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BROADBASING & DEEPENING THE BOND MARKET IN INDIA

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At the time of its independence in 1947 India had only the traditional commercial banks, all with private sector ownership. Like the typical commercial banks in other parts of the world, the banks in India were also not keen to provide medium and long-term finance to industry and other sectors for their fixed asset formation. The banks were willing to fund basically the working capital requirements of the credit-worthy borrowers on the security of tangible assets. Since the government was keen to stimulate setting up of a wide range of new industrial units as also expansion/diversification of the existing units it decided to encourage setting up of financial intermediaries that provided term finance to projects in industry. Thus emerged a well-knit structure of national and state level development financial institutions (DFIs) for meeting requirements of medium and long-term finance of all range of industrial units, from the smallest to the very large ones. Reserve Bank of India (the central banking institution of the country) and Government of India nurtured DFIs through various types of financial incentives and other supportive measures. The main objective of all these measures was to provide much needed long-term finance to the industry, which the then existing commercial banks were not keen to provide because of the fear of asset-liability mismatch. Since deposits with the banks were mainly short/medium term, extending term loans was considered by the banks to be relatively risky.

The five-year development plans envisaged rapid growth of domestic industry even in the private sector to support the import substitution growth model adopted by the national planners. To encourage investment in industry, a conscious policy decision was taken that the DFIs should provide term-finance mainly to the private sector at interest rates that were lower than those applicable to working capital or any other short-term loans. In the early years of the post-Independence period, shortages of various commodities tended to make trading in commodities a more profitable proposition than investment in industry, which carried higher risk. Partly to correct this imbalance, the conscious policy design was to increase attractiveness of long-term investment in industry and infrastructure through relatively lower interest rates. To enable term-lending institutions to finance industry at concessional rates, Government and RBI gave them access to low cost funds. They were allowed to issue bonds with government guarantee, given funds through the budget and RBI allocated sizeable part of RBI's National Industrial Credit (Long Term Operations) funds to Industrial Development Bank of India, the largest DFI of the country. Through an appropriate RBI fiat, the turf of the DFIs was also protected, until recently, by keeping commercial banks away from extending large sized term loans to industrial units. Banks were expected to provide small term loans to small-scale industrial units on a priority basis.

I. Regulated Financial System

Until almost the middle of the last decade the financial system was highly regulated. Although the DFIs were given freedom to extend term loans to projects, which they considered support-worthy based on their rigorous technical and financial appraisal, their interest rate structure was administratively fixed by the RBI along with the other interest rates in the system. The interest rates charged by the commercial banks were appropriately aligned in such a way that the project loans were relatively lower than the loans extended by banks for such purposes as working capital for industrial and other units. Similarly, the rates that the corporate entities could offer on their bonds were fixed by the Finance Ministry which used to regulate the capital markets until the independent capital market regulator viz., Securities Exchange Board of India (SEBI) was set up about a decade ago. The Finance Ministry, however, used to informally consult RBI before it fixed the interest rates on corporate bonds. Usually the interest rates on bonds and the interest rates of the DFIs were such that the corporate units did not have much attraction to raise funds from the market. There were other factors, which also discouraged corporate sector raising funds directly from the market. The debt-equity norms on bond funds were more rigorous than the ones that the institutions allowed in respect of their term loans. While the Finance Ministry did not permit bond issues of companies that would exceed the debt-equity ratio of 2:1, the institutions used to extend loans that would result in a debt-equity of up to 3:1 in respect of highly capital-intensive projects. Further, for the common investors corporate debt was not attractive in view of the absence of a secondary market for corporate debentures. Another highly discouraging factor was the high level of stamp duty that the state governments levied on secondary market transactions in bonds. On account of all these discouraging factors corporate bond market did not develop and the corporate borrowers preferred to raise funds by approaching term lending institutions.

Financial Sector Liberalisation

The situation has significantly changed after the financial sector policies were revamped and deregulation was introduced after 1991. The DFIs no longer have the comfort of the protective policy climate in which they operated. They no longer have access to concessional sources of finance like government guaranteed bonds or budgetary support. Now they have to compete with commercial banks, whose cost of funds is way below that of the DFIs. With their extensive branch network the banks have access to low cost deposits. The branch network of DFIs is small and RBI has given them limited access to deposits since the DFIs are not subject to the statutory liquidity ratio and cash reserve ratio as in the case of commercial banks. DFIs are finding it difficult to accept the obligations of SLR and CRR on their entire asset base just to have unfettered access to the deposit market.

Global competition through more liberal imports has negative impact on the profitability of several industrial units assisted by the DFIs in the past. Hence the DFIs are getting saddled with increasing levels of NPAs. Opening up of the Indian economy to comply with WTO requirements has meant more liberal imports and considerable slow down in

fresh domestic investments. This has adversely affected fresh business of the DFIs and the demand for term loans has come down sharply. More liberal industrial policy framework has encouraged mergers, amalgamations, restructuring and rationalisation of production capacities, leading to productivity improvements and consequently less demand for creation of additional capacities in various industries. Greater import availability, which also ensures much wider range of choices (and often better quality), has resulted in declining demand for term finance from industry.

The DFIs are increasingly realising that their special role as purveyors of development finance is no longer relevant in the deregulated financial system, which has cut off their access to low cost funds. DFIs are finding it difficult to remain viable by raising funds from the market at market related rates and compete with the commercial which have also started project lending in a big way with the help of the low cost deposit funds. DFIs have also found that they are not in a position to raise long maturity funds from the market and have to remain contented with short and medium term maturity bond funds. They cannot afford to get over-exposed to long gestation projects, as it would lead to serious asset-liability mismatches. DFIs have therefore started diversifying their activities into shorter maturity loans. Some of them are seriously toying with the idea of converting themselves into a commercial bank or have reverse merger with one of the commercial banks.

Since the DFIs are increasingly withdrawing themselves from project lending it has become imperative for the government to devise suitable policy frame that will encourage emergence of alternative supply sources of project finance. In view of the current slackness in overall investment activity in the Indian economy the dwindling sources from the traditional suppliers of project finance are not being felt so explicitly. But once the investment climate improves and demand for long term funds picks up alternative sources of term finance to industry and infrastructure need be to found. The best course of action for the government would be to strengthen the capital market and in particular encourage growth of an active bond market. The capital market can be relied upon to play an effective role provided a suitable policy frame for the development of an active and highly liquid nation wide debt market is put in place. The need for developing a vibrant debt market that also encourages relatively longer maturity instruments suited for financing infrastructure projects has been effectively highlighted by a high powered committee in "The India Infrastructure Report" submitted by it to the Government of India in June 1996.

Capital Market: Role of Banks & DFIs

The move of some of the DFIs to convert themselves into commercial banks in response to the financial sector deregulation and consequent loss of their business opportunities appears to have been rather too hasty. Commercial banking, prima facie, is currently appearing to be a highly attractive proposition for these DFIs. This can at best be an attractive option in so far as the immediate future is concerned. However, a more meaningful medium to long-term strategy for the DFIs would be to reorient their activities and try to become increasingly capital market oriented institutions. Even for the

commercial banks, their survival as viable and vibrant entities would very much depend on how fast they will transform themselves into capital market oriented institutions.

The days of pure DFIs or pure commercial banks are fast getting over. Just as DFIs are now facing uncertain business prospects, the commercial banks are also facing problems of a different kind. In so far as the DFIs are concerned it is a “grass is greener on the other side” syndrome. Indian banks also have to live with several policy constraints. One major area of concern for them continues to be the priority sector lending, which is mandated to account for 30% of their total advances. On account of regional and political pressures on banks their NPA levels in priority sector advances are quite high. With much smaller size of average account, the operating costs of priority sector advances to small-scale industry, agriculture, small road transport operators, etc. which are mandated by the government, are very high for the banks. These costs would be certainly much higher to the new entrants to banking activity with their market related salary structures. Currently, easy access to low cost retail deposits and freedom to participate in the money market and related areas may be the attractions of being a commercial bank. Even though a DFI cannot be member of the money market club it can get most of the advantages once a full-fledged repo market develops. The banking industry led by the State Bank of India, (country’s largest commercial bank), is in the process of operationalising Clearing Corporation which will act as the central counter-party to all settlements in debt trading, bilateral repo as also third-party repo transactions.

