

Derivatives Trading in Emerging Economies with Special Reference to India

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Abstract: In this study The National Stock Exchange of India (NSE) has been taken as the sample exchange since this is the only exchange which provided the derivatives facility throughout the reference period of the study. The reference period of the study has been taken from 2001-02 to 2011-12. MAGR has been employed to determine the growth of derivatives in NSE and this study concludes that the derivatives products such as Stock Futures, Stock Options, Index Options and Index Futures have shown significant growth during the earlier years during which the national and international sentiment was quite optimistic, however, since the year 2009-2010 the derivatives market have registered sluggish growth even negative growth in some cases because of the slowdown in The U.S.A. and debt crises in the Euro zone which engulfed the emerging capital markets all over the globe including India. It was this reason that impacted the volumes of derivative products in India. Despite, all these economic disturbances the overall growth of derivatives continued in India though at decreasing pace.

Keywords: Derivatives, Stock Futures, Stock Options, Index Options, Index Futures, MAGR.

1 Introduction

Financial markets are volatile and so, it is the prime concern of all the financial agents to balance or hedge the related risk factors. Risks can be of various kinds, like price risk, counter-party risk and operating risk of the underlying asset. The concept of derivatives came into existence to reduce the price-related risk. Therefore, the value of a derivative is entirely derived from the value of its underlying, like base metal, stock indices, precious metal, equity share, etc. A derivative contract, product, instrument or simply 'derivative' is to be sharply distinguished from the underlying asset, which is an asset bought or sold in the cash market on normal delivery terms (L.C. Gupta, 1996). A simple derivative instrument hedges the risk component of an underlying asset. For example, rice farmers may wish to sell their harvest at a price which they consider is 'safe' at a future date to eliminate the risk of a change in prices by that date. To hedge their risks, farmers can enter into a forward contract and any loss caused by fall in the cash price of rice will then be offset by profits on the forward contract. Thus, hedging by derivatives is equivalent to insurance facility against risk from market price variations. In this way a derivative is contracts for differences-the difference between the agreed future price of an asset on a future date and the actual market price on that date and settlement in this contract is by delivery or cash. With the fast advances in technology that have aided quantitative approaches to risk management and the increasing volumes of transactions in derivatives and other

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structured products that are so complex that they are often labelled “exotic” like other countries of the world. India too has responded to this change, tempered with a gradualist, non disruptive approach, that has stood us in good stead over the years. (Gopinath, 2006).

2 Review of Literature

The researchers all over the world have done research on derivative trading and were able to find out various facts about derivative and its trading. In this literature review efforts have been done to bring into the picture the research done about various issues throughout the world by the researchers. The literature review on the various issues is as follows:

Derivative as Risk Management Tool

Bose and Suchismita conducted research on “The Indian Derivatives Market Revisited” in the year 2006. They found that Derivatives products provide certain important economic benefits such as risk management or redistribution of risk away from risk-averse investors towards those more willing and able to bear risk. Derivatives also help price discovery, i.e. the process of determining the price level for any asset based on supply and demand. These functions of derivatives help in efficient capital allocation in the economy; at the same time their misuse also poses a threat to the stability of the financial sector and the overall economy.

Liquidity

Routledge, Bryan and Zin, Stanley of Carnegie Mellon University conducted research on “Model Uncertainty and Liquidity” in year 2001. Extreme market outcomes are often followed by a lack of liquidity and lack of trade. This market collapse seems particularly acute for markets where traders rely heavily on a specific empirical model such as in derivative markets. In this paper we capture model-uncertainty explicitly using an Epstein-Wang (1994) uncertainty-averse utility function with an ambiguous underlying asset-returns distribution.

Spot Future Relationship

Dheeraj Mishra, R Kannan and Sangeeta D Mishra (2006), tried to find out the spot - future parity relationship in case of index futures in the Indian stock market. NSE Nifty has been chosen as underlying asset. It also aims at exploring different factors responsible for the violation of spot-future parity relationship. It was found that there exists a theoretical relationship between spot, futures and other relevant variables as dividend yield, maturity etc. the paper also aimed at finding out whether there exists an arbitrage profit due to violation of spot future. It was found that arbitrage profits are higher for far month future contracts than for near month future contracts. Arbitrage profits are more for undervalued future markets than overvalued future markets.

