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National Stock Exchange of India

Continuum of NSE's Transformational Journey: Negotiating New Frontiers

Introduction

The National Stock Exchange of India (NSE) is not only the premier stock exchange in India but also one of the leading stock exchanges of the world. In India, it is credited with playing a key role in the modernisation and transformation of the Indian securities market. Incorporated in 1992, NSE commenced operations in 1994 with electronic screen-based trading to replace the traditional open outcry prevalent in those times. This early adoption of technology ensured that participants, irrespective of their geographical locations, were able to view a single order book and trade real-time in a transparent manner. The other distinguishing feature of NSE was that it was perhaps the first exchange in the world that started as a demutualised exchange, where the ownership and management of the exchange were divorced from each other and also from the right to trade on it. Not being managed by owners, which was a break from the past, meant that there was no built-in incentive for mis-governance. These two features of NSE transformed the Indian market, which lacked transparency in the pre-NSE era, into a deep, liquid and transparent market that enjoyed the trust and confidence of investors. Within a year after it began operations, NSE became the market leader and has since sustained its leadership in equity shares turnover.*[1]

The scale and breadth of NSE's products and services, its state-of-the-art technology, and the culture of being continually customer-centric have enabled NSE to proactively deliver innovative solutions for emerging demands in the ecosystem. NSE's integrated business model and sustained leadership position across multiple asset classes have, over the years, attracted a growing number of new participants (investors and traders in India and globally). This in turn resulted in improved market liquidity, efficient price discovery and additional listings. These contributions of NSE to the Indian securities market have been widely recognised.

The improvements in the qualitative indicators of the market are also reflected in the size of the market in India, which has grown tremendously since the mid-1990s. According to the World Bank data, for the period from 2010 to 2016, the market capitalisation-to-GDP ratio for Indian middle income country–averaged about 72 percent, much higher than the 53 percent average of all middle-income countries.

Table 1: Value of Shares Traded: Global Ranking and Growth in 2017

Rank in Value of Shares Traded in 2017 (in 2016)	Exchange	Value of Shares Traded (USD Trillion)	YoY Growth in Shares Traded in 2017(%)
1 (1)	New York Stock Exchange	14.5	-16
2 (2)	Cboe Global Markets	12.3	-10
3 (4)	Nasdaq	11.3	2
4 (3)	Shenzhen Stock Exchange	9.2	-21
5 (5)	Shanghai Stock Exchange	7.6	1
6 (6)	Japan Exchange Group	5.8	3
7 (7)	Cboe Europe Equities	2.4	-10
8 (10)	Hong Kong Exchange	2.0	45
9 (8)	Euronext	1.9	9
10 (9)	Korea Exchange	1.9	14
11 (11)	Deutsche Börse Group	1.5	12
12 (12)	TMX Group	1.2	6
13 (16)	NSE	1.0	46
14 (13)	SIX Swiss Exchange	0.9	9
15 (14)	Australian Stock Exchange	0.8	1

Source: WFE Annual Statistics Guide 2017

Further, although India's performance in this respect fell short of the average for the high-income country category (about 104 percent for this period), there have been some years in the past when India has surpassed the high-income countries average, particularly in the immediate aftermath of the global financial crisis (2009 and 2010).*[2] More recently, in 2017, NSE registered the highest growth among major exchanges worldwide in value of shares traded, pushing it to rank 13th (from 16th in 2016) in terms of value of shares traded (Table 1).

Recognising that there is no scope for complacency, NSE has been continually endeavoring to maintain its domestic leadership position, and also emerge as a stronger global player. This piece seeks to analyse how NSE has responded to the market and regulatory developments in the past, particularly in the recent years and what new paths it is exploring to realise its vision in the medium term. For this purpose, five key areas have been chosen: listing of small and medium-sized enterprises (SMEs) and start-ups, expanding retail investor base, nurturing new markets, establishing international exchange and leveraging technology.

