



## **A STUDY ON TREND AND GROWTH OF DERIVATIVES MARKET: EVIDENCE FROM BSE AND NSE IN INDIA**

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### **Abstract**

*The main aim of study is to identify the trend and growth rate of derivative market in India and to compare the performance of derivative market of BSE and NSE. Data for the study is collected from secondary sources such as official websites of BSE, NSE and monthly bulletins of SEBI. Data for the study is covered from 2010-2022. The study concludes that the average annual number of contracts and its turnover of derivative instruments in NSE are exponentially more than those of BSE. They are not consistent number of contracts of derivative instruments throughout the study period. They are rightly skewed. Compound annual growth rate of NSE derivative instruments is almost positive. NSE outperforms BSE in no. of contracts and its turnover of stock future, stock option, call and put during the study period.*

**Keywords:** *Derivatives market, Index Future and Stock Future, Index Option and Stock Option, Call and Put.*

### **Introduction**

India, one of the developing countries is on the way of managing and mitigating the risks in various forms. In tot it is a device which can be used for the purposes of hedging risk for risk averse and earning profits for risk takers. Financial derivatives are one type of financial instrument whose main purpose is to provide commitments of prices for future dates. Commitment is given to protect one against the adverse movements or fluctuations in the price. Another aspect of financial derivative is the aspect of earning profit.

A derivative is a financial security with a value that is reliant upon or derived from, an underlying asset or group of assets. The most common underlying assets for derivatives are stocks, bonds, commodities, currencies, interest rates, and market indexes. Derivatives can be traded in stock exchange markets or over-the-counter (OTC) markets. The most commonly traded derivatives are futures, forwards, options and swaps. Derivatives were originally meant to balance the exchange rate for internationally traded goods. But as of today it is used for wider purposes like hedging, speculation, arbitrage and so on. The derivative market in India has been growing steadily since its 'introduction' in June 2000.

Derivative products improve the price discovery process and provide increased informational flow in the market.

### **Literature Reviews**

**Parizad PhirozeDungore, Kulbir Singh & Rajesh Pai (2022)** the study found that the volume dynamics suggest the frequency of trades for individuals is large (94.13% Number of futures contracts traded; 91.14% number of options contracts traded). By volume, individuals trade 50% on average compared to others. Hence, the number of trades entered into by retail investors is large, especially



when the market gains momentum as they speculate to benefit from meager fluctuations in price changes. Another observation stated that large non-day trades for Nifty Index futures contracts were less likely to take place during periods of high volatility, and preliminary investigation suggests that public and private companies trade approximately 46% by volume of intraday and non-day traded contracts.

**Prof. Suman Mishra et al., (2022)** concluded that the rise of derivatives market is a resourceful achievement of financial engineering that provides an effective and less costly solution to the problem of risk that is implanted in the price pickiness of the underlying asset. In India, the development and progress of derivatives market is relatively a recent phenomenon.

**Sreelekha Upputuri , M.S. V Prasad and Sandhya Sri (2021)** the emergence of derivatives market is an ingenious feat of financial engineering that provides an effective and less costly solution to the problem of risk that is embedded in the price unpredictability of the underlying asset. The study concluded that the India's experience with the equity derivatives market has been extremely positive over the years.

**Devis J S Palathra, Yadukrishnan V (2020)** the equity derivatives market turnover has grown from Rs.2365 Cr. in 2000-2001 to Rs. 257175099.5 Cr. in 2019-20.

**Neha Shekhawat and Randeep Singh (2019)** the Indian derivative market has achieved tremendous growth over the years, and also has a long history of trading in various derivatives products. Finally, it is concluded that there is big significance and contribution of derivatives to Indian market and good importance in future prospects.

**V. Oliinyk et al., (2019)** the results of a research have confirmed positive correlation and causality of indicators of economic growth from use of exchange derivatives in real economy. It is received for the studied period of 2000-2015 proofs that the exchange market of derivatives of the USA positively influences the economic.

**Dr.V.Usha Kiran and Kishan (2018)** the overall business growth in each and every product in derivatives at NSE is signaling a positive trend. CAGR of equity derivatives and Interest rate futures stands at 94% and currency derivative segment with 53%. All the Derivative segments at NSE have a positive correlation between contracts and total turnover. In the coming years India will be one the prominent derivative transaction destinations of the world.

