Report

of

Working Group

On

Screen Based Trading

In

Government Securities

I N D E X

Introduction

1. The Negotiated Dealing System (NDS) is an electronic platform owned and maintained by RBI. It has been posted on the **In**dian **Fi**nancial **Net**work (INFINET) maintained by **I**nstitute for **D**evelopment and **R**esearch in **B**anking **T**echnology (IDRBT), a fully owned initiative of RBI. Originally conceived to facilitate dealings in government securities – Central/State Government securities and Treasury Bills (gilts) and money market instruments, NDS was intended to be mainly used as a trading/reporting system for secondary market gilts transactions and for electronic submission of bids in primary auctions of gilts by RBI. Over time, while the nature and scope of activities carried out in NDS has expanded, as indicated below, its primary focus remains the gilts market.

NDS – Current Activity Scope

2. NDS current activity scope includes –

- Reporting of all outright and repo gilt trades concluded in the Over-the-Counter (OTC) secondary market;
- Order entry for quote driven market in gilts;
- Negotiation mode for concluding gilts deals;
- Submission of bids for primary gilts auctions;
- Reporting of call and notice money transactions;
- Reporting of term money transactions;
- Value free transfer of gilts;
- Electronic down-load of security balances in SGL/CSGL Accounts with PDO

3. NDS operations commenced on February 15, 2002. Almost all market participants who maintain Current and SGL Accounts with RBI have joined NDS. Most SGL transactions at the Public Debt Office (PDO), Mumbai are now on electronic mode through NDS. Similarly, bids in LAF, gilts auctions are being generally submitted electronically through NDS resulting in reduced auction bid processing time, besides minimising clerical errors. To provide wider access to the data on the gilts market, information on trades captured by the NDS is being disseminated through the RBI's website since October 25, 2002 on near real time basis. With mandatory reporting requirement in respect of all call/notice money and term money market transactions, regulatory access to such information is now better with reduced reporting time lags. Although several members fail to report all their money market transactions or report them with considerable time lags, market players have generally benefited from the reporting system in that assessment of market trends are now more meaningful.

4. NDS has helped in achieving paperless and straight through clearing and settlement of secondary market gilts trades through CCIL as a central counterparty. The system has brought about significant improvements in transactional efficiency and transparency. Better dissemination of information on market deals and moves towards deepening the gilts market have also been facilitated as reflected in the better price discovery and increased market turnover. NDS has had its share of woes and problems too. These problems faced by the NDS could be classified into two categories, viz.; technical issues and business related issues.

5. On the technical front, problems have largely hovered around the periodic disruptions in NDS usage, loss of network connectivity, performance related issues, inadequacy of technical/help-desk support, etc. The common perception on business related issues point largely to the lack of user-friendly features and functionalities of the NDS. Resultantly, the core aim of proper development of the domestic gilts market has perhaps not kept pace with the original intent.

Constitution of the Working Group

6. To review some of these issues as also to bring more transparency in trading of Gilts RBI constituted a Working Group headed by Dr R.H.Patil (Chairman, CCIL) and comprising of the following other members, to study the pertinent issues relating to further development of the government securities market to help bring about greater degree of transparency and make appropriate recommendations:

1.	**Dr R. H. Patil**	**-**	**Chairman, CCIL**	**-**	**Chairman**
2.	**Shri R.V. Joshi**	**-**	**MD, STCI**	**-**	**Member**
3.	**Shri D.G. Kamath**	**-**	**MD, GSTC**	**-**	**Member**
4.	**Shri K. Unnikrishnan**	**-**	**IBA Representative**	**-**	**Member**
5.	**Shri Jayesh Mehta**	**-**	**PDAI Representative**	**-**	**Member**
6.	**Shri P. Mukherjee**	**-**	**FIMMDA Representative**	**-**	**Member**
7.	**Shri Jasbir Singh**	**-**	**CGM, IDMD, RBI**	**-**	**Member**
8.	**Shri Chandan Sinha**	**-**	**CGM, RBI, Guwahati**	**-**	**Member**
9.	**Ms. Kamala Rajan**	**-**	**DIT, RBI**	**-**	**Member**
10.	**Shri R. Muralidharan**	**-**	**GM (Banking), RBI, Mumbai**	**-**	**Member**
11.	**Shri B.B. Sangma**	**-**	**DGBA, RBI**	**-**	**Member**
12.	**Shri P.J. Thomas**	**-**	**DBOD, RBI**	**-**	**Member**
13.	**Shri T Rabi Sankar**	**-**	**IDMD, RBI**	**-**	**Convener**

Original Terms of Reference of the Working Group

7. The original terms of reference for the Working Group were as under:

- **i.** To review the current usage of the real time on-screen deal negotiation and anonymous trading capability of the NDS and suggest remedial measures.
- **ii.** To suggest the appropriate extent to which such capability should be mandated, as a first step.
- **iii.** To indicate the time frame to achieve the mandated use of the facility in stages with a concrete action plan.
- **iv.** To recommend technical, institutional and other measures to implement such an action plan.

8. The Group has since submitted its Interim Report to the RBI in February 2004. In its Interim Report, the Group examined in detail the present NDS environment. The major observations, based on the position obtaining currently in the gilts market, were as under:

a. Most of the secondary market gilts trades are effected through brokers. This has resulted in lack of liquidity on NDS, which has remained merely a reporting system;
b. The price discovery process is being achieved through intermediaries, which apart from being non-transparent, does not provide pre and post trade transparency;
c. The existing OTC market dominated by a few brokers does not get to adequately reflect plurality of views of all active market participants;
d. It would be desirable to minimize the influence of brokers on NDS members to mitigate influence in market direction;
e. NDS participants do not currently have facility to gauge market depth in terms of all available quotes;
f. Although NDS provides for a negotiation functionality, deals concluded, if any, have to be re-entered in NDS and are subjected to a validation/confirmatory process leading to possible errors and delays, which are major limitations of the NDS;
g. These shortcomings can be addressed by a screen based trading system with features currently not present in NDS.

Expansion of the Working Group's Scope of Work

9. While concurring broadly with the observations contained in the Interim Report as also the expected improvements and benefits that would accrue from screen based trading, it was felt that the issue needs to be explored in more detail. The Group has now been requested by RBI to submit its advices on the following issues:

a) The problems faced by market participants and RBI in operating present NDS system for various purposes and suggestions in regard to hardware and software to ensure that NDS operates smoothly and efficiently without delays;
b) The specific steps for implementation of an order driven anonymous screen based gilts trading system;
c) The technological requirements for the screen based trading i.e., both hardware and software including related technological issues for its integration with existing RBI systems;
d) Action plan for migration to screen based trading;
e) Issues and steps involved in developing and improving market making and liquidity in gilts market on the exchanges;
f) Issues that need to be addressed to ensure efficient clearing and settlement of trades on NDS and the exchanges;
g) Issues relating to connectivity of depositories with RBI PDO-NDS for speedier value free transfers etc.;
h) Sequencing of steps that need to be taken in regard to trading on NDS and the stock exchanges.

10. The Group has examined each of the above issues referred to it, in the light of the earlier study conducted and the Interim Report submitted by it. While carrying out a comprehensive analysis and careful consideration of all related aspects, the Group is of the view that the way forward lies in critically analyzing each of the issues involved and looking at possible alternatives, timely and cost-effective solutions to them. As an attempt in this direction, the Group is pleased to submit its Report in the subsequent paragraphs, which comprises of four Sections –

SECTION I

NDS – TECHNICAL ISSUES: PROBLEMS AND POSSIBLE SOLUTIONS

The technical problems observed could be broadly classified into two categories viz., Issues beyond NDS and NDS related issues.

A. Issues beyond NDS

1. NDS is one of the many applications that use INFINET. Hence problems, if any, in the INFINET have an impact on the performance of NDS. The users of INFINET use it for several purposes of their own (like e-mails) as also those relating to the NDS applications. Further, over time, many RBI applications have been added to INFINET. Some of CCIL's applications are also hosted on the INFINET. It is therefore necessary to list all such applications running on the INFINET so as to determine a hierarchy of priorities in which such transactions can be handled; this will help in allocating the highest priority, from the technical angle, to the NDS related transactions. A periodic review of bandwidth utilizations for different uses should also be made so that it becomes possible to ensure allocation of required bandwidth for NDS related activities on a priority basis.

2. Another critical issue relating to network that needs to be examined is why some of the members face inordinately long response time in their NDS transactions. Particular attention should be given to the likely problems that may be faced because of combining VSAT traffic with that of the landline traffic when messages travel on the INFINET. Internal studies done by CCIL indicate that some of the packets sent on the INFINET get lost in transit necessitating their re-transmission by CCIL system to ensure that members do receive the communications sent to them. In this context it is worth examining the desirability of putting all the NDS related transactions on another dedicated telecommunication network within the INFINET framework so that all the problems that NDS members currently face can be more satisfactorily resolved. This would also eliminate some of the LAN related problems at the members' end.

3. It may also be desirable to review the existing technical tools available for network monitoring, their adequacy and scope for improvements. NSE for example has a network monitoring tool for all its VSAT operations that helps in tracking functional quality/health of its satellite communication network as also tracking response time for members when they are transacting on NSE's trading system. Similarly, the monitoring of NSE's large leased line network is done by MTNL as part of its MLDN service package. It is desirable that similar services/arrangements are put in place in

regard to the INFINET facilities made available to the members, at least in respect of their time and mission critical NDS transactions.

4. IDRBT/RBI should proactively monitor the network infrastructure for maximum uptime. They should be able to have remote access to router at Member end to monitor/test and have control over the network. Member-end LAN traffic should not be allowed to enter INFINET. IDRBT/RBI should regularly check bandwidth utilisation of all links. Members should also regularly monitor their INFINET leased line. Backup leased line should be properly maintained.

5. Most members are connected to INFINET through 64 kbps lines. Prima facie, it appears the delays faced by members in respect of their time critical NDS applications are due to bandwidth constraints. With the number of applications having increased, there is urgent need to review the adequacy of this bandwidth and its possible enhancement to 2 mbps lines. This would need to be mandated as members may come up with the issue of extra cost burden. Going forward, dependence on this Network is only set to increase and if adequate bandwidth is not ensured at all times, failures would be frequent which will have its impact on the system as a whole. Moreover, all NDS members are institutions who can be persuaded to see the overall cost benefit analysis of migrating to a higher band-width. Experience suggests that members who have already installed 2 mbps lines do not have network related issues. In extremely exceptional cases, the alternative could be the provision of an exclusive 64k lease line meant only for the NDS operations.

