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Financial Derivatives in India: A Case Study of BSE and NSE

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Abstract

Any country's financial system is responsible for overall development of that country. Financial system plays an important role in the economic development of the country. Healthy financial sector helps to increase the cash flow and create capital that contributes to development of the country. After the LPG, Indian financial market entered into new stage of global integration and liberalization. The study focused on analyzing the growth of financial derivatives in BSE and NSE in India and also at global front. It has been observed that Indian derivatives market has shown an impressive growth in India as well as global level.It also observed that financial derivatives had tremendously grown at NSE as compare to BSE. National Stock Exchange is third largest in the world in cash segment and first in the derivatives trading in the world in the year 2019.

Keywords: Financial Derivatives, BSE, NSE, Stock Future And Option, Index Future And Option.

Introduction

Financial system plays an important role in the economic development of the country. Healthy financial sector helps to increase the cash flow and create capital that contributes to development of the country.In India, the financial system has been divided into - money market also known as short term security market and capital market which is even known as long term security market. The capital market also consists of stock market, bond market, insurance market, derivatives market and foreign exchange market.

The government of India took an important policy reform in 1997 by liberalizing and globalizing the trade policies. These policies led to the change in the financial system bringing new and innovative financial instruments in the Indian financial market. Government of India launched financial derivatives in the year 2000 with the twin objective of hedging the price risk and reducing the fluctuation of price on commodity and capital market.With the launch of derivatives the Indian financial sector experienced tremendous growth in market turnover and increase in various contracts. Derivatives are risk management tool that helps organization to effectively transfer risk. The contract price of derivatives is determined from financial and non-financial assets.

In India trading in derivatives stated from stock market since 2000s with the introduction of index future contract followed by index option contract. The market turnover of NSE has grown from 23.65 billion in 2000-01 to 3027 trillion in 2019-20. Over the past twenty years the growth of Bombay Stock Exchange was not as appealing as National Stock Exchange. NSE flourished because of tremendous growth in market turnover, trading frequency and advanced technology.

Derivatives and its Classification

Buying or selling any assetsby singing a contract all such contract is called derivatives the value of this contract is derived from an underlying asset. Underlying asset is tradable in the market. Derivatives are contract where one parties agree to buy and another agree to sell a specific assets and specific quantity at specific price and on specific date. Thus, in this contract the transaction happens today and payment is made in future.If

the derivatives are a stock option the value depends upon price of stock.Derivatives are a contract which derives its value from the prices as index of price of underlying securities.

The derivatives market is classified into - financial derivatives and commodity derivatives. In financial derivatives, the underlying assets are like share, bond index, debenture, currency, interest rate. In commodity derivatives, the underlying assets are commodity like gold, silver, rice and wheat. Derivatives instrument and contract are four types: Forward contract, Future contract, Option contract and Swaps contract. Forward contract are contracts between two parties without the involvement of third party. Future contract is unlike a forward contract which is customized contract, it is a standardize contract between two parties, where one party agree to buy an agreed quantity of any asset such as commodity, currency, gold , crude oil at an agreed price and at given future date. This is also necessary to both the parties to keep a margin with clearing house and deposit the amount with the broker through with whom the agreement will be sign.

In the option contract, where one party agree to buy and the other party agree to sell an agreed quantity of an underlying assets at an agreed price within a specified period of time.Unlike a future contract the buyer of the option has the right but not obliged to buy or sell the underlying assets.Option contractare oftwo types -Call option and put option. The buyer of the option has no obligation to sell the assets. Swap contract is a type of exchange, it is an agreement between two parties to exchange the cash flows and liabilities in the future.

Derivative is a new phenomenon among the investors, the study attempts to explore the growth of derivative market in India as well at global front. Derivative helps the investors to reduce the future market risk. The present study aims to examine the growth of financial derivatives in BSE and NSE. Also, the study attempts to evaluate the performance of Indian derivatives market at the global level.