Catching Companies Young: Listing of SMEs and Start-ups

One of the most significant challenges facing the SMEs is inadequate access to equity capital. Historically, SMEs have depended heavily on debt capital from banks and financial institutions, which have often made them overleveraged and also vulnerable to adverse economic conditions. Recognising this challenge, in 2012, the Securities and Exchange Board of India (SEBI) permitted exchanges to (a) create a dedicated platform for SMEs to access capital markets for raising equity capital, and (b) allow SMEs' shares to be listed and traded.*[3]

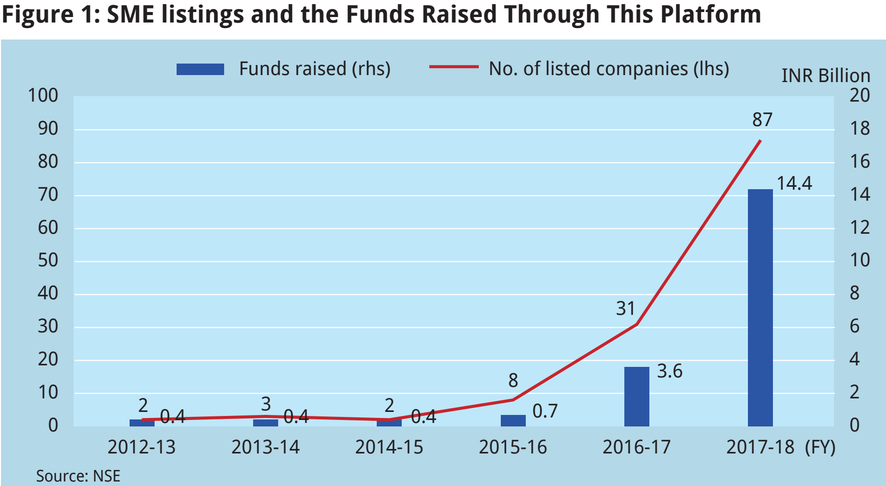
In response, NSE launched EMERGE to help SMEs raise equity capital from informed investors willing to invest early in promising companies. As of end-March 2018, 133 companies have been listed on EMERGE; most of them in the last two years (Figure 1). Together, these companies have raised about INR 20 billion since the platform was launched.

As a segment of NSE, EMERGE enjoys all the benefits of a well-established exchange, such as well-oiled trading terminals of the main exchange, its risk management and surveillance systems and the existing infrastructure. While NSE's aim is to create an enabling environment and attract more and more SMEs to tap the public markets, it has made the eligibility criteria for SMEs to access EMERGE tighter than those set by SEBI, mainly to strengthen investor protection. Thus, only SMEs with basic minimum financial soundness and track record can list on EMERGE.

Aside from giving opportunities to more and more SMEs to make public issues, NSE also envisages EMERGE as a means to expand its Main Board, as SMEs that grow beyond a certain threshold level are allowed to migrate to the Main Board. Indeed, some of the companies that are currently on EMERGE may one day be part of NIFTY 50. NSE's commitment towards SMEs is further demonstrated by the numerous seminars and workshops that it conducts across all SME clusters to make entrepreneurs understand the benefits and obligations of going public.

In recent years, start-ups have also come under NSE's focus. India's start-up ecosystem has grown rapidly in the past few years to become the world's third-largest after the U.S. and China. Only a handful of start-ups, however, have gone public. Further, even though initial public offerings (IPOs) in India have generally been dominated by more traditional sectors such as financial services, NSE expects a shift in IPOs towards new-economy companies in the coming years.*[4] NSE's EMERGE-ITP – a regulated market place which allows start-ups to list with or without an IPO – addresses both the issues. This platform connects growing businesses to a pool of sophisticated investors and offers them a wide variety of exciting investment opportunities. This is expected to help NSE diversify its listing campaigns in the medium term to target new categories of issuers. Towards this end, NSE is also in talks with SEBI to tweak some of the conditions for listing on EMERGE-ITP to make it more attractive to a wider range of companies and investors.