As regards mobilisation of funds, the exponentially growing Internet will bring down the costs of resource mobilisation for the DFIs. They need not have to invest large sums for setting up brick and mortar branches like the traditional commercial banks in India. DFIs should increasingly issue bonds/instruments in demat form to minimise issue expenses and transaction costs in the secondary markets, since depository transactions have been recently exempted from stamp duty. DFIs should also work out arrangements for market making in their debt instruments and providing assured liquidity to investors. If the DFIs are able to create an active market for their bonds, they will be able to wean away depositors from the banks since the bonds will be much more liquid than the term deposits of the commercial banks. With such arrangements for raising and deploying resources the DFIs can hope to have best of both the worlds.

Commercial Banks

The commercial banks in India have become considerably changed entities after the financial sector deregulation was launched in the early part of the last decade. Deregulation of interest rates, together with the RBI directives/guidelines on capital adequacy, income recognition, asset classification and provisioning have all led to a major change in the attitudes of bankers towards deposit mobilisation and the deployment of funds. Assets, which did not earlier look like being bad, are now getting classified as NPAs requiring appropriate provisioning. Deregulated interest rate regime has ushered in an era of interest wars and client snatching. Profitability levels are therefore increasingly under pressure. Earlier zeal to expand loan portfolio even if it meant adding to risky portfolio and possible NPAs has significantly waned. Consequently there has been

considerable shift in favour of risk-free portfolio or assets that do not demand addition to capital base. Although the rule requires the banks to invest only 25% of their deposit funds in government bonds and other approved securities the banking sector invested 38% of its deposit funds in such securities. The earlier obsession to mobilise deposits and to assess performance of banks/branches/officers on the basis of their deposit mobilisation efforts is no longer there. Several banks are trying to increase the share of their fee-based incomes rather than be after interest incomes. The transformation that was observed in the US with banks moving away increasingly from fund-based incomes to fee based incomes is also gradually catching up in India. Some of the newly set up banks have not only embraced information technology wholesale in their operations but have also been orienting their business strategy to derive growing part of their income from activities that are directly and indirectly related to the capital market.

Since banks have surplus funds and are not able to identify good borrowers they are ever on the look out for good quality paper in the market. Recent developments in this area have been adverse to the banks that are relying on the loan business. Corporates prefer raise money through commercial paper and debentures as their costs are much below even the sub-prime lending rates of banks. Interest rates on these instruments further fell recently by about 25 to 50 basis points. Ironically, due to large floating liquidity with the banks they are noted to be largely responsible for driving down the rates on commercial paper and debentures. Many creditworthy borrowers do not seek to renew loans or go for fresh loans from the banks or the DFIs. Both banks and DFIs are actively competing for good quality paper, which happens to be in short supply currently. Given the great appetite of banks for high quality paper, corporates with good credit ratings prefer to float paper in the market. Interestingly, the banks, which would have normally lent funds to good borrowers at their prime rates, are willing to absorb paper floated by the same clients, although such paper fetches yields that are lower than their prime rate. With a view to earning fee-based incomes banks are also assisting their customers to raise part of the funds needed by the corporates from the market by way of commercial paper provided it is rated as investment grade.

Role of DFIs & Banks

DFIs and commercial banks are thus at the threshold of a new phase of their transformation into capital market oriented institutions. Until recently their prime business motivation was to function as pure and simple financial intermediaries engaged in mobilising resources and lending them to the needy borrowers. But during the last ten years or so composition of their assets and liabilities is getting increasingly influenced by the market forces. In the past, while commercial banks used to mobilised resources mainly from the primary savers the DFIs were relying on the captive sources of funds and only small amounts used to be raised from the primary savers. With financial sector deregulation the dependence of DFIs have no choice other than depending on the primary savers for mobilising the fresh/incremental funds. Both the DFIs and the banks are realising that they need to increasingly become market oriented in their intermediation activities. They have also recognised the need to increase the proportion of their fee-

based incomes, as such activities do not impair quality of their assets or lead to growth in their NPA levels.

While there has been a perceptible change in the approach of banks and the DFIs in favour of financial intermediation some policy changes are needed to remove the distortions that have encouraged them to be biased in favour of *loan culture rather than bond culture*. It may be worthwhile to dilate a bit to bring out the whole import of this statement.

Underdeveloped Bond Market

The Indian financial system is not well developed and diversified. One major missing element is an active, liquid, and large debt market. In terms of outstanding issued amount, Indian debt market ranks as the third largest in Asia, next only to that of Japan and South Korea. Further, in terms of the primary issues of debt instruments, Indian market is quite large. The government continues to be a large borrower unlike South Korea where the private sector is the main borrower. If we compare the size of the Indian GDP with the outstanding size of the debt flotation, Indian debt market is not very much underdeveloped.

The gross domestic savings rate in the Indian economy is reasonably satisfactory at around 23%. According to RBI's annual studies on savings, about 78% of the aggregate financial savings of the household sector were invested in fixed income assets. The average Indian household has great appetite for debt instruments provided they are packaged properly. The main financial instruments popular with the households are bank deposits, provident funds, insurance, income-oriented mutual funds, and postal savings schemes. However, the share of fixed income instruments that could be traded in the secondary markets is negligible. The main reason for this is the absence of an active secondary market in debt instruments. Investors are not willing to invest in tradable instruments as they lack required liquidity. It is thus a typical case of "chicken and egg problem". Since there are not enough number of issues and the floating stock in the secondary market is very small there is hardly any trading in them. Currently almost 98% of the secondary market transactions in debt instruments relate to government securities, treasury bills and bonds of public sector companies. The quality of secondary market debt trading is very poor if we compare it with the quality of the secondary market in equities. Debt markets lack the required transparency, liquidity, and depth. With reference to the usual standards or yardsticks of market efficiency the Indian debt markets would not score more than 30% of the marks that the Indian equity markets would score.

The US has one of the most active secondary markets in both government and corporate bonds. The trading volume in the US debt market is said to be on an average ten times the size of the equity trading. In India the average daily trading in debt during the last year was about one tenth of the average daily trading in equities. These comparisons bring out the underdeveloped nature of the Indian debt markets. The secondary debt market suffers from several infirmities. It is highly non-transparent compared to the equity market. It is highly fragmented since the ownership titles of government securities are fragmented in

14 offices of the RBI, which acts as a depository for the government debt including the treasury bills. A seller from New Delhi cannot trade in Mumbai market since security held in RBI office in New Delhi cannot be easily transferred to Mumbai office of RBI and vice-versa. Since the current small order book stands fragmented city-wise the price discovery process does not throw up the best possible prices.

Corporate Bond Market

For too long, most of the corporate entities have been depending on loans from banks and institutions and they have not shown any interest to raise at least a small of the required resources from the market through bonds or commercial paper. The cash credit system also made them complacent about cost effective fund management through treasury operations. Under their age-old cash credit system, banks grant credit/borrowing limits to the corporates. They can use bank funds within the granted credit limits at their convenience and return the same back to the banks as they receive from their customers. Since the interest is charged by banks only on the average outstanding drawals, the cash management responsibility of the corporates got transferred from the borrowers to the banks.

Corporates have been raising funds from the retail markets by way of term deposits just as the banks do. This is an age-old system quite popular with several corporates. The company statute permits corporate entities to raise public deposits within certain limits. Currently the amount of deposits that a corporate can raise is equal to 50% of its capital and free reserves. Surprisingly even the corporate units which raise funds through public deposits have also not shown interest in issuing bonds although they could raise more money this way than through public deposits. Corporates can raise bond funds so long as their term debt does not exceed twice the amount of paid up capital plus free reserves. Several good credit-rated corporates have been showing interest in raising funds by way of private placement from big lenders/investors but they do not like to tap the public issue market. One of the reasons why they do not like to make public issue of debt is that the regulatory requirements including quality and the type of disclosures are more rigorous or onerous in the case of public issues. Although the interest rates they pay on such placements would be equally attractive to retail investors, corporates have not shown much interest in the retail investors. Recently through an amendment to Companies Act government has tried to plug possible misuse of the system by stipulating that the privately placed debt cannot be distributed to more than 50 investors. Market feed back suggests that the corporates are not happy with this amendment and a number of them are trying to find ways for bypassing the legal requirement of distributing debt among not more than 50 investors. One of the possible that is being discussed is to issue the privately place to less than 50 investors in the initial stage and these investors to sell it to much larger number of investors at the second stage as if it is a secondary market operation.

