

2 National Stock Exchange

Establishment of NSE is perhaps the most important event in the securities market reforms in India. It was set up with the objectives of (a) providing a nation-wide trading facility for all types of securities, (b) ensuring equal access to all investors all over the country through an appropriate communication network, (c) providing a fair, efficient and transparent securities market using an electronic trading system, (d) enabling shorter settlement cycles and book entry settlement, and (e) meeting the current international standards. It has fulfilled its mandate in letter and spirit. The standards set by NSE in terms of market practices and technology have become industry benchmarks and are being emulated by other market participants.

Indian securities market has undergone a massive transformation in the last six years in terms of microstructure, market practices and trading volumes. The market today uses the state-of-art information technology to provide an efficient and transparent trading, clearing and settlement mechanism, and has witnessed several innovations in products and services. These include, demutualisation of exchange governance, screen based trading system, compression of settlement cycle, dematerialisation and electronic transfer of securities, securities lending and borrowing, professionalisation of trading members, fine-tuned risk management system, emergence of clearing corporation to assume the counterparty risk, market for debt instruments and derivatives, and intensive use of information technology in all the operations. The market today compares favourably with the best in the world. NSE has played a catalytic role in bringing about this transformation.

Market Transformation

Demutualisation

Historically, the trading members, who provided broking services, also owned, controlled and managed the stock exchanges. The brokers elected their representatives to regulate activities of the exchange, including their own activities. In case of dispute between brokers and the investors, there was no assurance that investors' interests would receive the same utmost objective treatment. As the self may sometimes get precedence over regulation, broker-owned exchanges are not suitable to work as effective self-regulatory organisations. More and more stock exchanges all over the world are realising the limitations of broker-owned exchanges and discovering the advantages of demutualised stock exchange. LSE, NYSE and NASDAQ have announced their plans to get demutualised, while Australian stock exchange demutualised a year ago. NSE has been from day one the purest form of a demutualised stock exchange where brokers do not own the shares and its management is free from broker control. The right to trade is completely divorced from ownership and management. This has completely eliminated any conflict of interest. NSE model, however, does not preclude, rather accommodates broker involvement, support and contribution in a variety of other ways.

Capital Market

Trading Mechanism

NSE shifted trading platform from the trading hall in the premises of an exchange to computer terminals at the premises of the brokers and then

to the personal computers (PCs) in the homes of the investors and is working to shift it further to hand-held portable devices for the convenience of mobile investors.

Before NSE was set up, the trading on stock exchanges in India used to take place through open outcry without use of information technology for immediate matching or recording of trades. This was inefficient. To bring in transparency, efficiency and depth in the market, NSE introduced a fully automated screen based trading system, known as the National Exchange for Automated Trading (NEAT) system, which operates on a strict price/time priority. It enables members from across the country to trade simultaneously with enormous ease and efficiency. A member punches into the computer quantities of securities and the price at which he wants to transact and the transaction is executed through the mainframe computer of the exchange as soon as the order punched by him finds a matching sale or buy order from a counterparty. This has cut down on time, cost and risk of error, as well as possibility of fraud. NEAT has lent considerable depth in the market by enabling large number of members all over the country to trade simultaneously and consequently narrowed the spreads significantly. A single consolidated order book for each stock displays, on a real time basis, buy and sell orders originating from all over the country. This makes NSE a real national market. It has improved information efficiency by allowing faster incorporation of price sensitive information into market prices. High speed of execution of trades has increased operational efficiency. It is possible for market participants to see the full market, which has made the market more transparent, leading to increased investor confidence. Since audit trail is absolutely perfect and disputes can be settled by logging the trade execution process in its entirety, all investors irrespective of their financial standing or geographical location are assured of fair treatment.

The trading system is an anonymous order driven system. This helps orders whether large or small to be placed without the members being disadvantaged by disclosure of their identity. The trading system operates on a strict price time priority. All orders received on the system are sorted with the best priced order getting the first priority for matching, i.e., the best buy orders match with the best sell order. Similar priced orders are sorted on time-priority basis, i.e., the one that came in early gets priority over the later one. Orders are matched automatically by the computer keeping the system transparent, objective and fair. Where an order does not find a match, it remains in the system and is displayed to the whole market, till a fresh order comes in or the earlier order is cancelled or modified.

The trading system provides tremendous flexibility to the users in terms of kinds of orders that can be placed on the system. Several Time-related (Good-till-cancelled, Good-till-day, Immediate-or-cancel), Price-related (buy/sell limit and stop-loss orders) or Volume-related (All-or-none, Minimum fill, etc.) conditions can be easily built into an order. The trading system also provides complete market information on-line. The market screens, at any point of time, provide complete information on total order depth in a security, the five best buys and sells available in the market, the quantity traded during the day in that security, the high and the low, the last traded price, etc. Investors can also know the fate of the orders almost as soon as they are placed with the trading members. Thus the NEAT system provides an Open Electronic Consolidated Limit Order Book (OECLOB). Limit orders are orders to buy or sell shares at a stated quantity and stated price. If the price quantity conditions do not match, the limit order will not be executed. The term “limit order book” refers to the fact that only limit orders are stored in the book and all market orders are crossed against the limit orders sitting in the book. Since the order book is visible to all market participants, it is termed as an “open book”.

NSE is the first stock exchange in the world to use satellite communication for trading. It set up its own dedicated satellite communication network to provide connectivity to all its brokers who operate through their trading terminals in different cities. NEAT is now accessed directly from 370 cities. It today boasts of the largest VSAT-based on-line trading system in the world with over 3,000 VSATs and over 6,000 trading terminals. Orders originating from any part of the country get matched in NSE's mainframe computer and immediately get confirmed on the originating trading terminal in about 1.5 seconds.

NSE has set up a disaster back-up site at Pune with its entire infrastructure including satellite earth station and the high-speed optical link with its main site at Mumbai. The site at Pune is a mirror replica of the complete production environment at Mumbai. The transaction data are backed up on near real time basis to keep both the sites synchronised all the time with each other. In case of any disaster at Mumbai site, the operation can continue uninterrupted from Pune. NSE is the only exchange today to have such a business continuity plan.

NSE launched internet trading in early February this year. It is the only stock exchange in the country to provide web-based access to investors to trade directly on the exchange. The orders originating from the PCs of investors are routed through the internet to the trading terminals of the designated brokers with whom they have relations and further to the exchange for trade execution. Soon after these orders get matched and result into trades, the investors get confirmation about them on their PCs through the same internet route. This has made a huge difference in a geographically vast country like India and assuaged the grouse of small investors in far-flung locations who do not have proper access to a stock broker and the market. It has significantly expanded the reach of the exchange to the homes of ordinary investors.

Membership

NSE took the initiative to set minimum benchmarks for its trading members. The standards for admission of members laid down by the Exchange stress on factors, such as, corporate structure, capital adequacy, track record, education, experience, etc. and reflect a conscious effort by the Exchange to ensure quality broking services so as to build and sustain confidence in the Exchange's operations. The capital adequacy requirements stipulated by the Exchange are substantially in excess of the minimum statutory requirements as also in comparison to those stipulated by other exchanges. Admission is a two-stage process with applicants required to go through a written exam followed by an interview.

