



AN EMPIRICAL STUDY ON GROWTH AND DEVELOPMENT OF FINANCIAL DERIVATIVES IN INDIA

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Abstract

The derivatives market plays a crucial role in the economic development of a country. Financial derivatives have caused a drastic change in the growth of the financial market. Financial derivatives have caused a drastic change in the growth of the financial market. The equity derivatives market has exhibited exponential growth both in terms of volume and number of contracts traded. In this paper, there is growth in index futures and index options as well as growth in stock futures, the number of contracts established, the daily total turnover in the year, and the average daily trading turnover. The study found that the growth of equity derivatives, commodity and debt market performance, and options segment. The derivatives market has been showing an upward trend since its inception in 2013–2023. The data collected from the NSE website has been analyzed to trace the growth in the equity derivatives market for four derivative products, viz., stock futures, stock options, index futures, and index options. The index options are dominating the NSE. This reveals that Indian investors' awareness of derivatives trading and index options is growing in general. To analyze day trading dynamics for Nifty Index futures and options contracts, a detailed study is conducted to understand the quantum of volume traded and how volume traded affects the underlying volatility.

Key Words: Capital market, Derivatives, Forward, Futures, Options, Equity.

Introduction

Market liquidity, an important factor that affects market efficiency, is primarily determined by the effectiveness and efficiency of the market's price discovery function. Financial markets with a high volume traded provide more liquidity for market participants than thinner markets with few available securities and participants and thus limited trading opportunities. The heterogeneity of market participants in terms of transaction needs, risk appetites, and investment horizons can enhance market liquidity. Bearing in mind these factors, this study is an attempt to understand trading dynamics for Nifty Index futures and options contracts traded on the National Stock Exchange (NSE) of India.

The derivative segment in India has grown by leaps and bounds within a span of 16 years, positioning India among the top five derivative markets in the world. Compared to cash markets, the volumes in the derivative markets have been enormous. Since 2008–09, index options have become the dominant product traded. The percentage turnover in Index options was 75.0 percent of total turnover in the equity derivative segment in 2015–16. The share of single stock futures has decreased to 12.4 percent from 57.7 percent in the same period. This trend continued until the present time in 2021. Index options continue to dominate, and a surge is witnessed in 2019–20 with the premium turnover almost doubling in 20–21 as compared to the previous year for Index as well as stock options. Table 1 provides details about the shifting trading pattern in equity derivative contracts.



To understand trading dynamics, the growth and prominence of derivative trading is studied. Intra-day trades are also analyzed for significant relationships. The popularity of day trading stems out of the ability of the day trader to take advantage and make profits of market inefficiencies as well as market volatility. The Securities and Exchange Board of India (SEBI), the regulator of the Indian Securities market, has not provided any definition for day trading through any of its circulars, rules or regulations. In India, day trading is allowed for retail investors in both the cash and derivative segment. On the other hand, institutional investors day trade only in derivative contracts

The emergence of the market for derivatives products, most notably forwards, futures and options, can be tracked back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. By their very nature, the financial markets are marked by a very high degree of volatility. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking-in asset prices. As instruments of risk management, these generally do not influence the fluctuations in the underlying asset prices. However, by locking-in asset prices, derivative product minimizes the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors.

Derivatives are risk management instruments, which derive their value from an underlying asset. The underlying asset can be bullion, index, share, bonds, currency, interest, etc.. Banks, Securities firms, companies and investors to hedge risks, to gain access to cheaper money and to make profit, use derivatives. Derivatives are likely to grow even at a faster rate in future. The objective of an investment decision is to get required rate of return with minimum risk. To achieve this objective, various instruments, practices and strategies have been devised and developed in the recent past. With the opening of boundaries for international trade and business, the world trade gained momentum in the last decade, the world has entered into a new phase of global integration and liberalisation. The integration of capital markets world-wide has given rise to increased financial risk with the frequent changes in the interest rates, currency exchange rate and stock prices. To overcome the risk arising out of these fluctuating variables and increased dependence of capital markets of one set of countries to the others, risk management practices have also been reshaped by inventing such instruments as can mitigate the risk element. These new popular instruments are known as financial derivatives which, not only reduce financial risk but also open us new opportunity for high-risk takers. These were simple contracts developed to meet the needs of farmers and were basically a means of reducing risk. Derivative markets in India have been in existence in one form or the other for a long time.

