

BSE UPDATE JANUARY 2022



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EVOLUTION OF THE EXCHANGE



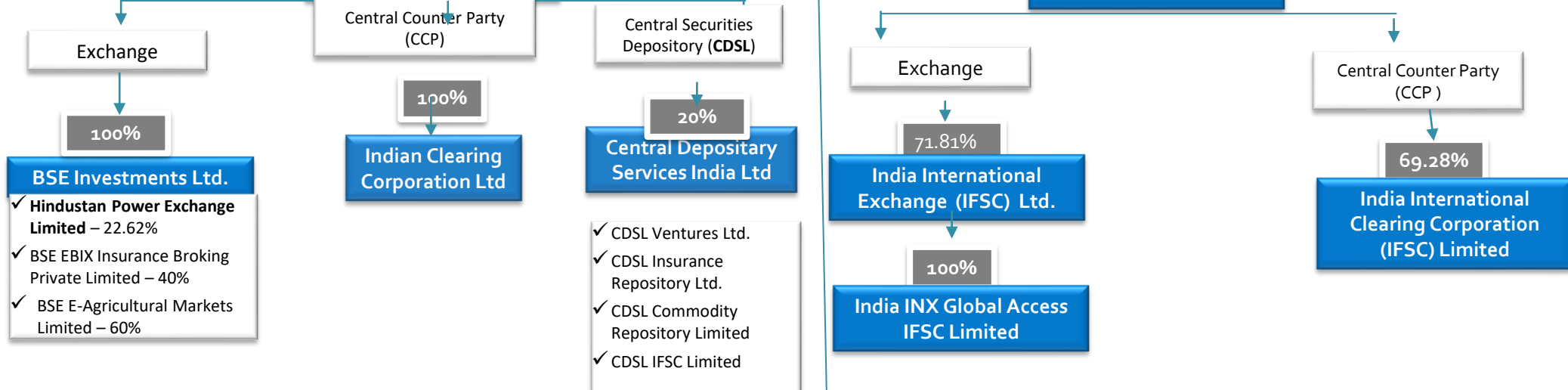
Key Milestones

Date			
26th Oct ,2017	India's Premier Stock Exchange BSE and World's largest Insurance Exchange Ebix, Inc. Sign MOU to Launch Joint Venture Company, for Setting up Pioneering Insurance Distribution Network in India	7th June, 2021	BSE touches record milestone of over 7 crore registered users
03 rd Feb, 2017	BSE becomes India's 1st listed Stock Exchange	11th June , 2020	BSE becomes India's First Exchange to Introduce and adopt India Good Delivery Standards for GOLD and SILVER: BIS IS 17278 :2019
16 th Jan ,2017	Commencement of Trading at India INX	26th Aug, 2019	BSE launches India's first exchange traded interest rate options
09 th Jan, 2017	Hon'ble Prime Minister of India, Shri Narendra Modi inaugurated India International Exchange (IFSC) Ltd, India's 1st International Exchange	15th May ,2019	BSE launches StAR MF mobile application for IFA's –"IFA StAR MF Mobility"
09 th July, 2016	Shri Arun Jaitley, Hon'ble Minister of Finance Unveiled the Commemorative Postage Stamp Celebrating 140 glorious years of BSE	1st Oct ,2018	BSE launches its commodity derivatives segment making it India's 1st Universal Exchange
02 nd Jan, 1986	S&P BSE SENSEX, country's first equity Index launched (Base Year: 1978-79 =100)	01st Aug ,2018	BSE launches 'chatbot', "Ask Motabhai", for faster, more convenient access to stock market information
31 st Aug, 1957	BSE granted permanent recognition under Securities Contracts (Regulation) Act (SCRA)	17th July ,2018	BSE building received trademark
09 th July 1875	The Native Share & Stock Broker's Association formed	15th Nov ,2017	BSE's 100% subsidiary, Marketplace Tech Infra Services, goes live with hosted trading platform BEST(BSE Electronic Smart Trader)

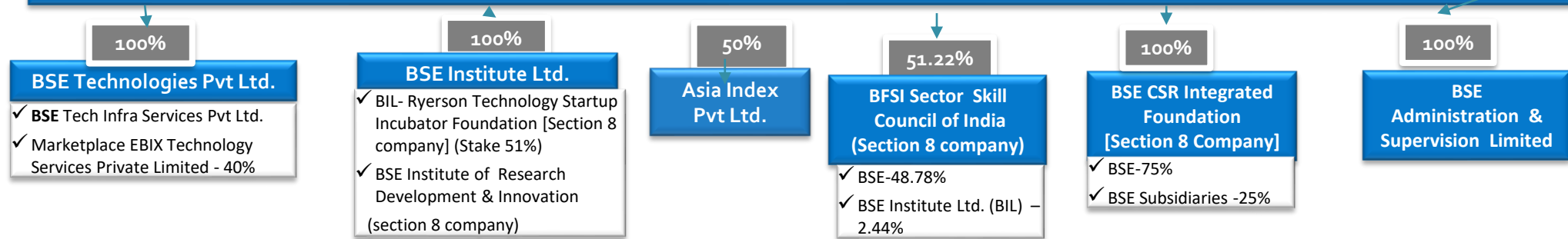
BSE *

DOMESTIC

IFSC-GIFT CITY



SERVICES



BSE - PUBLIC

* BSE LTD.
 • NSE Symbol : BSE
 • Bloomberg Symbol : BSE IN
 • Reuters Symbol 5 : BSEL.NS

BSE SHAREHOLDING PATTERN

As on September 30, 2021

Category	%
Trading Members & Associates of trading Members	27.11%
Promoter & Promoter Group	0
Public	72.89%
Non Promoter-Non Public	0
Share Underlying DRs	0
Shares held by Employee Trusts	0
Total	100%

*Market Capitalization \$ 3,562.51 Billion
(Market capitalization as on 3rd Jan 2022)

*Conversion rate is taken \$1 = Rs. 75.421

BSE & ITS PARTNERS




- Eurex T7 trading architecture



- Partnership on Index products
- Marketing and Branding of BSE Indices
- New Index Product



INSURANCE DISTRIBUTION

- BSE EBIX Insurance Broking Private Ltd JV with EBIX Received approval. Beta Launch initiated



- Board Presence
- 5.61% investment in BSE as on 30.09.2021
- Key user and supporter of platform

KEY HIGHLIGHTS



1

Strong Distribution Network

2

Diversified Business Model

3

Active Relationship with Market Participants

4

State –of-the -Art Infrastructure and Technology

5

Financial Strength

6

Alliance with Global Exchanges

Board of Directors

Name/Title

Description



Justice Vikramajit Sen
Former Supreme Court Judge and
Chief Justice, High Court of
Karnataka
Chairman &
Public Interest Director

- Born on 31st December 1950. Attended St. Xavier's School, Delhi and passed the ISC in the First Division. Graduated from St. Stephen's College with Honours in History. Attained First Division in LL.B from Faculty of Laws, Delhi University, and was awarded the First Prize in Moot Court and Silver Medal in Labour Laws. Captained Faculty Teams in Basketball and Tennis and was chosen Sports Secretary. Practiced in all the Courts in Delhi, although primarily in the High Court of Delhi. Handled civil, arbitration and commercial disputes. Had a special interest and consultancy on minority rights.
- Member - 7th and 8th Synod, Church of North India; Delhi Diocesan Council, CNI; New Delhi YMCA, Board of Directors. Board of Governors – St. Stephen's College, Delhi; Bishop Cotton School Shimla; Queens Mary's School, Delhi; St. Stephen's Hospital, Tis Hazari, Delhi; Philadelphia Hospital, Ambala. Managing Committees of several other Christian Institutions. Pursued special interest and consultancy on Minority rights in India. Core Member of the Inter Denomination Committee under aegis of the Catholic Bishop's Conference of India for recommendations of amendments to the Personal Laws relating to Christians in India.
- Appointed as an Additional Judge of the Delhi High Court on 7th July 1999. Appointed permanent Judge on 30.10.2000. Member of the Malta Judicial Conference under the auspices of the Hague Convention; Addressed the South Asia Forum for Infrastructure Regulation Workshop organized by Bangladesh Telecommunication Regulatory Commission during August 3-4, 2002; Invited by United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) to the Regional Expert Conference on "Harmonized Development of Legal and Regulatory Systems for E-commerce in Asia and the Pacific: Current Challenges and Capacity Building Needs" at Bangkok, Thailand from July 7-9, 2004; Participated in the 'Global Intellectual Property Academy (GIPA) Session on enforcement of Intellectual Property Rights' from 18th to 21st September 2007 at Alexandria, Virginia, organized by United States Patent and Trademark Office (USPTO); Invited by the Lord Chancellor of the United Kingdom to the opening of Machaelmas Sittings on 1st October 2007; Sessions Chairman of the Third Malta Judicial Conference on Cross-frontier Family Law Issues from 22nd to 29th March 2009 organized in Malta by the Hague Conference on Private International Law. Addressed the 'International Family Justice and Judicial Conference for Common Law and Commonwealth Jurisdiction', held from 4th to 7th August 2009 at Cumberland Lodge, Windsor, England; Member of International Association of Family Judges. Addressed "International Judicial Conference on Cross-Border Family Relocation" held in Washington D.C. from 23-25 March 2010; and addressed the '3rd Meeting of the Working Party on Mediation in the Context of the Malta Conference' held on 11th & 12th May 2010 at Gatineau, Canada.
- As a Member of the Planning Committee of the Common Law-Commonwealth Conference 2009 addressed the Conference in Hyderabad in February 2011. Co-Moderator in the Conference on Mediation organized in association with Hong Kong Mediation Council and Hong Kong International Arbitration Centre. First Chairperson of Delhi High Court Arbitration Centre and in this capacity was involved in its establishment as well as its operation. Member, National Legal Services Authority and Executive Chairman, Delhi Legal Services Authority. Unlawful Activities (Prevention) Tribunal declaring Deendar Anjuman as an unlawful Association in the year 2003. Unlawful Activities (Prevention) Tribunal declaring Liberation Tigers of Tamil Elam (LTTE) as an unlawful Association in the year 2008 and thereafter in 2010. Member, Indian Society of International Law. Member, India International Law Foundation, New Delhi.

Board of Directors



Justice Vikramajit Sen
Former Supreme Court Judge and
Chief Justice, High Court of
Karnataka
Chairman &
Public Interest Director

On 12.09.2011 appointed as Acting Chief Justice – High Court of Karnataka and assumed office as Chief Justice, High Court of Karnataka on 24th December 2011.

Took oath as Judge, Supreme Court of India on 24th December 2012

Retired on 30.12.2015 (F.N.)

Invited by the Japanese Government to its Symposium on Civil Aspects of Child Abduction under The Hague Conference on Private International in Tokyo in June 2016. Invited as the Guest Speaker at the commencement session of the New Delhi Conference of the International Association for Family Law, held at the India International Centre on 13th September 2016.

Appointed as FIFA Observer to oversee the elections of CAF in Cairo in September 2016. Appointed as the Sole Administrator of the Delhi District Cricket Association (January 2017-June 2018).

Appointed by the Government of Karnataka as the Chairman of the Draft Amendment Committee for Karnataka Private Medical Establishments Act, 2007.

Chairperson of the Broadcasting Content Complaints Council (BCCC) for the term 12-07-2017 to 11-7-2020

Appointed as Sole Arbitrator, or Presiding Arbitrator, or a Member of the Arbitral Tribunal in several domestic and international Arbitrations including LCIA, ICC and SIAC, in India as well as in Singapore and London. Passed 23 Arbitral Awards till date (12 Awards as Sole Arbitrator and 11 as Presiding Arbitrator or as a Three Member Arbitral Tribunal)

Awarded the 'Capital Foundation Justice Kuldip Singh National Award' by the Capital Foundation Society, in recognition of the outstanding contribution to Environmental Protection

Board of Directors

Name/Title


Description




Shri Ashishkumar Chauhan
Managing Director & CEO

- Ashish, a technocrat from IIT and IIM, currently works as the MD and CEO of BSE (formerly Bombay Stock Exchange), with market capitalization of listed companies close to USD 3 trillion.
- At BSE since 2009, Ashish helped BSE become the fastest exchange in the world with 6 microseconds response time, completed its IPO, revived its revenues, introduced mobile stock trading to India, diversified in areas such as currency, commodities and equity derivatives, SME, start-ups, Mutual fund distribution, IPO/bond distribution, insurance distribution, agri spot market, power trading, and international exchange at Gift city etc.
- Ashish acted as the CEO of IPL cricket team Mumbai Indians in its formative years and worked as the President and CIO of Reliance group from years 2000 to 2009 in the field of IT, e-commerce, public relations, media, telecom, sports, organised retail, IPO, petrochemicals, refining, oil and gas etc.
- Ashish is one of the founders of at NSE (National stock exchange) and is considered the father of modern financial derivatives in India due to his work there from 1993-2000. He is also the creator of Nifty index and was in charge of creating the first screen-based trading. He started his career as a banker with IDBI.
- Ashish is a serial entrepreneur. He is considered amongst the foremost experts in the fields of fintech, market microstructure, transaction processing, corporate governance, finance, regulatory policies, business, technology, cricket, and Indian social issues. He has spoken at conferences organised by UN, WEF, WFE, UNCTAD, OECD, Commonwealth etc. He has been a part of the policy committees of Ministry of finance, Ministry of MSME, CBDT, RBI, SEBI etc. He also headed the South Asia Federation of Exchanges (SAFE), consisting of 20 plus exchanges.
- He has won several prestigious Indian and international awards over last 3 decades including Digital Icon of the Year, Asian Banker, Top 50 CIOs in the world etc. He serves on the board of prestigious Indian universities including IIMs, AJNIFM, NITs, NIITs etc. amongst his many social activities. He is also acting as the Chancellor of University of Allahabad, UP, India, one of the nationally important universities and the oldest Universities in Asia set up in 1887. He is a distinguished visiting faculty at Ryerson University in Toronto and Honorary Professor at Nottingham University Business School.
- He has co-authored a book titled on BSE 'A temple of wealth creation'. A book titled 'Sthithpragya - the process of maintaining equilibrium' has been written on his life journey.