There are no entry/exit barriers to membership in NSE. Anybody can become member by complying with the prescribed eligibility criteria and exit by surrendering membership without any hidden/overt cost. The members are admitted to the different segments of the Exchange subject to the provisions of the Securities Contracts (Regulation) Act, 1956, the Securities and Exchange Board of India Act, 1992, the rules, circulars, notification, guidelines, etc., prescribed thereunder and the bye laws, rules and regulations of the Exchange.

A prospective trading member is admitted to Capital Market (CM) and Wholesale Debt Market (WDM) segments, or both CM and Derivatives (Futures and Options) segments of the Exchange. Only corporate members are admitted on the WDM segment, while individuals and firms are also eligible on CM and Derivatives segment.

Settlement Mechanism

The trades accumulate over a trading cycle and at the end of the cycle, these are netted out and payment of cash and delivery of securities settle

the balance. These carry the risks and difficulties akin to those of futures market without corresponding gains in price discovery and hedging services. Many things can happen between entering into a contract and its performance, providing incentives for either of the parties to go back on its commitment. This had resulted in defaults and risks in settlement on occasions. The time that elapses between trade execution and its settlement coupled with growing volume of trades between unknown participants facilitated by nation-wide screen based trading system, under volatile market conditions necessitated innovations to enforce the trades and prevent market failures.

NSE set up National Securities Clearing Corporation Ltd. (NSCCL) as its wholly owned subsidiary to manage clearing and settlement of trades executed on the NSE. NSCCL has adopted novation in clearing and settlement and stands as counter party for all trades. In case one of the parties to trade goes under the water, NSCCL steps in to assume all its liabilities and completes the settlement. It has put in place a strong margining and risk containment mechanism. A large Settlement Guarantee Fund, which has a corpus of over Rs. 2,339 crore today provides cushion for any residual risk. As a consequence, despite the fact that NSE sometimes records a daily turnover of Rs. 9,000 crore or more, credit risk no longer poses any threat in the market place. The market now has full confidence that settlements shall take place in time and shall be completed irrespective of default by isolated trading members.

Settlement of trades required moving securities physically from the seller to the ultimate buyer, through the seller's broker and buyer's broker, which took time with the risk of delay somewhere along the chain. Further, the system of transfer of ownership was grossly inefficient as every transfer involved physical movement of paper to the issuer

for registration, with the change of ownership being evidenced by an endorsement on the security certificate. In many cases, the process of transfer took much longer than the two months stipulated in the statutes, and a large proportion of transactions ended up as bad delivery due to faulty compliance of paper work. Theft, forgery, mutilation of certificates and other irregularities were rampant. In addition, the right of the issuer to refuse transfer of a security posed one more problem. All this added to costs, and delays in settlement, restricted liquidity and made investor grievance redressal time consuming and at times intractable. To obviate these problems, the Depositories Act, 1996 was enacted to ensure free transferability of securities with speed, accuracy and security by (a) making securities of public limited companies freely transferable subject to certain exceptions; (b) dematerialising the securities in the depository mode; and (c) providing for maintenance of ownership records in book entry form.

NSE took initiative to promote dematerialisation of securities by setting up National Securities Depositories Limited in 1996. The depository system gained quick acceptance in all segments of the market. Institutions are now required to mandatorily trade only in dematerialised form in respect of 985 securities. Similarly dematerialised trading is compulsory for all investors in respect of 1,229 securities. Over 99% of value of trades settled by delivery on NSE are settled by demat delivery. It is expected that most of the securities would be traded in demat form by end 2000. Reduction in paper has not only reduced risks in the system and operating costs, but also facilitated introduction of newer products like rolling settlement and lending and borrowing of securities.

NSE is the only exchange in the country to offer a market driven automated lending borrowing mechanism (ALBM). This provides nation-wide

access to borrow and lend securities to improve the efficiency of settlement system and to correct temporary imbalances in demand and supply.

Risk Management

Market integrity is the essence of any financial market. To pre-empt market failures and protect investors, NSE has put in place a comprehensive risk management system, which is constantly monitored and upgraded. The risk management process encompasses capital adequacy of members, adequate margin requirements, limits on exposure and turnover, indemnity insurance, on-line position monitoring and automatic disablement, etc. NSE also administers an efficient market surveillance system to curb excessive volatility, detect and prevent price manipulations. NSE has set up an Investor Protection Fund, which has a corpus of about Rs.57 crore, to take care of investor claims that may arise out of non-settlement of obligations by a trading member for trades executed on the exchange.

Traditionally, brokerage firms in India were individually owned or partnership concerns with unlimited liabilities. This restricted the amount of capital that such firms can raise. The growing volume of transactions made it imperative for such firms to be well capitalised and professional. The necessary legal changes were effected to open up the membership of stock exchanges to corporate entities with limited liability. NSE encouraged setting up of corporate broking members. Nearly 90% of members of NSE are corporate brokers.

One area where NSE made a major difference to the system is insistence on minimum capital requirements for its trading members. Indian stock exchanges did not attach much importance to capital adequacy requirements by way of minimum net worth. When NSE opened up its membership in 1994 for the equities market, it insisted on a minimum net worth of Rs.10 million for all the

corporate trading members. Simultaneously, NSE also introduced the concept of exposure/trading limits to brokers linked to the amount of assets pledged by them with it. Each trading member's open interest or exposure to the market is monitored strictly on a real time basis. Each member's aggregate exposure at any point of time is linked to the amount of funds and other collateral deposited by him with the Exchange. NSE is the first stock exchange in the world, which introduced a system of exposure monitoring on a real time basis. Information technology has tremendously enhanced the risk management capabilities of the stock exchanges. NSE uses information technology extensively in risk management. It tracks each broker's exposure in the entire market as also in different stocks on a real time basis. Depending on the amount of cash, pledge of liquid and sound stocks and bank guarantees, each broker is given an aggregate exposure limit. As soon as the broker reaches 75% of his exposure he gets a warning signal about the exposure level. Thereafter he is given two more warnings as he further increases his exposure. All his trading terminals located in all parts of the country are automatically disabled as soon as he crosses the exposure limit even by a small amount.

Table 2-1 presents the market design of CM segment of NSE.

Wholesale Debt Market

Only trading mechanism available in the debt market was the telephone market prior to June 1994, when NSE launched WDM segment. It is the first and so far the only formal trading platform, which provides an efficient price discovery mechanism and a transparent and risk-free environment for trading of a wide range of debt securities. The trading system, called NEAT, is a fully automated screen based trading system that enables members across the country to trade simultaneously with enormous ease and efficiency. It is an order driven system, which matches best buy and sell orders on price-

Table 2-1: Market Design of CM Segment

Aspect	Design used at NSE
Securities	1,200 securities are traded on the CM segment.
Intermediaries	960 brokerage firms having trading terminals in over 370 cities all over the country trade in CM segment of NSE. The exchange is owned by large financial institutions and banks.
Trading Mechanism	NSE follows a fully automated screen-based trading system, known as the National Exchange for Automated Trading (NEAT) system, which in an anonymous order-driven system and operates on a strict price/time priority.
Transparency	The limit order book is displayed on the trading screen on real time basis, subject to the restriction that only prices and quantities of the best five are displayed. Every day, the Last Traded Price (LTP) is displayed after trade. Summary information (bid offer and LTP) is disseminated over real time to information vendors and is available at zero cost on the internet.
Distribution	Satellite technology is used to reach 3,000 VSAT locations in India. Each VSAT has, on an average, three trading terminals. Orders are confirmed within 1.5 seconds to all trading terminals.
Settlement Cycle	Trades are netted from Wednesday open to Tuesday close. Net obligations as of Tuesday evening are settled on a T+5 basis. Trades are also settled on T+5 rolling settlement basis for select number of scrips.
Clearing	Clearing corporation performs novation, adopting legal responsibility for the net settlement obligations of each clearing member.
Settlement	About 99% settlements are executed electronically. The rest are settled using physical share certificates.

time priority. The identity of the buyer and seller are completely protected on the system. The full potential of this on-line, automated and transparent debt market is yet to be realised. The market participants have not yet graduated to the advanced trading mechanism and continue to trade outside the automated trading system, which is neither transparent nor provides an efficient price discovery mechanism. Although the deals struck outside the trading system through intermediaries are reported to the Exchange as negotiated trades and are disseminated to the market through the NEAT system, the market is yet to reap the real advantages of the on-line, automated and transparent debt market. NSE is looking forward to regulatory support for replicating trading framework of equity market in the debt market, i.e., applying four key principles of anonymity, price/time priority, nationwide market, and settlement guarantee.