The study is divided into fivesections; the current section gives an overview about the derivative market, need of the study, objective of the study and section plan. Section 2 presents the wide review of related literature. Section 3 discusses the research methodology. Section 4 represents the data analysis of growth and performance of derivatives in India and at global level. The last section, section 5 concludes the study.

Review of Literature

Gupta and Rajkumar (2007) the purpose of this study was to explore the impact of derivatives trading on stock market volatility. The underlying assets are stock future and option, and index future and option. The monthly average data has been collected from SEBI bulletin for the six years start from the June 2000 to 2006. To measure the impact of derivatives on stock market volatility mean, S.D, regression coefficient, t-test was used. Thestudy concludes that the turnover of index future and option and stock future and option have significant impact on stock market volatile.

Gahlot, Datta, and Kapil (2010) examined the impact of derivatives trading on stock market volatility for the period 1997 to 2005. The underlying assets are S&P CNX Nifty and variables are turnover and number of contract. To analyze the results econometric tools ARCH and GARCH model were been used. The study concludes that the volatility in S&P CNX nifty has decline after introduction of S&P CNX nifty future.

Singh and Kansal (2010) have analysed the impact of derivatives trading on stock market volatility for the period of 2000 to 2009. The underlying asset is the Index future and option, stock future and option the variables are number of contract and total turnover. The statistical tools used in the study are mean, S.D, paired sample test. It was concluded that stock future dominates the derivatives market with 57% of total turnover in the year 2008-09 followed by index future it is been observed that introduction of derivatives trading had significant impact on stock market return.

Vashishtha and Kumar (2010) attempted to analyse the historical roots of derivatives trading, trend and growth of future prospect and challenge of derivatives market in India for the period of 2001 to 2008. The study concludes that India’s experience with launch of derivatives market has been extremely encouraging and successful.

Shalini and Ravindra (2014) explored the derivatives market in India and its current position in global market. The time period of this study 2000 to 2014. The variables analysed for the study is turnover, number of contract. To analyze the current position at global level the world index are been discussed. The studyconcludes that India has grown in derivative market and even surpassed its global partners.

Gautam and Kavidayal (2016)have analyzed the scenario of Indian derivatives market as well as global derivatives segments for the period 2010 to 2014. The analysed the movement in the Bombay stock exchange and national stock exchange andat the global setup world top five Index were studied. It was concluded that in world ranking NSE has 15^{th} rank in 2006, 8^{th} rank in 2008 and 4^{th} rank in 2013. So the Indian derivatives market has grown tremendously over years.

Bindal (2018) attempted to analyze the growth and position of Indian derivatives market and its trading in India. The secondary data has been collected from the books, newspaper and websites for period start from 2009 to 2017. The underlying assets are taken in this study currency future and option and variables are number of contract and turnover.On the basis of data analyzed it was concluded that financial derivatives market has vital role in risk management and economic growth.

Research Methodology

The study attempts to analyse the growth of BSE and NSE over the period of 2000-01 to 2019-20. The variables analysed for the study are - total turnover and number of contract for stock future and option, index future and option. The top 10 index of global derivatives trading are taken for the study to evaluate the performance of Indian derivatives market at the global level. The data are been sourced from the database of BSE and NSE and world federation exchange.

Data Interpretation

Growth of Derivatives Market in India: BSE and NSE

In 1875, the Bombay Cotton Trade Association (BCTA) started trading with future contract in India. But in the year 1952 government of India banned trading in cash settlement, option contract and derivatives trading. Stock trading in India shifted to informal forward market. In 1991, major change over happened in the Indian economy and that was the introduction of new economic reforms. Liberalization reform promoted overall competition in the Introduction of financial derivatives trading in India was promulgation of security law ordinance 1995. The ban on future commodity trading was withdrawn in 2000s. L.C.Gupta committeegranted final approval to start derivatives trading in India. SEBI permitted derivatives segment of two stock exchanges - BSE and NSE and even clearing house. SEBI approved trading in future contract based on S&P CNX NIFTY index and BSE30 and also known as SENSEX. Trading in index option contract commenced in June 2001 and option contract on individual security in June 2001. Future contract on individual stock were launched in November 2001.