The more detail about evolution of derivatives is shown in table No.1 with the help of the chronology of the events.

A Chronology of events: Financial Derivatives in India:

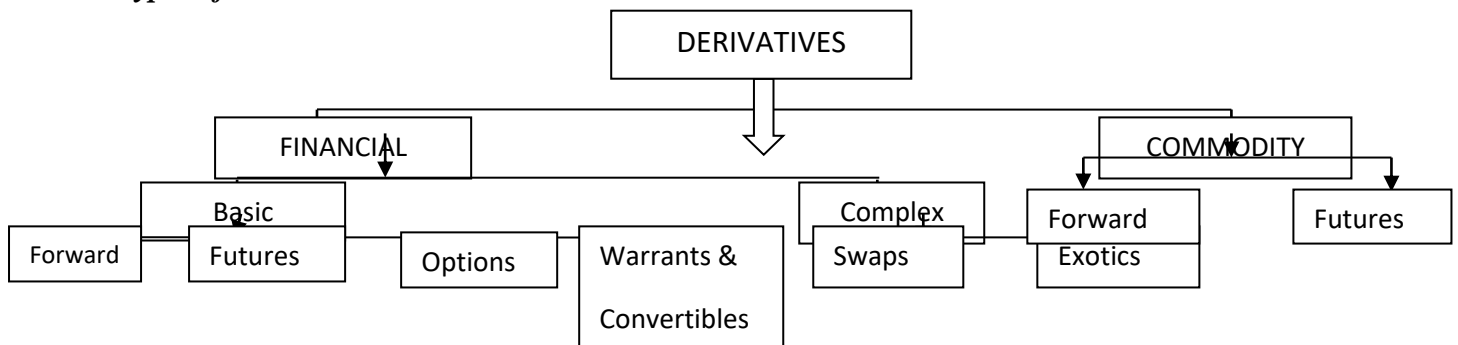
s/no	progress date	progress of financial derivatives
1	1952	Enactment of the forward contracts (Regulation) Act.
2	1953	Setting up of the forward market commission
3	1956	Enactment of Securities Contract Regulation Act 1956
4	1969	Prohibition of all forms of forward trading under section 16 of SCRA.
5	1972	Informal carry forward trades between two settlement cycles began



		on BSE.
6	1980	Khuso Committee recommends reintroduction of futures in most commodities. 7
7	1983	Govt. amends bye-laws of exchange of Bombay, Calcutta and Ahmadabad and introduced carry forward trading in specified shares
8	1992	Enactment of the SEBI Act.
9	1993	SEBI Prohibits carry forward transactions.
10	1994	Kabra Committee recommends futures trading in 9 commodities
11	1995	G.S. Patel Committee recommends revised carry forward system.
12	14th dec 1995	NSE asked SEBI for permission to trade index futures
13	1996	Revised system restarted on BSE.
14	18th nov 1996	SEBI setup LC Gupta committee to draft frame work for index futures
15	11th may 1998	LC Gupta committee submitted report
16	1st June 1999	Interest rate swaps/forward rate agreements allowed at BSE
17	7th july1999	RBI gave permission to OTC for interest rate swaps/forward rate agreements
18	24th may 2000	SIMEX chose Nifty for trading futures and options on an Indian index
19	25th may 2000	SEBI gave permission to NSE & BSE to do index futures trading
20	9th June 2000	Equity derivatives introduced at BSE
21	12th June 2000	Commencement of derivatives trading (index futures) at NSE
22	31st aug 2000	Commencement of trading futures & options on Nifty at SIMEX
23	1st June 2001	Index option launched at BSE
24	Jun-01	Trading on equity index options at NSE
25	Jul-01	Trading at stock options at NSE
26	9thb July 2001	Stock options launched at BSE
27	Jul-01	Commencement of trading in options on individual securities
28	1st nov 2001	Stock futures launched at BSE
29	Nov-01	Commencement of trading in futures on individual security
30	9th nov 2001	Trading of Single stock futures at BSE
31	Jun-03	Trading of Interest rate futures at NSE
32	Aug-03	Launch of futures & options in CNX IT index
33	13th sep 2004	Weekly options of BSE
34	Jun-05	Launch of futures & options in Bank Nifty index
35	Dec-06	'Derivative Exchange of the Year by Asia risk magazine
36	Jun-07	NSE launches derivatives on Nifty Junior & CNX 100
37	Oct-07	NSE launches derivatives on Nifty Midcap -50
38	1st Jan 2008	Trading of Chhota (Mini) Sensex at BSE
39	1st Jan 2008	Trading of mini index futures & options at NSE
40	3rd march 2009	Long term options contracts on S&P CNX Nifty index
41	29th oct 2008	Trading of currency futures at NSE
42	Aug-08	Launch of interest rate futures
43	1st oct 2008	Currency derivative introduced at BSE
44	10th dec 2008	S&P CNX Defty futures & options at NSE