The US experience clearly bears out that the Indian private corporate sector is adopting a myopic approach by overlooking the advantages of financial disintermediation. Sooner it gets out of the habit of depending excessively on the banks, institutions, and the private

placement market, the better it would be for it from a long-term point of view. The problem of asset-liability mismatches is going to catch up with the banks sooner than later and their appetite for term debt will decline. In so far as the DFIs are concerned they are already in a transition phase toying with the idea of commercial/universal banking. Since their access to long-term funds has dwindled they will not be in a position to meet demand for term funds of industry and infrastructure sectors when investment activity picks up from the present low levels. Continued excessive dependence on banks and DFIs is not in the interest of good credit-worthy borrowers, as they would end up paying up more than what they would have to pay if they decide to raise funds from the market directly.

Initially, before an extensive good retail distribution network is built up, the borrowing costs of good-credit rated borrowers from the primary savers including the households may turn out to be slightly higher than those charged to them by banks and institutions. There are also those hassles of servicing large number of investors, which the corporates have been avoiding all these years by either taking loans or tapping the private placement market. A number of significant reforms have taken place in the Indian financial and capital market areas, which make it possible to tap the retail bond market with minimum hassles.

During the last five years movement to depository form for ownership and secondary market transactions has made tremendous progress. Currently, 99.7% of the secondary market transactions in equities are settled through book entry transfers in the depository. The National Securities Depository Ltd (NSDL) promoted by the National Stock Exchange (NSE) along with IDBI and UTI has helped in almost getting rid of paper-based settlements in equities. About a year ago through suitable legislative changes the debt instruments have been brought under the ambit of depository. As a result all ownership transfers through the depository have been completely exempted from the payment of stamp duty, which is quite prohibitively costly. NSE now provides direct on-line connectivity to 430 cities and towns across the whole country through a satellite communication link-up for secondary market trades. The response time for trades from any part of the country is less than 1.5 seconds.

NSE has extended its secondary market infrastructure for making primary issues of debt and equity through either direct fixed price mechanism or through the book-building route. The costs of primary issues as also of secondary market trades of debt and equity can be kept at very modest levels by relying on the infrastructure of NSE and NSDL. With the disappearance of paper securities and abolition of stamp duty in depository mode transfers, the costs of secondary market transactions as also the costs and hassles of servicing of large number of investors can be significantly minimised. Banks and the DFIs can earn good returns if they undertake market making in bonds of their choice. Market making will provide liquidity to the bonds and help in popularising them among millions of investors who have natural preference for fixed income securities. Banks can perform this role with minimum level of risk if they hold investors' security accounts as depository participants besides holding their cash accounts.

Like in most of the well-developed markets all over the world the Indian stock exchanges had also adopted trading systems that relied overwhelmingly on the jobbing or market making mechanism. The Bombay Stock Exchange (BSE), which until November 1994

used to account for about 70% of the trading turnover of all the stock exchanges in India, had adopted jobbing or market makers system of trade. It was in November 1994 that NSE introduced fully screen-based order driven trading system in India. Many market observers had opined that NSE, as an Exchange would not take off since it did not adopt the time-tested market making trading system. For about a year since November 1994 there was a fierce competition between the order driven system adopted by a totally new exchange like NSE and the market making system of a well-entrenched stock exchange like the BSE. Interestingly the market preferred the order driven system as could be noted from the fact that after about a year's time, that is by November 1995, NSE emerged as the largest stock exchange of the country in terms of daily trading turnover. Since the Indian equity market has a history of more than a 120 years investors could quickly discover that the advantages of the order driven trading system in terms of much lower transaction costs and freedom from the stranglehold of the market makers.

However, Indian investor is still new to the debt market. As of now, most of the investors in favour of fixed income assets prefer bank deposits, postal savings schemes, etc. To entice these investors to the debt market they will have to be assured of adequate liquidity in the secondary market for debt instruments. In the case of the fixed income assets such as bank deposits or postal savings schemes the investors are protected in regard to both the principle value of investment and the rate of return. However, principal value of the debt instruments traded in the secondary market may not always be equal to their original investment value. Most of the investors are aware that the market value of the bond is likely to fluctuate in response to movements in interest rates. For instance, the market value of the bond may be below its issued price in response to upward movement in interest rates. The opposite would happen if interest rates decline. Most of the investors would be prepared to absorb this price risk. But what they may not be willing to live with is the decline in the bond value merely because there is hardly any liquidity in the secondary market. Until the market provides a mechanism for pricing bonds based on their intrinsic worth and that bonds do not get quoted at a discount merely because there is no liquidity investors may be unwilling to go in for traded debt instruments. Conscious efforts therefore need to be made to create liquidity in the debt instruments by encouraging market makers to give two-way bid and offer quotes with reasonably narrow spreads. Once the investors are convinced that they are assured of liquidity in the market their willingness to shift from the currently popular fixed income assets like bank deposits to tradable debt instruments like corporate debentures would be greater.

As of now the average investors are not yet aware of the advantages of investing in debt instruments that are traded in the market. Tradable debt instruments are yet to catch fancy of most of the average investors although they prefer to invest major part of their savings in the fixed income securities. Therefore, it is more a matter of developing *investors' tastes* for such instruments before the fixed income oriented investors naturally start investing in them. In the early stages of development of the debt market it would be both desirable and necessary to introduce active market making so that investors are assured of liquidity for the debt instruments. The banks and DFIs are best suited to take upon themselves the role of market makers for their clients who enjoy good credit rating. The existence of information asymmetry is actually in favour of the banks and DFIs. They have good access to far more dependable information about their corporate clients than

average investors do. Since they can assess credit risk of the debentures of their clients they are in a better position to make bid and offer quotes for such debentures. Instead of extending loans/credits to their corporate clients, banks and institutions should persuade some of their clients to tap the debt market for long-term bonds or commercial paper. The attractions of such instruments to the investors would be considerable if the banks actively make market in these instruments by making two-way quotes.

Banks can offer both cash account and depository account facilities to investors at most of their branches. They are, therefore, in a better position to tempt their depositors to invest in the bonds floated by their good clients. Investors would be better inclined to invest in a debt instrument if they know that their bank would be willing to buy/sell the instrument from them at a pre-announced price. This being a fee-based income activity banks will be passing on the credit risk directly to the investors. Banks do not have to raise additional capital to meet the stringent capital adequacy norms if they choose to play the intermediary role in the sale of debenture rather accept deposits to extend credit to their corporate clients.

Advantage of Debt Market to Banks

One of the important lessons of the recent Asian crisis was that banks did not pay any attention to protecting themselves from the currency and asset liability mismatches, especially arising from those of their domestic currency loans based on their foreign currency borrowings. India could, however, escape from the contagion effect because its short-term external currency borrowings were relatively small and the banks transferred the entire currency risk to their clients. While banks in India have been able to better protect themselves from asset liability mismatches arising from foreign currency loans they are still to tackle seriously their asset liability mismatches in the domestic currency. In respect of the DFIs it has been observed that the asset liability problem they have so far faced is of a peculiar nature. When they enjoyed the facility to raise rupee funds through government guaranteed bonds the weighted average maturity of their borrowings was higher than the weighted average maturity of their loan portfolio. Secondly, since they were able to raise funds at relatively lower rates, and since it was a period of administered interest rates they did not face the problems that the financial intermediaries face on account of interest rate movements. Even in regard to banks the asset liability mismatch problem was minimal as they were lending mainly by way of short-term loans and they had the freedom to raise lending rates in response to developing situations. But this comfortable world came to an end after the financial sector deregulation.

Minimising asset liability mismatches as well as managing interest rate risks are becoming some of the major preoccupations for both banks and the DFIs. All the DFIs are exercising call options and redeeming the non-SLR bonds, which they had earlier floated at high interest rates. Since average lending rates have declined during the recent past DFIs are finding that some of their earlier market borrowings are at rates, which are higher than what they charge on fresh loans. Similarly, to protect themselves from problems arising from asset liability mismatches and interest rate risks they are deploying bulk of their funds by way of short-maturity loans. Indian borrowers are still resisting

variable interest clause in the loan agreement. Part of the difficulty faced in this area is the absence of a benchmark with reference to which the variable interest rate clause can be drafted. The Indian sovereign bond market is not well developed and the interest rate thrown up by the system is still not acceptable to most of the borrowers and lenders. The efforts made by NSE and others to develop benchmark rates will be touched upon in another section.