**Mohammed Rubani (2017)** resulted in partly deregulating the exchange rates, removing the trade controls, reducing the interest rates, making major changes for the capital market entry of foreign institutional investors, introducing market-based pricing of government securities, etc. All these measures have increased the volatility of prices of various goods and services in India to producers and consumers alike. Further, market determined exchange rates and interest rates also created volatility and instability in portfolio values and securities prices. Hence, hedging activities through various derivatives emerged to different risks.

**U. Motorniuk et al., (2016)** Activity in global OTC derivatives markets fell in the first half of 2015. The notional amount of outstanding contracts declined from \$629 trillion at endDecember 2014 to \$553 trillion at end-June 2015. Even after adjustment for the effect of exchange rate movements on positions denominated in currencies other than the US dollar, notional amounts were still down by about 10%.



**Kostiantyn VOZIANOV (2015)** The development of the CEE derivatives market is characterized by rapid growth of derivatives trading for the past two decades; high concentration of trading volumes on the stock market; offering a wide range of derivative products, allowing investors to effectively hedge risk or get exposure; exchange consolidation; tendency to increased use of modern telecommunication technologies etc. The key problems of CEE derivatives market are low liquidity and the lack of domestic investors for achieving the desired depth of the market.

**Prakash Yalavatti (2015)** The Indian derivative market has exhibited exponential growth in terms of volume and number of contracts traded. The market turnover of NSE has grown from Rs 2,365 Crores in 2000-01 to Rs 3,82,11,408.05 crores in 2013-14 and BSE market turnover also increased from Rs 5021.81 crores in 2003-04 to Rs 92,19,434.32 crores in 2013-14. Within a short span of fourteen years, there is a substantial development in derivatives trading in terms of turnover and number of contracts traded in India.

**S Revathy et al., (2014)** found that the risk premium of equity is essentially the same as commodity, equity returns are negatively correlated with commodity return and currency return and also found that the equity, commodity, and currency derivatives are used for hedging purpose.

**Ms. Shalini H S and Dr. Raveendra P V (2014)** In India, the emergence and growth of derivatives market is relatively a recent phenomenon. Since its inception in June 2000, derivatives market has exhibited exponential growth both in terms of volume and number of contracts traded. The market turnover has grown from Rs.2365 Cr. in 2000-2001 to Rs. 26444804.86 Cr. in 2013-14. Within a short span of twelve years, derivatives trading in India has surpassed cash segment in terms of turnover and number of traded contracts.

**Shruthi B.C and Dr. N. Suresh (2013)** concluded that the performance of derivatives in NSE is lot higher than BSE and the NSE is on par with the global exchanges compared to BSE in terms of the number of contracts traded for Stock Index Options and Futures and also Stock Futures.

**Ashutosh Vashishtha and Satish Kumar (2010)** the derivatives turnover on the NSE has surpassed the equity market turnover. Significantly, its growth in the recent years has surpassed the growth of its counterpart globally. The market turn-over has grown from Rs.2365 crore in 2000-2001 to Rs. 11010482.20 crore in 2008-2009. Within a short span of eight years, derivatives trading in India has surpassed cash segment in terms of turnover and number of traded contracts.

**Dr. Gurcharan Singh and Salony Kansal (2010)** the finding suggests that a derivative trading has reduced the volatility. The decrease in volatility would be mainly attributed to the fact that derivative markets attract an additional set of traders to the market, which led to increase in the trading volume. With the increase in trading volume, a greater liquidity will be reflected in the prices of the underlying market and then the market will become more stable.

### **Need for the Study**

The derivatives are new innovative products in Indian capital market. The real growth and development of derivatives market can be traced after 2000-01 onwards. Many regulatory frameworks have been developed and many committees were set up to give suggestions and recommendations for derivatives market developments in India. But still the Indian derivatives market is not well-developed market compared to the other country's derivatives market. So, there is a need to understand the



present level of growth and development of financial derivatives markets India to think further for its development.

### Objectives of the Study

1. To study the trend and the growth rate of derivative market in India.
2. To compare the performance of derivative market of BSE and NSE.

### Hypotheses Development

**H<sub>0</sub>:** There is no significant difference between means of number of contracts and turnovers of BSE and NSE during the study period.

