Clearing & Settlement Systems in India
Issues and A Way ahead

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Part I

Introduction

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- Clearing & settlement are commonly referred to as post-trade services.
- Clearing - plumbing of securities and derivative markets.
- Core part of a smoothly and efficiently functioning financial market infrastructure.
- Clearing services have traditionally been provided by clearing houses.
- Settlement services provided by depositories and clearing banks.

Introduction to Clearing

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- Clearing is the process that happens between execution and settlement.
- Clearing comprises of:
  1. *Basic clearing services* like trade confirmation, transaction/position management and delivery management.
  2. *Value added clearing services* like novation, netting, risk management, cash and collateral management.
  3. *Complementary clearing services*

Industrial Organization of Clearing Industry

- Two contesting views on the organization of the post-trade architecture:
  1. Vertical integration - Deutsche Bourse, DTCC.
  2. Horizontal integration - LCH.Clearnet, Eurex Clearing, OCC.
- Competing institutional structures coexist in the US and European clearing industries.
- Academic literature split in their support for either structures.
- Vertical structures at the Indian bourses.

Structural changes in the clearing industry

- Technological progress leading to lower costs of trading.
- Improved methods of risk measurement and forecasts.
- Improved investor access to financial markets.

Need to revisit clearing systems with a view to recognize investor needs consolidated across sectors rather than focus on individual market segments.

- Short term points of pain
- Medium term problems
- Long term issues

Part II

Review of current post trade architecture

Market segments for post-trade services

- Exchange traded products
  1. Equity (cash)
  2. Equity derivatives
  3. Currency derivatives
  4. Interest rate derivatives
  5. Fixed Income securities: Corporate and government bonds (retail and wholesale)
  6. Securities Lending and Borrowing scheme (SLBS)
  7. Mutual fund service system (MFSS)
  8. Commodity markets
- Over the counter products
  1. Foreign exchange forwards and swaps
  2. Interest rate swaps
  3. Credit default swaps

Equity market: Spot and derivatives

Participants in the market:

1. Domestic retail/institutional, foreign institutional investors.
2. Exchanges: NSE, BSE and MCX-SX.
3. Clearing houses: NSCCL, ICCL.
4. Depositories: CSDL and NSDL
5. Regulator: SEBI

Instruments traded:

1. Equity spot, stock futures, stock options, index futures, index options.

Clearing for Equity markets

- The risk management comprises of liquid net worth and exposure limits.
- Liquid net worth = Total liquid assets - Initial margin
- Liquid net worth should be at least Rs 10 (50) lacs at all times for equity (equity derivatives), notional value of gross open positions at all times should not exceed 33 1/3 times the liquid net worth.
- At least 50% of liquid assets has to be in cash equivalents viz. cash, bank guarantee, fixed deposits and dated government securities (or dematerialized securities with appropriate haircuts).
- Units of MMMFs and gilt funds accepted as cash equivalent after appropriate haircuts.

Clearing for Equity markets: Risk management

- Debt securities acceptable if they are investment grade. With haircuts.
- Total cash equivalent in form of debt or equity not to exceed 15% of liquid net worth.
- In July 2007, RBI permitted clearing houses and CMs to open and maintain demat accounts with foreign depositories; to acquire, hold, pledge and transfer foreign securities, offered as collateral by FIIs ; and to liquidate such securities if need arises.
- FIIs allowed to put foreign securities as collateral subject to certain safeguards. Appropriate haircuts were applied.

Cross margining and Portfolio margining in Equity

- The positions of clients in both the cash and derivatives segments to the extent they offset each other is considered for the purpose of cross margining as per the following priority:
    1. Index futures position and constituent stock futures position in derivatives segment,
    2. Index futures position in derivatives segment and constituent stock position in cash segment, and
    3. Stock futures position in derivatives segment and the position in the corresponding underlying in cash segment
- Portfolio margining for index option portfolios.

Issues in equity markets: Cross margining

- The positions in the derivatives segment for the stock futures and index futures should be in the *same expiry month* to be eligible for cross margining benefit.

