4

Securities Markets

Progress in the securities markets, in terms of dimensions such as institutional structure, efficient and transparent price discovery, sound risk mitigation, and robust settlement systems, continued in 2003-04. Trading volumes surged, new highs were attained in prices and liquidity, primary markets revived, and new products were launched. Broad-based improvements in asset markets comprising equity, debt, commodities and currencies helped in the transmission of information across markets, spreading of risks, and improving resource allocation and efficiency. Developments in May 2004 severely tested market resilience and robustness of the institutional structure. The risk management system amply demonstrated its resilience on May 17, 2004.

Equity market

Developments on the market

4.2 After a disappointing performance in 2002-03, the equity market staged a strong recovery in 2003-04 (Table 4.1). For example, the NSE-50 index, which was subdued for the early part of 2003, rose sharply from August 2003 onwards to reach a level of 1879.75 in December 2003. The index, which had dropped by 13.4 per cent in 2002-03 rose sharply by 81.1 per cent in 2003-04. Returns on the second tier stocks, in the Nifty Junior index, were even sharper: this index grew by 169.3 per cent in 2003-04, compared with a drop of 19.6 per cent in 2002-03.

4.3 The P/E ratio of the NSE-50 index, which reflects expectations about future earnings growth, fell sharply from 19.1 on March 7, 2002 to 10.9 on May 12, 2003. From May 2003 till March 2004, expectations changed sharply in the favourable direction, and the P/E ratio rose to 22 on March 8, 2004. In the following weeks, uncertainty about the political situation have given a sharp drop in the P/E ratio to a level of 12.1 on June 11, 2004.

Table 4.1 : NSE-50 index

Month	2002	2003	2004
January	1075.40	1041.85	1809.75
February	1142.05	1063.40	1800.30
March	1129.55	978.20	1771.90
April	1084.50	934.05	1796.10
May	1028.80	1006.80	1483.60
June	1057.80	1134.15	
July	958.90	1185.85	
August	1010.60	1356.55	
September	963.15	1417.10	
October	951.40	1555.90	
November	1050.15	1615.25	
December	1093.50	1879.75	

Liquidity

4.4 Obtaining a deep and liquid market has been a central goal of reforms of the 1990s. The impact cost for Nifty at transactions of Rs.5 million, which is the best measure of market liquidity, was as high as 0.15 per cent in early 2002. Over the entire period 2002-03 and 2003-04, the market has been much more liquid, with an impact cost of 0.1 per cent.

4.5 Another measure of liquidity that is often used is the 'turnover ratio' (TR), which is defined as the latest 12 months turnover (NSE+BSE) divided by market capitalisation. For liquid stocks in the country, this ratio was 129 per cent in April 2002. It rose to 173 per

Box 4.1 : Market movements on May 17, 2004

- In early May, Nifty had been in the region of 1740. On 14th May 2004 (Friday), Nifty fell sharply, from 1717.5 to 1582.4, a drop of 7.9 per cent.
- On Monday the 17th, many Asian markets fell, some by over 4 per cent. South Korea was down by 5.14 per cent, Taiwan was down by 5.10 per cent and Thailand was down by 4.61 per cent. These international developments were combined with news about the Indian general elections.
- When the Indian market opened at 9:55 AM, Nifty fell sharply at the open. The index fell by 178.5 points (11.3 per cent) in the first 15 minutes of trading. By existing rules, a move of larger than 10 per cent triggers a one-hour market closure.
- When trading resumed at 11:15 PM, Nifty fell by 5 per cent more within a few minutes, which triggered off a market closure for two hours. For the BSE Sensex, this was a fall of 787 points from the Friday close. The lowest value of Nifty recorded on Monday was 1292.2, a drop of 18.34 per cent compared with the previous close. This was the largest ever one-day move of the index.
- When trading resumed at 1:15 AM, the indices recovered. At the close, the BSE Sensex was down by 564 points and Nifty by 193.65 points. On Monday, Nifty closed at 1389, a drop of 21 per cent compared with the level of the preceding 3 May.
- Trading volume on the equity spot market at NSE and BSE attained values of Rs.4032 crore and Rs.2060 crore respectively.
- At NSE, putting together both the spot market and the derivatives segment, 56 members were deactivated at the end of the day. On both exchanges, the settlement guarantee funds were not eroded. This is a testimony to the strength of the risk management systems that are in place.
- Nifty recovered 6.8 per cent by 31 May, to end the month at 1483.6.

cent in April 2003 and has dropped to 131 per cent as of April 2004.

Volatility and correlations

4.6 There is considerable interest in the volatility of the equity market, and in the extent that Indian equities have co-movement with equity markets outside the country. Table 4.2 presents a long view of volatility and correlations for weekly returns on equity indexes. Weekly returns are used instead of daily returns, here, in order to avoid some of the technical difficulties with correlations and variances associated with stock market indexes. The S&P 500 index of the US is one of the most important market indexes in the world. The Korean Kospi index is used as a proxy for the behaviour of 'emerging markets'.

4.7 Indian indexes have shown lower volatility in the latest two years, when compared with the full period. The S&P 500 index in the US has had roughly the same volatility throughout. Korea has also experienced lower volatility in the latest two years.

4.8 The table also shows correlations, which summarise the integration of financial markets. Nifty and S&P 500 have had a correlation of 0.29 in the last two years, which is slightly higher than that observed in the full period. At the same time, 0.29 is a fairly low value, which shows that there are high gains from placing Indian equities in global portfolios. For example, the correlation of the Korean index against the S&P 500 is higher at 0.436, which implies that the gains from diversifying global portfolios using Korean equities are smaller.

4.9 The correlation between Nifty and the Korean Kospi index reflects India's co-movement with other 'emerging markets'. This appears to be more significant, with a value of 0.406 in the last two years. This value has also risen when compared with the full period, where the correlation was 0.286.

Table 4.2 : Volatilities and correlations for equities

	Long period Oct 1995 - May 2004	Last 2 years June 2002 - May 2004
Volatility of Indian indexes		
Nifty (top 50)	3.622	3.134
BSE Sensex (top 30)	3.710	2.912
Nifty Junior (next 50)	4.393	3.701
Volatility of international indexes		
S&P 500 (US)	2.508	2.382
Kospi (Korea)	5.101	4.008
Correlations between indexes		
Nifty and S&P 500	0.225	0.290
Nifty and Kospi	0.286	0.406
Nifty Junior and S&P 500	0.104	0.218
Kospi and S&P 500	0.315	0.436

4.10 Nifty Junior reflects the second tier of less liquid stocks in the country, which includes many high technology stocks which may be expected to be more sensitive to global asset markets. However, the correlation between Nifty Junior and the S&P 500 in the last two years has been just 0.218. This correlation has also risen from a level of 0.104 in the full period.