Figure 1: SME listings and the Funds Raised Through This Platform

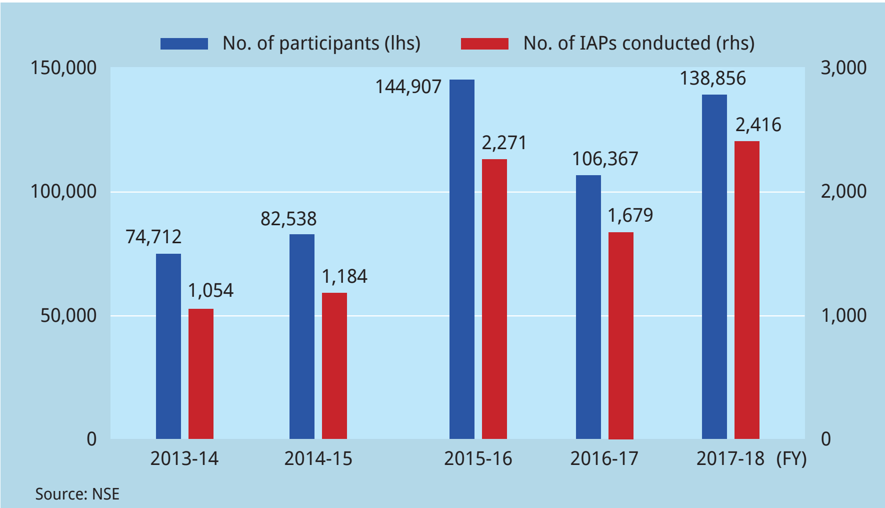


Expanding Retail Investor Base: Education and Technology Are Key

Indian capital markets are comparatively underpenetrated, with significant potential for further growth. NSE has recognised that educating more and more investors and potential investors and increasing their awareness is a key route through which the investor base can be expanded and investor protection can be achieved.

Since July 2010, NSE has worked in co-ordination with SEBI to conduct investor awareness programs (IAPs), which are offered for free, with an aim to provide existing and potential investors with knowledge and understanding of the financial markets and guide them in effective financial planning. Over the years, the IAPs have increased in frequency and have been attracting an increasing number of participants (Figure 2). The areas broadly covered are rights of investors, do's and

Figure 2: Details of the Investor Awareness Programs (IAPs) Conducted by NSE



Source: NSE

don'ts of investing, functioning of securities market, Know Your Customer (KYC) and products of the exchange. Educational and informative booklets relating to operational and functional aspects of the market are distributed to investors free of charge. Some of these IAPs have been targeted at groups such as senior citizens, police officers, hospital staff, factory staff, post office employees and special women's groups.

Years of efforts by NSE and others to spread investor awareness have contributed to some positive developments in the market. In the last few years, the number of individuals participating in the capital market through mutual funds has grown rapidly and further, many of these individuals have been investing through Systematic Investment Plans (SIPs) route, which helps them to remain disciplined, while not having to worry about timing the market. The individual investor base has grown at a compound annual growth rate (CAGR) of about 16 percent over the period from 2014 to 2018. Based on Association of Mutual Funds in India, as of end-March 2018, there are 71 million individual investor accounts in mutual funds, 20 million of which are SIP accounts. Finally, the investors from smaller cities (cities other than the top 15 in India), have begun showing increasing interest in mutual funds; in FY 2017-2018, for example, assets under management of investors in these smaller cities have grown by 38 percent, higher than the overall industry growth of 22 percent for the same period.

