank should consider a variety of factors, such as the shape and level of the current term structure of interest rates and the historical and implied volatility of interest rates. In low interest rate environments, the Reporting Bank should also consider negative interest rate scenarios and the possibility of asymmetrical effects of negative interest rates on its assets and liabilities;

(c) consider the nature and sources of its IRRBB exposures, the time it would need to take action to reduce or unwind unfavourable IRRBB exposures, and its capability and willingness to withstand accounting losses in order to reposition its risk profile. The Reporting Bank should select scenarios that provide meaningful estimates of risk and include a range of shocks that is sufficiently wide to allow the Board or its delegates, as the case may be, to understand the risks inherent in the Reporting Bank's products and activities. When developing interest rate shock and stress scenarios for IRRBB, the Reporting Bank should –

(i) have scenarios which are sufficiently wide-ranging to identify parallel and non-parallel gap risk, basis risk and option risk. In many cases, static interest rate shocks may be insufficient to assess IRRBB exposure adequately. The Reporting Bank should ensure that the scenarios are both severe and plausible, in light of the existing level of interest rates and the interest rate cycle;

(ii) give special consideration to instruments or markets where concentrations exist, because those positions may be more difficult to liquidate or offset in a stressful market environment;

(iii) assess the possible interaction of IRRBB with its related risks, as well as other risks (for example, credit risk and liquidity risk);

(iv) assess the effect of adverse changes in the spreads of new assets and liabilities which are replacing those assets and liabilities maturing over the horizon of the forecast on its NII;

(v) where the Reporting Bank has significant option risk, include scenarios that capture the exercise of such options. For example, a Reporting Bank that has products with sold caps or floors should include scenarios that assess how the risk positions would change should those caps or floors move into the money. Given that the market value of options fluctuates with changes in the volatility of interest rates, the Reporting Bank should develop interest rate assumptions to measure its IRRBB exposures to changes in interest rate volatilities; and

(vi) specify the assumptions used in building its interest rate shock and stress scenarios such as the term structure of interest rates that will be incorporated and the basis relationship between yield curves and between rate indices. The Reporting Bank should also estimate how interest rates that are administered or managed (for example, prime rates or retail deposit rates, as opposed to those that are purely market-driven) might change, and should document how these assumptions are derived;

(d) incorporate into forward-looking scenarios –

(i) changes in portfolio composition due to factors under the control of the Reporting Bank (for example, its acquisition and production plans), as well as external factors (for example, changing competitive, legal or tax environments);

(ii) the introduction of new products where only limited historical data are available; and

(iii) new market information and new emerging risks that are not necessarily covered by historical stress episodes;

(e) perform qualitative and quantitative reverse stress tests[746] in order to –

(i) identify interest rate scenarios that could severely threaten the Reporting Bank's capital and earnings; and

(ii) reveal vulnerabilities arising from its hedging strategies and the potential behavioural reactions of its customers.

[746] Refer to "Principles of sound stress testing practices and supervision" issued by the BCBS in October 2018.

Section 2: IRRBB Measurement System and Models

2.1 For the purposes of paragraph 5.34 of Annex 10A, Column (B) of Table 10D-1 sets out dimensions that may influence the exercise of embedded behavioural options, in respect of the products set out in column (A) of Table 10D-1.

Table 10D-1 – Dimensions influencing the exercise of embedded behavioural options

(A) Product	(B) Dimensions influencing the exercise of the embedded behavioural options
Fixed rate loans subject to prepayment risk	Loan size, loan-to-value (LTV) ratio, obligor characteristics, contractual interest rates, seasoning, geographical location, original and remaining maturity, other historical factors, and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices.
Fixed rate loan commitments	Obligor characteristics, geographical location (including competitive environment and local premium conventions), customer relationship with the Reporting Bank as evidenced by cross-products, remaining maturity of the commitment, seasoning and remaining term of the mortgage.
Term deposits subject to early redemption risk	Deposit size, depositor characteristics, funding channel (for example, direct or brokered deposit), contractual interest rates, seasonal factors, geographical location and competitive environment, remaining maturity, other historical factors and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices.
Non-maturity deposits (NMDs)	Responsiveness of product rates to changes in market interest rates, current level of interest rates, spread between the Reporting Bank's offer rate and market rate, competition from other firms, the Reporting Bank's geographical location and demographic and other relevant characteristics of its customer base.

