



USE OF DERIVATIVE INSTRUMENTS IN RISK MANAGEMENT: SCENARIO OF INDIAN FINANCIAL MARKETS IN THE POST LIBERALIZATION PERIOD

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RESEARCH ARTICLE



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Abstract

Economic liberalization in India, which was initiated in the year 1991, necessitated the financial markets to provide risk-management tools to the participants. As a result, introduction of derivative instruments became a prerequisite. Although derivative trading had remained a practice since a long period of time, they were mostly unregulated and OTC based with all the related drawbacks. To make the economy globally competitive, as a compulsion due to liberalization, a well-regulated derivative trading mechanism was trying to be developed. This study is an attempt to explore the evolution of derivatives trading in stock, commodity, currency and interest rate markets with corresponding empirical evidence so as to pave the way for necessary interpretations required for the policy decision making. It is found that derivative trading in India, across all the financial markets, has been developing continuously with newer instruments being introduced for better risk-management and proficient functioning.

Keywords: *derivative instruments, derivative trading, economic liberalization, risk-management, financial markets*

Introduction

Derivative instruments become essential weapons for risk-management especially in the liberalized economy where the financial markets are required to be made globally competitive. Thus, the scenario in the Indian economy changed drastically, in respect of derivative trading, after the initiation of the liberalization process in 1991. It became a prerequisite for the government to offer such instruments to the participants across all the financial markets such as the stock, commodity, currency and interest rate markets. On the other hand, un-regulated derivative trading may compromise on transparency leading thereby to impact, adversely, on the faith of the participants and therefore the government was skeptical in the initial phase. As a result, a serious and steady approach was followed by the government and thereby forming expert committees to look into the matter. An endeavor has been made in this paper to explore the developments in the financial markets in respect of derivative trading since liberalization.

Theoretical Framework and Back Drop of the Study

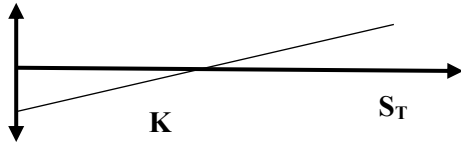
The evidence of use of derivative instruments, in some form or the other, was found in the ancient Indian civilization. However, during the last few decades, these instruments are being predominantly used in risk management. Since the liberalization process was initiated in 1991 in the Indian economy, the regulators, on behalf of the government, started the initiatives of introducing robust risk-management mechanisms by providing risk-management tools in the form of derivative instruments in the different wings of the financial markets. Various committees such as the Kabra Committee (1994), the G S Patel Committee (1995) and the L C Gupta Committee (1996) have been formed and their recommendations reintroduced the derivative trading in Indian economy with better regulatory control and transparency which, in turn, ensured 'absolutely no issue with settlement' even 'at the peak of global financial crisis' of 2008 (J. C. Hull & S. Basu, 2022). Under the guidance of the RBI for the currency market and that of the SEBI (as the Forward Market Commission was merged with SEBI) for both the commodity market and the stock market, the risk-management using derivative instruments started playing the leading role.

The traders in the derivative market are categorized into three types, namely, Hedgers, Speculators and Arbitrages, on the basis of their approaches towards risks associated with movements of prices. A Hedger always tries to seek protection from the risks associated with price movements; on the other hand, the speculators try to bet on the direction of the movement of price in the future, thereby enjoy taking risk; while the Arbitraders try to earn risk-less profit by taking offsetting positions in two markets with price inconsistencies.

The derivative instruments such as the forward, futures, option and swaps are the common form of risk-management tools. In recorded history, since the 18th century, forward contracts have been found in the Indian economy to provide protection from adverse price movements especially for the commodity trading in the over the counter (OTC) market. Gradually with the process of bringing the different financial markets under the monitoring and control of regulatory bodies through the exchanges, the futures and option trading for risk-management in the commodity, stock and foreign currency markets increased. The swap trading, on the other hand, is found in the interest rate market. Payoffs from the various derivative contracts are shown below.

Payoffs from Forward and Futures Contract

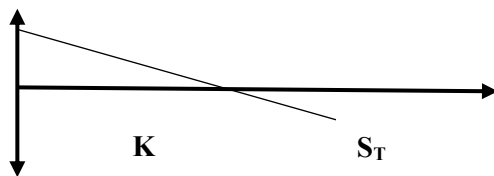
(1) Trader taking long position



The trader, taking a long position i.e. who is willing to buy the underlying asset, shall gain when the spot price on the day of maturity of contract the $(S_T) > \text{Delivery Price } (K)$, as he shall be able to buy at a lower price.

On the other hand, when $S_T < K$, the trader shall lose, as to execute the contract being obligatory, he shall have to buy at a higher price.