### Research Methodology

Research Methodology suggests the ways and methods for conducting research is exploratory research. The study is based on secondary data. Data for the study is collected and analyzed from published sources such as official websites of BSE, NSE and monthly bulletins of SEBI. Data for study is thirteen years covering from 2010 2022. The data collected for the study is graphically presented, adequately tabulated, suitably analyzed and meaningfully interpreted. Descriptive statistics and inferential statistics are used for analysis.

### Derivatives of the Study

The following list of variables of derivative market of BSE and NSE has been taken under study;

1. Index Future
2. Stock Future
3. Index Option (Call)
4. Stock Option (Call)
5. Index Option (Put)
6. Stock Option (Put)

### Results and Discussions

**Table No1: Index Future of BSE and NSE**

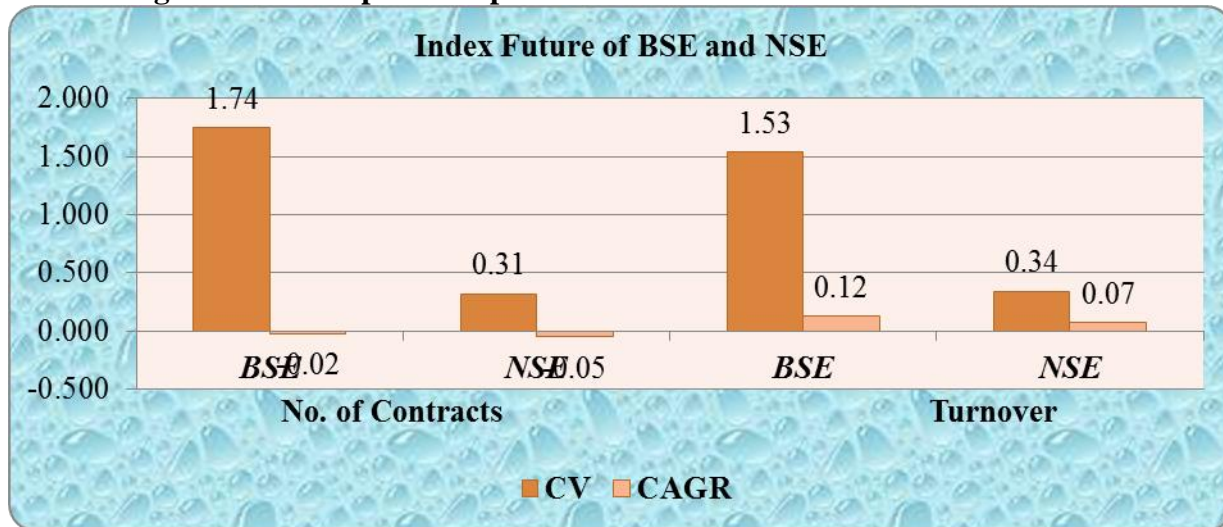
Year	Index Future			
	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	5613	165023653	154	4356755
2011-12	7073334	146188740	178449	3577998
2012-13	4704602	96100385	122374	2527131
2013-14	2136269	105270529	63494	3085297
2014-15	1227926	129314318	48632	4109472
2015-16	306712	140538768	13097	4557124
2016-17	32288	66535071	2267	4335941
2017-18	44117	57674584	3218	4810454
2018-19	438	69824522	39	5568914
2019-20	150212	94472538	14934	6677312
2020-21	47311	100944165	4286	6491027
2021-22	4454	93662937	493.58423	8429378
<b>P-value</b>	<b>0.000</b>		<b>0.000</b>	



<b>Average</b>	<b>1311106.333</b>	<b>105462517.500</b>	<b>37619.799</b>	<b>4877233.614</b>
<b>SD</b>	<b>2290904.905</b>	<b>33632528.685</b>	<b>57731.116</b>	<b>1668507.253</b>
<b>CV</b>	<b>1.747</b>	<b>0.319</b>	<b>1.535</b>	<b>0.342</b>
<b>Skew</b>	<b>1.956</b>	<b>0.339</b>	<b>1.766</b>	<b>0.786</b>
<b>Kurt</b>	<b>3.146</b>	<b>-0.789</b>	<b>2.437</b>	<b>0.458</b>
<b>CAGR</b>	<b>-0.023</b>	<b>-0.055</b>	<b>0.124</b>	<b>0.068</b>

Source: Author's Compilation

Figure No 1: Graphical Representation of Index Future of BSE and NSE



Average annual number of index future contracts and turnovers are Rs. 1311106.333 and 37619.799 and 105462517.500 and 4877233.614 in BSE and NSE respectively during the study period. NSE is more consistent in comparison with BSE. Only NSE has Compound Annual Growth Rate. Both of them are rightly skewed; hence, their average means are greater those of median. They are leptokurtic in BSE. Rest of them are platykurtic during the study the period.

