Secondary Market - Clearing and Settlement

Introduction

In 1989, the Group of Thirty (G-30), a non-partisan, not-for-profit, international consultative body, issued a report on the state of securities settlement systems in major securities markets. The report was issued in response to the functioning of the securities settlement infrastructure during the October 1987 market crash and focused on three specific concerns:

- *The systemic risk posed by the settlement system in periods of extreme securities market volume and volatility*
- *The efficiency of the settlement system and its inherent capacity to absorb extraordinary transaction volumes through advanced automated systems*
- *The need for harmony in settlement systems in national markets to eliminate cross- border processing disparities and the resulting risk and inefficiency*

The G-30 report contained nine key recommendations which, when enacted in national markets, would address these issues and concerns. A central recommendation called for all securities trades to be settled on a rolling, three-day period with finality of payment. G-30 called upon market leaders in developed countries to implement the recommendations. Securities settlement systems (SSSs) are an increasingly important component of the domestic and global financial infrastructure. It is for this reason that the Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of IOSCO (International Organization of Securities Commissions) established the Task Force on Securities Settlement Systems in December 1999 to develop recommendations for the safety and efficiency of SSSs.

In November 2001 the CPSS and the Technical Committee of IOSCO published *Recommendations for Securities Settlement Systems*. The November 2001 report sets out and discusses 19 recommendations which identify minimum standards that securities settlement systems should meet to enhance safety and efficiency. The recommendations are designed to cover systems for all types of securities, for securities issued in both industrialized and developing countries, and for domestic as well as cross-border trades. These recommendations have been included in the Key Standards for Sound Financial Systems highlighted by the Financial Stability Forum. National authorities responsible for the regulation and oversight of SSSs are encouraged to assess whether markets in their jurisdiction have implemented the recommendations and to develop action plans for implementation where necessary. The new report of November 2002, also prepared by the Task Force on Securities Settlement Systems, aims to set out a clear and comprehensive methodology for use in these assessments. The committee put up a report to develop a clear and comprehensive methodology for assessing whether the recommendations have been implemented. The methodology is intended primarily for use in self-assessments by national authorities or in peer reviews of such self assessments. It also is intended to serve

as guidance for Financial Sector Assessment Program (FSAP) assessments and for other forms of technical assistance, possibly including financing of reform efforts by the World Bank.

The securities settlement systems (SSS) in the corporate securities market in India have witnessed several innovations during the last one decade keeping in tune with the global developments. These include use of the state-of-art information technology, compression of settlement cycle, dematerialisation and electronic transfer of securities, securities lending and borrowing, professionalisation of trading members, fine-tuned risk management system, introduction of straight through processing, emergence of clearing corporation (CC) to perform the role of central counter party etc., though many of these are yet to permeate the whole market. The discussion in this chapter is, however, largely based on the settlement systems adopted by the National Securities Clearing Corporation Limited, the only CC in the country and by the National Securities Depository Limited, the lead depository.

Core Clearing and Settlement Processes

Traditionally the stock exchange provides the platform for trading to its trading members. While entering an order, the trading member has to identify the clearing member who is going to settle the trades on its behalf. Hence, the clearing house or the CC determines the funds/securities obligations of the trading members and ensures that trading members meet their obligations of securities and funds in time for smooth running of settlement system. The clearing banks and depositories interface provide the necessary connecting mechanism among the custodians/clearing members (CM) for settlement of funds and securities obligations of members. The core clearing and settlement processes include:

Trade Recording: The key details about the trades are recorded to provide basis for settlement. These details are automatically recorded in the electronic trading system of the exchanges.

Trade Confirmation: The counterparties to trade agree upon the terms of trade like security, quantity, price, and settlement date, but not the counterparty which is always the CC. The electronic system automatically generates confirmation by direct participants. The ultimate buyers/sellers of securities also affirm the terms, as the funds/securities would flow from them, although the direct participants are responsible for settlement of trade.

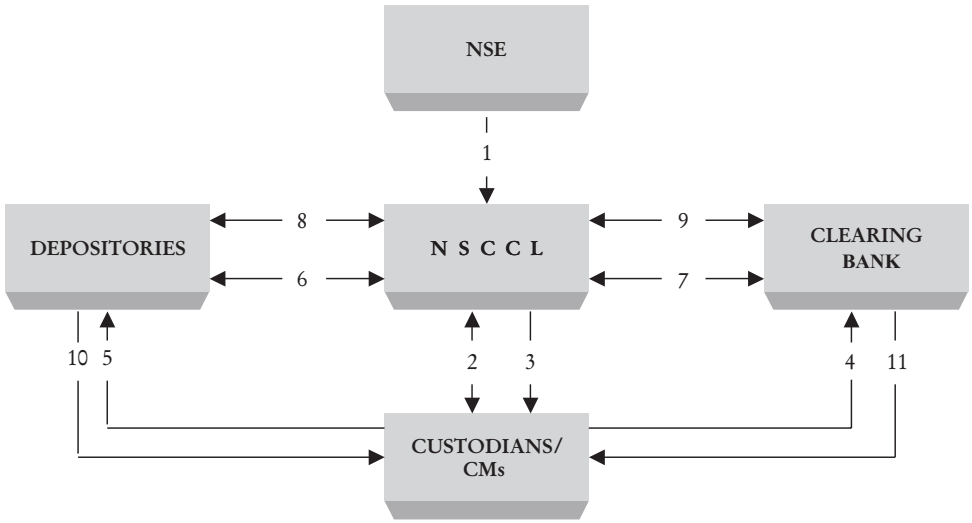
Determination of Obligation: The next step is determination of what counter-parties owe, and what counter-parties are due to receive on the settlement date. The CC interposes itself as a central counterparty between the counterparties to trades and nets the positions so that a member has security wise net obligation to receive or deliver a security and has to either pay or receive funds.

Pay-in of Funds and Securities: The members bring in their funds/securities to the CC. They make available required securities in designated accounts with the depositories by the prescribed pay-in time. The depositories move the securities available in the accounts of members to the account of the CC. Likewise members with funds obligations make available required funds in the designated accounts with clearing banks by the prescribed pay-in time. The CC sends electronic instructions to the clearing banks to debit member's accounts to the extent of payment obligations. The banks process these instructions, debit accounts of members and credit accounts of the CC.

Pay-out of Funds and Securities: After processing for shortages of funds/securities and arranging for movement of funds from surplus banks to deficit banks through RBI clearing, the CC

sends electronic instructions to the depositories/clearing banks to release pay-out of securities/ funds. The depositories and clearing banks debit accounts of the CC and credit accounts of members. Settlement is complete upon release of pay-out of funds and securities to custodians/ CMs. The settlement process for transactions in securities in the CM segment of NSE is presented in the Chart 5-1.

Chart 5-1: Clearing and Settlement Process at NSE



1. Trade details from Exchange to NSCCL (real-time and end of day trade file).
2. NSCCL notifies the consummated trade details to clearing members/custodians who affirm back. Based on the affirmation, NSCCL applies multilateral netting and determines obligations.
3. Download of obligation and pay-in advice of funds/securities.
4. Instructions to clearing banks to make funds available by pay-in time.
5. Instructions to depositories to make securities available by pay-in-time.
6. Pay-in of securities (NSCCL advises depository to debit pool account of custodians/CMs and credit its account and depository does it).
7. Pay-in of funds(NSCCL advises Clearing Banks to debit account of custodians/CMs and credit its account and clearing bank does it).
8. Pay-out of securities (NSCCL advises depository to credit pool account of custodians/CMs and debit its account and depository does it).
9. Pay-out of funds (NSCCL advises Clearing Banks to credit account of custodians/CMs and debit its account and clearing bank does it).
10. Depository informs custodians/CMs through DPs.
11. Clearing Banks inform custodians/CMs.

Risk Management: A sound risk management system is integral to an efficient SSS. The CC ensures that trading members' obligations are commensurate with their net worth. It has put in place a comprehensive risk management system, which is constantly monitored and upgraded to pre-empt market failures. It monitors the track record and performance of members and their net worth; undertakes on-line monitoring of members' positions and exposure in the market, collects margins from members and automatically disables members if the limits are breached.

Settlement Agencies

The CC, with the help of clearing members, custodians, clearing banks and depositories settles the trades executed on exchanges. The roles of each of these entities are explained below:

CC: The CC is responsible for post-trade activities of a stock exchange. Clearing and settlement of trades and risk management are its central functions. It clears all trades, determines obligations of members, arranges for pay-in of funds/securities, receives funds/securities, processes for shortages in funds/securities, arranges for pay-out of funds/securities to members, guarantees settlement, and collects and maintains margins/collateral/base capital/other funds.

Clearing Members: They are responsible for settling their obligations as determined by the CC. They have to make available funds and/or securities in the designated accounts with clearing bank/depositories, as the case may be, to meet their obligations on the settlement day.

Custodians: Custodian is a clearing member but not a trading member. He settles trades assigned to him by trading members. He is required to confirm whether he is going to settle a particular trade or not. If it is confirmed, the CC assigns that obligation to that custodian and the custodian is required to settle it on the settlement day.

Clearing Banks: Clearing banks are a key link between the clearing members and CC for funds settlement. Every clearing member is required to open a dedicated clearing account with one of the clearing banks. Based on his obligation as determined through clearing, the clearing member makes funds available in the clearing account for the pay-in and receives funds in case of a pay-out.

Depositories: Depositories help in the settlement of the dematerialised securities. Each custodian/clearing member is required to maintain a clearing account with the depositories. He is required to make available the required securities in the designated account on settlement day. The depository runs an electronic file to transfer the securities from accounts of the custodians/clearing member to that of CC. As per the schedule of allocation of securities determined by the CC, the depositories transfer the securities on the pay-out day from the account of the CC to those of members/custodians.

Risks in Settlement

The following two kinds of risks are inherent in a SSS:

Counterparty Risk: This arises if parties do not discharge their obligations fully when due or at any time thereafter. This has two components, namely replacement cost risk prior to settlement and principal risk during settlement. The *replacement cost risk* arises from the failure of one of the parties to transaction. While the non-defaulting party tries to replace the original transaction at current prices, he loses the profit that has accrued on the transaction between the date of original transaction and date of replacement transaction. The seller/buyer of the security loses this unrealised profit if the current price is below/above the transaction price. Both parties encounter this risk as prices are uncertain. It has been reduced by reducing time gap between transaction and settlement and by legally binding netting systems. The *principal risk* arises if a party discharges his obligations but the counterparty defaults. The seller/buyer of the security suffers this risk when he delivers/makes payment, but does not receive payment/delivery. This risk can be eliminated by delivery *vs.* payment mechanism which ensures delivery

only against payment. This has been reduced by having a central counterparty which becomes the buyer to every seller and the seller to every buyer. A variant of counterparty risk is *liquidity risk* which arises if one of the parties to transaction does not settle on the settlement date, but later. The seller/buyer who does not receive payment/delivery when due, may have to borrow funds/securities to complete his payment/delivery obligations. This has been reduced by provision for stock lending and margin trading. Another variant is the *third party risk* which arises if the parties to trade are permitted or required to use the services of a third party which fails to perform. For example, the failure of a clearing bank which helps in payment can disrupt settlement. This risk has been reduced by allowing parties to have accounts with multiple banks. Similarly, the users of custodial services face risk if the concerned custodian becomes insolvent, acts negligently or commits fraud.

System Risk: This comprises of operational, legal and systemic risks. The operational risk arises from possible operational failures such as errors, fraud, outages etc. The legal risk arises if the laws or regulations do not support enforcement of settlement obligations or are uncertain. Systemic risk arises when failure of one of the parties to discharge his obligations leads to failure by other parties. The domino effect of successive failures can cause a failure of the settlement system. These risks have been contained by enforcement of an elaborate margining and capital adequacy standards to secure market integrity, settlement guarantee funds to provide counter-party guarantee, legal backing for settlement activities, business continuity plans, etc.