For the convenience of retail participants, who otherwise have to hold securities in physical form

and settle their transactions on a bilateral basis, NSCCL offers constituent SGL facility.

In its tradition of innovation, NSE developed and launched the NSE Mumbai Inter-bank Bid Rate (MIBID) and the NSE Mumbai Inter-bank Offer Rate (MIBOR) for the overnight money market on June 15, 1998. The success of the overnight MIBID/MIBOR encouraged the Exchange to develop benchmark rates for the term money market and launch the 14-day MIBID/MIBOR on November 10, 1998 and the 1 month and 3 months rates on December 1, 1998. These rates are disseminated daily and being used by bankers, issuers and investors extensively.

In line with NSE's strong focus on debt market segment and in its continuous effort to innovate, the Exchange has launched a 'Zero Coupon Yield Curve' (ZCYC), which will help in the valuation of securities across all maturities irrespective of their liquidity in the market. The product has been developed keeping in mind the requirement of the

banking industry, financial institutions, mutual funds, insurance companies, etc., who have substantial investment in sovereign papers.

Derivatives Market

NSE worked very hard for about three years to build skills and systems and to disseminate knowledge to prepare market for derivatives trading. The trading required development of appropriate legislative framework, which came through in February 2000. NSE launched index futures based on S&P CNX Nifty in June 2000. As and when regulatory approvals are in place, NSE would also introduce index options and futures and options in individual securities.

In order to provide a facility of arbitrage between cash and futures market, NSE provides basket-trading facility. This enables a trading member to buy or sell a portfolio through a single order. The system automatically works out the quantity of each security to be bought or sold in proportion to their weightages in the portfolio.

Primary Market

In its strive to continuously improve Indian securities market, NSE offers its infrastructure for conducting on-line IPOs through book building. The advantages of this new system are: a) the investor parts with money only after allotment, b) it eliminates refunds except in case of direct applications, and c) it reduces the time taken for issue process. The securities can get listed on the exchange from the 15th day from the closure of the issue. NSE's on-line IPO system was launched with the book building issue of Hughes Software Systems Ltd. in September 1999.

To compliment its developmental efforts for debt market, NSE has, jointly with ILFS, floated a B2B portal to serve the requirements of private placement market for debt instruments. This B2B web-enabled market place for primary issuance of debt securities provides investors and brokers similar

levels of efficiency and transparency on the primary market segment as the exchange system provides for secondary market in debt. This e-infrastructure is being used by quality issuers.

Testing and Certification

A critical element of financial sector reforms is the development of a pool of human resources having right skills and expertise to provide quality intermediation services in each segment of the industry. In order to dispense quality intermediation, personnel working in the industry need to (a) follow certain code of conduct usually achieved through regulations, and (b) possess requisite skills and knowledge generally acquired through a system of testing and certification. It is necessary that they have a proper understanding of the business and skills to serve different constituents of market. Such testing and certification has assumed added significance in India as there is no formal education/training on financial markets, especially in the area of market operations while at the same time the market has undergone complete transformation in the recent years. The industry has a large work force with varying levels of professional qualifications, skills and experience that do not necessarily match their work responsibilities. Taking into account international experience and needs of the financial markets in India, NSE has launched a testing and certification programme, called NSE's Certification in Financial Markets (NCFM). NCFM is an on-line, fully automated and nation-wide testing system, a revolutionary concept in administration of examinations and only one of its kind today in the country. NCFM tests practical knowledge and skills that are required to operate in financial markets, in a very secure and unbiased manner, and certifies personnel with a view to improve quality of intermediation. This has gained market acceptability, as there is a realisation that the financial markets are soon going to be turf of certified professionals due to regulatory compulsions and/or initiatives of the industry. About 10,000 candidates have been tested so far.

Table 2-2: Milestones in the life of NSE

Month/Year	Event
November 1992	Incorporation.
April 1993	Recognition as a stock exchange.
May 1993	Formulation of business plan.
June 1994	WDM segment goes live.
November 1994	CM segment goes live through VSAT.
March 1995	Establishment of Investor Grievance Cell.
April 1995	Establishment of NSCCL, the first Clearing Corporation.
June 1995	Introduction of centralised insurance cover for all trading members.
July 1995	Establishment of Investor Protection Fund.
October 1995	Became largest stock exchange in the country.
April 1996	Commencement of clearing and settlement by NSCCL.
April 1996	Launch of S&P CNX Nifty.
June 1996	Establishment of Settlement Guarantee Fund.
November 1996	Setting up of NSDL, first depository in India, co-promoted by NSE.
November 1996	'Best IT Usage' award by Computer Society of India.
December 1996	Commencement of trading/settlement in dematerialised securities.
December 1996	Dataquest award for 'Top IT User'.
December 1996	Launch of CNX Nifty Junior.
February 1997	Regional clearing facility goes live.
November 1997	'Best IT Usage' award by Computer Society of India.
May 1998	Promotion of joint venture, India Index Services & Products Limited (IISL).
May 1998	Launch of NSE's Web-site: www.nse.co.in .
June 1998	Launch of MIBID/MIBOR.
July 1998	Launch of 'NSE's Certification Programme in Financial Markets.
August 1998	'CYBER CORPORATE OF THE YEAR 1998' award.
February 1999	Launch of 'Automated Lending and Borrowing Mechanism'.
April 1999	'CHIP Web Award' by CHIP magazine.
October 1999	Setting up of NSE.IT.
January 2000	Launch of NSE Research Initiative.
February 2000	Commencement of Internet Trading.
June 2000	Commencement of Derivatives Trading.
September 2000	Launch of 'Zero Coupon Yield Curve'.

NSE Research Initiative

In order to improve market efficiency further and to set international benchmarks in securities industry, NSE launched the NSE Research Initiative with a view to develop information base and a better insight into the working of securities market in India. The objective of this initiative is to foster research, which can support and facilitate: (a) stock exchanges to better design market micro-structure, (b) participants to frame their strategies in the

market place, (c) regulators to frame regulations, (d) policy makers to formulate policies and (e) broaden the horizon of knowledge. NSE supports research initiatives on issues that have a bearing on securities market in India.

Growth of NSE

Facts and Figures

The chronology of events in the life of NSE is presented in Table 2-2.