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- A *spread margin* of 25 percent of the total applicable margin on the eligible off-setting positions is levied in the respective cash and derivative segments.
- Cross margining benefit is computed at client level on an online real time basis and passed on to TM/CM and ultimately to the client.
- For institutional investors, however, the cross margining benefit is provided only after confirmation of trades.

Issues in equity markets

- The sovereign securities tendered as collateral by FIIs shall be treated as part of the cash component of the liquid assets of the CM.
- The value of the sovereign securities shall not be more than 10% of the total value of the cash component of the liquid assets of the clearing member.

Currency market

Participants in the market:

1. Exchanges: NSE, BSE, USE, MCX-SX.
2. Clearing houses: NSCCL, ICCL, MCX-SXCCL.
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Instruments traded:

1. Currency futures (USDINR, EURINR, GBPINR, JPYINR) and currency options (USDINR).
2. Maximum maturity of 12 months for currency futures.
3. For currency options, three serial monthly contracts followed by three quarterly contracts of the cycle March/June/September/December.

Clearing for currency markets: Risk management

- The risk management for the currency derivative segment comprises of the initial margins and the extreme loss margins.
- Permissible liquid assets, applicable haircuts and minimum cash equivalent norms same as that of equity derivatives segment.
- For currency futures, the Initial Margin requirement is based on a worst case loss of a portfolio of an individual client across various scenarios of price changes.
- The initial margin is deducted from the liquid net worth of the clearing member on an online, real time basis.

Clearing for currency markets: Risk management

- A currency futures position at one maturity which is hedged by an offsetting position at a different maturity is treated as a calendar spread. The benefit for a calendar spread would continue till expiry of the near month contract.
- Extreme loss margins on the mark to market value of the gross open positions deducted from the liquid assets of the clearing member on an online, real time basis. For a calendar spread position, the extreme loss margin shall be charged on one third of the mark to market value of the far month contract.
- The initial margin and the extreme loss margin are deducted from the liquid assets of the clearing member. Liquid net worth to be at least Rs 50 lacs at all times.

Clearing for currency markets: Risk management

- In case of currency options, the Initial Margin requirement would be based on a worst scenario loss of a portfolio of an individual client comprising his positions in options and futures contracts on the same underlying across different maturities and across various scenarios of price and volatility changes.
- The initial margin is deducted from the liquid networth of the clearing member on an online, real time basis.
- A long currency option position at one maturity and a short option position at a different maturity in the same series, both having the same strike price would be treated as a calendar spread.
- The margin for options calendar spread would be the same as specified for USD-INR currency futures calendar spread.
- Extreme loss margin equal to 1.5% of the notional Value of the open short option position would be deducted from the liquid assets of the clearing member on an on line, real time basis.

Clearing for currency markets: Risk management

- Segregation of clients' money vis-a-vis clearing member's money in place for currency derivatives.
- Position limits on gross open positions at the client level and at the trading member level for all the currency futures and currency options.

Clearing for currency markets: Portfolio margining

- For currency futures, a portfolio based margining approach is adopted to take an integrated view of the risk involved in the portfolio of each individual client comprising his positions in futures contracts across different maturities.
- For currency options, a portfolio based margining approach is adopted to take an integrated view of the risk involved in the portfolio of each individual client comprising his positions in options and futures contracts across different maturities.

Settlement mechanism for currency markets

- The currency futures and options contract are settled in cash in Indian Rupee.
- The settlement price for currency futures is the RBI Reference Rate on the date of expiry for USD and Euro contract and the Pound sterling and Japanese Yen exchange rate published in the RBI Reference Rate publication.
- The last day for trading of the futures contract is two working days prior to the final settlement day.
- The currency futures contract expire on the last working day of the month.

Settlement mechanism for currency markets

- The mark to market gains and losses are settled in cash before the start of trading on T+1 day.
- The Exchange shall impose stringent penalty on members who do not collect margins from their clients.
- For options, premium would be paid in by the buyer in cash and paid out to the seller in cash on T+1 day. Until the buyer pays in the premium, the premium due shall be deducted from the available liquid Net Worth on a real time basis.