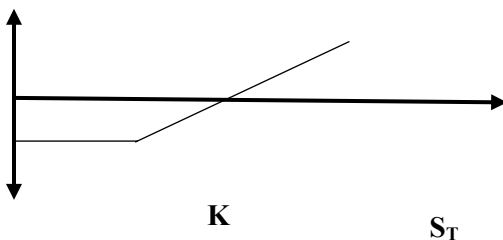
(2) Trader taking short position



The trader, taking a short position i.e. who is willing to sell the underlying asset, shall gain when $S_T < K$, as he shall be able to sell at a higher price.

On the other hand, when $S_T > K$, the trader shall lose, as to execute the contract being obligatory, he shall have to sell at a lower price.

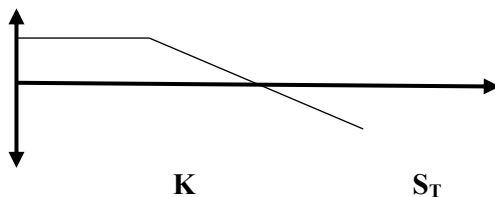
(1) Buyer of Call Option



The execution of the contract is optional to the trader and therefore when $S_T > K$, the trader shall gain by buying the underlying asset at a lower price.

When, $S_T < K$, the trader shall not execute the contract being non-obligatory to him and buy the underlying asset from the spot market at a lower price. In this case his maximum loss can be the amount of option premium paid.

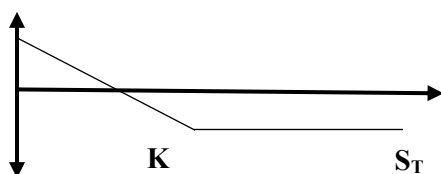
(2) Writer of Call Option



The execution of the contract is obligatory to the trader and therefore when $S_T > K$, the trader shall lose by selling the underlying asset at a lower price.

When, $S_T < K$, the option buyer shall not execute the contract and therefore maximum gain to the trader concerned shall be the amount of option premium received.

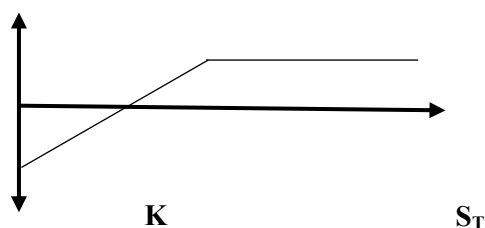
(3) Buyer of Put Option



The execution of the contract is optional to the trader and therefore when $S_T < K$, the trader shall gain selling the underlying asset at a higher price.

When, $S_T > K$, the trader shall not execute the contract being non-obligatory to him and sell the underlying asset at the spot market at a higher price. In this case his maximum loss can be the amount of option premium paid.

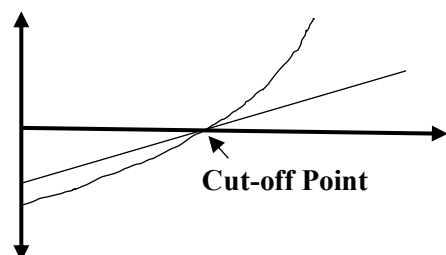
(4) Writer of Put Option



The execution of the contract is obligatory to the trader and therefore when $S_T < K$, the trader shall lose buying the underlying asset at a higher price.

When, $S_T > K$, the option buyer shall not execute the contract and therefore maximum gain to the trader concerned shall be the amount of option premium received.

Payoffs from Option Contracts *Payoffs from Swap Contract*



The execution of the contract is obligatory to both the traders. The cut-off point indicates the break even when both of them shall face the same financial consequence and beyond the point one of the traders shall gain while below the point the other shall gain.

Review of Literature and Research Gap

An extensive review of literature became necessary for the present study. However, only a few, out of the many studies consulted, are mentioned below. Bandivadekar & Ghosh (2003) in their empirical analysis found a declining trend in spot market volatility in the stock market. In interpreting the reasons, it came out that the increased impact of recent news and reduced effect of uncertainty arising out of news bought the requisite stability in the market. Singh & Kansal (2010) in examining, empirically, the impact of derivatives trading in the Indian stock market, identified the additional set of traders that are attracted which leads to increase in trading volume to bring more stability in the market. Yadav & Majumdar (2023) mentioned the rapid growth of the Indian derivative market which offers a wide range of instruments for risk management, speculating price changes and diversifying portfolios. Their study also analyzed the trading regulatory system to bring market integrity and transparency. Tewari & Sinha (2023), in their descriptive study, pointed out the growth of derivative trading at an exponential rate. The study in assessing the impact on the economy, analyzed the historical scenario, regulatory scrutiny, and market dynamics to outline the challenges to be faced by derivatives market in India in reforming its future trajectory. Vilas (2023) tried to explore the derivatives trading in respect of options and futures and discovered that the potentials of trading is yet to be availed of by the investors and therefore necessary awareness becomes indispensable. Raut (2024) studied, in detail, the evolution and operations of the derivative market in India and offered valuable insights of the intricacies for effective decision making. The studies mentioned above had explored the empirical evidence regarding derivatives trading and remained confined to specific markets or instruments only. However, in the present study, an endeavor is being made to analyze the evolution of derivatives trading separately for each of the wings of the financial market considering all the varieties of instruments to present a comprehensive picture.