Board of Directors

	Name/Title	Description
	<p style="text-align: center;">Shri Sumit Bose IAS (Retd.) Former Union Finance Secretary</p> <p style="text-align: center;">Public Interest Director</p>	<ul style="list-style-type: none"> ▪ Shri Sumit Bose joined the Indian Administrative Service in 1976 and allotted to the Madhya Pradesh Cadre. After superannuation was Member, Expenditure Management Commission set up to review the allocative and operational efficiencies of Government expenditure to achieve maximum output. The Commission concluded its work end February 2016 after giving a series of reports inter alia on fiscal management, defence expenditure, streamlining administrative processes and public procurement and social sector spending. ▪ Immediately prior to superannuation, was the Union Finance Secretary (as Secretary, Department of Revenue). Had also served as Secretary (Expenditure) and Secretary (Disinvestment) as well as Secretary in the Thirteenth Finance Commission, consecutively in the Ministry of Finance, GOI since August 2007 till superannuation. Was member of the core group for the Union Budget from 2010 to 2015. Served the Government of Madhya Pradesh (GoMP) as Principal Secretary (Finance) during which tenure various reforms including fiscal responsibility legislation, outcome budgeting, extensive use of the PPP mechanism, contributory pension scheme was introduced in MP. Had also done an early stint in the Department of Economic Affairs, MOF, GOI as Deputy Secretary in the Fund Bank Division. ▪ Have been involved in several assignments in the field of education for more than eight years, first as Secretary, School Education in the GoMP and then as Joint Secretary in the Ministry of HRD, GOI. During the latter assignment, was responsible for the launch and execution of Sarva Shiksha Abhiyan for universalization of elementary education. ▪ Have served the GoMP in the field, as the District Magistrate and Collector of Sidhi Rewa, Gwalior and Bhopal Districts. In the State Secretariat, besides Departments of Finance and Education, served in the Chief Minister's Office in two stints, first as Special Assistant as a junior officer and later as Secretary to the Chief Minister. ▪ Undertook various consultancy assignments on aid effectiveness, land acquisition and resettlement and primary education with the World Bank, Commonwealth Secretariat, United Nations Development Programme and Department for International Development, (UK) in India and in Washington DC, London, Kenya and Turkey. ▪ Shri Sumit Bose is Director on the Board of Coromandal International Limited , Tata AIG General Insurance Company Ltd , Foundation to educate girls globally ,HDFC Standard Life Insurance Company Limited, HDFC Pension Management Company , J. B. Chemicals & Pharmaceuticals Limited, Vice Chairman National Institute of Public Finance and Policy, New Delhi, Chairman, Board of Directors of Vidhi Centre for Legal Policy, New Delhi, Board of Governors of The Doon School, Dehradun, a Member, Governing Body, Parivaar Education Society, Kolkata ,Director ,Jal Seva Charitable Foundation.



Board of Directors

	Name/Title	Description
	<p style="text-align: center;">Shri S.S. Mundra Public Interest Director</p>	<ul style="list-style-type: none"> ▪ Mr. S.S. Mundra retired as Deputy Governor of Reserve Bank of India on 30th July 2017 after completing a stint of three years. Prior to that, the last position held by him was as Chairman and Managing Director of Bank of Baroda from where he superannuated in July 2014. In a banking career spanning over four decades, Mr. Mundra held several important positions including that of Executive Director of Union Bank of India, Chief Executive of Bank of Baroda (European Operations) amongst others. He also served as RBI's nominee on the Financial Stability Board (G20 Forum) and its various committees. Mr. Mundra was also the Vice-chair of OECD's International Network on Financial Education (INFE). ▪ Prior to joining RBI, Mr. Mundra also served on Boards of several multi-dimensional companies like the Clearing Corporation of India Ltd (CCIL), Central Depository Services (India) Ltd. (CDSL), BOB Asset Management Company, India Infrastructure Finance Corporation (UK) Ltd. (IIFCL), IndiaFirst Life Insurance Company Ltd., Star Union Dai-Ichi Life Insurance Company Ltd., National Payments Corporation of India Ltd., etc. The experience gained in guiding these entities has bestowed him with wide leadership skills and keen insights in best practices in Corporate Governance. ▪ Mr. Mundra has been a regular presence as a Speaker on various Forums. He has delivered more than 100 speeches/presentations on diverse issues viz. banking, financial inclusion & literacy, MSME financing, audit, Fraud Risk Management, Cyber security, Consumer Protection, Human Resource Management etc. at both domestic and international forums. Many of these speeches have been published on the websites of Reserve Bank of India and that of the Bank for International Settlements. ▪ Mr. Mundra, a Post Graduate from University of Poona, is a Fellow Member of Indian Institute of Banking & Finance (FIIB). Amity University has conferred the Degree of Doctor of Philosophy (D.Phil.), Honoris Causa, upon Mr. Mundra, in recognition of his services in the field of banking and related areas. ▪ He is now on the Board of BSE Ltd., DSP Investment Managers, Airtel Payments Bank Limited, Ayana Renewable Power Private Limited, Havells India Limited, PTC India Limited as Independent Director and the Non-Executive Chairman on the Boards of Acuite Ratings and Research Limited and Indiabulls Housing Finance Limited, besides being on the Advisory Board of M/s. Global Risk Advisory Committee of PayU Global – Netherlands, India Advisory Board of Master Cards and CFM Asset Reconstruction Pvt Ltd and on the Governing Board of IMT – Ghaziabad, to name a few.

Board of Directors

	Name/Title	Description
	<p style="text-align: center;">Shri David Wright Public Interest Director</p>	<ul style="list-style-type: none"> • Shri David Wright has worked for nearly 34 years in the European Commission from 1977-2011, after graduating from Worcester college ,Oxford in 1974 in politics ,economics and philosophy(PPE). He held a variety of posts including at the beginning of his career responsibility for oil and gas data in the Statistical Office, Luxembourg (1977-1981) during the second oil crisis; energy policy coordination and modelling in the Directorate General for Energy, Brussels (1982-1987); and then industrial trade policy negotiations during the Uruguay multilateral trade round (1987-1989). • From 1989-1992 he was a member of President Delors' "Think Tank" called the "Cellule de Prospectives" where he worked on industrial policy and wrote the first Commission document on sustainable development. In this period he co-authored a book with Professor Alexis Jacquemin on the post-1992 EU political and economic agenda called "Shaping factors, shaping actors". From 1993-1994 he was a member of Sir Leon Brittans' Cabinet and worked on various aspects of trade and industrial policy, including completion of the Uruguay Round in 1994. In 1995 he became an Adviser to President Jacques Santer in his Cabinet – covering competitiveness, industrial and telecom policies, political relations with the UK and Ireland, financial services, risk capital and various other trade and foreign policy briefs. • From March 2000 – October 2010 he was first Director, then Deputy Director-General for securities and financial markets, then for all financial services policy in DG Internal Market and Services. He helped design and drive forward the Financial Services Action Plans to integrate the EU's capital and financial services markets. He was the rapporteur for both the Lamfalussy (2000/1) and De LaRosière Committees (2008/9), chaired the Securities and Banking Committees and represented the Commission in the Financial Services Committee and in various FSB/G20 fora. He also played a leading role in the EU-US financial markets dialogue in this period. • He was the EU Visiting Fellow at St Antony's College, Oxford until July 2011 and was a Member of the European Commission's Task force on Greece until the end of January 2012. • David Wright's appointment as Secretary General of the International Organization of Securities Commissions (IOSCO) commenced on 15 March 2012.

Board of Directors

	Name/Title	Description
	<p>Shri Umakant Jayaram Public Interest Director</p>	<ul style="list-style-type: none"> • Shri Umakant Jayaram has 27 yrs Cross functional experience in Global Investment Banking, Finance Planning & Analysis ,Risk Consulting / Business transformation. • Shri Umakant Jayaram has successfully led the Global Finance Planning and Analysis services function for JP Morgan Chase Investment Bank and delivered key breakthroughs in finance technology architecture change, in the area of Analytics and Business intelligence. He has also directed the Global Markets Structuring function in Deutsche Bank CIB centre in India. He has directed the Global Markets Operations strategy for ABN AMRO Investment Bank Operations across Equities, Fixed Income and Derivatives Clearing and Settlements. He is well versed with emerging markets products pricing, risk, regulatory and compliance issues relating to financial markets.
	<p>Sushri Jayshree Vyas Public Interest Director</p>	<p>Sushri Jayshree Vyas, a professionally qualified Chartered Accountant has been working as the Managing Director of Shree Mahila Sewa Sahakari Bank, Ahmedabad since 1986 which has more than 5,00,000 women clients. During her tenure she has taken active steps to introduce and operate an Integrated Micro Insurance Scheme for women working in the informal sector. This scheme was introduced for the first time in the country and in a short period of three years covered more than 150,000 women. She has also devised and implemented various housing finance schemes, which have been accessed by over 20,000 poor women. She has introduced, organized and managed savings groups of poor women in more than 5000 villages in nine districts of Gujarat. This scheme has helped more than 150,000 women start saving for the first time in their lives, and availed credit facilities for coming out of the vicious circle of Poverty. In addition, she has prepared modules and manuals for providing training for running effective saving and credit programs for various national voluntary organizations involved in similar activity</p> <ul style="list-style-type: none"> • In the year 2001, financial literacy programme was introduced in Sewa Bank, first of its kind in India – at initiative of Su Shri Jayshree Vyas.. • In the year 2006, Micro Pension Scheme was introduced for Sewa Bank Members (Unorganized sector workers) under her leadership.. • Some of her key appointments include: <ul style="list-style-type: none"> • Managing Trustee in Indian School of Micro finance for women (ISMW, Ahmedabad). • Board Director in Ananya Finance for Inclusive Growth Pvt. Ltd. • Board Director in TFC (Trade Facilitation Center). • Board Director of Gujarat Urban Cooperative Bank Federation. • Member of Advisory Committee of SEBI (Securities and Exchange Board of India)- Investor’s Protection and Education Fund” (IPEF).


Board of Directors






Shri T.C. Suseel Kumar
Shareholder Director

- Shri T.C. Suseel Kumar has retired as Managing Director of Life Insurance Corporation of India in January 2021. A University Rankholder in Post Graduate, Mr Suseel Kumar joined the Corporation as a Direct Recruit Officer in 1984. During a span of more than 3 decades in the Corporation, Mr Kumar held various distinguished positions in the Corporation pan India and abroad. Holding the senior position as Executive Director at the Corporate Office, Mr Kumar has the distinction of working in all major streams that included Marketing, Customer Relationship Management, Personnel, Finance & Accounts, Audit, Corporate Planning, Inspection, Estates, Human Resource Development, Bacassurance and Investments besides heading foreign operations in Mauritius.
- Quite strong at analytics and interpretation of data, Mr Kumar had authored the business strategies of the Corporation aligning the short and long term goals to regain the market share. During his stewardship in Marketing, the LIC has crossed many a milestone with all time high First Year Premium Income and consolidated its market leadership with appreciable growth.
- He also pioneered the market research program to target the millennial for both new business and agency recruitment. The Corporation, after over a decade, could add more than a lakh of Agents during the year 2020-21. He was also instrumental in rolling out automated business data compilation and analysis in real time across the Corporation and that enabled the managers to strategize and execute the business plans.
- With his rich experience and expertise in the field of insurance and finance behind his name, Mr Suseel Kumar has held position in the Board of many important companies viz. National Mutual Fund- Mauritius, LIC Lanka Limited, LIC HFL AMC Limited, LIC Pension Fund, LIC Mutual Fund Trustee Company, National Insurance Academy. His contribution as Board member was significant as companies derived rich benefits from his cross functional expertise.
- He has attended various senior management training seminars and that include sessions at Asian Institute of Management, Manila, Indian School of Business, Hyderabad and various Indian Institute of Management.
- Presently he is on the board of Axis Bank Limited, BSE Limited and Lakshmi Machine Works Limited.



MANAGEMENT TEAM

	NAME / TITLE	DESCRIPTION
	<p>Shri Ashishkumar Chauhan Managing Director & Chief Executive Officer</p>	<ul style="list-style-type: none">• Ashish, a technocrat from IIT and IIM, currently works as the MD and CEO of BSE (formerly Bombay Stock Exchange), with market capitalization of listed companies close to USD 3 trillion.• At BSE since 2009, Ashish helped BSE become the fastest exchange in the world with 6 microseconds response time, completed its IPO, revived its revenues, introduced mobile stock trading to India, diversified in areas such as currency, commodities and equity derivatives, SME, start-ups, Mutual fund distribution, IPO/bond distribution, insurance distribution, agri spot market, power trading, and international exchange at Gift city etc.• Ashish acted as the CEO of IPL cricket team Mumbai Indians in its formative years and worked as the President and CIO of Reliance group from years 2000 to 2009 in the field of IT, e-commerce, public relations, media, telecom, sports, organised retail, IPO, petrochemicals, refining, oil and gas etc.• Ashish is one of the founders of NSE (National stock exchange) and is considered the father of modern financial derivatives in India due to his work there from 1993-2000. He is also the creator of Nifty index and was in charge of creating the first screen-based trading. He started his career as a banker with IDBI.• Ashish is a serial entrepreneur. He is considered amongst the foremost experts in the fields of fintech, market microstructure, transaction processing, corporate governance, finance, regulatory policies, business, technology, cricket, and Indian social issues. He has spoken at conferences organised by UN, WEF, WFE, UNCTAD, OECD, Commonwealth etc. He has been a part of the policy committees of Ministry of finance, Ministry of MSME, CBDT, RBI, SEBI etc. He also headed the South Asia Federation of Exchanges (SAFE), consisting of 20 plus exchanges.• He has won several prestigious Indian and international awards over last 3 decades including Digital Icon of the Year, Asian Banker, Top 50 CIOs in the world etc. He serves on the board of prestigious Indian universities including IIMs, AJNIFM, NITs, NIITs etc. amongst his many social activities. He is also acting as the Chancellor of University of Allahabad, UP, India, one of the nationally important universities and the oldest Universities in Asia set up in 1887. He is a distinguished visiting faculty at Ryerson University in Toronto and Honorary Professor at Nottingham University Business School.• He has co-authored a book titled on BSE 'A temple of wealth creation'. A book titled 'Sthithpragya - the process of maintaining equilibrium' has been written on his life journey.