2.2 For the purposes of paragraph 5.36 of Annex 10A, a Reporting Bank should –

(a) for accurate and timely measurement of IRRBB for effective risk management and control, ensure that its risk measurement system is able to identify and quantify the major sources of IRRBB exposure. The Reporting Bank should select the most appropriate form of measurement system by considering the mix of its business lines and the risk characteristics of its activities;

(b) rely on more than one measure of risk, given that risk management systems tend to vary in how they capture the components of IRRBB. The Reporting Bank should use a variety of methodologies to quantify its IRRBB exposures under both the economic value and earnings-based measures, ranging from simple calculations based on static simulations using current holdings to more sophisticated dynamic modelling techniques that reflect potential future business activities;

(c) ensure that its management information system allows it to retrieve accurate IRRBB information in a timely manner and captures interest rate risk data on all its material IRRBB exposures. The Reporting Bank should also ensure that there is sufficient documentation of the major data sources used in the Reporting Bank's risk measurement process;

(d) use data inputs that are automated as much as possible to reduce administrative errors. The Reporting Bank should periodically review and test the data mapping against an approved model version, and should monitor the type of data extracts and set appropriate controls; and

(e) ensure that, where cash flows are slotted into different time buckets (for example, for gap analyses) or assigned to different vertex points to reflect the different tenors of the interest rate curve, the slotting criteria is stable over time to allow for a meaningful comparison of risk figures over different periods.

2.3 For the purposes of paragraph 5.39 of Annex 10A, a Reporting Bank should –

(a) ensure that the validation of IRRBB measurement methods and assessment of corresponding model risk is included in a formal policy process that is reviewed and approved by the Board or its delegates. -The Reporting Bank should specify the management roles and designate the parties responsible for the development, implementation and use of models in the policy. -In addition, the Reporting Bank should specify and integrate, within the governance processes for model risk management, the model oversight responsibilities and policies including the development of initial and ongoing validation procedures, evaluation of results, approval, version control, exception, escalation, modification and decommission processes;

(b) have in place an effective IRRBB validation framework, which should include 3 core elements, namely –

(i) evaluation of conceptual and methodological soundness, including developmental evidence;

(ii) ongoing model monitoring, including process verification and benchmarking; and

(iii) outcomes analysis, including backtesting of key internal parameters (for example, stability of deposits, prepayments, early redemptions, pricing of instruments);

(c) address the expected initial and ongoing model validation activities, establish in the policy set out in sub-paragraph (a) a hierarchical process for determining model risk soundness based on both quantitative and qualitative dimensions such as size, impact, past performance and familiarity with the modelling technique employed;

(d) ensure that model risk management for IRRBB measures follows a holistic approach that begins with motivation, development and implementation by model owners and users. The Reporting Bank should ensure that the process for determining model inputs, assumptions, modelling methodologies and outputs is reviewed and validated independently of the development of IRRBB models, prior to the model receiving authorisation for usage. The Reporting Bank should present the review and validation results and any recommendations on model usage to the Board or its delegates for approval, and upon approval, subject the model to ongoing review, process verification and validation at a frequency that is consistent with the level of model risk determined and approved by the Reporting Bank;

(e) ensure that the ongoing validation process establishes a set of exception trigger events that obligate the model reviewers to notify the Board or its delegates in a timely fashion, in order to determine any corrective actions or restrictions on model usage. The Reporting Bank should designate clear version control authorisations, where appropriate, to model owners. With the passage of time and due to observations and new information gained over time, the Reporting Bank may modify or decommission an approved model. The Reporting Bank should have in place policies for model transition, including change and version control authorisations and documentation;

(f) include in the validation process model inputs or assumptions which may be sourced from IRRBB models developed by third-party vendors, related modelling processes or sub-models (both in-house and vendor-sourced). The Reporting Bank should document and explain model specification choices as part of the validation process;

(g) where the Reporting Bank purchases IRRBB models, ensure adequate documentation of its use of those models, including any specific customisation. If vendors provide input for market data, behavioural assumptions or model settings, the Reporting Bank should have a process in place to determine if those inputs are reasonable for its business and the risk characteristics of its activities; and

(h) ensure that its IA review the model risk management process as part of its annual risk assessment and audit plans, where such audit activity should not duplicate model risk management processes, but should review the integrity and effectiveness of the risk management system and the model risk management process.