Table 2-3: Achievements of NSE

Parameter	Date	Magnitude
CM Segment		
▪ Number of VSATs	September 30, 2000	2,919
▪ Number of cities covered	September 30, 2000	356
▪ Settlement Guarantee Fund	September 30, 2000	Rs. 2,339 crore
▪ Investor Protection Fund	September 30, 2000	Rs. 57 crore
▪ Number of Companies available for trading	September 30, 2000	1,070
▪ Record number of trades	September 19, 2000	8,60,077
▪ Record daily turnover (Quantity)	October 13, 1999	1,647 lakh
▪ Record daily turnover (Value)	September 19, 2000	Rs. 9,719 crore
▪ Record market capitalisation	February 21, 2000	Rs. 1,194,282 crore
▪ Record value of S&P CNX Nifty Index	February 23, 2000	1818.15
▪ Record value of CNX Nifty Junior Index	February 23, 2000	5365.90
▪ Record Funds Pay-in/Pay-out	September 19, 2000	Rs. 1,366 crore
▪ Record Securities Pay-in/Pay-out (Value)	February 22, 2000	Rs. 3,267 crore
▪ Record Securities Pay-in/Pay-out (Quantity)	October 20, 1999	1,453 lakh
WDM Segment		
▪ Number of securities available for trading	September 30, 2000	1,498
▪ Record daily turnover (Value)	February 3, 2000	Rs. 3,576 crore

The achievements of NSE in terms of various parameters are presented in Table 2-3.

Capital Market

The CM segment of NSE provides trading platform for trading of equity and preference shares, debentures, warrants and coupons. At the end of September 2000, securities of 1,070 companies were available for trading. During the year 1999-2000, NSE reported a turnover of Rs. 8,39,052 crore, which accounted for 41.6% of the total market. The market capitalisation of NSE stood at Rs. 10,20,426 crore at the end of March 2000. It is highest among all the exchanges in the country and accounts for about 90% of the total market capitalisation. The business growth of CM segment is presented in Annexure 2-1 and Chart 2-1.

The CM segment of NSE provides a true nationwide market, as indicated by the spread

of VSATs and the distribution of turnover. The share of Mumbai in turnover declined from 97.4% during 1995-96 to 44.3% during 1999-2000. The city-wise distribution of turnover is presented in Table 2-4. NSE owns the largest VSAT-based trading network in the world today. The expansion of NSE network in different cities and number of VSATs since November 1994 is presented in Chart 2-2. As at end September 2000, there were 2,919 VSATs spread over 356 cities. The list of towns and cities and the state-wise distribution of VSATs as at end September 2000 is presented in Annexure 2-2. The India map indicating location of VSATs is presented in Annexure 2-3.

Interestingly, liquidity and depth of an order book are also governed by Newton's principle of gravity. Just like a large mass attracts small mass, the huge liquidity and order depth of NSE is sucking liquidity of other exchanges. This is having significant impact on the fortunes of small exchanges. Since the trading

Table 2-4: City-wise Distribution of Turnover

Sl. No.	City	Share in Turnover (%)	
		1999-2000	April - Sept. 2000
1	Ahmedabad	2.66	2.64
2	Amritsar	0.17	0.15
3	Bangalore	1.42	1.52
4	Baroda	0.81	0.83
5	Bhavanagar	0.15	0.16
6	Calcutta / Howrah	9.85	9.02
7	Chandigarh/Mohali/ Panchkula	1.07	0.84
8	Chennai	3.88	3.83
9	Cochin/Ernakulam/ Parur/Kalamassery	0.74	0.87
10	Coimbatore	0.59	0.65
11	Delhi/Ghaziabad	17.77	17.75
12	Gajuwaka/Vishakhapatnam	0.88	0.95
13	Hyderabad/Secunderabad/ Kukatpally	2.47	2.47
14	Indore	1.06	1.19
15	Jaipur	1.22	1.12
16	Kanpur	0.63	0.55
17	Lucknow	0.16	0.12
18	Ludhiana	0.21	0.19
19	Mumbai	44.26	45.91
20	Nagpur	0.19	0.15
21	Pune	1.25	1.10
22	Rajkot	0.46	0.35
23	Surat	0.26	0.41
24	Vijayawada	0.45	0.35
25	Others	7.36	6.86

volumes of these exchanges are fast declining, purely as a matter of survival strategy, they are setting up subsidiary companies through which their members access NEAT. NSE has already admitted subsidiaries of six regional stock exchanges. Most of the small exchanges would end up as satellites of NSE in about a year, and over the next five years only about four or five stock exchanges would survive and after a decade or so the number would further reduce to two or three. The market liquidity on NSE is now superior to that seen in the GDR market in most cases, as may be seen from Table 2-5.

The trading intensity is also quite high on NSE in comparison to other international stock exchanges. According to FIBV, NSE was the fifth largest stock exchange in terms of number of transactions in 1999 after NASDAQ, NYSE, Korea and Taiwan. It is the fifteenth largest market in terms of number of shares traded on any stock exchange in the world.

Automated Lending and Borrowing Mechanism

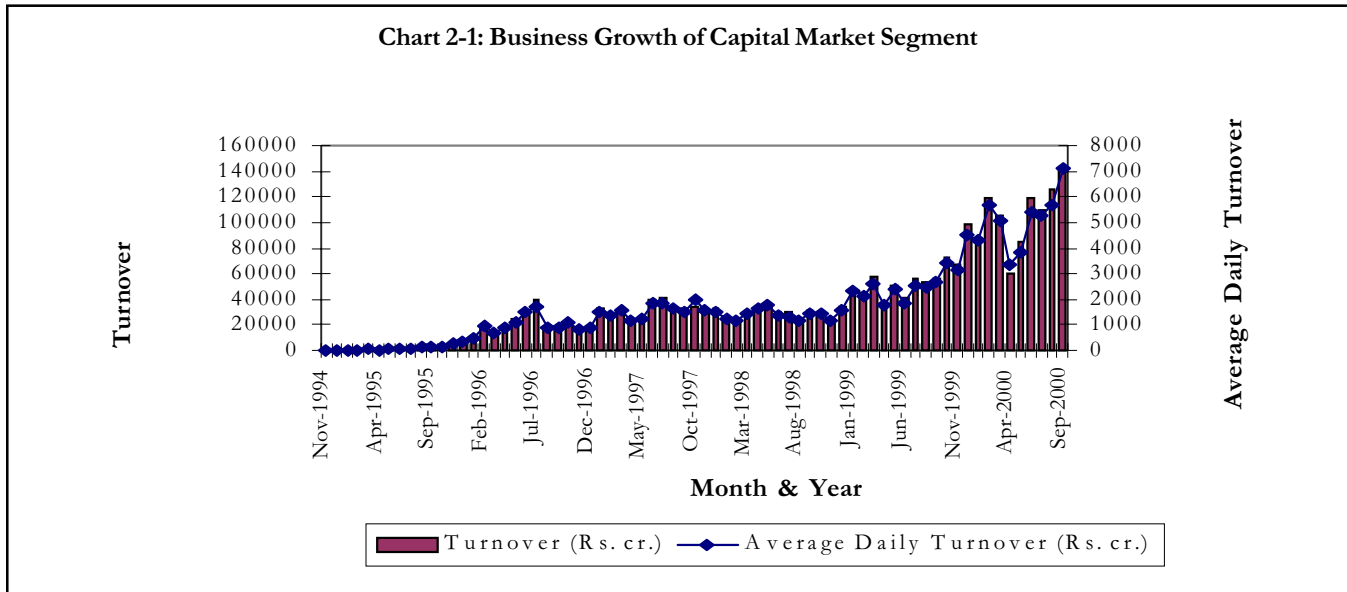
In order to facilitate timely delivery of securities, to improve the efficiency of the settlement system and to correct temporary imbalances in demand and supply, NSE provides a facility, called Automated Lending and Borrowing Mechanism (ALBM), to lend/borrow securities/funds at market-determined rates. During April-September 2000, 55 crore securities worth Rs. 29,986 crore were lent/borrowed.