45	Aug-09	Launch of interest rate futures at NSE
46	7th aug 2009	BSE-USE form alliance to develop currency & interest rate derivative markets
47	18th dec 2009	BSE's new derivatives rate to lower transaction costs for all
48	Feb-10	Launch of currency future on additional currency pairs at NSE
49	Apr-10	Financial derivatives exchange award of the year by Asian Banker to NSE
50	Jul-10	Commencement trading of S&P CNX Nifty futures on CME at NSE
51	Oct-10	Introduction of European style stock option at NSE
52	Jul-11	Commencement of 91 day GOI trading Bill futures by NSE
53	Aug-11	Launch of derivative on Global Indices at NSE
54	Sep-11	Launch of derivative on CNX PSE & CNX infrastructure Indices at NSE
55	30th march 2012	BSE launched trading in BRICSMART indices derivatives
56	29th nov 2013	BSE launched currency derivative segment

Types of Derivatives:



Trends of Derivatives Market

In India India is one of the most successful developing countries in terms of a vibrant market for derivatives. This reiterates the strengths of the modern development of India’s securities markets, which are based on nationwide market access, anonymous electronic trading, and a predominantly retail market. There is an increasing sense that the equity derivatives market is playing a major role in shaping price discovery. Equity derivatives trading started in India June 2000, after regulatory process which stretched over more than four years. In July 2001, the equity spot market moved to rolling settlement. Thus, in 2000 and 2001, the Indian equity market reached the logical conclusion of the reforms program which began in 1994. It is important to learn about the behaviour of equity market as well as investors towards equity market in new regime. India’s experience with launch of equity derivatives market has been extremely positive, by world standards. NSE is now one of the prominent exchanges amongst all emerging markets, in terms of equity derivatives turnover. There is an increasing sense that the derivatives market is playing a major role in shaping price discovery. The figure seems that the total turnover on the F&O segment increased by Rs.31,349,732 crore during 2011-12 as compared with Rs 2,365 crore during 2000-01. The average daily turnover during 2011-12 was Rs 125,903 crore from Rs 12 crore in 2000-01 which shows CAGR of 120.49% in terms of turnover and CAGR of 115.64% in terms of average daily turnover.



Review of Literature

Financial derivatives are mainly contract based marketing activities. Futures contracts are exchange traded contracts, Forward contracts are OTC traded. Investors having no idea to investing in the stock market it is a risky one too many investors thinking. I am providing basic knowledge to the investors.