2.4 For the purposes of paragraph 5.40 of Annex 10A, a Reporting Bank should –

(a) report risk measures to the Board or its delegates regularly, and compare current exposure with policy limits. In particular, the Reporting Bank should report the results of the periodic model reviews and audits as well as comparisons of past forecasts or risk estimates with actual results to inform the Board or its delegates of potential modelling shortcomings on a regular basis. The Reporting Bank should clearly identify portfolios that may be subject to significant mark-to-market movements within the Reporting Bank's management information system and subject such portfolios to oversight in line with any other portfolios exposed to market risk;

(b) ensure that the reports prepared for the Board or its delegates, as the case may be, include the following:

(i) summaries of the Reporting Bank's aggregate IRRBB exposures, and explanatory text that highlights the assets, liabilities, cash flows, and strategies that are driving the level and direction of IRRBB;

(ii) reports demonstrating the Reporting Bank's compliance with policies and limits;

(iii) key modelling assumptions such as NMD characteristics, prepayments on fixed rate loans and currency aggregation;

(iv) results of stress tests, including assessment of sensitivity to key assumptions and parameters;

(v) summaries of the reviews of IRRBB policies, procedures and adequacy of the measurement systems, including any findings of internal and external auditors, or other equivalent external parties (such as consultants); and

(c) ensure that reports detailing its IRRBB exposures are provided to the Board or its delegates, as the case may be, on a timely basis and reviewed regularly. The Reporting Bank should ensure that such IRRBB reports provide aggregate information as well as sufficient supporting detail to enable the Board or its delegates, as the case may be, to assess the sensitivity of the Reporting Bank to changes in market conditions, with particular reference to portfolios that may potentially be subject to significant mark-to-market movements. The Board or its delegates, as the case may be, should review the Reporting Bank's IRRBB management policies and procedures in light of the reports, to ensure that they remain appropriate and sound. The Board or its delegates, as the case may be, should also ensure that analysis and risk management activities related to IRRBB are conducted by competent staff with technical knowledge and experience, consistent with the nature and scope of the Reporting Bank's activities.

Section 3: Internal Assessment of Capital Adequacy for IRRBB

3.1 For the purposes of evaluating its capital adequacy for IRRBB, a Reporting Bank should take the following into account:

(a) the size and tenor of internal limits on IRRBB exposures, and whether these limits are reached at the point of capital calculation;

(b) the effectiveness and expected cost of hedging open positions that are intended to take advantage of internal expectations of the future level of interest rates;

(c) the sensitivity of the internal measures of IRRBB to key modelling assumptions, including key assumptions on ΔEVE such as the inclusion or exclusion of commercial margins, the Reporting Bank's actual equity allocation profile, the stability of NMDs and prepayment optionality;

(d) the impact of interest rate shock and stress scenarios set out in paragraph 5.24 of Annex 10A on positions priced off different interest rate indices;

(e) the impact on economic value and NII of mismatched positions in different currencies;

(f) the impact of embedded losses;

(g) the distribution of capital relative to risks across different entities in the banking group, in addition to overall Group level capital adequacy;

(h) the drivers of the underlying risk;

(i) the circumstances under which the risk might crystallise.

3.2 A Reporting Bank should –

(a) ensure that the contribution of IRRBB to its overall internal capital assessment is based on the Reporting Bank's IMS outputs, taking account of key assumptions and risk limits. The Reporting Bank should also ensure that the overall level of capital is commensurate with its actual measured level of risk (including for IRRBB) and its risk appetite, and is duly documented in its ICAAP report;

(b) develop its own methodologies for capital allocation, based on its risk appetite. In determining the appropriate level of capital, the Reporting Bank should consider both the amount and the quality of capital needed;

(c) consider its capital adequacy for IRRBB in relation to the risks to economic value, given that such risks are embedded in the Reporting Bank's assets, liabilities and off-balance sheet items. For risks to future earnings, given the possibility that future earnings may be lower than expected, the Reporting Bank should consider capital buffers. The Reporting Bank should consider –

(i) the ΔEVE under a variety of interest rate shock and stress scenarios. Where the Reporting Bank's EVE is significantly sensitive to interest rate shock and stress scenarios, the Reporting Bank should assess the impact on its capital adequacy arising from financial instruments held at market value, and the potential impact in the case where banking book positions held at historical cost become subject to market valuation; and

(ii) the strength and stability of the earnings stream and the level of income needed to generate and maintain normal business operations. Where the Reporting Bank has a high level of IRRBB exposures, that could under a plausible range of market scenarios, result in the Reporting Bank reporting losses or curtailing normal dividend distribution and business operations, the Reporting Bank should ensure that it has sufficient capital to withstand the adverse impact of such events until it can implement mitigating actions such as reducing IRRBB exposures or increasing capital; and

(d) ensure that its evaluation of its capital adequacy for IRRBB as part of its ICAAP flows through to assessments of capital associated with business lines.

Section 4: Further Guidance

4.1 For further guidance, a Reporting Bank should refer to "SRP 98 – Application guidance on interest rate risk in the banking book", issued by the BCBS in December 2019, and any other relevant publications issued by the BCBS and the Authority in this area.