Development of an active bond market will help to resolve some of the problems of asset liability mismatches faced by banks and institutions. After the interest rates regime was deregulated it has become difficult for all the market participants to predict the yield curve with any degree of confidence. Since the month-to-month fiscal situation of the government of India also has become a highly unpredictable variable interest rates at which government raises bond funds have also become unpredictable. RBI has tried to even out these fluctuations by itself stepping in to absorb central government bonds and later selling them off in the secondary market at more appropriate times. All the same the financial intermediaries are often at a loss to predict with any degree of reasonable accuracy to predict either the level or shape of the yield curve. Duration risks in particular are becoming highly unpredictable. Another reality with which banks have to live is the requirement of extending advances not by way of cash credit mechanism as they used to do it earlier but by way of term loans to large borrowers at the insistence of RBI. Earlier the banks could revise interest rates on the outstanding cash credit advances as and when they decided to revise their lending rates. The same flexibility is not available with the term loans. Secondly, the banks have now to worry more about their asset composition to maintain reasonably satisfactory capital adequacy level. Banks need to use funds increasingly for acquisition of assets, which are easily disposable and offer much greater freedom to change their composition in response to changes in the interest rates structure or maturity pattern of their existing liabilities. Banks can enjoy such flexibility if bulk of their assets could be easily reshuffled through market operations. It would be possible for banks to achieve the same objective if an active market in credit derivatives could be developed. Therefore, while extending short-term advances, banks should favour accommodating their customers through the bills scheme or commercial paper. Similarly, instead of extending term loans banks should prefer the route of marketable debentures of various maturities.

Assets traded in the market help in inducing a sense of discipline both among lenders and the borrowers. In India, debt, which is rated by one of the recognised rating agency can be listed on the stock exchanges. Such debt is periodically reviewed from the rating angle by the rating agencies. In order that the resource tap remains open by way of renewal/reissue of the existing debt or making fresh issues for funding growth in operations or taking up new activities the borrowers will have to be ever alert to keep rating at a satisfactory level. The lending agencies also will be in a much better position to evaluate quality of their portfolio periodically when their exposure, at least to the large borrowers, is the form of credit-rated marketable debt. Although some banks have developed their own versions of credit rating it would always be preferable to also take into account rating of assets by professional rating agencies. Based on the assessment of the professional rating agencies the banks would have much more dependable assessment of the quality of their portfolio. With pressure on banks to make greater disclosures about

the quality of their portfolios the management of banks would be in a better positioned to ward off unhealthy extraneous pressures to lend to risky borrowers.

Size of the Debt Market

The Wholesale Debt Market (WDM) segment of NSE, which makes available for trading most of the debt securities, has an aggregate market capitalisation of around Rs.6094 billion as of April 2001. Of this the 69.6 % was in the form of dated securities of the Central Government while Treasury bills accounted for an additional 3.1%. The dated securities of the State Governments were 7.4% of the total debt. The relative share of corporate bonds was modest at 2.5%. With the financial institutions becoming increasingly active in raising funds at market related rates, the share of their bonds at 4.6% of the total was higher than that of the corporate bonds. The public sector units mainly of the central government depend on bond to a large extent with the outstanding stock of their bonds accounting for about 5.9% of the total.

It is thus clear that the debt market is dominated by the central and the state governments, public sector units, and the financial institutions (mainly the DFIs). Currently, the WDM segment of NSE serves as the only formal platform for trading (including trade reporting) of a wide range of debt instruments. As a consequence of the various measures taken by RBI and NSE to popularise trading in debt instruments the number of daily trades on NSE's WDM segment increased from 5 in 1994-95 to 223 in 2000-01. Similarly, during the same period, the average daily turnover in debt instruments increased from Rs 300 mn. to Rs 14.8 bn. and the aggregate annual turnover from Rs 67.8 bn to Rs 4285.8 bn. The share of the trades in government securities and Treasury bills on NSE, which were settled by RBI through its depository system known as the SGL by relying on DVP-1 system (which settles trades on a gross basis, that is trade for trade). A large number of trades in government securities are also done bilaterally in the OTC market and are not reported to the NSE. The shares of trades on the WDM segment of NSE accounted for 60% of all the trades while the other OTC segment accounted for the balance 40%.

Trade in debt instruments is concentrated in government securities and treasury bills; trade in these types of instruments together accounted for 96.6% of the aggregate trade in debt instruments on the NSE during 2000-2001. Trades in public sector bonds, institutional bonds, and the corporate bonds each accounted for 1% of the total debt trading during the year. Thus the government securities trade dominates the primary as well as the secondary debt market in India. It would no exaggeration to say that debt market in India is almost synonymous with the debt instruments floated by the government sector including public sector units and institutions.

Indian banks which account for about 90% of the banking in India had 34% share in the debt as against 17% by the foreign banks. It is thus clear that Indian banks are relatively much less aggressive players than the foreign banks in spotting profit opportunities in the market. The primary dealers are perhaps the most aggressive lot by contributing to 22% of the total trades in 2000-2001 as against 19% during the previous year. The DFIs and the mutual funds were relatively small players accounting for only about 4% of the total trades in the debt market.

II. RBI & Government Securities Market

The government securities market is a very important segment of the debt market for several reasons. In most of the market economies it is perhaps the largest and very active segment. Being a fairly liquid and large market most of the players in the market use sovereign debt instruments for their liquidity management as well as a collateral for several types of transactions including the repos and collateralised large payments systems. The yield structure as given by the secondary market in sovereign debt serves as **the benchmark rate** for all the other yield rates in the system. It is a universally accepted proposition that the term structure of interest rates cannot be meaningfully estimated in the absence of a deep, vibrant, and efficient market in sovereign rated debt instruments. The yield rate structure for all the other debt instruments in any financial system evolves or emerges with reference to the term rate structure of the sovereign instruments. RBI has therefore been laying considerable emphasis on the development of an efficient and vibrant government securities market.

The last decade witnessed significant transformation in the government securities markets. These developments were as a result of the joint move by RBI and GOI to gradually align the yield structure to the market expectations. Till then the coupon rates on government securities were administratively determined. Until a few years ago the artificially low rates of government securities in relation to the market expectations had an impact on the entire yield structure in the entire financial system. This also hindered growth of an active secondary market in government bonds. As a first step, RBI introduced in June 1992 an auction system for the issue of government securities. The major objective behind this move was to help the market to understand the niceties of the price discovery process. RBI has used both the auction method and the pre-determined coupon/tap issue for this purpose before fully going in for completely market determined rates.

Treasury bills are issued primarily through the auction method. Generally the multiple price auctions method used for issuing the instruments. Apart from the allotment through auction, the practice of non-competitive bids at the cut off yield rates is accepted from certain types of investors. The State Governments generally manage their liquidity through purchase of treasury bills issued by the Central Government; they are allotted these at the weighted average price determined in the auction. Non-competitive bids are accepted outside the notified amount for auction. This practice has been adopted to encourage participants who do not have the expertise needed to participate in the auction. RBI also participates in the non-competitive bids in both dated securities and the treasury bills for part of the issues in case the entire issue is not subscribed. On a number of occasions RBI has accepted private placements of government stocks and released them to the market when the interest rate expectations turned out to be favourable. RBI has to resort to this system whenever the government's needs for funds suddenly spurt and the issue through the auction would result in creating sudden destabilisation in the market rates.

A multiple price auction method is associated with the problem called winners' curse. It is therefore suggested that a uniform price auction method would be more equitable. RBI

therefore recently introduced the uniform price auction method for 91-day treasury bills. With a view to further the process of consolidation, since 1999-2000 RBI is making most of the primary issues of dated securities by way of re-issues and price-based auctions, instead of yield-based auctions. As the secondary market widens and deepens it needs large-sized issues for efficient price discovery process in the secondary market and development of proper benchmark rates. RBI is also planning to develop an active market is Separately Traded Registered Interest and Principal of Securities (STRIPS).

RBI announces a fixed calendar for auctions of all types treasury bills. The auctions of 14-day and 91-day treasury bills were so far auctioned on a weekly basis while auctions of 182-day and 364-day treasury bills are held on a fortnightly basis. RBI has decided to discontinue the 14-day and 182-day treasury bills and have auctions only in 91-day and 364-day treasury bills. Henceforth the weekly auction of 91-day Treasury bill amount will be Rs. 2.5 billion and the fortnightly auction of 364-day Treasury bill will be Rs 7.5 billion. RBI is yet to adopt a fixed pre-announced calendar in respect of the issues of dated securities.