Objectives of the Study: The objectives of the study are:

1. To explore the use of derivative instruments in Indian financial markets for risk management; and
2. To present the evolution of derivatives trading separately for the stock, commodity, currency and interest rate markets since liberalization of the Indian economy.

Data and Research Methodology

The study is exploratory in nature for which secondary data are collected from various journals; websites of regulatory bodies such as the RBI and the SEBI; the exchanges such as the NSE, BSE, MCX etc. and they are duly presented using graphs and charts for providing proper interpretations. Each wing of the Indian financial market, i.e. stock, commodity, currency and interest rate markets, are explored in separate sections to identify their respective progression and impact on risk management.

Analysis and Findings

The Indian economy is witnessing a steady growth in respect of use of derivative instruments in managing risk since the last few decades. In this section of the study, the specific uses of derivatives instruments to combat as well as to use the movements of prices in commodity, stock, foreign exchange and Interest rate markets so as to avail of the benefits of hedging, speculation and arbitraging are discussed.

Analysis

Use of Derivative Instruments in Stock Market: The stock market can be regarded as the ‘Barometer’ indicating the functioning of the economy. In order to provide the investors with a lucrative avenue of investment as well as to ensure channelization of savings for the purpose of all round development of the economy, constant initiatives are being made by the government. To make the Indian stock market more accessible for all types of investors and to ensure a clear and transparent mechanism of risk management, the following developmental initiatives were undertaken.

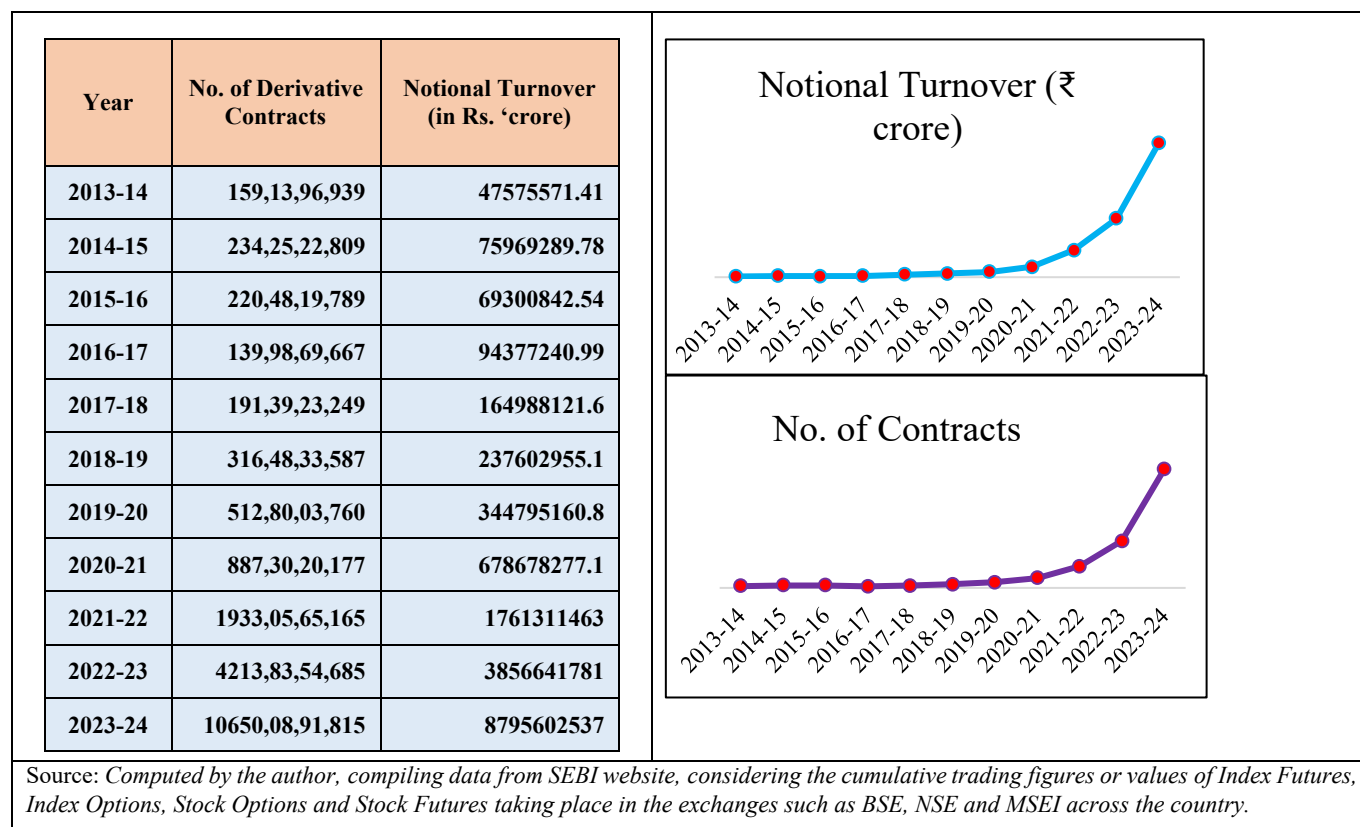
Table-1: Developments in Indian Stock Market in respect of Derivative Instruments