In order to examine the impact of trades (i.e. selling activities) on the asymmetric volatility relation, Kittiakarasakun et al. (2012) have employed the Computer Trade Reconstruction (CTR) data of NASDAQ-100 index futures distinguishing informed trades and uninformed trades. They find that the selling impact of informed trades on the asymmetric volatility is at most weak. In addition, small-size trades have a greater impact on the asymmetric volatility relation than large-size trades. Results suggest that selling activity of uninformed traders can significantly influence asset return and volatility. Moreover, there is a common consensus that the magnitude of intraday variation is higher in the Indian capital markets compared to other developed and developing markets. According to Agarwalla and Pandey (2012), in other markets (Nikkei-225 and S & P 500), the volatility at intraday peak is around twice the volatility at intraday low; in India, it is almost four times. The intraday five-minute absolute returns range from 0.05% to 0.11% in the case of Nikkei-225. They report high intraday variation in the case of large cap stocks relative to small cap stocks. Higher volatility is also observed in the first one hour of trade after weekends, in the first half-an-hour after the holidays and in the last one hour of trade before the weekends. Temporary scheduled trading halts cause the volatility to rise when the market reopens. Interesting findings about the Indian derivative markets have also been given by Srivastava et al. (2008) They state that the participation of institutional investors in the Indian stock derivative market is extremely limited. It can be attributed to the regulatory restrictions wherein such investors are allowed to use derivative securities mainly for hedging and arbitrage purposes only. Varma Jayanth (2000) provides evidence of the violation of the put-call parity in the Indian markets and shows that short sale in the cash market impedes arbitrage between the cash and derivative segment and overpricing of deep in the money calls.

Makbul Rahim (2001)”argued in his speech that the regulatory framework must provide the right environment for the development and the growth of the market. High standards of probity and professional conduct have to be maintained and reach world class standards. Integrity is very important as well confidence. The development of a proper free flow of information and disclosure helps investors to make informed investment decisions”.

Rajeswari, T. R. and Moorthy, V. E. R. (2005):” said that expectations of the investors influenced by their perception and human generally relate perception to action. The study revealed that the most preferred vehicle is bank deposit with mutual funds and equity on fourth and sixth respectively. The survey also revealed that the investment decision is made by investors on their own, and other sources influencing their selection decision are news papers, magazine, brokers, television and friends or relatives.

B. Das, Ms. S. Mohanty and N. Chandra Shil (2008)“Studied the behavior of the investors in the selection of investment vehicles. Retail investors face a lot of problem in the stock market. Empirically they found and concluded which are valuable for both the investors and the companies having such investment opportunities. First, different investment avenues do not provide the same level of satisfaction. And majority of investors are from younger group”.



Jayanth R. Varma (2009)”Stated that derivative exchanges have fared much better banks during the global financial crisis (2007-2008) as their models were stronger and robust than the internal models of the banks. The robustness should never be compromised for an increased sophistication and calibration of the markets. The benefits of Information Technology should be fully exploited to cover risk management. The exchange should not be complacent on their margining systems and try to eliminate the elements that contribute towards the fragility of the risk management systems”.

Mayank Raturi (2005)” concluded that the value of outstanding derivative contracts continues to expand, despite some setbacks due to the aftermath of the Baring Bank and similar bankruptcies stories. Survival of Credit Derivatives was also questioned”.

Chen and Firth (2004)“Analyzed the relationship between return and trading volume of four commodity futures in China, by using correlation and Granger causality test. They found no correlation between return and volume, but signify the causality from trading volume and return, vice versa. They, however, found a correlation between absolute return and trading volume”.

Gupta and Ravi (2012)” investigated the relationship in price discovery which proved that futures markets are more responsive in dissemination information and price discovery to correct spot market”.

Mahanta (2012) analyzed price trends in the international market and concluded that gold price movements in international market is positively correlated with Indian gold price movements, so proper considerations to international markets should be given while designing policies of derivatives market in India.

Barua and Mahanta (2012)” investigated the high inflationary pressure due to commodity derivatives. Few futures contracts like red gram, black gram, chickpeas, wheat, rice, potato, refined soybean oil and rubber have been canceled, but analysis proved that the ban on these commodity futures contract didn't bring price stability”.