4.11 Table 4.2 focused on the latest two years. Breaking this down into 2002-03 versus 2003-04, and using daily returns data, shows that the returns volatility for Nifty went up from 0.99 per cent per day in 2002-03 to 1.43 per cent per day in 2003-04. The situation in terms of volatility and correlation may hence be summarised as follows:

- Equity volatility has been low in the recent period, when compared with India's longer experience. However, 2003-04 was a more volatile year than 2002-03 on both equity and currency markets.
- India's deepening globalisation is leading to higher correlations between Indian equity indexes and world markets. However, these correlation coefficients are as yet small, and there are considerable gains from diversification for global portfolios that harness Indian equity indexes.

Market size

4.12 The equity market capitalisation grew from Rs.7.25 trillion in March 2003 to Rs.13.77 trillion in March 2004. This value was roughly of the same size as bank deposits. This suggests that in 2003-04, the equity market was roughly as big as the banking system in terms of financial intermediation.

4.13 Expressed in US dollars, the equity market capitalisation worked out to $310 billion, which makes India one of the bigger equity markets in the developing world. The equity market capitalisation in March 2004 worked out to 49 per cent of the 2003-04 GDP.

4.14 Many companies have listed shares, but negligible liquidity. In order to focus on relatively liquid companies, we focus on the set of companies where the number of days where trading does not take place is no worse than 25 per cent. There are roughly 2,000 companies in this set. By this definition, the size of the 'active equity market' was Rs.11.81 trillion in March 2004.

Growth of anonymous electronic trading

4.15 Tables 4.3, 4.4 and 4.5 show the top exchanges of the world, according to the World Federation of Exchanges (FIBV), sorted by the number of transactions per year. While the mean transaction value varies enormously across countries, the number of transactions conveys something about the vitality of trading, and the complexity of the IT systems required.

4.16 In 2002, NSE appeared at rank 3 and BSE appeared at rank 7. This was the first time that India fared well in any international ranking connected with finance. In the 2003 ranking, NSE retained the #3 slot, and BSE improved to #5. Going by this data, NSE would need more than a doubling in the number of trades, in order to displace the 2nd ranked exchange (NYSE) as of 2003.

4.17 As of April 2004, the NSE equity spot market was doing 1.6 million transactions per day and trading volume of Rs.5048 crore per day. These values can be expressed on a per-second basis, assuming there are 20,000 seconds per trading day. Thus, on average, we may say that in each second of trading on the NSE equity spot market, there are 80 transactions worth Rs.31,646 each. These are averages, and both the number of trades per second and the average transaction value per second fluctuate significantly about these averages.

Stress testing of NSCC

4.18 The National Securities Clearing Corporation (NSCC) does risk management at NSE. It becomes the legal counterparty to the net settlement obligations of every clearing member at NSE. When a clearing member on NSE defaults on payment obligations, these are fulfilled by NSCC, which prevents 'contagion' and any adverse effects on others. The modern institutional development of asset

Table 4.3 : Trading intensity in the world: 2001			
	Exchange	**Country**	**No. of Trades (in 000)**
1	NASDAQ	US	602956
2	NYSE	US	339105
3	Korea	Korea	157620
4	Taiwan	Taiwan	141280
5	Deutsche Borse	Germany	84000
6	Euronext	(many)	54136
7	Chicago	US	51052
8	Italy	Italy	44265
9	London	London	32668
10	Istanbul	Turkey	31380

Table 4.4 : Trading intensity in the world : 2002			
	Exchange	**Country**	**No. of Trades (in 000)**
1	Nasdaq	US	600860
2	NYSE	US	545556
3	**NSE**	**India**	**233600**
4	Korea	Korea	193046
5	Shanghai	China	178650
6	Taiwan	Taiwan	169995
7	**BSE**	**India**	**148000**
8	Shenzhen	China	130421
9	Deutsche Borse	Germany	73327
10	Euronext	(many)	64596

Table 4.5 : Trading intensity in the world: 2003			
	Exchange	**Country**	**No. of Trades (in 000)**
1	Nasdaq	US	733000
2	NYSE	US	722753
3	**NSE**	**India**	**336300**
4	Shanghai	China	205554
5	**BSE**	**India**	**179595**
6	Taiwan	Taiwan	163805
7	Korea	Korea	139221
8	Shenzhen	China	132114
9	Deutsche Borse	Germany	74866
10	Euronext	(many)	70857

markets in India critically relies on the level of robustness of NSCC. Hence, it is important to know about the robustness of NSCC when faced with episodes of stress.

4.19 NSCC performs novation services - i.e. becomes the legal counterparty - to positions on both the spot and the derivatives markets. The spot market is now a pure delivery market, without leveraged trading, and hence there is little concern about systemic risk on the spot market. Hence, we focus on the derivatives market, which is where leveraged trading takes place.

4.20 In each month, the day with the highest pay-in requirements on the derivatives segment is isolated. On this date, the five biggest clearing members are identified. The scenario where each one of these five biggest members fails simultaneously is evaluated. It is assumed that each default imposes a loss of 15 per cent on NSCC compared to outstanding positions.

4.21 This is an extreme 'stress test' in the sense that right from the inception of NSCC in 1996, there have not been failures by top-five clearing members.

4.22 For example, in December 2003, the biggest pay-in requirements were observed on 8th December. If all the biggest five members were to fail on this date, this would impose a loss of Rs.574 crore upon NSCC. The margins in hand and deposits from these five members (which are, in turn, largely from the customers of these members) worked out to Rs.1307 crore. Hence, this scenario - a loss of Rs.574 crore protected by Rs.1307 crore in deposits - was very comfortably handled by the NSCC risk management systems.

4.23 This procedure has been applied from Jan 2002 till Dec 2003. It has been found that in every month of this period, member deposits have always been adequate to cover this extreme event (of all the top five members failing together on an extreme day).

4.24 Two realworld episodes of stress testing of the risk management systems at NSCC took place in recent times. In April 2003, there was sharp volatility in IT stocks. In particular, on April 10, 2003, the share price of Infosys fell by 26.8 per cent and that of Mastek fell by 49.2 per cent. On the next day, 11 April, Infosys fell by another 14 per cent. These sharp movements were particularly challenging, from a risk management perspective, since they coincided with banking holidays, which impeded the payments of

margins. The second episode where the risk management systems were tested was on May 17, 2004, as described in the box above. In both cases, NSCC coped with extreme price movements, and all payments obligations were successfully upheld.

4.25 These experiences suggest that the core risk containment system that is present at NSCC, and supervised by SEBI, has sound foundations. The next steps in improving the robustness of these clearing systems lies in the interfaces between the clearing corporations and the banking system. There is a need for clearing in central bank funds, to avoid the risks to the clearing corporation that can emanate from bank failure.

Securities settlement at NSDL

4.26 There has been continuing progress on securities settlement at NSDL. In April 2004, depository services were available from 1,721 locations across the country from 216 depository participant firms. As of May 28, 2004, there were 5.35 million client accounts at NSDL, which owned dematerialised securities worth Rs.6.1 trillion of equity, Rs.2.6 trillion of debt and Rs.0.13 trillion of commercial paper. These securities were issued by 5,315 firms. Users of NSDL held Rs.2,639 crore of government bonds.