Year	Developments
1991	Initiation of Liberalization process in Indian economy
1992	Enactment of Securities and Exchange Board of India (SEBI) Act
December 1995	NSE sought permission from SEBI for introducing Index Futures.
November 1996	Framework of Index Futures was drafted by LC Gupta Committee
May 1998	Report was submitted by LC Gupta Committee
May 2000	SEBI permitted Exchanges (NSE & BSE) to trade in Index Futures
June 2000	Exchanges (NSE & BSE) started trading in Index Futures
June 2001	Exchanges (NSE & BSE) started trading in Index Options
July 2001	Exchanges (NSE & BSE) started Stock Options (i.e. on individual Securities)
November 2001	Exchanges (NSE & BSE) started Stock Futures (i.e. on individual Securities)

Source: Compiled by the author from the websites of SEBI, RBI and NSE etc. and consulted the book by J. C. Hull & S. Basu.

Interpretation: The endeavor to provide derivative instruments as risk-management tools was an obvious phenomenon in the process of liberalization of the economy. Enactment of Securities and Exchange Board of India Act and thereafter establishing SEBI was made for supervising the functioning of the market with the objective of providing a more transparent and trustworthy ecosystem of investment. The gradual and timely introduction of futures and options instruments for the index as well as for the individual securities equipped the market participants with adequate risk-management tools so that they can avail of the necessary benefits of price fluctuations.

Figure-1: Trends of Derivative Instruments used in Indian Stock Market



Interpretation: The above table depicts the overall picture of turnover of derivative contracts comprising Futures and Options on individual securities i.e. on stock as well as on index. The last 10 years' data indicate a growing trend in the use of derivative

instruments in the stock market for better risk management. After remaining steady for initial years a sharp growth is found from the years of outbreak of COVID-19 pandemic i.e. 2020-21 onwards, a growing trend in use of derivative instruments by the market participants is likely to make the trading mechanism more flourishing.

Use of Derivative Instruments in Commodity Market: In some form or the other, commodity trading is widely spread across the country. However, the challenge lies in bringing informal trading under the preview of regulatory supervision and exchange traded mechanisms. Risk management, especially in the form of forward contracts, has remained a century old phenomenon in the commodity market. A continuous initiative has been made by the government to bring more robustness in the trading mechanism so as to ensure transparent and hassle-free settlement of the contracts. The developments in the market in respect of introduction of derivative instruments is tabulated as follows.

Table-2: Developments in Indian Commodity Market in respect of Derivative Instruments