Amendments to Part XI: Public Disclosure Requirements

Division 2: General Requirements

Sub-division 2: Frequency and Timing of Disclosures

Amendments to the following paragraphs in Sub-division 2 of Division 2 of Part XI

11.2.3 A Reporting Bank shall make the disclosures required under –

(a) Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part according to the frequency of disclosure for each disclosure requirement set out in Table 11-1; and

(b) Sub-division 8 of Division 3 of this Part on an annual basis.~~; and~~

(c) [Deleted by MAS Notice 637 (Amendment) 2022]~~Sub-division 9 of Division 3 of this Part at least on an annual basis and where such disclosures are made only on an annual basis, explain why this is appropriate. To enhance market discipline, the Reporting Bank is encouraged to make more frequent quantitative disclosures, e.g. on a semi-annual basis.~~

(d) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment No. 2) 2018]
[MAS Notice 637 (Amendment) 2022]

11.2.3A Notwithstanding paragraph 11.2.3(a), where the Reporting Bank is not designated by the Authority as a D-SIB and –

(a) has not been notified by the Authority that it is an internationally active bank; or

(b) is a subsidiary of a banking institution incorporated outside Singapore,

the Reporting Bank may make the disclosures required under Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part, except for disclosure requirements set out in Table 11-1A, as follows:

(i) where the frequency of disclosure for a disclosure requirement set out in Table 11-1 is on a quarterly basis, the Reporting Bank may make such disclosures on a semi-annual basis; and

(ii) where the frequency of disclosure for a disclosure requirement set out in Table 11-1 is on a semi-annual basis, the Reporting Bank may make such disclosures on an annual basis.

[800] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment) 2019]
[MAS Notice 637 (Amendment) 2021]
[MAS Notice 637 (Amendment) 2022]

11.2.6 A Reporting Bank shall make the disclosures required under Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part with effect from the corresponding implementation date set out in Table 11-1.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

Sub-division 3: Location and Form of Disclosures

Amendments to the following paragraphs in Sub-division 3 of Division 2 of Part XI

11.2.9 A Reporting Bank shall complete the quantitative data required under the tables in Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part in accordance with the definitions provided. A Reporting Bank shall present narrative commentaries to supplement such required quantitative disclosures in a format at the Reporting Bank's discretion and to explain any significant changes between reporting periods and any other issues of interest to market participants.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

Tables with a fixed format in Sub-divisions 2 to 7, 9, 11 and 12 of Division 3 of this Part

[MAS Notice 637 (Amendment) 2022]

11.2.10 Where the format of a table in Sub-divisions 2 to 7, 9, 11 and 12 of Division 3 of this Part is described as fixed, a Reporting Bank shall complete the fields in accordance with the instructions given in the table. Subject to paragraph 11.2.14, a Reporting Bank may delete rows or columns from the table but shall not alter the numbering of subsequent rows and columns. A Reporting Bank may add additional sub-rows and sub-columns to the table to provide additional details to a disclosure requirement. However, the Reporting Bank shall not alter the numbering of prescribed rows and columns in the table.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

Tables with a flexible format in Sub-divisions 2 to 7, 9 to ~~10,~~ 11 and 13 of Division 3 of this Part

[MAS Notice 637 (Amendment) 2022]

11.2.11 Where the format of a table in Sub-divisions 2 to 7, 9 to ~~10,~~ 11 and 13 of Division 3 of this Part is described as flexible, a Reporting Bank may present the required information either in the format provided in the table, or in one that is more suitable for the Reporting Bank. However, where a customised presentation of the information is used, the Reporting Bank shall provide information that is comparable (i.e. at a similar level of granularity) with the disclosure requirements set out in the table.

[MAS Notice 637 (Amendment) 2022]

Disclosure requirements in Sub-division~~s~~ 8~~ and 9~~ of Division 3 of this Part

[MAS Notice 637 (Amendment) 2022]

11.2.12 For the disclosure requirements in Sub-division~~s~~ 8~~ and 9~~ of Division 3 of this Part, a Reporting Bank has the discretion to determine the form of the disclosures required in this Part, and may choose to use either graphical or such other forms or both, that the Reporting Bank deems appropriate to assist users in forming an opinion on the risk profile and capital adequacy of the Reporting Bank.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment No. 2) 2018]
[MAS Notice 637 (Amendment) 2022]