Issues in clearing currency markets

- The liquid assets for trading in currency futures would be maintained separately in the currency futures segment of the clearing corporation.

Interest rate futures markets

Participants in the market:

1. Exchanges: NSE, BSE.
2. Clearing houses: NSCCL, ICCL.
3. Depositories: CSDL and NSDL
4. Regulator: SEBI

Instruments traded:

1. 10 year GOI security, 91 day GOI T-bill, 2 year and 5 year notional coupon bearing GOI securities

Clearing interest rate futures markets: Risk management

- Interest rate futures trades subject to three margins: initial margins, extreme loss margin and calender spread margins.
- Initial Margin requirement is based on a worst case loss of a portfolio of an individual client across various scenarios of price changes, deducted from the liquid net worth of the clearing member on an online, real time basis.
- Extreme loss margin of 0.3% of the value of the gross open positions of the futures contract is deducted from the liquid assets of the clearing member on an on line, real time basis.
- Interest rate futures position at one maturity hedged by an offsetting position at a different maturity is treated as a calendar spread.

Clearing interest rate futures markets: Risk management

- Permissible liquid assets, the applicable haircuts and minimum cash equivalent norms are drawn from the equity/currency derivatives segment.
- Position limits on gross open positions at both the client level and at the trading member.
- In case of FIIs, the total gross long position in cash and Interest Rate Futures markets taken together should not exceed their individual permissible limit for investment in government securities and the total gross short position, for the purpose of hedging only, should not exceed their long position in the government securities and in Interest Rate Futures, at any point in time.
- The liquid assets for trading in Interest Rate Futures is provided separately and maintained with the Clearing Corporation.

Interest rate markets: Cross margining

- SPAN used to measure risk of the portfolio of each individual client comprising his positions in futures contracts across different maturities.

Settlement mechanism for Interest rate markets

- The Daily Settlement Price is the closing price of the 10-year Notional Coupon- bearing GoI security futures contract on the trading day.
- The mark-to-market (MTM) gains and losses shall be settled in cash before the start of trading on T+1 day. If MTM obligations are not collected before start of the next days trading, the Clearing Corporation shall collect correspondingly higher initial margin to cover the potential for losses over the time elapsed in the collection of margins.
- The contract would be settled by physical delivery of deliverable grade securities using the electronic book entry system of the existing Depositories (NSDL and CDSL) and Public Debt Office (PDO) of the RBI.

Debt market

Participants in the market:

- Bilaterally negotiated market and exchange traded market.
- Wholesale G-sec market: banks and financial institutions
- Retail G-sec: Direct and indirect members - Primary dealers, public sector institutions, banks, mutual funds, FIIs, provident funds, charitable institutions, trusts and societies
- Clearing house: CCIL
- Settlement: CCIL
- Regulator: RBI

Instruments traded:

- Government securities (wholesale and retail)
- Securities issues by public institutions
- Corporate bond market

Clearing for debt markets: Risk management

- In wholesale debt markets, CCIL collects initial margin and mark to market margins from members on their outstanding positions. Both the margins are collected trade wise and aggregated at the member level.
- Additional volatility margin by CCIL, in case of abnormal volatility shifts.
- CCIL requires maintenance of balance for both initial and mark to market margin under the securities guarantee fund (SGF).
- Members contribution of balances is in the form of eligible government securities, T bills and cash, where cash must account for at least 10 percent of the total margin require- ments.
- Risk management in the retail debt market follows the same procedure as the capital market, i.e. the clearing corporation of the stock exchange imposes a daily margin, which is the sum of the initial VaR margin, the mark to market margin and the extreme loss margin.

Clearing for corporate bond markets

Participants in the market:

- Banks, Financial Institutions, Mutual funds, Corporate, FIIs and Individuals.
- Clearing through corresponding clearing houses.
- The trades are settled at participant level on DvP I basis i.e., on gross basis for securities and funds through the bank and depository participant accounts specified by the participants.
- Types of CMs: TCM, PCM, TM, and SCM.