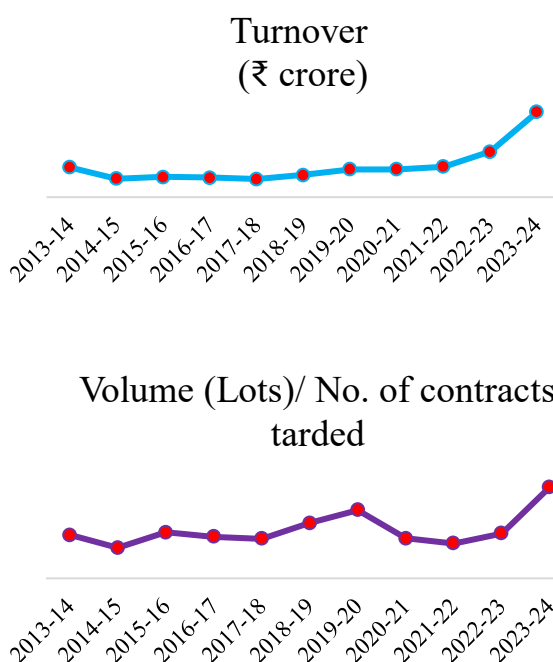
Year	Developments
1875	Futures Trading was started by Bombay Cotton trade Association
1952	Forward Contract (Regulation) Act was enacted
1953	Forward Market Commission (FMC) was established
1956	Securities Contract Regulation Act (SCRA) was enacted
1969	All forms of Forward Trading was prohibited as per section 16 of SCRA 1956
1980	Futures trading in most of the commodities was recommended by Khuso Committee
1991	Initiation of Liberalization process in Indian economy
1992	Enactment of Securities and Exchange Board of India (SEBI) Act (At that time commodity derivative trading was not under the purview of SEBI)
1993	Kabra Committee was formed
1994	Futures trading in nine (9) commodities was recommended by Kabra Committee
2003	Futures trading in commodities was started
2013	Commodity transaction Tax was introduced in commodity derivative trading
2015	FMC was merged with SEBI
2017	Option trading on Commodity futures started

Source: Compiled by the author from the websites of SEBI, RBI and NSE etc. and consulted the book by J. C. Hull & S. Basu.

Interpretation: India has a long history of derivative trading in commodities since ancient times. However, in recorded history, futures trading in commodities started in the seventeenth century. As most of the derivative trading used to take place informally i.e. in the form of forward trading in OTC markets, the government tried to monitor the market and as a result, after the independence, Forward Contract (Regulation) Act was enacted in the year 1952. Gradually, the Forward Market Commission (FMC) was formed and Securities Contract Regulation Act (SCRA) was introduced. In spite of these initiatives, the forward market still used to face default risks at the time of maturity and as a consequence forward trading was prohibited in 1969 by SCRA 1956. The need of risk-management in commodity markets, therefore, remained one of the concerns for the government and different committees were formed since independence to formalize derivative trading in commodity markets. Khuso Committee (1980), in its recommendation, suggested the introduction of futures trading for most commodities. The most significant phenomenon in recent times in the Indian economy has been the initiation of the liberalization process, where the challenges for the government was to make the financial markets at par with the global markets. Thus, in the commodity market also, the requirement of risk-management tools in the form of derivative instruments were highly felt. The Kabra Committee (1994) recommended futures trading in nine (9) commodities. After a long ban for a few decades, finally, in the year 2003, futures trading in commodities started. The objective of the government as regard the commodity derivative market, especially for the futures market, was to bring parity with the stock market and consequentially the commodity transaction tax (CTT) was introduced for derivative trading in the market which is thought to similar in nature as that of securities transaction tax (CTT) in the stock market. Another notable incident took place in the year 2015 when the Forward Market Commission (FMC), which used to be the regulatory body for commodity derivative trading, was merged with the SEBI and SEBI started regulating derivative trading thereafter. This brave step by the government is likely to boost confidence of the market participants as SEBI remains well known for its active regulatory and vigilant monitoring. To equip the market participants with a further risk-management tool, in the year 2017, option trading on commodity futures was started.

Figure-2: Trends of Derivative Instruments used in Indian Commodity Market

Year	Volume (Lots)/ No. of contracts tarded	Turnover (₹ crore)
2013-14	249898481	9843441.315
2014-15	175880339	6087770.113
2015-16	263989081	6653782.483
2016-17	240262504	6462513.2
2017-18	228516671	5985305.435
2018-19	317706465	7364269.653
2019-20	392424616	9224839.055
2020-21	229121906	9222927.078
2021-22	201939939	10028820.24
2022-23	258801776	15013608.46
2023-24	524947036	28063326.37



Source: Computed by the author, compiling data from SEBI website, considering the cumulative trading figures or values of Commodity Futures and Commodity Options in all the segments such as Agriculture, Bullion (Precious Metals), Metals, Energy, Gems & Stones taking place in the exchanges such as MCX, NCDEX, ICEX, BSE and NSE across the country.

Interpretation: The table depicts the overall picture of commodity derivative trading including both futures and options. The steadiness of the market, followed by rapid growth in the post COVID-19 pandemic era indicates that the market participants are seeking exposure to derivative instruments for risk-management which is likely to make the commodity trading mechanism more robust. The initiative of the government of merging FMC with SEBI may be the game changer as the market participants are being assured that the market is in the safe hands of the most trusted and stringent regulatory body in India.