Sub-division 4: Omissions

Amendments to paragraph 11.2.14 in Sub-division 4 of Division 2 of Part XI

11.2.14 In line with the principle set out in paragraph 11.1.2(c), a Reporting Bank may omit part or all of the disclosures in the tables in Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part, if the information required to be disclosed is assessed not to provide meaningful or relevant information to users. In particular, a Reporting Bank shall assess if the information required to be disclosed in Tables 11-13, 11-14, 11-15, 11-16, 11-20, 11-25, 11-26, 11-37, 11-38 and 11-41 would provide meaningful or relevant information to users in accordance with the requirements set out in the scope of application fields in these tables. A Reporting Bank which omits disclosures in the tables in Sub-divisions 2 to 7 and 9~~10~~ to 13 of Division 3 of this Part on the basis that the disclosure of the information is not meaningful or relevant shall state clearly in a narrative commentary why such information is considered not to be meaningful or relevant to users. Where applicable, the Reporting Bank shall describe the portfolios excluded from the disclosures and the aggregate total RWA of those portfolios.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

Division 3: Specific Disclosure Requirements

Sub-division 1: Introduction

Amendments to Sub-division 1 of Division 3 of Part XI

11.3.1 Table 11-1 presents a summary of the disclosure requirements set out in Sub-divisions 2 to 7 and 9~~10~~ to 13 of this Division.

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

11.3.2 Sub-division~~s~~ 8 ~~and 9~~ of this Division sets out the Operational Risk disclosure requirements. ~~in the following areas -~~

~~(a) Operational Risk in Sub-division 8 of this Division; and~~

~~(b) Interest Rate Risk in the Banking Book in Sub-division 9 of this Division.~~

~~(c) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]~~

~~(d) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]~~

~~(e) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]~~

[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2022]

Table 11-1: Summary of disclosure requirements

	Tables	**Fixed format**	**Flexible format**	**Quarterly**	**Semi-annually**	**Annually**	**Implementation date**
Sub-division 2: Overview of key prudential metrics, risk management and RWA	Table 11-1A: Key Metrics	✓		✓			1 January 2018
	Table 11-2: Risk Management Approach		✓			✓	1 January 2017
	Table 11-3: Overview of RWA	✓		✓			1 January 2017
	Table 11-3B: Overview of RWA	✓		✓			31 December 2018
Sub-division 3: Linkages between financial statements and regulatory exposures	Table 11-4: Differences between Accounting and Regulatory Scopes of Consolidation and Mapping of Financial Statement Categories with Regulatory Risk Categories		✓			✓	1 January 2018
	Table 11-5: Main Sources of Differences between Regulatory Exposure Amounts and Carrying Amounts in Financial Statements		✓			✓	1 January 2018
	Table 11-6: Qualitative Disclosure of Differences between Carrying Amounts in Financial Statements and Regulatory Exposure Amounts		✓			✓	1 January 2018
	Table 11-6A: Prudent Valuation Adjustments	✓				✓	31 December 2018
Sub-division 4: Credit Risk	Table 11-7: General Qualitative Disclosures on Credit Risk		✓			✓	1 January 2017
	Table 11-8: Credit Quality of Assets	✓			✓		1 January 2017
	Table 11-9: Changes in Stock of Defaulted Loans and Debt Securities	✓			✓		1 January 2017
	Table 11-10: Additional Disclosures related to the Credit Quality of Assets		✓			✓	1 January 2017
	Table 11-11: Qualitative Disclosures related to CRM Techniques		✓			✓	1 January 2017
	Table 11-12: Overview of CRM Techniques	✓			✓		1 January 2018

	Tables	Fixed format	Flexible format	Quarterly	Semi-annually	Annually	Implementation date
	Table 11-13: Qualitative Disclosures on the use of external credit ratings under the SA(CR)		✓			✓	1 January 2017
	Table 11-14: SA(CR) and SA(EQ) - Credit Risk Exposure and CRM Effects	✓			✓		1 January 2017
	Table 11-15: SA(CR) and SA(EQ) – Exposures by Asset Classes and Risk Weights	✓			✓		1 January 2017
	Table 11-16: Qualitative Disclosures for IRBA Models		✓			✓	1 January 2017
	Table 11-17: IRBA - Credit Risk Exposures by Portfolio and PD Range	✓			✓		1 January 2017
	Table 11-18: IRBA - Effect on RWA of Credit Derivatives used as CRM	✓			✓		1 January 2017
	Table 11-19: IRBA– RWA Flow Statement for Credit Risk Exposures	✓		✓			1 January 2018
	Table 11-20: IRBA – Backtesting of PD per Portfolio		✓			✓	1 January 2017
	Table 11-21: IRBA - Specialised Lending and Equities under the Simple Risk Weight Method		✓		✓		1 January 2017
Sub-division 5: CCR	Table 11-22: Qualitative Disclosures related to CCR		✓			✓	1 January 2017
	Table 11-23: Analysis of CCR Exposure by Approach	✓			✓		1 January 2017
	Table 11-24: CVA Risk Capital Requirements	✓			✓		1 January 2017
	Table 11-25: Standardised Approach - CCR Exposures by Portfolio and Risk Weights	✓			✓		1 January 2017
	Table 11-26: IRBA - CCR Exposures by Portfolio and PD Range	✓			✓		1 January 2017
	Table 11-27: Composition of Collateral for CCR Exposure		✓		✓		1 January 2018
	Table 11-28: Credit Derivative Exposures		✓		✓		1 January 2017