Growth of Derivatives: BSE

BSE first launched SENSEX in June 2000 trading in future contract for the first time and also started trading in index option contract in June 2001. BSE started trading of stock option on July 9, 2001 and single stock futures contract in November 2002. In BSE the number of contract and turnover increased over a period of time

Chart 1: Growth of BSE Total Number of Contract

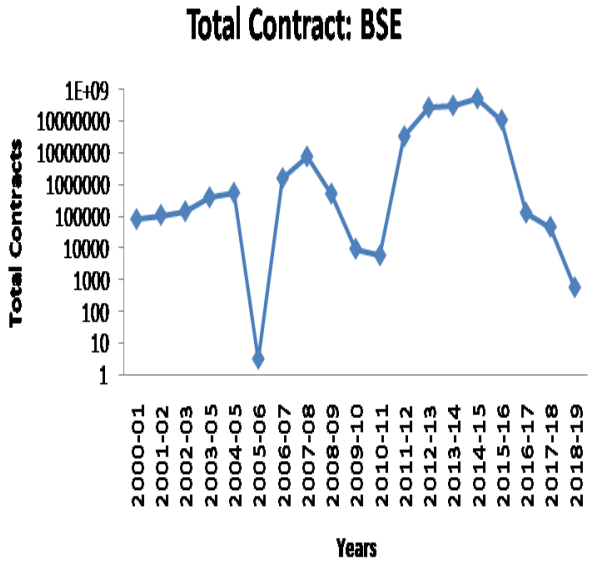

Chart 2: Growth of BSE Market Turnover

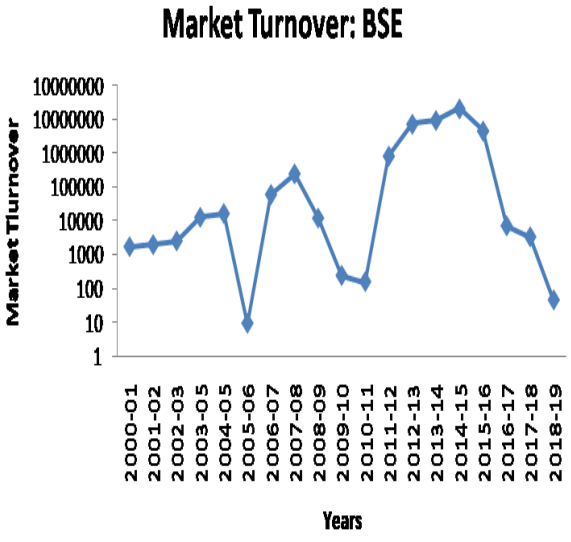

Chart 1 and 2 shows that growth of total number of contract and total turnover in BSE have increased over a period 20 years. The graph shows that the total turnover of BSE increased from 1673 crores in 2000-01 to 16112 crores in the year 2004-05. But in the year 2006 the total turnover had declined from rs.16112 crores to rs.9 crores.The main reasons for the sharp reduction in the number of contract and turnover was the meltdown in Indian stock market. This is because of rise in the interest rate in US due to inflationary expectations and a global fall in metal and other commodity prices was the prime reason for the stock market meltdown. These factors have contributed to the crash in stock

market.Turnover of cash and derivatives market have sharply fallen. After the recovery, Indian stock market has grown from rs.9 crores to 4475008.32croresin total turnover in the year 2015-16. In the year 2010-11 the Bombay stock exchange has launched liquidity enhancement incentive scheme from (LEIS). The number of contract and trading increased but on 1st April2016 the BSE discontinued the scheme of liquidity enhancement incentives programme it affected the trading and turnover in Bombay stock exchange. In the year 2017-18 there was a sharp fall in the turnover and trading contract. The total turnover has declined from rs. 445008.32 crore to rs.44 crores in the year 2018-19.In the above diagram clear shows that over a long period of time derivatives turnover and contract had been fluctuated.