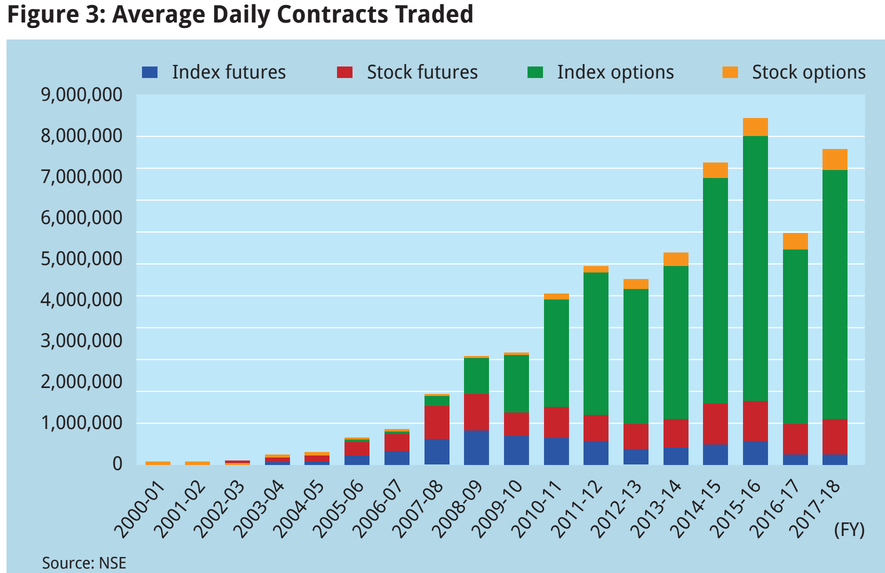
NSE envisages these positive trends to continue in the medium term and is bracing itself to take advantage of them through the digital platform for mutual funds (NSE MF II) that it created in 2013. The platform has allowed the mutual fund distributors to move from paper mode to digital mode, standardise operations, increase transparency and reduce cost and time taken to conclude mutual fund transactions. The convenience and transparency offered through the platform have been a major attraction for new investors. Further, this platform has the potential to become a one-stop shop for distribution of financial products (including non-exchange traded products such as corporate fixed deposits and postal products and so on); which not only would create stronger incentives for mutual funds distributors to register on this platform, but also would indirectly expand the retail footprint of NSE. NSE has already demonstrated its capability in this direction by allowing distribution of sovereign gold bonds on this platform. The initiative has the potential to transform the mutual fund industry to an extent similar to the way the reforms of the early 1990s transformed equity market trading.

Meanwhile, to take advantage of the continuing trend of rising mobile and internet penetration in India, NSE has introduced a web-based and mobile trading platform (called NOW). By facilitating trade execution through the internet, it has made trading a lot easier, particularly for retail investors. In the medium to long term, assuming that mobile and internet penetration continues to increase in India, this mode of trading is expected to gain popularity and help induce a culture of investment in financial instruments even in areas beyond major cities.

Nurturing New Markets: Policy Sets the Stage

Right from its inception, NSE has continually developed and launched new products to meet the diverse needs of investors. A series of reforms in the cash equity segment in India in the 1990s that strengthened the market micro structure, and the progressive liberalisation in product development

Figure 3: Average Daily Contracts Traded



Source: NSE

that followed gave a boost to this effort. In 1995, NSE launched the NIFTY 50 index which continues to be the flagship index.*5 Following regulatory approval, derivatives trading at NSE commenced with the launch of futures on the NIFTY 50 index in June 2000. A year later, in June 2001, option contracts were launched on the NIFTY 50. Futures and options on individual stocks were launched subsequently in the same year. In a few years' time, NSE could establish itself globally as one of the top traders in equity derivative products (in terms of volume). Thus, over the years the exchange has achieved not only a diversification in the offering of products, but also significant trading volumes growth for most of the products offered (Figure 3).

The success of equity derivatives led to the launch of a currency derivatives segment in August 2008. Here again, the product suite expanded over the years, even though multiple regulators had to be involved in the product approval process.

NSE's well-defined product development process which evolved after years of experimentation and expertise provides a framework that is expected to put NSE on a strong footing in the medium term. While there would be continued efforts in the short to medium term to further develop the currency derivatives and interest rate futures markets, signs of some exciting future developments are already visible in some areas.