Market Participants

In India the major investors in government securities are the commercial banks, co-operative banks, insurance companies, provident funds, financial institutions including the DFIs, mutual funds (including the gilt funds), primary dealers, and non-bank finance companies. RBI also invests in government securities either through the private placement route or by absorbing the un-subscribed portion of an auction for notified amount. Commercial banks are the dominant investors historically because of the Statutory Liquidity Ratio (SLR) compulsions. But during the last several years banks are investing substantially more than what is required by the SLR compulsions as the demand for funds is not growing or that they prefer investing in government securities in view of the capital adequacy requirements. Given the risk-reward matrix banks find it more attractive to invest in government securities. Life Insurance Corporation (LIC) is another major investor next to the banks. As at end 1999 while RBI held 9.1% of the stock of the Central and State Government securities, 59.5% was held by commercial banks, 17.9% by LIC, and 13.5% by others. During the last decade the mandatory SLR ratio was brought down by RBI from 38.5% of the total demand time liabilities of the banks to 25% as of now. But banks' investment in government securities is around one-third more than what is statutorily required indicating thereby that banks now consider government securities to be a preferred option. From the viewpoint of the debt markets this is a healthy development, as it will help in developing an efficient government securities market that can throw up a meaningful benchmark yield rate. An equally important development has been the growing popularity of the Gilt Funds, which invest all their disposable resources into gilt securities. Slowly but surely many investors are discovering the advantages of gilt securities and the risk-reward matrix. This should help in the development of a retail market in government securities for a class of investors who would invest either through the Gilt Funds or directly. One major attraction of gilt investments is the abolition of the Tax Deducted at Source (TDS) for gilt investments. This will also facilitate in the development of the yield curve that does not contain the noise generated by TDS.

Institutional Infrastructure

The main infrastructural components of a market are: (a) a transparent trading system that is conducive for an efficient price discovery process, (b) a settlement system that underwrites the settlement risks of the market players, and (c) large number of active market players with differing and divergent perceptions so that market is not too much under the influence of herd mentality with very few willing to take positions counter to the general trend. Currently, RBI is actively engaged in building all these three essential components of the market.

RBI is currently engaged in the development of a Negotiated Dealing System (NDS) platform to which all the large market players will be connected through a closed user group telecom network. The market players like banks and primary dealers who have both security account and cash account with RBI will be asked to hook on to the NDS platform. Statute requires RBI to function as depository to hold all the depository accounts of all major investors in government securities like banks and primary dealers. Some of these investors like banks in turn offer depository participant services by holding the sub-accounts of investors in government securities like corporate entities.

The institutional players like banks and primary dealers will be required to either match or negotiate their deals on the NDS platform or will be required mandatorily to report all their OTC deals to this platform. All these deals will be cleared and settled by the RBI under DVP-1 method which involves settlement trade by trade without the facility for netting. Alternatively, the market players have an option to settle their deals with the Clearing Corporation of India Ltd. (CCIL) which has been set up only recently and is in the process of building up its infrastructure and systems. CCIL will settle these deals, to begin with, by using the DVP-2 method, where the trades in securities are not netted but the funds are netted as at the end of the day for next day settlement. The CCIL will be connected to the NDS platform on a real time basis so that all the deals, which the market players would like to be settled by CCIL, will be routed automatically by NDS to the CCIL. It is envisaged that eventually all the deals in government securities will be cleared and settled by the CCIL under the DVP-3 method, which involves end of the day netting of both securities and funds.

Broad basing the Market

The market microstructure theory tells us that efficiency of a financial market depends on the plurality of players who have divergent perceptions and different objective functions. Large number of players is required to ensure competitive conditions in the market. It is also essential that the players should not be swayed by herd instinct and should be able to spot profit opportunities in different market conditions. With this view in mind RBI has been encouraging different types of new players who would take active interest in the development of a deep and vibrant debt market. The Discount and Finance House of India (DFHI) was set up in 1988 at the initiative of RBI with RBI initially holding controlling interest. Later, RBI completely withdrew from DFHI by off-loading its holdings in favour banks and institutions. Original objective of DFHI was to develop the money market. It was also allowed to participate in Treasury bills and dated securities. RBI encouraged setting up of the Securities Trading Corporation of India (STCI) in 1994

for developing an efficient secondary market in government securities and bonds of public sector companies. Later both DFHI and STCI were transformed into Primary Dealers (PDs).

RBI encouraged setting up PDs since 1996 with a view to activating the secondary market in governing securities and treasury bills. Institutions like banks and insurance companies are the major investors in government securities, but their activity is geared more with investment motive rather than trading interest. RBI therefore decided to encourage a class of active players in the government debt market who would be keen to generate their profits mainly through active trading and broad basing their customer base for the purpose. PDs take considerable interest in the primary issues of the government securities and treasury bills by aggressively participating in the auctions. They also act as market makers providing continuous two-way quotes thereby ensuring liquidity and support to the success of primary market operations. Through their various operations in the secondary market the PDs create appropriate conditions for the success of open market operations conducted by RBI.

As of now there are 16 approved PDs in the gilt market. One of the conditions stipulated by RBI while granting approval to the PDs is that they should have active and continuous presence in the government securities market and participate in auctions for government securities by bidding for certain minimum amounts and also ensuring a minimum success ratio in the auctions. Each PD is expected to achieve an annual turnover of not less than five times in dated government securities and ten times in treasury bills, within which outright transactions should be three and six times respectively. To facilitate activities of the PDs, RBI grants them facilities like current account/SGL account, liquidity support linked to bidding commitments, freedom to deal in money market and favoured access to open market operations.

For further broad basing the gilt market with second tier of dealer system in trading and distribution and imparting greater liquidity and turnover in government securities RBI announced a scheme of satellite dealers was put in place in December 1996. Already, RBI has granted approvals to 9 satellite dealers. The satellite dealers will also be eligible for limited liquidity support from the RBI in their efforts towards activating government securities market. While the PD have made a significant impact on the government securities market including the Repos, the satellite dealers are yet to make their presence felt in this market.

Gilt Funds

Recognising the important role that the mutual funds can play in encouraging investment by the retail investors in government securities RBI has been encouraging pure Gilt Funds that invest all their funds in government securities. These Gilt Funds are eligible for liquidity support from RBI by way of reverse repos in central government securities. Such liquidity will be limited to 20% the investment of the Gilt Fund in central government securities.

Clearing Corporation

RBI considers money and government securities markets as critical for facilitating the conduct of its monetary policy and is therefore keen to improve the transmission mechanism. RBI is keen that it has greater control over the liquidity in the system and hence needs efficient mechanism to transmit interest rate signals particularly through the repo instrument. Since repo provides access to collateralised liquidity, RBI is keen to encourage development of a healthy repo market by widening the range of participants and instruments eligible for repo purposes as also by ensuring uniformity in trading and accounting practices. RBI has therefore consciously encouraged banks, primary dealers, insurance companies, and other major market participants to set up Clearing Corporation, which will make repo operations more efficient and provide adequate safeguards to protect the integrity of the market. According to RBI further progress in the reform of the financial markets could be facilitated to a considerable extent on the commencement of the operations of the Clearing Corporation, which will significantly upgrade the settlement standards for a whole range of debt and money market instruments.

As of today most of the trades in the debt instruments (other than in corporate debt) are negotiated telephonically and reported on the system. Settlement of all the trades done by banks, DFIs and Primary Dealers in the sovereign debt instruments like Central and State government dated securities and treasury bills etc. is done in the RBI. These entities maintain both their cash and depository accounts with RBI. Under the Public Debt Act the RBI is the sole depository for all sovereign debt instruments including the Treasury Bills. With rapid growth in the number transactions in sovereign debt instruments RBI is finding it difficult to manage all the settlement activities in debt instruments. RBI is computerising its Public Debt Office. The clearing corporation called Clearing Corporation Of India Limited (CCIL) will introduce best international standards in clearing and settlement by adopting strong risk management systems and procedures.

CCIL has already been set up as a limited liability non-government company with equity capital of Rs 500 million. It will act as central counter-party in the settlement of all trades in government securities, treasury bills, money market instruments (like commercial paper and certificates of deposits), repos, foreign exchange, and derivatives of any kind including futures, options, swaps, swaptions, caps, collars where the underlying instrument is a security or money market instrument. CCIL will be a clearing and settling agency in respect of all trades done by banks, DFIs, primary dealers, mutual funds, and other large financial intermediaries. Thus, while CCIL will be concerned with the clearing and settlement of deals of the institutional players, the retail trades will be cleared and settled by the clearing corporations set up by the stock exchanges. It is planned that CCIL will establish, at a later date, appropriate linkages with the clearing corporations of the stock exchanges for finally clearing settling their trades in respect of all the above mentioned instruments. A precondition to the establishment of such a linkage to the clearing corporations of the stock exchanges will be that they should act as central counter-parties providing settlement guarantee in respect of the trades executed on their stock exchanges.