Volatility in the Market due to Derivative Trading

Sen Shankar Som and Ghosh Santanu Kumar (2006) studied the relationship between stock market liquidity and volatility and risk. The paper also deals with time series data by applying “Cochrane Orchutt two step procedures”. An effort has been made to establish a relation between liquidity and volatility in this paper. It has been found that here is a statistically significant negative relationship between risk and stock market liquidity.

Objectives of the Study

- To determine the growth of derivatives products in NSE India.
- To examine the impact of economic slowdown on the derivatives market in India.

3 Data Base and Methodology

So as to accomplish the objectives of the study, the researchers have collected the relevant data, regarding the daily trading volumes both in terms of contracts and value. This data has been collected from the website of National Stock Exchange of India (NSE). The reference period of the study spreads over 11 years from 2001-02 to 2011-2012.

MODEL FRAMEWORK

For the purpose of determining the behavior of growth and establishing the findings, the researchers have employed Moving Average Growth Rate (MAGR).

Mathematically, this can be written as:

Where

MAGR= Moving average growth rate

Byv = Base year in volume

Cyv = Current year in volume..

4. Results and Discussions

Index Futures

“A Futures Contract is a standardized contract, traded on a futures exchange, to buy or sell a certain underlying instrument at a certain date in the future, at a pre-set price. The future date is called the delivery date or final settlement date. The

pre-set price is called the futures price. The price of the underlying asset on the delivery date is called the settlement price. The futures price, naturally, converges towards the settlement price on the delivery date”.

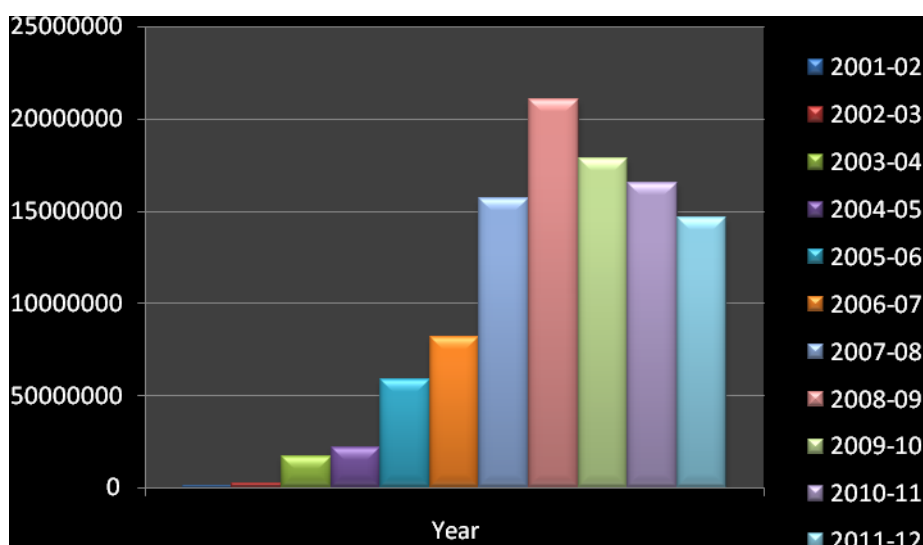
BUSINESS GROWTH IN DERIVATIVES SEGMENT (NSE)

TABLE: 1-A Index Futures (contracts)

Year	No. of contracts	MAGR in %
2001-02	1025588	
2002-03	2126763	107
2003-04	17191668	708
2004-05	21635449	26
2005-06	58537886	171
2006-07	81487424	39
2007-08	156598579	92
2008-09	210428103	34
2009-10	178306889	-15
2010-11	165023653	-7
2011-12	146188740	11

Source: Compiled from the data taken from NSE

In the above table 1-A, the trading volume and average growth of Index Futures in terms of contracts is shown and in the year 2002-2003 MAGR stands at 207% which is followed by a significant increase in the subsequent year as the growth rate touches 808% which also stands as the highest growth rate throughout the reference period. This upward trajectory continues up to 2008-2009 in which the growth rate touches 34%. However, in the subsequent two years the growth slides into the negative zone due to negative sentiment and showed recovery by registering marginal growth of 11% in the year 2011-12. The same has been shown in the bar diagram given below.