Table 1: Business Growth of Index Future and Option at BSE (in rs.cr.)

INDEX						
	Index Option			Index Future		
Years	Turnover Call	Turnover Put	No. of Contract Call	No. of Contract Put	Turnover	No. of Contract
2000-01	-	-	-	-	1673	77743
2001-02	39	45	1139	1276	1276	79552
2002-03	1	0	41	2	1811	111324
2003-05	0	0	1	0	6572	246443
2004-05	1471	827	48065	27210	13600	449630
2005-06	3	0	100	0	5	89
2006-07	0	0	2	2	55491	1638779
2007-08	31	7.66	951	210	234660.16	7157058
2008-09	6.11	3.01	251	122	11757.22	495830
2009-10	137.76	-	5276	-	96	3744
2010-11	-	0.25	-	10	157.07	5613
2011-12	200089.57	418252.8	7206514	17569130	1.78448.53	7073334
2012-13	3230232.06	3797250	116324195	140909766	122429.78	4701927
2013-14	5705316.57	3349887	182685008	113674567	63493.84	2136269
2014-15	10112605.13	10016621	244203156	254031531	48632.35	1227926
2015-16	2560240.69	1825708	58773325	44664651	13097.16	306712
2016-17	1254.9	3214.45	24433	63916	2666.86	32288
2017-18	5.92	2.29	82	32	3217.51	44117
2018-19	-	-	-	-	33.55	379

Table 1 shows the business growth of index future and option contract and turnover at Bombay stock exchange.The data clearly shows that derivatives trading at BSE have declinedover the period of time but it has shown fluctuation in past 20 years. There were lots of reasons behind derivatives trading fluctuation at BSE. The index future introduce in the year 2000-01 the total number of contract was 77743 and total turnover Rs.1673croresand index option number of contract was 1139 in 2001-02, and total turnover of call and put option contract was Rs.39crores and Rs. 45 crores respectively. It has increased till 2004-05. In the year 2004-05 index future total number of contract was 449630 and total turnover was Rs.13600crores, and index option total number of contract was 48065 and total turnover of call and put was RS.1471crores and 827crores respectively. In the year 2005-06 the total number of contract and turnover of both index future and index option hasreduced. Index future total number of contract was reducedto 89 and total turnover reduced to Rs.5crores and index option total number of contract was 100 and total turnover of call and put was Rs.3crores and zero in the year 2005-06.The index future total number of contract and total turnover increased tors.178448.53crores and 72006514 respectively.Index option total number of contract of call and put increased to 17569130 and 7073334 respectively. In the year 2011-12, total turnover of call and put increased to Rs.200089.57crores and Rs.418252.8crores respectively. 1 April 2016 the BSE discontinued its market making scheme liquidity enhancement incentives programme, it so affected the trading and turnover in Bombay stock exchange and total turnover and number of contract have again sharply fall down. After 2016 the trend continued to show decline in total turnover and number of contract in both index future and index option.

Table 2: Business Growth of StockFuture and Option at BSE
(in rs.cr.)

