The Clearing Corporation of India Ltd.

Consultation Paper

Proposal to Introduce Stress Loss Margin (SLM)

1. Introduction

1.1. CCIL offers CCP clearing services in government securities (outright and market repo), triparty repo, Forex (spot and forward) and Rupee Derivatives. In these segments, in the event of a member default, any loss in excess of defaulter's margins is covered using CCIL's contributions (termed as, "Skin in the Game" or SIG) from its Settlement Reserve Fund and member contributed Default Fund, as per the Default Waterfall notified for the segment.

1.2. The purpose of Default Fund is to mitigate tail risk in an efficient manner. This is because, the Default Fund is a mutualised pool of resource, which can be used to mitigate losses on account of any member default under stressed market conditions thereby enabling CCIL to keep margin requirements at reasonable levels.

1.3. The Clearing Corporation sizes its default funds at the end of each month based on the daily largest Cover 1(for cash segments [1]) /Cover 2 (for derivative segments [2]) stress loss in the last six months plus stress losses on account of 5 weak entities. Any reduction in the default fund quantum during month end re-computation is floored at 85% of the prevailing level. Default Fund is revised on an intra-month basis, if Cover 1/Cover2 stress loss as per the daily stress test exceeds highest Cover 1/Cover2 loss in the preceding six months. It is observed that Cover 1/Cover 2 Stress Losses vary a lot over a look back period of six months. Therefore, the Default Fund and SIG requirements continue at elevated levels even when the stress losses come down.

[1] Trades in Outright, Market repo, Triparty repo and Forex settlement constitute "cash segment".

[2] Trades in Forex Forward and Rupee Derivatives (MIBOR OIS and MMFOR) constitute "derivative segment".

1.4. Furthermore, large default losses could be on account of concentrated portfolios. Therefore, to mitigate the risks emanating from concentrated portfolios, CCIL collects Concentration Margin from the members that are in breach of certain thresholds based on Initial Margin (IM) or Gross Position. However, Concentration Margin provides a relatively small cushion only and a large portion of stress losses are still mutualised. The loss mutualisation requirement is significantly high in case of Forex Forwards segment where the Default Fund quantum has been above Rs. 4,000 Crores and CCIL's Skin in the Game (SIG) has been above Rs. 1,000 Crores for a considerable period during the year 2022.

1.5. Incidentally, capital charges for banks are higher on default fund requirements as against margin requirements. Further contributions to default fund get locked for a minimum period of six months while margins get released on settlement of trade positions.

1.6. Default fund is based on stress losses after setting off margins. Hence, if margin requirements of members with large stress losses are increased, by levying stress loss based margins (in addition to the margins already being levied), their stress losses are likely to be contained to reasonable levels. This will help in limiting the increase in required contributions towards Default Fund for all other members of the segment.

1.7. Owing to the benefits highlighted above, many global CCPs are now collecting additional margins from market participants with high stress losses by stepping up their initial margin requirements or by collecting margins separately in the form of Stress Loss Margin or Default fund Additional Margin (DFAM). Practices of some international CCPs are summarised in the table below. Some more details pertaining to these practices along with references are presented in Annexure 1.

CCP	Threshold for collecting additional margin	Additional margin collected from a member if threshold is breached
LCH LTD	Internal Credit Score (ICS) based percentage (ranging 0-45%) of maximum Cover 2 Stress Loss in last 60 days	Monthly DFAM- Difference of [max. of member's last 60 days stress loss and the threshold]. Daily DFAM- Difference of daily stress loss of member over the threshold, minus monthly DFAM, if any.
EUREX CLEARING	45% of average Cover 2 Stress Loss of last 3 months	On a daily basis, the excess stress loss of a member over threshold is collected as additional margin.
HKCC	50% of maximum Default Fund in last 10 years	On a daily basis, the excess stress loss of a member over threshold is collected as additional margin.
CME	Breach in cover 2	Decided by risk committee

Table: 1 CCP approaches for collecting Stress Loss based margins

1.8. Based on the above discussion, CCIL proposes to levy additional margins in the form of "Stress Loss Margins". The details of the proposal are discussed in the next section. The proposed methodology was back-tested using stress loss and margins data for a period of 21 months from Aug 2021 to Apr 2023, in order to assess the impact on members' margin requirements, default fund requirements and consequent improvements (i.e. reduction) in loss mutualisation requirements.

2. Proposal

2.1. **Proposed methodology**

SLM shall be levied on a member, if its stress loss exceeds a certain threshold level. This **threshold** is defined as some percentage of the **average Cover 1/Cover 2 stress losses** (without setting off stress loss margins), as applicable for the segment, over a **look-back period of six months**. On a given day, SLM to be imposed on a member shall be determined by calculating "Computed SLM" and "Applicable SLM". "Computed SLM" shall be the difference between the highest stress loss of the member (across all stress scenarios) for the day and the threshold level. "Applicable SLM" or SLM to be levied on a member shall be equal

to the highest such requirement (Computed SLM) as computed for a certain number of days termed as **retention period**. The retention period determines the number of days for which the Computed SLM shall be levied and withheld, unless revised upwards on account of subsequent increase in the highest stress loss of the member.

Threshold, th, applicable for a segment for the month can be given by,

$$th = \ Average\ of\ [Cover\ Stress\ Loss\ without\ SLM]_{6M}$$

For a member (m), "**Computed SLM**" on a day (i) can be given by,

$$SLM_{computed,m,i} = Max\left[SL_{m,i} - th, 0\right]$$

$$where, SL_{m,i} = Max\ SL\ for\ the\ member\ m\ across\ all\ stress\ scenarios\ on\ day\ i$$

"**Applicable SLM**" on member (m) on i[th] day is given by,

$$SLM_{applicable,m,i} = Max\begin{bmatrix} SLM_{computed,m,i}, \\ SLM_{computed,m,i-1}, \\ \dots, \\ SLM_{computed,m,i-rp+1} \end{bmatrix}$$

$$where, rp = retention\ period(days)$$

2.2. **Levying of SLM**

The objective of levying SLM is to reduce loss mutualisation by limiting the Default Fund requirements. In the proposed approach, SLM will be levied on those members who have stress losses exceeding some percentage of average Cover 1/ Cover 2 stress loss and will therefore, pull the Default Fund requirements closer to the average of Cover 1/Cover 2 stress loss over the preceding six months. We propose that SLM be collected on the basis of the stress test results for the previous day and therefore an incremental SLM called on any given day cannot be considered as an available resource for bringing down the stress loss of that day against which it is collected. However, it is observed, that the stress losses are driven by the size of a member's portfolio. In case of derivative segments, large portfolios that result into large stress losses are built over a period of several days. Therefore, SLM in such cases is likely to be accumulated gradually over a period of time and therefore a steep increase in stress losses resulting in increased Default Fund requirement can generally be averted.

