FBIL – MIBOR-OIS Curve[1]

Methodology Document – Version II

The FBIL MIBOR-OIS Curve will be constructed on the basis of trades executed in the market. All MIBOR-OIS transactions reported to CCIL upto 5 pm are used for computation of MIBOR-OIS Curve. The Curve will be constructed for 1, 2, 3, 6, 9, 12, 24, 36, 48 and 60 months Tenors.

The OIS Curve will be constructed using the following methodology:

1. The rates will be based on traded data for each Tenor. The minimum threshold criteria for each tenor will be three surviving trades aggregating ₹75crore in value after removing the outliers calculated using the criteria of +/-3SD. All trades reported and matched at CCIL upto 5 PM will be considered.

2. The rate for each Tenor will be calculated as the volume weighted average rate of the surviving trades.

3. Rates will be constructed for 1 Month, 2 Month, 3 Month, 6 Month, 9 Month, 1 Year, 2 Year, 3 Year, 4 Year and 5 Year Tenors.

4. Benchmark computation will comprise of two parts – shorter tenors comprising of 1 Month, 2 Month, 3 Month and longer tenors comprising of 6 Month, 9 Month, 1 Year, 2 Year, 3 Year, 4 Year and 5 Year Tenors. Computation for longer tenors will be done first given their relative liquidity.

5. Market trades on money market rate basis upto 1 year and trades on semi-annual basis for Tenors more than 1 Year. For consistency of the continuous curve construction, all semi-annual rates will be converted into annualized basis using the formula:

$$Annualized\ Rate = ((1 + \frac{Semi-Annual\ Rate\%}{2})^2 - 1)$$

6. After converting all the traded rates into standardized annualized rates, rates for all missing Tenors (where threshold criteria of 3 surviving trades aggregating ₹ 75 crore in value is not met) are computed as the previous day's OIS rate of the Tenor plus the average spread over the previous day of the two adjacent Tenors or the nearby Tenor spread as the case may be if minimum 2 traded points are available between 6 Month

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[1] The document has been prepared by Dr. Golaka C Nath for FBIL.

and 5 Year. The spread is based on the standardized rates as mentioned above (Annexure 1). The dataset used herein are the trades from 6 months to 5-year maturity only.

7. Final rates will be disseminated as per the respective market convention for the various Tenors. 2Y, 3Y, 4Y and 5Y will be shown as Semi-annual Rate after reconverting them from annualized rates to semi-annual rates.

8. If only one traded point is available, then the previous day's OIS rates are repeated for rest of the Tenors keeping only the traded point.

9. If no OIS rates for any Tenor can be calculated on a day due to lack of traded points, then the previous day's OIS rates are repeated.

10. For the purpose of benchmark computation for the shorter tenors (1M, 2M and 3M), the threshold criteria of 3 surviving trades aggregating ₹75 crore in value will be adhered to as above, and the rate for each Tenor will be calculated as the volume weighted average rate of the surviving trades.

11. In case traded points are not available, rates will be computed as the previous day's OIS rate of the Tenor plus the average spread over the previous day of the two adjacent Tenors or the nearby Tenor spread as the case may be. The dataset used for this will be trades from 1 Month to 6 Month maturity. (Annexure 2)

12. All Rates will be calculated by rounding off upto 4 decimals. The display will be upto 2 decimals.

13. The display format is given in Annexure 3.

14. A brief summary of revision is also available at Annexure 4.

The Benchmark FBIL MIBOR-OIS curve for the day will be published by 5.45 PM on all business days excluding Saturday, Sunday and Mumbai Holidays.