STOCK						
Stock Option					Stock Future	
Years	Turnover call	Turnover put	No.of contract Call	No.of contract Put	Turnover	No. of contract
2000-01	-	-	-	-	-	-
2001-02	79	35	3605	1500	452	17951
2002-03	21	-	783	19	644	25842
2003-04	174	157	4391	3230	5171	128193
2004-05	2	-	72	17	213	6725
2005-06	-	-	2	-	1	12
2006-07	-	-	-	1	3515	142433
2007-08	0.21	0.14	9	6	7609.2	295117
2008-09	-	-	-	-	8.49	299
2009-10	-	-	-	-	0.3	8
2010-11	-	-	-	-	-	-
2011-12	1277.27	191.82	39848	7657	10216	326342
2012-13	5186.57	5059.75	178313	209557	3420.1	116933
2013-14	22185.51	23945.18	667365	877355	54599	1901877
2014-15	93854.5	81233.84	3010092	2700450	9794.3	305714
2015-16	31904.16	42408.53	1009439	1413452	13450	51815
2016-17	-	-	-	-	203.08	2901
2017-18	0.18	-	3	-	36.76	467
2018-19	0.08	-	2	-	10.52	169

The table 2 shows the business growth of stock option at Bombay stock exchange. The table clearly show the derivatives trading in BSE are didn't show steady rise, but it fluctuated over a period of time. The reason of the fluctuation we already discussed. In the year 2001-02 the total turnover and total number of contract of future stock was Rs.452crores and 17951 respectively, and stock option total turnover of both call and put was Rs.79crores and Rs.35crores respectively and total number of contract of call and put was 3605 and 1500 respectively. It is increase till 2004-05. In the year 2005-06 the stock future total number of contract and turnover was 12 and Rs.1crores respectively, and stock option total turnover and number of contract of call and put are zero. The stock future total turnover and number of contract increase Rs.10216crores and 326342 respectively, and stock option total turnover of both call and put was Rs.1277.27crores and Rs.191.82crores respectively, and total number of contract of call and put was 39848 and 7657 respectively. The stock future total turnover and total number of contract was Rs.10.52 and 169 respectively in the year 2018-19. The stock option total number of contract and turnover of call and put was nearest to zero.

Growth of Derivatives: NSE

NSE started index contract trading on June 12, 2000. The first derivatives product was S&P CNX index. The trading on index option contractwas introduced on June 4, 2001 and future contract on individual security started on November 9, 2001.Twenty years data clearly show that the NSE turnover and contract trading have shown a steep rise in last few years. The turnover rate increased manifold in the national stock exchange. The factorswhich contributed towards the growth of derivatives market was the price volatility risk which was transferred by the use of derivatives like future and option. It hedges the risk and protects the investors against adverse price movement in financial assets like equity, bond, and share exchange assets.
The globalization even led to the growth of the NSE derivatives in India. It is evident that globalization of industrial and financial activities necessitate the use of derivatives to guard against future losses. This factor alone has contributed to derivatives to a significant extent. The technological advancement in the area of high speed processors, network system and exchange method of data entry facilitated the rapid movement of information. It had its consequentimpact on market price and with the greater price volatility producers and consumers were exposed to grater price risk.

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Chart 3: Growth of Number of Contract: NSE

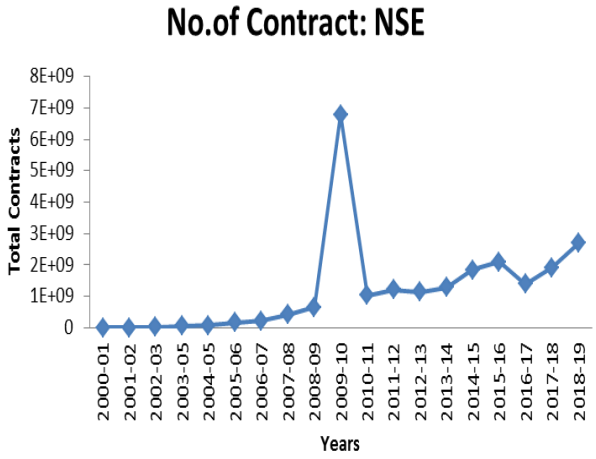

Chart 4: Growth of Total Turnover: NSE

Chart 3 and 4 shows the business growth of total turnover and number of contract at NSE. Over last twenty years clearly shows that NSE turnover and contract trading increased rapidly. In the year 2000-01 the turnover of NSE wasrs.23billionwhich increased tors.3027443 billion in 2019-20. The trading contract has increased from Rs.905billionin 2000-01 to rs.44693048billionby 2019-20.