Settlement Cycle

NSCCL clears and settles trades as per well-defined settlement cycles, as presented in Table 5-1. Since the beginning of the financial year 2002, all securities were being traded and settled under T+3 rolling settlement. And from April 1, 2003, trades have been under T+2 rolling settlement. This is a step towards further reducing the settlement cycle to T+1 in 2004. NSCCL notifies the consummated trade details to clearing members/custodians on the trade day. The custodians affirm back the trades to NSCCL by T+1 day. Based on the affirmation, NSCCL nets the positions of counterparties to determine their obligations. A clearing member has to pay-in/pay-out funds and/or securities. A member has a security-wise net obligation to

Table 5-1: Settlement Cycle in CM Segment

Activity	T+3 Rolling Settlement (From April 1, 2002)	T+2 Rolling Settlement (From April 1, 2003)
Trading	T	T
Custodial Confirmation	T+1	T+1
Determination of Obligation	T+1	T+1
Securities/Funds Pay-in	T+3	T+2
Securities/Funds Pay-out	T+3	T+2
Valuation Debit	T+3	T+1
Auction	T+4	T+3
Bad Delivery Reporting	T+5	T+4
Auction Pay-in/Pay-out	T+6	T+5
Close Out	T+6	T+5
Rectified Bad Delivery Pay-in/Pay-out	T+7	T+6
Re-bad Delivery Reporting	T+9	T+8
Close Out of Re-bad Delivery	T+10	T+9

T+1 means one working day after the trade day. Other T+ terms have similar meanings.

receive/deliver a security. The obligations are netted for a member across all securities to determine his fund obligations and he has to either pay or receive funds. Members' pay-in/ pay-out obligations are determined latest by T+1 day and are forwarded to them on the same day so that they can settle their obligations on T+2 day. The securities/funds are paid-in/ paid-out on T+2 day and the settlement is complete in 2 days from the end of the trading day.

The activity schedule for T+2 rolling settlement shall be as follows:

S. No.	Day	Time	Description of Activity
1.	T		Trade Day
2.	T+1	By 11.00 am	Conformation of all trades (including custodial trades). Facility of an exception window for late confirmations would be made available by the exchanges.
		By 1.30 pm	Processing and downloading of obligation files to brokers/custodians
3.	T+2	By 11.00 am	Pay-in of securities and funds
		By 1.30 pm	Pay-out of securities and funds

Policy Developments

SEBI continuously reviews the working of SSS as also the risk management practices being followed by stock exchanges and their clearing corporations and rationalises them according to changing market conditions. The year 2002-03 witnessed major innovations in market practices such as introduction of rolling settlement in a phased manner and shrinkage of the settlement cycle to T+2 days, introduction of market wide circuit breaker, VaR based margining system and margining on gross basis. Major policy developments during the period April 2002 to June 2003 is presented below:

I. No Delivery Period

SEBI directed the stock exchanges to implement the decision to abolish "no delivery period" by May 1, 2002 on account of both closure/record date for corporate actions in respect of securities traded in compulsory demat mode. For implementation of the decision to abolish "no delivery period", any short delivery by any member in the previous settlement where delivery was to be on cum basis can be closed out to the extent of the short delivery if the shares cannot be acquired in auction on cum basis. The mark up price for such a close-out would be 10%. The reference price for the close out would be the latest available closing price at the exchange.

II. Introduction of T+2 Rolling settlement in Equity Market

SEBI had introduced T+5 rolling settlement in equity market from July 2001 and subsequently shortened the settlement cycle to T+3 from April 2002. After having gained experience of T+3 rolling settlement and also taking further steps such as introduction of STP, it is now felt appropriate to further reduce the settlement cycle to T+2 thereby reducing the risk in the market and to protect the interest of investors. Now SEBI has decided to introduce T+2 rolling settlement in Indian equity market from April 1, 2003. The calendar of events/activities in T+2 rolling settlement is as mentioned hereafter.

Confirmation of the institutional trades by the custodians to be sent to Stock exchanges latest by 11.00 a.m. on T+1. A provision of an exception window would be available for late confirmations. The time limit and the additional charges for the exception window would be decided by the exchanges. The exchanges/Clearing House/Clearing Corporation would process and download the obligation files to the brokers' terminals latest by 1.30 p.m. on T+1. DPs shall accept instructions for pay-in of securities by the investors in physical form atleast upto 4 p.m. and in electronic form by 6 p.m. on T+1. The depositories would accept the requests from DPs till 8:00 p.m. for 'same day processing'. The Depository would permit the downloading of the pay-in files of securities and funds till 10:30 a.m. on T+2 from the broker pool accounts. The Depository would process the pay-in requests and transfer the consolidated pay-in files to the Clearing House/Clearing Corporation by 11:00 a.m. on T+2. The Exchanges/Clearing House/Clearing Corporation would execute the pay-out of securities and funds latest by 1:30 p.m. on T+2 to the Depositories and Clearing Banks and the Depositories and the Clearing Banks would in turn complete the process by 2:00 p.m. on T+2.

III. Shorter Settlement Cycle

In a further step towards easy flow of funds and securities SEBI decided to shorten the settlement cycle from the T+3 rolling settlement to T+2 w.e.f April 1, 2003. The activity schedule for which is presented below:

S.No.	Day	Time	Description of Activity
1.	T		Trade Day
2.	T+1	By 11.00 am	Custodial Conformation of trades. Facility of an exception window for late confirmations to be provided.
		By 1.30 pm	Process and download obligation files to brokers/custodians
3.	T+2	By 11.00 am	Pay-in of securities and funds
		By 1.30 pm	Pay-out of securities and funds

SEBI advised the stock exchanges to put in place the following systems for effecting settlement on T+2 basis:

(a) A facility of late confirmation of trades by the custodians. However, the time limit for late confirmation shall be fixed in a manner that the download of the final obligation files to brokers is not delayed.

(b) Stock exchanges shall levy an additional charge to discourage late confirmations by the custodians.

(c) The stock exchanges shall provide a system for handling shortages of funds and securities in an expeditious manner to adhere to the time schedule for pay-out.

(d) The stock exchanges shall also amend their bye laws to mandate the pay-out of funds and securities to the clients by the broker within 24 hours of the payout.

(e) The stock exchanges shall design an alternative clearing and settlement system in respect of companies whose shares have not been dematerialised to align the clearing and settlement system for such stocks with the T+2 rolling settlement.

(f) The stock exchanges shall not normally permit changes in the client ID and shall keep a strict vigil on cases of client code modification and shall implement a monetary penalty structure that shall escalate with the number of such incidences.

(g) Stock exchanges shall encourage members to adopt automatic downloading of pay-in files for securities and funds. The members shall also be encouraged to adopt direct transfer of securities/funds to clients account on pay-out.

The stock brokers are required to adhere to the following schedule in T+2 rolling settlement.

S. No.	Day	Time	Description of Activity
1.	T		Trade Day
2.	T+2	Until 10.30 am	Accept pay-in instructions from investors into pool account
		By 10.30 am	Submit final pay-in files to the depository and the clearing bank.

With the above schedule of activities for the exchange and the brokers, the stock exchanges have to provide facilities desirable for further smoothening of the clearing and settlement viz., online confirmation of trades by custodians, system of capturing details of the client's depository account and bank account, system for online transmitting the client wise pay-in obligation to depository, system wherein pay-out files shall be sent to the clearing banks with a request to online credit to the bank accounts of the clients.

IV. Risk Management in Secondary Market

In pursuance to discussions in the meeting of the Group on Risk Management Systems for Equity Markets, SEBI took following decisions:

i. The margin, which was imposed on the FIs, FIIs, Banks and MFs on the sale position in scrips where there was a positive differential between the minimum VaR (1.75 times Index VaR) and the actual scrips VaR, would not be levied.

ii. The price band of 10%, which was imposed on 53 stocks on which derivatives products were available, would not be applicable.

iii. A client other than FIs, FIIs, MFs, had to maintain a deposit of not less than 10% of his net open position with the broker. It is now decided that if the client position exceeds Rs. 5 lakh, the broker would have to collect 10% margin from the clients. Further, the certification of the collection of this upfront margin would be done by the compliance officer.

Pursuant to the deliberations of the Group on Secondary Market Risk Management regarding the risk management structure after implementation of T+2 rolling settlement w.e.f April 1, 2003 the stock exchanges now have been advised to follow the given structure:-

Categorisation of stocks for imposition of margins

- The risk containment measures for the scrips shall be based on their volatility and liquidity. The scrips shall be classified into three groups *viz.,* stocks having traded at least 80% (+/-5%) of the days for previous eighteen months (from July 1, 2001) would constitute Group I and Group II.
- Out of the scrips identified above, the scrips having mean impact cost of less than or equal to 1% shall be categorised under Group I and the scrips where the impact cost is more than 1, shall be categorised under Group II.

- The remaining stocks shall be categorised under Group III.
- The impact cost shall be calculated at 15th of each month on a rolling basis considering the order book snapshots of the previous six months. On the calculated impact cost, the scrip shall move from one group to another group from the 1st of the next month.
- The impact cost shall be the percentage price movement caused by an order size of Rs. 1 lakh from the average of the best bid and offer price in the order book snapshot. The impact cost shall be calculated for both, the buy and the sell side in each order book snapshot. The computation of the impact cost adopted by the Exchange shall be disseminated on the website of the Exchange.

Risk Containment Measures

VaR based margins

- For the stocks in Group I, the VaR will be scrip VaR (3.5 sigma) computed in a manner specified for the scrip on which stock futures are traded. On the stocks in Group II where the impact cost is more than 1, the VaR margin shall be higher of scrip VaR (3.5 sigma) or three times the index VaR, and it shall be scaled up by √3. For the stocks in Group III, the VaR margin would be equal to 5 times the index VaR and scaled up by √3.
- For determining the margins for Group II and Group III, the minimum index VaR would continue to be taken as 5% as at present.
- The volatility estimates for the scrips and the index for the VaR shall be computed on the price differential of 2 days. The VaR calculated by an exchange at the end of the previous day would be used for the purpose of margin calculations for the transactions carried out on the day.
- In addition to the collection of the VaR based margins, the exchanges shall continue to collect mark-to-market margin. The existing 12% additional margin would phase out progressively and w.e.f April 1, 2003, the additional margin would be reduced to 6%. This additional margin shall be further reduced on the implementation of advance collection of VaR based margins and all the margins would be collected on T+1 basis.
- The exchanges at their discretion may impose additional margin/adhoc margin/special margin on scrip's wherever necessary to contain the risk in the market. The existing provision with respect to capital adequacy and the gross exposure limits shall continue to apply.

Dissemination to the market

- The VaR calculations will be based either on S&P CNX Nifty or BSE Sensex and would be disseminated by the NSE and BSE daily on their websites by 6.30 pm in a downloadable format.

The stock exchanges were advised to implement the margin structure as mentioned above on April 1, 2003.

V. Composition of Capital and Margins

Based on the deliberations of the Advisory committee on Derivatives and Market Risk Management, it is decided to revise the compositions of additional capital and margins and the eligibility criteria for securities as follows:-

Cash and non-cash component of additional capital and margins

a. The minimum cash component of the additional capital and margins shall be increased from the existing level of 30% to 50%.

b. The cash component of additional capital and margins shall be increases to 50% in a manner so that the members/brokers of the Exchange can comply with it by end of June 2003.

c. The cash component may be in the form of cash or cash equivalents. Cash equivalents shall include FDRs, Bank guarantees, government securities and units of the schemes of liquid mutual funds or government securities mutual funds.

d. The bank guarantees shall be considered as cash equivalent only if the guarantees have been provided by the banks whose net worth is more than Rs. 500 crore. The exchanges shall lay down exposure limits either in rupee terms or as percentage of the Trade Guarantee Fund (TGF)/Settlement Guarantee Fund (SGF) that can be exposed to a single bank directly or indirectly and in any case the exposure of the TGF/SGF to any single bank shall not be more than 15% of the total liquid assets forming part of TGF/SGF of the exchange. The exposure as mentioned above would include guarantees provided by the bank for itself or for others as well as debt or equity securities of the bank which have been deposited by members for additional capital or margins.