Use of Derivative Instruments in Currency Market

Currency market refers to foreign exchange market where conversions take place in respect of foreign currencies. The major currency pairs in the Indian market are USD-INR, GBP-INR, EUR-INR and JPY-INR. In international trade and commerce, the currency market plays a pivotal role. The market, by its very nature, is highly volatile and sometimes becomes so unpredictable that the derivative instruments become indispensable for risk management. Since the initiation of the liberalization process, the following developments took place in the market.

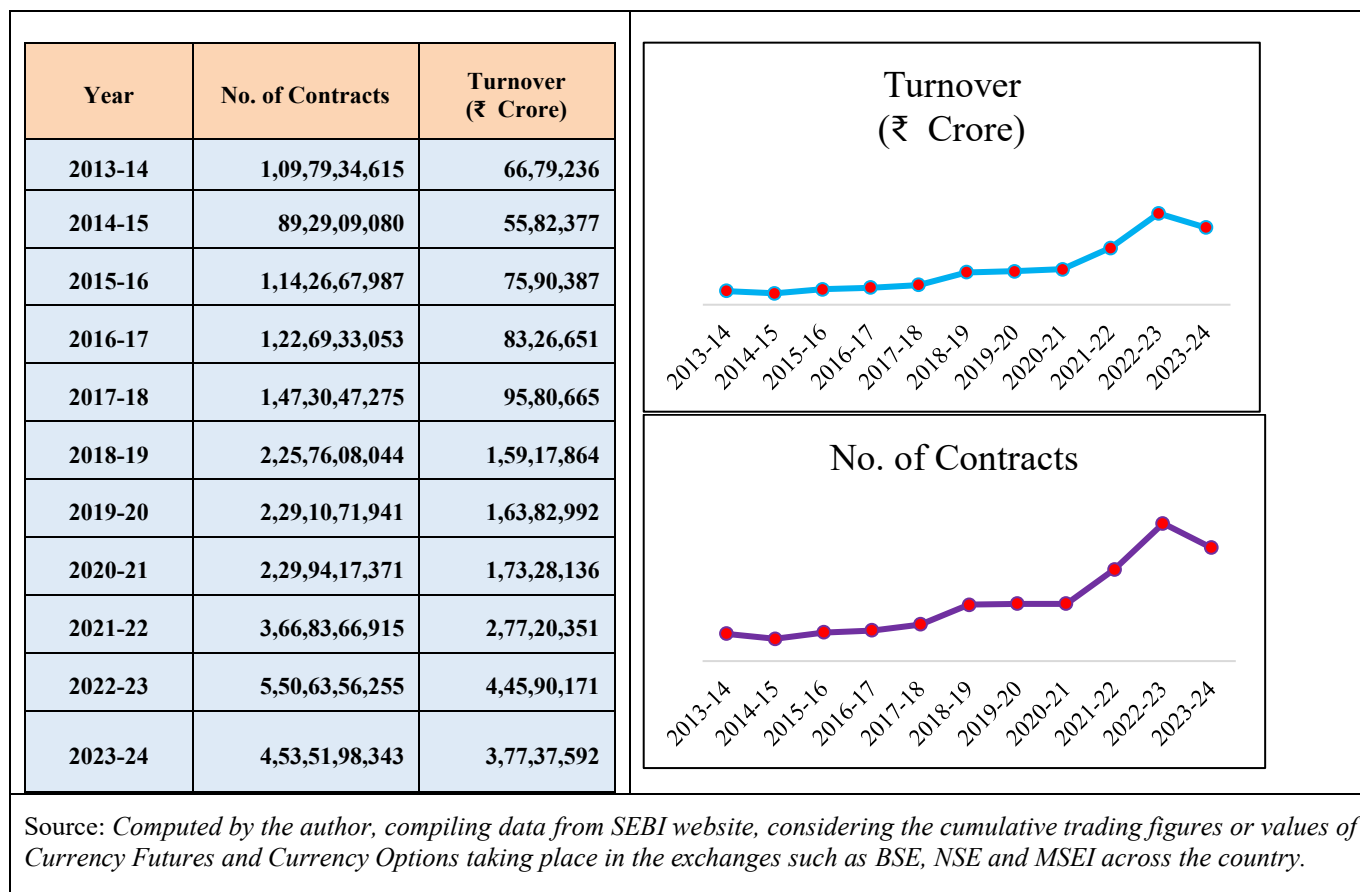
Table-3: Developments in Indian Currency Market in respect of Derivative Instruments

Year	Developments
1935	Establishment of Reserve Bank of India (RBI)
1991	Initiation of Liberalization process in Indian economy
July 2003	RBI allowed Option trading on foreign currency
August 2008	RBI allowed Futures trading on foreign currency
August 2008	Currency Derivatives were launched at NSE
October 2010	Currency Option was introduced on USD-INR at NSE
November 2013	Currency Derivatives were launched at BSE

Source: Compiled by the author from the websites of SEBI, RBI and NSE etc. and consulted the book by J. C. Hull & S. Basu.