It is evident from p-value of t' statistic that the null hypothesis is rejected and hence, there is significance difference between means of number of contracts and turnover of index future of BSE and NSE.

Table No 2: Stock Future of BSE and NSE

Year	Stock Future			
	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	0	186041459	0	5495757
2011-12	326342	158344617	10216	4074671
2012-13	116933	147711691	3418	4223872
2013-14	1901877	170414186	54609	4949282
2014-15	305714	237604741	9794	8291766
2015-16	51815	234243967	1350	7828606
2016-17	2901	173860130	203	11129587
2017-18	467	214758366	37	15597520
2018-19	271	255533869	18	16147011

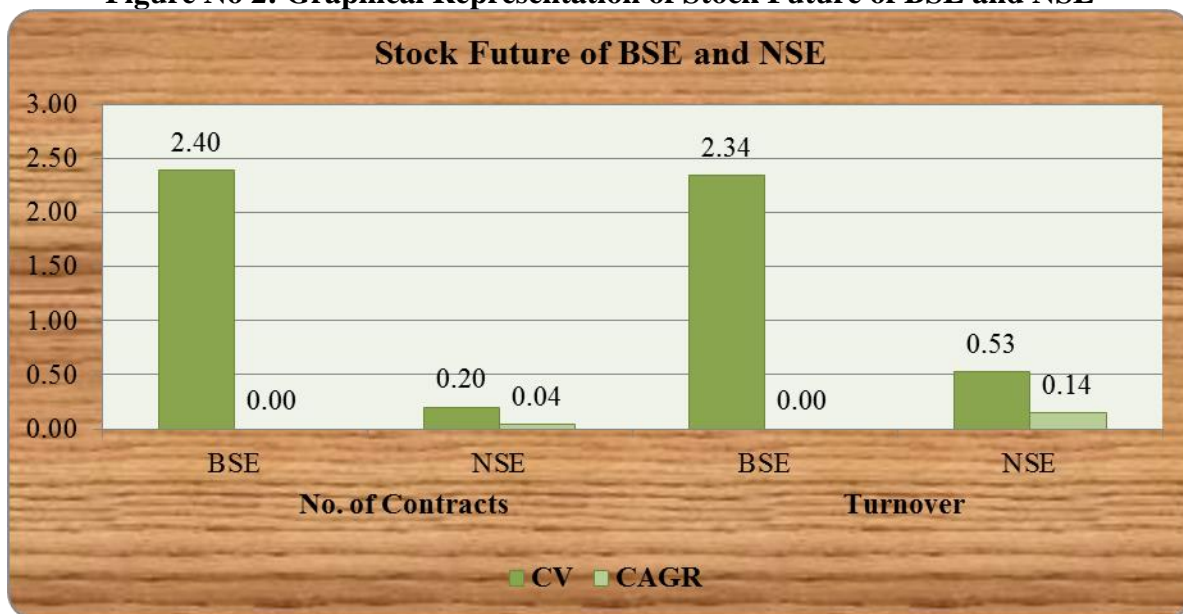




2019-20	2983	256643910	163	14874729
2020-21	0	192219079	0	12694418
2021-22	0	265608826	0	21038938
<b>P-value</b>	<b>0.000</b>		<b>0.000</b>	
<b>Average</b>	<b>225775.250</b>	<b>207748736.750</b>	<b>6650.667</b>	<b>10528846.376</b>
<b>SD</b>	<b>541192.155</b>	<b>41521469.049</b>	<b>15565.785</b>	<b>5574478.883</b>
<b>CV</b>	<b>2.397</b>	<b>0.200</b>	<b>2.340</b>	<b>0.529</b>
<b>Skew</b>	<b>3.182</b>	<b>0.036</b>	<b>3.130</b>	<b>0.447</b>
<b>Kurt</b>	<b>10.499</b>	<b>-1.599</b>	<b>10.204</b>	<b>-0.893</b>
<b>CAGR</b>	<b>0</b>	<b>0.036</b>	<b>0</b>	<b>0.144</b>

Source: Author's Compilation

Figure No 2: Graphical Representation of Stock Future of BSE and NSE



The average annual number of stock future contracts in NSE is more than that of BSE during the study period. No stock future contracts in BSE during 2010-11, 2020-21 and 2021-22. They are more consistent in NSE. All of them are rightly skewed. Stock future of NSE and BSE are platykurtic and leptokurtic respectively. The CAGR of NSE is 3.6% and 14.4% during the study period. There are significant differences among the number of contracts and turnover in BSE and NSE. Hence, null hypothesis is rejected.

