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|  Instruction | N° | TITLE |
| | V-4.1 | MARGINING OF TRIPARTY REPO TRANSACTIONS (CALCULATION METHODOLOGY) |

CHAPTER 1 SCOPE

Provisions of this Instruction shall not apply to Special Clearing Members.

Article 1

This Instruction sets out the procedure for the calculation of Margins on Triparty Repo Transactions.

In the framework of this Instruction, the following definitions apply:

- The Cash Borrower / Collateral Giver holds the obligation to deliver collateralising securities, to pay Triparty Repo Interest and to return the cash borrowed;
- The Cash Lender / Collateral Taker holds the obligation to pay the cash lent and to return the collateralising securities.

The margining methodology foresees the following types of Margins:

- a) Total Initial Margin, which covers the market risk on the Clearing Member's portfolio of collateralising securities; such Total Initial Margin covers:
 - Initial Margin which itself comprises :
 - Application of Risk parameters per Risk Class and Specific Risk Margin (such margin covers unfavourable financial instrument price variations inside defined risk classes or specific risk for financial instruments standing out of such risk classes);
 - Fails Margin covering the risk inherent to the non allocated cash amount for the Collateral Giver;
 - S/S-1 Margin, which accounts for risk inherent to differences of open positions between same Clearing Day settlement and next Clearing Day settlement.
 - Collateral Pledge Charge applying for the associated charge represented by the refinancing towards the National central Bank;
 - Accrued Coupon Margin to cover accrued coupon variations.
- b) Triparty Repo Interest Margin, which covers the payment of the Triparty Repo interest,
- c) Minimum Deposit, which is an initial payment prior to any trade,
- d) Additional margin including Sovereign Risk Margin, which covers the Sovereign risk considered on a list of countries defined by LCH SA Risk Management, Concentration Risk Margin, which covers the increase in cost of securities liquidation, and Wrong Way Risk which covers the correlation risk between a Clearing Member's risk and the risk of the paper used to borrow against.

CHAPTER 2 MARGINING METHODOLOGY

Section 2.0 Calculation of the Net Position Exposures

Article 2.0.1

- a) The Net Position Exposure for same Clearing Day settlement is calculated as follows:
- Triparty Repo Transactions already initiated and not yet returned + Triparty Repo Transactions with initiation date S (where S is the current Clearing Day).
- b) The Net Position Exposure for next Clearing Day settlement is calculated as follows:
- Triparty Repo Transactions already initiated and not yet returned + Triparty Repo Transactions with initiation date S+1 (where S is the current Clearing Day) – Triparty Repo Transactions with return date S+1.

Section 2.1 Calculation of the Total Initial Margin

Article 2.1.1 Methodology

The methodology is based on the following steps:

- selection of Triparty Repo Transactions with initiation date on or prior to the date of calculation and return not yet reached at the date of calculation;
- for this set of Triparty Repo Transactions, identification of collateral securities being held on accounts and the non-allocated amount;
- valuation of collateral securities portfolios made upon clearing price as defined by LCH SA;
- calculation is processed for each margin being part of the Total Initial Margin.

Total Initial Margin includes Initial Margin, Collateral Pledge Charge and Accrued Coupon Margin.

Article 2.1.2 Calculation of the Collateral Pledge Charge

The Collateral Pledge Charge covers the collateral management cost in case of Clearing Member Event of Default and especially the cost of pledge to Central Bank, as well as the sale of the Triparty Repo maturities.

LCH SA considers the worst of the two following situations:

- a) the Triparty Repo transacted by a Defaulting Clearing Member is kept until maturity and associated collateral is liquidated after having being pledged to Central Bank until liquidation (LCH SA would thus be exposed to variations of the overnight ECB rates); and
- b) the Triparty Repo transacted by the defaulting Clearing Member is sold during the liquidation (LCH SA is thus exposed to the repo market rate).

LCH SA then applies this worst rate to the net Open Position for each Clearing Member, (i) when Cash Borrower (Collateral Giver) adding the cost of pledge of the recalled securities during liquidation or (ii) when Cash Lender (Collateral Taker).

Article 2.1.3 Calculation of Initial Margin

The Initial Margin covers the expected variation of the collateral value compared to the cash amount given or received.

The Initial Margin covers the unfavourable Financial Instrument price variations in the case of a sale or purchase of collateralized financial instruments following an Event of Default.

The Initial Margin calculation is computed per Clearing Member, per compartment and per Basket; it is based upon homogeneous Risk Classes set up by LCH SA at Basket level with associated variation parameters.

The Initial Margin includes the ECB haircut where it will floor the risk for LCH SA in the case of a Cash Borrower / Collateral Giver and where it will be added to the risk of the asset in the case of a Cash Lender / Collateral Taker, LCH SA having to purchase at market price.

The Initial Margin also includes Fail Margin (to cover the risk associated with allocation fails) and S/S-1 Margin (to cover differences between current Clearing Day's Open Position and next Clearing Day's Open Position).

Fail Margin allows LCH SA to cover the risk of the cash Open Position not being collateralized (LCH SA will calculate a potential average collateralisation of such cash position and apply its Initial Margin algorithms).

S/S-1 Margin allows LCH SA to cover the risk of a significant change in the net Open Position of a defaulting Clearing Member between its current Clearing Day's net Open Position and its next Clearing Day's net Open Position. LCH SA will apply a flat margin rate on the additional net Open Position.