Research Methodology

Need of the Study

Derivatives help to reduce the risk (or) transfer the risk. It also helps to the investors to get more returns with less risk. Therefore, the present study has been undertaken to understand the growth of the derivatives market.

Objectives of the Study

The primary objective of the study is to know the growth and development of derivative market and its instruments since its inception.

- To know the growth of equity derivatives.
- To know the growth of commodity derivatives.
- To know the growth of debt derivatives.

Data Collection:

The study exclusively based on secondary data. Secondary data collected from various sources such as text books, reports, annual reports of various organizations, research articles,



conferences, workshops, etc. Secondary data was also used to conceptualize the term risk and the degree of risk involved, this apart of websites of companies, stock exchanges, NSE and BSE were used.

Tools of Analysis

A theoretical study is to be conducted with the objective of knowing growth and development of derivative market and its instruments since its inception.2013to 2023.

Significance of the Study

Discovery of prices: Due to highly competitive nature, the futures market has become an important tool to determine prices, based on today's and tomorrow's amount of estimated supply and demand. Future market price depends on a continuous flow of information.**Reduction of risk:** Future markets are also a place for people to reduce risk when making purchases. Risk is reduced because the price is pre-set, therefore letting participants must know how much they will need to buy or sell.

Data Analysis And Interpretation

Growth of Equity Derivatives market in India

Growth of Equity Derivatives Market in India			
Years	Total no of contracts	Total turnover (in crs)	Average daily turnover (in crs)
2022-2023	37,25,85,105	3,43,15,313.19	1,37,812.51
2021-2022	67,05,21,025	6,60,78,327.86	2,66,444.86
2020-2021	33,81,60,959	3,50,60,169.08	1,41,371.64
2019-2020	26,81,884	2,62,268.63	1,061.83
2018-2019	24,40,99,818	1,54,34,599.55	62,236.28
2017-2018	21,47,58,367	1,55,97,519.72	62,766.69
2016-2017	17,38,60,131	1,11,29,587.15	45,059.05
2015-2016	23,42,43,968	78,28,607	31,720.46
2014-2015	23,76,04,742	82,91,766.28	33,521.06
2013-2014	17,04,14,187	49,49,282	19,956.79

Source:- Compiled from www.nseindia.com

Interpretation:-

The above table showing the growth of equity market from 2013 to 2023. financial year the market is having high growth, because the total no of contracts are more though thetrading days .Financial derivatives, including futures and options, have gained immense popularity in the world of finance and are widely used globally. This growth has been so rapid that it is now referred to as the derivatives revolution.

Growth of Commodity derivatives market in India

Growth of Commodity Market in India			
Years	Total no of contracts	Total turnover(in crs)	Average daily turnover (in crs)
2022-2023	2100	8245896	33116



2021-2022	1931	7234826	29410
2020-2021	1817	5055913	20387
2019-2020	1808	4236983	17154
2018-2019	1733	4329665	17818
2017-2018	1688	2808488	11189

Source:- Compiled from www.nseindia.com

Interpretation

The above chart and table showing the growth of commodity market from 2017 to 2023. The last two decades have witnessed many-fold increase in the volume of international trade and business due to the wave of globalization and liberalization sweeping across the world. This has led to rapid and unpredictable variations in financial assets prices, interest rates and exchange rates, and subsequently, to exposing the corporate world to an unwieldy financial risk. In the present highly uncertain business scenario, the importance of risk management is much greater than ever before. 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.