	Tables	Fixed format	Flexible format	Quarterly	Semi-annually	Annually	Implementation date
	Table 11-29: RWA Flow Statements under the CCR Internal Models Method	✓		✓			1 January 2017
	Table 11-30: Exposures to Central Counterparties	✓			✓		1 January 2018
Sub-division 6: Securitisation	Table 11-31: Qualitative Disclosures related to Securitisation Exposures		✓			✓	1 January 2017
	Table 11-32: Securitisation Exposures in the Banking Book		✓		✓		1 January 2017
	Table 11-33: Securitisation Exposures in the Trading Book		✓		✓		1 January 2017
	Table 11-34: Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Originator or as Sponsor	✓			✓		1 January 2017
	Table 11-35: Securitisation Exposures in the Banking book and associated Regulatory Capital Requirements – A Reporting Bank acting as Investor	✓			✓		1 January 2017
Sub-division 7: Market Risk	Table 11-36: Qualitative Disclosures related to Market Risk		✓			✓	1 January 2017
	Table 11-37: Qualitative Disclosures related to IMA		✓			✓	1 January 2017
	Table 11-38: Market Risk under Standardised Approach	✓			✓		1 January 2017
	Table 11-39: RWA Flow Statements of Market Risk Exposures under IMA	✓		✓			1 January 2017
	Table 11-40: IMA Values for Trading Portfolios	✓			✓		1 January 2017
	Table 11-41: Comparison of VaR Estimates with Gains or Losses		✓		✓		1 January 2017

	Tables	Fixed format	Flexible format	Quarterly	Semi-annually	Annually	Implementation date
Sub-division 9: Interest Rate Risk in the Banking Book	Table 11-43: IRRBB Risk Management Objectives and Policies		✓			✓	1 January 2023
	Table 11-43A: Quantitative Information on IRRBB	✓				✓	1 January 2023
Sub-division 10: Remuneration	Table 11-44: Remuneration Policy		✓			✓	31 December 2017
	Table 11-44A: Remuneration Awarded during the Financial Year		✓			✓	31 December 2017
	Table 11-44C: Special Payments		✓			✓	31 December 2017
	Table 11-44E: Deferred Remuneration		✓			✓	31 December 2017
Sub-division 11: Composition of Capital	Table 11B-1: Composition of Regulatory Capital	✓			✓		1 January 2018
	Table 11C-1: Reconciliation of Regulatory Capital to Balance Sheet		✓		✓[800A]		31 December 2017
	Table 11D-1: Main Features of Regulatory Capital Instruments		✓		✓		31 December 2017
Sub-division 12: Leverage Ratio	Table 11F-1: Leverage Ratio Summary Comparison Table	✓		✓[800B]			31 December 2017
	Table 11G-1: Leverage Ratio Common Disclosure Template	✓		✓			31 December 2017
Sub-division 13: Macroprudential Supervisory Measures	Table 11-46: Geographical Distribution of Credit Exposures Used in the Countercyclical Capital Buffer		✓		✓		31 December 2017
	Table 11-47: Disclosure of G-SIB Indicators		✓			✓	31 December 2018

[800A] The frequency of disclosure may, with the prior approval of the Authority, be made with at least the same frequency as the publication of the Reporting Bank's financial statements.

[MAS Notice 637 (Amendment No. 3) 2017]

[800B] The frequency of disclosure may, with the prior approval of the Authority, be made with at least the same frequency as the publication of the Reporting Bank's financial statements.

[MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment No. 2) 2018]
[MAS Notice 637 (Amendment) 2022]

Amendments to Sub-division 9 of Division 3 of Part XI

Sub-division 9: Interest Rate Risk in the Banking Book

11.3.15 A Reporting Bank shall disclose all items set out in Table 11-43 and Table 11-43A[804A].

[MAS Notice 637 (Amendment) 2022]

Table 11-43: ~~Interest rate risk in the banking book~~IRRBB Risk Management Objectives and Policies

[MAS Notice 637 (Amendment) 2022]