Bar Chart: 1- A Number of contracts per year in Index Futures**. Table: 1-B Turnovers of Index Futures (value)**

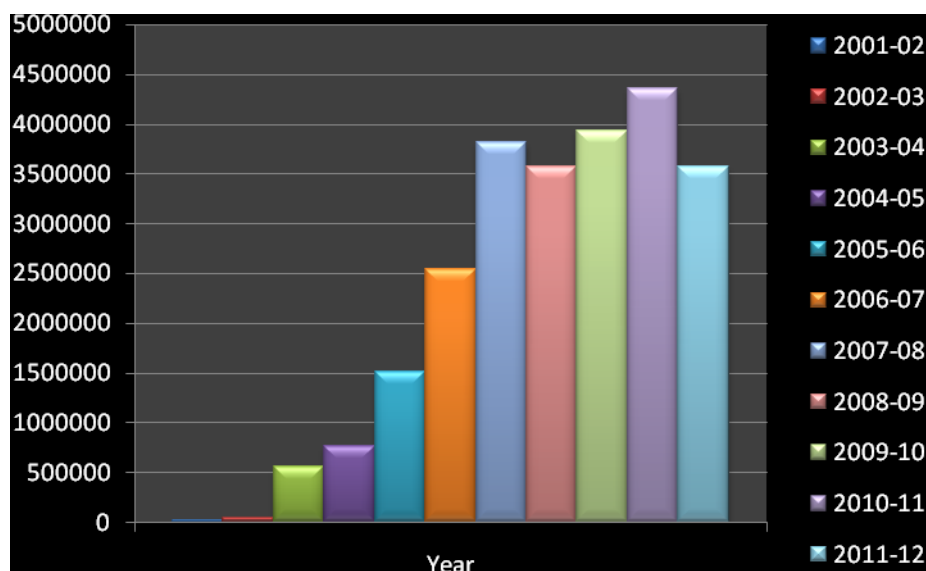
Year	Turnover (Rs. Cr.)	MAGR in %
2001-02	21483	
2002-03	43952	105
2003-04	554446	1161
2004-05	772147	39
2005-06	1513755	96
2006-07	2539574	68
2007-08	3820667	50
2008-09	3570111	7
2009-10	3934389	10
2010-11	4356755	11
2011-12	3577998	-18

Source: Compiled from the data taken from NSE

In the above table it can be observed that the Index Futures has shown a consistent increase in its volume in terms of value as the first year 2002-03 has witnessed an increase of 105% which is followed by a substantial increase in the subsequent year by 1161% which also stands as the highest level of increase in a single year. This upward trajectory continues till 2007-08 which recorded an increase of 50% but the year 2009-2009 witnessed a decline and the MAGR dives into negative zone by touching -7%. However, in the year 2009-2010 the volume picks up again and the MAGR touches 10% followed by another 11% growth, but the last year 2011-2012 again witnesses negative growth of -18%. Thus, it can be established that the volume of Index Futures in terms of value has shown consistent growth in most of the years except the two years of the reference period in which a marginal

negative growth rate is recorded. The same has been depicted in the below given bar diagram.

BAR CHART: 1- B Turnover in Rs. Crores of Index Futures



STOCK FUTURES

Presently stock futures and options are available on 119 securities.

Table: 2 - A Stock Futures (Contracts)

Year	No. of contracts	MAGR in %
2001-02	1957856	
2002-03	10676843	445%
2003-04	32368842	203%
2004-05	47043066	45%
2005-06	80905493	72%
2006-07	104955401	30%
2007-08	203587952	94%
2008-09	221577980	9%
2009-10	145591240	34%
2010-11	186041459	28%
2011-12	158344617	-15%

Source: Compiled from the data taken from NSE

The table 2-A shows the volume and MAGR of Stock Futures. The first year registers the growth of 445% which also stands as the highest level of growth throughout the reference period. This is followed by 203% of growth in the

subsequent year. This trajectory of growth continues in the subsequent years even though at decreasing rate which touches 9% in the year 2008-09. In the year 2009-10 the growth rate picks up and touches 34% which continues in the subsequent year as well but the last year witnesses the negative growth by -15% . The MAGR signifies that the growth rate has remained good throughout the reference period except the last year. The behaviour of volumes is also shown in the below given bar diagram.