Reference: OIS Curve – A concept on Methodology by Dr. Golaka C Nath

Annexure 1: Calculation Process for the Missing Values Using Spread of Adjacent/Nearby Tenor(S)

		A	B	C	D	E	F	G	H	I
			Computation of Missing Rates using Previous day's OIS Rate and Spread for July 18, 2017							

	A	B	C	D	E	F	G	H	I
1	Date	Tenor	6M	9M	1Y	2Y	3Y	4Y	5Y
2			6	9	12	24	36	48	60
3	17-Jul-17	Disseminated Rates	6.1763	6.1915	6.2066	6.1721	6.1375	6.189	6.2467
4		Standardized Rates	6.1763	6.1915	6.2066	=ROUND(((((1+F3%/2)^2)-1)*100),4)	=ROUND(((((1+G3%/2)^2)-1)*100),4)	=ROUND(((((1+H3%/2)^2)-1)*100),4)	=ROUND(((((1+I3%/2)^2)-1)*100),4)
5	17-Jul-17					6.0797	6.0461	6.0961	6.1521
6	18-Jul-17	Traded	BLANK	BLANK	6.2125	BLANK	BLANK	BLANK	6.2517
7	18-Jul-17	Standardized to Annual	-	-	6.2125	-	-	-	=(((1+I6%/2)^2)-1)*100
8									6.3494
9	18-Jul-17	Traded/Computed Rate	=C4+(E9-E4)	=(D4+((C10-C4)+(E9-E4))/2	6.2125	=(F5)+((E9-E4)+(I9-I5))/2	=(G5)+((F10-F5)+(I9-I5))/2	=(H5)+((G10-G5)+(I9-I5))/2	6.2517
10			6.1822	6.1974		6.1813	6.1956	6.2695	
11	18-Jul-17	Final Rates	6.1822	6.1974	6.2125	=ROUND(((1+F10%)^(1/2)-1)*2*100),4)	=ROUND(((1+G10%)^(1/2)-1)*2*100),4)	=ROUND(((1+H10%)^(1/2)-1)*2*100),4)	6.2517
12						6.0886	6.1025	6.1742	

Annexure 2: Calculation Process for the Missing Values Using Adjacent/Nearby Tenor(S) for Shorter Tenors

	A	B	C	D	E	F
	Computation of Missing Rates using Previous day's OIS Rate and Spread for March 27, 2018					
1	Date	Tenor	**1M**	**2M**	**3M**	**6M**
2			1	2	3	6
3	26-Mar-18	Disseminated Rates	6.5206	6.3200	6.2550	6.2776
4	26-Mar-18	Standardised Rates	NA	NA	NA	NA
5	27-Mar-18	Traded	BLANK	6.2956	BLANK	6.2532
6	27-Mar-18	Standardised to Annual	NA	NA	NA	NA
7	27-Mar-18	Traded/Computed Rate	=ROUND(C3+(D7-D3),4)	6.2956	=ROUND(((E3)+((D7-D3)+(F7-F3))/2),4)	6.2532
8			6.4962		6.2306	
9	27-Mar-18	Final Rates	6.4962	6.2956	6.2306	6.2532
10						

Annexure 3: Display Format for FBIL MIBOR – OIS (All rates in %)

Date	Time	1M	2M	3M	6M	9M	1Y	2Y	3Y	4Y	5Y	Comments
26-03-18	17:45	6.52	6.32	6.26	6.28	6.39	6.49	6.52	6.65	6.77	6.86	
27-03-18	17:45	6.50	6.30	6.23	6.25	6.34	6.46	6.46	6.57	6.67	6.74	

Annexure 4: Revision to Methodology

Sl. No.	Existing provision	Revised provision
1	Currently, the benchmark is being published for 7 tenors starting from 6 months upto and including 5 years. The rates for tenors of 1, 2 and 3 months are not published.	Under the revised methodology, the rates for shorter tenors, viz. 1 month, 2 months and 3 months shall be calculated and published based on the traded data. If sufficient traded data is not available for any tenor, rate for a tenor will be computed as the previous day's OIS rate for the tenor plus the average spread over the previous day of the two adjacent tenors or the nearby tenors as the case may be.
2.	Currently all the missing tenors are interpolated/ extrapolated based on the adjacent tenors or nearby tenors as the case may be , if three traded tenors are available between 6 months and 5 years (Annexure 1 to the existing methodology).	If traded data is not available for any tenor (6 months to 5 years' tenors), rate will be computed as the previous day's OIS rate for the tenor plus the average spread over the previous day of the two adjacent tenors or the nearby tenors as the case may be if minimum two traded points are available between 6 months and 5 years.