4.27 The total value of demat securities at NSDL rose from Rs.4.5 trillion in April 2002 to Rs.5.5 trillion in April 2003, and further rose sharply to Rs.10.1 trillion in April 2004. This partly reflects the rise in stock prices over 2003-04.

4.28 Data for the number of securities where settlement took place reflects changes in market activity, without being influenced by fluctuations in prices. Securities settlement at NSDL, which had dropped from 1.27 billion securities in April 2002 to 1.1 billion securities in April 2003 rose sharply to the level of 1.94 billion in April 2004.

4.29 In April 2003, there were 729 firms where the demat proportion exceeded 75 per cent, i.e. where less than a quarter of shares continued to exist in physical form. As of April 2004, this number had gone up to 951 companies. Similarly, in April 2004, there were 1766 firms where the demat proportion was greater than 50 per cent, as compared with 1431 firms as of the previous year.

4.30 As of early 2004, NSDL was handling roughly 10 million settlement transactions per month. In addition, there were roughly 40,000 transactions per month where securities were pledged.

4.31 NSDL has created three pioneering systems: SPEED-e, STeADY and IDeAS. SPEED-e allows users to execute delivery instructions using the Internet. STeADY constitutes Internet-based infrastructure for facilitating straight-through processing. IDeAS constitutes Internet-based facilities for end-users to view their depository holdings and transactions.

4.32 These three systems are as yet nascent and have only a limited usage. They reflect the continual process of improving the sophistication of depository services in the country. In addition, they are important developments insofar as they represent the beginning of a shift away from proprietary protocols and proprietary computer networks, to the Internet as the vendor-neutral public data network underlying Indian finance.

Growth of equity derivatives

4.33 One of the outstanding phenomena of recent years has been the growth of the equity derivatives market. This is India's first effort at building a modern, transparent, well-regulated derivatives market. It is hence a particularly important experiment in learning about market design.

4.34 Table 4.6 shows the structure of equity market turnover in 2002-03 and 2003-04.

Table 4.6 : Equity market turnover

(Rs. crore)

	2002-03	2003-04	Change (per cent)
Equity spot	9,32,062	16,02,152	72
Equity derivatives (total)	4,42,341	21,42,521	384
Of which:			
Index derivatives	55,011	6,13,857	1015
Equity options	1,09,404	2,70,367	147
Total equity turnover	**13,74,402**	**37,44,674**	**172**

Equity spot market turnover grew by 72 per cent from Rs.9.3 trillion to Rs.16 trillion. The equity derivatives market grew by 384 per cent from Rs.4.4 trillion to Rs.21.4 trillion.

4.35 Putting these together, total equity market turnover grew by 172 per cent from Rs.14 trillion in 2002-03 to a level of Rs.37 trillion in 2003-04, or roughly 130 per cent of GDP. The equity market capitalisation was 49 per cent of GDP. The overall turnover ratio for the equity market - combining spot and derivatives - works out to 265 per cent, which is a fairly strong value, by world standards.

4.36 The spot market accounted for as much as 83 per cent of total turnover in January 2002. From this point, the derivatives market has steadily grown faster than the spot market. August 2003 was the first month where equity derivatives turnover exceeded the equity spot market.

4.37 The simplest kind of trading within the equity derivatives market is trading on the nearest available expiration futures on individual stocks. When equity derivatives trading first commenced, the skills of market participants readily transported to trading futures on individual stocks. When market sophistication grows beyond this simplest activity, there is growth in three directions: (a) A greater share of index derivatives, as opposed to individual stock derivatives, (b) A greater share for contracts expiring beyond the near month (i.e. longer-dated contracts) and (c) A greater share for options as opposed to futures. These three aspects serve as litmus tests for the buildup of sophistication on the equity derivatives market.

4.38 The share of *index* derivatives was as small as 9.4 per cent in April 2002. From that point, the share of the index derivatives has risen considerably. 2003-04 was the year in which which index derivatives reached takeoff, with 1015 per cent growth. From January 2004 onwards, index derivatives accounted for over 33 per cent of equity derivatives trading.

4.39 Nifty rose to become the biggest underlying in the period from January 2003 to August 2003 (Table 4.7). In January 2003, Nifty was not the biggest underlying on any trading day. In August 2003, Nifty was the biggest underlying on all trading days. The market has stayed in this pattern from August 2003 onwards.

Table 4.7 : The rise of Nifty in the equity derivatives market

Month	Fraction of days where Nifty was the largest underlying
January '03	0.00
February '03	0.16
March '03	0.35
April '03	0.20
May '03	0.48
June '03	0.71
July '03	0.74
August '03	1.00

4.40 Going by turnover in 2003-04, the biggest five underlyings on the NSE equity derivatives market were: (1) Nifty, Rs.6.01 trillion, (2) TELCO, Rs.1.89 trillion, (3) TISCO, Rs.1.68 trillion, (4) Satyam Computer, Rs. 1.24 trillion, and (5) State Bank of India, Rs.1.22 trillion. This highlights the gap between Nifty and the largest single-stock underlying.

4.41 This experience with rapid growth of index derivatives, and the domination of Nifty, is consistent with economic logic, which predicts that that the biggest role in the derivatives market is for macroeconomic underlyings - such as the equity index, interest rates and currencies - which are the most important sources of risk for households and firms, when compared with the fluctuations of shares or bonds issued by individual firms or fluctuations of individual commodities.

4.42 While this growth of the index derivatives is impressive, India still considerably lags the relationships found internationally. In calendar 2003, index derivatives at NSE were merely 40 per cent of the equity spot at NSE. This estimate overstates the size of the Indian index derivatives market, since it does not account for the BSE spot market. This ratio (of 0.4) greatly lags behind that found in numerous markets, where the index derivatives market ranges from 1.3 to 40.6 times larger than the equity spot market.

Table 4.8 : Turnover : Equity spot versus index derivatives (calendar 2003)

(Billion USD)

	Equity spot	Index derivatives	Ratio
Tokyo	2,131	86,409	40.6
Osaka	113	2,448	21.7
Taiwan	592	9,328	15.7
Korea	459	2,257	4.9
Euronext	1,905	5,243	2.8
Hong Kong	296	622	2.1
US (NYSE,NASDAQ, CBOE,CME)	16,760	21,406	1.3
NSE	196	73	0.4

4.43 This is vividly visible in comparing NSE against Hong Kong. The NSE spot market appears to be plausibly large, at a turnover of $196 billion, when compared with the Hong Kong spot market turnover of $296 billion. However, the NSE index derivatives market appears extremely small, with turnover of $73 billion, when compared with Hong Kong's value of $622 billion.

4.44 Options trading is another sophisticated aspect of the derivatives market, where there are considerable hurdles faced in terms of knowledge and awareness amongst the largely retail trading community. However, unlike the index derivatives, options trading has not yet grown in prominence in India. As of March 2004, options accounted for only 11 per cent of equity derivatives turnover; the remainder was taken up by futures. Options turnover growth, at only 147 per cent, substantially lagged the growth of equity derivatives turnover, so options actually lost ground in 2003-04.

