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THE CLEARING CORPORATION OF INDIA LTD

Risk Management Department

Consultation Paper

Proposal for Revision in the Lookback periods in Anti-Procyclicality measures in Initial Margin Models

1. Introduction

CCIL computes Initial Margin (IM) in all segments where it provides CCP Clearing using some variant of Value at Risk (VAR) model. While Historical Simulation VAR based model is used in Securities and Forex settlement segments, volatility weighted Historical Simulation VAR based model is used in Rupee Derivatives and Forex Forward segments. The haircut rates for securities deposited in Securities segment SGF, Default Fund, and towards borrowings in Triparty repo are also determined using Historical Simulation VAR based models. The parameters of these VAR models are tabulated as follows:

Segment	Margin Model	VAR Model Parameters
Securities Segment : Margin factors for outright and market repo trades, and Haircut rates for SGF, Default Fund and Triparty repo collateral securities	Computed at an individual security level using Historical Simulation VAR model to arrive at: (i) Initial Margin factors on outright and market repo trades. (ii) Haircut rates on securities deposited in SGF, Default Fund and Triparty repo (iii) Haircut rates on securities deposited as collateral for borrowing in Triparty repo.	For securities in each tenor based bucket: 99th percentile, 5 day holding period with 1000 day lookback. Subject to a **floor** computed as 95th percentile, 5 day MPOR with a lookback period of 10 years

Segment	Margin Model	VAR Model Parameters
Securities Segment: Initial Margin on Tri-party Repo trades	Historical simulation based Value at Risk factor	Initial Margin is derived based on 99th percentile, 3 day MPOR with 1000 day lookback for various short term rates subject to a floor of 0.5%.
Forex Settlement	The market risk factor for USD INR Spot rate is based on historical simulation based Value at Risk	99th percentile, 3 day holding period with 1000 day lookback; Subject to a **floor** computed at 99th percentile, 3 day MPOR with a look back period of 2500 days
Forex Forward	Initial Margin is calculated at a portfolio level using a volatility weighted historical simulation based Value at Risk model.	99th percentile, 5 day MPOR with 1000 day lookback, of which 250 returns are from a continuous 250 day period of **stress** from the last 10 years.
Rupee Derivatives (MIBOR and MIFOR)	Initial Margin is calculated at a portfolio level using a volatility weighted historical simulation based Value at Risk model.	99th percentile, 5 day MPOR with 1000 day lookback; of which 250 returns are from a 250 day continuous period of **stress** from the last 10 years.

Table 1: VAR Model for IM computation and Determination of Haircut rates for Securities

1.2 The stress periods included in the IM model for Forex Forward and Rupee Derivatives segment are reviewed on a monthly basis. The margin factor floors are reviewed on a yearly basis for Forex settlement segment. In securities segment, the floors get reviewed at the time of fortnightly revision of margin factors.

1.3 Prefunded resources to cover market risk can be in the form of margins and mutualized default fund (to cover losses of one / two largest participants and their affiliates in the event of extreme but plausible market movements). CCPs usually apply a combination of the "defaulter pays" and the "survivor pays" principles to cover the losses from a participant's default. Margin requirements are set to cover the losses on account of participant defaults under normal market circumstances while the default fund would help meet losses, in excess of the margins, in extreme but plausible conditions. Margins collected from members work on a 'defaulter pays' principle, as these are utilized in the event of member's own default. Default Fund, on the other hand, works on a 'survivor pays' principle, as these are utilized in the event of default of other members.

1.4 CCPs employ various measures to ensure that initial margin models are not pro-cyclical in nature. An impact of these measures is that Initial Margins are relatively higher even in periods of low market volatility. Higher margins result in relatively lower default fund requirements and thus, as stated in para 1.3 above, help to maintain a balance between members' margin and default fund contributions.