MANAGEMENT TEAM


	Name/Title	Description
	<p>Shri V Balasubramaniam Managing Director & Chief Executive Officer (India INX)</p>	<ul style="list-style-type: none"> ▪ Shri V. Bala is the founding Managing Director and Chief Executive Officer of India International Exchange IFSC Ltd. (India INX) the first International Exchange from India in GIFT City International Financial Services Centre Special Economic Zone which started its operations from JAN, 2017 and a wholly owned subsidiary of BSE (Asia's first stock exchange). He also holds board position in the following organisations – 1)BSE Institute Limited – Education business, 2)BSE Sammaan – CSR Exchange and 3)India International Clearing Corporation IFSC Limited. ▪ Prior to this, he was the Chief Business Officer of BSE heading the business development encompassing all business segments viz. Equities, Equity Derivatives, Debt, Interest Rate Futures, Currency Derivatives, Mutual Fund Distribution platform and SME platform. In addition to the markets business, he was also responsible for the listings and data business of BSE and managing the entire trading operations and membership operations. ▪ He has over 25 years of experience in the Capital Markets industry and has previously worked with Reliance Group as Vice President and was also as co-founder of Marketplace Technologies Limited which was acquired by BSE. ▪ He was also part of the core team involved in setting up the National Stock Exchange of India. He was instrumental in creating the Capital Market segment, Nifty Index creation, setup of NSCCL as the first clearing corporation in India, NCFM certification creation and the Futures and Options segment inter-alia. ▪ He has Masters in Commerce from the University of Mumbai, Rank holder from the Institute of Cost Accountants of India, Diploma from Institute of Chartered Financial Analysts of India and is a Certified Information Systems Auditor.
	<p>Shri Neeraj Kulshrestha Chief Regulatory Officer</p>	<ul style="list-style-type: none"> ▪ Shri Neeraj Kulshrestha heads the regulatory functions of the exchange including membership compliance, surveillance, inspection, investigation, regulatory communication, investor services, listing compliance and regulatory legal. ▪ At BSE he was earlier responsible for Business Development, Trading, Membership and Listing Operations and Development. ▪ He has about 27 years experience in Capital markets, which includes Securities Markets and General Insurance. ▪ Prior to BSE he was an Executive Director in Morgan Stanley India for 10 years. He was earlier with National Stock Exchange and has managed various functions like Trading Operations, Inspection and Investigation, Futures and Options Clearing and Trading. He was also the CEO of India Index Services Ltd. and Dotex International Ltd.. ▪ He has completed his Bachelors in Computer Science from Delhi University and a MBA (Finance) from Indore University.
	<p>Shri Nayan Mehta Chief Financial Officer</p>	<ul style="list-style-type: none"> ▪ Shri Nayan Mehta currently heads all finance, accounting, treasury and taxation functions of the Exchange. He represents BSE as the Senior Vice Chairman on the Executive Board of the South Asian Federation of Exchanges. He represents BSE on the Boards of group companies and joint ventures of BSE and as a member of the Qualified Audit Review Committee of SEBI. ▪ He has previously worked at Credit Analysis & Research Ltd. as Joint General Manager (Accounts), CFO at Multi Commodity Exchange of India Limited and has also worked at the National Stock Exchange. ▪ He holds a Bachelors in Commerce degree from University of Mumbai. He is a qualified Chartered Accountant as well as a qualified Cost and Management Accountant.

MANAGEMENT TEAM

	Name/Title	Description
	<p>Shri Kersi Tavadia Chief Information Officer</p>	<ul style="list-style-type: none"> ▪ Shri Kersi Tavadia has over 30 years of experience in the area of Application Systems/ IT Infrastructure development and management, managing all aspects of IT operations in Financial Services, Capital markets and manufacturing companies. He has played a leading role in transforming BSE into the fastest exchange in the country ▪ He is instrumental in promoting, adaption of Open Source technologies and has successfully deployed one of the largest Data Warehouse on Open source platform. ▪ He has provided technical leadership & architectural vision in implementation of Mission Critical Applications across the organization including IT Infrastructure, Web portals, web based, and non-web based customized solutions. ▪ He is amongst the Pioneers to implement single-window Multi-Exchange online trading systems to facilitate trading across multiple asset classes.
	<p>Shri Sameer Patil Chief Business Officer</p>	<ul style="list-style-type: none"> ▪ Shri Sameer Patil heads the Business Development of the exchange including equity & equity derivatives, currency derivatives, commodity derivatives, fixed income, debt and mutual funds. ▪ He is instrumental in setting up and responsible for Business Development of INDIA INX at GIFT CITY IFSC. Currently, INDIA INX has more than 90% market share. ▪ He is a board member of INDIA INX Global Access (INDIA INXGA). ▪ He has about 21 years of experience in financial sectors like Commodities, Currency Derivatives, Indices etc and has experience in Trading, Hedging Strategies, Product Designing and Business Development. ▪ He was associated with MCX since inception for more than a decade as Senior Vice President – PKMT (Precious Metals) & Business Development and K J Investors Services (I) PVT LTD, an affiliate of Cargill Investors Services, Illinois, Chicago, USA as Senior Financial Analyst. ▪ He is credited for successful launch of the flagship contracts on MCX the Gold, Silver, WTI Crude Oil and Copper contracts. The Gold Petal contract launched on April 18, 2011 was awarded as the Best Innovative contract of the year by FOW Singapore. ▪ He is awarded the "India UAE business Ambassador of the year 2018" at Abu Dhabi and was nominated for the prestigious IIFC awards for excellence in respective fields. Past recipients of the awards being Mother Teresa, APJ Kalam, Rajesh Khanna, Sunil Gavaskar etc. ▪ He is Science Graduate from Mumbai University and MBA in finance

MANAGEMENT TEAM



	Name/Title	Description
	<p>Shri Girish Joshi Chief Trading Operations and Listing Sales</p>	<ul style="list-style-type: none"> ▪ Shri Girish Joshi heads the Trading Operations and Listing Sales of the Exchange. ▪ He has worked with ICICI Bank Group for 10 years. At ICICI Bank Group he worked in various areas like ICICIDirect.com, Treasury Mid Office and in the area of Regulatory Reporting and Monitoring at CFO office of the Bank. ▪ He was also one of the earliest core team members who were involved in the set-up of National Stock Exchange (NSE). During 7 years at NSE he worked in Wholesale Debt Market and post trade functions. ▪ He was also a member of Corporate Bonds and Securitization Advisory Committee (CoBoSAC) of Securities and Exchange Board (SEBI) of India- ▪ He has represented BSE in various sub groups formed by SEBI for market developments like E-IPO / T+3 listing, Regulatory Framework for Index Providers, Development of CBLO type products for Corporate Bonds, Listing of REITs and InVit etc. He has also represented BSE on the Secretarial Standard Board (SSB) and Corporate Governance Award Expert Group formed by the Institute of Company Secretary of India (ICSI). Currently he is also co-opt member of Western India Regional Council of ICSI. He represents BSE at Sustainable Stock Exchange initiative of the United Nations and various sub committee of CII for Capital Market development. ▪ Shri Girish Joshi is a Chartered Accountant as well as a Cost Accountant by qualification

LINES OF BUSINESS





TOTAL FUND MOBILIZATION THROUGH (EQUITY AND DEBT)

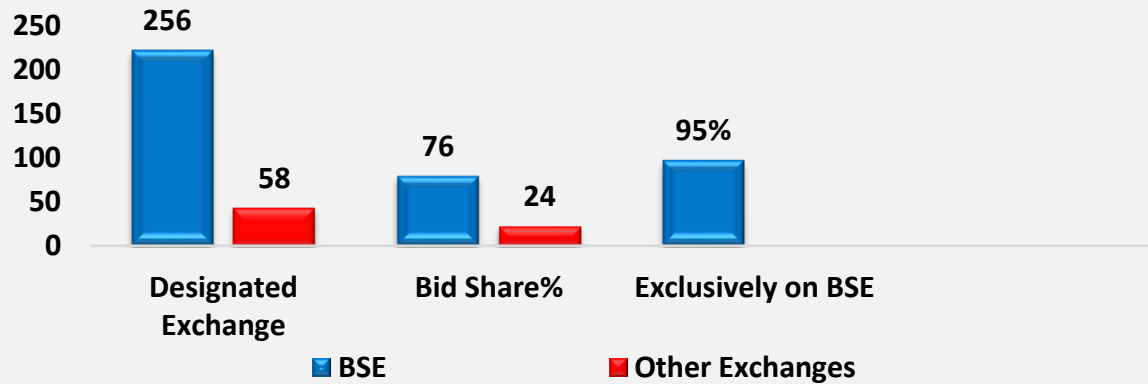
- Total Rs. 1,77,502.35 crores (\$ 23.82 billion*) have been raised in Indian Markets through Stock Exchanges in India since April 2019
- Rs. 1,18,083.15 crores (\$ 15.85 billion*) have been raised at BSE since April 2019
- BSE is the market leader with 75% of total funds raised
- BSE has the largest number of listed companies in world



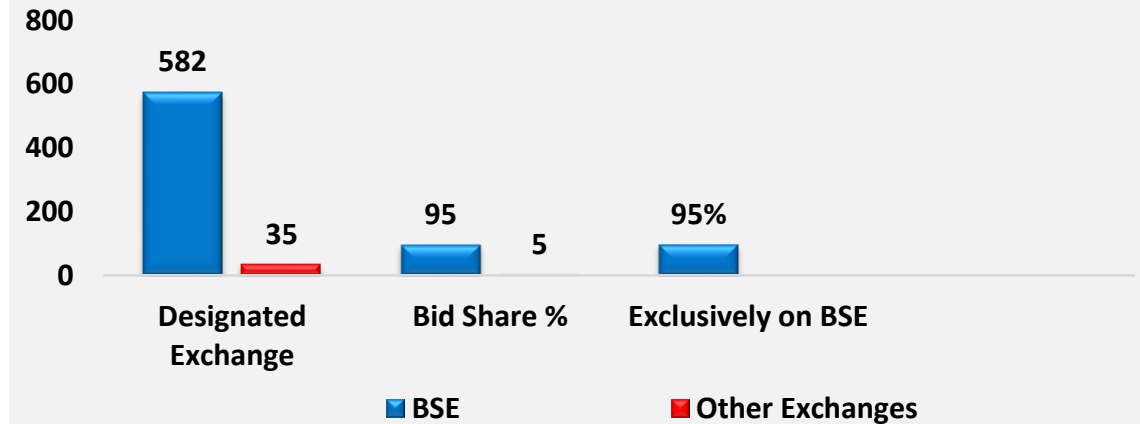
- BSE is the preferred choice amongst entities for listing Privately Placed Debt Instruments (PPDI). In F.Y. 2021-22 (till December 31, 2021), corporates have raised Rs. 3,34,085 Crores (\$ 44.84 billion) through Privately Placed Debt Instruments on BSE. In F.Y. 2020-21, 1421 Instruments were listed on BSE with an amount totalling to Rs. 4,89,162.7182 crores (\$ 66.23 billion) vis-a-vis 515 instruments on other Exchange(s).
- Amounts raised via Rights Issue on BSE in F.Y. 2021-22 (till December 31, 2021) is Rs. 5407.05 Crores (\$ 0.73 billion) and whereas for the F.Y. 2020-21 it was Rs.64,058.61 crores(\$ 8.67 billion).
- In F.Y. 2021-22 (till December 31, 2021), corporates have raised Rs. 45544.35 crores (\$ 6.11 billion) through Preferential Issues on BSE. In the past financial year, i.e. F.Y. 2020-21, the fund raising via preferential issues on BSE was Rs. 46,693.89 crores (\$ 6.32 billion).
- Listed Corporates have mobilized Rs. 27409.7 crores (\$ 3.6 billion) via Qualified Institutional Placement ("QIP") transactions (till December 31, 2021) in F.Y. 2021-22 against Rs 78,738.38 crores (\$10.66 billion) in F.Y 2020-21.
- Amount raised via Commercial Paper on BSE in F.Y. 2021-22 (till December 31, 2021) is Rs. 10,55,822 Crores (\$ 141.70 billion) against Rs 10,56,046.95 crores (\$142.98 billion) in F.Y.2020-21.

CAPITAL RAISING PLATFORMS - OFS/OTB/ BOND PLATFORM

BSE's Leadership in OFS*

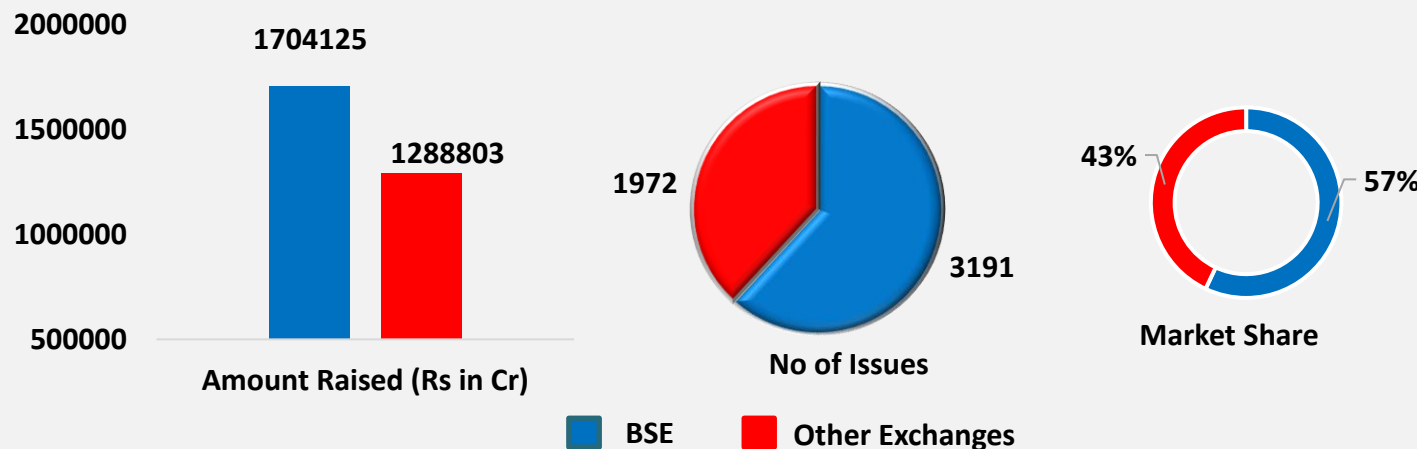


BSE's Leadership in OTB**



▪ **OFS** is a mechanism provided by the Exchange for promoters to dilute their holdings in listed companies in a transparent manner through a separate window with wider investor participation.

▪ **OTB** is Acquisition window enabled for facilitating Buyback, Takeover and Delisting for listed companies



BSE's Leadership in BOND Platform***

BSE BOND is the Electronic Book Mechanism (EBM) offered by BSE to carry out the bidding process for private placement of debt securities in the primary market.

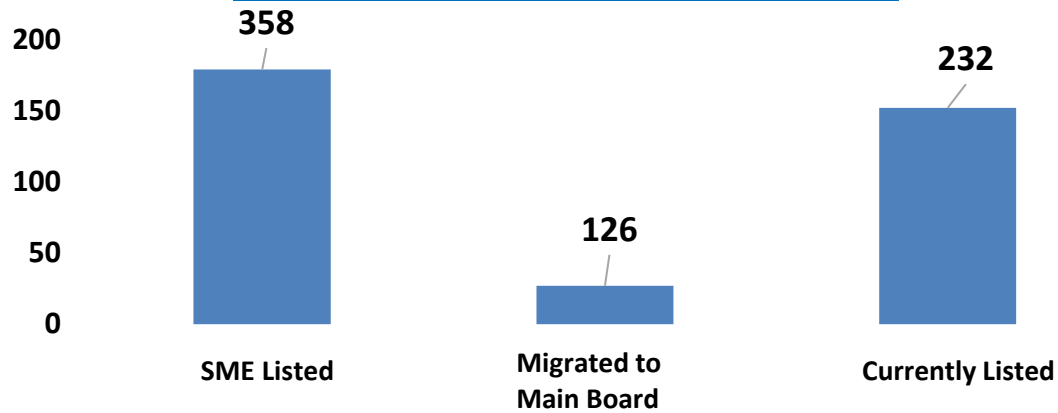
It is an efficient, transparent and a user-friendly mechanism for price discovery of Privately Placed Debt Instrument (PPDI) issuances.