Interpretation: Active currency market is one of the pre-requisites for a liberalized economy so as to facilitate international trade and commerce by providing adequate tools for risk management. RBI being the regulator of the currency market allowed options and futures trading respectively in the years 2003 and 2008. The NSE and BSE, upon receipt of permission from RBI, launched currency derivative trading respectively in the years 2008 and 2013.

Figure-3: Trends of Derivative Instruments used in Indian Currency Market



Interpretation: The currency market is found to offer all major currency conversions to facilitate derivative trading for risk management. Except for the year 2023-24, a steady growth is witnessed over the last 10 years, indicating thereby that a well-functioning mechanism of risk-management in the currency market.

Use of Derivative Instruments in Interest Rate Market

Interest rate market is regulated by RBI to facilitate banking and financial sectors across the country. To strengthen the mechanism, a constant endeavor has been made by the government so as to impose regulatory supervision in order to maintain fairness and transparency in the system. The following developmental measures have been taken since liberalization of the Indian economy.

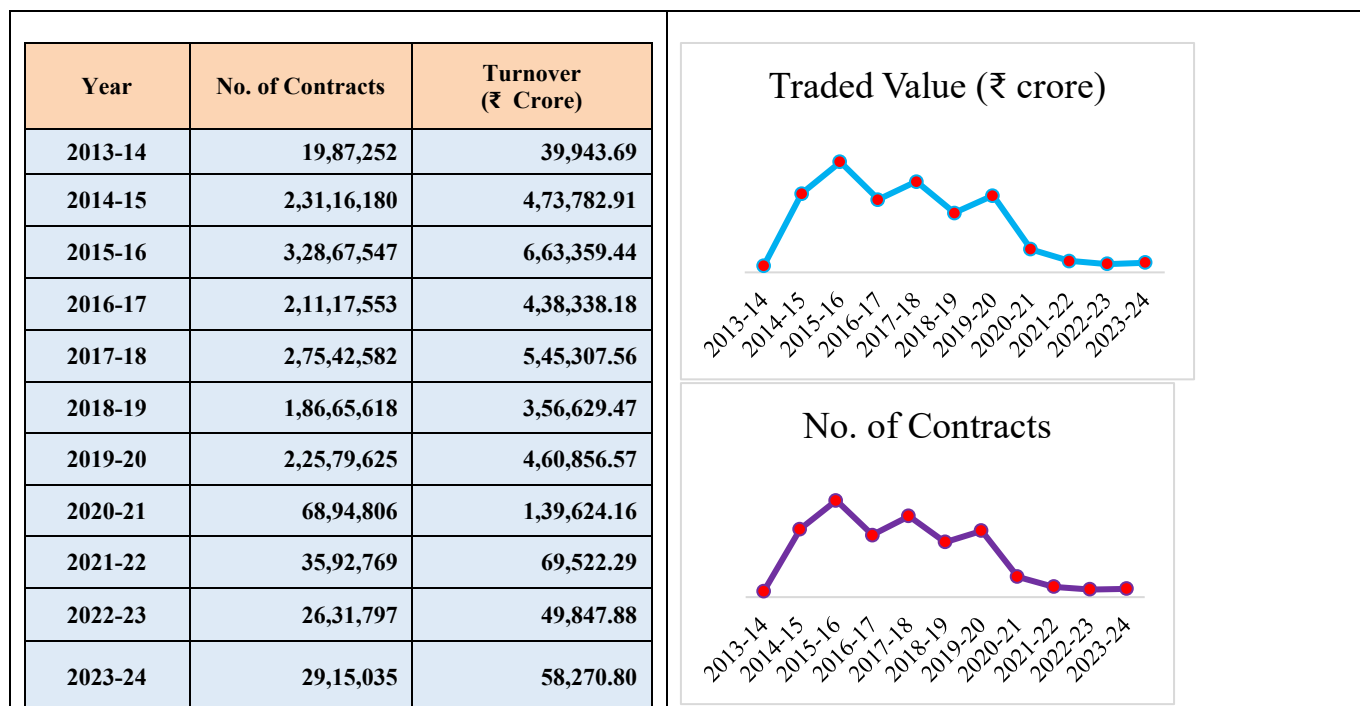
Table-4: Developments in Indian Interest Rate Market in respect of Derivative Instruments

Year	Developments
1935	Establishment of Reserve Bank of India (RBI)
1991	Initiation of Liberalization process in Indian economy
July 1999	RBI allowed Interest Rate Swap/ Forward Rate Agreement
August 2009	Interest Rate Futures were launched at NSE
December 2011	Credit Default Swaps were launched on Over the Counter (OTC) basis.
January 2014	Interest Rate Futures were launched at BSE

Source: Compiled by the author from the websites of SEBI, RBI, NSE etc. and consulted the book by J. C. Hull & S. Basu.