For the sake of convenience, one could compartmentalise the debt market into three broad segments. The first segment would consist of the wholesale market made up of the large financial intermediaries like banks, DFIs, insurance companies, primary dealers,

and large mutual funds. As of today bulk (over 97%) of the trade in debt instruments in India is confined to these large players. The banks and insurance companies are obliged by the statute to invest certain part of their resources in government securities and treasury bills, and certain other approved securities. The second tier of the debt market, which may be conveniently called as the semi-wholesale segment, consists of provident funds, trusts and corporate units. Provident funds are large investors in debt instruments and they are not permitted to invest any part of their funds in equities. Recently, some of the corporate entities have started investing and trading in debt instruments as part of their treasury management. The third tier of the debt market is the retail market mostly made up of households or individual investors. The investment/trading needs of these three segments are not uniform. But for the purposes of developing an active, vibrant, and healthy debt market it is necessary to build appropriate strong linkages among these three segments through the secondary market route. CCIL has therefore plans to build strong links between clearing corporations of the stock exchanges like the NSCCL. As of now NSE's clearing corporation NSCCL has in place strong risk management practices and a large settlement guarantee fund. NSE has an extensive network of trading terminals all over the country so that it can provide a good trading platform for both the semi-wholesale and the retail segments of the debt market.

One of important ways to deepen the debt market would be increase the number of investors belonging to the semi-wholesale segment and the retail segment. Currently the investors in the semi-wholesale segment face considerable difficulties in transacting in the debt instruments. Their transaction costs are quite high as the sellers/buyers ask for much higher spreads over the going prices in the wholesale market. The other difficulty they face is that there are not many depository participants who are willing to offer their services to such investors. Often they are forced to opt in favour of physical instruments, which are issued with considerable delay and become non-fungible. Some of the banks, which offer the depository services charge heavily for such services. As a result dealing in government securities is a painful process for investors in the semi-wholesale segment. Much worse is the case of the retail investors as they have hardly any access to government securities. They are found to be too small investors to be of much interest to the players in the secondary market.

A proactive policy on the part of RBI is needed to improve situation in this area. RBI should persuade banks to be active in creating new markets for government securities among the semi-wholesale and retail investors. The investments of commercial banks in government securities are nearly 40% more than what they are needed to hold because of statutory compulsion. Banks need to be persuaded to use this excess stock of government securities in creating a market among the semi-wholesale investors as well as the small household investors. Instead of continuing with their obsession for mobilising deposits they should persuade corporates and common depositors to invest in government securities. Banks should provide depository services so that their transaction costs are minimal. Banks should become market makers in government securities by selling and buying government securities at their branches and earn a safe trading and fee-based income. Corporates would be able to manage their treasury operations if banks offer their services. If banks perceive that their holding of any particular government security is in excess of their requirements they can sell it in the wholesale market and vice when they

find that investors in the semi-wholesale or retail markets want to buy but the banks do not have the required stocks in surplus. This way the banks would be able to establish an umbilical linkage between the wholesale market and the other two segments of the market.

The banks should adopt a variant of this approach to develop market for corporate debentures. Instead of extending term loans to their well credit rated customers the banks should encourage them to tap the market. They should use their extensive branch network to distribute corporate bonds among depositors and earn fee-based incomes. In case they are not able to distribute all the bonds within the normal open period they should hold the stocks and distribute later.

RBI attaches great deal of importance to CCIL in its reform process of the financial system. It has decided to make call or notice money market a purely inter-bank market by phasing out mutual funds, insurance companies, and DFIs from the call money market during the course of next year. Currently, mutual funds, DFIs and insurance companies lend their temporary surplus funds in the call money market until they are able to invest them more gainfully. They are, however, not allowed to borrow from the call money market. In future after CCIL starts providing tripartite repo facilities by acting as a central counter-party for guaranteeing settlements and return of stocks to the respective parties RBI wants them to rely only on the repo market to deploy their temporary surplus funds through the CCIL. RBI is keen that CCIL should be able to broaden and deepen the debt and the forex markets by geographically widening access to its settlement network. Currently most of the institutional deals in all the money, debt and forex markets take place in the OTC markets at Mumbai, which cannot provide the comforts of settlement guarantee. After the CCIL starts extending settlement guarantee (armed with strong risk containment policies and a sizeable settlement guarantee fund) it will significantly enhance market safety.

While CCIL will be handling the settlement of the trades of the wholesale players in the financial system it will also act as a clearing entity for the trades executed on the stock exchanges. In order to promote retail access to government securities the stock exchanges will be encouraged to facilitate trades in these instruments by relying on the order-driven screen-based trading system on the same lines as the trading in equities and the corporate debt instruments. RBI will formulate the guidelines in this area in consultation with SEBI, the securities market regulator. The stock exchanges that take trading in government securities will be required to have their own clearing corporation that acts as the central counter party for the transactions that it would be routing to the CCIL for final settlement. The clearing corporation of a stock exchange should have in place tight risk management systems and a settlement guarantee fund commensurate to the volume of transactions it will be handling at its exchange.

Settlement Guarantee

The risk containment measures at CCIL will be quite crucial since it will be acting as the counter party offering settlement guarantee. The experience gained in this area at the National Securities Clearing Corporation Limited (NSCCL) of NSE will be of great help to CCIL. The NSCCL currently acts as the central counter-party guaranteeing settlement

of all the trades in equities done at NSE. Before NSE was set up, the Indian stock exchanges were not taking any responsibility for settlement of transactions of their members. The stock exchanges were merely working out settlement obligations of each of their brokers and expecting that the brokers would complete the settlement among themselves. Realising the grave risks that the market was facing under that system NSE established NSCCL as a wholly owned subsidiary for clearing and settlement of all the equity trades executed on the NSE screen.

The system of settlement guarantee introduced by the NSCCL was unique when it was introduced for the first time in India. The regulatory system as it prevails even today in India does not formally recognise and define the role of the clearing corporation in the clearing and settlement of the trades done on an exchange. The securities laws of the country as well as the securities market regulator viz., SEBI have not yet formally recognised the clearing corporation of NSE although it does inspect it at least once in a year whenever it conducts inspection of NSE. Instead of waiting for formulation of regulations by SEBI for the clearing corporations and granting of recognition to the NSCCL NSE decided to go ahead with the setting up of NSCCL by relying on some other legal enactment. NSE has tied up the legal niceties of the settlement guarantee mechanism by taking refuge under the Indian Contracts Act, which is in force since several decades in India. The success of NSCCL in significantly improving the settlement standards of the equity market has a good lesson. Whatever be the gaps in the existing legal framework, one should try to explore whether some other existing piece of legislation can be used suitably to bring about desirable changes and improve quality of market infrastructure.

As of today, the relationship between NSCCL and its clearing members is governed by the Indian Contract Act and is therefore contractual in nature. Every clearing member of the NSCCL has to sign a legally binding contract with the NSCCL and affirm that the member accepts all the obligations of membership as stipulated in the membership contract document. The document is typed on a stamp paper so as to make it a legally binding contract on the member. As per this contract, every clearing member has to furnish a base minimum cash and other collateral like bank guarantee (lines of credit), etc. that gives him the right to have position limits up to a specified amount on a real time basis. If a member wants to have higher open positions or exposure limits the member is expected to provide additional collateral and margin as required by the NSCCL. A member's total open position at any point of time is the summation of the stock-wise net absolute values in all the stocks. To protect integrity of the settlement system NSCCL has in place computerised systems to monitor total open position of each member on a real time basis. The members are informed about their open positions continually and their trading terminals get automatically disconnected once they cross the limits fixed by the NSCCL in relation to the collateral pledged by the members with the NSE and NSCCL. A recent landmark judgement of the Supreme Court of the country has given first right in favour of the clearing corporation to the collateral pledged by its members.

The settlement guarantee mechanism devised by NSE through the NSCCL has proved the test of time through a number of market upheavals during the last six years. After meeting all its guarantee obligations in respect of the defaulting members NSCCL has

ploughed back surpluses equivalent to \$20 million. While other stock exchanges had to pass through difficult and trying periods NSE has escaped all these crises unscathed. During March this year other exchanges have faced difficulties as their settlement guarantee schemes, which are patterned differently from that of NSCCL, have inherent shortcomings. Recently, therefore, the security market regulator SEBI issued directives to all the other exchanges to redesign their trade guarantee schemes on the lines of NSCCL's settlement guarantee scheme.