Eligible Securities

Equity shares classified in Group I at the stock exchange in accordance with the parameters of volatility and liquidity as prescribed in SEBI circular no. SMD/POLICY/CIR-9/2003 dated March 11, 2003 shall be eligible as security for the non-cash component of the additional capital and margin subject to haircut equivalent to the respective VaR of the equity shares. Units of all mutual funds shall also be eligible security for the purpose of non-cash component of additional capital and margin subject to a haircut equivalent to the VaR of the unit's NAV plus any exit load charged by the mutual fund.

The eligible shares for the purpose of the securities portion of the base minimum capital shall only be those which are classified as Group I in terms of the parameters of volatility and liquidity as stipulated in SEBI circular No. SMD/Policy/Cir-9/2003 dated March 11, 2003, subject to a standard haircut of 15%. However, the smaller stock exchanges shall accept the shares that are in the Group I of the BSE or the NSE for the purpose of base minimum capital. The valuation for these shares shall be done at least once a week.

VI. Electronic Funds Transfer (EFT)

To facilitate a vibrant and economical funds transfer facility, RBI proposed to implement a new EFT system called Special Electronic Fund Transfer (SEFT) on April 1, 2003 coinciding with the launch of T+2 rolling settlement. SEFT shall enable transfer of funds inter-bank from one branch of a bank in one location to another branch of the same/another bank in the same/another location in a maximum period of two hours. There shall be no minimum limit on the amount to be transferred to use SEFT although shall have a initial maximum cap of Rs. 2 crore per transfer. Multiple transfers can be considered for higher amounts for funds in the same settlement.

VII. Refund of Base Minimum Capital

Pursuant to the representations form stock exchanges requesting for refund/withdrawal of the base minimum capital (BMC) in view of the insignificant volumes at the exchanges, SEBI has decided to review the capital requirements given in earlier circulars no. SMD/SED/Cir/93/22570 dated October 21, 1993 and SMD/SED/RCG/270/96 dated January 19, 1996, as follows.

The exchanges having average daily turnover of less than Rs.1 crore for the past three consecutive months from the date of the present circular issued on June 18, 2003 may maintain the BMC at Rs 1 lakh. Besides, the exchanges which have the average daily turnover less than Rs.1 crore for any three consecutive months after the date of the circular would also be eligible to maintain the BMC at Rs. 1 lakh. The excess of the BMC over Rs 1 lakh may be refunded to the member subject to the following conditions:

i. The member has been inactive at the stock exchange for the past 12 months

ii. There are no investor complaints pending against the member.

iii. There are no arbitration cases pending against the member.

iv. The exchange shall retain/deduct/debit from the BMC to be refunded, the amount of any complaints/claims of the investors against the member and for dues crystallized and contingent to the exchange/SEBI arising out of pending arbitration cases, appealed arbitration awards, administrative expenses, SEBI turnover fees, etc.

v. The exchange shall ensure that the member has paid the SEBI turnover fees and has obtained a No-Objection Certificate from SEBI in this regard.

However, if the average daily turnover of the exchange exceeds the prescribed level of Rs.1 crore for a period of one month at any time after the date of this circular, the exchange shall enhance the requirement of the BMC of the members back to the level stipulated in SEBI Circular No. SMD/SED/RCG/270/96 dated January 19, 1996 and shall obtain undertaking to this effect from the members.

VIII. Straight Through Processing

SEBI Committee on Straight through Processing (STP) recommended adoption of ISO15022 standards for usage in communication. It proposed that STP may be mandated for institutional investors in the Indian capital markets from December 2, 2002. It advised that the market participants may gear up their systems and processes so that STP may be implemented by December 2002 without any difficulty.

IX. Circuit Breaker in Rolling Settlement

SEBI decided to implement w.e.f. July 2, 2001 an index based market wide circuit breaker system, which will apply at three stages of the index movement either way at 10%, 15% and 20%. These circuit breakers will bring about a coordinated trading halt in all equity and equity derivative markets nationwide. The breakers would be triggered by movement of either BSE Sensex or the NSE S&P CNX Nifty whichever is breached earlier in the following manner:

Duration of trading halt (in minutes)

% movement in either indices in either direction	Before 1 p.m.	1 p.m. to 2 p.m.	2 p.m. to 2.30 p.m.	After 2.30 p.m.
10	60	30	30	No halt
15	120	60	Trading halt for the remainder of the day	
20	Trading halt for the remainder of the day			

These percentages would be translated into absolute points of index variations on a quarterly basis and at the end of each quarter these absolute points of index variations would be revised and be applicable for the next quarter. The absolute points would be calculated based on the closing level of the index on the last day of trading in a quarter and rounded off to the nearest 25 points in the case of the BSE Sensex and the nearest 10 points in the case of the S&P CNX Nifty.

In addition to the market-wide index-based circuit filters, it was also prescribed that there would be individual scrip wise price bands of 20% either way for all scrips in the compulsory rolling settlement except for the scrips on which derivative products are available or scrips included in indices on which derivative products are available. In respect of scrips not in compulsory rolling settlement, the existing price bands would continue to apply. Subsequently, as a temporary measure of stability, a price band of 10% was introduced on all shares on which derivative products are not available (since withdrawn).

Risk Management

There have been umpteen experiments with different risk containment measures in the recent past. These measures have been repeatedly reviewed and revised. This section, however, discusses the measures prevailing as in June 2003.

Capital Adequacy Requirements

The capital adequacy requirements stipulated by the NSE are substantially in excess of the minimum statutory requirements as also to those stipulated by other stock exchanges. The capital adequacy norms to be followed by members are presented in Table 5-2.

Table 5-2: Capital Adequacy Norms for Membership on NSE

Requirement	Members of			Professional Clearing Members of	
	CM and F&O Segment	CM and WDM Segment	CM, WDM and F&O Segment	CM Segment	CM and F&O Segment
Net Worth	Rs. 100 lakh	Rs. 200 lakh	Rs. 200 lakh	Rs. 300 lakh	Rs. 300 lakh
Interest Free Security Deposit (IFSD)	Rs. 125 lakh	Rs. 250 lakh	Rs. 275 lakh	Rs. 25 lakh	Rs. 34 lakh
Collateral Security Deposit (CSD)	Rs. 25 lakh	Rs. 25 lakh	Rs. 25 lakh	Rs. 25 lakh	Rs. 50 lakh

Note: A professional clearing member (PCM) is required to bring in IFSD of Rs. 6 lakh and CSD of Rs. 17.5 lakh (Rs. 9 lakh and Rs. 25 lakh respectively for corporate members) per trading member in the CM segment.

Source: NSE.

The deposits kept with the Exchange as part of the membership requirement are taken as base minimum capital of the member to determine his intra-day turnover limits and/or gross exposure limit. Additional base capital (ABC) is required to be deposited with the NSCCL by the member for taking additional exposure.

Trading and Exposure Limits

NSCCL imposes limits on turnover and exposure in relation to the base minimum capital of a member, which is the amount of funds and securities that a member keeps with the Exchange/ NSCCL.

The members are subject to limits on trading volumes in a day as well as exposure at any point of time. Gross intra-day turnover (Buy+Sell) of a member shall not exceed 33 $\frac{1}{3}$ times of the base capital (cash deposit plus security deposit). Similarly, gross exposure (aggregate of cumulative net outstanding positions in each security, at any point of time) of a member shall not exceed 8.5 times free base capital up to Rs. 1 crore. If a member has free capital in excess of Rs. 1 crore, his exposure shall not exceed Rs. 8.5 crore plus 10 times of the capital in excess of Rs. 1 crore. Members exceeding these limits are automatically and instantaneously disabled by the automated trading system.

Determination of Gross Exposure: The gross exposure of a member is computed across all securities and across all open settlements. Open settlements are all those settlements for which trading has commenced and for which pay-in is yet to be completed. It is arrived at by adding up the absolute values of the products of net cumulative values and the specified adjustment factor, for all securities in which a member has an open position. For this purpose, scrips have been classified in to three groups, based on market capitalisation, impact cost and number of trades. Groups I, II and III have been assigned adjustment factors of 1, 2 and 5 respectively. The determination of gross exposure is illustrated in the Table 5-3.

Members exceeding the gross exposure limit are not permitted to trade with immediate effect until the member's cumulative gross exposure is reduced to below the gross exposure limits as defined above or any such lower limits as applicable to the members. Alternatively, a member may bring in additional base capital resulting in enhanced gross exposure limit.

Table 5-3: Determination of Exposure for Exposure Limits

Day	Net Value (buy value-sale value)			Cumulative Net Value #			Gross Exposure*
	Scrip A	Scrip B	Scrip C	Scrip A	Scrip B	Scrip C	
Day 1	-31,000	-115,000	-49,900	-31,000	-115,000	-49,900	510,500
Day 2	52,500	155,000	146,600	21,500	40,000	96,700	585,000
Day 3	-19,600	-105,000	198,000	1,900	-65,000	294,700	1,605,400
Day 4	9,900	103,000	-750,000	42,800	153,000	-405,400	2,375,800
Day 5	-29,200	-31,000	408,500	-38,900	-33,000	-143,500	822,400
Day 6	-5,000	0	-104,800	-24,300	72,000	-446,300	2,399,800
Day 7	-35,000	22,000	345,600	-69,200	-9,000	649,300	3,333,700
Day 8	36,000	54,300	320,000	-4,000	76,300	560,800	2,960,600

It is the cumulative net values of the scrip for last three days (T to T-2). For example, the exposure at the end of day 6 is cumulative open position of the scrips for days 4 to 6.

* While arriving at the exposure, it is assumed that scrips A, B and C have adjustment factors 1, 2 and 5 respectively. That is, cumulative net values have been multiplied by the adjustment factors and then the absolute values of the products have been summed up to determine exposure.

A penalty of Rs. 5,000 is levied for each violation of gross exposure limit and intra-day turnover limit, which is paid by next day. The penalty is debited to the clearing account of the member. Non-payment of penalty in time attracts penal interest of 15 basis points per day till the date of payment. In respect of violation of gross exposure limit on more than one occasion on the same day, each violation is treated as a separate instance for purpose of calculation of penalty. The penalty is charged to the members irrespective of whether the member brings in additional capital subsequently.

Early pay-in of funds/securities: If members meet funds obligations prior to the funds pay-in day, after satisfying the applicable conditions, then the margin payable by the member is re-computed after considering the funds pay-in. The value of the advance pay-in made is reduced from the cumulative net outstanding position of the member for the purpose of calculating gross exposure.

Similarly, if members deliver securities prior to the securities pay-in day, after satisfying the applicable conditions, then the margin payable by the member is recomputed after considering the above pay-in of securities. The value of the advance pay-in made is reduced from the cumulative net outstanding position of the member for the purpose of calculating gross exposure.

On-line Exposure Monitoring: NSCCL has put in place an on-line monitoring and surveillance system whereby exposure of the members is monitored on a real time basis. A system of alerts has been built in so that both the member and NSCCL are alerted as per pre-set levels (reaching 70%, 85%, 95% and 100%) when the members approach their allowable limits. The system enables NSSCL to further check the micro-details of members' positions, if required and take pro-active action.

The on-line surveillance mechanism also generates various alerts/reports on any price/volume movement of securities not in line with past trends/patterns. For this purpose the exchange maintains various databases to generate alerts. Alerts are scrutinised and if necessary taken up for follow up action. Open positions of securities are also analysed. Besides this, rumors in the print media are tracked and where they are price sensitive, companies are contacted for verification. Replies received are informed to the members and the public.

Inspection and Investigation: As per regulatory requirement, a minimum of 10% of the active trading members are to be inspected every year to verify the level of compliance with various rules, byelaws and regulations of the Exchange. Usually, inspection of more members than the regulatory requirement is undertaken every year. The inspection randomly verifies if investor interests are being compromised in the conduct of business by the members. The investigation is based on various alerts, which require further analysis. If further analysis suggests any possible irregular activity which deviates from the past trends/patterns and concentration of trading at NSE at the member level, a more detailed investigation is undertaken. If the detailed investigation establishes any irregular activity, disciplinary action is initiated against the member. If the investigation suggests suspicions of possible irregular activity across exchanges and/or possible involvement of clients, the same is informed to SEBI.

