

# Basel Committee on Banking Supervision

MAR

Calculation of RWA for  
market risk

MAR23

Standardised approach:  
residual risk add-on

**Version effective as of  
01 Jan 2023**

First version in the format of the consolidated  
framework, updated to take account of the  
revised implementation date announced on 27  
March 2020.



BANK FOR INTERNATIONAL SETTLEMENTS



## Introduction

**23.1** The residual risk add-on (RRAO) is to be calculated for all instruments bearing residual risk separately in addition to other components of the capital requirement under the standardised approach.

## Instruments subject to the residual risk add-on

**23.2** Instruments with an exotic underlying and instruments bearing other residual risks are subject to the RRAO.

**23.3** Instruments with an exotic underlying are trading book instruments with an underlying exposure that is not within the scope of delta, vega or curvature risk treatment in any risk class under the sensitivities-based method or default risk capital (DRC) requirements in the standardised approach.<sup>1</sup>

### Footnotes

<sup>1</sup> *Examples of exotic underlying exposures include: longevity risk, weather, natural disasters, future realised volatility (as an underlying exposure for a swap).*

### FAQ

**FAQ1** *Is future realised volatility considered an "exotic underlying" for the purpose of the RRAO?*

*Yes, future realised volatility is considered an exotic underlying for the purpose of the RRAO.*

**23.4** Instruments bearing other residual risks are those that meet criteria (1) and (2) below:

- (1) Instruments subject to vega or curvature risk capital requirements in the trading book and with pay-offs that cannot be written or perfectly replicated as a finite linear combination of vanilla options with a single underlying equity price, commodity price, exchange rate, bond price, credit default swap price or interest rate swap; or
- (2) Instruments which fall under the definition of the correlation trading portfolio (CTP) in [MAR20.5](#), except for those instruments that are recognised in the market risk framework as eligible hedges of risks within the CTP.

## FAQ

**FAQ1** *Are bonds with multiple call dates considered instruments bearing other residual risks for the purpose of the RRAO?*

*Yes. Bonds with multiple call dates would be considered as instruments bearing other residual risks, as they are path-dependent options.*

**23.5** A non-exhaustive list of other residual risks types and instruments that may fall within the criteria set out in [MAR23.4](#) include:

- (1) Gap risk: risk of a significant change in vega parameters in options due to small movements in the underlying, which results in hedge slippage. Relevant instruments subject to gap risk include all path dependent options, such as barrier options, and Asian options as well as all digital options.
- (2) Correlation risk: risk of a change in a correlation parameter necessary for determining the value of an instrument with multiple underlyings. Relevant instruments subject to correlation risk include all basket options, best-of-options, spread options, basis options, Bermudan options and quanto options.
- (3) Behavioural risk: risk of a change in exercise/prepayment outcomes such as those that arise in fixed rate mortgage products where retail clients may make decisions motivated by factors other than pure financial gain (such as demographical features and/or and other social factors). A callable bond may only be seen as possibly having behavioural risk if the right to call lies with a retail client.

**23.6** When an instrument is subject to one or more of the following risk types, this by itself will not cause the instrument to be subject to the RRAO:

- (1) Risk from a cheapest-to-deliver option;
- (2) Smile risk: the risk of a change in an implied volatility parameter necessary for determining the value of an instrument with optionality relative to the implied volatility of other instruments optionality with the same underlying and maturity, but different moneyness;
- (3) Correlation risk arising from multi-underlying European or American plain vanilla options, and from any options that can be written as a linear combination of such options. This exemption applies in particular to the relevant index options;

- (4) Dividend risk arising from a derivative instrument whose underlying does not consist solely of dividend payments; and
- (5) Index instruments and multi-underlying options of which treatment for delta, vega or curvature risk are set out in [MAR21.31](#) and [MAR21.32](#). These are subject to the RRAO if they fall within the definitions set out in this chapter. For funds that are subject to the treatment specified in [MAR21.36\(3\)](#) (ie treated as an unrated "other sector" equity), banks shall assume the fund is exposed to exotic underlying exposures, and to other residual risks, to the maximum possible extent allowed under the fund's mandate.

**23.7** In cases where a transaction exactly matches with a third-party transaction (ie a back-to-back transaction), the instruments used in both transactions must be excluded from the RRAO capital requirement. Any instrument that is listed and/or eligible for central clearing must be excluded from the RRAO for other residual risks as defined in [MAR23.4](#). Any instrument that is listed and/or eligible for central clearing with an exotic underlying must be included in the RRAO.

*FAQ*

*FAQ1 Can hedges (for example, dividend swaps hedging dividend risks) be excluded from the RRAO?*

*Hedges may be excluded from the RRAO only if the hedge exactly matches the trade (ie via a back-to-back transaction) as per [MAR23.7](#). For the example cited, dividend swaps should remain within the RRAO.*

*FAQ2 Can total return swap (TRS) products be netted with the underlying product(s) that drive the value of the TRS for the purposes of the RRAO?*

*As per [MAR23.7](#), a TRS on an underlying product may be excluded from the RRAO capital requirement if there is an equal and opposite exposure in the same TRS. If no exactly matching transaction exists, the entire notional of the TRS would be allocated to the RRAO.*

## **Calculation of the residual risk add-on**

**23.8** The residual risk add-on must be calculated in addition to any other capital requirements within the standardised approach. The residual risk add-on is to be calculated as follows.

- (1) The scope of instruments that are subject to the RRAO must not have an impact in terms of increasing or decreasing the scope of risk factors subject to the delta, vega, curvature or DRC treatments in the standardised approach.
- (2) The RRAO is the simple sum of gross notional amounts of the instruments bearing residual risks, multiplied by a risk weight.
  - (a) The risk weight for instruments with an exotic underlying specified in [MAR23.3](#) is 1.0%.
  - (b) The risk weight for instruments bearing other residual risks specified in [MAR23.4](#) is 0.1%.<sup>2</sup>

*Footnotes*

<sup>2</sup> *Where the bank cannot satisfy the supervisor that the RRAO provides a sufficiently prudent capital charge, the supervisor will address any potentially under-capitalised risks by imposing a conservative additional capital charge under Pillar 2.*