6. INFINET uses IBM's MQ Series for its communication protocol. The NDS network has suffered in terms of its operational reliability due to problems associated with the IBM MQ sender/receiver channel issues, viz., both channels being down, sender channel up but receiver channel down or vice versa. Due to this, many a time other Queue Managers have been asked to stop whenever NDS Queue Managers have had problems. Moreover, while IBM MQ is a standard utility used across various networks, its suitability for specific applications such as NDS may need to be reviewed. In this context, it may be appropriate to ascertain global experience with regard to usage of IBM MQ for dealing applications. CCIL's experience in IBM MQ's ability to support dealing application communication protocol has not been very encouraging.

7. **Given all these problems/issues vis-à-vis the INFINET it may be desirable to arrange for an independent technical study of the operations of INFINET by a reputed and competent agency/body to assess its reliability, performance, connectivity, bandwidth, communication protocols, configuration, network monitoring tools deployed/desirable, scalability, current capacity utilisation, need for augmentation if any for future requirement etc.**

B. NDS Related Issues

1. Help-desk Support

a. The telephone lines at NDS Helpdesk are inadequate. There are only three lines, out of which one is for network related problems and the other two for operational/system problems. Member feedback indicates that there have been many occasions when NDS Helpdesk phone response time has been long and its manning, especially during business hours, inadequate. Further, solutions provided from the Helpdesk have at times failed to resolve the problem reported, when concerned members have been asked to contact their respective vendors for IBM-MQ series and Oracle related issues. The help desk should also have proper staff complement conversant with technical and operational related applications/issues.

b. The commonly reported operational issues on NDS are –

   i. Host server not responding;
   ii. Queue Manager receiver channel inactive;
   iii. Automation error received on client while logging in to application;
   iv. More than one entries of dllhost.exe found in Task Manager where ever there are more than six NDS clients which increases server CPU utilisation;
   v. Inability to generate reports from client workstations;
   vi. Server processes dying

c. There is urgent need to review the nature and extent of technical support/help-desk available in NDS. Requisite facilities need to be augmented by providing adequate telephone lines, ensuring that the desk is always sufficiently manned during critical business hours etc. Further the Helpdesk services need to be integrated to provide single point support for both network and operational problems.

d. A structure needs to be formalized to log member problems/feed-back through a defect tracking mechanism. Logging of reported problems and solutions offered will be useful for providing uniform/consistent solutions to similar problems reported by different members. Such documentation will facilitate further analysis and appropriate responses as also assist in review/modifications and further development of NDS. These arrangements need to be built into the NDS application itself.

2. Software Releases/Upgrades

a. It is noticed that the compatibility of the application with latest Windows Service Packs, Windows Operating Systems, IBM MQ Series etc. are not being constantly monitored on an on-going basis. It is also observed that there are frequent updates/patches sent for updation. Problems are generally encountered during major upgrades with some of the functions not found to be working after major upgrades, for which patches/fixes are again required.

b. The software releases/updates should be comprehensively tested by installing and checking all system functionalities before it is sent to Members so that no patch is required to be subsequently released. Detailed procedure for installation/update should be provided in an Installation Manual. A comprehensive document detailing new features should be provided with every release/upgrade.

c. Installation/Operations training at regular intervals should be organised for Member staff. The training should also focus on problem reporting and resolution.

3. Periodic Audits

a. Latest Operations Manual/Guidelines for infrastructure set up and operation at member's end need to be provided by RBI.

b. Periodic audit of IT infrastructure at member's end should be carried out by RBI.

c. Hardware, Software, Network requirements, proper back-ups, updated software for Anti-Virus should be checked.

4. IBM & Unix Servers

a. NDS, which comprises of various modules, is hosted on a single IBM Mainframe Server at RBI. From a technological point of view, it may not be advisable to have more than one critical system running on a single server. If any problem develops even for a couple of hours with such a server that hosts several critical operations, there will be chaos in the market. In CCIL, for example, the different settlement systems as also the FX Dealing and CBLO Dealing applications are all placed on different servers;

b. It is, therefore, desirable that to begin with the proposed NDS gilts automated order matching system is placed on a different server. In this context experience suggests that IBM servers are far more costly than UNIX servers. The reliability of UNIX servers compares very favourably with that of IBM servers. Hence IBM itself has started manufacturing UNIX servers. CCIL relies mainly on the HP UNIX servers, which are significantly cheaper (capacity-to-capacity basis) than IBM mainframe servers. It is given to understand that recently, SBI too has opted in favour of HP UNIX servers for its massive computerization currently under implementation.

c. At the member end, with increasing functions and operating requirements, the present server/client configurations may be inadequate. It is imperative that certain minimum acceptable server and LAN configurations, keeping in view both current and future requirements, are mandated. Prescription of minimum IT configuration standards are essential for ensuring availability of the system for carrying out vital operations at all times.

5. Members' Local Database

The local data base utility currently available at member end in the current NDS needs to be reviewed and enhancements, if necessary, planned for implementation. It is possible to consider periodic polling and population of data at the local data base level instead of every query travelling from client to the central server. This would help reduce network traffic helping improve the overall network and system efficiency.

6. Business Contingency Planning

Adequate business contingency planning/redundancies need to be put in place at member end as part of the technological infrastructure creation process. This is one area which has not perhaps been given its due importance. Given the increasing dependence on IT and related technological capabilities, it is now time that the need for effective fall back measures being put in place is understood and implemented. There should also be provision for back-up or Disaster Recovery Plans with periodical testing of live applications also.

7. Software Issues

a. In the area of software, perhaps, the most critical change immediately required is to review the manner in which business issues are being handled at NDS. It is imperative that the concerned business departments in RBI such as IDMD, PDO, MPD etc. lead and drive the software development in their respective areas with technical support coming from DIT. This would bring about the necessary ownership and focus required to constantly review and update requisite processes and features in tandem with changing/emerging requirements. It may be worthwhile to consider structure of a standing committee consisting of officials from these departments with some basic knowledge of software development to ensure that the review or updation takes place without avoidable delay.

b. The settlement processes existing in NDS are performing reasonably well. The NDS front-end, however, requires urgent attention and modifications/enhancements as discussed in this Report.

c. The most significant module in NDS is the Gilts Secondary Market Module, which being the main focus of this Report, is discussed at length separately.

d. As for the other modules, it is felt that the Call/Term Money Module may not be fully achieving its purpose of accurate real time capture of all trade information in these markets. Even the repo trades, currently, cannot get reported on the system in a certain time period (usually 9:30 am to about 11:00 am) on the NDS. This position needs to be rectified by bringing about the required changes with mandatory prescriptions and extensive verification as part of the regulatory audit process. The real time capture of all trades information will be facilitated if the front offices of members are interfaced with NDS.

e. The Auction Modules facilitate submission of electronic bids by market participants. It is felt that the functionality scope could be extended further to encompass the auction process itself i.e., computation of cut-off, allotment to successful bidders etc. through appropriate linkages with the Securities Settlement System. These features would further reduce the time lag between bid submission and announcement of auction results, allotment of securities to successful bidders. Further, the module should be in a position to handle both primary and OMO auctions covering both issue and purchase of gilts by RBI. The ultimate objective should be to build interfaces between the Auction Module and the NDS secondary market settlement system (carried out through CCIL) which would bring about significant advantages to market participants in the form of netting across primary and secondary market transactions. The present DVP III mode of settlement does call for this electronic interface to avoid delay in processing of trades.

f. As already mandated for Call/Notice and Term money transactions, compulsory reporting of all OTC interest rate swaps could be envisaged and requisite facilities developed in NDS to assist better regulatory supervision of this sensitive and growing market.

8. Modular Software

In the context of reviewing NDS operations, it may be desirable to individually look at the various modules of NDS. It is likely that relative software has been developed as a single application. The best way forward would be perhaps to examine the possibility of looking at modular software architecture with each different functionality such as Call Money, Term Money, Gilts Primary Auctions, LAF, Gilts trading etc. being unbundled and developed as separate modules. This would greatly reduce dependencies, ease the process of software development/testing, ensure easier scalability of each of the modules to address emerging requirements etc.

9. Constitution of Formal User-group

There is need for formally constituting User Group Standing Committees comprising some permanent members nominated by concerned RBI Departments (such as IDMD, PDO, MPD, DGBA, DIT etc.), CCIL as also industry bodies such as FIMMDA, PDAI, AMFI etc. to address NDS related issues on an on-going basis. Such representation should be at the operating level with sufficient expertise in related domain areas. The User Group should serve as a forum for free and frank exchange of views on all aspects relating to the functioning of NDS and the related activities.

SECTION II

STATUS OF NDS GILT MARKET

In India the gilt market continues to remain a telephone driven OTC market with small number of brokers assisting in price determination. According to some debt market dealers the OTC market is quite transparent. They often argue that the gilt markets in most parts of the world are OTC markets. There is some basis in this argument if it is interpreted to mean that most of the trading in gilts does not take place on the organised stock exchanges or a few well organised trading platforms. It should, however, be noted that the dominant global developments in most of the active gilt markets are in the direction of moving away from the telephone or voice broking to broker-dealer screen trading systems. This has happened even in the global foreign exchange markets where screens are dominating the trading systems. As the trading volumes and the number of market participants and investors grow financial markets come to deploy increasingly sophisticated information technology tools in the areas of both deal matching and clearing and settlements. On account of their inability to effectively cope up with growing size of the markets, both from the viewpoint of volumes and geographical coverage, the gilt markets are increasingly moving towards screen trading.

Global trends towards Screen Based Trading

Since screen based trading has been found to be more cost-effective, transparent, and user-friendly it is gaining increasing foothold. In recent years, many developed markets have been working to automate and introduce screen based trading systems. The last decade has witnessed a dramatic increase in both the number and the market share of screen-based trading systems. The adoption of screen based trading systems has transformed the economic landscape of trading venues and is proving a force for change in market architecture and consequential trading possibilities. Electronic trading has been removing geographical constraints and allowing much higher trade volumes to be handled, and in customized ways that until recently would have been technically impossible or prohibitively expensive. Within the fixed income market sector, electronic trading has made most inroads into many government bond markets. As per a Survey by the Bond Markets Association of USA, there were 77 electronic, fixed-income trading systems operating in the U.S. and Europe in late 2003 versus 11 in 1997. Of these 77 electronic trading systems, 46 were based principally in the USA and 31 in Europe. Information provided by trading platform vendors suggests that fixed income trading executed electronically has increased in volume steadily over the past several years, including throughout 2003. The Survey concluded that online bond trading grew significantly with average growth of 70 percent 2003.