Table No 3: Index Option (Call) of BSE and NSE

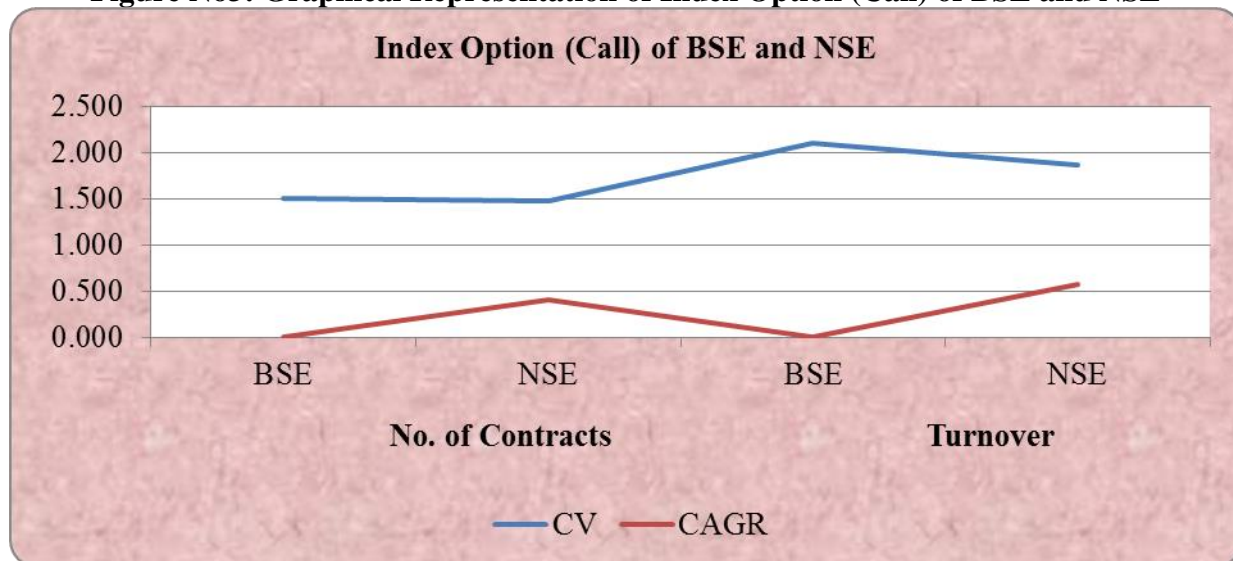
Year	Index Option (Call)			
	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	NA	314533244	NA	9090702
2011-12	7206514	428034677	200090	11554301
2012-13	116324195	408530477	3230232	11581485
2013-14	182685008	452047068	5705317	13823059
2014-15	244203156	701416670	10112605	20771439



2015-16	58773325	837683830	2560541	26063791
2016-17	24433	548735127	1255	38097964
2017-18	82	783312918	6	71028905
2018-19	19158	1391027617	1309	107726327
2019-20	2032161	2480471005	200440	169696654
2020-21	98463305	2812742661	10028162	189135795
2021-22	516462443	9136661286	52641382	846479110
<b>P-value</b>	<b>0.037722704</b>		<b>0.093954403</b>	
Average	102182815.000	1691266381.667	7056778.281	126254127.690
SD	154090653.776	2484771596.320	14850736.562	235404598.802
CV	1.508	1.469	2.104	1.865
Skew	2.036	2.860	3.084	3.051
Kurt	4.499	8.740	10.004	9.825
CAGR	0	0.401	0	0.574

Source: Author's Compilation

Figure No3: Graphical Representation of Index Option (Call) of BSE and NSE



During the study period, average annual number of index option (call) contracts and turnover are more by 16% in NSE than those of BSE. They are inconsistent and rightly skewed. CAGR of them in NSE is 40.1% and 57.4% respectively. All of them are platykurtic during the study period. Significance difference between number of index option (call) contracts in BSE and NSE have become evident from p-value of t' statistic.