Bar Chart: 2 - A Number of contracts per year in stock future

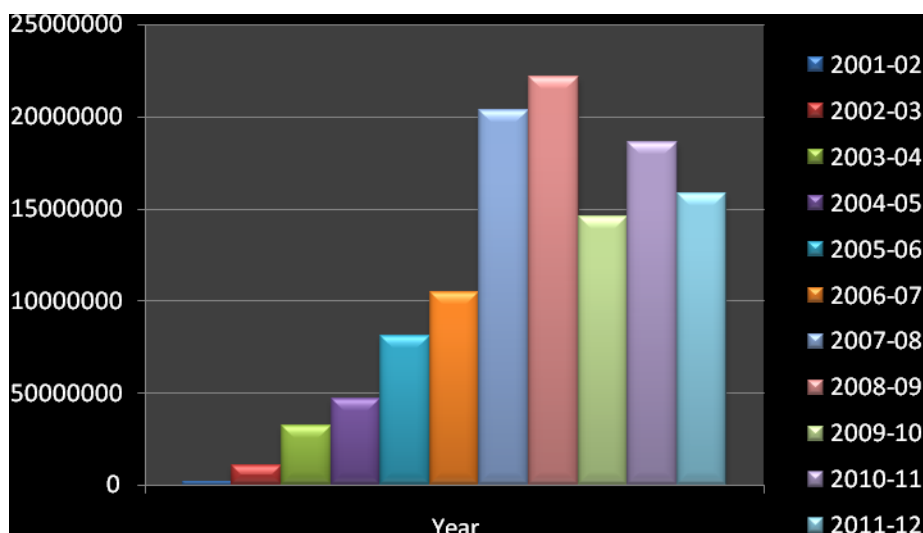


TABLE: 2 – B Turnover of Stock Futures (Value)

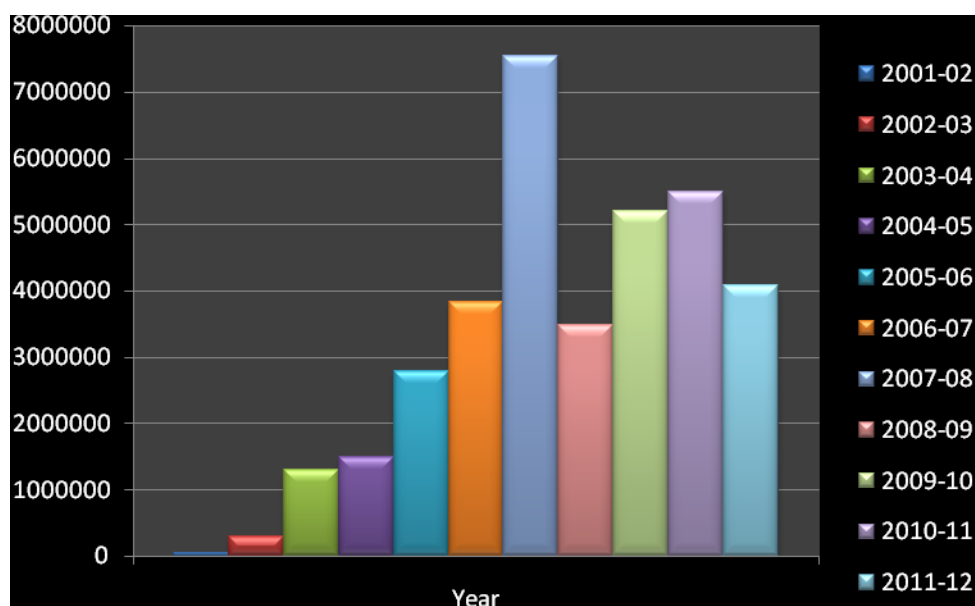
Year	Turnover (Rs. Crores)	MAGR in %
2001-02	51515	
2002-03	286533	456%
2003-04	1305939	355%
2004-05	1484056	14%
2005-06	2791697	88%
2006-07	3830967	37%
2007-08	7548563	97%
2008-09	3479642	-54%
2009-10	5195246	49%
2010-11	5495756	7%
2011-12	4074670	-64%

Source: Compiled from the data taken from NSE

The table 2-B depicts the MAGR of Stock Futures in terms of value wherein the first year 2002-03 registers the growth of 456% which also stands as the highest

growth rate throughout the reference period. This is followed by another good growth rate in the subsequent year in which the growth rate touches 355%. But the third year witnesses a steep fall and the growth rate slides down to 14%. However, in the subsequent three years the growth rate again picks up till it slides into negative zone in the year 2008-2009, touching -54%. In the year 2009-2010 the MAGR again records positive growth and this continues in the subsequent year as well but the last year ends in the red zone as the level of MAGR touches -64%. The behaviour of trading volumes is also depicted in the bar diagram given below.