Margin Requirements

NSCCL imposes stringent margin requirements as part of its risk containment measures. The daily margin comprises of MTM margin and VaR-based margin. The margins are computed at

client level and paid by trading members on T+1 basis. Non-payment of margin attracts a penal charge of 0.09% per day of the amount not paid throughout the period of non-payment.

Mark to Market Margin: Mark to Market (MTM) margin is computed on the basis of mark to market loss to a member. MTM margin is the notional loss which a member would incur in case his cumulative net outstanding positions in all securities were closed out at the closing price of the securities at the end of the relevant day. In case the security has not been traded on a particular day, the latest available closing price at the NSE is considered as the closing price. For each security this is worked out by multiplying the difference between the close price and the price at which the trade was executed by the cumulative buy and sell open position (for buy position the close price being lower than the actual trade price and for sale position, the close price being higher than the actual trade price). The aggregate across all securities is the MTM margin payable by a member. It is calculated as under:

MTM Profit/Loss = [(Net buy quantity * Close Price) - Net Buy value] + [Net sale value - (Net Sale quantity * Close Price)]

The profit/loss across different securities within the same settlement is set off to determine MTM loss for a settlement, but set off benefits across settlements are not allowed. MTM is calculated taking into account client level positions. MTM profit of one client shall not be adjusted against the MTM loss of other clients.

In the event of the net outstanding position of a member in any security being nil, the difference between the buy and sale values is considered as notional loss for the purpose of calculating the mark to market margin payable.

Value at Risk-based Margin: The VaR rate is applied to the security-wise net outstanding position at client level to determine VaR based margin. Such margin computed is added across all clients for all securities to get the VaR margin for a member. The computation of the VaR rate as well as the marginable exposure on which VaR rate is applied is explained below.

Computation of VaR Rate

VaR rate is a single number, which encapsulates whole information about the risk in a portfolio. It measures potential loss from an unlikely adverse event in a normal market environment. It involves using historical data on market prices and rates, the current portfolio positions, and models (e.g., option models, bond models) for pricing those positions. These inputs are then combined in different ways, depending on the method, to derive an estimate of a particular percentile of the loss distribution, typically the 99^{th} percentile loss. The step by step computation of VaR-based margin is explained below.

- Obtain the closing price of the security (for the days on which it was traded in the exchange) and closing index values for the previous one-year period. Let these be
  - Closing prices of the security → $CP_0, CP_1, CP_2, \ldots\ldots\ldots CP_n$
  - Closing values of index → $CV_0, CV_1, CV_2, \ldots\ldots\ldots CV_n$

  Calculate the logarithmic returns with respect to previous day's closing price of the security/closing value of index for each day in the reference period. Logarithmic return (R_n) for day 'n' can be computed using the formula:
  - For scrip → $R_n = LN(CP_n/CP_{n-1})$
  - For index → $R_n = LN(CV_n/CV_{n-1})$

Compute initial volatility by calculating the standard deviation of returns for the one year period using the formula:

Standard deviation $\sigma_0 = \sqrt{\sum_{i=1}^{n} (\overline{R} - R_i)^2 / n}$

where $\overline{R}$ is the average return for the reference period.

- Calculate daily volatility for subsequent days. For day 1, the volatility will be

$$\sigma_1 = \sqrt{\lambda(\sigma_o)^2 + (1-\lambda)R_1^2}$$

Similarly for day 2

$$\sigma_2 = \sqrt{\lambda(\sigma_1)^2 + (1-\lambda)R_2^2}$$

Where, λ=0.94, a parameter which indicates how rapidly volatility estimate changes. This value has been arrived at on the basis of the empirical study done by Prof. J R Varma.

Calculate VaR for the scrip at 3.5σ level and VaR for the index at 3σ level. A higher σ level is used for the scrip because the scrip is expected to have higher volatility as compared to the index, which is a portfolio. The volatility estimate at 3σ level represents 99% VaR.

- Calculate VaR for a security or index for a particular day using the σ for both long positions and short positions.
  - For scrip,
    VaR for short positions = Exponential (3.5σ)-1, and
    VaR for long positions =1- Exponential (-3.5σ).
  - For index,
    VaR for short positions = Exponential (3σ)-1, and
    VaR for long positions =1- Exponential (-3σ)

To ensure that risk for all possible situations is covered, long VaR or short VaR, whichever is higher, is considered as the VaR for the scrip or index, as the case may be.

Derive index-based scrip VaR from the index VaR. The VaR Multiplier (relative volatility of the scrip as compared to that of index) is multiplied with index VaR to get the index-based scrip VaR. A minimum VaR multiplier of 1.75 has been stipulated by SEBI for the calculation of index-based scrip VaR. VaR multiplier for scrips is computed on a monthly basis by dividing 'average standard deviation of the scrip return for last six months' by 'average standard deviation of the index return for last six months'.

For the securities, which come under Group I of the SEBI classification, Index-based VaR or scrip VaR, whichever is higher, is used as the VaR for the scrip. For all other securities 3 times Index VaR is used as the VaR for the scrip. An additional margin of 6% is added to this applicable VaR. This additional margin is applied in order to safeguard against the remaining 1% cases. The total VaR margin calculated using the above steps is rounded up to the higher integer. This percentage so derived is the VaR margin rate, applicable on the open position. Maximum VaR applicable on a scrip, however, shall not exceed 100%.

NSE disseminates VaR margin rates to the members and public at large through its website. VaR margin rate for each security is provided on a daily basis, at the end of each trading day. These rates are applicable on the positions at the end of next trading day. A separate file is also provided on a daily basis for the VaR margin rates applicable for the institutional trades on the net outstanding sale positions at the end of next trading day. A file on the multiplier is provided on a monthly basis, detailing the multiplier to be applied on each security in the following month.

All margins are payable on trade day plus one. Members are required to compute their margin obligations and deposit the margin money in cash, bank guarantee or FDRs, rounded off to the next higher multiple of Rs. 10,000.

The margins deposited in cash on a given day are released to the member on the subsequent day after adjustment for margin, ABC and any other funds dues. If a member delivers securities prior to the securities pay-in day, the margin payable by him is recomputed after considering the above pay-in of securities. The value of the advance pay-in made is reduced from the cumulative net outstanding position of the member for the purpose of gross exposure limits.

Determination of Exposure

The exposure to be reckoned for the purpose of applying VaR-based margin rates is determined in the manner illustrated in Table 5-4. It is arrived at by adding up the absolute values of the net cumulative positions for all securities in which a member has an open position, assuming the member has only two clients and no proprietary position. It is also assumed that the scrips A, B, C and D attract VaR rate of 25%, 30%, 35% and 40% respectively.

Table 5-4: Determination of Exposure for VaR Margins

Client A

Day	Net Value (buy value-sale value)				Cumulative Net Value*				VaR Margin for the Day #
	Scrip A	Scrip B	Scrip C	Scrip D	Scrip A	Scrip B	Scrip C	Scrip D	
VaR Rate	25%	30%	35%	40%	25%	30%	35%	40%	
Day 1	5,000	-115,000	-49,900	3,100	5,000	-115,000	-49,900	3,100	54,455
Day 2	52,500	155,000	146,600	-248,300	57,500	40,000	96,700	-245,200	158,300
Day 3	43,000	-105,000	198,000	-100,700	95,500	50,000	344,600	-349,000	299,085
Day 4	65,000	103,000	-750,000	969,300	108,000	-2,000	-552,000	868,600	568,240
Day 5	-29,200	-31,000	408,500	-49,900	35,800	72,000	-341,500	919,400	517,835
Day 6	-5,000	0	-104,800	96,700	-34,200	-31,000	303,700	46,800	142,865
Day 7	-35,000	22,000	345,600	294,700	-40,000	22,000	240,800	391,400	257,440
Day 8	36,000	54,300	320,000	-455,300	1,000	76,300	665,600	-160,600	320,340

Client B

Day	Net Value (buy value-sale value)				Cumulative Net Value*				VaR Margin for the Day #
	Scrip A	Scrip B	Scrip C	Scrip D	Scrip A	Scrip B	Scrip C	Scrip D	
VaR Rate	25%	30%	35%	40%	25%	30%	35%	40%	
Day 1	-31,000	13,600	122,000	69,500	-31,000	13,600	122,000	69,500	82,330
Day 2	9,800	-43,900	-33,000	59,800	-21,200	-30,300	89,000	129,300	97,260
Day 3	8,500	-59,300	94,000	64,800	18,300	-103,200	61,000	124,600	106,725
Day 4	9,900	-33,200	45,300	-25,700	18,400	-92,500	139,300	39,100	96,745
Day 5	5,940	-31,000	-115,000	-36,400	15,840	-64,200	-69,700	-62,100	72,455
Day 6	-5,000	21,500	40,000	-24,000	940	-9,500	-75,000	-60,400	53,495
Day 7	25,000	1,900	-65,000	53,000	20,000	23,400	-25,000	29,000	32,370
Day 8	36,000	11,800	38,000	48,500	61,000	13,700	-27,000	101,500	69,410

Member

Day	Net Value (buy value-sale value)				Cumulative Net Value*				VaR Margin for the Day #
	Scrip A	Scrip B	Scrip C	Scrip D	Scrip A	Scrip B	Scrip C	Scrip D	
VaR Rate	25%	30%	35%	40%	25%	30%	35%	40%	
Day 1	36,000	128,600	171,900	72,600	36,000	128,600	171,900	72,601	136,785
Day 2	62,300	198,900	179,600	308,100	78,700	70,300	185,700	374,500	255,560
Day 3	51,500	164,300	292,000	165,500	113,800	153,200	405,600	473,600	405,810
Day 4	74,900	136,200	795,300	995,000	126,400	94,500	691,300	907,700	664,985
Day 5	35,140	62,000	523,500	86,300	51,640	136,200	411,200	981,500	590,290
Day 6	10,000	21,500	144,800	120,700	35,140	40,500	378,700	107,200	196,360
Day 7	60,000	23,900	410,600	347,700	60,000	45,400	265,800	420,400	289,810
Day 8	72,000	66,100	358,000	503,800	62,000	90,000	692,600	262,100	389,750

It is the sum of absolute cumulative net values multiplied with the VaR rate for all scrips.
* It is the cumulative net values of the scrip for last two days (T and T-1), as margins are collected on T+1 basis. For example, the exposure at the end of day 6 is cumulative open position of the scrips for days 5 and 6.

Index-based Circuit Filters

An index based market-wide circuit breaker system applies at three stages of the index movement either way at 10%, 15% and 20%. These circuit breakers bring about a coordinated trading halt in all equity and equity derivatives markets nation wide. The breakers are triggered by movement of either S&P CNX Nifty or Sensex whichever is breached earlier. As an additional measure of safety, individual scrip-wise price bands of 20% either way have been imposed for all scrips, including debentures and warrants. However, in respect of scrips for which derivative products are available or those included in indices on which derivative products are available, a daily price limit of 10% is applicable. Any order above or below 20% over the base price comes to the Exchange as a "price freeze". NSE may suo moto cancel the orders in the absence of any immediate confirmation from the members that these orders are genuine or for any other reason as it may deem fit. The Exchange views entries of non-genuine orders with utmost seriousness as this has market-wide repercussion.

Settlement Process

The settlement process begins as soon as members' obligations are determined through the clearing process. The settlement process revolves around the clearing corporation, which with the help of clearing banks and depositories, with clearing corporation providing a major link between clearing banks and depositories ensures actual movement of funds as well as securities on the prescribed pay-in and pay-out day.

This requires members to bring in their funds/securities to the clearing corporation. The CMs make the securities available in designated accounts with the two depositories (CM pool account in the case of NSDL and designated settlement accounts in the case of CSDL). The depositories move the securities available in the pool accounts to the pool account of the clearing corporation. Likewise CMs with funds obligations make funds available in the designated accounts with clearing banks. The clearing corporation sends electronic instructions to the clearing banks to debit designated CMs' accounts to the extent of payment obligations. The banks process these instructions, debit accounts of CMs and credit accounts of the clearing corporation. This constitutes pay-in of funds and of securities.

After processing for shortages of funds/securities and arranging for movement of funds from surplus banks to deficit banks through RBI clearing, the clearing corporation sends

electronic instructions to the depositories/clearing banks to release pay-out of securities/ funds. The depositories and clearing banks debit accounts of the clearing corporation and credit accounts of CMs. This constitutes pay-out of funds and securities.