4.45 The third dimension of growing sophistication is the spread of liquidity in derivatives trading to contracts beyond the near month. As of March 2004, as much as 94 per cent of the equity derivatives trading at NSE was in the near month contract. This suggests that there has not, as yet, been a broadening of trading away from the near month.

4.46 In summary, the growth of the equity derivatives market is an important milestone in India's financial sector development. It features modern institutions: electronic trading, novation at the clearing corporation, nationwide access to households and firms. The first milestone of sophistication took place in 2003-04, with a shift from individual stock derivatives to index derivatives.

4.47 Yet, the index derivatives market is small by world standards. In addition, liquidity remains largely restricted to futures (as opposed to options) and the near month (as opposed to long-dated derivatives). These aspects suggest the need for continued policy attention to developing the liquidity and market efficiency of the equity derivatives market.

The primary market for equity

4.48 India's public issue market has made important advances in terms of market design, where it has moved closer to pure computerised auctions which discover the fair price for a set of securities that are up for sale. This has served to remove the human element, non-transparency and costs from the public issue process.

Table 4. 9 : Volume of issuance (debt and equity) on the primary market

	2002-03		2003-04	
Category	Number	Value	Number	Value
Public issues	14	3,639	35	22,265
Of which				
IPO	6	1039	14	1412
Total	**26**	**4,070**	**57**	**23,271**

4.49 Table 4.9 shows summary statistics for the volume of issuance on the primary market. From 2002-03 to 2003-04, there was a large increase in the resource flow through the primary market, from Rs.4,070 crore to Rs.23,271 crore. This reflected the response of firms to the buoyancy of prices.

4.50 Table 4.10 summarises some of the large public issues which took place in 2003-04. It shows 8 issues, each of which was larger than Rs.200 crore. All these showed very strong returns from issue date to listing date, except for one (Petronet LNG), where IPO investors got a -34 per cent return on an annualised basis between issue date and listing date.

Table 4.10 : Some recent large primary market offerings			
Firm	**Issue size (Rs. crore)**	**Issue date**	**Annualised returns (per cent)**
Maruti	903.04	19 Jun 2003	425.02
Indian Overseas Bank	240.00	12 Sep 2003	155.79
Vijaya Bank	240.00	17 Oct 2003	88.78
Patni Computer Systems	430.65	5 Feb 2004	24.35
UCO Bank	240.00	10 Sep 2003	642.13
Bank of Maharashtra	230.00	4 Mar 2004	552.06
Petronet LNG	391.47	9 Mar 2004	-34.07
Biocon	315.00	18 Mar 2004	725.49

Incubation of companies by venture capitalists

4.51 The venture capital (VC) industry seeks to systematically deliver capital to entrepreneurs who have ideas for a startup but not access to capital, which can be a vital ingredient for entrepreneurs who lack access to capital. Internationally, the VC industry has played a major role in encouraging first-generation entrepreneurship. VCs adopt great risks in this process, since most startups do not succeed.

4.52 The Indian VC industry has now grown to a significant size. As on March 31, 2004, there were 44 SEBI registered VC funds who had raised Rs.1750 crore of resources from domestic and foreign investors. Of this, foreign investors had put in Rs.230 crore. These VC funds had invested Rs.1415 crore in 409 companies.

4.53 Roughly speaking, if one in ten VC projects goes IPO, then we may expect roughly 40 IPOs over the next two to three years owing to these 409 investments. This is a significant number, and highlights the economic significance of the VC industry as the breeding ground for the important companies of the future.

4.54 The largest five VC funds are: (1) ICICI venture funds (Rs.486 crore), (2) IL&FS investment managers (Rs.211 crore), (3) GVFL Ltd. (Rs.103 crore), (4) IDFC asset management (Rs.100 crore) and (5) SIDBI venture capital (Rs.100 crore).

4.55 A steady stream of profitable exits, where the VC fund sells out its holding of a startup, are required for the sustainable growth of the VC industry. In 2003-04, SEBI-registered VC funds obtained 56 exits, amounting to Rs.116 crore. Of this, 4 exits were through the IPO route (Rs.9 crore). Buyouts accounted for 16 exits (Rs.42 crore). There is an innate lag between investing in a startup and obtaining an exit (if the project succeeds). This experience with 56 exits, which reflects investments made some years ago, suggests that the Indian VC industry has finished with the nascent stages where investments were being made but exits were unproven.

Improving process engineering of the primary market

4.56 In early 2004, certain weaknesses were observed in the process engineering of the primary market, particularly in the context of the sale of ONGC shares by the government. These were partly caused by the unusual loads faced in the system. In a 26-day period (22nd February to 18th March), 10 big public issues (6 PSUs + 4 others) were open for subscription, attracting nearly 4.2 million applications. This was a significant load when compared with the 3.5 million applications which were processed in the preceding 327 day period of the fiscal year.

4.57 These weak links involve the use of human-based procedures. There is a need to engage in detailed rethinking of the process design, of all steps from application till allotment.

4.58 The secondary market for equity now offers the capacity of seamless end-to-end electronic operation. In particular, for

customers of an electronic bank and an Internet broking facility, who use the Internet-based facilities offered by NSDL, all elements of trading on the secondary market can be done electronically, without any human intervention. There is a need to bring a similar focus, and engineering capacity, on the task of eliminating human handling on the primary market also. In order to address these questions, and other issues in the securities markets infrastructure, on April 23, 2004, SEBI has constituted a Securities Markets Infrastructure Leveraging Expert Task Force (SMILE Task Force) chaired by Dr. P. J. Nayak.

Debt market

Movements of interest rates

4.59 On the government bond market, the yield curve has exhibited interesting movements. The interest rate at the short end of the yield curve (91 days) dropped from 5.63 per cent on 31 March, 2003 to 4.72 per cent on 31 March, 2004. The interest rate at the long end of the yield curve (10 years) dropped from 6.52 per cent to 5.44 per cent over this same period.

4.60 Given 4.5 per cent inflation, this translates to a real rate of return as of 31 March, 2004 of roughly 20 basis points at the short end, and roughly 90 basis points at the long end.

4.61 Through these rate reductions, strong positive returns were obtained on both, the 1-year bond (+1.03 per cent) and the 10-year bond (+11.5 per cent) in 2003-04. These came on the back of rate reductions, and hence strong positive returns, in 2002-03 also.

4.62 The total return on the GOI bond index - inclusive of coupons and capital gains - of 9.4 per cent in 2002-03 was followed by returns of 11.9 per cent in 2003-04. This reflects the overall average returns delivered by government bonds as an asset class.

4.63 The GOI bond index, i.e. the portfolio of all government bonds, has had a steadily lengthening maturity, going from a duration of 5.11 years on March 30, 2002 to 5.544 years on March 31, 2003 to 6.359 years on March 31, 2004.