Instruments traded:

- Commercial paper and bonds
- Instruments traded: corporate bond strips, floating rate bonds with floors and caps, securitized products, corporate bonds with embedded put and call options.
- Tenor of 1-12 years.

Commodity markets

Participants in the market:

- Exchanges: 22 commodity exchanges in total, 5 main exchanges - MCX, NMCE, NCDEX, ACE and ICEX.
- Regulator: Forwards Market Commission (FMC)
- Clearing and settlement: Warehouse, registrar and transfer agent, assayer for physical settlement and clearing houses of exchanges for the settlement of closing out positions, and clearing banks for the settlement of payments
- FIs, NRIs, Banks, MFs etc are not allowed to participate in commodity exchanges currently.

Instruments traded: agri commodities, metals, non-metals, energy.

Clearing for commodity markets: Risk management

- Only PCM are allowed to clear trades.
- Open positions of PCM /arrived at by aggregating open positions of all TMs clearing through him.
- TCM positions arrived at summing client positions.
- Client positions nettet at individual level and grossed across all clients at the member level.
- Propeitary positions netted at a member level.

Clearing for commodity markets: Risk management

- Clearing members need to maintain deposits with the clearing house in the form of Base minimum capital, which comprises of interest free cash security deposit and collateral security deposit.
- Initial margins levied using VaR to cover a one-day loss.
  - For client positions: These are netted at the level of individual client and grossed across all clients, at the member level without any set-offs between clients.
  - For proprietary positions: These are netted at member level without any set-offs between client and proprietary positions.
- Additional margins may be levied for deliverable positions.

Clearing for commodity markets: Risk management

- Liquid networth = Effective deposits - Initial margins
- Effective deposits includes all deposits made by the members in the form of cash, cash equivalents (bank guarantees, fixed deposit receipts and GOI securities)and collaterals form the effective deposits.
- Position limits specified at a member and client level for a commodity and for near month contracts. Typically member level limits are 3-5 times of the client level limits or 15 percent of the market open interest, whichever is higher.

Settlement mechanism for commodity markets

- The fund settlement and margin payments are executed through the clearing bank.
- Two types of settlement: daily mark-to-market (MTM) and final MTM settlement; cash settled by debiting/ crediting the clearing accounts of CMs with the respective clearing bank.
- Settlement involves payments (Pay-Ins) and receipts (Pay-Outs) for all the transactions done by the members.
- Settlement of futures contracts can be done in two ways physical delivery of the underlying asset and by closing out open positions.

Part III

Bottlenecks in the current architecture

Short term points of pain

1. Permissible collaterals for different market players across market segments
2. Loan exposure of custodian banks to FIIs and the issue of IPCs
3. Payment system bottlenecks

Differential collateral across participants

Foreign institutional investors: **Cash market**:

- Initially, margining requirements for trades by institutional investors in the cash segment permitted FIIs to use only cash as collateral.
- In 2010, RBI allowed FIIs to provide collateral in the form of domestic Government securities acquired by FIIs in accordance with the debt limits under the FII regulations and foreign sovereign securities with a AAA rating.

Equity derivatives market:

- Sept 2007: SEBI permits FIIs to offer foreign sovereign securities with AAA rating as collateral to the recognised Stock Exchanges in India for their transactions in derivatives segment.
- Government securities continue to be unavailable to FIIs for derivative transactions.

Loan exposures of custodian banks to FIIs

- In June 2007, RBI allows banks to grant loans and advances to individuals against units of Mutual Funds and issue Irrevocable Payment Commitments (IPCs) to stock exchanges (BSE & NSE) on behalf of Mutual Funds/FIIs.
- However, such exposures were not included by the banks for computation of their Capital Market Exposure.
- RBI advised banks to be judicious in granting loans and asked them to consider the loans and IPCs as capital market exposures.
- FIIs are not permitted to avail of fund or non-fund based facilities such as IPCs from banks. Transition time given to banks to comply with the requirements.
- In Sept 2010, RBI sets up risk mitigation mechanism to safeguard banks from FII defaults. Only those custodian banks to issue IPCs which have an inalienable right over the securities to be received as payout in any settlement.
- In December 2011, RBI extended indefinitely the above risk management provision for custodian banks.