Commodity derivatives

Commodities derivatives are perhaps the only major asset class that is not allowed to be traded on stock exchange platforms in India, making it the final frontier for development of world class multi-asset derivatives platforms. Efforts are currently underway to break through this frontier. In 2015, the government brought the regulation of the commodity derivatives market under the purview of SEBI. While this undoubtedly strengthened regulatory oversight, it was recognised that the market can reap the benefits of economies of scope and scale only if the commodities and securities derivative markets are integrated in terms of participants, brokers and operational frameworks, as in major derivatives markets such as the Chicago Mercantile Exchange (CME), the Eurex Exchange and the Singapore Exchange (SGX). In line with this thinking, SEBI permitted brokerages in September 2017 to deal in commodities and other securities through a single entity. Subsequently, SEBI also announced in its board meeting on 28 December, 2017 that the integration of trading in commodities and other securities shall be done with effect from October 2018, paving the way for stock exchanges to introduce commodity derivatives trading. In the medium to long term, this development is expected to provide NSE's participants and brokers significant benefits in terms of capital efficiency, liquidity management, and reduction in operational and compliance costs.

Corporate bond market

Despite several efforts in the past one and half decades, the corporate bond market in India has remained largely underdeveloped, although some developments in recent years have generated some optimism. For example, several large corporates in India have been turning to the corporate bond route in the last few years to raise resources, as the bank finance is experiencing a severe slowdown due to a twin balance sheet problem. Corporate bonds outstanding have risen from INR 12.9 trillion in March 2013 to INR 27.4 trillion in March 2018. This trend is expected to continue in the medium term, as the banks will take some years to recover from the crisis they are facing. Meanwhile, policymakers have taken a slew of measures to not only vitalize the corporate bond market, but also to allow exchanges to play a key role in developing this market, recognising the need for greater transparency. One example of the government's support for exchange platform is its announcement to introduce debt exchange traded funds (ETFs) to raise resources for central PSUs. Furthermore, the Reserve Bank of India (RBI) has recently permitted corporate bond repos with guaranteed settlement on exchange platforms. This is expected to improve trading activity in the corporate bond market and would further pave the way for implementation of credit products such as credit default swaps (CDS) on exchange platform to manage credit risk in corporate debt instruments.

On its part, NSE recognises these opportunities and has strengthened its commitment to develop a vibrant corporate bond market through its platform. A number of initiatives have been taken. For example, NSE launched its Electronic Debt Bidding Platform (NSE-EBP) for issuance of debt securities on a private placement basis in July 2016, with an aim to bring efficiency and transparency in the price discovery mechanism and to reduce the time and cost of these issuances. Earlier, NSE had started an anonymous order-matching platform for secondary market trades in the debt segment. In effect, it could do for the bond market what anonymous order matching did for equities. The platform has not been popular so far, partly because it gives access only to corporate bonds. NSE is working with regulators to bring all cash fixed-income products (such as commercial papers and certificates of deposits) to this platform. In the medium term, a large part of NSE's efforts would be focused on creating appropriate micro structure and conducive regulatory environment to help stimulate corporate bond trades to migrate from over-the-counter (OTC) to exchange platform.

Going Global: International Exchange in GIFT

The prime minister's vision to create an international financial services centre in India that caters not only to India but the entire world has begun to take shape with the establishment of an International Financial Services Centre (IFSC) at Gujarat International Finance Tec-City (GIFT) in the state of Gujarat. Following the government's announcement of regulatory guidelines for firms to operate in the centre and a subsequent approval from SEBI, NSE and The National Securities Clearing Corporation Limited (NSCCL) have incorporated two subsidiaries NSE IFSC Limited and NSE IFSC Clearing Corporation Limited respectively to act as an international exchange and clearing corporation.