* Since Feb 2012
 ** Since July 2015
 *** Since July 2016

BSE SME –INDIA'S BIGGEST SME PLATFORM

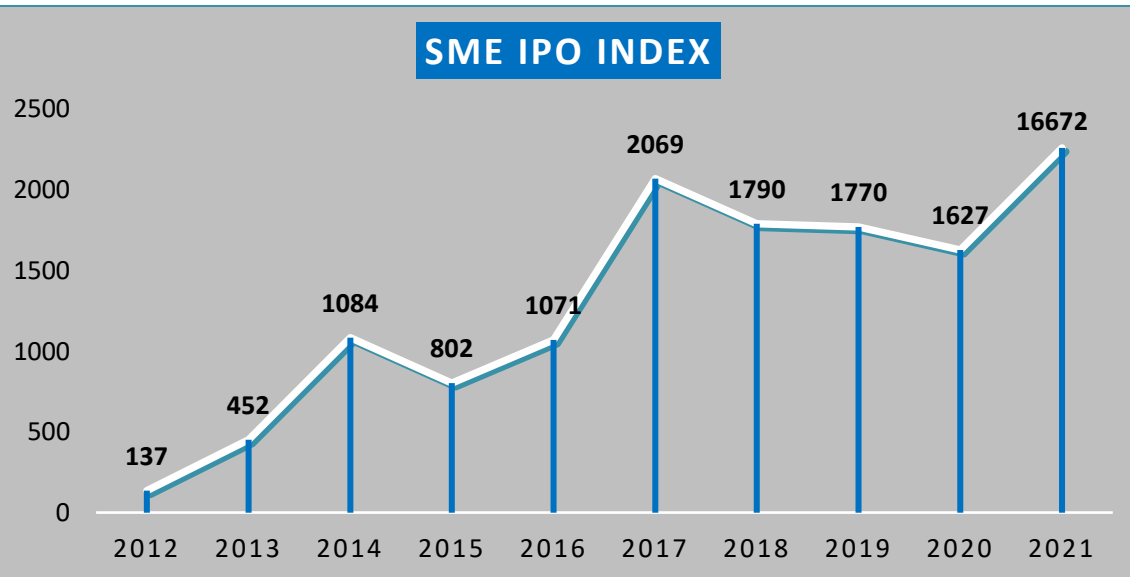


Companies on BSE SME Platform



- BSE is the first stock exchange in India to receive approval from SEBI on 26th September 2011 to launch SME Platform.
- SME IPO Index with a Base value of 100 as on 16th August, 2012 is aimed at tracking the companies listed on SME platform was launched on 14th December 2012. As on 31st December, 2021 its value was 16,671.85.
- The Platform facilitates capital raising by small and medium enterprises including start-up companies which are in their early stages of growth. It also provides easier entry and exit options for informed investors like angel investors, VCFs and PEs etc. and equity financing which lowers the debt burden leading to lower financing cost and healthier balance sheet.

SME IPO INDEX



Market Capitalization of 232 companies –Rs.20,046.46 Crs. (USD 2708.98 Million)

Market Capitalization of 126 companies Migrated to Main Board – Rs.27,612.36 Crs. *(USD 3731.4 Million). Conversion rate is taken \$1= Rs. 74.

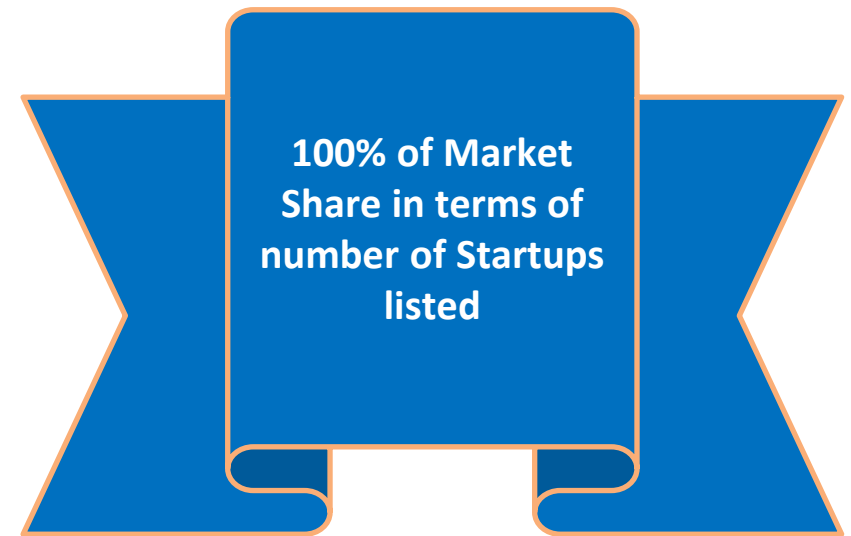
60% of Market Share in terms of number of SMEs listed

Data as of December -2021

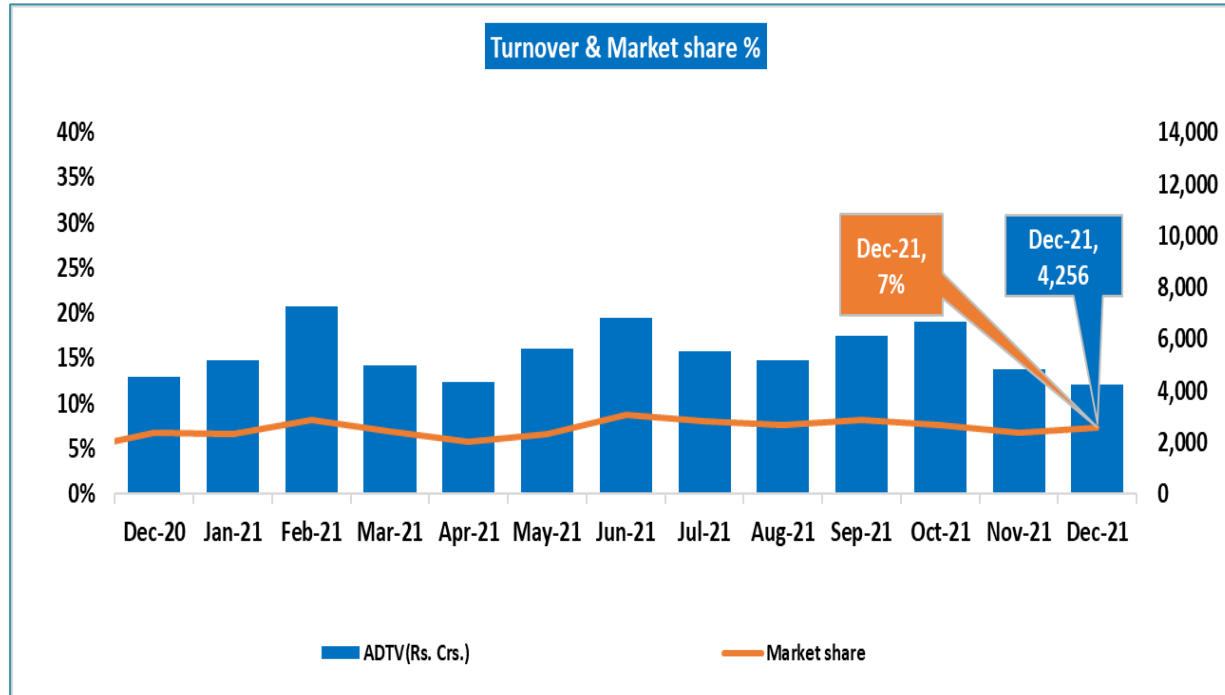
BSE STARTUPS –INDIA'S 1ST STARTUP PLATFORM



- BSE is the first stock exchange in India to launch Startups Platform on 22nd December 2018
- The 'Startup Companies' seeking to be listed on the BSE Startups Platform should be in the sector of IT, ITES, Bio-technology and Life Science, 3D Printing, Space Technology, E-commerce, Hi-tech Defence, Drones, Nano Technologies, Artificial Intelligence, Big Data, Augmented/Virtual Reality, E-gaming, Exoskeleton, Robotics, Holographic Technology, Genetic Engineering, Variable Computers Inside Body Computer Technology and other high-tech industries.
- No. of companies listed - 13
- Market Capitalization - Rs. 261.16 Crs *(\$35.29. millions)
*(Conversion rate is taken \$1 = Rs. 74)







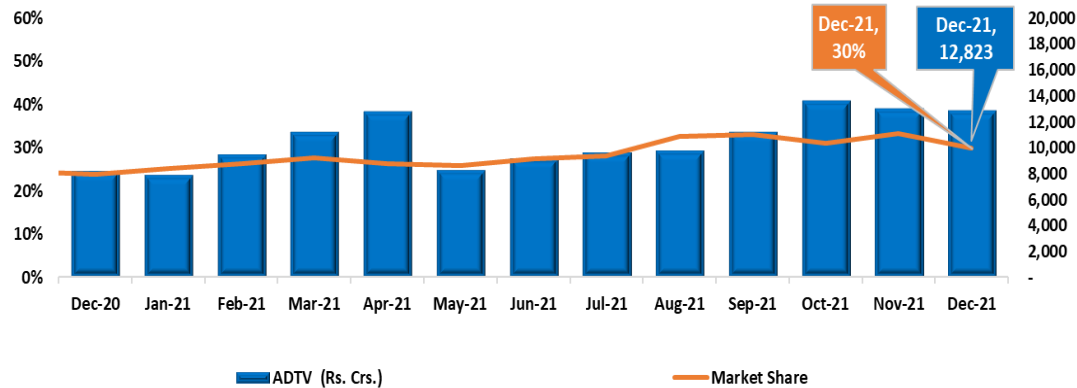
Revised transaction charges slab are for group A, B and common scrips in other groups.

Monthly Turnover in Rs. Crs in calendar month	Rate (in Rs.) per Crore on incremental turnover.
Turnover < 1250 Crores	345.00
Turnover between 1250 - 2500 Crores	340.00
Turnover between 2500 - 5000 Crores	335.00
Turnover between 5000 - 10000 Crores	330.00
Turnover between 10000 - 15000 Crores	325.00
Turnover between > 15000 Crores	320.00

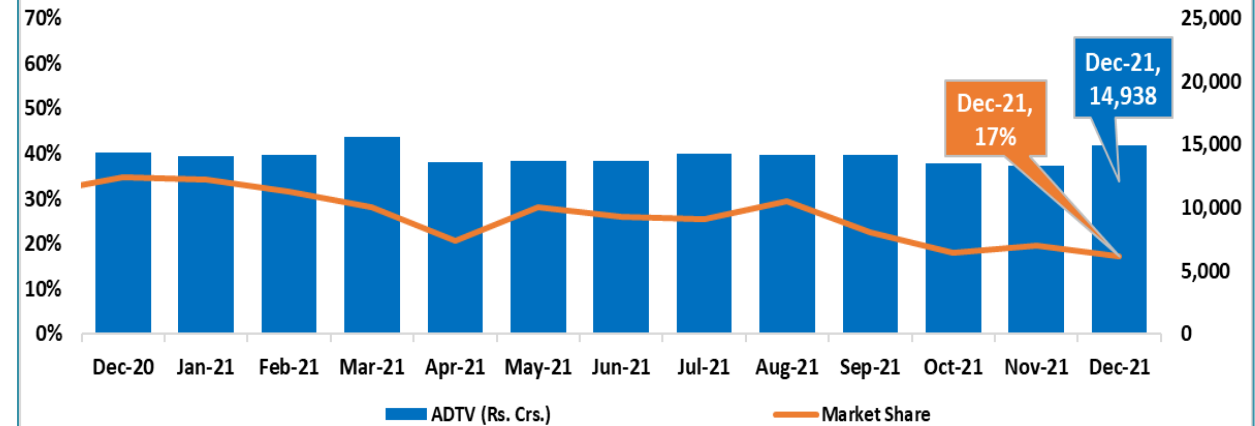
Notice number: 20210210-42 dated 10th feb 2021 for reference.

CURRENCY DERIVATIVE

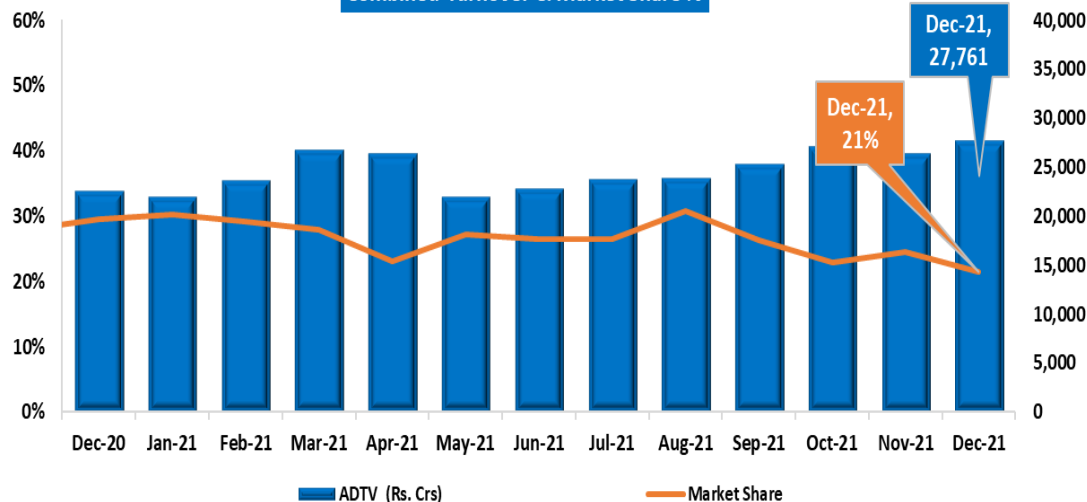
Currency Futures



Currency Options



Combined Turnover & Market Share %

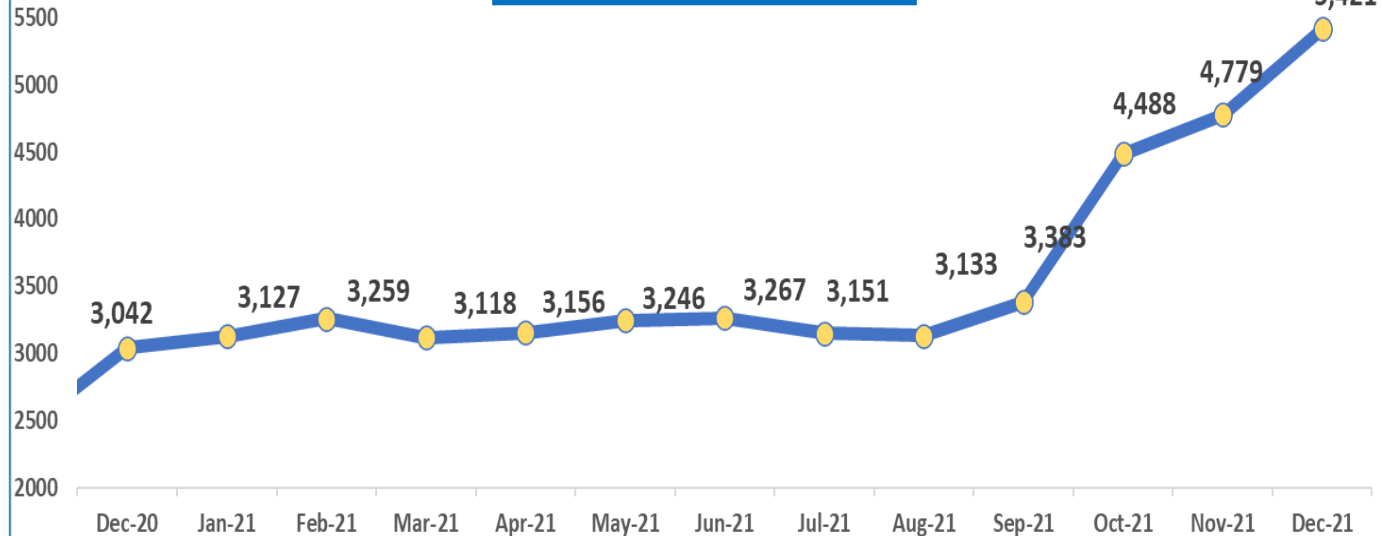


Transaction charges in Currency Derivative Segment

Sr.No	Incremental Monthly Turnover in Currency Futures (Rs. Crore)	Currency Futures - Charges Applicable per crore (on both active and passive side)
1	Turnover < 1000 Crores	22.00
	Turnover between 1000 - 2000 Crores	22.00
	Turnover between 2000 - 3000 Crores	22.00
	Turnover between 3000 - 5000 Crores	22.00
2	Turnover between 5000 - 10000 Crores	16.50
	Turnover between 10000 - 20000 Crores	11.00
4	Turnover > 20000 Crores	0.00

COMMODITY DERIVATIVES

COMMODITY DERIVATIVES -ADTV (Rs.Crs.)