Table No 4: Stock Option (Call) of BSE and NSE

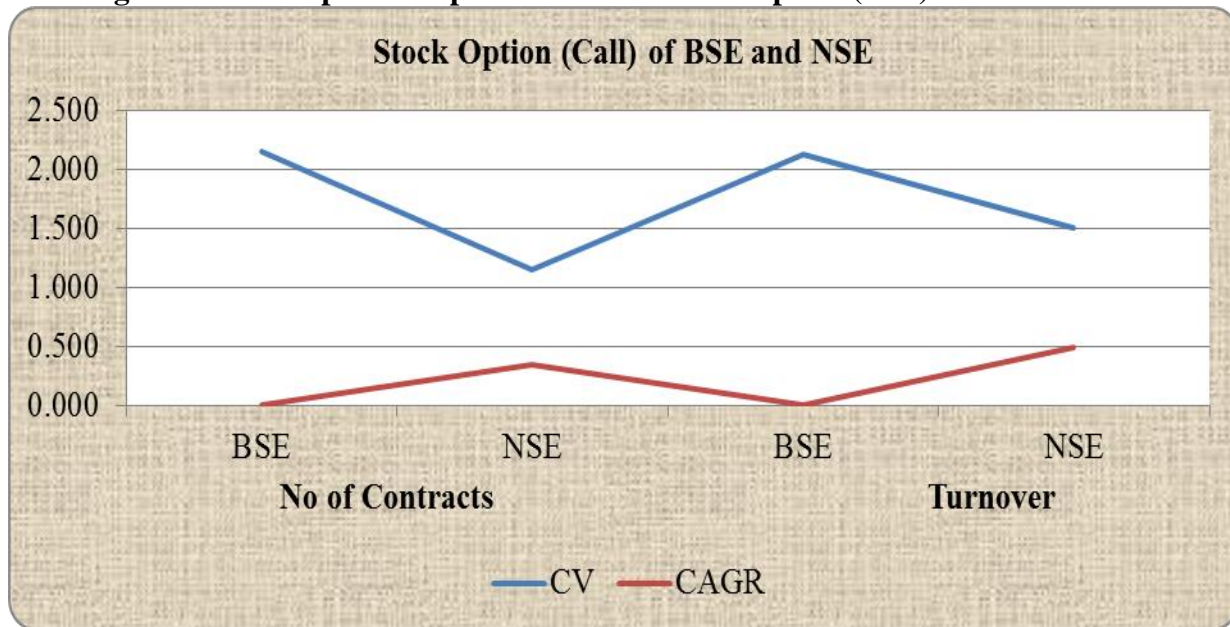
Stock Option (Call)				
Year	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	0	24273560	0	777109
2011-12	39848	24565283	1277	671770
2012-13	178313	42499219	5186	1302779



2013-14	667365	50300025	22186	1543895
2014-15	3010092	61204473	93854	2243382
2015-16	1009439	65322962	31904	2325030
2016-17	0	61205774	0	4147488
2017-18	3	86282094	0	6728007
2018-19	2	123510308	0	8517920
2019-20	8473	125587962	626	8003237
2020-21	0	150484927	0	11505459
2021-22	0	481501426	0	40928812
<b>P-value</b>	<b>0.006616067</b>		<b>0.031770197</b>	
Average	409461.250	108061501.083	12919.417	7391240.657
SD	881452.829	124360828.037	27542.758	11146246.904
CV	2.153	1.151	2.132	1.508
Skew	2.753	2.849	2.720	2.873
Kurt	7.998	8.874	7.811	8.966
CAGR	0	0.348	0	0.486

Source: Author's Compilation

Figure No 4: Graphical Representation of Stock Option (Call) of BSE and NSE



No Stability in number of stock option (call) contracts and turnover are in BSE and NSE. NSE is exponentially greater than those of BSE. They are right skewed. NSE outperforms BSE both in number of contracts and its turnover by 34% and 48%. There is a significant difference among the means of number of stock option (call) contracts and its turnover in BSE and NSE. Hence null hypothesis is rejected.