Settlement is deemed to be complete upon declaration and release of pay-out of funds and securities. The settlement is performed by NSCCL as per well-defined settlement cycle for rolling and account period settlement. The settlement cycles for the CM segment are presented in Table 5-1. Under Rolling Settlement, the securities/funds pay-in/pay-out takes place on T+2 day. While pay-in of securities/funds takes place at 11.00 am on T+2 day, the pay-out of securities/funds takes from 1.30 p.m. on same day. Thus settlement is complete in 2 days from the end of the last day of the trading cycle.

Dematerialised Settlement

In order to promote dematerialisation of securities, NSE joined hands with leading financial institutions to establish the National Securities Depository Ltd. (NSDL), the first depository in the country, with the objective of enhancing the efficiency in settlement systems as also to reduce the menace of fake/forged and stolen securities. This has ushered in an era of dematerialised trading and settlement. SEBI has made dematerialised settlement mandatory in an ever-increasing number of securities in a phased manner, thus bringing about an increase in the proportion of shares delivered in dematerialised form. The share of demat delivery in total delivery at NSE increased to more than 99% in value terms during 2002-03. There is an increasing preference to settle trades, particularly in high value securities, in demat form.

Settlement Guarantee

After the execution of trade, the NSCCL becomes the counter-party to each transaction and ensures that funds and securities obligations are met. It provides settlement on the strength of a settlement guarantee fund. A large Settlement Guarantee Fund, which stood at Rs. 14,868 million at the end of March 2003, provides the cushion for any residual risk. It operates like a self-insurance mechanism where members contribute to the Fund. In the event of failure of a trading member to meet settlement obligations or committing a default, the Fund is utilised to the extent required for successful completion of the settlement. This has eliminated counter-party risk of trading on the Exchange. The market has full confidence that settlement shall take place in time and shall be completed irrespective of default by isolated trading members.

Other stock exchanges have been allowed by SEBI to use trade guarantee funds maintained by them for meeting the shortages arising out of non-fulfillment/partial fulfillment of funds obligations by members in a settlement before declaring the concerned member a defaulter as in the case of NSCCL, subject to the condition that: (a) in cases where the shortage was in excess of the BMC, the trading facility of the member was withdrawn and the securities pay out due to the member was withheld, (b) in cases where the shortage exceeded 20% of the BMC and was less than the BMC on six occasions within a period of three months, the trading facility of the member was withdrawn and the securities pay-out to the member was withheld. On recovery of the complete shortages, the member would be permitted to trade with a reduced exposure.

Professional Clearing Member

NSCCL admits a special category of members called Professional Clearing Members (PCM). A PCM clears and settles trades executed for their clients (individuals, institutions etc.). In

such an event, the functions and responsibilities of the PCM would be similar to Custodians. PCMs may also undertake clearing and settlement responsibility for trading members. In such a case, the PCM would settle the trades carried out by the trading members connected to them. The onus for settling the trade would be thus on the PCM and not the trading member. A PCM has no trading rights but has only clearing rights, i.e. he just clears the trades of his associate trading members and institutional clients.

Settlement Statistics

The details of settlement of trades on CM segment of NSE are provided in Annexure 5-1. About 22.5% of trades in terms of volume and 14.2% in terms of value were settled by delivery during 2002-03. There has been a substantial reduction in short and bad deliveries. Short deliveries averaged around 0.6% of total delivery in 2002-03. The ratio of bad deliveries to net deliveries progressively declined to almost negligible in 2002-03 There has been a dramatic pick-up in demat settlement which accounted for more than 99% of total delivery-based settlement in value terms during the period.

During 2002-03, taking all stock exchanges together, 24.42% of securities accounting for 14.35% turnover were settled by delivery and the balance were squared up/netted out (Table 5-5). In the preceding year, 24.38% of shares accounting for 15.21% of turnover were settled by delivery. This indicates preference for non-delivery-based trades, particularly in high volume securities and reflects the impact of rolling settlement.

Table 5-5: Delivery Pattern in Stock Exchanges

(In per cent)

Exchange	2001-02		2002-03	
	Quantity	Value	Quantity	Value
NSEIL	21.30	13.98	22.62	14.23
Mumbai	31.65	19.52	32.13	16.02
Calcutta	10.55	6.69	13.23	6.13
Delhi	45.91	32.12	65.40	18.92
Ahmedabad	4.89	2.93	1.59	0.64
Uttar Pradesh	2.53	0.92	2.53	1.56
Bangalore	22.30	28.86	0.00	1.56
Ludhiana	9.65	6.20	0.00	0.00
Pune	3.95	2.94	5.88	0.00
OTCEI	1.29	0.53	0.00	0.00
Hyderabad	57.53	19.80	37.13	34.78
ICSEIL	0.53	17.43	0.33	0.19
Chennai	10.23	9.07	0.00	0.00
Vadodara	0.00	0.00	0.00	0.00
Bhubaneshwar	0.00	0.00	0.00	0.00
Coimbatore	0.00	0.00	0.00	0.00
Madhya Pradesh	6.17	3.83	0.00	0.00
Magadh	0.00	0.00	0.00	0.00
Jaipur	0.00	0.00	0.00	0.00
Mangalore	0.00	0.00	0.00	0.00
Gauhati	100.00	100.00	23.81	210.00
SKSE	0.00	0.00	0.00	0.00
Cochin	2.72	6.35	0.00	0.00
Total	**24.38**	**15.21**	**24.42**	**14.35**

* Delivery ratio represents percentage of delivery to turnover of a Stock Exchange
Source: SEBI.

Settlement Efficiency

During last couple of years, the clearing and settlement mechanism in India has improved considerably. This is clearly evident from the benchmarks of settlement efficiency compiled by Standard and Poor's as presented in Table 5-6. These benchmarks which are expressed as a score out of 100, provide an indication of the aggregate level of post-trade operational efficiency in securities markets. The Settlement Benchmark provides a means of tracking the evolution of settlement performance over time. The Settlement Benchmark for India improved from

Table 5-6: Benchmarks of Settlement Efficiency

(Score out of 100)

Benchmark	1994	1995	1996	1997	1998	1999	2000	2001	2002
Settlement	8.3	-16.8	-0.7	-1.2	10.0	41.9	59.6	75.8	89.3
Safekeeping	71.8	75.0	76.6	76.8	69.7	78.1	81.9	86.7	89.7
Operational Risk	28.0	0.0	16.8	23.5	47.3	43.6	51.4	59.1	65.2

Source: S&P Fact Book 2002.

8.30 in 1994 to 89.3 in 2002. The Safekeeping Benchmark provides the efficiency of a market in terms of collection of dividends and interest, reclamation of excess withheld taxes, and protection of rights in the event of a corporate action. India's score for safekeeping improved from 71.80 in 1994 to 89.7 in 2002. The Operational Risk Benchmark takes into consideration the settlement and safekeeping benchmarks and takes into accounts other operational factors such as the level of compliance with the G30 recommendation, the complexity and effectiveness of the regulatory and legal structure of the market, and counterparty risk. The status of Implementation of G30 recommendations on the Corporate Securities market in India are presented in Table 5-7. India scored 65.2 out of 100 in Operational Risk Benchmark in 2002 as per the said S&P Statistics as compared to 28.00 in 1994.

Table 5-7: Status of Implementation of G30 Recommendations

	Recommendations	Corporate Securities Market
1a.	All comparisons of trades between direct market participants (i.e. brokers broker/dealers and other exchange member) should be accomplished by T+0.	It is no more relevant as trades are matched on the screen based trading system in the Exchange and matched trade details are linked to settlement system of the Clearing Corporation electronically. Hence trade comparison and confirmation are instantaneous.
1b.	Matched trade details should be linked to the settlement system.	
2.	Indirect market participants (such as institutional investors and other indirect trading counterparties) should achieve positive affirmation of trade details by T+1.	This has been largely achieved as contract notes are required to be issued within 24 hours of the trade that can be affirmed by the market participants. The Exchanges have also voluntarily introduced system of trade verification through web-enabled services for the benefit of all market participants.
3a.	Each country should have in place an effective and fully developed central securities depository, organised and managed to encourage the broadest possible direct and indirect industry participation.	There are in place fully developed two depositories which maintain and transfer ownership records in electronic form for the entire range of securities. The securities are held in depository in dematerialised form. The systems are in place for smooth inter-depository

Contd...

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	Recommendations	Corporate Securities Market
		transfer of securities. Today about 100% of securities settlement takes place through depositories. The uniform of set of rules issued by SEBI governs the depositories. Securites are freely moved from one depository to another for settlement purpose.
3b.	The range of depository eligible instruments should be as wide as possible.	
3c.	Immobilisation or dematerialisation of financial instruments should be achieved to the utmost extent possible.	
3d.	If several CSDs exist in the same market, they should operate under compatible rules and practices, with the aim of reducing settlement risk and enabling efficient use of funds and available cross-collateral.	
4a.	Each market is encouraged to reduce settlement risk by introducing either Real Time Gross Settlement or	The RBI is planning to introduce RTGS in January 2004 The present capital market settlement system of the clearing coproration relies on multilateral netting the obligations to determine obligations of members who have security-wise net obligations to receive/deliver and a fund obligation to pay or receive.
4b.	a trade netting system that fully meets the "Lamfalussy-recommendations"	
5	Delivery based payment (DvP) should be employed as the method of settling all securities transactions. DvP means simultaneous, final, irrevocable and immediately available exchange of securities and cash on a continuous basis through out the day.	The trading members pay-in funds/securities as determined after netting of obligations to the clearing corporation which in turn pays-out funds and securities to the receiving trading members. The clearing corporation has full control over receeipts and payments and does not make pay-out to receiving trading members unless the concerned trading members have fulfilled their respective pay-in obligations. This is akin to DvP in the sense that there is no principal risk, that is, a member making pay-in is guaranteed of pay-out by the clearing corporation.
6a.	Payments associated with the settlement of securities transactions should be made consistent across all instruments and markets by adopting the "same day" funds convention.	The pay-in and pay-outs for both funds and securities take place on the same day.
6b.	Payments associated with the servicing of securities portfolios should be made consistent across all instruments and markets by adopting the "same day" funds convention.	
7a.	A rolling settlement system should be adopted by all markets.	Rolling settlement was introduced for all listed securities from December 31, 2001 while settlement of funds and securities on T+2 basis have been introduced from April 1, 2003.
7b.	Final settlement for all trades should occur no later than T+3.	
8a.	Securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions.	SEBI has framed securities lending and borrowing scheme under which approved intermediaries can lend securities.

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	Recommendations	Corporate Securities Market
8b.	Existing regulatory and taxation barriers that inhibit the practice of lending and borrowing of securities should be removed.	These have been removed. It has been clarified that the lending of securities would not be treated as 'transfer' so as to attract the provisions relating to capital gains under the Income Tax Act.
9a.	Each country should adopt the standard for securities message developed by the International Organisation of Standardisation (ISO Standard 7775). For Staright through processing, the common messaging standards is ISO 15022.	The depositories and clearing coprorations use message strcuture based on SWIFT standards.
9b.	In particular, countries should adopt the ISIN numbering system for securities issues as defined in the ISO Standard 6166.	ISINs have been issued by SEBI. ISIN numbering system is being used by exchanges and depositories for settlement of securities in demat form.