Wholesale Debt Market

The WDM segment provides the only formal trading platform for trading of a wide range of debt securities, including, government securities, treasury bills and bonds, zero coupon bonds, index bonds, commercial papers, certificates of deposit, corporate debentures, state government loans, SLR and non-SLR bonds issued by financial institutions, units of mutual funds and securitised debt. The trading system on WDM segment is similar to that of CM segment, providing automated screen based trading. The turnover on WDM segment has been growing rapidly since it commenced business in June 1994. The turnover increased from Rs.6,781 crore during 1994-95 (June-March) to Rs. 3,04,216 crore during 1999-2000. The average daily turnover increased from Rs.30 crore to Rs.1,035 crore during the same period. The business growth of the WDM segment is presented in Chart 2-3.

Derivatives Market

The Futures and Options trading system, called the NEAT-F&O trading system, provides a fully automated screen based trading for S&P CNX Nifty



futures on a nationwide basis and an on-line monitoring and surveillance mechanism. It provides an order driven market and complete transparency of market operations. NSCCL undertakes clearing and settlement of all deals executed on this segment.

The derivatives trading on the Exchange commenced with S&P CNX Nifty Index Futures on June 12, 2000. The Index futures market recorded a total turnover of Rs.353 crore during June 12, 2000 to end September 2000. More than 12,000 contracts were traded during the same period.

Web-Site

The Exchange has been a front-runner in dissemination of real time information. In pursuance of this objective, NSE launched its web-site www.nse.co.in. The site is a store-house of information on the operations of NSE as also the entire securities market. It provides a number of utilities like stock ticker, portfolio manager, online graphs, stock watch, indices, bhavcopy, circulars and publications. Most of these are in downloadable form.

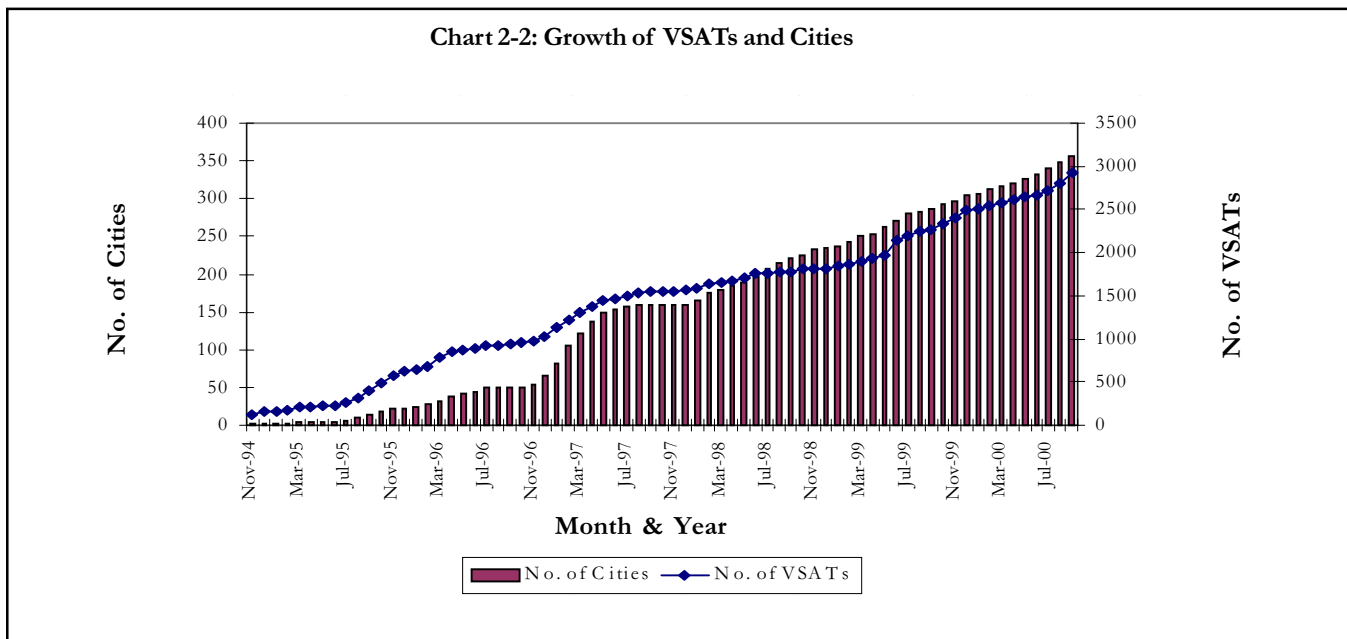


Table 2-5: Impact Costs: NSE and GDR Markets

Security	Transaction Size (Rs.)	Impact Cost (%)	
		NSE	GDR
INDRAYON	414,120	1.2	3.0
GRASIM	450,713	1.2	3.0
ASHOKLEY	270,070	2.7	2.4
TELCO	453,033	0.2	2.4
EIHOTEL	548,888	1.7	2.4
ITC	584,588	0.1	2.3
L&T	620,288	0.2	2.2
IPCL	472,133	0.4	2.1
M&M	517,650	1.2	1.7
INDHOTEL	780,938	1.6	1.7
BAJAJAUTO	1,133,475	0.3	1.6
RANBAXY	852,338	1.3	1.6
ICICI	580,125	0.8	1.5
BSES	905,888	0.3	1.5
SBIN	899,283	0.1	1.2
HINDALCO	1,247,715	1.2	0.9
RELIANCE	792,005	0.1	0.8