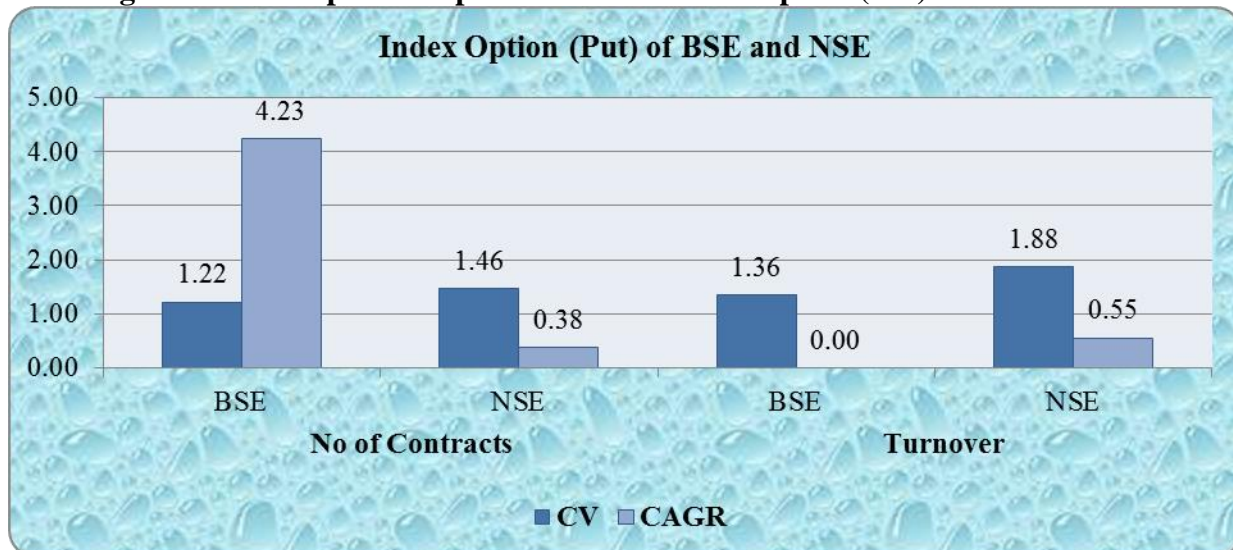


**Table No 5: Index Option (Put) of BSE and NSE**

Index Option (Put)				
Year	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	NA	336105313	NA	9274664
2011-12	17569130	435983059	418253	11165731
2012-13	140909766	412346672	3797249	11200089
2013-14	113674567	476518107	3349884	13944282
2014-15	254031531	677226193	10016621	19151225
2015-16	44654651	785844656	1825708	22888140
2016-17	63916	518509789	3214	34699323
2017-18	32	731721304	2	63892971
2018-19	11298	1261429870	885	95576078
2019-20	480178	2095899292	45523	140995316
2020-21	94917467	2546901586	8045015	167628813
2021-22	154054127	8486599364	13436452	763018087
<b>P-value</b>	<b>0.034080892</b>		<b>0.074269362</b>	
Average	68363889.417	1563757100.417	3411567.157	112786226.554
SD	83268993.531	2290883975.574	4622855.942	211782319.656
CV	1.218	1.465	1.355	1.878
Skew	1.094	2.939	1.289	3.087
Kurt	0.523	9.169	0.528	10.018
CAGR	4.233	0.381	0	0.554

Source: Author's Compilation

**Figure No 5: Graphical Representation of Index Option (Put) of BSE and NSE**



Average annual number of index option (Put) contracts in NSE is greater as against the BSE over the study period. They are inconsistent and are rightly skewed. Their exponential growth in NSE as against BSE. As it is evident that the p value of t' statistics is less than 5% level of significance. Hence,