Growth of debt market in India

Growth of Debt Market in India			
Years	Total no of contracts	Total turnover(in crs)	Average daily turnover (in crs)
2022-2023	7491	314855.25	1411.91
2021-2022	12419	517889.42	2148.92
2020-2021	16875	682426.2	2831.64
2019-2020	14676	569494.67	2363.05
2018-2019	18789	772369.06	3258.94
2017-2018	21143	851433.62	3503.84

Source:- Compiled from www.nseindia.com

Interpretation:-

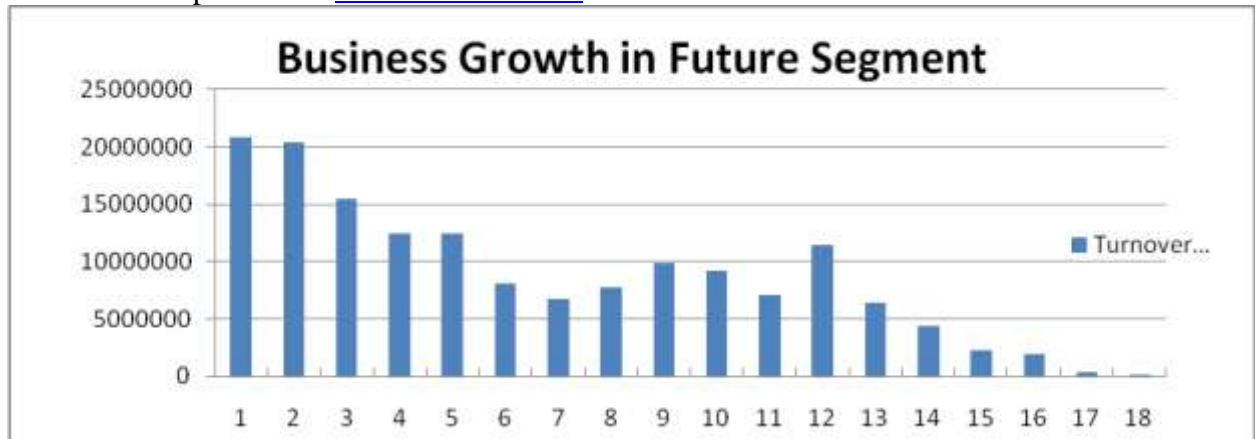
The above chart and table showing the growth of debt market from 2017 to 2023. The development and growth of the derivatives market has been particularly pronounced. This study focuses on exploring the use of futures and options in the Indian stock market and aims to provide insights and recommendations to investors on how they can maximize their profits in the derivative markets.

Business growth in future Segment

Business growth in future Segment						
Year	Index Futures		Stock Futures		Total	
	No. of contracts	Turnover(Cr)	No. of contracts	Turnover(Cr)	No. of contracts	Turnover(Cr)
2022-23	67034171	5363947.37	245701540	15536389.86	312735711	20900337.23
2021-22	57674584	4810454.34	214758366	15597519.71	272432950	20407974.05
2020-21	66535070	4335940.78	173860130	11129587.14	240395200	15465527.92
2019-20	140538674	4557113.64	234243967	7828606	374782641	12385719.64
2018-19	129303044	4107215.2	237604741	8291766.27	366907785	12398981.47
2017-18	105252983	3083103.23	170414186	4949281.72	275667169	8032384.95
2016-17	96100385	2527130.76	147711691	4223872.02	243812076	6751002.78
2015-16	146188740	3577998.41	158344617	4074670.73	304533357	7652669.14
2014-15	165023653	4356754.53	186041459	5495756.7	351065112	9852511.23

2013-14	178306889	3934388.67	145591240	5195246.64	323898129	9129635.31
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Source:- Compiled from www.nseindia.com