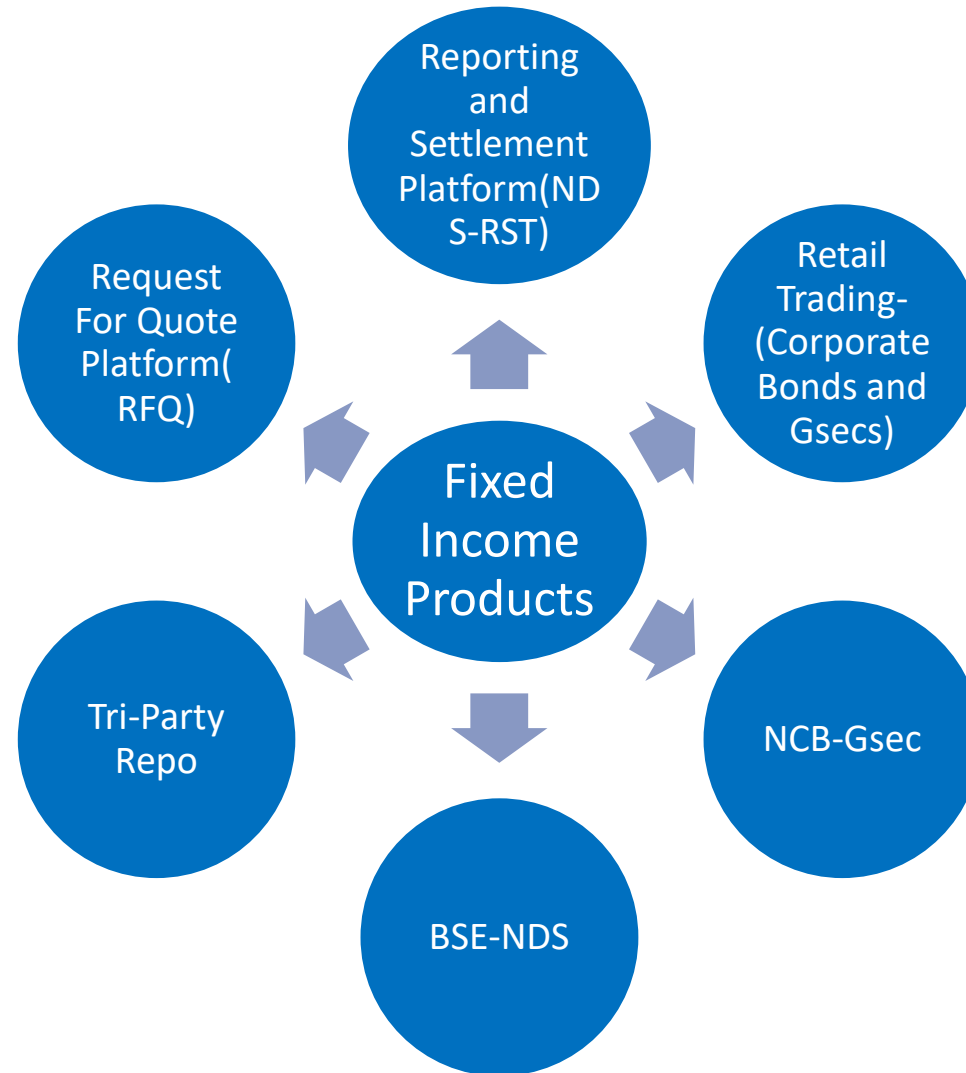
Commodity Launch details

NAME OF THE PRODUCT	DATE OF COMMENCEMENT OF BUSINESS
AGRI COMMODITIES	
GUARSEED	06-Feb-19
GUARGUM	06-Feb-19
COTTON	18-Feb-19
TURMERIC	28-Jun-19
ALMOND	22-Jun-20
COTTON J-34 FUTRURES	7-June-2021

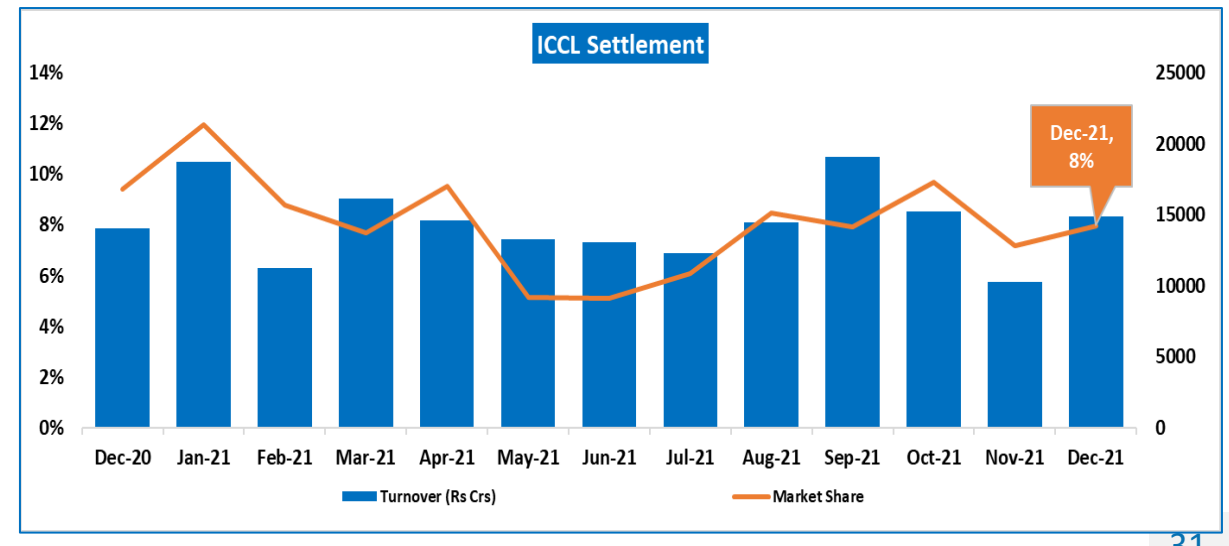
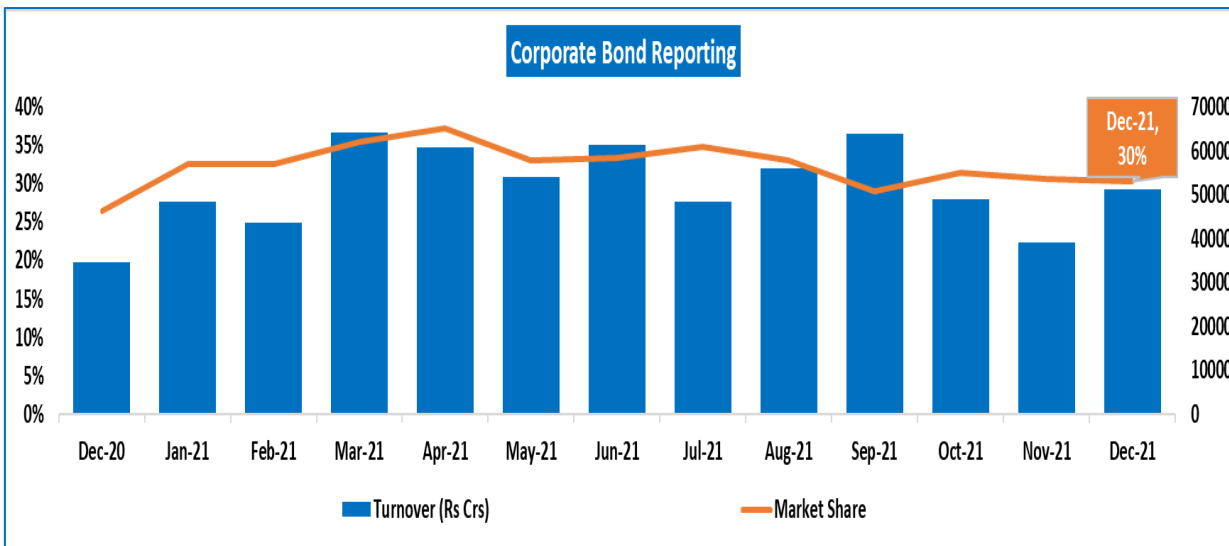
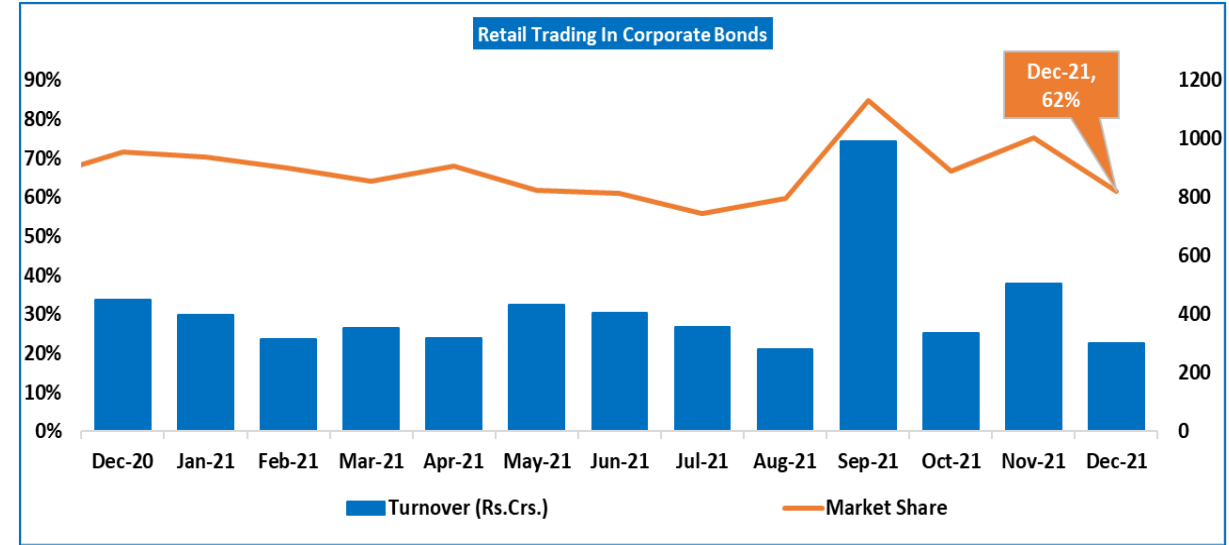
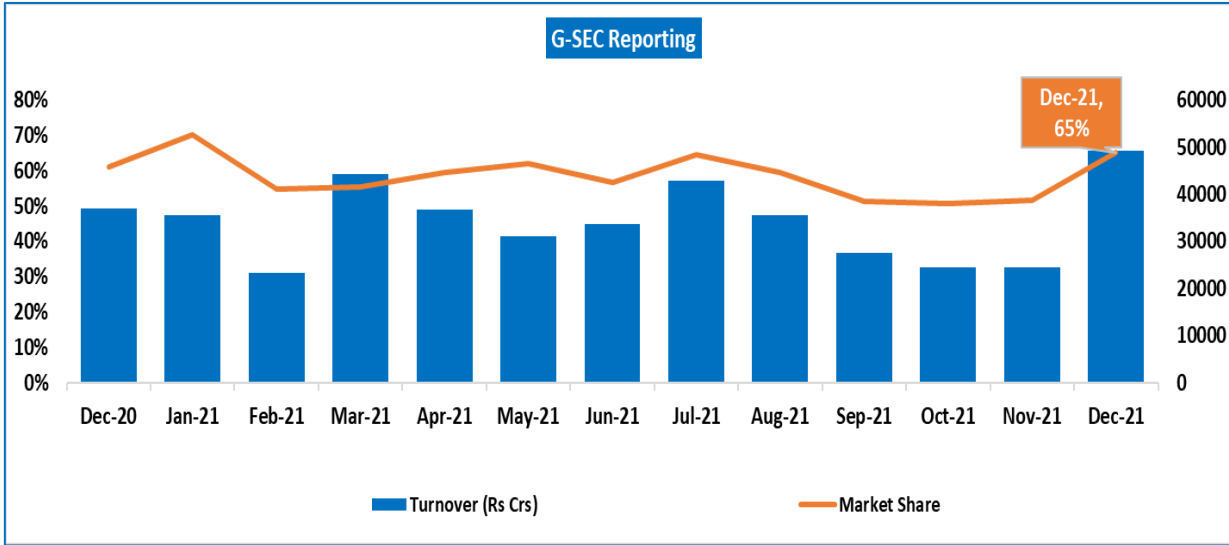
Commodity Launch details

NAME OF THE PRODUCT	DATE OF COMMENCEMENT OF BUSINESS
NON-AGRI COMMODITIES	
GOLD (1 KG)	01-Oct-18
SILVER (30 KG)	01-Oct-18
COPPER	02-Nov-18
GOLDM	18-Feb-18
SILVERMINI	13-Jun-19
SILVER KG	13-Jun-19
GOLD M OPTIONS	01-Jun-20
SILVER KG OPTIONS	01-Jun-20
GOLD (1KG)-OPTIONS	24-Aug-20
SILVER (30 KG) OPTIONS	24-Aug-20
STEEL BILLETS FUTURES	01-Mar-21
COPPER OPTIONS	30-Mar-21