Risk Management at CCIL

NSCCL has in place a fairly complex risk containment mechanism. Until 2nd July of this year the equity market in India followed an account period trading system under which the trades during the week were netted at the close of the trading cycles and were settled after a week. For example, NSE's trading week began each Wednesday and ended on the following Tuesday. The member-wise net obligations for securities and funds were communicated to all the members on Wednesday and the settlement was completed on the subsequent Wednesday or a week thereafter. Unlike the rolling settlement, the account period trading system is a mix of both cash and futures markets. Hence it requires far more stringent risk containment systems than the rolling settlement system. NSE, therefore, decided to adopt the risk management practices, which are followed by the derivative exchanges of Chicago viz., CME and CBOT. The two important margins imposed by the NSCCL are the initial margin for controlling member's aggregate open position at any point of time and the mark-to-market margin for recouping the notional losses incurred by a member at the closing prices of the day. Besides these two important margins NSCCL has also volatility margin, and concentration margin. NSCCL maintains a large settlement guarantee fund to meet any contingencies arising from market disruptions and inability of some of the market players to meet fully their settlement obligations.

CCIL is also going to put in place similar strong risk containment measures. Given the nature of the market and the types of the clearing members it will be dealing with CCIL enjoys certain inherent advantages vis-à-vis the NSCCL. The clearing members of the CCIL are going to be mainly large and well-capitalised entities. The entities like banks and primary dealers being under the direct supervision of RBI are amenable to significantly far higher levels of discipline than the traditional Indian brokers who are not well capitalised and are prone to cut corners for earning profits at any cost. In short, most of the clearing members with whom NSCCL has to deal with are a very difficult lot. Secondly the instruments that will be handled by CCIL are subject to much lower degree of volatility than the equities, apart from the fact that banks and other clearing members of CCIL prefer much shorter settlement cycles.

As of today, most of the transactions in the debt market are settled on the same day or up to T+2 day basis. RBI acts as the depository for government securities and the treasury bills, which currently account for 97% of the transactions in the debt market. CCIL will fix margins by adopting VaR based margin model at 99% confidence level. The margin levels of the CCIL will incorporate an element of lower level of liquidity for some of the debt instruments that are not traded frequently so that relatively higher replacement costs for non-delivery of stocks are taken care of. An alternative method that is being thought

of is to have a system of substitution of stocks in case the replacement costs or unwinding of positions turns out to be too expensive for the CCIL. To facilitate quick clearing and settlement CCIL plans to enter into an arrangement with certain willing parties to lend securities to the CCIL on a temporary basis so that it can complete settlements whenever any of the clearing members fail to pay in securities on the specified day/time. CCIL will provide the agreed collateral to such lending parties, besides paying certain charges. CCIL will also guarantee return of securities to the lenders. CCIL will levy penalties on the members who deliver short (either securities or funds) in such way that it earns a net income after allowing for the costs incurred in completing the settlement in time. One of the other options being considered by CCIL is to compensate the receiving party if any of the delivering parties fails to pay in on the designated day/time. For example, in case buyer of securities fails to pay in cash to the CCIL the member's position could be wound up by returning the stocks to the seller/s along with a predetermined level of cash compensation. Since the clearing members of CCIL have both cash and security accounts in RBI all the settlements will be completed in the RBI itself, thereby negating any of the risks of a settlement bank. CCIL has decided to adopt pure and safe DVP mode with settlement being final and irrevocable.

III. NSE Initiatives

With a view to developing an active bond market NSE has taken several initiatives. NSE has been interacting with the market participants continually for their feedback both for identifying deficiencies in the working of the debt market and to have their valuable inputs in devising measures for making bond market active and efficient. One of the major deficiencies in the development of the debt markets that was identified some time ago was the absence of a benchmark yield rate. A good benchmark rate helps to shed light on the state of the market expectations at any point of time. It also helps in the development of new and innovative debt and debt-based derivative instruments. Ideally, an active and deep secondary bond market does help in estimating a meaningful benchmark rate. An active bond market helps in computing a reference rate that is meaningful, unbiased, transparent, representative, and reliable.

But in the absence of an active bond market it is possible to estimate benchmark rate that would be a close approximation to the more accurate benchmark rate. NSE developed a methodology for estimating reference rates based on sampling technique called "Polling and Bootstrapping". This method involves polling a carefully selected panel of market participants (which is subject to periodic review) for their estimate of reference rate (in terms of rate of borrowing—the Bid, and the rate of lending—the Offer) for a standard transaction size. Then the polled sample is subjected to "bootstrapping with adaptive trimming" in order to arrive at reference rate.

Bootstrapping method is a computational device to find approximation of quantities that are very difficult or even impossible to compute analytically. The basic idea is to take a sample that we are interested in and think of it as if it is a population and then by replacement sampling create a new sample, a bootstrap sample. If we repeat this several times, obtaining lots of bootstrap samples, we can use the mean of the computed quantities as an estimate of the expected value of this bootstrapped quantity. The main

purpose in adopting this method is to identify outliers and trimming the data set of its extreme values and computing the mean and its standard deviation. Basically the idea is to minimise the impact of the extreme sample values on the final values.

Calculating fixed trimmed mean of the sampled rates have been used by some organisations which need to use a reference rate, for example the CME for its Eurodollar contracts and the CBOT for its Municipal Bond Index. They collect rates from individual dealers and compute a reference rate as the trimmed mean obtained after deleting “n” highest and lowest observations. For example, at CME Eurodollar, the two highest and lowest observations are rejected and the rest of the quotes averaged to get a reference rate. The major concern of such a trimming procedure is vulnerability to market manipulation of the rates and the amount of the sampling noise. Secondly, excessive trimming may lead to loss of information, whereas too little trimming may lead to excessive influence of the extreme values on the reference rate. Thirdly, the sample sizes are typically very small and hence statistics based on the assumptions of normal distribution may give wrong results. Besides adopting a more scientific method of bootstrapping NSE uses a large sample of 32 representative banks, institutions, and primary dealers who are active players in the market.

NSE launched its overnight Mumbai Inter-bank Bid Rate (MIBID) and Mumbai Inter-bank Offer Rate (MIBOR) for the money market on June 15, 1998. The success and wide market acceptability of NSE MIBID/MIBOR encouraged it to develop benchmark rates for the term money market. NSE launched the 14-day NSE MIBOR/MIBID on November 10, 1998 and the longer-term money market rates for 1 month and 3 months on December 1, 1998. NSE is trusted by the securities markets for its unbiasedness, independence, and professionalism. Hence, the function of forecasting has become more meaningful as the information is computed and disseminated by an institution which is not only trustworthy but has no vested interests of its own in the market movements. NSE broadcasts the overnight rates daily at 0955 (IST) and the other rates at 1215 (IST) to the entire market through its trading system. These rates are made available simultaneously through its website, which also carries historical data. In addition, leading information vendors like Reuters, Bridge News Service and Bloomberg also make available NSE rates on their systems. The Indian financial dailies prominently carry MIBID/MIBOR information together with NSE's daily bond trading data.

An interesting point that should be noted in respect of these MIBID/MIBOR values is the effect of transparency on them. When NSE decided to calculate daily the 3-month MIBID/MIBOR it sought the views of several active market participants. NSE was keen to know whether such an effort will throw up meaningful rates and whether the market would find them useful. Majority of the contacted market players were sceptical about the exercise as they felt that the resultant rates would have very high degree of variance and therefore not very much helpful to them. Despite these reservations NSE decided to go ahead with the exercise on an experimental basis and did not share the rates with market almost for over a month. When it was felt that the estimated rates were not bizarre and that market would find them useful at least to some extent NSE started sharing them with the market players who were participating in the sample survey daily. Interestingly, after NSE started sharing these with the market players the value of standard deviation of these

rates almost continually declined over the next several weeks and the spread between the bid and offer rates also narrowed considerably. This experiment has shown that the initial scepticism of the market players about NSE's 3-month rates experiment was rather misplaced. By now the whole market has recognised the utility of NSE's MIBID/MIBOR rates and has accepted them as highly reliable benchmarks for the deals struck for Interest Rate Swaps, Forward Rate Agreements, Floating Rate Debentures, and Term Deposits.