4.64 The bond market was less volatile in 2003-04 as compared with the previous year. The daily returns volatility of the 10-year zero coupon bond dropped sharply from 0.71 per cent per day in 2002-03 to 0.47 per cent per day in 2003-04. As a consequence, the daily returns volatility of the NSE GOI bond index fell from 0.43 per cent per day in 2002-03 to 0.27 per cent per day in 2003-04.

Liquidity

4.65 Impact cost, which is the best measure of financial market liquidity, is not observed on the bond market, owing to the bilateral trading procedures that presently prevail. The total turnover for government bonds (both central and state), which is a rough proxy of market liquidity, was Rs.24.6 trillion in 2001-02. This grew to Rs.28 trillion in 2002-03, and rose further to Rs.30.7 trillion for the period April-January of 2003-04. This turnover is highly concentrated in a few bonds. Roughly 20 of the bonds that exist have turnover ratios in excess of 75 per cent.

4.66 Expressed in terms of turnover ratio, i.e. taking into account the growth of the market capitalisation, bond market liquidity has not grown. In February 2002, the turnover ratio of the government bond market was 190 per cent. This dropped slightly to 181 per cent in February 2003 and further to 152 per cent in February 2004.

4.67 As a consequence of a series of policy decisions aimed at converting the call money market into a pure inter-bank market, the call money market has seen a decline in turnover, from levels like Rs.30,000 crore per day in 2002 to levels of roughly Rs.10,000 crore per day towards the end of 2003-04. At the same time, the CBLO market, which is comparable in some respects to the call money market, has grown to a level of Rs.2,506 crore per day in March 2004.

Market size

4.68 The government bond market has grown rapidly, fueled by large fiscal deficits.

The market capitalisation of the government bond market grew from Rs.6.7 trillion in March 2003 to a level of Rs.9.7 trillion in March 2004. The state government bond market also grew from Rs.1.4 trillion in March 2003 to Rs.1.8 trillion in March 2004.

4.69 The corporate bond market grew from Rs.0.85 trillion to Rs.1.36 trillion over these two years. These values only reflect the securities trading on the NSE Wholesale Debt Market (WDM) and are likely to be biased downwards.

Electronic trading for collateralised borrowing

4.70 Given the success of electronic trading in numerous other asset markets, there is a natural interest in modernising the debt market also, in order to move away from the archaic bilateral trading procedures.

4.71 In order to address concerns of the burgeoning unsecured inter-bank call money market, an important innovation took place at the Clearing Corporation of India (CCIL) through the launch of its new product *Collateralised Borrowing and Lending Obligation* (CBLO). The CBLO is like a repo, i.e. it can be interpreted as borrowing backed by securities as collateral. Issued at a discount to face value, CBLOs always redeem at par, similar to treasury bills or zero coupon bonds. The maturities range from 1 day to 1 year.

4.72 There are many unique innovations, by world standards, in how CBLO is structured. It includes facilities for closing out of borrowing positions prior to maturity.

4.73 In addition to running the trading system, CCIL is the central counterparty; i.e. it does netting by novation for the CBLO. This eliminates counterparty credit risk. As in the equity market, where novation first came about in India, this has helped grow the market size, and enable transactions between heterogeneous counterparties. Private firms, NBFCs, etc., who would normally be excluded from the OTC bond market because they are considered unsafe by the existing market participants, are all able to participate in the CBLO market thus contributing to market liquidity, increasing competition, and delivering the gains from trading to a wider range of economic agents in the country.

4.74 The importance of CBLO lies in the fact that it marks the first successful use of anonymous electronic trading in the bond market in India. In contrast with many initiatives in modernising the bond market which have faced difficulties, CBLO has been a remarkable success in terms of attracting turnover. Trading began in January 2003. From July 2003 onwards, trading grew rapidly, to reach an average daily turnover of Rs.2506 crore in March 2004. This makes CBLO one of the important markets in the country. It combines both the transparency and market efficiency of a modern market design, and the significant market size, that is required to obtain reliable prices.

Netting for fixed income and currencies

4.75 Once the idea of novation at a central counterparty was proven in the equity market, it has found favour in many other areas. In close consultation with RBI, the Clearing Corporation of India (CCIL) has applied this idea on the fixed income and the currency markets.

4.76 CCIL has setup novation and multilateral netting processes, backed by guaranteed settlement, which are comparable to what NSCC had done on the equity market in 1996. Through this, funds settlement of all markets that CCIL serves migrated to the multilateral netting arrangement, whereby individual member obligations to pay or receive funds arising out of every single transaction are aggregated and offset into a single net fund obligation.

4.77 In addition to substantially reducing individual member funding requirement, such netting reduces liquidity risk as also counterparty credit risk from a gross to net basis. By reducing the number and overall value of payments between its members, this has enhanced the efficiency of the payment system and reduced settlement costs associated with growing volumes of market activity. It has also reduced the size of credit

and liquidity exposures incurred by market participants on their unsettled transactions. The reduced need for intra-day liquidity or credit used to bridge timing gaps between gross payments and gross receipts has led to better liquidity management. The earlier instances of 'gridlock' and 'SGL bounce' in the gilts markets due to problems associated with management of funds have vanished through the use of netting by novation at the central counterparty. Netting by CCIL has increased trading opportunities for its members without need for re-allocation of existing credit facilities apart from reducing capital allocation for claims on counterparties.

4.78 In the currency market, delivery of currencies involved in a typical transaction do not happen at the same time due to time zone differences. By becoming a central counter-party and guaranteeing settlement of such trades after effecting multilateral netting, CCIL has made settlement of such trades possible on a netted basis. To take care of the risks emanating from settlement of trades at different points of time (in separate time zones), CCIL set up a robust risk control mechanism by setting exposure limits for the market entities and by resorting to a sound loss allocation mechanism. In this area, while CCIL delivers the benefits of netting, this is not based on the principle of novation.

4.79 CCIL is a unique experiment in market design, by world standards. It links up the idea of netting at a central counterparty with an OTC market. This is relatively unconventional by world standards, where the technology of netting by novation is generally only applied when trading itself is centralised at an exchange. CCIL is an innovative effort where a design component of the exchange (i.e. the clearing corporation) has been linked up to a fragmented OTC market.

4.80 CCIL thus represents an effort to modernise the post-trade processes of the fixed income and currency markets, while their trading systems continue in an archaic form. It represents a different line of attack when compared with the reforms program on the equity market, where the first target of the reforms program was the modernisation of trading (1994), after which improvements in clearing (early 1996) and settlement (end 1996) took place.

4.81 The transactions flowing through CCIL owing to these activities are enormous. On the currency market, in 2003-04, there was an average daily volume of $1.5 billion on the currency spot market and $0.6 billion on the currency forward market.

4.82 CCIL achieved a funds netting factor of 75.74 per cent in gilts markets in 2003-04 as compared with 71.88 per cent in 2002-03 translating to an actual reduction in member fund requirements to the tune of Rs. 30,58,793 crores in 2003-04. In the currency market, CCIL achieved a netting factor of 83.28 per cent in 2003-04 as compared with 82.86 per cent in 2002-03 leading to an actual reduction in member funding requirements to the tune of USD 417 billion in 2003-04.

