

Rate Shock Recalibration - Basel Committee – December 2023

Suggestions

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Steps followed in the new approach:

1. Computation of daily rates, between January 2000 and December 2022, for nine specified tenors.
2. Calculation of absolute rate shocks for a rolling 6-m horizon.
3. Measurement of average rate shocks, across various tenors, for determination of parallel, short and long rate scenarios.
4. Choice of 99.9% worst shock for each type of scenario (i.e. parallel, short and long) as $P_{99.9\%}|R_{i,c}|$. The modulus sign ensures that the final rate shock is non-negative.
5. Appropriate caps and floors, for necessary conservatism, with flexibility to national regulators for fixation of higher caps.

Scope of improvement

1. The absolute rate shocks are calculated, for each tenor, over a rolling window of 125 days (6 months). The rate changes should be annualized, since the capital computation horizon is annual. In other words, the absolute rate changes should be computed over a moving window of 250 days (1 year), for each tenor.
2. In estimating the shocks for various scenarios, the historical time series of rate changes for 3m, 6m and 1Y time buckets have been considered for short rate and the 10Y, 15Y and 20Y time buckets have been considered for long rate. The historical rate changes in the intermediate (medium-rate?) time buckets of 2Y, 5Y and 7Y have been omitted. There are two issues here. First, the definition of long and short rate tenors for calibration diverges from the classification of the 19 time buckets for capturing the notional repricing cash flows– in which short term rates related buckets are up to 2 Years and the long term rates related buckets are from 7 year onwards. Secondly, rate changes in these intermediate buckets (2Y, 5Y and 7Y) may be material in determining the EVE impact. Hence, the shocks in medium-term buckets should be incorporated, for more accurate coverage.
3. The distribution of interest rate shocks may not be symmetric. However, in the recalibration exercise, by considering the 99.9th percentile modulus value of rate changes, the size of the rate shocks in the up and down scenarios have been kept the same. The approach may consider the 99.9th percentile and 0.1st percentile rate changes to create separate shocks for the respective up and down scenarios.
4. The recent episode of bank failures, after the co-ordinated spike in policy rates across the world, warrants more conservative rate shock scenarios than the ones proposed by the Basel Committee. These scenarios can be designed as follows.

a. At the outset, the 99.9% worst shocks should be computed, for each tenor. Then, such large shocks should be averaged, to determine parallel, short and long rate changes. When the shocks are averaged first, as proposed by the Committee, diversification benefits are captured. On a given day, shocks in some tenors may be large and positive, others close to zero and a few large and negative. In short, large rate hikes may not always occur together across all tenors. In contrast, when rate shocks are sorted and the 99.9% worst hikes are calculated for each tenor, to begin with, diversification benefits are ruled out by design. This is known as correlation breakdown – simultaneous occurrence of large shocks across tenors or asset markets – and is a salient EWS of most financial crises.

b. Most of the rate shocks (i.e. between January 2000 and end-2022) belong to a falling rate regime. Therefore, the entire database (almost 6000 observations) may be bifurcated into two non-overlapping sets – normal and stressed. The normal set may consist of 4000 observations and the stressed one 2000 largest shocks (approx.). The shocks need not belong to a continuous period, for either set. This approach is similar to the Peaks-over-Threshold (POT) method in Extreme Value Theory. Step (a) may then be applied to each set. In order to allow some diversification benefits, under normal conditions, Step (a) may be used only for the stressed phase, as well. Calibration for the normal phase may follow the BIS approach. This decomposition will enable banks to compute normal and stressed capital charges for IRRBB, under Pillar II of the Basel Accords.