In contrast, in case of cash segments, the members' positions tend to change significantly on a day-to-day basis. Therefore, collecting SLM on the basis of the stress test results for the previous day will not always provide the certainty of reduction in stress losses and Default Fund requirements. This is also evident from the back testing analysis carried out and discussed in 2.3.11.

2.3. **Choice of SLM parameters**

To arrive at appropriate parameters of SLM model (threshold level, retention period), it is useful to understand the impact of these parameters on margin levels, default fund requirements etc. An analysis has been carried out and detailed results are in Annexure 2.

Analyses for derivatives segments

2.3.1. In case of derivatives segments (wherein the resources are maintained as per Cover 2 Standards), for the analysis, we have considered four different **threshold levels, viz. 45%, 50%, 55%** and **60%** of the average Cover 2 Stress Loss over a **six months look-back period**. Further, we have considered **retention periods of 1 day, 2 days and 3 days** for each selected threshold.

2.3.2. The impact on **top 10** Cover 2 stress losses for each combination of threshold and retention period is shown in Tables [1.1 to 1.3]. As expected (and discussed in para 2.2 above), in derivatives segments, all 10 stress loss numbers show improvement (i.e. lowering of stress loss and hence, default fund requirements) as the threshold levels are brought lower and the corresponding retention periods are increased.

2.3.3. The resultant impact on Default Fund levels with different threshold levels with one-day retention period are shown in Charts [1.1 to 1.3]. As expected, with the threshold level of **45%,** it can be seen that a considerable reduction in Default Fund level can be achieved (a highest reduction of around Rs. 881 Crores [24%] in Forex Forwards segment, Rs. 569 Crores [46%] in Rupee Derivatives (MIBOR) segment and Rs. 160 Crores [46%] in Rupee Derivatives (MIFOR) segment, as compared to the requirements prevailing at the time). In contrast, with the threshold level of **60%**, the highest reduction in Default Fund level for Forex Forwards segment is around Rs. 668

Crores [18%]), and in Rupee Derivatives segments, around Rs. 480 Crores [39%] and Rs. 136 Crores [39%] in MIBOR and MIFOR Default Funds respectively). The results for threshold levels of 50% and 55% are observed to be lying between the results for 45% and 60% levels.

2.3.4. Further, the impact of varying retention periods is shown in the Charts [2.1 to 2.3], where the Default Fund levels with the threshold of 45% and retention periods as 1 day, 2 days and 3 days are plotted. It can be seen that the Default Fund levels can be further lowered by retaining the Stress Loss Margins for a longer period.

2.3.5. The highest Default Fund levels for the period Aug 2021 to Apr 2023 for different combinations of threshold levels and retention period are shown in various charts [3.1 to 3.3].

2.3.6. The SLM requirements from impacted members in terms of number of days, average requirements and highest requirement during the assessment period for the two boundary combinations of threshold and retention period (viz. (i.) threshold of 45% with retention period of 3 days and (ii.) threshold of 60% with retention period of 1 day) are tabulated in Tables [2.1 to 2.3]. The results for other combinations of threshold and retention period fall within these two boundary cases.

2.3.7. The range of average increase in margin requirements and the highest increase, as a percentage of IM (inclusive of volatility and concentration margins), for the impacted members (one to two members per day per segment) as observed during the assessment for the above mentioned boundary cases are tabulated below:

Segment	**Threshold 45% and RP = 3 days**		**Threshold 60% and RP = 1 day**	
	Average range	**Highest**	**Average range**	**Highest**
Forex Forwards	4% - 28%	51%	0 – 5%	33%
Rupee Derivatives (MIBOR)	7% - 54%	110%	0 – 24%	63%
Rupee Derivatives (MIFOR)	7% - 57%	170%	0 – 28%	157%

Table 2: Average and Highest increase in Margin requirements (post SLM implementation) (Back tested for the period Aug 2021 to Apr 2023)

2.3.8. Further, the average of "*IM to Default Fund ratio*" (an indicator of degree of loss mutualisation[3]) for the two boundary cases as against the current ratio are shown in the table below:

Segment	Prevailing ratio	Threshold 45% and RP = 3 days	Threshold 60% and RP = 1 day
Forex Forwards	6.72	8.53	7.13
Rupee Derivatives (MIBOR)	7.20	10.20	8.92
Rupee Derivatives (MIFOR)	3.24	5.05	4.29

Table 3: Current and Revised "IM to DF" ratios (back tested for the period Aug 21 to Apr 23)

Product-wise average ratios for some large CCPs and a global average are shown in Table [3.1].

2.3.9. **Inference**: Based on the above analyses, we infer that the mutualisation of losses can be reduced using the suggested approach. A conservative choice of threshold at 45% and SLM retention period of 3 days seem appropriate for achieving the desired results.

Analysis for other (non-derivatives) segments

2.3.10. In case of Securities, Triparty Repos and Forex Settlement segments (wherein the resources are maintained as per Cover 1 Standards), for the analysis, we have considered four different **threshold levels, viz. 80%, 85%, 90%** and **95%** of the average Cover 1 Stress Loss over a **six months look-back period**. Further, in these cases also, we have considered **retention periods of 1 day, 2 days and 3 days** with each selected threshold.

2.3.11. The impact on top 10 Cover 1 stress losses for each combination of threshold and retention period is shown with colour coding in Tables [4.1 to 4.3]. As expected (and discussed in para 2.2 above), in non-derivative segments, a reduction in stress loss on levying SLM is not certain. In case of Forex Settlement segment, in two out

[3] Higher the ratio, lower is loss mutualisation.

of ten cases, there is no improvement (i.e. reduction) in stress loss (as SLM was imposed on the day after and not on the day when such stress loss was observed), irrespective of threshold or retention period. On similar lines, in case of Securities and Triparty Repos segments, there was no improvement in one out of the ten cases. If these cases happened to be instances of highest stress loss, then the Default Fund would be revised upwards to these levels. Therefore, the purpose for which the SLM is levied (i.e. to reduce mutualisation of losses by collecting higher margins) may not be fulfilled.

2.3.12. **Inference**: As discussed in para 2.3.11 above, in cash segments, levying of SLM may not bring about a reduction in Default Fund requirements but the same is likely to result in increased margin requirements.