In Italy about 90 per cent of the trades in government debt are now conducted on the MTS (Mercato Telematico dei titoli di Stato) system which was developed in 1988 with the cooperation of Italian public authorities. The success of MTS has led to cloning of the platform elsewhere, especially in Europe. EuroMTS was launched in April 1999 as an international trading system for European benchmark government bonds. In addition, newly established local electronic trading platforms along the lines of MTS include MTS Amsterdam, MTS Belgium, MTS France, and MTS Portugal. Brazil and Korea have also adopted electronic bond-trading systems along the lines of MTS.

In India as well it may be essential to be proactive and make available screen based trading for efficiency of the price discovery process.

Gilt Trading on NDS – Evaluation and Way Forward

From a business perspective, the gilts market (which constitutes the most important segment of NDS) has developed reasonably well. However, since efforts to improve the quality of this market promise to very good yield results with reasonable speed, our attempts should first be directed to improve efficiency of this market and strengthen it further.

NDS today acts as a reporting platform wherein members report trades already concluded by them in the OTC market despite having a direct electronic negotiation facility. But even as a reporting platform, members do not find it to be highly user friendly, whenever market witnesses high level of activity. Whenever the gilts market is highly active some members have complained that they are not in a position to report all their trades to the NDS because of the inordinate response time delays. An oft-cited reason why NDS is being used only as a reporting platform is that there are hardly any quotes on the screen (lack of liquidity). Unlike an order driven system, NDS participants do not have the facility to see the depth of the market in terms of all available quotes for a particular security at any given time. The absence of user friendly features of the NDS (normally associated with electronic trading platforms), its systems capacity constraints, and its cumbersome confirmation procedures have discouraged participants from using its quote driven trading option. Market participants have preferred the easier option of trading through brokers. Resultantly, there is no liquidity in the NDS. Unfortunately, therefore, the basic objective of transparency in gilts trading and efficient price discovery remains unfulfilled.

NDS has provisions for real time dissemination of price information to the market. However, trades concluded outside NDS are not reported immediately (NDS stipulates that such trades should be reported within 15 minutes) leading to delayed transmission of traded prices to the market. The market is thus still not in receipt of real time trade information.

As opposed to Straight Through Processing (STP), deals negotiated on NDS have to be inputted again into the system to facilitate settlement. Except for firm quotes, there is a restriction that the seller dealer only needs to enter the deal particulars. This puts additional responsibilities on the dealers which have led to dealers preferring to trade in the OTC market and the back office personnel completing the data entry and all NDS related processes. Besides re-entering of deals also increases the potential of errors in reporting.

It is important that the NDS players who account for almost all the trading in gilts are accorded a more efficient and transparent screen based dealing interface which overcomes the above shortcomings. NDS should function as an

anonymous, automated order matching system to be used by all NDS members for all trades they transact with each other without the intermediation of a small number of brokers as it happens today. Once the 160 NDS members start trading on the system directly there would be quantum jump in the efficacy of price discovery process, thereby significantly improving market efficiency. It will facilitate dissemination of all market information including the unexecuted order book position and already executed trades on a real time basis. This will also help RBI to keep a close watch on all market developments on a continuous basis and take up quick surveillance as and when necessary.

NDS currently does not have a capability for cancellation/rejection/return of trades. Such a provision needs to be built. However, after the introduction of an automated screen matching system the need for rejecting/cancellation of trades/orders will arise only in extremely rare circumstances. For example, if there is evidence that two members are trying to rig up/down prices by entering orders that are very much out of line with market trends NDS administrator at RBI should have the facility to cancel such orders/trades. Access to this utility, which should be kept at the NDS Administration, needs to be controlled and all such actions need to be backed by proper documentation for audit trail purposes.

On-line transmission of trades to the settlement system and from thereon to CCIL should be possible via NDS. Possibility of providing interfaces between NDS and CCIL for on-line position monitoring will help members in more efficient margin management. This will help CCIL to extend on-line guaranteeing of trades of NDS members so that they can derive benefits from the DVP-III facility that RBI has extended recently.

NDS members should be encouraged to develop their own in-house market study capabilities so that their dependence on brokers for understanding market trends/movements is minimized. After the members discontinue their dependence on the voice brokers for their deal matching they will have to rely on their own in-house information/research base and trading strategies.

Some of the advantages of migrating the gilts market to an electronic anonymous order matching mode are discussed below –

a) Access -

   Screen Based trading can widen access to trading systems across several dimensions. Because of its OTC nature the G-sec market has remained Mumbai-centric. This puts NDS members with their head offices outside Mumbai in a disadvantageous position. Their Mumbai based dealing offices cannot get quick decisions from their superiors whenever there are unexpected market movements. Automated screen trading will help in putting all market players on par. Moreover, physical limitations that once rationed access to traditional venues no longer bite, meaning additional users can now participate at minimal marginal cost. At the same time remote linkages remove geographic limitations on the pool of potential users, and continuous multilateral interaction is enabled. This turnaround in the economics of access means that, in principle, arrangements can be decided more in response to the needs of the market.

b) Intermediation

The greater access possibilities offered by screen based trading have perhaps most obviously brought into question the role of intermediaries. An important implication of the automation of trading market structure is the potential for direct market access on the part of institutional investors. In an intermediated setting, the broker determines when execution will take place. If the broker is representing the best interests of the trader, execution would be rationally based on best price. This hypothesis appears to be refuted in practice. Secondly, there are also problems related to confidentiality of the information. Once an order is placed with a broker, information about the trade is no longer private, and information leakage can occur. If so, some information is reflected in quotes prior to trade execution, adversely influencing execution costs on the part of the original investor. Anonymous automated trading can get over such problems. Moreover, automated trading also enables institutions ***to avoid paying for intermediation services they may not be requiring.***

c) Transparency

Screen based trading facilitates greater pre- and post trade transparency. Pre-trade transparency refers to the availability of information about bids and offers. Post-trade transparency refers to real time transmission of information on executed trades, including price and execution time to all concerned. Screen based trading creates the potential for a very high degree of transparency across the whole trading process. On an order book, the best bid and offer orders available, the full depth of the book showing amounts at each price are available to all participants. In principle, systems can disseminate real-time pre- and post-trade information market-wide, while ensuring strict anonymity for all market players. Conversely, they can operate with minimal information leakage, in a manner that trading based on personal contact can not achieve. As electronic systems become more sophisticated, they make it more feasible to move along the multidimensional spectrum of transparency. Even big players find such transparent trading systems to be of great advantage. The facility of disclosing only small part of an order to the market helps in minimising impact of large orders on market prices.

d) Trading costs

Screen based trading and associated computing advances have given new impetus to trading cost reduction across all fronts. There is now scope to reduce what was once a “set cost” of business - one reason for the greater focus by institutions on analysing and cutting trading costs. The implicit costs of trading include the bid-ask spread paid to a liquidity provider and the price impact of the trade (i.e. the extent to which the trade price deviates from the current market price as a result of the trade). Electronic trading may reduce all these components. Market impact costs refer to any adverse impact on price as a result of information associated with the trade leaking ahead of execution, or because the trade is large enough to affect significantly supply and demand in the market or signal a predictable trade to come. Screen based electronic trading should help reduce these market impact costs.

e) Price discovery

Price formation in screen based trading systems is the outcome of precise order execution algorithms, in contrast to the trading floor or phone-based systems where relationships may matter as much as price or size. Furthermore, electronic trading allows basic algorithms to be extended to better meet trading needs and, for example, some now permit very detailed trading plans with contingent orders reflecting the various nuances of preferences. In general, electronic processing allows orders to reach the market faster because of higher processing speeds than with manual processes.

Prices therefore incorporate information more quickly. In addition, the investors may enjoy a tighter bid-ask spread on the screen based system.

Screen based trading systems automate the collection of pre-trade and post-trade information, e.g. obtaining quotes and requesting execution. By greatly increasing the amount and timeliness of information, these systems provide greater efficiency, accuracy and dispersal of trade relevant information such as best price and/or quantity, traded volumes etc.

f) Straight Through Processing

The automation of the trading process has important consequences for the operational efficiency of markets. Increased operational efficiency provides scope for Screen based trading systems to reduce the cost of trading. A large part of the scope for increased operational efficiency is due to lower order processing costs. Screen based trading makes it possible for trades to be passed straight through to the middle and back offices by linking the execution, confirmation, clearing and settlement of trades with market risk management and operational risk management procedures commonly referred to as straight through processing (STP). Since STP helps to do away with intermediate manual intervention it minimizes overhead costs for back office handling, risks associated with errors in trade reporting and record keeping. Thus the greatest advantage of STP is to make risk management more effective and manageable through appropriate IT tools.

g) Liquidity

Liquidity is essential for trading systems. It enhances the overall effectiveness of the market, reducing costs by narrowing spreads and giving depth such that prices are less affected by particular trades. Liquid markets are typically better placed to absorb shocks than less liquid ones, contributing to the robustness of financial systems. Liquidity is an essential ingredient of an efficient price discovery process and hence price signals for the wider economy. By lowering trading costs and widening access to market information, screen based trading systems enable more efficient trading. Assuming that deeper liquidity in markets means more efficient price discovery, market prices should better reflect available information about fundamentals, and hence prices adjust more quickly to (even small) changes in these fundamentals. Greater anonymity may enable participants to gradually unwind positions in smaller lots without having to expose their position to other market participants. The view of most market participants is that anonymity is better assured through electronic systems than it was in the traditional OTC markets, thereby ensuring liquidity.

h) Regulation and Supervision

From a regulatory perspective, financial stability is enhanced if markets are efficient, liquid, orderly and resilient. Screen based trading system, while being transparent, more efficient and fair, greatly facilitates better supervision of relative markets. The efficient and effective collation of data on a real time basis through electronic interfaces between the dealing platform and the regulatory systems would ensure on-going surveillance of critical parameters/indices of abnormal market behaviour such as erratic price movements, attempts at market manipulation etc. Erratic market movements, whether due to trader errors or more fundamental reasons, can be identified rapidly resulting in online real time electronic surveillance of the markets. Further, constant updation and analysis of price movements across

securities and trading volumes would considerably enhance prospects of timely interventions/corrective regulatory action - helping oversight, dynamic understanding of market expectation/sentiment and providing proper and timely direction.

Implementation of Screen Based Gilts Trading System on NDS

At the current stage of the G-sec market it is desirable that an automated screen-based trading system is made available for the NDS members. The desirable functions and features that would need to be built into such a System have been examined and the same is contained in Annexure “A” appended hereto.

The development and operationalisation of a fully automated Screen Based Order Matching System may be introduced in a phased manner so as to build comfort especially among the major players like banks and primary dealers. Given the criticality of the requirement for the development of an efficient and healthy gilts market, it would be prudent to take up this activity in phases.