Medium term problems

1. Improved methodologies for risk measurement and management
2. Portfolio based margining systems

Improved risk measurement methodologies

- VaR as industry standard since early 1990s.
- Post the financial crisis, questions raised about the adequacy of VaR to predict short term losses.
- BCBS review of trading book scrapped VaR as the basis of modeling market risk in May 2012.
- Risk management review committee setup in Jan 2012 to review the framework for cash and derivatives markets.

Longer term issues

1. Interoperability between clearing corporations
2. Cross marginging between exchange and OTC positions

Interoperability

- Interoperability in financial markets provides trading firms with the ability to select a clearing house of their choice from a number of valid alternatives.
- Advantages:
  1. Risk management expertise and robustness of their preferred CCP.
  2. One CCP connection to manage, with lower back office costs and op- erational risks.
  3. Lower clearing fees, by concentrating business with one provider.
  4. Lower settlement costs and operational risks, by reducing to one single settlement per stock per day.
  5. Lower funding costs and liquidity needs, both from lower margin requirements through netting and risk offsets.

Risks in interoperability

- Different risk management of trading entities
- Effective cross margining between venues,
- Managing the default risk of the CCPs themselves.
- Difference in timings of payment and collateral across clearing houses.
- Different legal and regulatory oversights.

Risks in interoperability

Interoperability related risks:

1. Contagion Risk among multiple Interoperating CCPs
2. Liquidity risks arising from implementing adequate collateralization
3. CCPs contributing to each others default funds
4. Behaviour of competing CCPs might disrupt market confidence
5. Differences in a CCPs rights and obligations towards their own participants versus interoperating CCPs.

Inter-CCP risk management framework

- The augmentation of default funds to pay margins to cover potential close-out losses in the event of an interoperating CCPs default.
- An Interoperability Convention among all interoperating CCPs to replace confidential bilateral agreements
- Commercial barriers to interoperability should be removed.
- Inter-CCP netting in the long term to minimise obligations, reduce liquidity and settlement risk.

Recent review of post trade institutions

- Clearing corporations are required to be independent entities, which will be separately recognised and supervised by SEBI and will have an independent risk committee that will not just interact with the directors of the corporation but with SEBI directly.
- The minimum networth for the clearing corporation and the depository will be Rs. 300 crores and Rs.100 crores respectively.
- All existing clearing corporations shall be mandated to build up to the prescribed networth of Rs. 300 crores over a period of three years from the date of notification/circular.
- At least 51% holding will be held by stock Exchanges. No single stock exchange, however, will hold more than 51% in any clearing corporation. A Stock Exchange holding 51% in a clearing corporation cannot hold more than 15% in any other clearing corporation.

Recent review of post trade institutions

- To ensure diversified clearing corporation ownership for shareholders other than stock Exchanges, the limit of 5% and 15% shall apply as in the case of stock Exchanges.
- Any stock exchange currently holding more than 51% shall be given three years time to bring its holding to the prescribed limit.

Recent review of post trade institutions

- In case of depositories, minimum 51% holding will be held by sponsors and the existing list of sponsors will continue.
- No other entity will be allowed to hold more than 5% of equity share capital. A single stock exchange will, however, not hold more than 24%.
- Depository may also be allowed to list but not the clearing corporation considering its risk bearing role.
- To bolster the risk management capacity of clearing corporation, the stock exchange will be mandated to transfer 25% of their profits to the Settlement Guarantee Fund (SGF) of the clearing corporations where their trades are settled.
- In case of depository, 25% of the profits will be transferred to Investor Protection Fund (IPF) of the depositories.
- The board of the clearing corporation will not have any clearing member representative.

Recent review of post trade institutions

- The Public Interest Directors (PIDs) representation on the board of clearing corporation will be 2/3 of the board strength. The rest of the board will constitute of shareholder Directors.
- The compensation structure for key management personnel are to be based on the principles of sound compensation practices issued by international fora like Financial Stability Board (FSB).

Thank You