3. Summary of the Proposal

3.1. Stress Loss Margin (SLM) to be introduced in derivative segments.

3.2. A threshold of 45% of average Cover 2 stress losses (without setting off stress loss margins) over a look-back period of six months and retention period of 3 days are proposed parameters of the SLM model.

3.3 The parameters proposed will be reviewed by CCIL on an annual basis.

4. Members are requested to send their comments and feedback on the proposal to us latest by **20th July 2023** at **rmd@ccilindia.co.in** for attention of Chief Risk Officer, CCIL with Subject line as: "**Consultation Paper: Proposal to Introduce Stress Loss Margins (SLM)"**. In case you need any clarifications, please feel free to contact Mr. Nandan Pradhan, VP, Risk Management Department on 6154 6422 or Mr. Kausick Saha, Chief Risk Officer, Risk Management Department on 6154 6441.

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Annexure 1

Global CCP's practices for calling additional stress loss margins

CME Clearing

Source: https://www.cmegroup.com/clearing/risk-management/files/cme-clearing-principles-for-financial-market-infrastructures-disclosure.pdf (Page 50)

Extract

"*In particular, the Stress Testing Committee focuses on fluctuations, if any, of the stress shortfall relative to the overall size of the Guaranty Fund that could lead to breaching the Cover 2 standard. This risk could be addressed by re-sizing the impacted Guaranty Fund or calling for additional financial resources from a subset of Clearing Members driving the shortfall. The Stress Testing Committee's decision would be made based on the prevailing facts and circumstances.*"

Source:https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/chicago-mercantile-exchange/2019/pdf/cme-assessment-2019-03.pdf (Page 15)

Extract

"*In situations where one clearing participant is driving the increase in the Cover 2 requirement, CME may choose to call additional margin from that clearing participant. During the assessment period, CME did not perform any off-cycle resizings of the OTC IRS guaranty fund. However, CME performed off-cycle resizings of its Base guaranty fund on 10 and 18 January. Over the period CME reported one Cover 2 stress test breach for its Base service; the projected shortfall was covered by additional margin collected the next day. The new stress shortfall margin add-on has been introduced to provide a buffer to reduce variability in the sizing of the Base guaranty fund.*"

LCH ltd

Source:https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/lch/2020/pdf/lch-assess-2020-12.pdf (Page 21)

Extract

"*LCH Ltd uses monthly DFAM to achieve a balance between defaulter-pays and mutualized resources, ensuring that participants with large exposures relative to other Rates service members provide larger contributions to the resources required to cover those exposures. Monthly DFAM is called from the largest participant if its STLOIM exceeds a specified threshold of the value of the default fund, determined by its internal credit score (ICS). Monthly DFAM is not mutualized; it can only be used to cover losses from the participant that posted it.*

LCH Ltd also calls daily DFAM from those participants with STLOIM that exceed a predefined proportion of the default fund. This predefined default fund proportion is based on the participant's ICS. The amount of daily DFAM called is the difference between the participant's STLOIM and the relevant proportion of the default fund on that day, less any monthly DFAM. Like monthly DFAM, daily DFAM is not mutualised; it can only be used to cover losses from the participant that posted it. Participants can ask clients to cover their own stress test losses (rather than the participant paying DFAM) through 'stress loss margin' (SLM)."

Eurex Clearing

Source:https://www.eurex.com/ec-en/services/risk-management/stress-testing/risk-mitigating-actions

Extract

"*As the Default Fund is a mutualizing mechanism, it is an essential function of a CCP to mitigate any unfavorable constellations to protect the clearing community. At first, the reasons behind any irregularity are thoroughly analyzed. If the root cause is found to be a member-/portfolio-specific situation, member-specific actions are pursued. This approach ensures that members cover their idiosyncratic risk. However, if the market environment changes in general, it may be sensible to have measures across all members.*

Member-specific mitigating actions apply as soon as a single Clearer Group consumes a large part of the Default Fund. The most relevant threshold is defined in order to prevent breaches in the "cover-2" requirement and is set at 45% of the current Default Fund requirement. Whenever a single Clearer Group's credit exposure (i.e. stress shortage/surplus metric) is breaching a so-called early warning threshold, which is set at 40% of the current Default Fund requirement, the group's members are made aware of this fact and informed about possible mitigating actions in case they would breach the 45% Default Fund threshold. As soon as the 45% Default Fund threshold is actually breached by a single Clearer Group, the exposure needs to be covered by additional collateral in order to remedy the breach.

Threshold	**Mitigating actions**
40% of current Default Fund requirement	Early warning threshold, where the respective Clearing Member is notified of its credit exposure and advised to comply with the thresholds.
45% of current Default Fund requirement	Additional collateral is required to cover the higher exposure and remedy the breach.

General mitigating actions may apply in case multiple Clearer Groups stand out in stress testing. In this case, the root cause will likely be a structural or general market change, which requires a strengthening of the CCP's overall Default Fund. Reasonable measures for this situation are an ad hoc recalibration of the Default Fund requirement or of the dynamic component."

HKCC

Source:https://www.hkex.com.hk/Services/Clearing/Listed-Derivatives/Risk-Management/Default-Fund?sc_lang=en

Extract

"*The adequacy of the Reserve Fund is assessed on a daily basis by conducting stress testing and HKCC will require participants to pay such amounts by way of HPAD for the purpose of providing further additional resources to the Reserve Fund. Generally, each HKCC Participant is allowed a HKD1 million HKCC Participant Additional Deposits Credit in arriving at its required HPAD.*

A threshold is imposed on the Reserve Fund with reference to the highest Reserve Fund size in the past 10 years. Reserve Fund additional margin in the amount of net projected loss of the participant in excess of 50% of the Reserve Fund will be collected from the concerned participants should the Reserve Fund threshold be reached."