Bar Chart : 2 - B Turnover in Rs. Crores Stock Futures



INDES OPTIONS

Index options are European Style. There are a minimum seven strike prices, three 'out-of-the- money', and one 'at-the-money' and three 'in -the -money'. The price at which the buyer has a right to buy or sell the underlying is the strike price.

TABLE: 3 A Index Options (Contract)

Year	No. of contracts	MAGR in %
2001-02	175900	
2002-03	442241	151%
2003-04	1732414	292%
2004-05	3293558	90%
2005-06	12935116	293%
2006-07	25157438	94%

2007-08	55366038	120%
2008-09	212088444	283%
2009-10	341379523	61%
2010-11	650638557	91%
2011-12	864017736	33%

Source: Compiled from the data taken from NSE

In the table 3-A, the MAGR of Index Options is recorded and it can be observed that the first year registers a growth of 151% which is followed by a further increase in the subsequent year by 292%. This upward trajectory in the growth continues as the year 2005-06 registers growth of 293% which also stands as the highest level of growth throughout the reference period. The growth in Index Options continues to be in positive zone as there exists no year in which it fell into red zone. The same has also been depicted in the below given bar diagram.

Bar Chart: 3 - A Number of contracts per year in Index Options

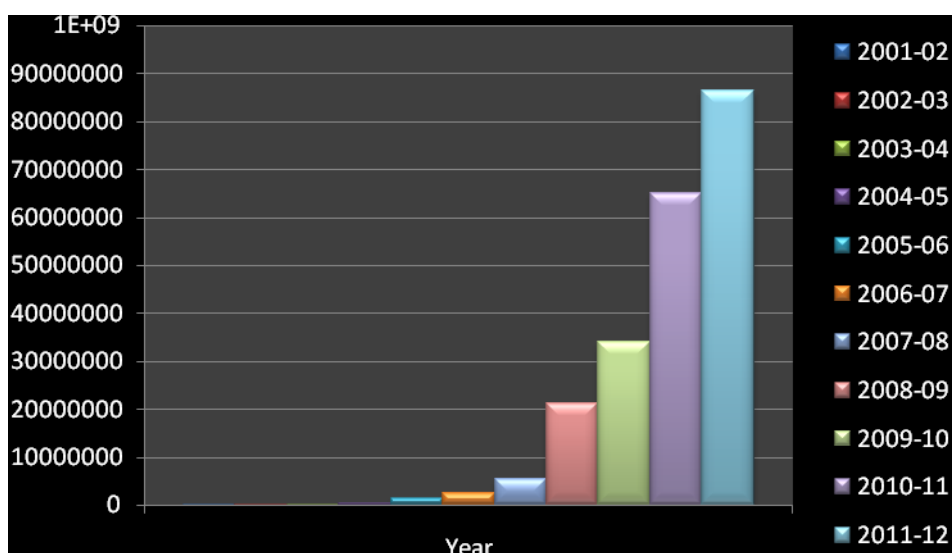


TABLE: 3 - B Turnover of Index Options (Value)

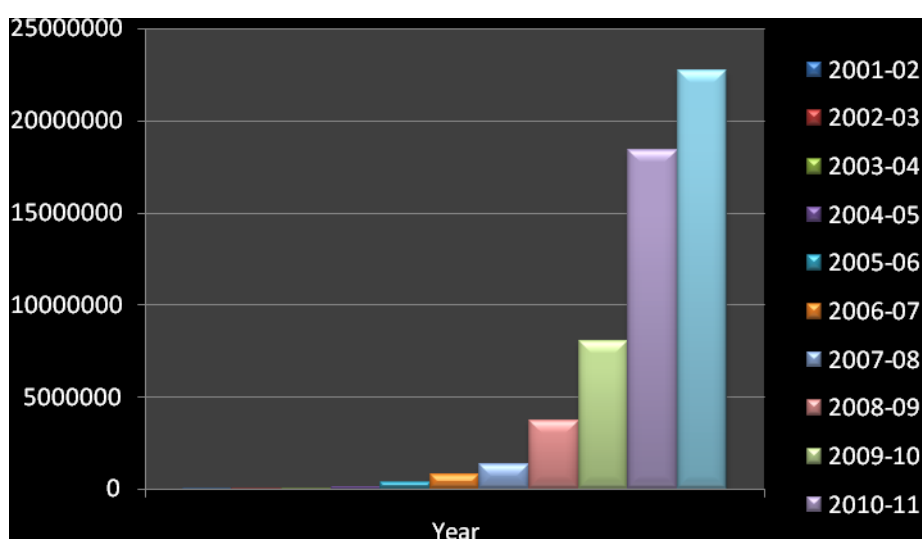
Year	Turnover (Rs. Crores)	MAGR in %
2001-02	3765	
2002-03	9246	146%
2003-04	52816	47%
2004-05	121943	131%
2005-06	338469	178%