ISSA Recommendations 2000

The international standards have been instrumental in improving safety and efficiency of the SSS. Table 5-8 attempts to assess Indian SSS for corporate securities in terms of ISSA recommendations, which have become universal benchmarks. The Indian SSS seems to have

Table 5-8: Indian Securities Settlement System vis-à-vis ISSA Recommendations 2000

I.	***Governance:*** *The SSS (Depositories/CC) have a primary responsibility to their users and other stakeholders. They must provide effective low cost processing. Services should be priced equitably.*	
	Are the boards that govern the SSS answerable to its users?	The boards are not explicitly answerable to its users, but to their promoters and the regulators.
	Does any single organisation, or a sector have a large voting position at the board of the SSS?	There are dominant shareholders in the depositories/CC.
	Is there cross subsidisation of products (e.g. international services subsidised by local ones or transaction costs subsidised by asset servicing charges)?	The depositories do not charge the investors and clearing members directly but charge its participants uniformly, who are free to have their own charge structure for their clients. However, the charges levied by depositories from participants and by participants of the same depository from clients vary widely. The CC does not levy any fee directly from members, but shares the transaction fee levied by the exchanges. These charges have reduced drastically over time with increase in volumes.
	What process is in place at the SSS to ensure that it meets the needs of all its stakeholders (e.g. institutions, broker dealers, retail investors, issuers)?	The SSS, being companies, are governed by the Companies Act, 1956 which prescribes operational and financial standards. Besides, a depository is governed by the Depositories Act, 1996 and the regulations made there under. A CC is governed by the rules and regulations made under the SCRA, 1956. They generally evolve policies in consultation with the regulator and various committees which comprise of representatives of users and eminent persons.
	What is the communications strategy of the SSS to its stakeholders and how is this run?	The SSS maintain websites and disseminate information through press releases, circulars and newsletters. They hold annual general meetings and publish annual reports detailing its actions and plans as well as financials.

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II	***Technology – Core Processing**: Securities Systems must allow the option of network access on an interactive basis. They should cope with peak capacity without any service degradation, and have sufficient standby capabilities to recover operations in a reasonably short period within each processing day.*	
	How often, over the last twelve months, have the SSS been required to change its published settlement timetable?	There has been no disruption of settlement schedule drawn by CC. The depositories adhere to the settlement schedules.
	Do the SSS operate real time or multiple batch processing for settlement?	The CC settles the trades in batches. But the depositories process the batches on real time. They also do real time settlement for off-market trades.
	Do the SSS allow interactive communication (on line real time) with its users, enabling settlement input and amendment?	Though securities are settled in batches, there is online real time interactive communication between the CC and the depositories, clearing bank and clearing members/custodians. The depositories also have interactive communication with their participants, and allow demat account holders to submit delivery instructions directly on the internet.
	Have the SSS ever failed to recover an outage within a reasonable time and what steps have been taken to prevent a similar event in the future?	This has never occurred. The depositories and the CC, however, maintain disaster recovery sites.
III	***Technology – Messaging and Standards:** The industry worldwide must satisfy the need for efficient, fast settlement by full adherence to the International Securities Numbering process (ISO 6166) and uniform usage of ISO 15022 standards for all securities messages. The industry should seek to introduce a global client and counterpart identification methodology (BIC-ISO 9362) to further facilitate straight through processing. Applications and programmes should be structured in such a way as to facilitate open inter-action between all parties.*	
	Does the market use ISIN as the primary securities identification code?	The market uses ISINs for all demat securities.
	Are the major participants in the market linked electronically?	The major exchanges provide nation-wide satellite links. The exchanges are also connected to CC which is connected to clearing banks, depositories, custodians and members electronically. Paper instructions are generally not used.
	Do the SSS communicate using true (i.e. not bilaterally agreed on sub-standards) ISO standards for securities messaging?	The depositories have bilaterally agreed automatic interfaces with participants and clearing agencies. The message structure is based on SWIFT/ISO 15022 standards.
	Does the market operate standard identification codes for counterparties or client accounts and, if so, how do these fit into a single global identification methodology?	The regulator has made it mandatory for all brokers to use unique client code for all clients. The depository participants have a unique identification numbers and they, in turn, allot client identification numbers. The market is yet to adopt universal client identification/ global identification methodology.
IV	***Uniform Market Practices:** Each market must have clear rules assuring investor protection by safe guarding participants from the financial risks of failed settlement and ensuring that listed companies are required to follow sound policies on corporate governance, transfer of economic benefits and shareholder rights.*	
	Does the market have securities lending and borrowing schemes in place, and are these open to all market participants and their settlement agents?	There is a securities lending and borrowing scheme in place. The FIIs can lend, but can not borrow.
	Does the settlement system mark fail trades to market and collect margin from the failing counterparty to protect the innocent counterpart's interest?	The CC identifies the short deliveries and conducts a buy-in auction on the day following the pay-out day. The clearing member is debited on the pay-out day by an amount equivalent to the securities not delivered, and valued at a valuation price based on the closing price on

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	the previous day. If the buy-in auction price is more than the valuation price, the clearing member is liable for the difference. All shortages not brought in are deemed closed out at the highest price between the first day of the trading period until the day of squaring off, or closing price on the auction day plus 20%, whichever is higher. This amount is credited to the receiving member's account on the auction payout day.
Does the market operate a guarantee fund or have an equivalent procedure to protect against the cost of failed transactions; and which sectors of the market does it cover?	The exchanges maintain Settlement Guarantee / Trade Guarantee Funds and use these funds for meeting shortages arising out of non-fulfillment/partial fulfillment of the funds obligations by the members in a settlement before declaring him a defaulter. There is no limit on pay-out per incident and all legitimate claims are honoured. The exchanges can use up to 25% of their guarantee funds to cover failures of payment during the allotment of IPOs for shares offered through them. Exchanges maintain an Investor Protection Fund to take care of investor claims arising out of non-settlement of obligations by a member. There is a limit on the amount payable per investor claim.
Are the stock transfer agents (share registrars) linked electronically to the depository?	Registrars and transfer agents are electronically linked to both the depositories. The depositories transfer securities electronically.
Is there a legal maximum time period to complete ownership transfers in the books of the issuer? If so, does market practice adhere to the deadline?	The Companies Act, 1956 requires companies to effect the transfers within 60 days. However, the dematerialized securities are freely transferable and depositories effect such transfers instantaneously. Over 99% of securities transactions are currently settled in demat form.
Are investors entitled to all benefits arising on a security from the point of purchase; and how are these rules enforced?	Based on the record date/book closure, the exchanges determine 'no-delivery' period during which securities are traded ex-benefits and before that cum-benefits. The purchaser gets all the benefits from the date of purchase before no-delivery period. Physical securities require registration of transfer in favour of purchaser in order to entitle him to corporate actions.
Is proxy voting permissible in the market and can such proxies be lodged by post or other remote delivery method?	A proxy can attend and vote at the meeting of the company, but can not participate in the deliberations. The document appointing a proxy need to be deposited at least 48 hours before the meeting. It is possible for a member to caste his vote by post also.
Are there binding rules in the market stating the minimum and maximum lapsed time between the announcement and completion of key events, including registration, the calling of shareholder meetings, the payment of dividends or interest, rights issues, tender offers and other voluntary corporate actions?	These are prescribed in the Companies Act, 1956 and the listing agreements. For example, a share transfer shall be registered within 60 days of presentation, the dividend shall be paid to shareholders within 30 days from the date of declaration, annual general meeting shall be held every year and not more than 15 months shall lapse between two such meetings, at least 21 days' notice shall be given for general meetings, etc.
Are all voluntary corporate actions advised through a central mechanism assuring consistent information to all investors?	Ex-dates for voluntary corporate actions are announced by the exchanges. These may differ among exchanges and on the same exchange for physical and dematerialized shares. These are disseminated through the web sites of the company, exchanges and depositories.

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		The regulator has put in place an integrated source of company information, which is accessible through a web site on lines similar to that of Electronic Data Gathering, Analysis and Retrieval (EDGAR). All company related information, which is mandatorily required to be filed by the companies with the exchanges under the listing agreement, are be available at one location in electronically interactive form.
	Is information on corporate actions available electronically, and is the minimum lapsed time for responding to such actions sufficient to enable all domestic and foreign investors to respond in a timely and considered fashion?	The exchanges notify members of corporate actions through their websites and circulars. These are also available on the web site of the company and the depositories. Generally, sufficient time is available to all investors to respond to corporate actions.
V	***Reduction of Settlement Risk:*** *The major risks in securities systems should be mitigated by five key measures, namely real delivery versus payment, trade date plus one settlement cycle, the minimisation of funding and liquidity constraints, scrip-less settlement, and mandatory trade matching and settlement performance measures.*	
	Does the market use DvP settlement procedures in accordance with one of the recognised BIS models?	The market uses a variant of BIS model 3 that settles transfer instructions for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle. The CC applies multilateral netting to determine obligations of members who have a security wise net obligation to receive/deliver and a fund obligation to pay/receive. The members pay-in fund/securities to the CC which in turn pays-out funds/securities to them. The CC has full control over receipts and payments and does not make pay-out unless pay-in has been received. This is akin to DvP in the sense that there is no principal risk, that is, a member making pay-in is guaranteed of pay-out.
	Does the market have a rolling settlement cycle of T+3 or shorter for all exchange traded instruments?	All other securities compulsorily moved to rolling settlement in December 2001 and the settlement cycles have been shortened from T+3 rolling settlement to T+2 rolling settlement from April 1, 2003.
	Could the market reduce the current settlement period to T+2 or below, without increasing fails rates? If so, how would this be achieved, and what plans are there to shorten the existing settlement cycle?	Limited availability of EFT constrains shorter settlement cycle. EFT is available only at 15 centres covering 8500 bank branches and that too, for values not exceeding Rs. 2 crore per transfer. The market has moved to T+2 rolling settlement from April 2003 and is expected to switch to T+1 rolling settlement by April, 2004.
	Is matching of trade details achieved on trade date, at least for direct market participants; and by trade date plus one for indirect participants?	Trades are executed on screen and matched trade details are linked to settlement system electronically. Hence matching of trades for direct participants is instantaneous. The custodians affirm trade details on T+1 basis.
	Is the depository scrip-less, and, if not, is it working to enable scrip-less settlement?	The depositories maintain ownership records of dematerialised securities and transfer the ownership electronically in book entry form.
	Does the market allow partial settlements?	The participants accept partial deliveries.
	Can the depository accommodate same day turnarounds?	The depositories do so for off-market transactions. Since institutions are required to do only delivery based transactions on exchanges and CC processes settlement in batches, same day turnaround is difficult.

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VI	***Market Linkages:*** *Convergence of Securities Systems, both within countries and across borders, should be encouraged, where this eliminates operational risk, reduces cost and enhances market efficiency.*	
	Is the depository linked electronically and in real time with other segments of the core market infrastructure (e.g. trading platforms, netting systems, payment systems)?	The depositories have secured real time linkages with CC which is connected with trading platform, netting and payment system.
	Is there one or more depository or settlement system in the market?	Each stock exchange has its own clearing agency. There are two depositories which are linked to most of the exchanges/clearing agencies.
	If there are several, has a consolidation been considered? If yes, by when?	The consolidation of trading and settlement system is left to market forces. There are 23 stock exchanges with equal number of clearing agencies and two depositories. The law encourages multiple agencies in the interest of competition.
	Does the securities system allow foreign systems to establish direct links on an equal basis to local members?	The system does not allow external agencies to participate in the securities system.
	Does the securities system allow foreign market participants to become direct participants?	The system does not allow foreign intermediaries to become direct market participants. They become direct participants through their local subsidiaries or joint ventures with local partners.
VII	***Investor Protection****: Investor compliance with the laws and regulations in the home countries of their investments should be part of their regulators' due diligence process. Investors, in turn, should be treated equitably in the home country of their investments especially in respect to their rights to shareholder benefits and concessionary arrangements under double tax agreements.*	
	Do domestic regulators monitor the procedures in place at their locally based cross-border custodians to assure compliance with the laws and regulations of the home countries of their investments?	SEBI regulates locally-based cross border custodians and RBI maintains oversight for foreign and local banks licensed to operate in India.
	What are the areas (e.g. benefits, investor compensation) where foreign investors are not treated in the same way as local investors?	The foreign investors are generally treated at par with domestic investors. However, there are ceilings on investments by OCBs, NRIs, PIOs, and FIIs. The FIIs can not engage in short selling, turnaround trading and securities borrowing.
	Can sales proceeds and income be repatriated without any restrictions?	These can be repatriated only after certain tax compliance.
	Are double tax agreements simple to apply, and do foreign investors receive promptly their full entitlement to dividends and interest payments?	The double taxation agreements are simple to apply. The dematerialisation has helped foreign investors to receive their entitlements promptly.
VIII	***Legal Infrastructure****: Local laws and regulations should ensure that there is segregation of client assets from the principal assets of their custodian; and no possible claim on client assets in the event of custodian bankruptcy or a similar event.*	
	Under local rules and regulations, what are the segregation requirements for keeping client assets and custodian assets in the depository?	The brokers and depository participants are required to segregate their assets from those of their clients.
	How are clients' assets protected in the event of insolvency of a custodian or depository?	The securities held with a custodian or depository can not be attached in case of insolvency, as they are not legal owners.
	Does local law recognise the existence of beneficial owners who may differ from the legal owner of a security?	The Depositories Act, 1996 explicitly created legal owners and beneficial owners for dematerialized securities. While the depository is the registered owner of the securities, the investors are beneficial owners.