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Annexure 2

Analyses based on data for the period Aug 2021 to Apr 2023

Threshold	Retention Period	Top 10 Stress Losses (in Rs. Crores)									
		1	2	3	4	5	6	7	8	9	10
No SLM	No SLM	4,380	4,328	4,189	4,147	4,125	4,033	3,991	3,947	3,932	3,903
60	1	4,201	3,583	4,165	4,147	3,701	3,996	3,990	3,487	3,442	3,584
60	2	4,201	3,583	3,893	4,057	3,649	3,996	3,940	3,487	3,388	3,584
60	3	3,938	3,583	3,893	3,938	3,627	3,996	3,940	3,487	3,388	3,584
55	1	4,026	3,284	4,022	4,028	3,552	3,827	3,837	3,246	3,262	3,290
55	2	3,964	3,284	3,750	3,904	3,500	3,827	3,786	3,246	3,094	3,290
55	3	3,639	3,284	3,750	3,785	3,425	3,808	3,786	3,246	3,094	3,290
50	1	3,727	2,984	3,880	3,875	3,359	3,528	3,681	3,038	2,968	2,996
50	2	3,665	2,984	3,608	3,750	3,296	3,528	3,612	3,038	2,800	2,996
50	3	3,339	2,984	3,608	3,631	3,131	3,509	3,612	3,038	2,800	2,996
45	1	3,428	2,705	3,738	3,576	3,060	3,229	3,374	2,744	2,674	2,702
45	2	3,366	2,705	3,465	3,452	2,997	3,229	3,305	2,744	2,506	2,702
45	3	3,040	2,705	3,465	3,333	2,837	3,210	3,305	2,744	2,506	2,702

Table 1.1 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Forex Forwards Segment

Threshold	Retention Period	Top 10 Stress Losses (in Rs. Crores)									
		1	2	3	4	5	6	7	8	9	10
No SLM	No SLM	1,283	1,260	1,254	1,254	1,253	1,243	1,242	1,233	1,231	1,228
60	1	944	843	852	853	867	979	762	1,019	888	902
60	2	927	843	837	852	852	956	663	1,019	888	902
60	3	900	843	837	836	851	882	663	1,019	845	902
55	1	899	798	808	808	822	934	735	975	843	857
55	2	882	798	793	807	807	911	634	975	843	857
55	3	856	798	793	792	806	838	634	975	806	857
50	1	855	753	763	764	777	889	707	930	799	812
50	2	838	753	748	762	763	867	578	930	799	812
50	3	811	753	748	747	761	793	578	930	767	812
45	1	810	709	718	719	733	844	653	885	754	768
45	2	793	709	703	718	718	822	523	885	754	768
45	3	766	709	703	702	717	748	523	885	728	768

Table 1.2 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Rupee Derivatives (MIBOR) Segment

		Top 10 Stress Losses (in Rs. Crores)									
Threshold	**Retension days**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No SLM	No SLM	347	344	341	332	332	331	331	329	327	327
60	1	113	112	130	111	109	116	119	118	89	126
60	2	113	112	119	111	108	114	118	107	89	126
60	3	113	111	119	111	108	112	111	106	89	126
55	1	104	103	121	102	100	106	110	109	80	117
55	2	104	103	110	102	99	105	109	98	80	117
55	3	104	102	110	102	99	103	102	97	80	117
50	1	95	94	112	93	90	97	100	100	72	108
50	2	95	94	101	93	90	96	100	88	72	108
50	3	95	93	101	93	90	93	93	88	72	108
45	1	85	85	103	84	81	88	91	90	67	98
45	2	85	85	91	84	81	87	91	79	67	98
45	3	85	84	91	84	81	84	84	78	67	98

Table 1.3 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Rupee Derivatives (MIFOR) Segment

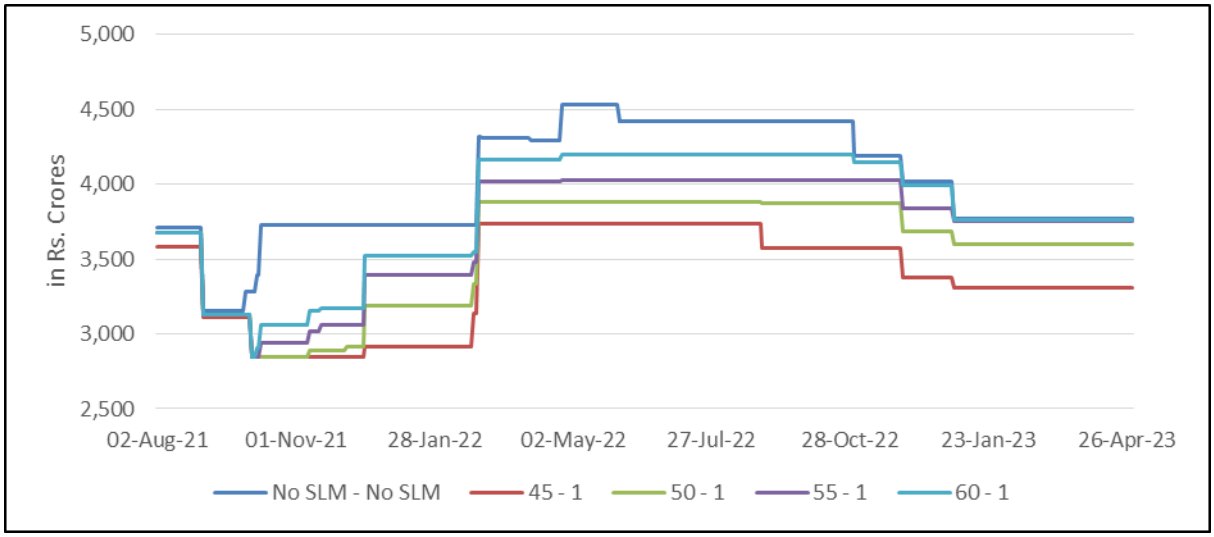

Chart 1.1 - Impact of different threshold levels and one-day retention period on Default Fund levels for Forex Forwards Segment