Table3: Business Growth of Index Future and Option at NSE (in rs.Bn.)

INDEX				
Years	Index Option		Index Future	
	Turnover	No. of contract	Turnover	No. of contract
2000-01	-	-	23	905
2001-02	12	1759	214	10255
2002-03	1	4422	439	21267
2003-05	9	17324	5544	171916
2004-05	23	32935	7721	216354
2005-06	57	129351	15137	585378
2006-07	176	251574	25395	814874
2007-08	2928	553660	38206	1565985
2008-09	917	2120884	35701	2104281
2009-10	1244	3413795	39343	17830688
2010-11	1926	6506385	43567	1650236
2011-12	2530	8640177	35779	146188
2012-13	1843	8208771	25271	961003
2013-14	2440	9285651	30831	1052529
2014-15	2653	13786428	41072	1293030
2015-16	3512	16235284	45571	1405386
2016-17	3500	10672449	43359	665350
2017-18	4606	15150342	48104	5767845
2018-19	6540	26524574	55689	698245
2019-20	8392	40116201	55110	755602

The table 3shows the business growth of stock future and option at national stock exchange. Twentyyears data depicts that stock future and option trading and turnover have shown an increasing trend. In the year 2001-02 the stock future turnover was rs.515 billion and number of contract was 19578 whichincreased to rs.130055 billion and number of contract to 2221431 in 2019-20.The stock option has also shown an similar trend over a period of 2000-01 to 2019-20. In the year 2001-02 stock option turnover was rs.13 billion and number of contract was 10375 which increased to rs.1916 billion and 1771022 in the year 2019-20.

Table 4: Business Growth of StockFuture and Option at NSE (in rs.Bn.)

STOCK				
Years	Stock Option		Stock Future	
	Turnover	No. of Contract	Turnover	No. of Contract
2000-01	-	-		-
2001-02	13	10375	515	19578
2002-03	30	35230	2865	106768
2003-05	80	55830	13059	323688
2004-05	49	50451	14840	470430
2005-06	48	52407	27916	809054
2006-07	59	52833	38309	1049554
2007-08	135	94606	75485	2035879
2008-09	82	132959	34796	2215779
2009-10	152	140162	51952	1455912
2010-11	204	325083	54957	1860414
2011-12	192	364943	407476	1583446
2012-13	342	667781	42238	1477116
2013-14	464	801744	49492	1704141
2014-15	617	914792	82917	2376047
2015-16	611	1002991	78286	2342439
2016-17	955	921060	1112955	1738601
2017-18	1482	1264113	155975	2147583
2018-19	2000	1869865	161470	2555338
2019-20	1916	1771022	130055	2221431

The table 4 shows the business growth of index future at national stock exchange. Form 2000-01 to 2019-20 index future and option trading and turnover increased manifold. In the year 2000-01 the index future total number of contract and total turnover was 9058 and rs.23 billion respectively which increased to 755602 and rs.5511026.84crores in the year 2019-20. Index option has also shown an increasing trend. In the year 2001-02 total turnover was rs.12 billion and total number of contract 1759 which increasedtors.8392 billion and 40116201 in 2019-20.

Performance of Indian Derivatives Market at Global Front

Indian derivatives market especially national stock exchange is recorded very important and eminent role at global market. Hull (2004) " it is not surprising that derivatives market are growing fast in many developing countries, mainly China and India are two countries whose economy are expected to play a dominant role in 21th century".