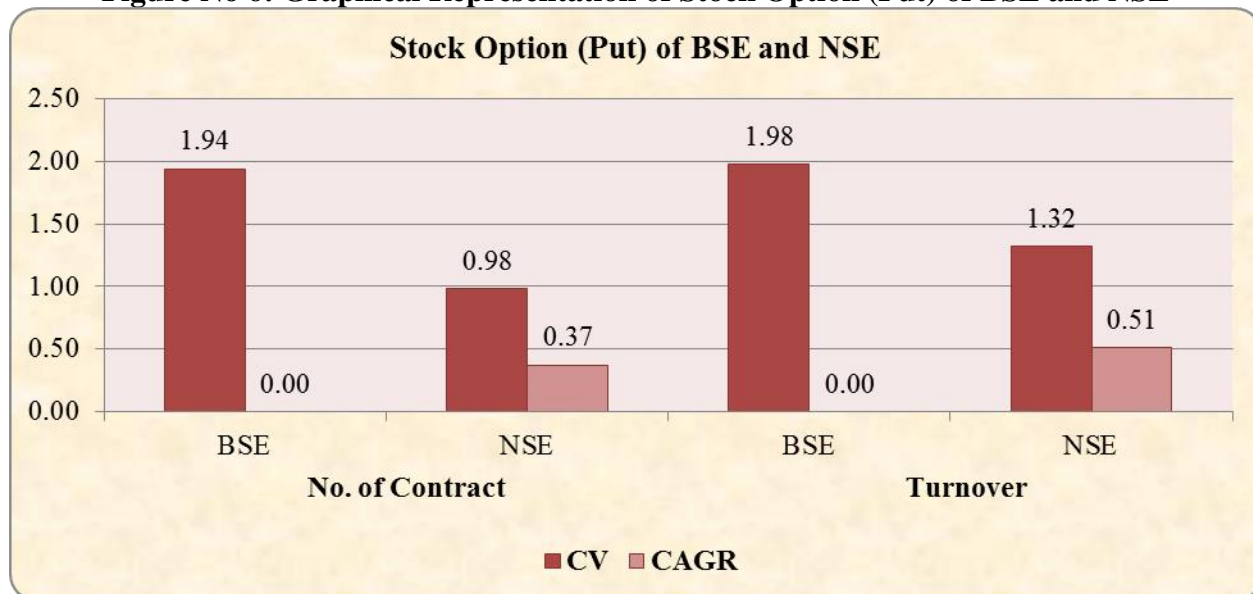
there is significant and insignificant differences between the means of number of index options (put) contracts and its turnover of BSE and NSE respectively.

**Table No 6: Stock Option (Put) of BSE and NSE**

Stock Option (Put)				
Year	No. of Contracts		Turnover (₹ crore)	
	BSE	NSE	BSE	NSE
2010-11	NA	8234833	NA	253235
2011-12	7657	11929088	192	305261
2012-13	209557	24278974	5060	697648
2013-14	877355	29874406	23945	865594
2014-15	2700450	30274736	81234	1039170
2015-16	1413452	34976212	42409	1163144
2016-17	NA	30900238	NA	1959998
2017-18	NA	40129282	NA	2927002
2018-19	NA	63476234	NA	4064454
2019-20	7876	72247170	583	4285645
2020-21	NA	72950447	NA	5022611
2021-22	NA	196010301	NA	15338809
<b>P-value</b>	<b>0.002023432</b>		<b>0.015947072</b>	
Average	434695.583	51273493.417	12785.250	3160214.222
SD	844045.472	50308305.388	25289.736	4175510.504
CV	1.942	0.981	1.978	1.321
Skew	2.176	2.450	2.234	2.579
Kurt	4.534	6.946	4.807	7.502
CAGR	0	0.373	0	0.507

Source: Author's Compilation

**Figure No 6: Graphical Representation of Stock Option (Put) of BSE and NSE**





BSE and NSE have instability in number of stock option (put) contracts and its turnover. Both of them have right skewed and platykurtic. NSE outperforms BSE exponentially.

There is a significant difference among the means of number stock option (put) contracts and its turnover in BSE and NSE. Hence, null hypothesis is rejected.

### Conclusion

The study concludes that the average annual number of contracts and its turnover of derivative market in NSE are exponentially more than those of BSE. Both the BSE and NSE derivative markets are rightly skewed; hence, their average means are greater those of median. There is no consistent number of contracts of derivative instruments in Bombay stock exchange and national stock exchange in India throughout the study period. Compound annual growth rate of NSE derivative instruments is almost positive.

In nutshell, NSE outperforms BSE in no. of contracts and its turnover of stock future, stock option, call and put during the study period.

It is evident from p-value of t' statistic that the null hypothesis is rejected and hence, there is significance difference between means of number of contracts and its turnover of BSE and NSE except number of index options (put) contracts and its turnover of BSE and NSE.

### Limitations and Further Research Scope

The study is mainly confined to the selected derivative market of BSE and NSE in India. The period of the study is only thirteen years which is another limitation of the study. There is a need to increase the number of financial products available in Indian derivatives market. Finally, there is a need to undertake Indian derivatives market to compare with World Derivatives Market to draw the meaningful insights from the data for future scope of research.

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