4.83 The equity market has long used 'DVP-3' settlement, where netting takes place for both funds and securities. Earlier, RBI regulations prohibited netting on securities; i.e. only netting on funds was permitted. From April 2, 2004, securities settlement at CCIL shifted to DVP-3. This has led to a securities netting factor of 36 per cent during April 2004. The netting efficiency on securities is expected to improve in coming months, as more firms build internal systems and human capital that is consistent with DVP-3.

4.84 The success of CCIL marks an important milestone for improving the market design of the fixed income and currency markets, which now have a strong 'middle component', the clearing corporation.

RTGS: A revolution in the wholesale payments system

4.85 Traditionally, payments transactions between finance companies were generally settled through an inter-bank multilateral net settlement mechanism. Difficulties in the payments system have been a long-standing problem in the Indian financial system.

4.86 One major effort for modernising the mechanisms for settlement of funds between banks is the Real Time Gross Settlement

(RTGS) system. The RTGS system ensures transfer of funds on a real time and on a one-to-one basis (i.e. between a sender and a beneficiary) in an electronic mode. RTGS systems lead to reduced settlement and systemic risks, especially in high-value inter-bank transactions.

4.87 RBI's RTGS system went into live operation on March 26, 2004. It offers just-in-time money transfer capabilities. Some of the salient features of the RTGS system are as follows: Payments are settled transaction by transaction; settlement of funds is final and irrevocable; settlement is done in real time; funds settled can be further used immediately. It is a fully secure system which uses digital signatures and public-key encryption for safe and secure message transmission. There is a facility for intra-day collateralised liquidity support for the member-banks to smoothen temporary mismatch of fund flows and thereby ensure smooth settlements.

4.88 Under the RTGS System, inter-bank transactions, customer based inter-bank transactions and net clearing transactions can be settled. Both high value and retail payments can be effected through the RTGS system. It is a single, all-India system.

4.89 The RTGS system commenced operations with four banks as members. Expansion of the RTGS system in terms of scope and coverage is taking place in phases. By late 2004, it is expected that RTGS payment services will be offered from 3000 bank branches in about 275 cities.

4.90 It is expected that banks will utilise the underlying RTGS capabilities, and create payments products through which households and firms of the country will achieve more effective payments. By itself, RTGS only constitutes the infrastructure which will enable such developmental work by banks.

Use of electronic auction for debt buy-back scheme

4.91 The Union Budget 2003-04 envisaged measures for debt restructuring as a part of fiscal consolidation. The buy-back of loans by the Central Government from banks on a voluntary basis was one such measure - the others being pre-payment of external debt and restructuring of State Governments' debt to the Centre through a debt swap scheme.

4.92 Accordingly, the Reserve Bank conducted the first buy-back auction on July 19, 2003, which envisaged buying back of 19 relatively illiquid securities. The market price of 18 of the securities ranged from Rs.122.75-148.87.

4.93 The anonymous auction was conducted through a live interactive platform developed by the Clearing Corporation of India Limited (CCIL) where the participants were allowed to revise their bids. This was the first use of electronic systems in the primary market for bonds, on the lines of the screen-based bookbuilding which has been in use for public issues on the equity market. The demand function was displayed on the screen in realtime, and participants could use this information to refine their bidding strategy.

4.94 There were 131 offers amounting to a total of Rs.14,434 crore (face value). The entire amount was accepted as these were at or above the minimum discount of 7.5 per cent (to the market value) expected by the Government.

4.95 The market value of these securities bought back amounted to Rs.19,394 crore. The difference between the market value and the face value (i.e. Rs.4,960 crore) was shared between the Government and market participants.

4.96 While the premium paid to market participants amounted to Rs.3,472 crore, the Government saved Rs.1,488 crore being the discount amounting to 7.67 per cent of the market value. In exchange of the securities bought back, the Government reissued four existing liquid securities of equal face value (Rs. 14,434 crore).

4.97 The prices at which the securities were reissued were the weighted average prices based on SGL transactions during the period July 14-18, 2003. Banks were allowed additional income deduction for tax purposes to the extent such business income was used for provisioning of their non-performing assets.

Commodity futures markets

4.98 An important area where many new developments took place in 2003-04 was the commodity futures markets. The Government issued a Notification on April 1, 2003 rescinding all previous notifications which prohibited futures trading in a large number of commodities in the country. These commodities have now been notified for regulation for the purpose of forward trading in them. This was followed by a Notification in May 2003 revoking the prohibition on non-transferable specific delivery forward contracts (i.e. merchandising contracts). These developments have set the stage for a prominent role for commodity futures trading in the country, provided sound market institutions come about, which use a sound market design.

4.99 The Government of India, on the recommendation of the Forward Markets Commission (FMC), granted recognition to National Multi Commodity Exchange, Ahmedabad (NMCE); Multi Commodity Exchange, Mumbai (MCX); and National Commodity and Derivative Exchange, Mumbai (NCDEX) as nation-wide multi-commodity exchanges. MCX commenced trading in November 2003 and NCDEX commenced trading in December 2003.

4.100 The FMC has applied high standards for the market design that should be used in these new areas. There are three competing exchanges, but all three have been required by FMC to use anonymous order-matching. Hence, the difficulties associated with non-transparent bilateral dealings has not arisen.

4.101 These exchanges have given a new thrust to futures trading in agricultural commodities. Prior to these exchanges, commodity futures trading typically took place in small groups of dealers who knew each other. In contrast, NCDEX has setup 505 terminals in 138 centres; MCX has setup 763 terminals in 132 centres and NMCE has setup 346 terminals at 90 centres. These electronic systems pool in orders from all across the country into the three computerised order matching systems. This marks a major break with the fragmented and non-transparent price discovery which took place earlier.

4.102 FMC has drawn upon the learning of the equity market in terms of favouring the 'demutualised' governance structure for exchanges:

- NCDEX, Mumbai has the equity participation of 19.95 per cent each from ICICI Bank, LIC, NABARD, NSE; 12.10 per cent from CRISIL, and 8.10 per cent from PNB.
- MCX has been promoted by Financial Technologies of India Limited (FTIL) which is a public limited software company. FTIL holds 150 lakh shares in MCX, and Union Bank of India holds the remaining 4.2 lakh shares.
- NMCE, Ahmedabad, has equity participation of 31.7 per cent from Central Warehousing Corporation, 30.5 per cent from Neptune Overseas Ltd., 13.4 per cent from Gujrat Agro Industries Corporation Ltd., 12.2 per cent from Punjab National Bank and 6.1 per cent each from Gujrat State Agricultural Marketing Board and National Agricultural Cooperative Marketing Federation of India Limited.