FIXED INCOME SEGMENT OVERVIEW



FIXED INCOME SEGMENTS

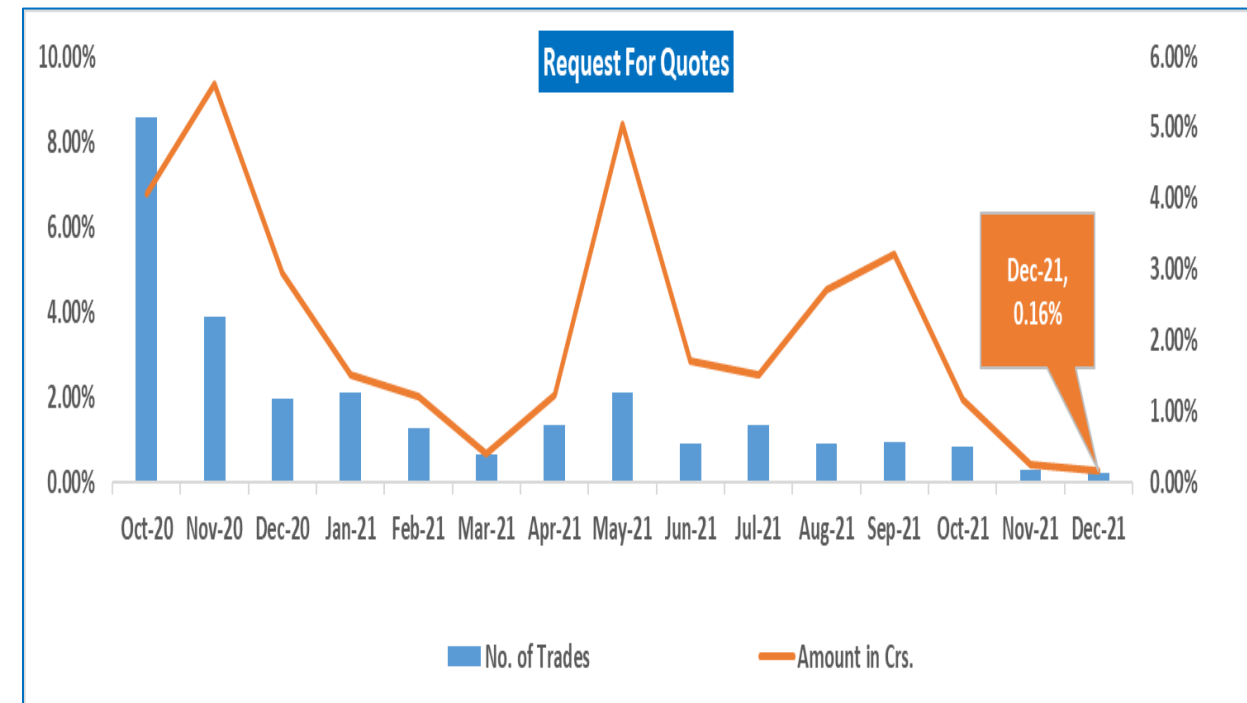


REQUEST FOR QUOTES

BSE has launched RFQ (Request for Quotes) platform in February 2020. RFQ is a web-based platform which will enable quoting and negotiation of trades. As per SEBI regulations, Mutual Fund started trading on RFQ platform from October 2020 and based on IRDAI circular Insurance Companies started trading on the RFQ platform from November 2020 respectively.

Following data shows the No. of Trades and Amount received in Request For Quotes in below mentioned securities from October 2020 till December 21

Corporate Bonds
Commercial Paper
Certificate of Deposit
Treasury Bills
Government Securities
State Development Loans

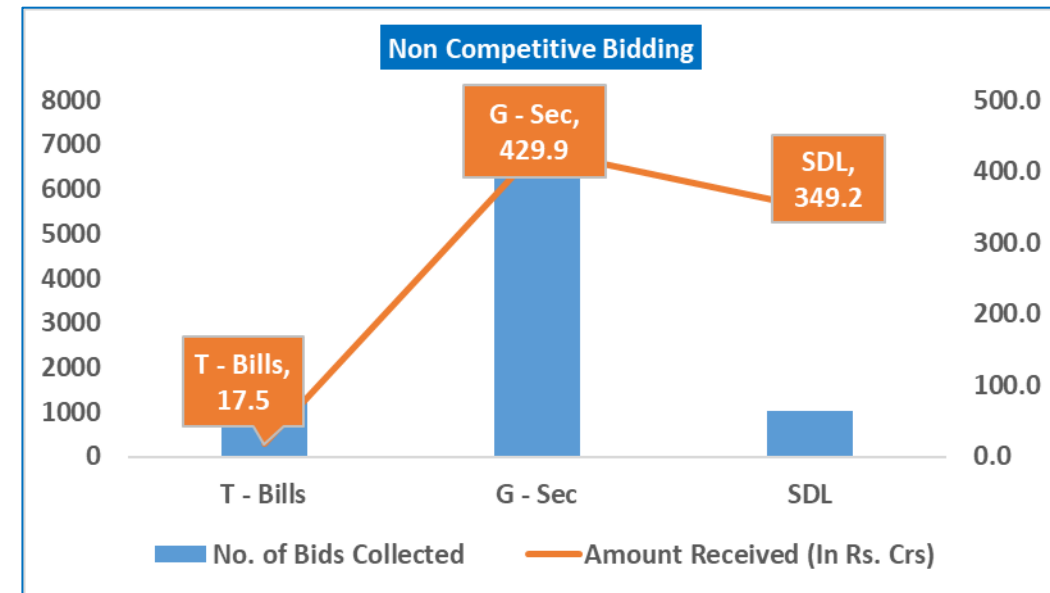


NON-COMPETITIVE BIDDING

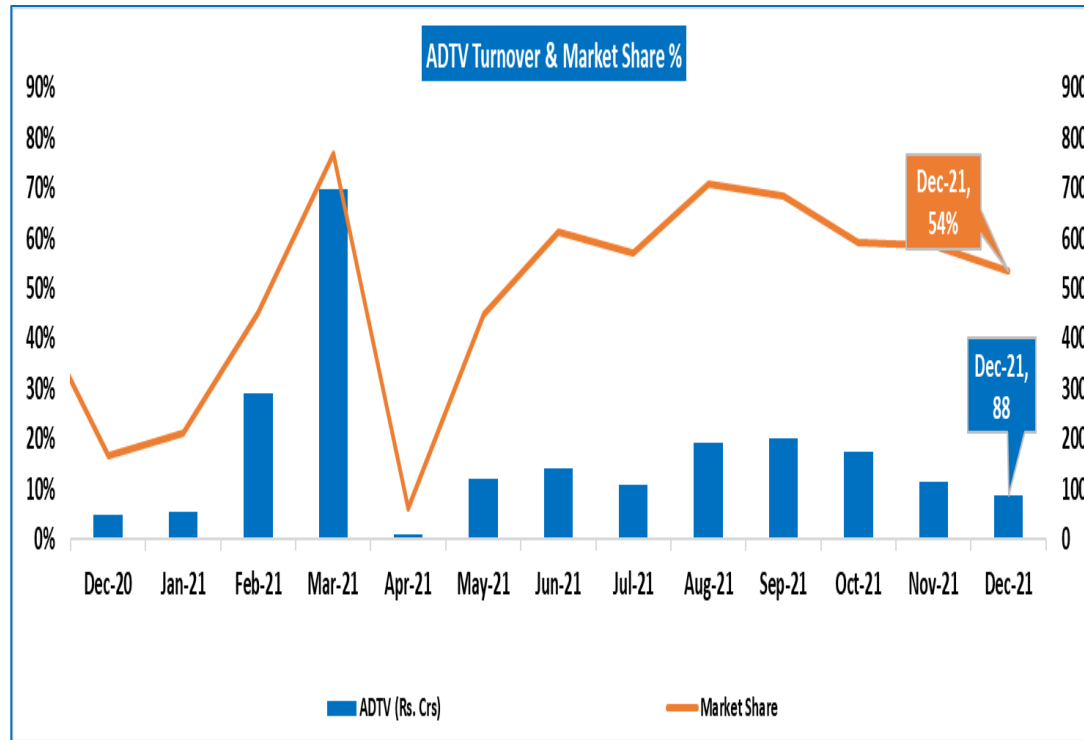
BSE has started with non-competitive bidding facility on Government securities and Treasury Bills from 24th April 2018.

BSE has started with non-competitive bidding facility on SDL securities from 25th November 2019.

Following data shows the No. of bids collected and Amount received in Non – Competitive Bidding auction in Treasury Bills, Government Securities and State Development Loans till December 2021, since inception,



INTEREST RATE DERIVATIVES



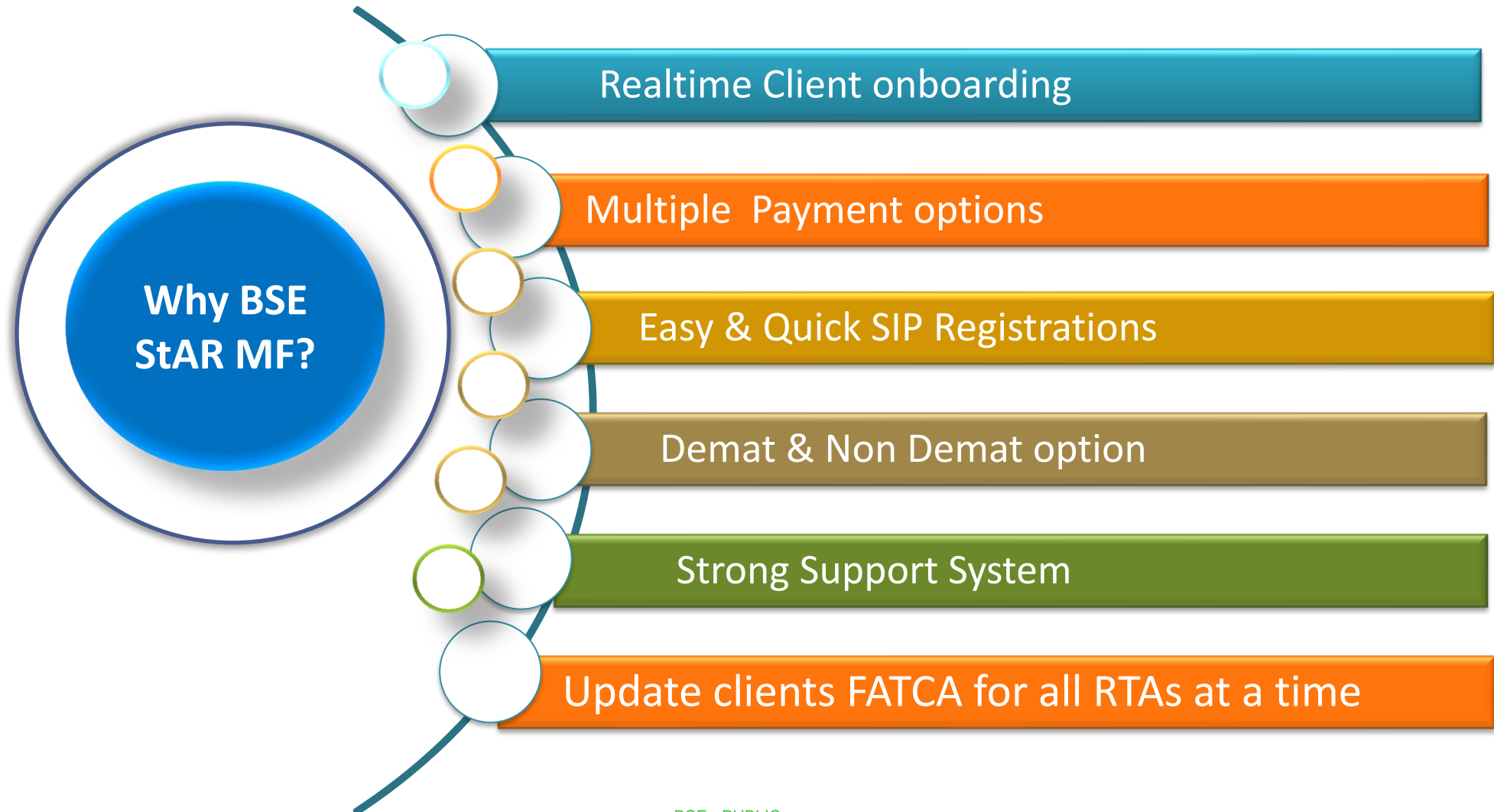
In India, Exchange traded futures have been available since 2014. BSE launched interest rate futures in November 2014 and interest rate options in August 2019. These contracts are a part of currency derivatives segment. It is our continuous endeavour to provide the widest range of offerings for investors and traders. Interest rate futures on below mentioned Government of India securities are currently available for trading :