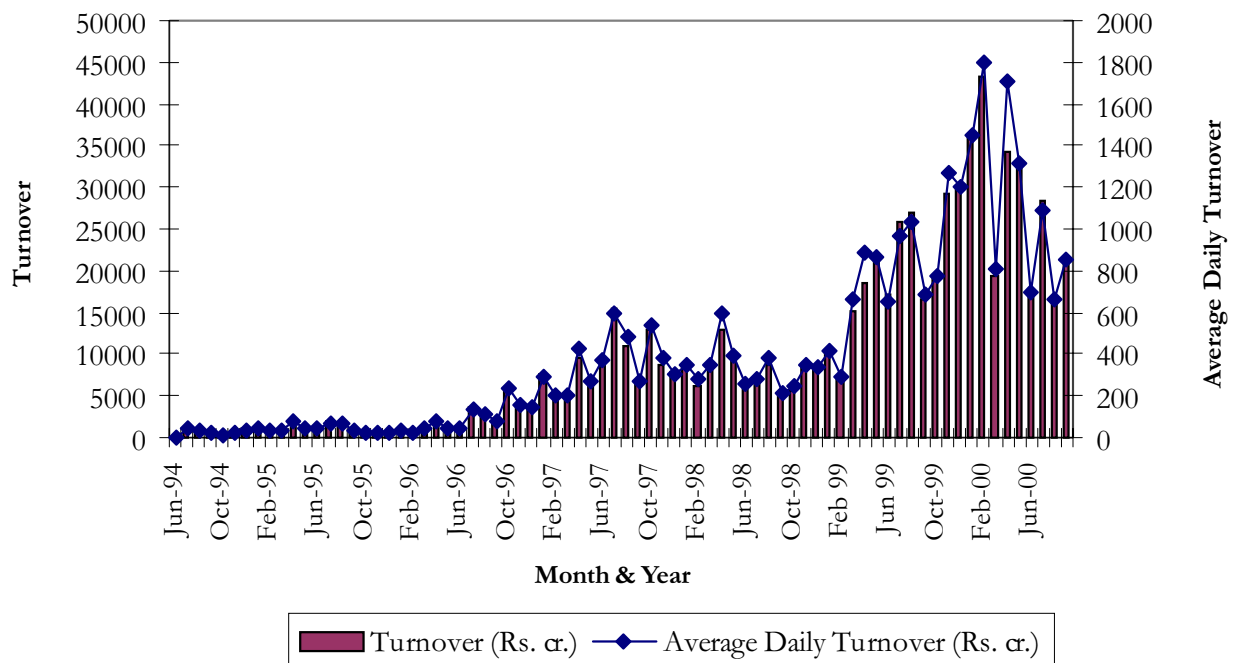
Source: "Changing Liquidity in the Indian Equity Market" by Ajay Shah and Sivaprakasam Sivakumar, Emerging Markets Quarterly Vol. 4 No. 2, Summer 2000.

Use of IT

Across the globe, developments in information, communication and network technologies have created paradigm shifts in the securities market operations. Technology has enabled organisations to build new sources of competitive advantage, bring about innovations in products and services, and provide for new business opportunities. Stock exchanges all over the world have realised the potential of IT and have moved over to electronic trading systems, which are cheaper, have wider reach and provide a better mechanism for trade and post trade execution.

NSE believes that technology will continue to provide the necessary impetus for the organisation to retain its competitive edge and ensure timeliness and satisfaction in customer service. In recognition of the fact that technology will continue to redefine the shape of the securities industry, NSE stresses

Chart 2-3: Business Growth of WDM Segment



on innovation and sustained investment in technology to remain ahead of competition. NSE's IT set-up is the largest by any company in India. It uses satellite communication technology to energise participation from 356 cities spread all over the country. In the recent past, capacity enhancement measures were taken up in regard to the trading systems so as to effectively meet the requirements of increased users and associated trading loads. With upgradation of trading hardware, NSE can handle up to 1 million trades per day. The capacity enhancement ensured that NSE could successfully handle nearly 9 lakh trades involving a turnover of about Rs. 9,719 crore on September 19, 2000. NSE has also put in place NIBIS (NSE's Internet Based Information System) for on-line real-time dissemination of trading information over the internet. In order to capitalise on in-house expertise in technology, NSE set up a separate company, NSE.IT, in October 1999. This is expected to provide a platform for taking up new IT assignments both within and outside India and attaining global exposure.

NSE Family

NSCCL

National Securities Clearing Corporation Ltd. (NSCCL), a wholly owned subsidiary of NSE, was incorporated in August 1995, and commenced clearing operations in April 1996. It has been set up to bring and sustain confidence in clearing and settlement of securities; to promote and maintain short and consistent settlement cycles; to provide counter-party risk guarantee, and to operate a tight risk containment system. It assumes the counter-party risk of each member and guarantees financial settlement. It has successfully brought about an upgradation of the clearing and settlement procedures and has brought Indian financial markets in line with international markets.

NSCCL carries out the clearing and settlement of the trades executed in the CM and derivative segments and operates Subsidiary General Ledger (SGL) for settlement of trades in government securities. It also undertakes settlement of transactions on Over the Counter Exchange of India.

NSCCL operates a fine tuned risk management system and innovative method of on-line position monitoring and automatic disablement. NSCCL has empanelled seven clearing banks to provide banking services to trading members and has established connectivity with both the depositories for electronic settlement of securities.

A large Settlement Guarantee Fund, whose corpus stood at Rs. 2,339 crore as at end September 2000, provides the cushion for residual risk.

NSDL

In order to solve the myraid of problems associated with trading in physical securities, NSE joined hands with IDBI and UTI to promote dematerialisation of securities and set up National Securities Depository Limited (NSDL), the first depository in India. NSDL, which commenced operations in November 1996, has eradicated paper from trading and settlement of securities, got rid of risks associated with fake/forged/stolen/bad paper and made transfer of securities automatic and instantaneous.

NSE.IT

NSE.IT, a 100% technology subsidiary of NSE, was incorporated in October 1999 to provide thrust to NSE's technology edge, concomitant with its overall goal of harnessing latest technology for optimum business use. NSE.IT is uniquely positioned to provide products, services and solutions for the securities industry. It endeavours to provide the

securities industry with technology that ensures transparency and efficiency in the trading, clearing and risk management systems. NSE.IT also plans to provide consultancy and implementation services in the areas of data warehousing, internet, business continuity plans, site maintenance, backups and real time market analysis.

Amongst the first products launched by NSE.IT are NeatXr, a Computer to Computer Linked (CTCL) order routing system and NeatXs, an internet trading system. Through Dotex International, it has launched “Broker Plaza”, which facilitates a large number of brokers/investors to directly trade on the exchange using a common internet infrastructure. It has also launched ‘Pro-Bos’, an advanced and comprehensive back-office solution for equities and derivatives trading. In order to provide complete solutions for internet trading, NSE.IT has set up an interface with HDFC Bank as payment gateway. NSE.IT has set up technology tie-ups with i-flex Solutions, Computer Associates, Intel, Elind Computers, Schoolnet, etc. In alliance with its partners NSE.IT will provide the securities industry with state-of-the-art technology and skills in a cost-effective manner. NSE.IT is also targeting stock exchanges world-wide for providing IT consultancy services.

IISL

India Index Services and Products Limited (IISL), a joint venture between NSE and Credit Rating Information Services of India Limited (CRISIL), was set up in May 1998 to provide indices and index services. It has a consulting and licensing agreement with Standard and Poor’s (S&P), the world’s leading provider of investible equity indices, for co-branding equity indices. It provides a broad range of services, products and professional index services.

Debtonnetindia.com

NSE joined as a strategic investor in

debtonnetindia.com, a new business-to-business (B2B) portal of Infrastructure Leasing and Financial Services (ILFS), which has been set up to service the private placement market for debt instruments. Web-enabled market place for primary issuance of debt securities provides investors and brokers same levels of efficiency and transparency as are available to participants in secondary debt market. The portal aims to deepen the debt market, give equal access and opportunity to all players, and ensure deeper penetration and wider distribution. NSE’s support for debtonnetindia.com would compliment NSE’s developmental efforts for the debt market.

DotEx International Limited

NSE.IT, the technology arm of the NSE, and i-flex Solutions Limited formed a new e-trading joint venture partnership company, DotEx International Limited (DIL). The company will launch a vertical portal that will offer a comprehensive range of products and services to both market participants and investors. The ranges of services include, anytime-anywhere equity trading over the net using standard PC’s, mobile phones and WAP-based devices. DIL also offers readymade technology and other infrastructure to enable market intermediaries to expand their reach and service capability. With inputs provided by DIL, NSE became the first stock exchange in India and among a few in the world to introduce an e-trading model for its brokers and investors.