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Does local law clearly define the point of time when a settlement, both for the security and the cash involved, achieves finality and thus cannot be unwound?	The settlement is complete with pay-out of securities/ funds to members. In fact once a trade is executed; it is eventually be settled and can not be unwound in between.
Does a pledgee have an absolute right to realise their security at all times?	The pledgee generally has such a right. On receipt of a notice from the pledgee, the depository records him as the beneficial owner in respect of pledged securities.
Does the depository have loss sharing provisions in its rules, and how would these be applied?	The depositories indemnify the beneficial owners of securities for any loss caused to them due to the negligence of the depositories or their participants. The depository can, however, recover the loss from the participant responsible for loss. Besides, the depositories have taken comprehensive insurance for business risk and system risk.

met most of the recommendations in spirit, if not in letters. For example, the SSS may have dominant shareholders or their boards may not be accountable to users directly, but there are systems in place in the form of Executive Committee or Committee on Settlement Issues to receive input from users. The key areas where substantial improvements are required to fully comply with ISSA standards are governance of SSS, messaging standards, and risk management. More importantly, the SSS model, as implemented by NSCCL, needs to be replicated for the whole market. Table 5-9 gives a comparative depiction of the Indian Securities Settlement System vis-à-vis the BIS-IOSCO recommendations of November 2002.

Table 5-9: Indian Securities Settlement System vis-à-vis BIS-IOSCO Recommendations

	Recommendations	Corporate Securities Market
	Legal Risk	
1.	**Legal Framework:** Securities settlement systems should have a well founded, clear and transparent legal basis in the relevant jurisdiction.	There are multiple laws govering trading and settlement in securities market. The Securities Contracts (Regulations) Act 1956 talks about trading while Indian Companies Act 1956 talks of transfer of ownership of shares. Moreover, the settlement issues are handled through Rules, Byelaws, Regulations, circulars, etc. of the exchanges as well as Clearing Corporation which has approval from the regulator. The laws, regulations, rules and procedures, and contractual provisions governing the operation of SSSs are public and accessible to system participants. The legal framework demonstrates a clear legal basis and a high degree of legal assurance for each aspect of the settlement process. The rules and contracts are enforceable in the event of the insolvency of a system participant. All market participants are treated as same in the eye of law.
	Pre-settlement Risk	
2.	**Trade Conformation:** Confirmation of trades between direct market participants should occur as soon as possible after trade execution, but no later than trade date (T+0). Where confirmation of trades by indirect market participants (such as institutional investors) is required, it should occur as soon as possible after trade execution, preferably on T+0, but no later than T+1.	Trades are executed on the screen-based system and matched trade details are linked to the settlement system. Hence confirmation of trades between direct participants are instantaneous and on-line information is passed on to both buyer and seller. The custodians must affirm the trades on T+1 basis for indirect market participants like institutional investors and FIIs.

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3	**Settlement Cycles:** Rolling settlement should be adopted in all securities markets. Final settlement should occur no later than T+3. The benefits and costs of a settlement cycle shorter than T+3 should be evaluated.	The market has moved to T+2 settlement basis from April 2003 and is scheduled to move to T+1 in 2004. The market has introduced STP in December 2002 and utimately would move to RTGS as and when it would be introduced by the regulators.The introduction of T+2 settlement did not increase the failed trades and today the bad delivery/ objection account for negligible amount. The risk management as well as penal provisions encourage counterparties to settle their obligations on the contractual dates.
4	**Central counterparties (CCPs):** The benefits and costs of a CCP should be evaluated. Where such a mechanism is introduced, the CCP should rigorously control the risks it assumes.	The Clearing Corporation provides novation to the system and guarantees the settlement. It has put in place comprehensive risk management system to preempt market failures. The exchange maintains Settlement Guarantee Fund (SGF) which is a contributed fund from the members and uses the same for meeting any shortages arising out of non-fulfillement /partial fulfillment of the funds obligations by members before declaring him a defaulter. The settlement guarantee is available to all trading members and in respect of all securities traded in the capital market segment of the exchange unless and until it is specifically provided for. The netting is multilateral and has sound and transparent legal basis as provided in the Rules, Byelaws and Regulations of the Clearing Corporation. The CCP manages its credit risk vis-a-vis participants through initial margins in terms of their minimum base capital as well as the VaR based margining system to cover the market risk.The CCP handles defaults through available legal provisions. The CCP have transparent and enforceable loss allocation rules.
5	**Securities lending:** Securities lending and borrowing (or repurchase agreements and other economically equivalent transactions) should be encouraged as a method for expediting the settlement of securities transactions. Barriers that inhibit the practice of lending securities for this purpose should be removed.	A securities lending and borrowing scheme is operational. Barriers to securities lending and borrowing have been removed. However, it constitutes a very insignificant part of the market. Securities lending and borrowing are guided by specific regulatory provisions as issued by market regulator (SEBI).
	Settlement Risk	
6	**Central securities depositories (CSDs):** Securities should be immobilised or dematerialised and transferred by book entry in CSDs to the greatest extent possible.	Almost all listed securities are traded and settled in book entry form. The securities held in depositores are dematerialised and are transferred through book entry form. There is clear provisions in Depositories Act which clearly identifies legal ownership and beneficial ownership.
7	**Delivery *versus* Payment (D*v*P):** CSDs should eliminate principal risk by linking securities transfers to funds transfers in a way that achieves delivery versus payment.	The clearing members pay-in funds and securities to the Clearing Corporation which in turn pays out funds and securities to the receiving clearing members.The Clearing Corporation has full control over receipts and payments and does not make pay-out unless the clearing member fulfills his obligations of pay-ins. This is akin to D*v*P in the sense that there is no principal risk. A member is guaranteed of pay-out if he fulfills its obligations. Hence, the technical, legal and contractual framework ensures that pay-outs take place only if pay-ins are received from a member.
8	**Timing of settlement finality:** Final settlement should occur no later than the end of the settlement day. Intraday or real-time finality should be provided	The settlement calender is well defined by the Clearing Corporation which is followed by all market participants. All final settlements occur on the settlement date. The risk management system has a control over the position/

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	where necessary to reduce risks.	exposure of the members which depends on their capital contribution to the exchange and margin money deposited with the Clearing Corporation. The settlement delivery instructions issued by ultimate clients are irreversible. Final settlement take place on T+2 basis.
9	**CSD risk controls to address participants' failures to settle:** CSDs that extend intraday credit to participants, including CSDs that operate net settlement systems, should institute risk controls that, at a minimum, ensure timely settlement in the event that the participant with the largest payment obligation is unable to settle. The most reliable set of controls is a combination of collateral requirements and limits.	The Clearing Corporation has put in place a comprehensive risk management mechanism encompassing capital adequacy of members, adequate marginging requirement, limits on exposure as well as intraday positions, indemnity cover through insurance, online position monitoring and automatic disablment. The Clearing Corporation ensures that the settlement takes place as scheduled irrespective of payment obligations of members. VaR based margining system takes care of potential losses and liquidity pressures from participant's failures to settle. Overdrafts or debit balances in securities are not permitted by depositories.
10	**Cash settlement assets:** Assets used to settle the ultimate payment obligations arising from securities transactions should carry little or no credit or liquidity risk. If central bank money is not used, steps must be taken to protect CSD members from potential losses and liquidity pressures arising from the failure of the cash settlement agent whose assets are used for that purpose.	The settlement agents used for funds settlement are the banking system and to reduce the risk on concentraing on a single bank, the Clearing Corporation has agreements with commercial banks that include private as well as state owned banks for participating as clearing banks. Exposure to settlement banks are not concentrated and the financial condition of the settlement banks is monitored and evaluated by the Clearing Corporation. Though the failure of such settlement banks can not be ruled out, it has not happened so far.
	Operational Risk	
11	**Operational reliability:** Sources of operational risk arising in the clearing and settlement process should be identified and minimised through the development of appropriate systems, controls and procedures. Systems should be reliable and secure, and have adequate, scalable capacity. Contingency plans and backup facilities should be established to allow for timely recovery of operations and completion of the settlement process.	The Clearing Corporation as well as Depositories have back up facilities for the failure of key systems in the form of disaster sites. The business continuity plan (disaster sites) of the Clearing Corporation has been tested are always in sync with the main system. The system provides for preservation of all transaction data. The contingency plans ensure at a minimum that the status of all transactions at the time of the disruption can be identified with certainty in a timely manner. The business continuity plan of the Clearing Corporation is reviewd regularly. External audit of the IT/ systems takes place on continuing basis.
	Custody Risk	
12	**Protection of customers' securities:** Entities holding securities in custody should employ accounting practices and safekeeping procedures that fully protect customers' securities. It is essential that customers' securities be protected against the claims of a custodian's creditors.	The depositories holding securities balances of the beneficial holders reconcile their records with the depository participants on daily basis. Depositories indemnify the investors for any loss arising out of its negligence or of any depository participant. Insolvency laws are adhered to and arrangements are in place at depositories to move the customer's position to a solvent intermediary. The entities holding securities balances for clients like custodians as well as depsotory participants and the depository itself are subjected to internal as well as external audit. Depositories as well as custodians are also regulated by the market regulator. For investors, the exchanges have Investor Protection Fund which is used to compensate an investor who suffers on account of default by a trading member.
	Other Issues	
13	**Governance:** Governance arrangements for CSDs and CCPs should be designed	The governance structure of CCPs and CSDs are designed to meet the public interest. These companies have been

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	to fulfil public interest requirements and to promote the objectives of owners and users.	floated under Companies Act 1956 which has specific requirement with regard to its activities. These entities provide information about its operations through their websites, press releases, circulars, etc. for the stakeholders. The rules, byelaws and regulations and circulars are available in public domain for the benefit of the users. The management of the CCPs and CSDs are accountable to the board. The board is determined on the basis of the shareholding pattern of the CSDs and CCPs. The board has also representation from public, academics as well as from the regulators. No decision is opaque and all decisions are communiacted to users through circulars as well as press releases.
14	**Access:** CSDs and CCPs should have objective and publicly disclosed criteria for participation that permit fair and open access.	The access rules/criteria are clearly disclosed to public through various forms. These criteria/rules have been framed by the regulator depending on various parameters in the interest of public as well as healthy competition. All such access criteria/rules have been designed in terms of perceived risk only. The procedure facilitating the orderly exit of particpants that no longer meet membership criteria also has been clearly disclosed to members. The information regarding continuing membership is publicly disclosed.
15	**Efficiency:** While maintaining safe and secure operations, securities settlement systems should be cost-effective in meeting the requirements of users.	The system providers like exchanges as well as CSDs have their internal methods of cost control which is passed on the members in the form of reduced transaction costs. The costs of trading, settlement, depository services, etc. to investors have come down progressively in recent years. The exchanges, Clearing Corporation, CSDs, etc. have their own review method to monitor service levels. However, no such regular survey of its users have been conducted. But the capacity levels are reviewed regularly to keep in tandem with the volume of business.
16	**Communication procedures and standards:** Securities settlement systems should use or accommodate the relevant international communication procedures and standards in order to facilitate efficient settlement of cross-border transactions	The present system does not envisage cross-border transaction directly coming to the settlement system. However, the system has the ability to easily convert domestic procedures and standards into the relevant international communication procedures as depositories use SWIFT for messaging. In order to introduce STP, it is proposed to adopt SWIFT ISO 150022 messaging standards as common messaging standard.
17	**Transparency:** CSDs and CCPs should provide market participants with sufficient information for them to identify and evaluate accurately the risks and costs associated with using the CSD or CCP services.	The CSDs and CCPs make clear disclosures to market participants about its rules, regulations, relevant laws, governance procedures, risks management system in place, the rights and obligations of participants and the cost of participation in the system. These are all available in the form of print outs as well as through websites. These rules, byelaws, regulations have also been framed with the consent of the regulator keeping public interest in mind. Set procedures and internal as well as external audit makes it process transaparent and current.
18	**Regulation and oversight:** Securities settlement systems should be subject to transparent and effective regulation and oversight.Central banks and securities regulators should cooperate with each other and with other relevant authorities.	The settlement system is regulated and overseen by the market regulator through inspection. Settlement banks are governed by central bank of the country and hence subject to the annual inspection by central banks. The settlement system is primarily a non-statute based approach and the relevant regulators have experienced staff, relevant resources and funding to carry out regulatory and oversight functions

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		effectively. There is a framework for cooperation between the securities regulator and the central bank, such as for the exchange of information and views on securities settlement system. There is regular interaction between central bank and securities market regulator. High Level Committee on Capital Markets (HLCC) ensures coordination among regulator.
19	**Risks in cross-border links:** CSDs that establish links to settle cross-border trades should design and operate such links to reduce effectively the risks associated with cross-border settlements.	Currently there is no provision to have cross-border trades settlement through CSDs. Present system does not allow any cross border links to the settlement system.