In view of its domain expertise and proven competence in this area CCIL may be associated with the task of making suitable modifications to the NDS to facilitate creation of requisite functionalities with appropriate linkages to the clearing and settlement processes.

The dealing system should be a part of the existing RBI NDS set-up. However, the same should be housed on a different server and should be kept under the direct control and supervision of IDMD, the RBI Department regulating the gilts market.

Trades could happen in the proposed system amongst NDS members where the buyers and sellers are all NDS members. The proposed system should be an anonymous order matching system wherein identity of parties is not revealed. The order matching should be based on a price-time priority algorithm, meaning thereby that orders with given price would get matched based on the basis of time priority.

RBI should specify the roles and responsibilities of members dealing on the system.

The proposed Order Matching System should follow some general principles of dealing which should be shared with the members. NDS members should adhere to these general principles.

Trades done on the proposed system should flow on-line to the NDS system without any additional confirmation requirement from either the buyer and/or the seller. The trades should follow the existing path for clearing and settlement through CCIL. This will ensure that minimum changes are required at the member end and at the RBI-NDS end while satisfying the objective of RBI-NDS being the repository of all gilts transactions

CCIL will continue to be the central counterparty to each trade done on the system and settlements of such trades would be guaranteed by CCIL subject to members adhering to CCIL’s Bye-Laws, Rules and Regulations. The comfort of a risk

mitigated environment with the counter-party risk having been eliminated on account of settlement guarantee provided by CCIL will facilitate such anonymous trading. On the dealing side, the risk could arise from failure of the system due to technical reasons with the result that members may not be able to deal or close out. Such risks could be significantly minimised if a robust and highly reliable communication network is put in place. Moreover, since the present system of reporting trades on NDS will continue until all the trades take place on the NDS efficiently to the satisfaction of all the NDS members, the above problem can be addressed. Besides, the trading on the system being transparent, it will promote better supervision and regulation.

To minimize implementation time for automated screen based trading on NDS the activity can be implemented in phases as follows:

Phase I

a. Price based order matching system for top 5/10 liquid Central Government Securities

b. All market participants to conclude all deals (unto Face Value of Rs. 25 crores) in these securities on the order matching system. For large deals of more than Rs. 25 crores, as well as for trades with non-NDS members the market participants may be given the option of concluding the same in the OTC market if they so desire.

c. Following functionalities/features should be available in Phase I -

- Place/Modify/Cancel Orders,
- Order Quantity Conditions like All or None/Disclosed Quantity,
- Market Queries like Market Watch, Market by Price, Market by Order,
- Customizable Market Watch Screens to monitor preferred Securities;
- Dealer Queries like Outstanding Orders, Previous trades, Net position
- YTM Calculator;
- Automatic Deal Ticket Generation and Printing;
- Dealer Blotter Generation and Printing;
- User friendly software with easy navigation
- Generation of .csv files of important outputs such as Deal Ticket to facilitate electronic feed into proprietary treasury systems at member-end;
- Provision to generate automatic on-line feeds to facilitate dissemination of trade information to market

d. Mechanism to be put in place to facilitate periodic review of securities by IDMD (if necessary in consultation with FIMMDA/PDAI/CCIL) covered under Order Matching Screen (at weekly/fortnightly intervals) to ensure liquidity

Phase II (to be operationalised in about 3 months after Phase I go-live)

Gradual increase in the number of securities to increase market coverage such that in about three months from implementation of Phase I, all actively traded Central Government securities are brought into the ambit of the Order Matching System

Phase III (to be operationalised in about 3 months after Phase II go-live)

a. Yield based order matching system for Treasury Bills to be part of the existing setup

b. Order Matching activity scope to be increased to cover Treasury Bills and State Government Securities.

c. Following advanced functionalities/features to be introduced in Phase III -

- Customizable Dealer hierarchy set-up,
- Activation of trigger orders viz Stop Loss, Take Profit orders,
- Interface with proprietary Back office software
- Provision to generate automatic on-line feeds to facilitate dissemination of outstanding order as well as trade information to market
- Enhancements and other features as may be required based on market feed-back

IT Requirements for Screen Based Trading on NDS and its Integration with existing RBI Systems

The Order matching system will be a plug-in module to the existing RBI-NDS setup.

Trades done on the system will flow to RBI-PDO and from thereon to CCIL for settlement as per existing procedures.

Trades done on the system should be treated as confirmed and not subjected to the current time consuming four-stage confirmation process as existing in the present NDS environment.

Trades will enter RBI-PDO at the Ready for Settlement Status.

The file formats and interface with RBI-PDO will need to be accordingly finalized.

RBI shall specify the hardware and software configuration for installation of the dealing application at the member end.

The hardware and software requirements at RBI and members end for installation of the dealing application are indicated in Annexure “B” appended hereto.

SECTION III

DEVELOPING RETAIL GILTS MARKET ON STOCK EXCHANGES

Globally, gilts markets are essentially wholesale markets (also often referred to as the inter-dealer markets) with major participants being institutions like banks, primary dealers, financial institutions, insurance companies, mutual funds, pension funds and provident funds. Retail participation from individuals and trusts is generally on a very subdued scale. In India too the scenario is no different. The dynamics of the two markets viz. wholesale and retail as well as the sentiments underlying trading in such markets is quite different. The trading parameters like the market lot size, the price ticks etc also vary across the two markets. It is therefore desirable to have a clear segmentation of the markets into Wholesale and Retail.

At the current stage of development of our G-sec market there is a strong case in favour of keeping the wholesale G-sec market of NDS members separate from the retail or mid segment market. In India the combined fiscal deficit of the Centre and the States as percentage of GDP is very high (well in excess of 10%). Having recognised the risks that the economy faces from continued high level of fiscal deficit GoI is serious about bringing down the level of fiscal deficit to a reasonable level of about 3% as percentage of GDP in the near future. But until that stage is reached the outstanding stock of government debt would have grown to significantly much higher levels. Hence, even after the net fiscal deficit comes down to reasonably acceptable level, the levels of gross market borrowings on behalf of the government would continue to remain at relatively very high levels. So long as the gross levels of government borrowings remain at such high levels the G-sec market will continue to be in a delicate stage; the regulation of such a delicate market would have to be done in such a way undue fluctuations in in G-sec prices (consequently interest rates) are avoided to the maximum extent possible.

As of today, RBI is not only the regulator but also the merchant banker to the Government, shouldering the onerous responsibility of ensuring that the required level of borrowings for the Central and the State Governments are mobilised. So long as the fiscal deficit in India remains very high it would be too risky to allow the G-sec market to be subjected to the vagaries/forces of a free market that is often subject to the influence of high level of speculative activity. Hence the RBI is keeping a tight vigil on the G-sec market, the trades in which have to be mandatorily reported by all the RBI regulated entities on the NDS that is being managed by the RBI. Given the current delicate stage of the G-sec market, movements in interest rates have to be suitably moderated/calibrated so that RBI is able to satisfactorily discharge its merchant banking responsibilities in respect of Central and State Government borrowings. Hence, even after the introduction of the automated screen based trading on the NDS, RBI should have to closely monitor the G-sec trading, especially of its regulated entities, all of which belong to the wholesale debt market segment. The recent turmoil in equity markets, which witnessed a free and steep fall in equity prices, forcing the exchange authorities to shut down the markets twice during the trading hours on 17th May 2004, does lend strong support to the argument that the G-sec market cannot be left to the mercy of unbridled speculative activity that is frequently observed on the stock exchanges.

Since movements in G-sec prices also reflect the level of interest rates in the financial system the G-sec market should have to remain under the close regulatory scrutiny of RBI on a near real time basis. Therefore, so long as the gross levels of Government borrowings remain high it is desirable that management of the NDS and regulation of the whole sale debt market remains with RBI.

While the wholesale gilts market should continue to remain with RBI it is desirable to initiate necessary steps to develop a retail market in gilts for serving the investors who currently do not belong to the wholesale gilts market. There are a whole range of existing and potential investors like company managed provident funds, corporates, trusts, high net-worth individuals, recently set up insurance companies, the proposed pension funds especially meant for the unorganised sectors of the economy who are not being served satisfactorily in regard to their investment demands for gilt securities. Concerted efforts need to be put in to service this class of investors through the instrumentality of the stock exchanges. The fact that even after the introduction of retail trading in G-sec on the stock exchanges there has been negligible trading on the exchanges proves the point that there are several missing elements in the scheme of things when the gilts trading was started on the stock exchanges. It is a fact that almost the entire G-sec trading is concentrated on the NDS which has been designed essentially for the wholesale G-sec market players, most of which are RBI regulated entities with the final settlements of their trades taking place in their respective SGL and current accounts maintained by them with RBI. Other participants in the G-sec market like provident funds, pension funds, corporates, various trusts, small cooperative banks, which comprise the middle segment presently depend on the OTC deals either through brokers or directly with NDS members. Settlement of securities in respect of the players generally takes place using the CSGL facilities of the NDS members; all G-sec trades including the CSGL trades are cleared and settled by CCIL.

Recently, the retail and mid segments have been extended the facility to trade in government securities on Stock Exchanges through exchange registered brokers. In so far as the individual retail investors are concerned they do not appear to have shown much interest in gilts investments. This is primarily because of the existence of competing instruments which provide better returns than government securities rather than lack of liquidity on exchanges. This, however, is not the case in respect of other investors like provident funds, pension funds, etc. most of whom are obliged to invest in G-secs as part of their investment strategy. The problem, therefore, is how to ensure that the stock exchange mechanism emerges as a preferred and ***cost-efficient alternative*** for such class of investors. The exchange platform is best suited for entities who deal in government securities in smaller lots than are the usual lots in the wholesale gilts market of the NDS members. In reality, it is the mid-segment represented by the non-NDS and non-retail players of the gilts market that has significant growth potential. It is desirable that increasingly trades of non-NDS members that belong to the mid-segment of the market are encouraged to shift to the stock exchanges through a well articulated strategy, given the fact that stock exchanges have much greater nation-wide reach.

There is need to pay much greater attention to the needs of the mid segment of the market as almost all these players do not have access to the NDS. It is these players who have to be systematically attracted to the stock exchange if exchange trading in gilts has to take off. This middle segment is already a large market and has the potential to grow at much faster pace than that observed during the recent past. For instance, the pensions market is poised to grow in a big way as it gets extended to all those who are currently outside the organized sector. Similarly, as and when corporates are permitted to

enter the repo markets, both for lending and borrowing of funds, there will be demand for government securities from the corporate sector for liquidity management. There is scope for increasing the share of small co-operative banks, NBFCs and other similar players in gilt trading. The solution, therefore, to the problem of negligible trading in government securities on the stock exchanges should not be in terms of shifting the NDS trades to the stock exchanges but to take necessary steps to encourage the non-NDS players to increasingly meet their requirements through the stock exchange mechanism.