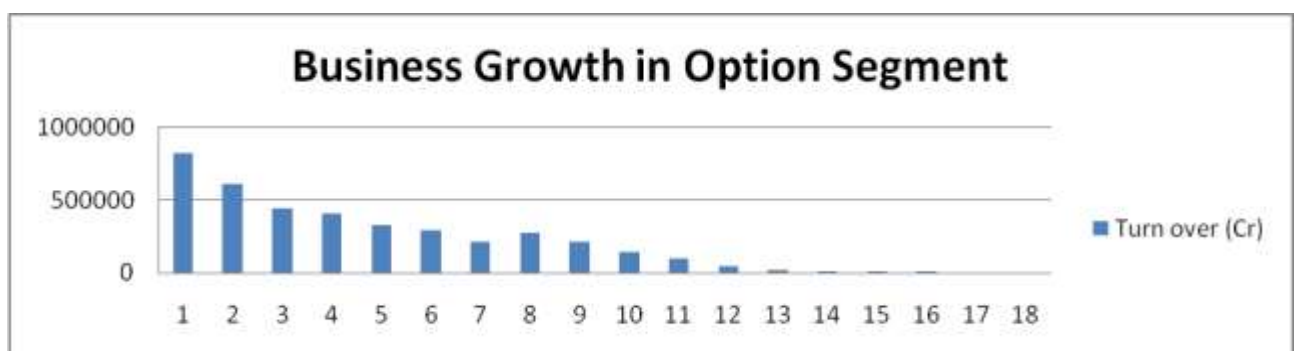


Interpretation:

From the above graph describing the business growth in future segment from 2002 to 2019. In the year 2018-2019 the option market has high growth (20900337.23), because the contracts are more in that year (312735711). In 2001-2002 has the low growth (72998), because the number of contracts is less in the year (2983444).

Business Growth In Options Segment

Business growth in Options Segment						
Year	Index Options		Stock Options		Total	
	No. of contracts	Premium Turnover(Cr)	No. of contracts	Premium Turnover(Cr)	No. of contracts	Premium Turnover(Cr)
2022-23	2532591983	627104.56	180313297	194710.15	2712905280	821814.71
2021-22	1515034222	460653.71	126411376	148217.5	1641445598	608871.21
2020-21	1067244916	350021.53	92106012	95570.09	1159350928	445591.62
2019-20	1623528486	351221.01	100299174	61118.39	1723827660	412339.4
2018-19	1378642863	265315.63	91479209	61732.59	1470122072	327048.22
2017-18	928565175	244090.71	80174431	46428.41	1008739606	290519.12
2016-17	820877149	184383.24	66778193	34288.56	887655342	218671.8
2015-16	864017736	253068.22	36494371	19612.93	900512107	272681.15
2014-15	650638557	192637.87	32508393	20474.97	683146950	213112.84
2013-14	341379523	124416.58	14016270	15272.89	355395793	139689.47



Interpretation:

From the above graph describing the business growth in option segment from 2002 to 2019. In the year 2018-2019 the option market has high growth (821814.71), because the contracts are more in that year (2712905280). In 2001-2002 has the low growth (2604.23), because the number of contracts are less in the year(1213429).



Findings

An effort towards building risk management models with respect to Indian conditions should be encouraged. Presently we find that all these models although may be workable are built on conditions of foreign markets, which if applied to Indian market conditions may or may not give the desired results. In the equity derivatives market by educating the investors at large. There are a large number of investors who do not invest in the equity derivatives market due to lack of knowledge of derivatives. Hence, there is far higher need to educate the general public at large about the investment avenue in the form of equity derivatives, the risks involved and its advantages, to make them understand the pros and cons of the equity derivatives, its benefits and usages etc. These steps may help in spreading the equity derivatives knowledge to the general public at large to get larger participation from the retail investors.

Conclusion

There is a vast scope for our markets to develop vis-a-vis the growth and development around the world. Maturity in this segment would come over the years with passing of time. Our regulators approach towards developing this segment seems to be positive but conservative. This of course is to protect the investor's interest and setbacks to our financial systems. There is a wide scope to study the functioning of derivative markets and models in Indian conditions to determine the market's functionality and effectiveness. A number of researchers have thrown light on the efficacy of the functioning of the derivative market, thus giving insights into designing future strategies by the stake holders. Conclusions could be drawn through following points:

1. Trading in derivatives is a riskier option than cash market due to high leveraged positions taken by counter parties but it is also a tool to hedge risk associated with price volatility and delivering underlying assets.
2. In developed countries regulators are well aware of the risks involved and take measures from time to time to control the risk factors. But since they work on the capitalist model the regulators allow the markets to determine their profit and loss positions.

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