2006-07	791906	134%
2007-08	1362110	72%
2008-09	3731501	174%
2009-10	8027964	115%
2010-11	18365366	129%
2011-12	22720031	24%

Compiled from the data taken from NSE

The table 3-B depicts the volume of Index Options and in the table it can be observed that the first year records the growth of 146% which is followed by decreased growth in the second year as the level of MAGR touches 47%. In the third year the growth picks up again and touches 131%. This upward trajectory continues as the following year records the highest level of growth by touching 178% MAGR. The subsequent years also maintains reasonable growth rates except the last year of the reference period in which the growth rate touches 24% which also stands the lowest rate of growth throughout the reference period. This information is also reflected in the below given bar diagram.

Bar Charts: 3 - B Turnover per year in Rs. Crores of Index Options



STOCK OPTIONS

TABLE: 4 – Stock Options (Contracts)

Year	No. of contracts	MAGR IN %
2001-02	1037529	
2002-03	3523062	240%
2003-04	5583071	58%

2004-05	5045112	-10%
2005-06	5240776	4%
2006-07	5283310	0.81%
2007-08	9460631	79%
2008-09	13295970	41%
2009-10	14016270	5%
2010-11	32508393	132%
2011-12	3649437	89%

Source: Compiled from the data taken from NSE

The table 4-A signifies the volume of Stock options in terms of contracts. In the table it can be observed that the year 2002-03 have registered a growth of 240% which also stands as the highest level of growth throughout the reference period which is followed by a growth of 58% in the subsequent year. But in the year 2004-05 witnesses a huge slide and the growth falls into the negative zone by touching -10%. However, the subsequent year shows some recovery by recording a marginal growth of 4% and it can be observed that the scenario does not improve in the subsequent year as well in which MAGR touches 0.8%. However, since the year 2007-08 the MAGR shows a significant recovery and records an increase of 79% growth. This upward trajectory continues till the end of the reference period except the last year 2011-12 which registers an increase of 5% growth. The same has been depicted in the below given bar diagram.

Bar Chart 4 - A Number of contracts per year in stock option

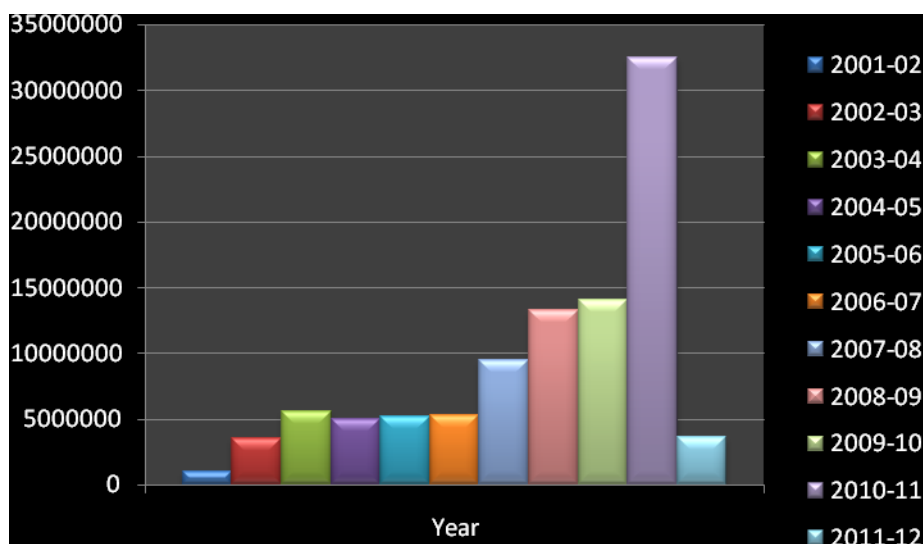
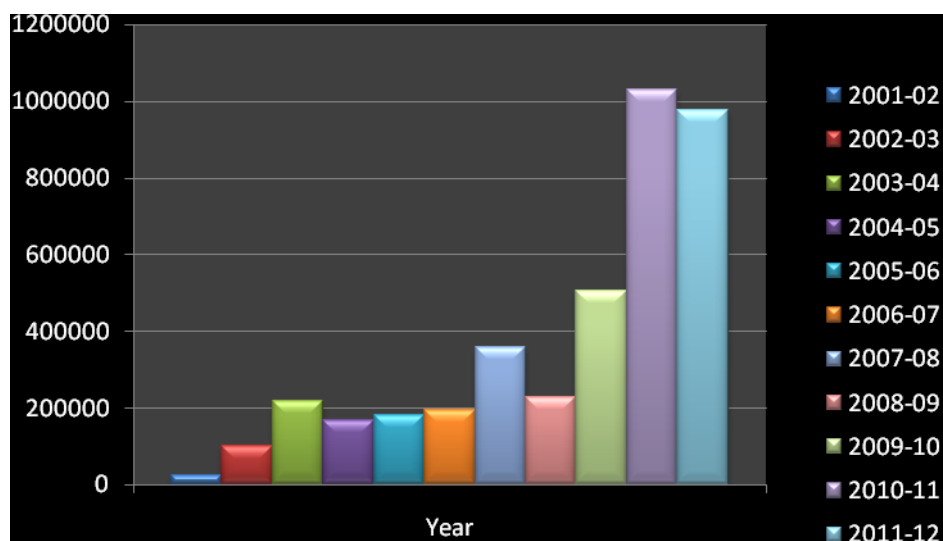