Importance of Market Makers

The current reality is that satisfactory arrangements do not exist for non-NDS players to buy or sell government securities. Often they have to undertake trades at prices in great variance with the prices prevailing on NDS. They are also required to bear higher transaction costs. The exchanges need to exploit this opportunity to the maximum extent possible. ***Orderly development of the middle segment of the gilts market should primarily be the joint responsibility of SEBI and the stock exchanges. All that the RBI should be doing is to extend a helping hand to SEBI in this endeavour***. It is desirable that regulatory compulsion be brought to bear upon the debt market brokers of the Exchanges. They should be mandated to become market makers on the exchange, to begin with at least in the actively traded gilts.

An important point which is often missed by students of financial markets and market players is that financial markets do not grow out of thin air. Conscious and proactive steps have to be taken before organised markets come into existence, if the desire is to create them in a relatively short period of time. In the early stages of their development the securities markets need a class of specialists who are commonly referred to as the market makers or jobbers. These market makers give two way or buy/sell quotes for stocks of their choice. They thus create a sense of liquidity in their chosen stocks to attract investors to the markets. Once the average investors are assured of an entry/exit route offered by the market makers they may not mind investing in such stocks. The other important feature of the securities markets is that liquidity breeds further liquidity. So the question basically is how to create the initial liquidity. ***Hence, the crucial importance of the market makers who help to create or germinate initial liquidity that helps to build higher and growing level of liquidity over time.***

Simultaneously, Exchanges need to launch awareness programmes to educate the mid segment investors about the services that can be offered by them through the stock exchange trading mechanism. The exchanges should also motivate their members to put in sincere efforts in this direction so that an active market can be developed without much loss of time. Ironically, all brokers who are very active in the NDS market are all members of NSE's wholesale debt market (WDM) segment. None of these brokers appear to have shown any interest in making NSE's WDM segment active and provide their services to non-NDS investors. Since all these brokers are earning huge amounts of brokerage by concentrating their attention on the OTC market that serves the NDS members, they have not shown any interest in serving the non-NDS players through the exchange platform despite having a very good idea of market movement, sentiment, trading flavour, volumes etc. Moreover, most of them already employ qualified personnel to provide the requisite services to their principals in the OTC market.

For undertaking the market making responsibility, it is not essential for the brokers to hold proprietary stocks of securities. This issue could be resolved if brokers are permitted to have arrangements with Primary Dealers and/or Banks for supply of stocks of government securities at prevailing NDS market prices. The market price risk involved in market making on the stock exchange would have to be borne by the brokers themselves. These costs can be factored into the bid/offer quotes made by them on the exchange. It is felt that the existing expertise available with the brokers could be used for good measure in developing a gilts market for the mid/retail segment on the Exchanges through the implementation of the following arrangements:

a) All market intermediaries/fixed income brokers registered with the National Stock Exchange (NSE), having a share of at least 5% of the aggregate market turnover in the wholesale debt market segment of the NSE during the current year as well as the previous financial year should be required to provide two-way buy/sell quotes;
b) All such entities (hereafter to be referred to as “market maker”) to be allowed to act as principal counterparties to trades subject to individual trades not exceeding Rs. 1.00 crore (face value) initially. This amount could be increased over time based on experience after ensuring stability of operations and adequacy of requisite surveillance, control and safeguards;
c) Market maker to have not more than say ten trades remaining uncovered at any point of time;
d) Market maker to provide two way quotes in not more than three liquid securities at any point of time. Exchange to ensure that their systems do not permit the matching of two counter market making quotes;
e) Market maker to be permitted to open a CSGL Account and Current Account with an NDS member (preferably one of the PDs) of its choice subject to extant CSGL guidelines;
f) Market maker to be further permitted to open a CSGL Account with one of the depositories viz., NSDL or CSDL;
g) All quotes provided by market maker to be for T+2 settlement only;
h) Market Maker to be permitted to act as counter-party and finalize trades with a primary NDS member for cover operations in respect of trades matched on Exchange;
i) Such cover trades as per (h) above for values T+0 up to a maximum of T+2 only
j) Settlement of trades as per (h) above to be settled via the NDS mechanism (directly at RBI PDO outside CCIL settlement mechanism) through the NDS member with whom market maker maintains CSGL and Current Account as per (e) above;
k) Appropriate funding of securities transactions to be arranged by market maker
l) All trades matched on the Stock Exchanges to be settled through Clearing Corporations of the respective Exchanges and concerned Depository where market maker maintains CSGL Account

Detailed flow-charts covering both dealing/settlement of the exchange trade as well as the relative cover operation is enclosed at Annexure “C” appended hereto.

Banks & Stock Exchange Membership

In this context it is worth examining whether banks should also take up membership of stock exchanges in addition to PDs, who have already been permitted to do so. In so far as PDs are concerned market making in gilts is one of their major responsibilities. Hence it is appropriate that the market savvy PDs are encouraged to take up membership -preferably through the subsidiary route - of a stock exchange of their choice and help in building an active gilts market through market making. Since PDs actively bid in the primary auctions conducted by RBI they should use a part of the stock of gilts thus acquired for active market making on the stock exchanges. But as regards banks taking up membership of stock exchanges there appear to be a number of strong reasons why banks are not the right type of entities to take up exchange membership. It may be recalled in this context that ***RBI took active interest in creating a totally new type of entities called Primary Dealers basically for the reason that banks are not at all well suited for taking active interest in the development of a vibrant and sufficiently broad-based government securities market.***

Because of the high SLR requirements in India, historically banks have been investing heavily in gilts as an investment proposition. The core activities of banks all along have been to act as financial intermediaries to mobilise saving of the community and lend them to a wide range of borrowers and economic activities. Banks are required to lend sizeable part of their disposable funds to priority sectors comprising small industry, agriculture, SRTOs, etc. They continue to be the main source of working capital funds for all range of industries; they also provide finance to export-import activities, besides helping their clients to manage their foreign currency transactions. In so far are the PDs are concerned their core function shall always be to function as active dealers in gilts and other debt instruments, In contrast the core activity of banks is to mobilise deposits and lend them to a wide range of economic activities. Banks are being entrusted with a number of social responsibilities, all of which are related to their basic lending functions. While the business goals of the top managements of PDs is to remain active in the primary and secondary markets in gilts the primary business objectives of the top managements of banks would and should continue to be with their role as the pre-eminent financial intermediaries in the Indian economy. In short, it is not desirable to burden banks with an additional responsibility of stock exchange membership for developing gilts markets when there are as many as 16 active primary dealers and a couple of dozen wholesale debt market members of the stock exchanges.

The worries about likely securities settlement failures if banks do not take up membership of stock exchanges appear to be misplaced. Since the stock of gilts with the primary dealers at any point of time is quite large (in relation to the size of the retail and the mid segment markets for gilts) it is unlikely that there would be settlement failures on account of security shortages. It would not also be fair to the PDs to assume that they would enter into sale transactions on the exchanges without having stocks of relevant securities. Given the relatively large size of the wholesale gilts market on the NDS the PDs can always cover their security requirements, if necessary, by entering into purchase transactions on the NDS before becoming sellers on the exchanges. Development of an active gilts market on the exchanges should be the primary responsibility of the professional debt market brokers of the stock exchanges and to some extent also of the PDs who are being actively encouraged by RBI to build vibrant gilts markets. In view of this there does not appear to be any justification for persuading banks to take up exchange membership. So long banks are expected to shoulder the onerous responsibility of being the primary mobilisers of the savings of the community for deploying them into a number of priority activities, it

would not be desirable to expect that the banks should also take up membership of stock exchanges for developing a gilts market for the retail and mid segments.

Any move to either compel or persuade banks to take up exchange membership for trading in gilts on the exchanges is not desirable as it would lead to avoidable diversion of the attention of the top management from their core or basic activities to stock exchange trading. A number of senior bankers are under the impression that large profits can be earned through trading on the stock exchanges. Once banks become active on the stock exchanges RBI's efficacy to regulate them with reference to its prime policy concerns will get considerably weakened vis-à-vis banks' trading in government securities. With their money power banks may create avoidable gyrations in interest rates if they join the bandwagon of speculative trades in G-secs on the stock exchanges. Given the delicate stage in which the G-sec market is currently placed it would not be desirable to allow banks to get entangled with speculative trades in gilts on the stock exchanges.

The real worry, however, is that lured by speculative profits top managements of banks may divert their prime attention from core banking activities to stock exchange trading. There is also another risk that needs to be kept in view in so far as the public sector banks (PSBs) are concerned. Given their HRD policy they are obliged to mandatorily rotate their staff periodically from one department to the other and from one geographical location to the other. In the absence of good grounding in stock exchange trading, staff of PSBs may get unwittingly entangled with manipulative/speculative trading activities on the stock exchanges. Unless the concerned staff members are in the market for a long period of time they would not be able to develop necessary market intelligence about different players in the markets and the games they play; the PSB staff would have limited time to develop their trading skills and market intelligence that would help them to keep away from manipulations that some of the unscrupulous market players may indulge.

Banks' trading on stock exchanges should not be merely for generating trading volumes on the stock exchanges as it would lead to fragmentation of liquidity of the wholesale players between the two markets, viz., the NDS and the stock exchanges. To borrow the terminology of the Customs Union literature, the trading volume that is generated on the stock exchanges should be of the type of ***trade creation and not trade diversion***. As of today, ***the wholesale gilts market represents the most sensitive of all interest rate markets in the country and events in this market have a significant bearing on the events in all other markets including equity and currency markets***. Market fragmentation and its potential to unfavourably affect liquidity in the wholesale gilts markets would not have highly favourable implications for the system as a whole. It will not, therefore, be desirable to mandate banks to compulsorily operate on the exchange gilts market.

With the NDS gilt market set to progressively move to an electronic screen based trading, the WDM brokers currently active in the OTC market would realize that they have to search for alternate revenue pastures. This would translate into their evincing real interest in developing the exchange gilt market. It is therefore recommended that the essential nature of the wholesale and retail markets need to be preserved. The wholesale market (also referred to as the inter dealer market) should function on the NDS as existing now and the mid/retail segment may be gradually shifted to the exchanges without causing any hardship to any of the mid segment investors like provident funds, small cooperative banks, etc. in the process. PDs may be expected to build an umbilical linkage between the two markets by being active on both of them and exploiting

arbitrage opportunities. To ensure that the price variations and consequential arbitrage opportunities between the NDS and exchange markets are at an acceptable level, mid-segment investors should also be allowed access to the wholesale market through NDS members as is allowed currently.