~~Qualitative Disclosures~~	~~(a)~~	~~A description of risk management objectives and policies, including:~~ ~~(i) the strategies and processes;~~ ~~(ii) the structure and organisation of the risk management function;~~ ~~(iii) the scope and nature of risk reporting and measurement systems; and~~ ~~(iv) the policies for hedging and mitigating risk, and processes for monitoring the continuing effectiveness of such policies.~~
	~~(b)~~	~~A description of the nature of interest rate risk in the banking book and key assumptions made by the Reporting Bank, including assumptions regarding loan prepayments and behaviour of non-maturity deposits, and frequency with which interest rate risk in the banking book is measured.~~
~~Quantitative Disclosures~~	~~(c)~~	~~The changes in earnings or economic value (or relevant measure used by the Reporting Bank) for upward and downward rate shocks according to the internal method of the Reporting Bank for measuring interest rate risk in the banking book, broken down by currency, where applicable.~~

Purpose	Provide a description of the risk management objectives and policies concerning IRRBB.
Scope of application	This template is mandatory for all Reporting Banks.
Content	Qualitative and quantitative information. Quantitative information is based on the daily or monthly average of the year or on the data as at the reporting date.
Frequency	Annually
Format	Flexible

804A In addition to the required disclosures in Table 11-43 and Table 11-43A, the Reporting Bank may disclose information on internal measures of IRRBB that would assist the market in interpreting the required disclosures in these tables.

[MAS Notice 637 (Amendment) 2022]

[MAS Notice 637 (Amendment) 2022]

Qualitative Disclosures	
(a)	A description of how the Reporting Bank defines IRRBB for the purposes of risk control and measurement.
(b)	A description[804B] of the Reporting Bank's overall IRRBB management and mitigation strategies.
(c)	The frequency of the calculation of the Reporting Bank's IRRBB measures, and a description of the specific measures that the Reporting Bank uses to gauge its sensitivity to IRRBB.
(d)	A description of the interest rate shock and stress scenarios that the Reporting Bank use to estimate changes in the economic value and in earnings.
(e)	Where significant modelling assumptions used in the Reporting Bank's internal measurement systems (IMS) (i.e. the EVE metric generated by the bank for purposes other than disclosure[804C]) are different from the modelling assumptions prescribed for the disclosure in Table 11-43A, the Reporting Bank shall provide a description of those assumptions and their directional implications and explain its rationale for making those assumptions[804D].
(f)	A general description of how the Reporting Bank hedges its IRRBB, as well as the associated accounting treatment.
(g)	A general description of key modelling and parametric assumptions used in calculating ΔEVE and ΔNII in Table 11-43A, which includes – (i) For ΔEVE, whether commercial margins and other spread components have been included in the cash flows used in the computation, and discount rate used; (ii) How the average repricing maturity assigned to non-maturity deposits has been determined (including any unique product characteristics that affect assessment of repricing behaviour by the Reporting Bank); (iii) The methodology used to estimate the prepayment rates of customer loans, and/or the early withdrawal rates for time deposits, and other significant assumptions; (iv) Any other assumptions (including for instruments with behavioural optionalities that have been excluded) that have a material impact on the disclosed ΔEVE and ΔNII in Table 11-43A, including an explanation of why these are material; and (v) Any methods of aggregation across currencies and any significant correlation between interest rates in different currencies.
(h)	(Optional) Any other information which the Reporting Bank wishes to disclose regarding its interpretation of the significance and sensitivity of the IRRBB measures disclosed and/or an explanation of any significant variations in the level of the reported IRRBB since the previous reporting period.
Quantitative Disclosures	

[804B] For example, monitoring of EVE and NII in relation to established limits, hedging practices, conduct of stress testing, outcome analysis, the role of independent audit, the role and practices of the asset and liability management committee, the Reporting Bank's practices to ensure appropriate model validation, and timely updates in response to changing market conditions.
[MAS Notice 637 (Amendment) 2022]

[804C] For example, for internal assessment of capital adequacy.
[MAS Notice 637 (Amendment) 2022]

[804D] For example, historical data, published research, management judgment and analysis.
[MAS Notice 637 (Amendment) 2022]

(i)	Average repricing maturity assigned to non-maturity deposits (NMDs).
(j)	Longest repricing maturity assigned to NMDs.

[MAS Notice 637 (Amendment) 2022]

Table 11-43A: Quantitative Information on IRRBB

[MAS Notice 637 (Amendment) 2022]

Purpose	Provide information on a Reporting Bank's changes in EVE and NII under each of the 6 standardised interest rate shock scenarios set out in Annex 10C.
Scope of application	This template is mandatory for all Reporting Banks.
Content	Quantitative information
Frequency	Annually
Format	Fixed
Accompanying narrative	Commentary on the significance of the reported values and an explanation of any material changes since the previous reporting period.