Table 5: Top 10 World Index of Single Stock Option Contract Traded: 2018

Sr. No.	INDEX	VOLUME (in US Tn $)	AGR (%)
1	B3 SA Brasil Bolsa Balcao	11946	75
2	NASDAQ (US Markets)	7023	17
3	Cboe Global markets	4661	13
4	Nyse Derivstives	4449	40
5	International Security Exchange(ISE)	3269	8
6	BATS Global Markets	3145	15
7	Eurex	1888	12
8	National Stock Exchange of India	1700	46
9	MIAX Options Exchange	1225	6
10	Hong Kong Exchange And Clearing	1256	22

Table 5 shows that top ten global exchange of the world traded the stock option and recorded a very high annual growth rate. In the above table Brasil Bolsa Balcao exchange recorded a very high annual growth rate of 75% in the year 2018. Nation stock exchange India of India is on 8th rank and recorded the annual growth rate of 46%.

Table 6: Top 10 World Index of Single Stock Future Contract Traded: 2018

Sr. No.	INDEX	VOLUME (in US Tn $)	AGR (%)
1	Koria Exchange	5017	79
2	National Stock Exchange	2529	25
3	Moscow Exchange	2359	17
4	Eurex	1762	74
5	ICE Future Europe	1027	25
6	Thailand Future Exchange (TFEX)	553	17
7	Borsa Istanbul	546	197
8	TAIFEX	228	22
9	Athens Stock Exchange	132	-29
10	MEFF	111	-7

The above table depicts the top ten stock future traded exchange in the world.The Korea exchange emerged as first and largest exchange for stock future in the world in the year 2018 and recorded 79% annual growth rate. India has second largest in the world by trading of stock future and recorded a 25% annual growth rate.

Table 7:Top 10 World Index of Stock Index Options Contract Traded: 2018

Sr. No.	INDEX	VOLUME (in US Tn $)	AGR (%)
1	Nation Stock Exchange of India	22148	63
2	Korea Exchange	6768	22
3	Eurex	4191	12
4	Cboe Global Markets	3923	25
5	CME Group	2075	23
6	TAIFEX	1948	4
7	Hong Kong Exchange And Clearing	400	25
8	Japan Exchange Group	362	9
9	Tel-Aviv Stock Exchange	330	2
10	Moscow Exchange	311	-18

The above table show the top ten index option traded exchange in the world. Nation stock exchange of India top's the rank index option traded in the world.Korea is the second largest in the world and recorded 63% and 22% annual growth rate respectively.

Findings and Conclusion

Growth of the derivative market in BSE and NSE is remarkableover the period of last 20 years. In BSE, the derivatives trading has increased but generally fluctuated over time. There weremany reasons for the same - in the year 2005-06 the Indian stock market faced great stock market meltdown which was because of rise in the interest rate in US which led to inflationary expectations andthe global fall in metal and other commodity pricesthe another reason discontinuation liquidity enhancement incentives programmed in 2016.

In NSE the derivatives trading was blooming and saw a manifold growth of total turnover and number of derivatives contract traded in the stock exchange in India as well at global level. The reason for the growth of derivatives in NSE was the efficiency in market turnover and trading frequency.The factorswhich contributed towards the growth of derivatives market was the price volatility risk which was transferred by the use of derivatives like future and option. It hedges the risk and protects the investors against adverse price movement in financial assets like equity, bond, and share exchange assets.

At global level the performance of Indian derivatives market holds an important stand. Financial derivative has shown impressive growth at NSE as compare to BSE.NSE ranks 8th position in the world traded exchange index was with annual growth rate 64%.While trading in single stock future,NSE ranks 2ndwith annual growth rate 25% in the world after Korea index. Trading of index option, NSE topped the list with annual growth rate 63% in the world and also claimed to be a global leader in trading of financial derivatives.

Innovations in derivatives have transformed the landscape of financial sector across the world and derivatives have earned a well-deserved and remarkable position among all financial product.India is one of the most successful developing countries in terms of vibrant market for exchange-traded derivatives with the increasing awareness in the investors. The equity derivatives playa major role in shaping price. It is observed that Indian derivatives market has shown an impressive growth at global level.

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