Issues for efficient Clearing & Settlement of Trades on NDS & the Exchanges

Clearing and settlement of trades done on NDS will happen as per existing process. Trades done on the order matching system will enter NDS Settlement Module at the "Ready for Settlement" stage and thereafter follow the same settlement process as with other trades.

CCIL will act as the central counterparty for settlement of all gilt trades on NDS. The guaranteed clearing and settlement service provided by CCIL is subject to the provisions of its Bye Laws, Rules and Regulations, as applicable from time to time.

Settlement of trades executed on the stock exchanges could be done by their respective clearing entities. There is no need to club the exchange settlements with the settlements of CCIL.

Any attempt at linkage between the clearing systems of the Exchanges and CCIL through a distribution of clearing responsibilities between them would create two parallel central counterparties which bristle with severe operational complications and legal complexities. The exchanges primarily deal in equities and equity related derivative instruments. On the other hand, CCIL's mainstay is clearing and settlement in gilts, currency and money markets. Apart from significant differences in volatility in the markets served by the exchanges and that served by CCIL, activities/movements in CCIL serviced markets are very closely monitored by RBI (as is the practice in most countries) who may even intervene in situations of extreme volatility. The same normally does not hold good in respect of equity markets.

Further, CCIL guarantees trades on the basis of margins maintained by its members. These margins are held by CCIL directly in the form of cash and/or specified highly liquid government securities. The clearing corporations of the Exchanges do not receive and maintain margins exclusively of cash and/or government securities. The credit quality and liquidity of collateral maintained by them are not of the same high quality.

Moreover, CCIL's membership comprises of highly regulated entities who maintain their accounts with RBI. Access to CCIL is, therefore, restricted to the highest quality from a risk perspective. Exchange trades on the other hand could flow from all classes of market players. Treating the entire spectrum of market players with the same risk perspective would be undesirable.

However, if a linkage between the settlements in both the wholesale and retail markets are completely unavoidable, the best possible alternative that could perhaps be considered, if acceptable to RBI, could be permitting the respective clearing corporations of the Exchanges to be admitted as members of NDS and CCIL with trades happening on the Exchanges flowing to the NDS environment for clearing and settlement. The respective clearing corporations of the Exchanges could act as principals in respect of trades reported by them for settlement with requisite margins, as prescribed, being required to

be maintained with CCIL. The above would ensure the parallel existence of both sections of the wholesale and retail markets and relative settlements being subjected to same quality risk management.

Connectivity of Depositories with RBI PDO-NDS for Speedier Value Free Transfers etc.

For settlement of trades done on Exchanges, its members are required to open demat accounts with depository participants of NSDL/CSDL. RBI has issued guidelines for value free transfer of securities from SGL/CSGL accounts to the depository accounts. Settlement of trades done on Exchanges happens on a T+2 basis. The transfer of securities from SGL/CSGL accounts to demat accounts happen on T+1 day. NDS already provides an electronic value free transfer module. Proper interfaces need to be built between the exchange clearing corporation/clearing houses and PDO-NDS for electronic transfer of pay-in/payout files. Such electronic transfers should be facilitated to be carried out on on-line basis

SECTION IV

CONCLUSIONS AND RECOMMENDATIONS

1. There is need to urgently review the existing performance and technical capabilities of INFINET as it has significant bearing on the performance of NDS. An independent technical study of INFINET can be entrusted to a corporate Agency or body.

2. Technical issues relating to NDS itself as pointed out in the Report need to be urgently examined and effectively addressed. There are a number of issues as indicated in the report relating to both Hardware and Software which need to be addressed immediately to enhance the tradability of the system

3. There is need for the immediate introduction of a Screen Based anonymous order matching system on NDS, to ensure transparency, better price discovery among various other things.

4. Operationalisation of NDS order matching system needs to be spread over sequential phases for proper implementation and smooth migration, allowing members to gain sufficient experience in handling an order matching system.

5. Given the situation of very high level of fiscal deficit in India, there is a strong case in favour of keeping the wholesale G-sec market of NDS members separate from the retail/mid segment market that would be developed on the stock exchanges. Since movements in G-sec prices reflect the level of interest rates in the financial system the G-sec market of NDS members should remain under the close regulatory scrutiny of RBI on a near real time basis. Therefore, so long as the levels of gross government market borrowings remain high it is desirable that management and regulation of wholesale debt market remain with RBI.
6. SEBI and Stock Exchanges need to initiate steps to build awareness especially amongst the mid-segment investors about the facilities available for gilt trading in the Exchanges. Brokers of WDM segment of Exchanges should be

compelled to engage in market making of gilts on the Exchanges with appropriate cover operations being permitted to them through conclusion of deals with NDS members. While PD's may be asked to facilitate trading on the exchange for the retail segment (preferably through their subsidiaries, Banks should confine themselves to the NDS market.

7. Creation of appropriate electronic interfaces between the Exchanges, Depositories and RBI-PDO is imperative for speedier value free transfer capabilities to facilitate settlement of securities trades concluded on Exchanges.

Annexure "A"

ELECTRONIC SCREEN BASED
PLATFORM FOR GOVERNMENT SECURITIES
ON NDS
DESIRABLE FUNCTIONS/SYSTEM FEATURES

1. INTRODUCTION

The secondary market in Indian government securities is presently an Over-the-Counter telephone market. Deals are concluded with the help of brokers and are reported on RBI-NDS. The NDS is an electronic platform developed by RBI, intended to facilitate dealings in government securities and money market instruments. In absence of a screen based order driven system on the NDS, direct dealing on the NDS has failed to pick up and the market continues to trade in the telephone market.

Introduction of a screen based Dealing System would facilitate better price discovery, liquidity, efficiency and transparency. Other benefits include widened geographical access, reduced intermediation, enhanced pre and post trade transparency, reduced trading costs, and better regulation and supervision.

The screen based Dealing System should essentially possess the following broad features:

1. Orders Driven: The Dealing system should be purely order driven with all orders from market participants being matched based on strict price/time priority.

2. Anonymous: The Dealing system should be an anonymous order matching system wherein identity of parties is not revealed. CCIL will be the central counterparty to each trade done on the Dealing System.

3. Transparent

The Dealing system should provide timely information, both pre-trade (for example, bid,
offer and depth) and post-trade (for example, last trade price and volume), and disseminate it widely real-time to all market participants.

4. Straight through Processing

The Dealing system should allow straight-through processing (STP), i.e. the seamless integration of the different parts of the trading process, starting from displaying pre-trade

Information and ending with settlement and risk management. Trades done on the system should be treated as confirmed and not subjected to the four-stage confirmation process as existing in the present NDS environment.

The Dealing System should provide for the following functionalities:

1. **Order Management**
   - Place Bid/Offer
   - Modify Order
   - Cancel Order
2. **Market Query**
   - Market Watch
   - Market by Price
   - Market by Order
   - Snap Quote
3. **Dealer Query**
   - Outstanding Orders
   - Previous trades
   - Dealer Blotter
   - Net Position
   - Activity Log
4. **Reports and Analysis**
   - YTM Calculator
   - Deal Ticket
   - Dealer Blotter
   - Activity Log

The functionalities are explained in detail in the subsequent chapters.

2. ORDER MANAGEMENT

2.1. PLACE ORDER

The Dealing System should support dealing in all Central and State government securities for T+0 and T+1 settlement. Both Proprietary and Constituent deals should be permitted.

A dealer should be in a position to place an order (Buy/Sell) in a CG/SG instrument specifying the settlement type, amount (Face value) and price at which trade has to be executed. The dealer especially market makers should also have the facility to place simultaneous Bid/Offer (two-way quotes) in the system at a Set Spread. The spread should be a parameterisable

function at the dealer level such that once the dealer specifies the Bid price, the Offer price is automatically populated on the screen.

The order so placed will be identified by unique identification number for audit trail purposes. These orders after validation such as quantity and price ticks will be accepted for matching in the Dealing system as confirmed orders. In case of unsuccessful validation, the order will be rejected. Dealer placing the order should get a notification for either confirmation or rejection.

The system should also allow the dealer the option to place conditional orders with respect to the amount or time as follows:

2.1.1. AMOUNT TYPE

a) ALL OR NONE (AON) – By selecting an AON condition, a dealer specifies that all of the order amount should be and no partial trades would be acceptable. AON orders are indicated by a special '#' sign in the system.

b) DISCLOSED QUANTITY (DQ) – Disclosed Amount is the part of order amount which the Dealer is willing to disclose to the market. The remaining amount of the order is hidden from the market and is released to the market only after the first lot is fully traded.

2.1.2. TIME CONDITIONS

a) DAY – By specifying a Day condition, the dealer agrees that the order can remain in the system till it finds a match or is cancelled by the dealer or till the end of the day. At the end of the day all outstanding day orders are cancelled by the system.

b) IOC – Immediate Or Cancel: An order with an IOC condition scouts the order book for a match. If a match is found, it gets traded or partially traded as the case may be. The remaining order gets cancelled immediately and does not remain in the order book.

2.2. MODIFY ORDER

The system should facilitate modifications of orders which are not fully traded or are partially traded. The dealer should be in a position to modify the amount, price, special conditions specified, if any and the constituent name. The dealer should get a notification of the successful modification of the order.

2.3. CANCEL ORDER

A dealer should be in a position to cancel his orders which are not fully traded or are partially traded. The system should provide a facility to cancel a particular order, cancel all orders in a particular instrument and cancel all outstanding orders across instruments. The dealer should get a notification of the successful cancellation of the order.

3. MARKET QUERY

3.1. MARKET WATCH

The Market Watch screen should allow a dealer to continuously monitor his preferred set of securities. The Market Watch screen should be customizable in the sense that the dealer can save his set of securities which remains in the Market Watch even after log off. The dealer can add, Modify or delete any instrument from the Market Watch. Information such as the Best Bid Price and YTM, Best Offer Price and YTM, Last traded Price and YTM, Last traded quantity and Total Traded quantity for a particular instrument should be available on a real time basis to the dealer. The Market Watch should allow immediate pickup of the Best Bid or Best Offer from the Market Watch screen. The Market Watch should also allow easy navigation to other Market Query screens like Market Inquiry, Market by Price, Market by Order and Dealer Query Screens like Outstanding orders and Previous trades.

The system should also have a facility which enables a dealer to track instruments not specified in his Market Watch. The facility should display the same information as the Market Watch and also provide for order pickup.