Looking Forward

Rolling Settlement

Indian securities markets are not yet fully compliant with one of the major recommendation of G-30 relating to period of settlement. While several countries have gradually transited to T+3 rolling settlement system, Indian securities markets are still

mainly reliant on account period settlement. NSCCL has already put in place systems to settle trades in all securities in rolling settlement mode. However, rolling settlement on T+5 basis has so far been permitted only for a limited number of relatively less liquid stocks. Contrary to the apprehension that the rolling settlement would drain liquidity from the market, the global experience suggests that shortening trading period and shifting to rolling settlement increases liquidity in the market.

Continuous Net Settlement

In the US, the Continuous Net Settlement (CNS) has been effectively employed by the clearing corporations for the settlement of transactions and for maintaining an orderly flow of money and securities. The CNS is essentially a post-settlement process, which enables the seller, who cannot deliver securities, to postpone the settlement of his obligations to the subsequent settlement. It is primarily a tool for imparting flexibility to the seller and avoiding painful auctions. In India, CNS in rolling settlement has recently been approved by SEBI. NSCCL has already carried out the necessary product development for launching CNS.

Overseas Trading Terminal

The exchange is working towards allowing its trading members to open its trading terminals abroad. The Exchange has approached the Department of Telecommunications (DoT) for their approval for extending the NSE trading network connectivity abroad. Trading members are also in the process of seeking regulatory clearances in the countries where they wish to open the NSE trading terminals.

Debt Market

The Exchange is looking forward to regulatory support for replicating trading framework of equity

market to debt market, i.e., applying four key principles of anonymity, price/time priority and nation-wide market and settlement guarantee.

The Exchange also plans to start a retail debt segment to cater to the growing demand of investors in debt instruments. This segment would deal in government securities, corporate debentures and bonds.

Derivatives Trading

In a developing securities market like ours, a variety of hedging products are necessary for protecting investors from volatility in the underlying securities. NSE has successfully launched the index futures based on S&P CNX Nifty. Once regulatory approval is granted, NSE would also introduce index options and futures and options on individual securities.

Straight Through Processing

NSE has been working with the banks, Depository Participants (DPs) and brokers to gradually introduce STP so that settlement risks are further eliminated. Under this system, the selling client's DP account will be checked as soon as broker gets sale order through the internet for securities balances and, similarly, buying client's bank account will be checked for cash balances. Only if this check confirms availability of adequate balances of either stock or cash, the order will be routed by the broker's trading terminal for trade execution.

Terrestrial line

The brokers operate from their own offices and transmit orders to the exchange computers, which are linked primarily through satellite communication system, owned and operated by NSE. The Exchange is in the process of setting up a terrestrial communication link for all its members so that in case of a possible disturbance in the satellite

communication system, members should continue to trade without any interruption.

WAP

NSE is working towards providing access to its order book through hand-held devices, which use WAP technology. This mode would serve primarily retail investors who are mobile and want to trade from any place when the market prices of stocks of their choice are attractive.

Clearing Bank

NSCCL is working towards same day pay-in and

pay-out of funds and securities. Under the current dispensation, the pay-in and pay-out of funds take place on consecutive days in account period settlement, as the funds take time to move through RBI clearing mechanism. In case of rolling settlement, NSCCL provides intra-day liquidity and declares pay-out in advance of the confirmation of pay-in and as a result, pay-in and pay-out takes place on the same day. As volumes under rolling settlement increase, NSCCL would not be able to fund and declare same day pay-out. For success of rolling settlement and for pay-in and pay-out of funds to take place on the same day, it is necessary for NSCCL to directly participate in RBI clearing.

Annexure 2-1: Business Growth of CM Segment

Year/Month	No. Of Trading Days	No. of Companies Traded	No. of Trades	Traded Quantity (Lakh)	Turnover (Rs. cr.)	Average Daily Turnover (Rs. cr.)	Turnover Ratio (%)	Demat Securities Traded (Lakh)*	Demat Turnover (Rs. cr.)	Market Capitalisation (Rs. cr.) **
1994-95 (Nov-Mar)	102	--	320,551	1,391	1,805	17	--	--	--	363,350
1995-96	246	--	6,628,909	39,912	67,287	276	--	--	--	401,459
1996-97	250	--	26,355,122	135,561	295,403	1,176	--	--	--	419,367
1997-98	244	--	38,143,038	135,685	370,193	1,520	--	--	--	481,503
Apr-98	20	1,296	4,662,273	14,369	32,672	1,634	6.32	189	180	516,805
May-98	19	1,286	4,264,737	12,798	34,047	1,792	6.78	120	98	502,014
Jun-98	22	1,254	4,098,481	13,265	29,542	1,343	6.96	104	140	424,697
Jul-98	23	1,254	3,979,446	10,797	29,531	1,284	6.95	36	96	425,006
Aug-98	20	1,248	3,379,663	9,259	23,015	1,151	5.66	24	53	406,291
Sep-98	22	1,259	4,169,950	12,593	31,288	1,422	7.36	24	82	425,100
Oct-98	20	1,238	3,596,208	10,721	28,696	1,435	7.28	45	61	394,316
Nov-98	21	1,260	3,685,797	11,659	24,239	1,154	6.22	49	75	389,442
Dec-98	22	1,241	4,551,792	13,850	34,438	1,565	8.20	229	320	419,865
Jan-99	19	1,218	5,401,159	17,202	44,670	2,351	9.94	1,728	3,170	449,221
Feb-99	21	1,242	6,003,961	18,660	44,999	2,143	9.95	2,059	6,352	452,081
Mar-99	22	1,244	6,775,609	20,154	57,337	2,606	11.67	3,934	13,191	491,175
1998-1999	251	--	54,569,076	165,327	414,474	1,651	--	8,542	24,177	491,175
Apr-99	20	1,173	4,936,582	11,758	35,933	1,797	8.07	5,633	26,799	445,380
May-99	21	1,168	6,693,702	18,831	50,263	2,393	9.97	12,187	42,187	503,911
Jun-99	22	1,158	6,001,332	19,207	40,473	1,840	7.64	12,770	35,674	529,468
Jul-99	22	1,181	7,656,431	23,349	55,455	2,521	9.34	15,049	48,333	593,651
Aug-99	22	1,179	8,141,693	22,869	53,699	2,441	8.04	11,963	42,147	668,187
Sep-99	21	1,181	8,008,074	21,857	55,878	2,661	8.14	11,653	42,023	686,740
Oct-99	21	1,188	9,164,126	26,100	72,216	3,439	10.78	14,160	52,445	670,062
Nov-99	21	1,180	7,718,113	18,847	66,331	3,159	9.13	11,387	50,004	726,419
Dec-99	22	1,162	10,280,458	24,034	98,585	4,481	11.56	16,333	87,170	852,985
Jan-00	20	1,164	8,914,108	19,417	85,939	4,297	9.03	14,592	77,160	951,712
Feb-00	21	1,155	10,922,258	20,249	118,694	5,652	11.10	15,117	108,704	1,069,770
Mar-00	21	1,099	9,992,178	16,187	105,584	5,028	10.35	12,927	99,060	1,020,426
1999-2000	254	--	98,429,055	242,704	839,052	3,303	--	153,772	711,706	1,020,426
Apr-00	18	1,059	7,370,260	13,390	57,229	3,179	6.76	11,679	52,021	846,391
May-00	22	1,050	11,053,948	16,477	79,037	3,593	10.00	14,538	72,995	790,478
Jun-00	22	1,058	13,162,106	19,607	119,373	5,426	14.00	17,392	111,926	852,554
Jul-00	21	1,050	12,244,626	19,114	110,056	5,241	14.74	17,114	101,847	746,402
Aug-00	22	1,038	13,773,865	23,456	125,347	5,698	15.78	21,177	116,186	794,516
Sep-00	20	1,035	14,187,290	25,946	142,480	7,124	19.51	41,945	135,714	730,350
April-Sept 2000	125	--	71,792,095	117,960	633,522	5,068	--	123,845	590,688	730,350

* Includes trading in compulsory demat securities and trading in book entry segment.