NSE IFSC currently hosts a widely diversified portfolio of products including derivatives of currencies, commodities, stocks and indices offered under a single platform. Since the commencement of trading in June 2017, trading volumes at NSE IFSC have been growing, partly aided by a range of initiatives including incentives under the exchange's Liquidity Enhancement Scheme, easy access to a variety of participants in terms of registration and membership and provision of facilities such as colocation, algorithmic trading and other advanced trading infrastructure. Also, since the exchange is located in IFSC, the trades executed on the exchange are exempt from security transaction tax, commodity transaction tax, dividend distribution tax, short-term and long-term capital gains tax and income tax. Further, for the success of the international exchange, the continued support of policymakers – the Ministry of Finance, RBI and SEBI – is evidenced from their prompt fine – tuning of the policies and regulations to address current and emerging issues. In the Union Budget for FY2018-2019, Finance Minister Mr. Arun Jaitley also proposed a unified regulator for IFSC GIFT, which is expected to result in faster and more consistent decision making.

In the medium term, NSE envisages four major benefits to accrue to it directly or indirectly, as the IFSC would:

1 Provide facilities and regulations comparable to any other leading international finance centres in the world. Companies from Asia, Africa and Europe should be able to raise funds from this Centre. It will be the rest of the world's gateway to India.

2 Enable Indian exchanges to compete on an equal footing with offshore financial centres. This has the potential to halt the migration of trading volume from India to offshore centres, which has been the trend in the past.

3 Take advantage of its geographic location to provide financial services to the entire world, opening with the Japanese markets and closing with the U.S. markets and thereby, serve as India's gateway to the rest of the world.

4 Mitigate the criticism that India has stopped becoming the price setter for even some Indian financial instruments; indeed, in about 10 years, GIFT should be able to become the price setter for at least a few of the most frequently traded instruments in the world.

Leveraging Technology: an Imperative for Sustaining Growth

NSE has been the pioneer in technology in the exchange space, ensuring high reliability and efficient performance of its systems through a tradition of innovation and investment in technology. As already stated, when it began operations in 1995, NSE adopted electronic trading, also called screen-based trading system (SBTS), which replaced the open outcry system prevalent then in India and brought about tremendous improvement in transparency. In delivering transparency, SBTS was complemented by a communication technology that involved establishment of Very Small Aperture Terminal (VSAT) links. The combination of the two technologies ensured that market participants could trade with one another irrespective of their geographic location and that orders and prices could become visible and instantly available to all participants across the country.

NSE leveraged technology not just when it began operations, but right through its history. Over the years, two technologies – algorithmic trading and co-location – have had a tremendous impact on speed of trade execution. The number of equity trades executed per day has risen from about 10,000 in 1995 to several million in 2017. Of course, advanced technology has been used not only in trading, but in other activities as well, such as clearing, settlements, risk management services, surveillance and listing, which have become imperative primarily because of an explosive growth in trading volumes. These advancements have helped NSE maintain its competitive position.

On a day-to-day basis, NSE's electronic systems deploy real-time hardware and software monitoring and analytics with self-correction capability, predictive behavior technology and surveillance of known failure points and unexpected events. To avoid outages or disruptions, NSE ensures that its systems have built in redundancy and excess capacity at all times; implement regular testing protocols; and adopt continuous obsolescence planning to keep its hardware and systems updated. To minimise cyber security threats, NSE has implemented a security framework to prevent and detect system intrusions and internal and external security tools.

Moving forward, NSE has a vision to maintain its leadership position in technology by continuing to take advantage of technological progress to introduce new products and market structures, so that markets become deeper, broader, safer and more efficient. In addition to advances in currently used technologies, NSE envisages that the following two technologies have the potential to shape the markets in the foreseeable future the most.

Blockchain and distributed ledger technology

Blockchain offers some key benefits for capital markets, including an immutable record of transactions, a shared view of data that is widely distributed but easily verified and a simple way to prevent duplicate transactions. Traditional approaches to solving the above issues have always involved significant reconciliation, complex procedures for establishing trust and a need for central authorities, which in turn have led to high barriers to entry and high costs of operation. It is widely recognised that blockchain technology can address these shortcomings of the traditional approaches. India is paying significant attention to blockchain, even as it remains watchful of issues around crypto-currencies. The capital markets regulator has set up a blockchain task force, and a number of participants in the markets have carried out pilots related to blockchain.