3.2. TICKER

There should be an online ticker which should display the last traded price of each instrument. The display should include the instrument description, traded price, settlement type and traded time.

3.3. MARKET DEPTH

The dealer should be in a position to view the depth of the market in a particular instrument in terms of price and orders. i.e Market by Price and Market by Order.

3.3.1. MARKET BY PRICE (MBP)

MBP should display atleast best five prices quoted and outstanding amount available (which are derived by accumulation of orders at the same price) at each price quoted in the market. MBP should also display the Open Price/YTM, High Price/YTM, Low Price/YTM, Last Traded Price/YTM, Last Traded Amount and Total Traded Amount. The total amount of Bids and Offers should also be displayed. The system should provide the facility to pick up orders from the MBP screen.

3.3.2. MARKET BY ORDER (MBO)

MBO should enable the dealer to view atleast best five outstanding orders available in the market arranged in the price / time priority. The orders with best price are shown first. For orders with the same price, the orders entered first are displayed first. There is no aggregation of order amounts as in Marker by Price screen. MBO should also display the Open Price/YTM, High Price/YTM, Low Price/YTM, Last Traded Price/YTM, Last Traded Amount and Total Traded Amount. The total amount of Bids and Offers should also displayed. The system should provide the facility to pick up orders from the MBO screen.

4. DEALER QUERY AND REPORTS

4.1. OUTSTANDING ORDERS

A dealer should be able to view his outstanding orders in a particular security as well as all his outstanding orders across securities. An outstanding security is an order that has been entered by a dealer but which has not yet been completely traded or cancelled. The dealer should be above to modify/cancel the orders from the outstanding orders screen.

4.2. PREVIOUS TRADES

A dealer should be able to view the trades done by him in a particular instrument. The trade information should also include the broken period interest and settlement consideration in addition to price and quantity details. The trade number should be unique and system generated for facilitating audit trails. The dealer should have the facility to reprint the deal tickets from the previous trades list. A Flat File (.CSV file) should also be generated to facilitate interface with dealer's back office software.

4.3. DEALER BLOTTER

A dealer blotter should be provided containing details of orders placed by the dealer, the trade details and other relevant information. The dealer blotter should be across instrument types and contain all data for audit and reconciliation purposes. A Flat File (.CSV file) should also be generated to facilitate interface with dealer's back office software.

4.4. NET POSITION

A dealer should be able to view his net position (Total Buy – Total Sell) in a particular instrument. Net position should be displayed for all instruments. This would indicate as to whether a dealer is holding a long or short position on a security.

4.5. DEAL TICKET

A Deal Ticket should be printed immediately on the matching of an order. The Deal Ticket should contain details about the security traded, the unique order and trade number, settlement date, the quantity and price details, the broken period interest, the settlement consideration and the constituent name, if any. A Flat File (.CSV file) should also be generated for each trade to facilitate interface with dealer's back office software.

4.6. ACTIVITY LOG

Activity Log gives the details of all the order and trade related status that an order undergoes throughout its life, like order entry, modification and cancellation that dealer has performed for an instrument or the trade execution resulted by order match. This will facilitate audit trails. Activity log should be available for a particular instrument and across instruments. A Flat File (.CSV file) should also be generated to facilitate interface with dealer's back office software.

4.7. YTM CALCUALTOR

There should be a provision of a YTM Calculator in the system to facilitate pre-order analysis by dealers. The YTM Calculator should follow the market bond conventions for various instruments. For e.g for instruments with less than six months to maturity, the yield should be calculated following the money market convention.

5. ADMINISTRATION

The ADMIN will be responsible for maintaining the Dealing System including instrument and member creation, setting up of operational parameters and managing trading sessions. The ADMIN Terminal will be accessible to authorized users only. The following functionalities will have to be provided in the ADMIB terminal:

5.1. INSTRUMENT CREATION AND MAINTENANCE

The ADMIN will create the instruments to be made available for trading. This would involve capture of information about ISIN ID, description, maturity date, coupon, coupon date, shut period, etc. Suspension/Termination of an instrument on account of shut period/maturity should be automatically done by the ADMIN system.

5.2. MEMBER/USER CREATION AND MAINTENANCE

The ADMIN will add new members and users to the Dealing System. This would involve capture of information about Member NDS ID, CCIL Member ID. ADMIN would also be responsible for suspension/termination of a Member.

5.3. OPERATIONAL PARAMETERS

The ADMIN will have to set up dealing parameters that would be applicable to members. This would include setting up the minimum lot size, the quantity tick size, the price tick size and the maximum and minimum price range.

5.4. TRADING SESSION

The ADMIN will manage the trading sessions applicable to the system. There will be different trading sessions for T+0 and T+1 settlement. There should also be a facility to extend the session timings whenever required.

5.5. CANCELLATION OF ORDERS

There could be instances of technical failures of the Dealing system in which case the dealer would require the ADMIN to cancel his outstanding orders. The ADMIN should have the facility to view all outstanding orders of a member and cancel orders as instructed by the dealer.

5.6. REPORTS

The ADMIN should have the facility to generate all member related reports when required. The reports would include Previous trade reports and Activity Log as well as the Daily Market update of all trades.

Annexure "B"

Hardware and Software Requirements for Gilts Screen based Trading System on NDS

1.0 Introduction

The Application Software for GILTS trading platform shall be client server based architecture with Oracle 9i as back-end database and VB as front-end. The architecture of the proposed GILTS trading platform and the interfaces with other applications is given in Annexure – I.

2.0 Hardware Requirement

The hardware for the GILTS system shall be based on open system like, Unix operating system and related layered software. The hardware shall have clustering and redundancy features to ensure high availability. It is suggested that there should be a disaster recovery (secondary) site in order to handle any eventuality of disaster at the primary site. Also, there should be separate environments for production, mock-testing and user acceptance testing to facilitate smooth release of new versions/upgrades. The suggested specification for the hardware is given in Annexure – II.

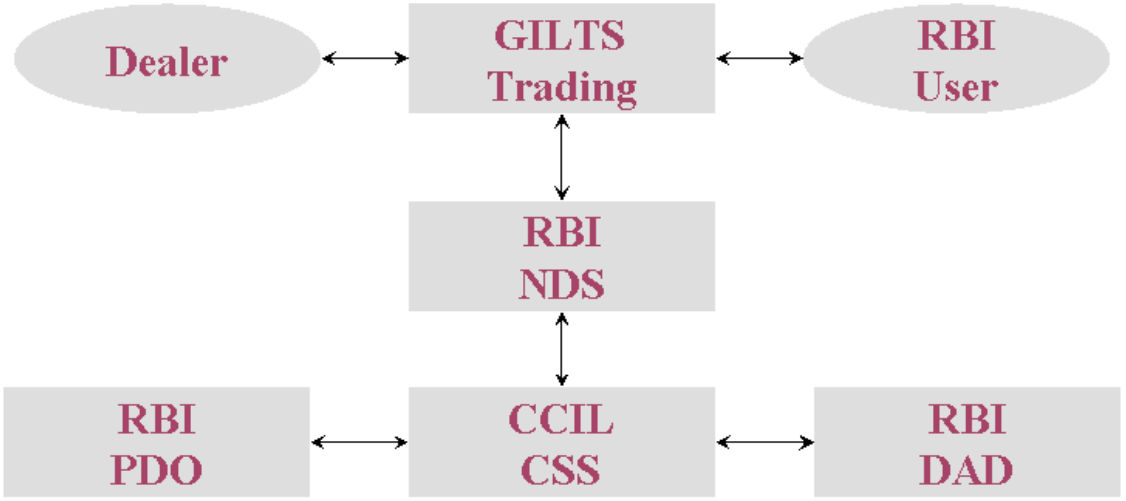
3.0 Software Requirement

The proposed GILTS platform shall be developed using 3-tiered architecture viz. Oracle database at the back-end, VB at front-end and IBM MQ series at middle as communication layer. The details of software requirements at Member location and Host location for GILTS trading platform are given in Annexure III.

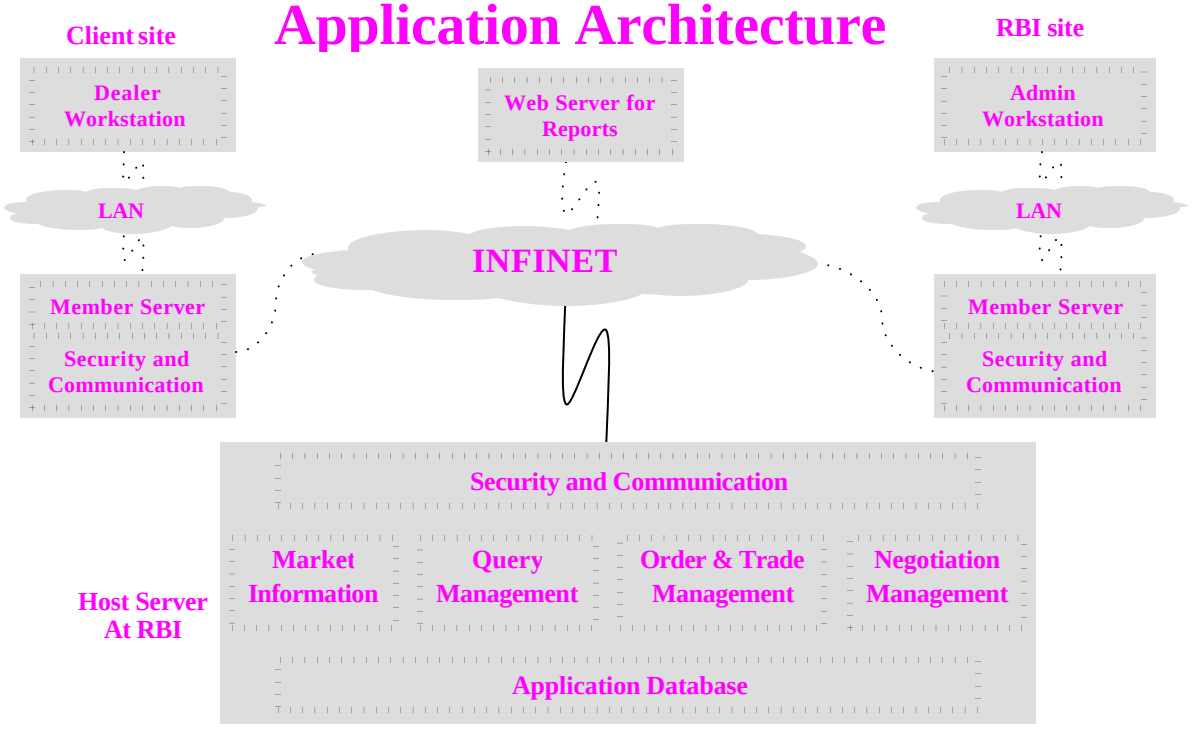
4.0 Application Architecture

The application architecture for the proposed GILTS platform will be the trading terminals and member server at member end connecting to the host at RBI end via INFINET. Hence, the users of GILTS trading platform would necessarily be a member of INFINET with a 2 mbps lease link connectivity to the nearest node and with backup communication line. It may also be ensured, incase of failure of the primary site, the members transparently changeover to the DR server without affecting their business operations.