[MAS Notice 637 (Amendment) 2022]

Changes in EVE and NII under standardised interest rate shock scenarios				
	ΔEVE		**ΔNII**	
Period	**T**	**T-1**	**T**	**T-1**
Parallel up				
Parallel down				
Steepener				
Flattener				
Short rate up				
Short rate down				
Maximum				
Tier 1 capital				
Period	**T**		**T-1**	
Tier 1 capital				

[MAS Notice 637 (Amendment) 2022]

Table 11-43B: Explanatory Notes to Quantitative Information on IRRBB

[MAS Notice 637 (Amendment) 2022]

Instructions	
(a)	For each of the 6 standardised interest rate shock scenarios set out in Annex 10C, the Reporting Bank shall report in the reporting currency for the current period (T) and for the previous period (T-1) – (i) ΔEVE under the interest rate shock scenario, calculated based on its IMS and in accordance with paragraphs 5.49 to 5.49B of Annex 10A; and

	(ii) ΔNII under the interest rate shock scenario, calculated in accordance with paragraphs 5.49C and 5.49D of Annex 10A.

[MAS Notice 637 (Amendment) 2022]

Amendments to Part XII: Reporting Schedules

Replacement of Schedule 5G in its entirety

MAS NOTICE 637: OTHER REPORTING SCHEDULES **ANNEX 12E**
SCHEDULE 5G
INTEREST RATE RISK IN THE BANKING BOOK

Name of the Reporting Bank:

Statement as at:

Scope of Reporting: Solo/Group

(In S$ million)

1. Adoption of the SA(IR) for the purposes of computing Delta EVE

(i)	Is the Reporting Bank adopting the SA(IR) for the purposes of computing Delta EVE?	
(ii)	If the Reporting Bank adopts the SA(IR) in part for the purposes of computing Delta EVE, please indicate the paragraphs of Annex 10B of MAS Notice 637 that the Reporting Bank adopts	

2. Computation of IRRBB

(a) Delta EVE calculated in accordance with paragraphs 5.49 to 5.49B of Annex 10A under the 6 interest rate shock scenarios set out in paragraphs 2(a) to 2(f) of Annex 10C
(EVE under current interest rates - EVE under interest rate shock scenario)

	Material Currencies (Currencies that account for more than 5% of banking book assets or liabilities)	Interest rate shock scenario						(vii) Maximum of the aggregated Delta EVE across the 6 interest rate shock scenarios
		(i) Parallel up	(ii) Parallel down	(iii) Steepener	(iv) Flattener	(v) Short rate up	(vi) Short rate down	
	SGD							
(A)	**Aggregated Delta EVE based on the Reporting Bank's methodology for aggregating Delta EVE across material currencies**							-
(B)	**Aggregated Delta EVE by taking the sum of all positive Delta EVE across material currencies**	-	-	-	-	-	-	-

(b) Delta NII calculated in accordance with paragraphs 5.49C and 5.49D of Annex 10A under the 2 interest rate shock scenarios set out in paragraphs 2(a) and 2(b) of Annex 10C
(NII under current interest rates - NII under interest rate shock scenario)

	Material Currencies (Currencies that account for more than 5% of banking book assets or liabilities)	Interest rate shock scenario		(iii) Maximum of the aggregated Delta NII across the 2 interest rate shock scenarios
		(i) Parallel up	(ii) Parallel down	
	SGD			
(A)	**Aggregated Delta NII based on the Reporting Bank's methodology for aggregating Delta NII across material currencies**			-
(B)	**Aggregated Delta NII by taking the sum of all positive Delta NII across material currencies**	-	-	-

3. Additional information on IRRBB
(a) Outlier Test in accordance with paragraph 5.48 of Annex 10A

(i)	15% of Tier 1 Capital	
(ii)	**Identified as an outlier Reporting Bank?**	

(b) Repricing maturity assigned to non-maturity deposits (NMDs) in accordance with paragraph 5.29(a)(iv) of Annex 10A, and Section 3 and Table 10B-2 of Annex 10B

(i)	Average repricing maturity assigned to NMDs (number of days)	
(ii)	Longest repricing maturity assigned to NMDs (number of days)	

[For Reporting Banks using own IMS in whole or in part for the purposes of computing Delta EVE in accordance with paragraph 5.19(a), 5.19(c) or 5.20 of Annex 10A only]
(c) Assumptions on the correlations of different currencies used, if any, when aggregating Delta EVE and Delta NII across material currencies, in accordance with paragraph 5.29(b) of Annex 10A

(i)	Please provide a description of the methodology and assumptions on the correlations of different currencies used to aggregate Delta EVE and Delta NII across material currencies for Panels 2(a) and 2(b) respectively (under rows 42 and 68)	