Machine learning and artificial intelligence

Machine learning is basically the harnessing of current compute technologies at a scale that is larger and faster than before. It looks magical, but it is based on well-understood techniques and algorithms. Availability of massive data sets together with huge increases in computing power are allowing machines to use machine learning to autonomously execute business work flows, which was not possible earlier. NSE believes that it can and should take advantage of progress in machine learning. For example, NSE's market surveillance, whose objective is to detect market manipulation and market instability events, can use machine learning to fine-tune traditional approaches, and also to detect previously undetected anomalous behavior.

Conclusion

Stock exchanges constitute a critical component of the capital market in any modern economy. For the capital markets to play an important role in determining the pace and pattern of economic development, it is necessary to have efficient and dynamic stock exchanges. The Indian experience shows that the exchanges' ability to contribute to the development of the capital market depends significantly on exchange reforms undertaken and the effectiveness of a strong securities market regulator. Coinciding roughly with SEBI's establishment, NSE was set up as a modern, demutualised stock exchange about two and half decades ago as part of the broad based economic reforms introduced in early 1990s, with an aim to revamp India's capital market, which used to be opaque, inefficient, fragmented and not easily accessible.

Not only did NSE unify the earlier fragmented market into a single national order book, providing equal access to all market participants in the country, but also it brought in unprecedented transparency and facilitated efficient price discovery. In a very short time, it could restore public faith in the market and also become the market leader. Over the years, assisted by the capital market regulator SEBI and NSE, India's capital markets have made tremendous progress in terms of market size and depth, diversification of investor base and sophistication. It would be no exaggeration to say that NSE's journey so far has been transformational. Moving forward, NSE is committed to maintaining this 'transformational' journey in its strategy and operations. The key areas that NSE envisages to focus on in the medium term include facilitating listing and growth of SMEs and start-ups, nurturing hitherto underdeveloped markets (such as the corporate bond market) and developing new segments such as commodities, expanding retail footprint, globalising at a much larger scale, leveraging technology and focusing on better risk management and regulation. Efforts towards these ends have already begun. NSE is positive that under the guidance and leadership of SEBI, NSE can make transformational changes in the years to come.

Notes

*1 As per reports issued by Securities and Exchange Board of India.

*2 The World Bank's database on World Development Indicators. https://data.worldbank.org/products/wdi

*3 According to SEBI regulations, companies with post-issue paid up capital (face value) up to INR 250 million can raise funds and list on the SME platform, while companies with post-issue paid up capital (face value) between INR 100 million and INR 250 million have the option of migrating to the Main Board and vice versa.

*4 Financial services companies accounted for about 56 percent of funds raised through IPOs during the period January 2015 to December 2017 according to Prime Database.

*5 Constituent stocks of NIFTY 50 index account for 62 percent of free float market capitalisation as of 31 March, 2018.

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Vikram Limaye is the Managing Director and CEO of the National Stock Exchange of India (NSE) which is the world's second largest exchange in cash market trades and one of the top three exchanges in index and stock derivatives volume.

Prior to joining NSE, he was the Managing Director & CEO of IDFC, a diversified financial services conglomerate. He started his professional career with Arthur Andersen in Mumbai in 1987 while pursuing his Chartered Accountancy and worked in the audit and business advisory services groups of Arthur Andersen, Ernst & Young and the consumer banking group of Citibank before going to the U.S. in 1994 to pursue an MBA. After completing his MBA, he worked on Wall Street for eight years with Credit Suisse First Boston in a variety of roles in investment banking, capital markets, structured finance and credit portfolio management before returning to Mumbai, India in 2004.

He has contributed to various committees of government and industry associations on a range of topics surrounding infrastructure, economic policy, markets, trade, and minority affairs. He has been a speaker at domestic and international conferences and has been a member of international government delegations for infrastructure and foreign direct investments into India. He has also been on the boards of various corporates, educational institutions and not-for-profit organisations.

He completed his Bachelors in Commerce from HR College of Commerce & Economics, a Chartered Accountancy, and an MBA in Finance and Multinational Management from the Wharton School of the University of Pennsylvania.