4.103 These policy decisions at FMC in recent years, which have given a modern design for commodity futures exchanges, have laid the foundations for an important new phase for the growth of agriculture in India. On one hand, the growth that has been made possible by electronic trading needs to be consolidated, by building a sound regulatory framework, comparable to what has been done by SEBI for the equity market, and sound risk management comparable to that found at NSCC or CCIL. There is also a need for an extensive effort to harness these markets in a variety of ways in the economy, such as (a) utilising options for 'price stabilisation' efforts of the government, (b) delivering credit products where farmers pay lower interest rates when prices are low, (c) extending knowledge and market access to every district of the country.

4.104 FMC initiated trading in gold and silver futures in 2003-04. By virtue of India's self-consumption of these metals, and through India's prominent role in global production chains in jewellery, there could be a prominent role for India to participate on the global stage, in setting prices, and in exporting financial services to the global bullion community.

4.105 Turnover has grown dramatically from 223 kg. of gold in October 2003 to 21,413 kg. of gold in March 2004. Similarly, silver turnover grew from 3.6 metric tonnes in October 2003 to 395 metric tonnes in March 2004. Among the three electronic exchanges, MCX has been particularly important in the bullion area.

Box 4.2 : Modernising commodity futures trading with a archaic spot market: Innovations at NCDEX

- There are innate contradictions in attempting to create a derivatives market in the absence of a transparent spot market.
- In the area of commodities, in order to obtain reliable spot prices, NCDEX has pioneered a unique concept of polling prices from relevant market places (mandis). The agencies CRISIL and CMIE have been chosen for the polling of spot prices from traders across the country. For every commodity, the polling is done from different centres where the major proportion of spot market trades is concentrated. There is a panel of traders familiar with the trends in the commodity concerned for each commodity; randomly selected members are being polled three times a day (market open, mid day and market close) to reveal the best buy and sell prices prevailing on the OTC spot market.
- This information is processed using a statistical procedure called the 'adaptive trimmed mean' (ATM) in order to remove outliers, arrive at a clean market price, and reduce the returns to manipulating the reports being given to the data agencies. Through this process, the nation is able to observe prices on the OTC market, which is otherwise non-transparent.
- NCDEX has seen a high level of convergence between the traded futures prices and the final settlement prices obtained through polling on expiry dates of contracts in the past four months. This is a testimony of the robustness of the process.
- This system has given a new level of near real-time access to reliable prices from agricultural markets in the country. This marks a milestone for the statistical system in agriculture, and sets the stage for modern development of commodity derivatives markets despite the presence of a fragmented OTC spot market.

Box 4.3 : Evening trading: An innovation in market design

- Domestic commodity prices are integrated with major commodity markets across the world. Domestic bullion prices are closely related to the current trading prices on the New York Mercantile Exchange (NYMEX-COMEX) in USA and the London Bullion Market Association. Similarly, domestic Palmolein prices are highly correlated to the prices on the Malaysia Derivatives Exchange Berhad (MDEX).
- Given the time zone differences with each such external exchange, and given the increasing volatility during trading hours of international exchanges, domestic users of commodity futures markets were exposed to adverse price movements taking place beyond normal trading hours in India.
- In a pioneering innovation, Multi Commodity Exchange (MCX) started an evening trading facility which commenced operations from 8 December 2003. Through this, trading goes on till 11:30 PM in the night in Indian Standard time. NCDEX also replicated this functionality from 23 February 2004 onwards.
- Ever since the introduction of this facility by MCX and NCDEX, trading volumes have grown in a sustained manner. At MCX, 60 per cent of the total volume of trade in bullion is in the evening session.

Demat settlement for commodities

4.106 A key enabling infrastructural institution which spurred growth in the Indian stock markets was the concept of holding shares in a dematerialised form, where individuals across the country interact with a depository, and are able to effectively obtain account balance statements, execute transfers of securities, etc.

4.107 This element of market design can equally be utilised in other asset markets. As in the equity market, free, secure and easy transferability of commodities is of utmost necessity to bring about a sound spot and derivatives market for commodities. NCDEX, NSDL and Karvy Consultants have jointly worked in creating an innovative new concept

of dematerialised settlement for commodities. Their developmental work has addressed issues such as : (a) Holding of commodity balances in electronic form, and conversion of warehouse receipts into electronic mode, (b) Safety, speed and security of transactions, (c) Online availability of stored commodity data at warehouses, (d) Commodity grading through multiple commodity identification numbers, (e) Tailor made depository infrastructure, (f) Technology awareness and networking between registrar, depository and warehouses.

4.108 With the set up of the above major infrastructure, the first commodity electronic dematerialisation, transfer and delivery was undertaken for one kilogram of gold on February 24, 2003. This was the first electronic transfer of commodities in the country, and serves as a milestone in the creation of modern markets for commodities.

4.109 These developments augur well for the efficiency of spot-futures arbitrage on the commodity derivatives markets. This element of market design will also facilitate bank lending against commodities, facilitate the spot market, and promote modern development of collateral management.

Classes of investors

Role of retail investors

4.110 India's equity market shows striking evidence of the domination of individuals in price discovery, which is considered a highly desirable feature of financial sector development. In April 2004, on the equity spot market, NSE had 31.9 million trades with a value of Rs.1 trillion. This corresponds to an average trade size of Rs.31,646. In March 2004, the average transaction size on BSE was Rs.31,503.

4.111 On the equity derivatives market, the average transaction size in March 2004 was Rs.557,218. Assuming an initial margin of 25 per cent, this means that the participating household would need to pledge a deposit of Rs.140,000. This is feasible for many households, and is not an exclusive preserve of institutional investors.

4.112 Across both spot and derivatives markets, the average transaction size seen is fairly small, and points to a substantial participation from individuals. If large institutional traders were dominant (either domestic or foreign), the average trade size would be much larger.

4.113 To look back at the earlier period, the average trade size on NSE in 1995-96 was Rs.101,505 and in 1996-97 it was Rs.112,086. After 1996-97, the trade size fell sharply till 2001-02, after which it has been at values between Rs.20,000 and Rs.35,000. This points to the increasing participation of households in the capital markets, and their domination in price discovery. This appears to have also been enabled by (a) The small 'market lot' of the stock market, which is 1 share, and (b) The continuing spread of trading terminals across the country, which has been fueled by dropping prices of telecom services.

4.114 In a related development, the share of Mumbai in NSE equity trading - combining households and institutional investors, in 2003-04 was 44.07 per cent. If the stock market had been dominated by institutional investors, then the share of Mumbai would have been much higher, since almost all institutional investors are in Mumbai.

4.115 Evidence on the growth of retail trading is also found from the client accounts data of the two depositories. In April 2002, NSDL and CDSL had 3.8 million accounts. All institutional investors in India are likely to have already opened depository accounts by this date. This shows that only a small number of households in the country had (as yet) commenced direct participation in the securities markets.

4.116 The number of accounts grew to 4 million by April 2003 and to 5.8 million by March 2004. This growth averages to the opening of 4,200 new accounts per working day. This suggests steady growth and enlargement of the universe of retail investors in the country. The average portfolio size of these 5.8 million accounts works out to Rs.5,12,000. This reflects an averaging across a few very large institutional investors and a large number of small holdings of households.