TABLE: 4 - B Stock Options turnover (value)

Year	Notional turnover (Rs. crores)	MAGR IN %
2001-02	25163	
2002-03	100131	298%
2003-04	217207	117%
2004-05	168836	-22%
2005-06	180253	68%
2006-07	193795	8%
2007-08	359136	85%
2008-09	229226	-36%
2009-10	506065	121%
2010-11	1030344	104%
2011-12	977031	-5%

Source: Compiled from the data taken from NSE

The table 4-B depicts the turnover of Stock Options in which it can be observed that the first year registers growth of 298% which also stands as the highest level of growth throughout the reference period which is followed by an increase of 117% in the subsequent year. But the year 2004-05 records negative growth as the MAGR touches -22%, however the subsequent year takes the growth into green zone again by touching 68% growth rate. This positive trend in the growth continues till the year 2008-09 again registers negative growth rate of -36%, but the last year of the reference period records growth of 121%, thus, ending with the positive note. The same information is reflected in the below given bar diagram.

FIGURE: 4 - B Turnover in Rs. Crores per year Stock Options**OVERALL TRADING****TABLE: 5 - AN OVERALL TRADING**

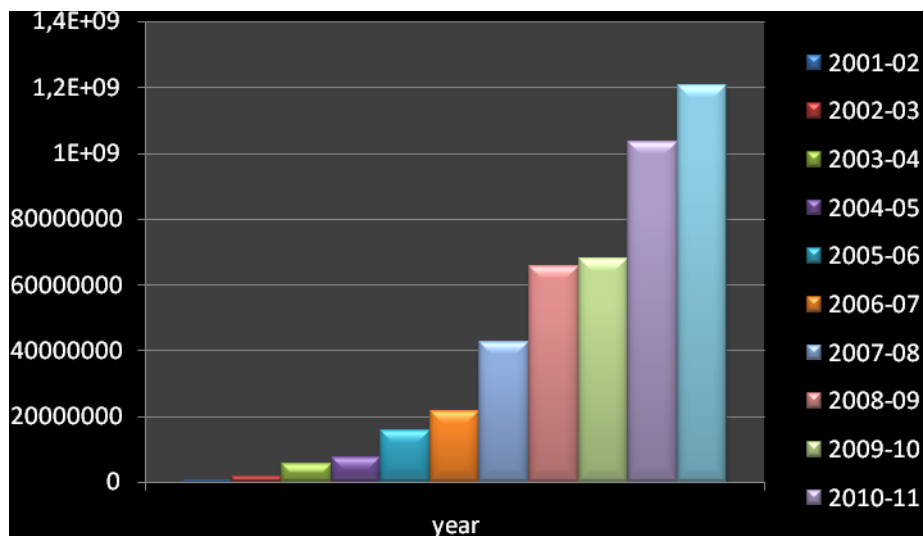
Year	No. of contracts	Moving Average Growth in percentage	Turnover (Rs. cr.)	Moving Average Growth in percentage
2001-02	4196873		101926	
2002-03	16768909	299	439862	332%
2003-04	56886776	239	2130610	384%
2004-05	77017185	35	2546982	20%
2005-06	157619271	105	4824174	89%
2006-07	216883573	38	7356242	52%
2007-08	425013200	96	13090477	78%
2008-09	657390497	55	11010482	-16%
2009-10	679293922	3	17663664	60
2010-11	1034212062	52	29248221	65
2011-12	1205045464	17	31349731	7