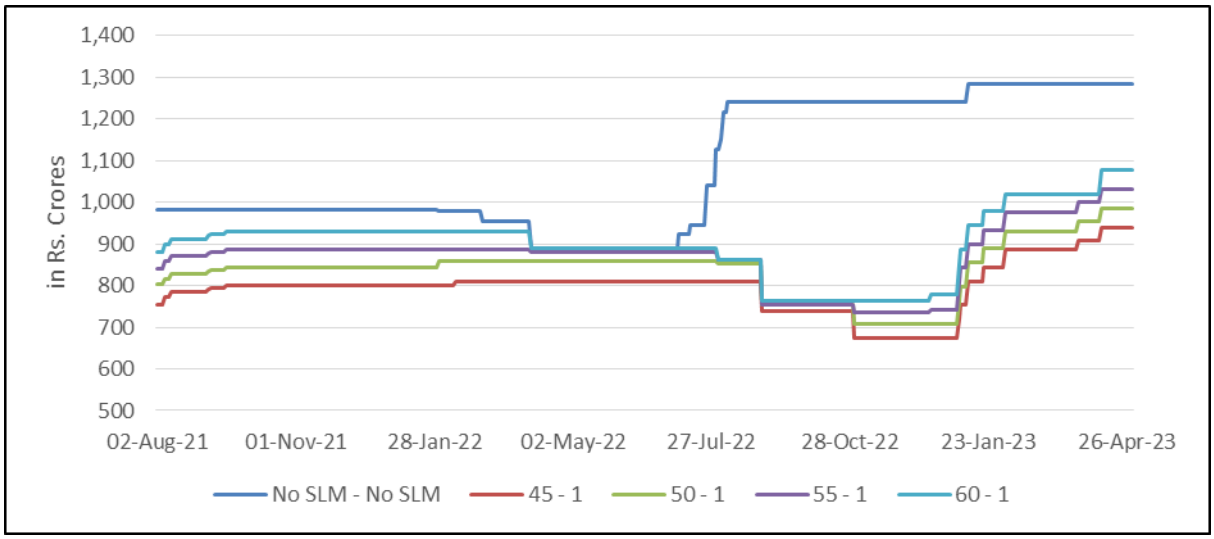

Chart 1.2 - Impact of different threshold levels and one-day retention period on Default Fund levels for Rupee Derivatives (MIBOR) Segment

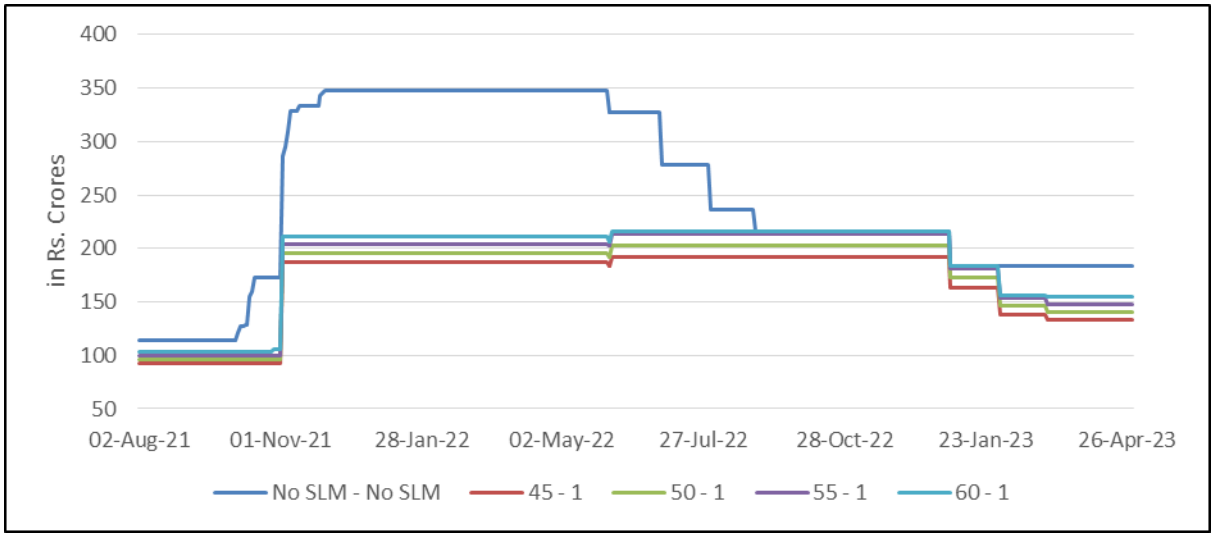

Chart 1.3 - Impact of different threshold levels and one-day retention period on Default Fund levels for Rupee Derivatives (MIFOR) Segment

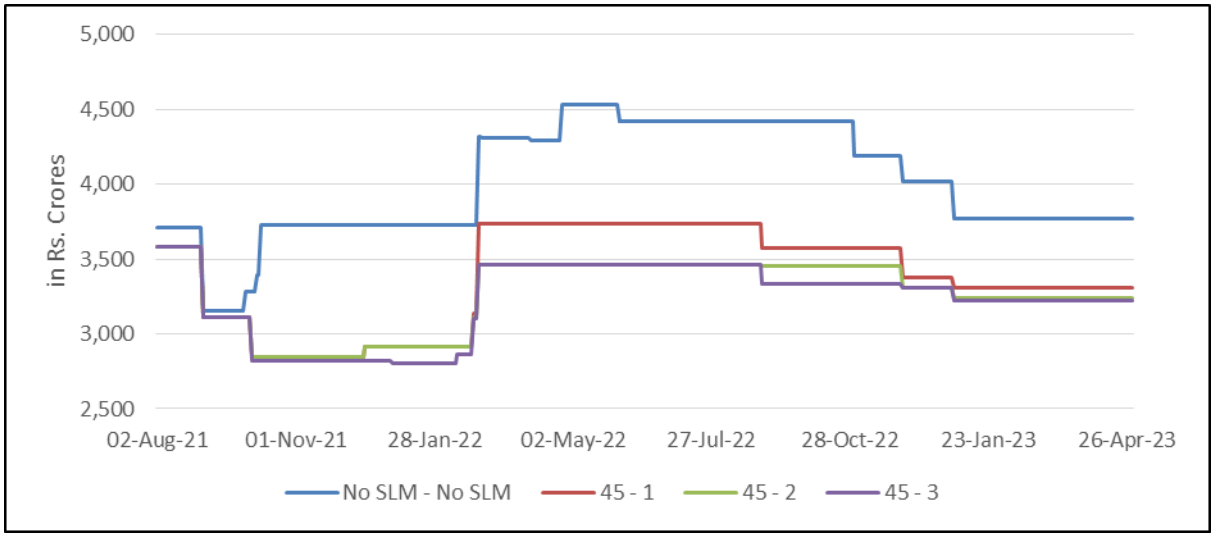

Chart 2.1 - Impact of varying retention period on Default Fund levels for Forex Forwards Segment