Policy Debates

Delivery versus Payment

The settlement systems are broadly of two types: deferred net settlement (DNS) and real time gross settlement (RTGS). In DNS, the clearing process nets the sell/buy positions of members over a period of time and each member settles only the net amount on a specified day. The liquidity requirements are considerably smaller under DNS. In RTGS, on the other hand, the settlement of all transactions (buy and sell) is done instantly on a gross basis. Members maintain sufficient liquidity throughout the trading cycle, as they have to settle all claims assigned to them. The RTGS is gaining popularity all over the world as it takes care of systemic risk arising out of default by any one member. RTGS, in specific context of securities settlement, means D*v*P, which completely eliminates or substantially reduces the *principal risk*, i.e., the risk that the seller of a security could deliver the security but did not receive payment, or the buyer of a security made payment but did not receive the delivery of the security. Thus, D*v*P system increases the efficiency of settlement arrangement.

The D*v*P system is generally preferred for large-volume transactions and internationally, it has been introduced for settlement of government securities. Several variants of D*v*P are in vogue. There are: (i) systems that settle transfer instructions for both securities and funds on a gross basis with final delivery of securities and payment of funds taking place simultaneously, (ii) systems that settle securities transfer instructions on a gross basis with final delivery of securities occurring throughout the trading cycle, but settle funds transfer instructions on a net basis with final payment of funds occurring at the end of the cycle, and (iii) systems that settle transfer instructions for both securities and funds on a net basis, with final transfer of both securities and funds occurring at the end of the trading cycle. It may be noted that D*v*P system in government securities is operating in India through subsidiary general ledger (SGL) accounts. Further progress in this regard is contingent upon implementation of EFT facility and RTGS in payment system.

D*v*P in securities settlement, though a difficult task, remains the ultimate goal of clearing and settlement agencies. The G 30 recommendations, which have been driving the best practices in the securities markets all over the world, specify that D*v*P should be employed as the method of settling all securities transactions, where D*v*P means simultaneous, final and irrevocable exchange of securities and cash on a continuous basis throughout the day. The ISSA also recommended implementation of real D*v*P as one of the key measures to mitigate risks in

securities settlement systems. It may be emphasised that the requirement of D*v*P settlement is at the level of direct participants and not at the level of clients.

Funds Clearing

Settlement of trades requires smooth, preferably instantaneous, movement of securities and funds in accordance with the prescribed schedule of pay-in and pay-out. NSE has been endeavouring to speed up movement of both funds and securities. The securities can now move instantaneously since all the participants have accounts with either of the two depositories, which are connected to each other and are connected to the Exchange. The movement of funds is not so instantaneous as only a few banks empanelled as clearing banks by NSCCL have the facility to transfer funds electronically. As participants have accounts in different banks at different places, movement of funds among participants invariably requires clearance through RBI's payment system. Further, the funds coming in and the funds going out of a clearing bank for settlement purposes rarely match requiring movement of funds from one clearing bank to another by using the RBI clearing system. This constrains same day pay-in and pay-out. The funds do not reach the accounts of investors on the same day as the NSCCL effects pay out to the trading members. These could be addressed if the clearing corporation directly participates in the RBI's clearing.

Clearing Corporation

The anonymous order book does not allow participants to assess the counter party risk. It is, therefore, necessary that the exchanges use a clearing corporation to provide novation and settlement guarantee. NSCCL provides such novation for all trades executed on NSE. Similar facility should be provided for trades on other exchanges. It is not necessary that each stock exchange must have its own exclusive clearing corporation. It may be better if the stock exchanges use the services of a clearing corporation or a few clearing corporations, as they share the depository services. Such an arrangement allows the clearing corporation to have an overall view of gross exposure position of traders across the stock exchanges and is much better geared to manage the risk. However, to provide for necessary competition, it is essential that there are at least two clearing corporations, just as this has been ensured in the case of depositories.

The clearing corporation ensures financial settlement of trades on the appointed day and time irrespective of default by members to bring in the required funds and/or securities, with the help of a 'Settlement Guarantee Fund'. This has revolutionised the volumes in the secondary market. It is important to keep improving the value of the Settlement Guarantee Fund by adding back all the accruals to the fund, subject to administrative expenses, to retain and build up the faith that the retail and foreign investment have reposed in the settlement mechanism. For this purpose, it is necessary to exempt the income of the Clearing Corporation from the purview of income tax.

As the clearing corporation guarantees financial settlement, it is necessary that it has first lien over the assets of insolvent clearing members.

It is meaningful for a clearing corporation to net all liabilities falling due on any given day for all types of settlement. As long as the clearing corporation is a centralised legal counter-party, risk management would dictate that it nets all obligations vis-à-vis each counter-party to itself.

Annexure 5-1: Settlement Statistics in CM Segment

Month/ Year	No. of Trades (mn.)	Traded Quantity (mn.)	Quantity of Shares Deliverable (mn.)	% of Shares Delivered to Total Shares Traded	Turnover (Rs. mn.)	Value of Shares Deliverable (Rs. mn.)	% of Delivery to Value of Shares Traded	Securities Pay-in (Rs. mn.)	Short Delivery (Auctioned quantity) (mn.)	% of Short Delivery to Delivery	Unrectified Bad Delivery (Auctioned quantity (mn.)	% of Unrectified Bad Delivery to Delivery	Funds Pay-in (Rs. mn.)	Settlement Guarantee Fund (Rs. mn.)*
Nov 94-Mar 95	**0.3**	**133**	**69**	**51.74**	**17,280**	**8,980**	**51.98**	**6,112**	**0.6**	**0.85**	**0.18**	**0.26**	**3,004**	**–**
1995-96	**6**	**3,901**	**726**	**18.62**	**657,420**	**117,750**	**17.91**	**58,045**	**18**	**2.46**	**3.22**	**0.44**	**32,583**	**–**
1996-97	**26**	**13,432**	**1,645**	**12.25**	**2,923,140**	**326,400**	**11.17**	**137,899**	**38**	**2.32**	**6.63**	**0.40**	**72,121**	**–**
1997-98	**38**	**13,522**	**2,205**	**16.31**	**3,700,100**	**597,748**	**16.15**	**217,125**	**33**	**1.51**	**7.29**	**0.33**	**108,272**	**–**
1998-99	**55**	**16,531**	**2,799**	**16.93**	**4,135,730**	**662,038**	**16.01**	**307,551**	**31**	**1.09**	**6.97**	**0.25**	**121,754**	**5,840**
1999-00	**96**	**23,861**	**4,871**	**20.42**	**8,030,497**	**826,070**	**10.29**	**797,828**	**63**	**1.30**	**11**	**0.23**	**279,921**	**13,910**
2000-01	**161**	**30,420**	**5,020**	**16.50**	**12,638,978**	**1,062,774**	**8.41**	**949,621**	**34**	**0.68**	**1.16**	**0.023**	**459,367**	**29,160**
Apr-01	9	1,632	564	34.57	282,261	60,829	21.55	52,139	2	0.28	0.0043	0.0008	19,155	27,510
May-01	15	2,776	643	23.15	518,350	73,711	14.22	37,519	2	0.24	0.0019	0.0003	19,758	26,200
Jun-01	13	2,280	513	22.52	431,360	59,601	13.82	40,579	1	0.27	0.0010	0.0002	16,260	24,085
Jul-01	10	1,315	297	22.59	290,920	37,210	12.79	40,205	2	0.70	0.0002	0.0001	18,300	21,100
Aug-01	11	1,551	302	19.46	285,720	39,620	13.87	35,313	3	1.03	0.0003	0.0001	18,470	21,020
Sep-01	12	1,655	314	18.94	337,180	39,330	11.66	38,074	2	0.51	0.0000	0.0000	20,680	18,695
Oct-01	15	1,978	349	17.62	352,250	42,470	12.06	41,360	4	1.15	0.0000	0.0000	19,540	18,030
Nov-01	14	2,265	487	21.48	374,710	56,790	15.16	54,678	5	0.95	0.0000	0.0000	23,110	18,758
Dec-01	17	2,922	593	20.29	530,976	71,844	13.53	69,244	5	0.81	0.0000	0.0000	30,347	18,761
Jan-02	23	3,833	573	14.95	713,290	79,400	11.13	78,486	4	0.68	0.0000	0.0000	34,400	18,365
Feb-02	17	2,687	660	24.57	488,230	79,820	16.35	79,353	4	0.59	0.0000	0.0000	30,160	18,659
Mar-02	17	2,576	636	24.69	475,962	77,034	16.18	76,577	4	0.62	0.0000	0.0000	30,301	17,880
2001-02	**172**	**27,470**	**5,930**	**21.59**	**5,081,208**	**717,658**	**14.12**	**643,525**	**36**	**0.61**	**0.01**	**0.0001**	**280,481**	**17,880**
Apr-02	21	3,011	751	24.95	561,302	89,325	15.91	88,556	6	0.81	0.00	0.0000	32,156	17,450
May-02	21	3,379	832	24.62	534,145	87,320	16.35	86,758	5	0.66	0.00	0.0000	31,617	17,140
Jun-02	20	3,914	1,023	26.14	463,339	80,005	17.27	79,551	6	0.62	0.00	0.0000	27,277	17,193
Jul-02	21	3,684	1,035	28.09	502,623	84,070	16.73	83,577	7	0.67	0.00	0.0000	29,420	16,888
Aug-02	19	2,682	509	18.96	454,430	53,115	11.69	52,748	3	0.59	0.00	0.0000	21,522	16,510
Sep-02	18	2,525	443	17.55	468,940	52,712	11.24	52,355	2	0.56	0.00	0.0000	23,364	16,289
Oct-02	20	2,659	460	17.30	513,820	57,340	11.16	57,043	2	0.46	0.00	0.0000	25,990	15,878
Nov-02	17	2,307	443	19.22	501,710	64,515	12.86	64,110	2	0.52	0.00	0.0000	26,353	15,651
Dec-02	22	3,377	757	22.43	638,722	88,595	13.87	88,233	4	0.46	0.00	0.0000	33,914	15,665
Jan-03	23	3,502	815	23.28	628,151	91,694	14.60	91,279	4	0.49	0.00	0.0000	33,549	15,328
Feb-03	19	2,859	603	21.10	487,172	67,367	13.83	67,092	2	0.38	0.00	0.0000	26,442	15,206
Mar-03	18	2,642	563	21.32	461,341	63,501	13.76	63,169	2	0.44	0.00	0.0000	29,316	14,868
2002-03	**240**	**36,541**	**8,235**	**22.54**	**6,215,694**	**879,560**	**14.15**	**874,470**	**47**	**0.57**	**0.00**	**0.0000**	**340,920**	**14,868**

* Balance at the end of period.