Recently the NSE MIBID/MIBOR got formal recognition from the central bank of the country viz., RBI, which has decided to use the rates in providing liquidity adjustment facility (LAF) to banks and the primary dealers. A part of the liquidity made available by RBI to banks and PDs is in the form of backstop facility and this is made available at a variable rate which is announced daily. This rate is 1.0 percentage point above the cut-off rate at which RBI injects funds into the system earlier during the day through its regular LAF auctions. The rate for back-stop facility is generally between 1.0 to 3.0 percentage points over NSE MIBOR as may be decided by RBI on Saturdays and on other days when no bids for repo or reverse repo auctions have been received/accepted.

Zero Coupon Yield Curve

An efficient debt market needs a mechanism for valuing sovereign paper held by the market players in their portfolio. A sound valuation tool should ideally satisfy following criteria: (a) it should have sound conceptual basis, (b) it should provide a framework that allows consistent valuation of similar instruments, and (c) it should be available at high frequency (preferably daily) so as to enable market players to constantly value and, if required, reshuffle their portfolios. To meet these requirements NSE developed a zero coupon yield curve (ZCYC) that helps in valuing securities across all maturities irrespective of their liquidity in the market and would create standardisation across industry in so far as valuation of financial instruments are concerned, more particularly the sovereign instruments. ZCYC has been developed keeping in mind the need of the banking industry that has substantial investment in sovereign papers. The ZCYC construction is based on the basic premise of *time value of money*. The rate of interest to be paid would vary with the time period that elapses between today and the future point of time. At any point of time therefore we would observe different spot rates of interest associated with different terms of maturity; longer maturity offering a 'term spread' relative to shorter maturity. The term structure of interest rates or ZCYC is the set of such spot interest rates.

Fixed income instruments may be categorised by the type of their payment streams. Most fixed income instruments pay to their holders a periodic interest payment, commonly known as the coupon and an amount due at maturity, the redemption value. There also exist some instruments that do not make any periodic interest payments but pay the principal amount together with the entire accumulated interest amount as a lump sum at maturity. These instruments are known as 'zero coupon' instruments. Treasury bill provides an example of such an instrument. Such instruments are sold at a discount to the redemption value, the discounted value being determined by the interest rate payable (yield) on the instrument.

In empirical models of the ZCYC, the discount stream of cash flows gives the underlying valuation of the bond. If the term structure is the only factor that influences the pricing of the bond, the present value relation, as we have mentioned earlier should give us *the* price of the bond. With PV relation, and with information available on 'trade date', 'traded price', 'coupon rate' and 'the date of maturity' of a bond, this essentially leaves as unknown only the set of interest rates. The trades on any given day provide us with information for the sample of traded bonds. Computation of the ZCYC now involves estimation of the appropriate set of interest rates that go into deriving the present value relation. This is done by specifying a functional form of the interest rate-maturity relation/discount function/forward rate function. The NSE methodology for estimating ZCYC relies on the 'Nelson-Siegel' functional form and uses the data on secondary market trades in government securities that is reported on NSE's debt trading screen. The NSE data used for the exercise accounts for about 65% to 70% of the total secondary market trading in debt. NSE's website makes available time series data on ZCYC from January 01, 1998. Daily information on ZCYC is made available to the entire market around 6.00 PM. The leading information vendors like Reuters, Bridge News, etc. also carry this information.

It should be noted that the ZCYC as computed by NSE today does not remove the influence of other factors that may also have an influence on the yield curve, In practice the observed prices of bonds may also carry influence of such factors as differential tax rates for income and capital gains that affect the relative valuations of bonds with different cash flows. Further, bonds with differential liquidity levels usually trade at different premium levels. Other bond characteristics also influence their valuations. For trades in the same bond conducted on the same day, dispersion in prices could be attributed to transaction costs that vary with the size of the trade, an intra-day effect on account of new developments during the day, or other factors that have not been explicitly accounted for in the estimation.

An argument usually held against ZCYC vis-à-vis YTM is that ZCYC is more complicated both in terms of computation and interpretation than YTM. While computation of YTM is certainly less time consuming, it takes far more time and ingenuity to use YTM as a pricing or valuation methodology for portfolios of securities that include non-traded instruments. In addition, YTM would have limited applicability as the debt market develops and new instruments like STRIPS and other derivative products are introduced. ZCYC on the other hand, is eminently suitable for valuation of such instruments. With large number of secondary market trades in government securities available to estimate a chosen model, it is possible to estimate a term structure for sovereign debt instruments daily, thus making it useful valuation methodology to track changes in portfolios of government securities on a day-to-day basis. Once the model and the software is built up the generation of the daily ZCYC, along with the underlying prices of all outstanding government securities, does not take much time.

Other Uses of ZCYC

The term structure of interest rate as given by the ZCYC can be used for various other purposes. It can be used to value government securities that do not trade frequently. It can be used to price all non-sovereign fixed income instruments after adding an appropriate

risk premium or spread to reflect its inherent risk. This way it would be possible to value corporate bonds, which are today not actively traded in India. Estimates of ZCYC at regular intervals over a period of time provide us with time series of the interest rate structure in the economy, which can be used to analyse/assess impact of monetary policy changes. This also forms input for VaR systems for fixed income systems and portfolios. ZCYC becomes quite useful in pricing new issues to the market after adding the required spreads depending upon their respective trading etc.

Standardised Repos

Indian experience has shown that the traditional method of trading in repos in a non-transparent telephone market is vulnerable to ethical lapses. Another major disadvantage of the telephone market is that it keeps the rest of the market in dark about the market sentiment and the price discovery process as it evolves throughout the trading day. This disadvantage can be largely overcome if there is a compulsion on all parties to disclose all their deals on a near real time basis to an electronic media that disseminates all the required market information instantaneously.

Major factors responsible for the slow growth of the repo market in India have been the credit risk apprehensions, limited participation, non-standardisation, and lack of clear understanding of legal, regulatory and accounting framework. An expert Committee of NSE has suggested a framework of standardised repo contracts to promote trading and settlement of repos. A trading contract in repos can be standardised in terms of amount per contract and the settlement date. For example, the contract could be in multiples of Rs 10 million and settled on the second day or the last but one day of each week. To meet their specific non-standardised requirements the market players can enter into specific OTC contracts complementary to the standardised contracts.

It is well known that liquidity in futures market gets consolidated if market players trade in a few well-defined contracts. As screen-based trading done on a wide-area network basis can enable participation of potential players located in other less active trading centres it enhances liquidity by making the trade and order book visible, on a real time basis, to the entire market. Transparency helps to improve the process of price discovery and increasing the confidence level of market players. When the clearing corporation acts as a counter party to all the trades settled through it and provides a settlement guarantee it significantly removes credit and settlement risk apprehensions. This helps in expanding market liquidity by attracting more participants and trades in the standardised repo market.

ANNEXURE TABLES

Table 1. Market Capitalisation of WDM Segment as on April 30, 2001

Security Type	Market Capitalisation (Rs. billion)	Share in Total (%)
Govt. Securities	4241.61	69.61
PSU Bonds	361.99	5.94
State Loans	450.95	7.40
MF Units	375.64	6.16
Fin. Institutions	278.19	4.57
Treasury Bills	186.67	3.06
Corporate Bonds	149.94	2.46
Others'	48.74	0.80
Total	6093.73	100.00

Table 2. Trades in WDM Segment

S. No.	Particulars	1999-2000	2000-2001
1	Number of trades	46,987	64,470
2	Turnover (Rs. billion)	3402.16	4285.82
3	Average trade size (Rs. million)	64.70	66.50
4	Average daily turnover (Rs. billion)	10.35	14.83
5	Average daily number of trades	160	223
6	Number of active scrips	1,057	1,038
7	Number of active members	50	48
8	Number of active participants	85	88

Table 3. Security-wise Distribution of Turnover

Securities	Turnover (Rs.billion)		% of Turnover	
	1999-2000	2000-2001	1999-2000	2000-2001
Govt. Securities	2828.80	3909.52	92.99	91.22
PSU Bonds	15.28	36.17	0.50	0.84
Institutional Bonds	33.45	42.70	1.10	1.00
Treasury Bills	110.07	231.43	3.62	5.40
Bank Bonds & CDs	8.05	20.27	0.26	0.47
Corporate Bonds & CPs	46.15	45.16	1.52	1.05
Others	0.36	0.57	0.01	0.01
Total	3042.16	4285.82	100	100

Table 4. Participants-wise Distribution of Turnover

Participants	Percentage share in turnover	
	1999-2000	2000-2001
Foreign Banks	15.05	16.90
Indian Banks	42.72	33.54
Primary Dealers	19.42	22.14
FIs, MFs, & Corporates	4.06	4.18
Trading Members	18.76	23.24
Total	100	100