Interpretation: As risk-management becomes essential, RBI, being the regulatory body, introduced derivative trading in the form of Interest Rate Swap and Forward Rate Agreement in the year 1999. NSE and BSE launched Interest Rate Futures in the year 2009 and 2014 respectively. In the OTC, Credit Default Swaps were allowed since 2011.

Figure-2: Trends of Derivative Instruments used in Indian Interest Rate Market



Source: Computed by the author, compiling data from SEBI website, considering the cumulative trading figures or values of Interest Rate Futures and Interest Rate Options taking place in the exchanges such as BSE, NSE and MSEI across the country.

Interpretation: The table depicts the overall scenario of Interest Rate Derivative trading through exchanges in India where a fluctuating trend is being found with initial growth and thereafter a wavy movement and towards the end a sharp decline. The possible reason may be a shift towards OTC to avail of the benefit of risk-management through swap contracts which also take place under the close supervision of RBI. The table below is presented to show the mechanism of derivative trading in Indian financial markets.

Table-5: Derivative Trading Mechanism in Indian Financial Markets

	Stock Market	Commodity Market	Currency Market	Interest Rate Market
Regulator(s)	SEBI	FMC, now SEBI	RBI & SEBI jointly	RBI & SEBI jointly
Derivative Instruments	Futures & Options	Forwards, Futures & Options on Futures	Forward, Futures, Option & Swaps	Forward, Futures, Option & Swaps
Exchange(s)	NSE, BSE	MCX, NCDEX & ICEX	BSE, NSE, MSEI	BSE, NSE, MSEI
OTC Trading	-	Forwards trading in OTC	Forex forwards, Forex options, Forex Swaps in OTC under close supervision of RBI	Forward Rate Agreement, Interest Rate Swaps, Interest Rate Options in FCY, Interest Rate Swaps in FCY, Interest Rate Swap Options in FCY under close supervision of RBI

Source: Compiled by the author.

Findings

The derivative instruments turn the adverse phenomenon arising out of price fluctuations into opportunities for the participants and thereby ensure a healthy and safe investment ecosystem. After the liberalization of the economy, it became essential for the financial markets to be equipped with the derivative instruments to ensure proficiency equivalent to their respective global counterparts. The findings of the study, as regard the derivative instruments are as follows:

1. The derivatives in the form of futures and options respectively for the index and individual securities were introduced through the stock exchanges. The empirical evidence suggests the gradual increase in use of such instruments implying thereby that the participants are seeking exposure for their risk-return trade-offs.
2. In the commodity market, forward trading remained as a risk-management tool for a fairly long period of time with the bottleneck of default risk due to dishonoring the contract at the time of maturity. To solve the problem, although initiatives

were made, after independence, by forming FMC and introducing SCRA to impose regulatory control, still the scenario remained almost the same. Thus, it became a compulsion for the regulators to introduce exchange traded derivative instruments in the form of futures and options. However, it took around 50 years since independence and finally exchange traded derivative trading started after liberalization.

3. Introduction of derivatives trading in the currency market was by compulsion due to liberalization to strengthen the mechanism to make the market operate in similar fashion to that of its global counterpart. As a result futures and options trading were launched by the exchanges as permitted by the RBI.
4. Derivative trading in the form of forwards, futures and swaps were launched to make the banking sector operate more proficiently. However, the empirical evidence suggests that trading in forwards and swaps OTC markets is preferred over futures in the exchange traded market and therefore a declining trend is observed in the figure presented.

Conclusion

India, being the fourth largest economy of the world with a vibrant prospect of becoming the fastest growing major economy in coming years (Press Information Bureau, Govt. of India), is on the right track in introducing derivatives instruments timely for the financial markets. The rapid growth in trading of derivatives, to facilitate the participants in their risk-management, indicates the building up of trust on the mechanism. The SEBI and RBI, in their specific domain, are performing exemplary roles in monitoring the activities and empowering the exchanges to provide all-round support to ensure clarity and transparency in the markets. The continuous improvements in operational efficiency and introduction of modern versions of derivative instruments for risk-management is spreading the mercury of expectation.

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Competing Interest: No

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