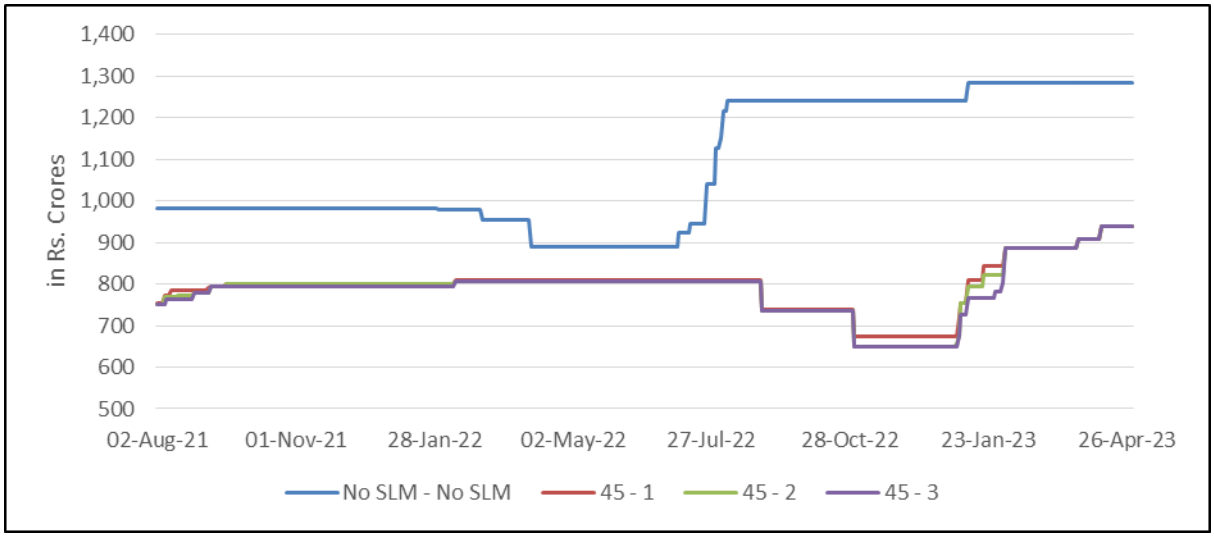

Chart 2.2 - Impact of varying retention period on Default Fund levels for Rupee Derivatives (MIBOR) Segment

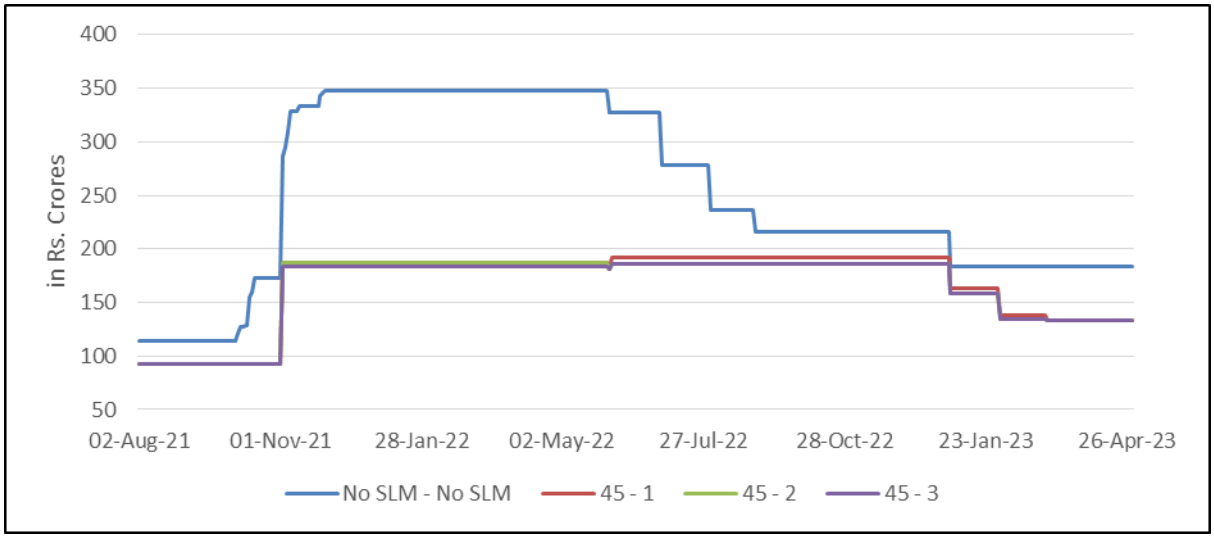

Chart 2.3 - Impact of varying retention period on Default Fund levels for Rupee Derivatives (MIFOR) Segment

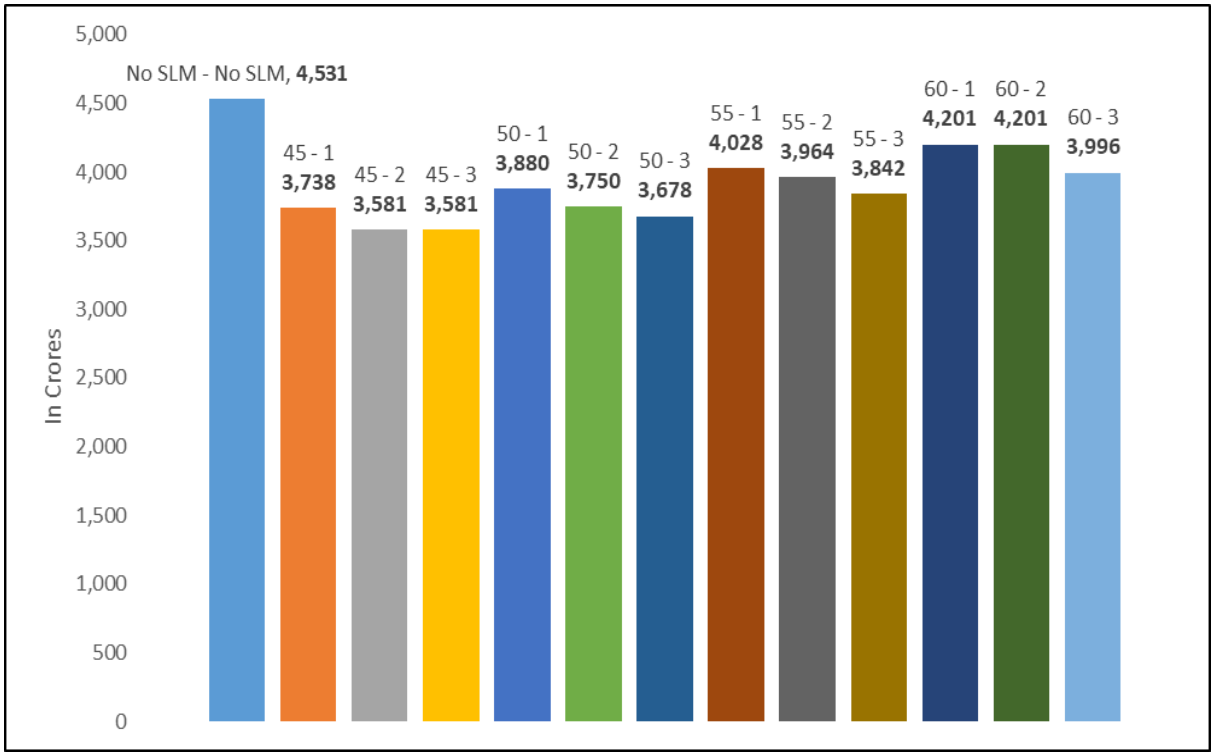

Chart 3.1 - Highest Default Fund levels for different combinations of threshold and retention periods for Forex Forwards Segment from Aug'21 to Apr'23