Systems' Overview



Application Architecture



Hardware Requirement:

Host End Server : (Production/Mock)

Sr. No.	Parameter	Specification
1	No. of Servers	2 Clustered
2	No. of Partitions per server	2 (One partition for production, other partition will for Mock)
3	Type of partition	Physical
4	Processor	>= 750 Mhz, hot CPU Upgradeability
5	No. of Processors per server	4 (2 CPU per Partition)
6	Memory per server	8 GB, upgradable to >=64GB (4GB per Partition)
7	Disk Storage	2*73GB per server with full fault tolerance.
9	Aggregated I/O channel Bandwidth	>8 GB
10	Redundant Power + Fans	Yes
11	IO slots per server	> 15, hot swap.
12	Ports per server	1 serial, 1 parallel port & 1 server management port.
13	Ethernet CARD per server.	6x100/1000 Mbps PCI based Ethernet Cards. (3x100/1000Mbps per partition).
14	No. of LVD SCSI card per server	2 (1 per partition)
15	No. of FC card per server	4 (2 per partition)
16	External Storage	500GB on SAN
17	Storage switches	2 x 8 ports SAN switches.
18	Tape Drives	To backup 100 GB in an hour.
19	Warranty	3 years comprehensive on site warranty

Report Server:

Sr. No.	Parameter	Specification
1	Type of Server	Intel Xeon based
2.	Clock Speed	>= 2.5 Ghz, FSB – 533 MHz
3.	Cache Memory	L2 Cache – Minimum 512 KB
4	No. of Processors per server	1 (upgradable to 2)
5	RAM	2 GB (upgradable to 8 GB)
6	Disk Storage	4*72GB (SCSI)
7	RAID Controller	ServRAID 4Mx with 64 MB battery backed cache
8	Ports per server	1 serial, 1 parallel port & 1 server management port, USB Ports – 3
9	Ethernet CARD.	10/100 Mbps PCI based Ethernet Cards.
10	Power Supply	2X 560 W redundant with voltage-sensing, auto restart
11	Warranty	3 years comprehensive on site warranty

Member Server:

Sr. No.	Parameter	Specification
1	Type of Server	Intel Pentium IV (Server class)
2.	Clock Speed	>= 2.5 Ghz, FSB – 533 MHz
4	No. of Processors	1
5	RAM	Min 1 GB
6	Disk Storage	2x40 GB

Dealer Workstation :

Sr. No.	Parameter	Specification
1	Type of Server	Intel Pentium IV (PC)
2.	Clock Speed	>= 2.0 Ghz
3	No. of Processors	1
4	RAM	Min 512 MB
5	Disk Storage	40 GB

Note : The above does not cover the requirements for DR site.

Annexure "B (III)"

Software Requirement :

a) Front-End Application Requirements at Member's Location

1. Dealer Workstation

i.	Operating System	:	Windows 2000 Professional
ii.	Database	:	Microsoft Access 2000
iii.	Messaging	:	IBM MQ Series Client (Version 5.3)

2. Member Server

i.	Operating System	:	Windows 2000 Server with Service Pack 3
ii.	Messaging	:	IBM MQ Series Server (Version 5.3)

b) Host-End Application Requirements at RBI Location

1. Host Server

i.	Operating System	:	Unix
ii.	Database	:	Oracle 9i Enterprise Edition (Version 9.0.1.4) , Oracle RAC
iii.	MQ	:	IBM Websphere MQ Series Server (Version 5.3)
iv.	Development Tools	:	

1. C++ Softbench (Version E.06.80)
2. Pro*C++ (Version 9.0.1.4.0)
3. Perl (Version 5.8.0)
4. C++ compiler.
5. Crystal Reports

2. Administrator Workstation

i.	Operating System	:	Windows 2000 Professional
ii.	Database	:	Microsoft Access 2000
iii.	Messaging	:	IBM MQ Series Client (Version 5.3)
iv.	Other Software	:	Oracle Client (Version 9.0.1.1) Crystal Reports Runtime

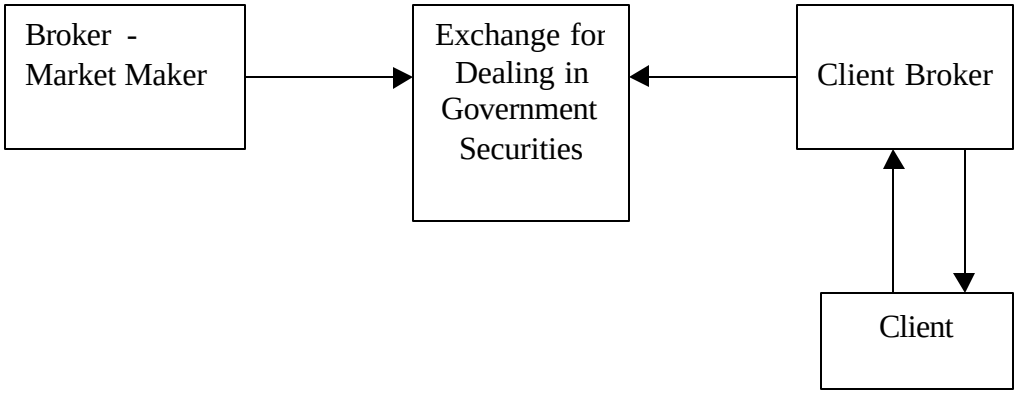
3. Report Server

i.	Operating System	:	Windows 2000 Server
ii.	Web server	:	ISS
iii.	Other Software	:	Crystal Reports Internet Connect License

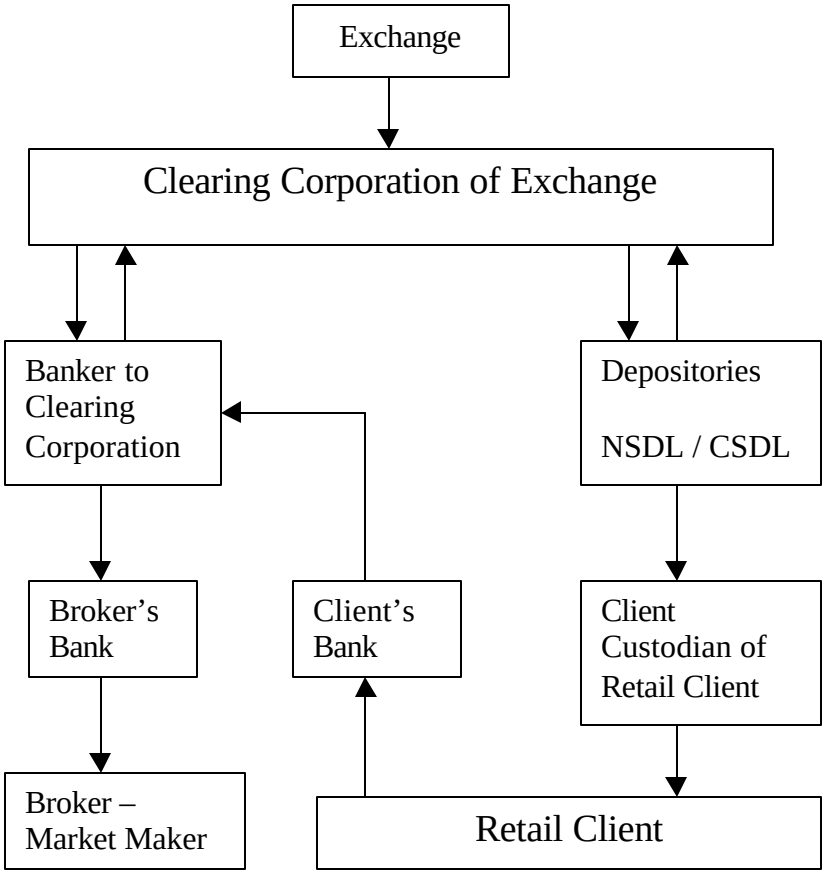
Annexure "C"

Flowchart of Gilts Dealing/Settlements on Exchanges including Cover Operations

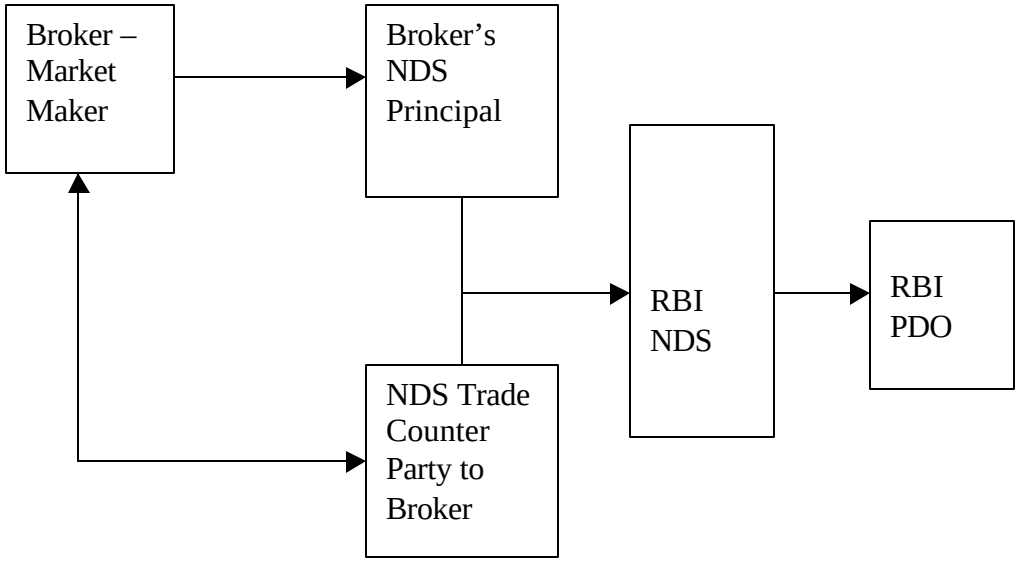
Dealing Flow Chart



Settlement Flow Chart



Cover Operation for Broker – Market Maker – NDS Dealing



NDS Deal Settlement Operations Flow Chart with linkage to Depository for ultimate settlement of Exchange Deal