** As at end of period

Annexure 2-2: Distribution of VSATs (as at end September 2000)

State	Towns and Cities	Total No. of Cities	Total No. of VSAT's
Andhra Pradesh	Adilabad, Amalapuram, Anakapalle, Anantpur, Bhadrachalam, Bhimavaram, Chirala, Chittoor, Cuddapah, Dharamavaram, Eluru, Gujuwaka, Guntur, Hindupur, *Hyderabad, Kakinada, Kandukur, Karimnagar, Kasibugga, Khammam, Kothagudem, Kurnool, Kukatpally, Mancheril, Mandapeth, Markapur, Mirialguda, Nalgonda, Nandyal, Narsaraopeta, Narsapur, Nellore, Nizamabad, Ongole, Palakol, Proddatur, Rajamundry, Ramagandum, Secunderabad, Srikakulam, Suryapet, Tadepalligudem, Tanuku, Tenali, Tirupathi, Vijayawada, Vizag, Vizianagaram, Warangal.	49	182
Assam	*Guwahati, Jorhat, Silchar.	3	8
Bihar	Bhagalpur, Deoghar, Dhanbad, Gindih, Jamshedpur, Muzzaffarpur, *Patna, Ranchi.	8	29
Delhi	*Delhi.	1	414
Goa	Panaji.	1	5
Gujarat	*Ahmedabad, Amreli, Anand, *Baroda, Bhavnagar, Bhuj, Botad, Borsad, Dahod, Dhrangadhra, Gandhinagar, Jamnagar, Junagadh, Kadi, Kalol, Khambat, Limdi, Mahuva, Mandvi, Mehsana, Morbi, Nadiad, Navsari, Patan, Palanpur, Petlad, Porabnder, *Rajkot, Savarkundla, Surat, Surendranagar, Unjha, Veraval, Visnagar, Vapi.	35	225
Haryana	Ambala Cantt, Bhiwani, Faridabad, Gurgaon, Hissar, Jagadhri, Jind, Karnal, Kurukshetra, Nabha, Panipat, Rewari, Rohtak, Sirsa, Yamuna Nagar, Sonapat, Kaithal, Panchkula, Fatehabad, Narnaul, Pehowa.	21	68
Himachal Pradesh	Parwanoo, Shimla.	2	3
Jammu & Kashmir	Jammu, Srinagar.	2	9
Karnataka	*Bangalore, Belgaum, Bijapur, Chickmagalur, Davangere, Hubli, Madikeri, *Mangalore, Manipal, Mulky, Mysore, Sagar, Shimoga, Sirisi, Tumkur, Udupi.	16	93
Kerala	Alappuzha, Aluva, Angamaly, Atingal, Calicut, Chalakudy, Changanacherry, Cheruthoni, Eraviperur, Ernakulam, Ettumanoor, Guruvaryur, Iringalokuda, Kalamassery, Kanjirapally, Kanhangad, Kannur, Kasaragode, Kattapana, Kalpetta, Kayamkulam, Kottarakkara, Koothattukulam, *Kochi, Kodungallore, Kollam, Kothamangalam, Kottayam, Kozhencherry, Malappuram, Mattancherry, Mavelikara, Murikkassaery, Muvattupuzha, Muddakayam, Pala, Palakad, Palarivattom, Parur, Pathanamthitta, Ranni, Thalassery, Thiruvalla, Thodupuzha, Trichur, Thiruvananthapuram, Tripunithura.	47	120
Madhya Pradesh	Bhatapara, Bhilai, Bhopal, Bilaspur, Dhamtati, Gwalior, *Indore, Jabalpur, Jhabua, Katni, Khandwa, Korba, Nagda, Neemuch, Raigarh, Raipur, Ratlam, Sagar, Satna, Ujjain.	20	87
Maharashtra	Ahmednagar, Akola, Amravati, Aurangabad, Chandrapur, Dhule, Ichalkaranji, Jalgaon, Kolhapur, Kopargaon, *Mumbai, Malegaon, Nagpur, Nashik, *Pune, Satara.	16	883
Orissa	*Bhubaneshwar, Berhampur, Cuttack, Sambalpur, Rourkela.	5	13
Punjab	Abohar, Amritsar, Barnal, Bathinda, Betala, Budhlada, Chandigarh, Faridkot, Ferozepur, Gobinagarh, Gurdaspur, Hoshiyarpur, Jalandhar, Kapurthala, Khanna, Kotakpura, *Ludhiana, Mandi Mansa, Moga, Mohali, Muktsar, Pathankot, Patiala, Rajpura, Sangrur, Threekay.	26	106
Rajasthan	Ajmer, Alwar, Anupgarh, Balotra, Banaswara, Bharatpur, Bhilwara, Bikaner, Chirawa, Chittorgarh, Dungarpur, Hanumangarh, Hindaun, *Jaipur, Jhalawar, Jodhpur, Kota, Newai, Pali, Sikar, Sri Ganganagar, Sujangarh, Udaipur.	23	99
Tamil Nadu	*Chennai, Chidambaram, *Coimbatore, Cuddalore, Dindugal, Erode, Gudiyatham, Gobichettipalayam, Hosur, Karaikal, Karaikudi, Karur, Kovilpatti, Kumbakonam, Madurai, Nagercoil, Namakkal, Neyveli, Pudukottai, Rajapalayam, Ranipeth, Salem, Sivakasi, Thanjavur, Tirunelveli, Tirupur, Trichy, Tuticorin, Theni, Virudhunagar, Vellore.	31	178
Uttar Pradesh	Agra, Aligarh, Allahabad, Banda, Bareilly, Bijnore, Bulandshar, Dehradun, Dhampur, Farukhabad, Firozabad, Gorakhpur, Ghaziabad, Haldwani, Hapur, Haridwar, Hathras, Jaunpur, Jhansi, Jagdisdhpur, *Kanpur, Kashipur, Kasganj, Khatauli, Lucknow, Mathura, Meerut, Moradabad, Muradnagar, Muzaffarnagar, Najibabad, Modinagar, Rampur, Rishikesh, Roorkee, Saharanpur, Shamli, Shahjahanpur, Shikohabad, Unnao, Varanasi.	41	183
West Bengal	Asansol, *Calcutta, Durgapur, Howrah, Jalpaiguri, Purulia, Raniganj, Siliguri.	8	211
Union Territory	Pondicherry.	1	3
Total		356	2,919

*Indicates cities which have a Regional Stock Exchange

Annexure 2-3: India Map: Distribution of VSATs