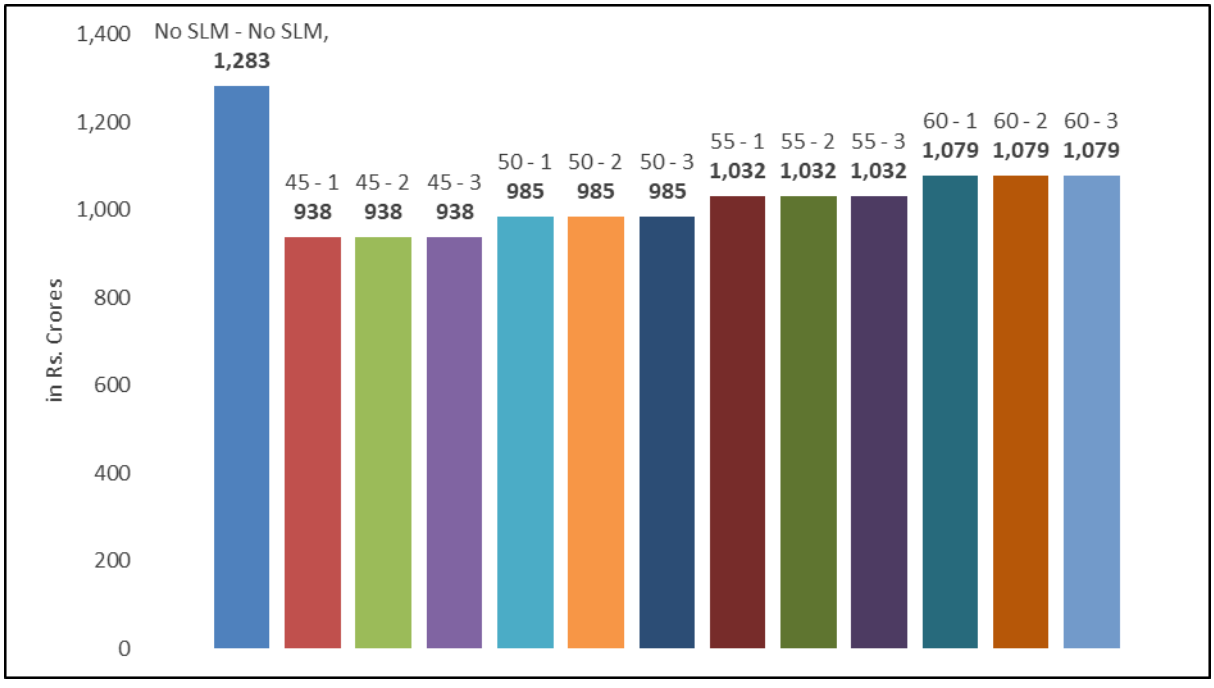

Chart 3.2 - Highest Default Fund levels for different combinations of threshold and retention periods for Rupee Derivatives (MIBOR) Segment from Aug'21 to Apr'23

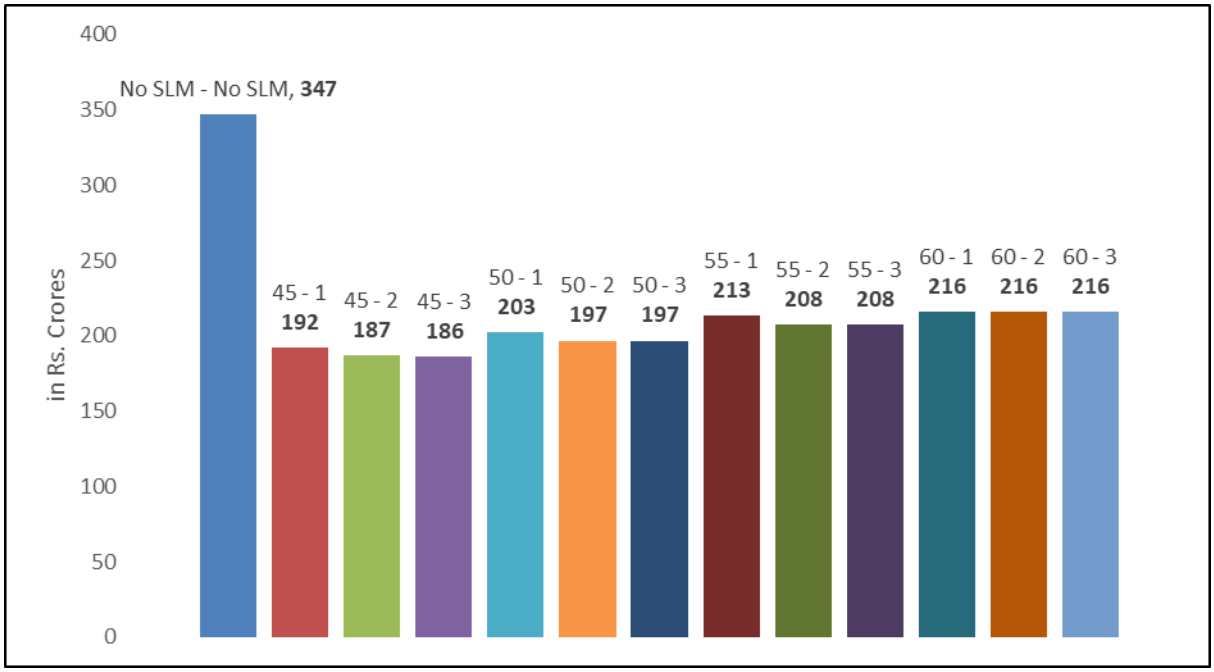

Chart 3.3 - Highest Default Fund levels for different combinations of threshold and retention periods for Rupee Derivatives (MIFOR) Segment from Aug'21 to Apr'23