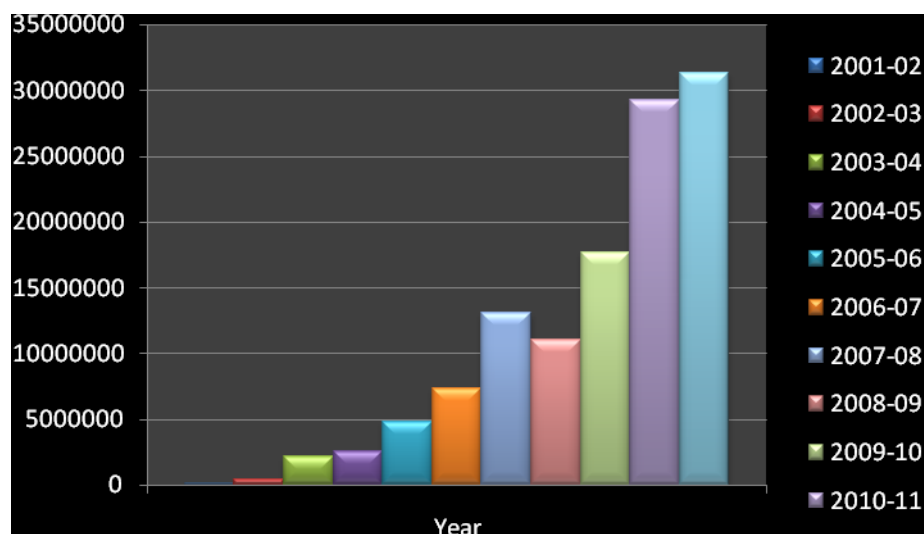
Compiled from the data taken from NSE

The table 5-A represent the overall volumes of derivatives products both in terms of contracts and volume at the National Stock Exchange of India. The year 2002-03 records a growth of 299%, regarding contracts and 332% in terms of value which is

followed by another increase in the subsequent year by 239% in terms of contracts and 384% in terms of value. However the year 2004-05 shows a decline in the MAGR both in terms of contracts and value. This positive growth continues in the subsequent years in terms of volume in contracts but the last year of the volume in value shows a negative growth as the MAGR touches -16% which is because of the steep fall in the stock prices and index (S&P CNX-NIFTY-50) on which Index Futures and Index options are available throughout the reference period. The same has been depicted in the below given bar diagram.

FIGURE: 5 - A Notional turnover of derivatives (contracts)



Bar Chart 5 – A turnovers in Rs. Crores of derivatives (value)

5 Findings & Conclusion

1. After making a thorough analysis of the volumes of Index Futures both in terms of contracts and value, it is confirmed that the Index Futures have witnessed a consistent growth from 2001-02 to 2008-09 but from the year 2009-2010, the volumes have registered marginal negative growth which was the result of pessimistic global sentiments, however, the overall growth in the Index Futures throughout the reference period was quite satisfactory.
2. In case of Stock Options, the analysis reveals that the volumes both in terms of contracts and value have registered consistent upward trajectory throughout the reference period, except, the last year in which the growth has fallen marginally into negative zone. However, the overall analysis establishes that the Stock Futures maintained their volumes growth, despite, the global meltdown.
3. The findings of the Index Options are substantially establishing that the volumes have registered significant and consistent growth throughout the reference period even during the period of global meltdown and Euro zone debt crises and never ever touched negative growth.
4. After undertaking the analysis of the Stock Options, it can be observed that the volumes of Stock Options both in terms of contracts and value have shown consistent growth throughout the reference period except a few years in which these contracts have witnessed negative growth. However, the overall picture puts forth positive picture of growth.

From the above discussion, it can be concluded that the derivatives products in India have registered unswerving and substantial growth since their inception in 2000-2001. Even though during the global meltdown and Euro debt crises the

emerging markets were badly hit yet these derivatives products did not witness alarming fluctuations. The growth story of these derivatives products remained going which indicates that these instruments were employed during the turmoil as hedging tools by the investors. Thus, it is established by the study that the derivatives products available at the National Stock Exchange of India have maintained their growth their growth story throughout the reference period.

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