4.117 The commodity futures markets have also adopted the pattern of having a large number of small participants. As an example, from January 1, 2004 till May 31, 2004, at NCDEX, there were 237,579 trades of value Rs.3,175 crore, giving an average transaction size of Rs.133,640.

4.118 As a counter-example, the NSE WDM segment, which reflects the OTC bond market, had an average trade size in April 2004 of Rs.7 crore. On the currency spot market, the average transaction size at CCIL in 2003-04 was $1.4 million. These large values come from markets which are dominated by institutional investors as opposed to households.

4.119 On the currency market, we obtain evidence from CCIL, which does netting by novation and thus observes information about the currency market even though the market itself is a fragmented OTC market without centralisation of information. CCIL's data shows that in 2003-04, 0.16 per cent of trading was from cooperative banks, 44.85 per cent was from foreign banks, 37.84 per cent was from public sector banks, 17.11 per cent was from private banks and 0.04 per cent was from financial institutions.

Role of FIIs

4.120 Net FII inflows, comprising both debt and equity, rose dramatically from Rs.2,822 crore in 2002-03 to Rs.48,968 crore in 2003-04. Net FII investments, and offshore primary market issuance, are both shaped by expectations on Indian equity and the Indian rupee, as also strong global investment flows into 'emerging markets'. Hence, offshore primary market issuance also went up from Rs.910 crore in 2002-03 to Rs.3,746 crore in 2003-04. These expectations changed in May 2004, and the largest ever one-month exit by foreign investors took place, of Rs.3,507 crore.

4.121 FIIs were slow to embark on equity derivatives trading in India. Liquidity in the equity derivatives market was first established by retail participants in 2001 and 2002. Until June 2003, the aggregate FII equity derivatives turnover was negligible, attaining values of below Rs.1,000 crore per month. The first month with substantial trading by FIIs on the equity derivatives was June 2003, with Rs.10,905 crore of equity spot market turnover and Rs.1,788 crore of equity derivatives turnover.

4.122 From these modest beginnings, FII turnover has grown steadily. The largest values are found in the most recent period. Hence, in Table 4.11, we focus on Jan-March 2004, i.e. the most recent period. FII turnover data is reported two ways (i.e. buys and sells are added together), while exchange turnover is reported one-way (i.e. each trade is counted once, even though there is one buyer and one seller). Hence FII turnover has to be divided by twice the reported exchange turnover when computing the share in turnover.

4.123 The table shows that in (say) March 2004, FII turnover appears to be quite large : Rs.28,872 crore of volume on the equity spot market and Rs.12,711 crore on the equity derivatives. However, these numbers need to be seen in the context of the large Indian equity market. We find that these maximal values for FII turnover accounted for roughly 8 per cent to 9 per cent of the equity spot turnover, and roughly 2 per cent of the equity derivatives market.

Table 4.11 : Role of FIIs in equity turnover in early 2004

(Rs. crore)

	FII (two-way)		India (one-way)		FII share (per cent)	
	Spot	Deriv.	Spot	Deriv.	Spot	Deriv.
January	30,484	13,395	1,99,889	3,27,850	7.6	2.0
February	27,507	10,882	1,60,182	2,73,569	8.6	2.0
March	28,872	12,711	1,55,662	2,60,986	9.3	2.4

Institutional investors

Growth of the mutual fund industry

4.124 Table 4.12 summarises the growth of the mutual fund industry. Overall assets under management (AUM) grew from Rs.102,831 crore to Rs.143,688 crore in 2004 or 5.1 per cent of GDP. A striking feature of this growth

Table 4.12 : Growth of mutual fund industry

(Rs. crore)

Date	Asset	Private MFs	Private share
April 2002	102,831	44,145	42.9
April 2003	89,238	65,398	73.3
March 2004	143,688	111,492	77.6

was the success of the private sector, which had an increase from 42.9 per cent of assets to 77.6 per cent of assets in this period.

The new pension system

4.125 From 1 January 2004 onwards, new recruits into the central government, including post and railways but excluding the armed forces, have been placed into a new defined-contribution pension system. When the system stabilises, it is expected to be opened up for access to the unorganised sector also.

4.126 The new system unbundles the overall problem of pensions into two parts: "accumulation" and "benefits".

4.127 In the working years, participants accumulate pension wealth, and utilise professional pension fund managers. In the case of government employees, government can be seen as 'pre-funding' the future pension through contributions which go into the individual account of each employee.

4.128 The focus in the working years is on asset management, using an NAV-based system. Here, the critical focus is on earning high rates of return in fund management.

4.129 Public infrastructure in the form of a 'central recordkeeping agency' (CRA) is envisaged in order to lower transactions costs, which could be particularly onerous for small value contributions.

4.130 A new regulatory agency, the Pension Fund Regulatory and Development Authority (PFRDA) has been created in order to perform the regulatory and developmental functions of the above elements. As with SEBI and IRDA, PFRDA has been created by an administrative order. Legislative action is required in order to make it statutory.

4.131 PRRDA's activities include contracting for the CRA, choice of fund managers, setting up regulatory requirements for fund management, reaching out into the unorganised sector, establishing linkages between the CRA and government, etc.

4.132 Upon retirement, participants would use part or all of their accumulated assets to purchase an 'annuity' from life insurance companies, in order to obtain the benefit of a monthly pension until death.

4.133 This pension system envisages harnessing many of the strengths of India's financial system. It is expected that existing bank branches (regulated by RBI) and post offices would offer access services, so as to avoid the cost of building up a new branch network. The pension fund managers would be prominent users of the existing asset markets in the country, including the markets for government bonds, corporate bonds, equity and (when international diversification commences) the currency spot and derivatives. The existing life insurance industry (regulated by IRDA) would produce annuities.

4.134 PFRDA would play a synergistic role, coordinating with SEBI, RBI and IRDA in effecting a new leap for India's pension sector. The new pension system is expected to create a new class of large institutional investors, who would participate on all the asset markets.

Conclusion

4.135 The securities markets have made enormous progress in recent years. India's equity market is now being increasingly recognised as a success story on the world scale.

4.136 The Forward Markets Commission had adopted the same sequence of reforms for the commodity futures markets as that adopted by the equity market in the early 1990s, which is to start with modernisation of the trading system. The focus of development in the commodity futures markets has shifted to the three 'multi-commodity exchanges', which are all based on anonymous order matching by computer. These efforts will need to be followed through with improvements in clearing and settlement, and strengthening the regulatory framework.

4.137 In the bond market, important progress has been achieved in the problem of clearing, with the use of the Clearing Corporation of India (CCIL). From April 2004, DVP-3 is in place, which implies that the efficiencies of netting are now available for both securities and funds. CCIL is also playing a valuable role with multi-lateral netting for the currency spot market. The CBLO market is India's first success in shifting to a transparent trading mechanism in the bond market.