Member	Threshold : Retention days = 45 : 3			Threshold : Retention days = 60 : 1		
	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)
Member 1	184	560	1,448	96	295	1,021
Member 2	34	480	914	15	201	465
Member 3	41	410	1,048	10	120	587
Member 4	26	295	605	1	156	156
Member 5	223	251	586	9	56	153
Member 6	33	202	445	8	52	103
Member 7	153	181	546	5	51	97
Member 8	12	139	305	0	0	0
Member 9	13	58	150	0	0	0
Member 10	3	38	38	0	0	0

*out of 423 days backtested

Table 2.1 - SLM requirements from impacted members in terms of number of days, average requirements and highest requirement during the assessment period for the two boundary combinations of threshold and retention period for Forex Forwards segment

Member	Threshold : Retention days = 45 : 3			Threshold : Retention days = 60 : 1		
	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)
Member 1	213	360	662	179	261	579
Member 2	160	104	227	47	41	102
Member 3	22	33	58	0	0	0
Member 4	38	30	85	1	2	2
Member 5	10	21	42	0	0	0
Member 6	46	19	45	0	0	0

*out of 423 days backtested

Table 2.2 - SLM requirements from impacted members in terms of number of days, average requirements and highest requirement during the assessment period for the two boundary combinations of threshold and retention period for Rupee Derivatives (MIBOR) segment

Member	Threshold : Retention days = 45 : 3			Threshold : Retention days = 60 : 1		
	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)	No. of days*	Avg. SLM (Rs. Crores)	Highest SLM (Rs. Crores)
Member 1	409	52	186	289	42	172
Member 2	81	35	87	54	28	73
Member 3	10	3	10	0	0	0

*out of 423 days backtested

Table 2.3 - SLM requirements from impacted members in terms of number of days, average requirements and highest requirement during the assessment period for the two boundary combinations of threshold and retention period for Rupee Derivatives (MIFOR) segment

CCP | Clearing Service	Average IM (USD mio.)	Average DF (USD mio.)	Average IM to DF ratio
GLOBAL LEVEL	1,302,000	118,000	**11.03**
LCH LTD | Interest_Rates	191,993	7,384	26.05
CME CLEARING | Base	172,615	5,291	32.83
ICE EUROPE | ICEU_F&O	129,969	3,211	40.47
EUREX CLEARING | ALL	82,756	6,008	14.65
ICE CREDIT | ICC_CDS	50,492	4,078	12.49
LCH SA | Fixed_Income	39,829	2,372	16.84
CME CLEARING | IRS	31,895	3,442	9.38
ICE US | ICUS_F&O	21,438	807	26.57
LCH LTD | Fixed_Income	12,555	2,001	6.44
LCH SA | Cash_and_Derivatives	11,410	2,366	4.83
ICE EUROPE | ICEU_CDS	10,020	1,319	7.65
SGX-DC | SGX-DC	8,895	276	32.26
LCH LTD | OTC_FX	8,110	2,052	4.02
ASXCL-FUTURES | Futures	5,837	144	40.50
LCH SA | OTC_CDS	5,135	2,030	2.55
LCH LTD | Equities	4,110	195	21.10
CCIL | Forex Forwards	3,885	519	**7.57**
CCIL | Securities - Treps	2,117	63	**34.14**
CCIL | Securities - (Outright & Repo)	1,214	92	**13.12**
CCIL | MIBOR	781	126	**6.41**
CCIL | Forex Settlement	768	87	**8.85**
CCIL | MIFOR	107	37	**3.87**

Table 3.1 - Service-wise average IM to DF ratio of various CCPs as per their quarterly Public Quantitative Disclosures (PQDs) [Average of four quarter end dates, viz. Sep 2021 to Jun 2022]

Threshold	Retension days	Top 10 Stress Losses (in Rs. Crores)									
		1	2	3	4	5	6	7	8	9	10
No SLM	No SLM	1,041	866	768	746	740	733	706	698	672	635
95	1	1,041	866	340	746	740	271	706	698	439	635
95	2	739	866	340	635	740	271	706	600	439	635
95	3	739	795	340	629	522	271	566	600	439	635
90	1	1,041	866	327	746	740	259	706	698	426	635
90	2	726	866	327	635	740	259	706	587	426	635
90	3	726	782	327	616	507	259	553	587	426	635
85	1	1,041	866	314	746	740	246	706	698	413	635
85	2	714	866	314	635	740	246	706	575	413	635
85	3	714	769	314	603	492	246	541	575	413	635
80	1	1,041	866	301	746	740	233	706	698	400	635
80	2	701	866	301	635	740	233	706	562	400	635
80	3	701	756	301	590	478	233	528	562	400	635

Table 4.1 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Securities Segment

Threshold	Retention Period	Top 10 Stress Losses (in Rs. Crores)									
		1	2	3	4	5	6	7	8	9	10
No SLM	No SLM	480	451	443	430	429	373	358	352	346	344
95	1	150	353	199	138	243	364	213	92	346	182
95	2	150	353	199	138	243	200	213	92	346	111
95	3	150	246	199	138	99	200	213	92	346	111
90	1	145	346	194	138	238	358	208	85	346	177
90	2	145	346	194	138	238	193	208	85	346	107
90	3	145	241	194	138	94	193	208	85	346	107
85	1	140	339	189	138	233	351	204	79	346	172
85	2	140	339	189	138	233	187	204	79	346	107
85	3	140	236	189	138	89	187	204	79	346	107
80	1	134	332	184	138	228	345	199	79	346	166
80	2	134	332	184	138	228	180	199	79	346	107
80	3	134	230	184	138	85	180	199	79	346	107

Table 4.2 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Triparty Repos Segment

Threshold	Retention Period	Top 10 Stress Losses (in Rs. Crores)									
		1	2	3	4	5	6	7	8	9	10
No SLM	No SLM	797	791	724	684	681	673	668	661	649	645
95	1	770	702	593	684	510	559	562	661	446	542
95	2	770	702	593	684	510	559	562	661	446	542
95	3	770	702	593	684	510	559	562	661	446	542
90	1	750	684	575	684	495	540	562	661	446	523
90	2	750	684	575	684	495	540	562	661	446	523
90	3	750	684	575	684	495	540	562	661	446	523
85	1	731	667	557	684	479	521	562	661	437	504
85	2	731	667	557	684	479	521	562	661	437	504
85	3	731	667	557	684	479	521	562	661	437	504
80	1	711	649	539	684	464	501	562	661	420	484
80	2	711	649	539	684	464	501	562	661	420	484
80	3	711	649	539	684	464	501	562	661	420	484

Table 4.3 – Impact of SLM on top 10 Stress Losses at various threshold and retention periods for Forex Settlement Segment