1.5 As indicated in Table 1, anti-procyclicality measures are in place in CCIL's initial margin models, such as inclusion of returns from a continuous 250 day period of stress in the Initial margin look-back period (for Forex Forward and Rupee Derivatives segment) and minimum margin / floor (for IM in Triparty repo trades and trades in Forex settlement and Securities segments).

1.6 CCIL has a uniform look-back period of 10 years for anti-procyclicality measures across all the segments. Presently, this window covers major events such as 2013 QE (Quantitative Easing) in US, 2018 Brexit in EU and 2020-2021 Covid19 pandemic.. However, major events like the global financial crisis of (2008) and the European debt crisis of (2011) have moved out of this 10 year window. By end of 2023, data pertaining to (2013) will also move out of the look back period. Year 2013 was the period of highest volatility in the USD/INR exchange rate, which is a key risk factor for Forex and Forex Forwards segment. It is felt that these periods of extreme market stress, viz. Global Financial Crisis (2008), European Debt Crisis (2011) and US Quantitative easing (2013) are representative of volatile market conditions and continue to remain relevant. Thus,

data from these periods need to be taken into account for determining stressed VAR / margin floors. There is also a risk that the exclusion of these data points could lead to pro-cyclical margin requirements, if a sudden stress event is encountered.

2. Proposal

2.1. In the light of above discussion, we propose some changes in our IM model parameters for various clearing services with an objective to achieve the following:
   a) To capture all relevant historical periods of stress in risk factors in our margin models.
   b) To ensure that the responsibility to meet loss on account of default handling is more on the defaulter (by way of higher margins) and less on the non-defaulters (by way of default fund contributions).

2.2. The proposed changes in IM model parameters are stated below:

   a) <u>Securities Segment:</u> For each tenor bucket, the 95th percentile 1 day VAR values will be computed for rolling periods of 10 years length, starting from 2006. The highest of such 1 day VAR values for each bucket shall be scaled as per the applicable margin period of risk (MPOR) to determine margin factor/haircut floor for all securities in that tenor bucket. Current lookback period for 1 day VAR floor is recent 10 years.

   b) <u>Forex Settlement Segment:</u> For determining margin factor floor, 1 day VAR values (99th percentile, 2500 day look back period) will be computed for rolling periods of 2500 days, starting from 2002 and highest of such 1 day VAR values shall be scaled as per the applicable margin period of risk (MPOR). Current look back period for 1 day VAR floor is recent 2500 days.

   c) <u>Forex Forward and Rupee Derivatives Segments</u>: The continuous 250 days stress period will be identified using a look back period starting from Oct'2002 for Forex Forward and from Jan'2009 for Rupee Derivatives. Current look back period is recent 10 years.

3. Impact Analysis of the Proposal

If the proposal is implemented, the data pertaining to certain stress events which has moved out of the look back period [2008 (Global financial crisis), 2011 (European debt crisis)] will once again be considered for arriving at the margin floors (securities and Forex segments) and the Stressed VAR (IRS and Forex Forwards segments).

- In Forex and Forex Forwards segment, the period of extreme stress pertains to year 2013 and this window already forms part of the current look back period. Hence the change will have no impact in the margins charged in these segments.

- In the Rupee Derivatives segment, the re-inclusion of data from 2011 will result in an increase in initial margins over the current levels to the levels that existed in 2021 and earlier, when this period was considered for IM computation. The extent of actual increase for individual members would depend on composition of their portfolios.

- In the securities segment, after the re-inclusion of the periods pertaining to 2008 and 2011, the securities wise margin factor floors could increase by about 0.03% to 0.70%.

Members are requested to send their comments and feedbacks on the proposals as detailed above. The feedback may be sent by email to us latest by July 15, 2022 at rmd@ccilindia.co.in for attention of Chief Risk Officer, CCIL with Subject line as: "*Consultation Paper: Proposal for Revision in the Lookback periods in Anti-Procyclicality measures in Initial Margin Models*". If any clarification is required on any aspect of this paper, please feel free to contact Mr. Nandan Pradhan, VP, Risk Management Department on 6154 6422.

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