- 726GS2029
- 768GS2023
- 727GS2026
- 717GS2028
- 668GS2031
- 795GS2032
- 757GS2033
- 645GS2029
- ONMIBOR
- 91DTB

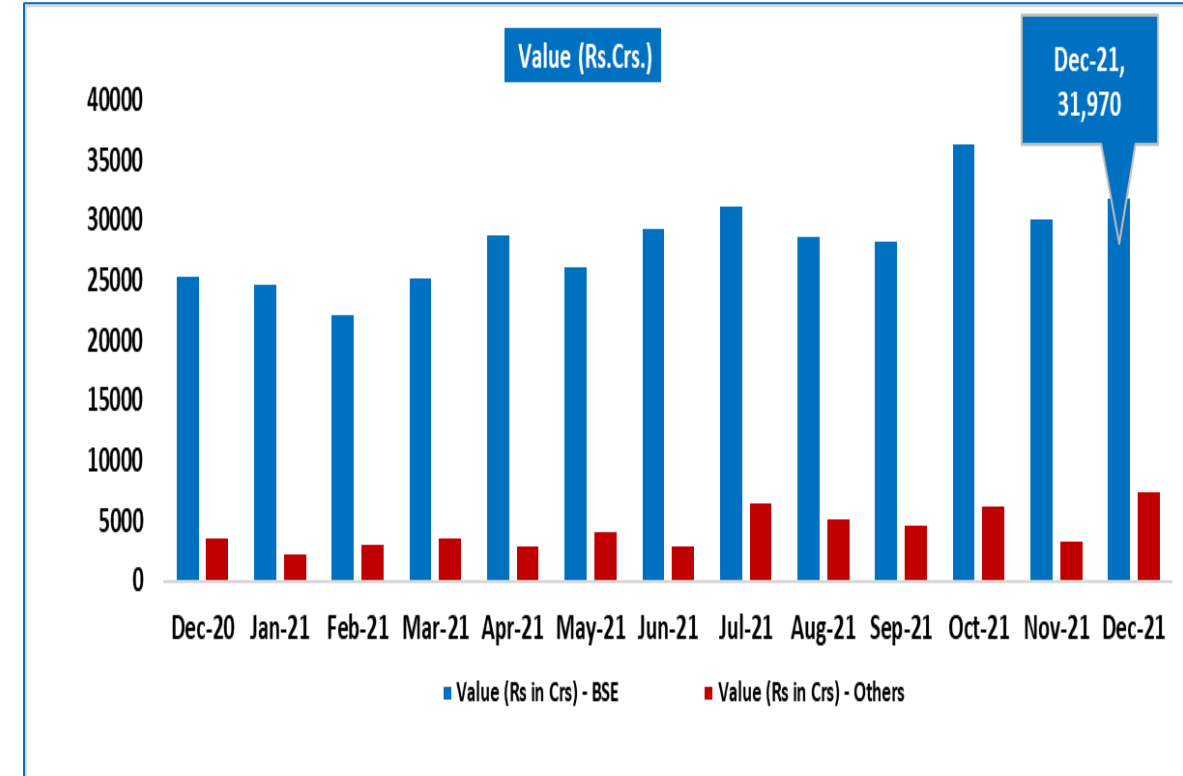
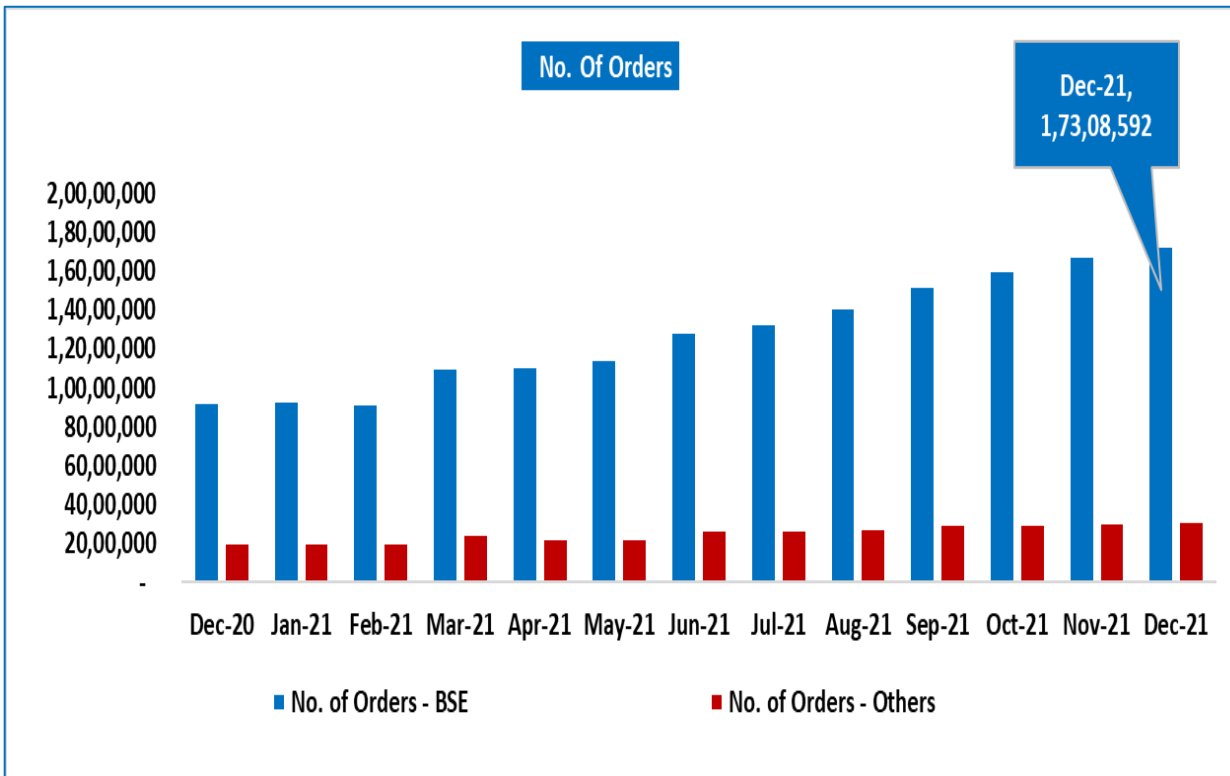
INTEREST RATE OPTIONS

- **BSE has launched India's first exchange traded interest rate options in August 2019.** Interest rate options provide for an efficient tool for managing interest rate risk and exposure through hedging. With a wide array of instruments being made available, Investors can hedge their risk across the yield curve. Apart from hedging, interest rate options can also be used for trading with various strategies.
- Eight-in-the-money, eight-out-of-the-money and one near-the-money call and put options are available for each underlying. The contracts currently available for trading are based on the underlying government of India securities as follows:
 - 726GS2029
 - 768GS2023
 - 727GS2026
 - 717GS2028
 - 668GS2031
 - 795GS2032
 - 757GS2033
 - 645GS2029
 - 579GS2030

WHY BSE STAR MF?



STAR MF-INDIA'S LARGEST ONLINE MF DISTRIBUTION PLATFORM



BSE StAR MF is the largest digital platform in MF Industry

BSE STAR MF PLATFORM – AT A GLANCE!



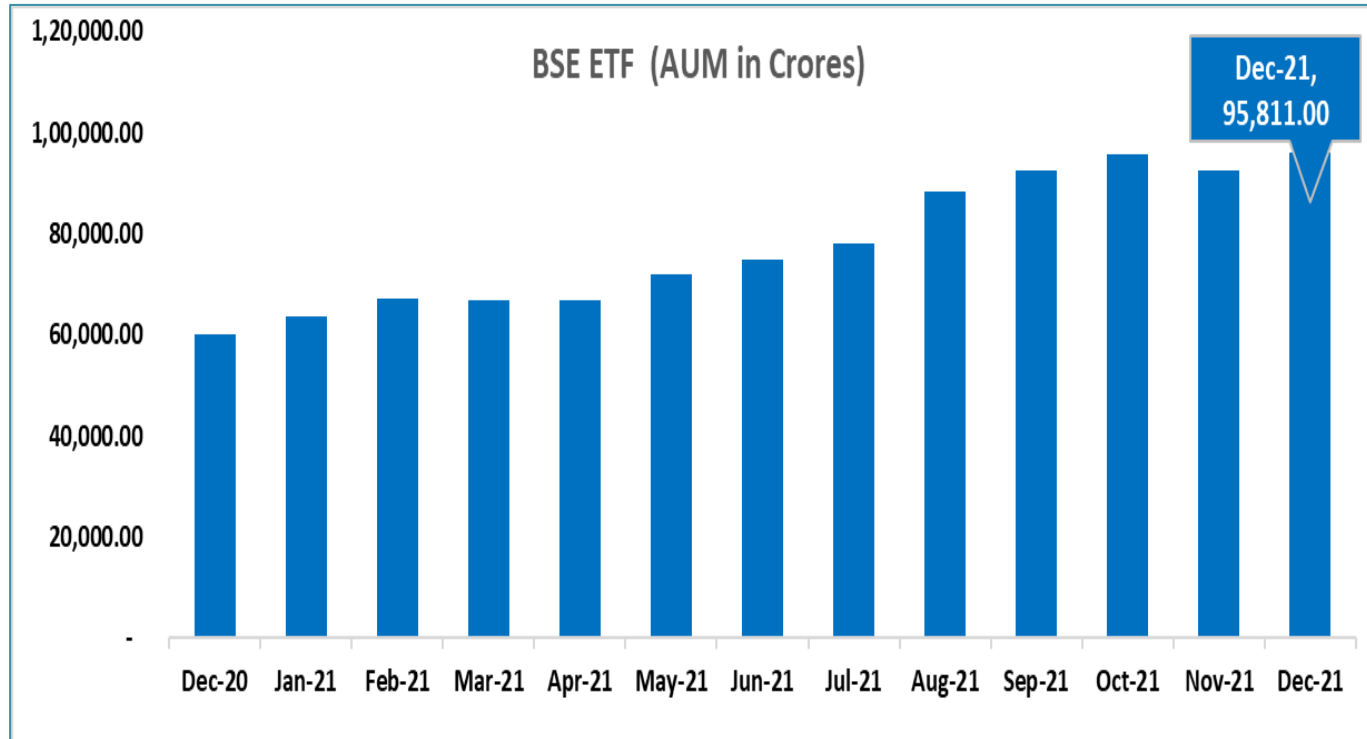
84% Market share

**Over 9.17 Lac new SIPs
registration**

1.73 Crs + Trxns

Over 71,332 distributors

ETF'S BASED ON S&P BSE INDICES



- ETF is a security that tracks an index, a commodity or a sector like an index fund or a sectoral fund but trades like a stock on an exchange
- Most common types of ETFs in India:
 - Equity ETF
 - Precious Metal ETF
 - Liquid ETF
- EPFO invests 15% of its investment corpus in large cap ETFs including S&P BSE Sensex based ETF's
- BSE in its effort to bring greater participation for retail investors in the Indian landscape has tied up with market makers for ETF's
- Average Daily Trading volume and turnover of ETF's at BSE has grown by 47% and 20% between 2014 to 2020
- As of November 2021, S&P BSE based ETF's asset base has reached Rs. 95,811.00 crores, of which ETF based on S&P BSE Sensex Index accounts more than 90% i.e., Rs. 66,481 crores.” (Source : AMFI)



DATA BUSINESS PRODUCTS

Market Data

- Equity Level 1 – Real-time & 1 minute Snapshots
- Equity Level 2 – Real-time
- Indices – Real-time & 1 minute Snapshots
- Derivatives (Equity , Index , Currency & Interest Rate Derivatives) – Real-time

Corporate Data

- Corporate Announcement
- Financial Results
- Shareholding Pattern
- Corporate Action - through SWIFT

End of day or Historical

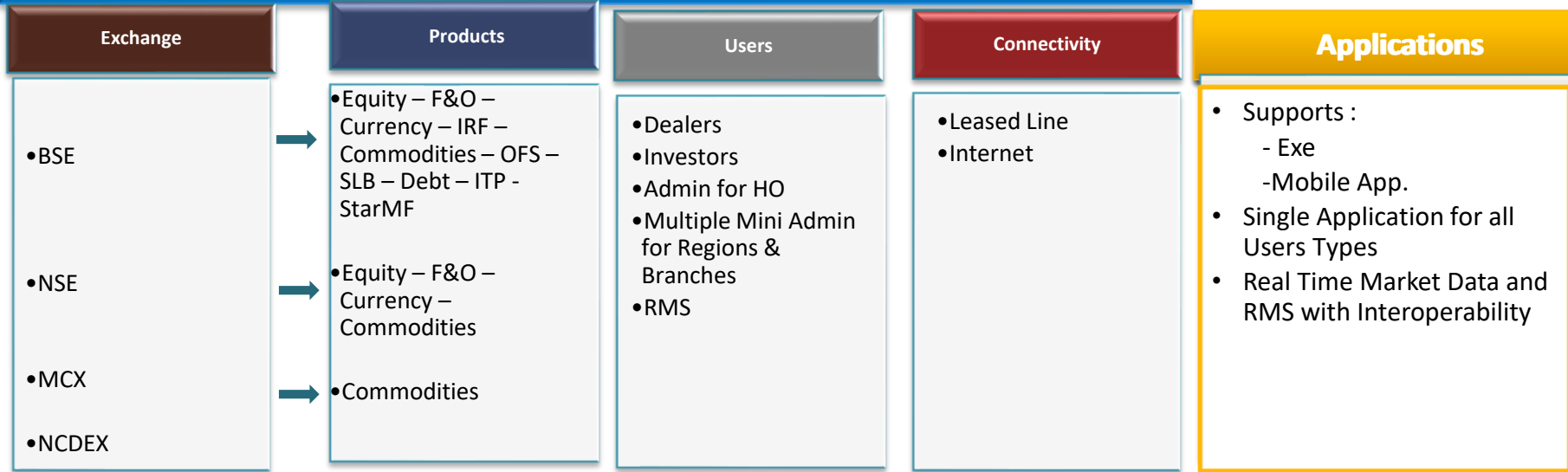
- Quotation files
- Annual report
- Daily Bulletin
- Sector Classification
- Trade and Order book data



BOLT PLUS - HOSTED MEMBER TRADING INTERFACE



One Window with Multiple Utilities



Application for Desktop and Mobile

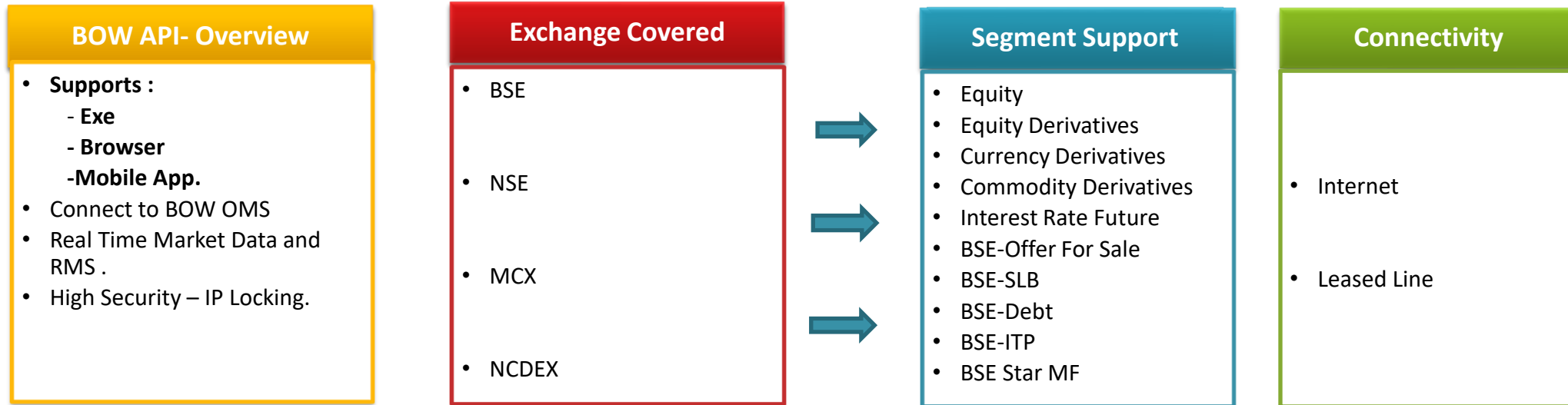
- Single window for Multi Exchange Segments with all Asset Class.
- Combined Market Depth.
- Facility of After Market Orders (AMO).
- Best Price Execution
- Real Time Margining and Risk Monitoring with Interoperability.
- DP / T1 holding upload with haircut percentage
- MTM Based Single Click Auto square Off. Timer Based Square off.
- Top Gainers / Top Losers - Most Active by VOLUME / VALUE.
- Corporate Action Information.
- Market Analytics Integration in Mobile
- NEWS Plus with RSS feeds and Twitter.
- No IT infrastructure cost to the Member.
- Completely Hosted Application.
- Single Application for all Users Types .
- Trade commencement in one day.
- Real time support services.
- Payment Gateway Integrated with Bill Desk

Bolt+on web (BOW)- Free of cost for all Members

BOW API – BUILD YOUR OWN TRADING FRONT END



Single API Interface to Trade on Multi Exchange segments



Key Advantage & Offerings

Multi Fold Advantage:

- ❖ Encourage members/Vendors to develop their OWN Front-End.
- ❖ Members Can use Hosted BOW's Robust OMS and RMS
- ❖ No impact of exchange mandated changes on API users
- ❖ No IT infrastructure / Connectivity cost to the Member.