Article 2.1.4 Determination of Margin parameters

Margin parameters for Risk Classes will be published in relevant Notices.

The parameters used in the margin calculation procedure will be periodically revised and, if needed, updated in order to take into account market conditions, volatility trends and the evolution of Financial Instruments prices.

Risk classes for Triparty Repos will be based upon:

- Four Asset type classes (from central government debt instruments to credit institutions debt instruments);
- Three Issuer rating types;
- Six Time to maturity buckets (below 1 year, 1 to 3 years, 3 to 5 years, 5 to 7 years, 7 to 10 years and over 10 years).

Article 2.1.5 Calculation of the Accrued Coupon Margin

The Accrued Coupon Margin aims at ensuring the risk of the change in accrued coupon during the holding period (period of liquidation). For a zero coupon financial instrument, this margin is null.

Article 2.1.6 Calculation of the Specific Risk Margin

The Specific Risk Margin aims at ensuring a specific coverage at ISIN level for collateralising securities; it then covers the incremental risks of the most volatile assets.

Specific Risk Margin applies to a set of securities not being inserted in any of the risk classes defined by LCH SA and which then require a specific margin parameter.

The Specific Risk is included in the Initial Margin.

Article 2.1.7 Calculation of the Total Initial Margin

The Total Initial Margin is calculated as the sum of the Collateral Pledge Charge, the Initial Margin and the Accrued Coupon Margin.

Section 2.2 Calculation of the Triparty Repo Interest Margin

This Margin is calculated on the trade date on the basis of a fixed rate. The convention used is Actual/360.

The Triparty Repo Interest Margin covers the repayment of the interest to the Cash Lender at maturity of the Triparty Repo Transaction.

Section 2.3 Calculation of additional Margin

Additional Margin includes concentration risk Margin, sovereign risk Margin and wrong way risk Margin.

- a) The concentration risk Margin is set to cover levels of Open Positions which may lead to higher costs of liquidation.
- b) The sovereign risk Margin covers the risks associated with changes in the creditworthiness of country of residence of the issuer of eligible financial instruments.
- c) The wrong way risk Margin covers the correlation risk between Clearing Members' risk and the risk of issuers of collateralized financial instruments.

Section 2.4 Calculation of Minimum Deposit

A Minimum Deposit is required to ensure a high level of coverage of the novated positions.

It covers:

- The novated trades not yet incorporated inside the Total Initial Margin;
- The positions not yet settled;
- The change inside the portfolio of collateralising securities between two margin calls.

The Clearing Member must comply with the Minimum Deposit payment the day before the first trade is sent for clearing.

Section 2.5 Calculation of Total Margins

Total Margins requested from Clearing Members. Collateral is re-evaluated on the basis of the previous Margin calculation session results and both following Margin call processes are applied:

- a) If total Margins are larger than the total Margins collected in the previous margin call, Clearing Members must deposit the difference;
- b) If total Margins are smaller than the total Margins collected in the previous margin call, the excess may be withdrawn by the Clearing Member.

Section 2.6 Calculation of Intra-Day Margins

Article 2.6.1 General provision

In addition to the Total Initial Margin, Triparty Repo Interest Margin and additional Margins calculated and called pursuant to Article 4.2.0.1 of the Clearing Rule Book and related Instructions, and pursuant to Article 4.2.0.2 of the Clearing Rule Book, LCH SA calculates Intra-day Margins.

Clearing Members Open Positions from the previous Clearing Day are re-evaluated with unsettled Trade Legs resulting from Transactions of the Clearing Day at the Transaction price.

Based upon those re-evaluated Open Positions, Clearing Members Margins are re-evaluated. This calculation process may result in an Intra-day Margin call in the conditions described in this Instruction and related Notices.

Intra-day Margins are calculated according to the same methodology used for daily Initial Margins.

The following Trade Legs are included in the calculation of Intra-day Margins calculation session cut-off time:

- a) For Triparty Repos, all Trade Legs whose Initial Transaction has already been settled and its Return Transaction is still unsettled
- b) Net fails resulting from Triparty Repos defined above
- c) For Same-Day Triparty Repos, all Trade Legs whose Return Leg is still unsettled.

Article 2.6.2 Definition of Intra-day Margin requirements

Intra-day Margins Requirements include:

- a) Initial Margins re-evaluated on the basis of re-evaluated Open Positions as defined in article 2.6.1 of this Instruction
- b) Triparty Repo Interest Margin and additional Margin.

Article 2.6.3 Intra-day Margin calls conditions

The timing of the Intra-day calculation session is defined in a Notice.

However in the course of the Clearing Day as described in the related Notice, LCH SA can as it deems necessary modify the timing of the Intra-day calculation session.

For each Clearing Member, LCH SA compares the amount of Intra-day Margin requirement to the amount of the latest cover call. The cover call is defined as the total amount of assets deposited as Collateral by the Clearing Member.

LCH SA shall then perform the following process: For each

Clearing Member for which:

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| Latest cover call | | | |
| | + | < | Intra-day Margins |
| threshold amount (if any) | | | requirements (as described in |
| | | | a Notice) |

LCH SA reevaluates the amount of existing Collateral and compares such amount to the amount of Intra-day Margin requirement.

And then,

For each Clearing Member for which as a result of such comparison it appears that:

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| existing revalued Collateral | < | Intra-day Margin requirement |
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LCH SA actually performs an Intra-day Margin call.