Key Offerings:

- ❖ Real Time market data to display in innovative ways.
- ❖ Order & Trade Management, User Management
- ❖ Best Price Execution
- ❖ Real Time Margining and Risk Monitoring with Interoperability
- ❖ Risk Management through BOW Admin interface
- ❖ DP / T1 holding upload with haircut percentage
- ❖ Payment Gateway interface
- ❖ Report Management

MULTI EXCHANGE RISK MANAGEMENT SYSTEM – MERMS-ICCL



Single API Interface to Validate Pre Trade Risk Management for Multi Exchange segments

MERMS API- Overview

- ❖ MERMS is hosted application for ICCL Members.
- ❖ Facilitates Risk Management services.
- ❖ Validation of Orders generated from.
 - ✓ Client Software
 - ✓ Algo Software
- ❖ ICCL Members can Monitor & control Limits & Risk Management of TM

Key Offerings & Risk Parameters

Key Offerings:

- ❖ Client software connection to MERMS
- ❖ Single Interface to Validate pre trade orders for Multi exchanges.
- ❖ Real time Pre trade risk management to multiple exchanges
- ❖ MERMS terminal to set risk parameters at Trading Member level

Risk Parameters:

- ❖ Risk management at Member Level
- ❖ Risk Parameters
 - ✓ Margin
 - ✓ MTM
 - ✓ Turnover
 - ✓ Exposures
 - ✓ Order Value & Limits etc.

Exchanges:

BSE, NSE, MCX and NCDEX.

Segments:

- ✓ Equity
- ✓ Equity Derivatives
- ✓ Currency Derivatives
- ✓ Interest Rate Future
- ✓ Commodity Derivatives
- ✓ BSE SLB
- ✓ BSE DEBT
- ✓ BSE Repo
- ✓ BSE ITP

Key Advantages

- ❖ Robust Comprehensive Single Interface RMS for Multi Exchange.
- ❖ Monitor and Control Trading Member Risk Management .
- ❖ Prevention of Erroneous orders before sending to Exchange based on risk parameters set
- ❖ No IT infrastructure / Connectivity cost to the Member.

BEST(BSE ELECTRONIC SMART TRADER)- FEATURES



Hosted Trading and Risk Management Application

One Window with Multiple Utilities

Exchanges/Segments	Users	Features
<ul style="list-style-type: none"> •BSE (Equity, Equity Derivatives, Currency Derivatives, Commodity Derivatives, StAR MF) •NSE (Equity, Equity Derivatives, Currency Derivatives, Commodity Derivatives) •MCX 	<ul style="list-style-type: none"> •Admin •Multiple Parallel Admin •Branch Admin •Dealer •Offline Client •Online Client 	<ul style="list-style-type: none"> •Real time Risk Management •User Management •Multi Exchange/Segment trading

Roles & Functionalities

Admin		Users	
User Management <ul style="list-style-type: none"> • User Creation • Creation & assigning roles • Manage Users • Reporting & MIS • Send Message 	Risk Management <ul style="list-style-type: none"> • Comprehensive Risk Rules • Real time Margin & MTM calculation • Managing different Risk levels • Multiple Trading Products • Admin Square off • MIS Auto Square off 	Dealers <ul style="list-style-type: none"> • Multiple Exchange & Segments for Trading • Real time broadcast • Basket Order, Spread Order, After Market Order, Cover Order functionality • Online IV's for Option Traders • Payment Gateway 	Online Client <ul style="list-style-type: none"> • Common login for EXE, WEB & Mobile platform • Real time broadcast • Payment gateway • Order & Trade reports • Historical reports

BSE's - WORLD CLASS TRADING INFRASTRUCTURE



Bolt Plus Live

Member Access

Peripheral Systems
connecting to BOLT Plus

Performance Testing &
Benchmarking

- Products available for trading -
 - Currency Derivatives – 29th November, 2013
 - Interest Rates Futures - 28th January, 2014
 - Equity Derivatives - 10th February, 2014
 - Equity – 7th April, 2014
 - Commodity Derivatives – 01st October, 2018

- API based access -
 - Advanced High performance Industry Standards based APIs (ETI, MDI/EMDI,EOBI)

- Reference Data, Risk Management, Surveillance, Clearing & Settlement, Data Warehouse

- Latency : < 6 μ s (Gateway in to Gateway out)
- Network latency for Colo users – 10 μ s
- Throughput Capacity: 5 lacs order per second
- Scalability: Horizontally scalable by adding partitions
- In built application level redundancy
- Usage of commodity hardware to ensure ease of availability

TECHNOLOGY PROGRAMME –CO-LOCATION FACILITIES

Fastest Co-location

- BSE is the fastest Exchange in the world with a speed of 6 microseconds.
- NTT – Netmagic has setup a State-of-the-art Data Centre to manage the co-location facilities for BSE
- It is the fastest Co-location service in India with round trip network latency of less than 10 microseconds.
- The response for an order has round trip latency of about 16 microseconds (including 10 microseconds of Co-location network latency).
- Market access across Equity, Equity Derivatives and Currency Derivatives segments.
- Extension of Precision Time Protocol (PTP) from BSE's Grandmaster clock to the Co-location enables members to synchronize with the Exchange clock.
- Equitable distribution of market data to all members by usage of same length cables for all members.
- Full order book multicast (EOBI) is provided to Co-location members at no cost.

NTT Netmagic Co-location Data Centre

Key technical highlights are:

- 10 Gbps Fibre optic cable connection with BSE trading system with full redundancy
- 24 X 7 operations support
- 24 X 7 High security zone
- Uninterrupted Power Supply with DG back up
- ITIL and ISO 27001 compliant
- FM200 Fire suppression facility
- Market Data feed from Thomson Reuters Electron network
- 99.999% uptime

TECHNOLOGY PROGRAMME-SOFTWARE AND HARDWARE

For services opted by member, BSE bears the cost on behalf of the member for;

- The software license cost for ALGO trading and market access
- The infrastructure cost on Co-location rack space
- The ALGO trading servers at Co-location
- The internet connectivity between Co-location and member's office

ALGO Trading

Algo Trading software is available from following vendors for quoting and market making in Eq. Derivatives including auto hedging capabilities across Exchanges and Segments:

- Greeksoft Technologies Pvt. Ltd
- uTrade Solutions Pvt. Ltd
- Resolute Softech

Cost Comparison

Service	BSE	Other Exchange
Co-location Network Bandwidth	10 Gbps fiber optic network	10 Gbps fiber optic network
Roundtrip Latency (in µsec): Exchange Response Time	6	500 #
Roundtrip Latency (in µsec): Colo Network*	10	500 #
Roundtrip Latency (in µsec): Exchange Response Time + Colo Network Latency	16	1000 #
10G Switch at Member Rack	Not Mandatory	Mandatory
10G NIC Card from Exchange per member	2 Solarflare Cards (SFN7322F)	NIL
Cost to member for 10G port connection	INR.0.50 Lakhs AMC (1 Primary & 1 Secondary)	INR 10 – 20 Lakhs
Full Racks	Free	One Time Cost : Rs. 1 Lakh plus AMC : Rs.12 Lakhs
Half Racks	Free	One Time Cost : Rs. 50,000 plus AMC : Rs.6 Lakhs
Quarter Racks	Free	Not Available
Servers	Free	Not Available
Algo software	Free	Not Available
Interactive connectivity cost	Free	Annual Cost per connection Rs.25 Lakhs for 1000 messages/sec
Market data connectivity cost	Free Market Data since November 2010. Free EOBI feed since June 2015.	Free Tick By Tick Data since July 2018.

***10G network with Solarflare card SFN7322F with Onload # Based on market feedback**

SPONSORED MARKET ACCESS

Implementation of 'Sponsored Market Access' (SMA) at Co-location

- SMA is a software distribution model in which applications are hosted by a service provider and made available to customers over a network.
- Free of cost rack space is allocated by BSE to the SMA Service providers to install their algo trading application server in Co-location. The members can connect to this SMA algo server at Co-location via Internet.
- The algo strategy parameters can be triggered from the member front-end application and sent to the SMA algo server at Co-location.
- The corresponding algos will generate orders to be sent to BSE trading system through Co-location network.
- The algo orders will be sent to the BSE Trading system via the high speed Co-location gateway for minimum latency.
- Members can execute orders over high speed Co-location network without installation of any infrastructure at Co-location by the members.

Advantages

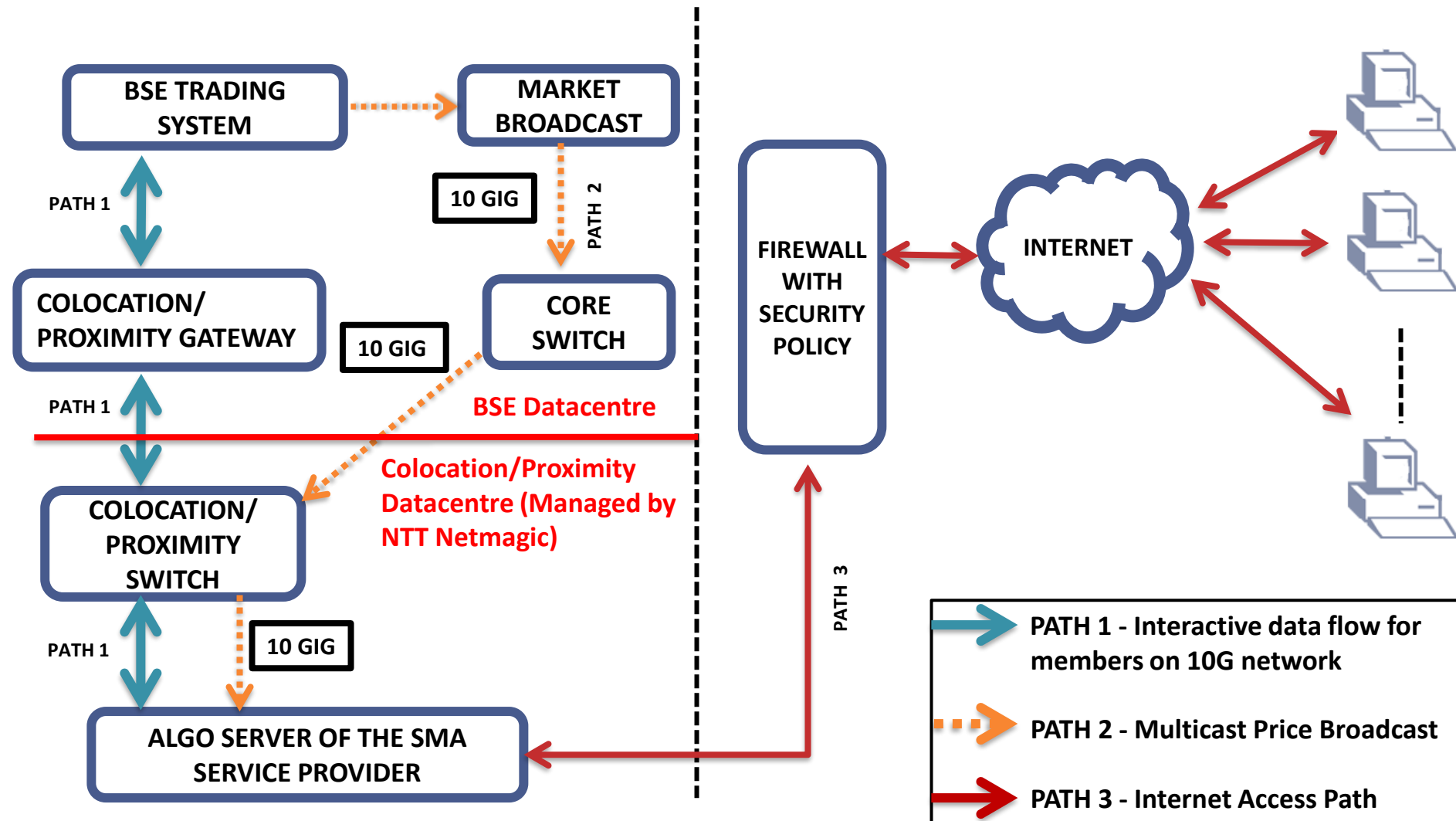
For Members

- Zero capital expenditure on infrastructure at Co-location.
- The algo orders will be generated at Co-location and sent to the BSE Trading system via the high speed 10G Co-location network for minimum latency.

For Vendors

- Free of cost rack space is allocated by BSE to SMA service providers to install their algo trading application server in Co-location.
- Vendor can service multiple clients with a centralized algo server installed at Co-location. Hence, vendor's cost of maintenance is low.

SPONSORED MARKET ACCESS NEW FACILITY AT CO-LOCATION



CONTRACT SYMBOLS

Bloomberg Ticker	Category	Type
SENSEX Index CT	S&P BSE SENSEX Index futures	Futures contract
BSE100 Index CT	S&P BSE 100 index futures	Futures contract
SENSEX Index OMON	S&P BSE SENSEX Index options	Options contract
BSE100 Index OMON	S&P BSE 100 Index Options	Options contract
LUSA Currency OMON	S&P BSE Currency Options	Options Contract
LUSA Curncy	Currency USDINR Futures	Futures Contract
LERA Curncy	Currency EURINR Futures	Futures Contract
LGBA Curncy	Currency GBPINR Futures	Futures Contract
LJPA Curncy	Currency JPYINR Futures	Futures Contract
TBBA Comdty	T-Bill	Futures Contract
IISA Comdty	Gov Bond 8.4%	Futures Contract
IIPA Comdty	Gov Bond 7.72%	Futures Contract

Thompson Reuters Symbols	Category	Type
0#BIF	S&P BSE SENSEX Equity Index	Futures contract
0#BHI	S&P BSE 100 Index futures	Futures contract
0#BIF*.BO	S&P BSE SENSEX Equity Index	Options contract
0#BHI*.BO	S&P BSE 100 Index Options	Options contract
0#BIR	Currency USD/INR	Futures contract
0#BEU	Currency EUR/INR	Futures contract
0#BGB	Currency GBP/INR	Futures contract
0#BJP	Currency JPY/INR	Futures contract
0#BSE91	Treasury Bill	Futures contract
0#B883	10 Yr G-Sec	Futures contract
0#B716	10 Yr G-Sec	Futures contract

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