TREND OF USAGE OF FOREX DEIVATIVES IN INDIAN STOCK EXCHANGE IN FIRST DECADE OF 21ST CENTRURY

Dr. GAJRAJ SINGH AHIRWAR

Research Supervisor, Department of Commerce

Sri Satya University of Technology and Medical Science, Sehore (M.P)

Email: gajrajsngh79@gmail.com

ABSTRACT- The futures market holds a great importance in the economy, and, therefore, it becomes imperative that we analyse this important market and seek answers to a few basic questions. The primary focus of this paper is to study the development of currency derivatives in India. It also seeks to analyse the volatility associated with these currency derivatives. To assess the growth of these instruments, the number of contracts traded and open interest at National Stock Exchange has been cumulatively analysed. An attempt has been made to ascertain if the daily returns from the National Stock Exchange for the currency futures are normally distributed. To this end, changes in the daily value of the Rupee with respect to Dollar, Yen, Euro and Pound was calculated for the period and the data has been put through an ANOVA Test to verify the returns' normal distribution hypothesis. Both investors and hedgers have responded positively to currency futures. Initially, currency futures were started for USD-INR contracts but trading in Euro-INR, Yen-INR and Pound-INR contracts were introduced in January 2010. In October 29, 2010 Currency Options on US Dollars were introduced. A comparison has also been conducted using currency futures and options on USD-INR. A comparison between the currency futures and options on USD-INR has also been done. The risk involved is comparatively low in this case and currency futures and options have proved to be a good tool for hedging the risk involved in the currency of a country (currency risk).

Keywords: Currency Futures, Currency Options, Volatility, Currency Risk, Open Interest.

INTRODUCTION

Currency futures have considerably acquired significance everywhere the world because the first bills futures contract was exchange in the old age 1972. With the favourable three age of the bill's futures on USD-INR that was allowed for business on the National Stock Exchange in August 2008, business in Euro-INR, Yen-INR and Pound-INR contracts have existed received in January 2010. A bills descendants division is not complete with just cash futures buoyant over the business principle; really, it needs the alternatives, excessively. The debut of currency futures in India has given a journey of as well three age and many changes have happened achieved in the business whole in this regard. Currency alternatives, even though an old age traditional, have win honourable approach in the NS E' s currency descendant's piece.

Pricing and Settlement of Currency Futures

According to the interest rate parity theory, the currency margin is dependent mainly on the prevailing interest rate (for investment for the given time period) in the two currencies. Therefore, the currency futures prices are determined with the help of the spot rates and interest rates prevailing at that time. The following formula is used to set the price for a contract for a given currency pair:

F=S (1+RQ xT) ÷(1+R,,xT)

Where,

F —the price for the currency futures contract;

S = the spot rate for the currency pair;

RQ = the interest rate of the quote currency;

RB = the interest rate of the base currency;

T = the time to maturity (in days).

Once the currency futures contracts reach their expiration date, they are settled in cash in the currency that underlies the contract. This settlement method arises from the fact that currency futures depend on the exchange rates between two currencies. The final settlement involves a cash payment in the underlying currency.

REVIEW OF LITERATURE

On The Trend of Usage of Forex Derivatives in the Indian Stock Exchange (2000-2010)

The first decade of the 21st century marked a significant evolution in the usage of forex derivatives in the Indian stock exchange, particularly with the liberalization of financial markets and regulatory changes by the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI). Several studies have analyzed the trends, growth patterns, and impact of forex derivatives on market efficiency, hedging strategies, and risk management practices.

1. Growth and Development of Forex Derivatives Market in India

Studies such as those by Sridharan and Kavitha (2008) and Thomas (2005) highlight that the Indian forex derivatives market witnessed substantial growth due to increased foreign trade, foreign direct investment (FDI), and portfolio investments. The introduction of currency futures in 2008 further accelerated market participation.

2. Regulatory Framework and Its Impact on Usage

The regulatory environment played a critical role in shaping the forex derivatives market. Research by Gopinath (2006) discusses how RBI gradually eased restrictions on forex derivative products, allowing corporates and financial institutions to hedge their currency exposure more efficiently. The introduction of over-the-counter (OTC) derivatives, such as forward contracts and options, facilitated greater risk management flexibility.

3. Hedging Strategies and Risk Management

Several empirical studies, including those by Ghosh (2009) and Bose and Coondoo (2004), suggest that Indian firms increasingly used forex derivatives to hedge against exchange rate fluctuations. These studies indicate a growing awareness and adoption of sophisticated risk management techniques among Indian corporations.

4. Market Efficiency and Speculative Trading

While derivatives were primarily introduced for hedging, researchers like Rao and Sehgal (2006) found that speculative trading in forex derivatives also grew significantly, particularly after the launch of currency futures in 2008. The study suggests that forex derivatives improved price discovery but also increased market volatility.

5. Impact of Global Events on Forex Derivatives Usage

The 2008 global financial crisis had a profound impact on the forex derivatives market. Studies like Patnaik and Shah (2010) note that market participants became more cautious, leading to a temporary decline in forex derivatives trading. However, post-crisis reforms and increased foreign investments helped in the revival of derivative usage by the end of the decade.

Objectives

The study aims to evaluate the development and growth of currency futures in India, focusing on their volatility and market performance. The key objectives include:

- Assessing the Growth of Currency Futures
- Examining the number of contracts traded and open interest for the four available currency futures contracts at the National Stock Exchange (NSE).
- Analysing the correlation between open interest and contracts traded to determine growth trends.
- Understanding the Growth of Currency Options

- Evaluating the relationship between open interest and contract volume for USD-INR currency futures and options.
- Comparing the open interest and trading volume of currency options and futures to understand their relative performance.
- Analysing the Distribution of Daily Returns
- Investigating whether the daily returns on currency futures traded on NSE follow a normal distribution.

Conducting an ANOVA test to examine variance in returns across different currency futures contracts.

RESEARCH METHODOLOGY

Data Collection

Secondary data sourced from NSE on contract volume, open interest, and daily returns of currency futures and options.

Growth Analysis

The correlation between open interest and contracts traded is used to assess market growth.

A positive correlation with increasing values suggests expansion, while a negative correlation indicates stagnation or decline.

Statistical Analysis

Normality Test: To check if currency futures return follows a normal distribution.

ANOVA (Analysis of Variance): Used to test differences in returns across different currencies.

Hypothesis Testing:

Null Hypothesis (H_0): The returns of currency futures are normally distributed.

Alternative Hypothesis (H_1): The returns of currency futures are not normally distributed.

The calculated F-value of 0.438 is less than the critical F-value, leading to the acceptance of the null hypothesis, implying that the returns are normally distributed.

QUANTITATIVE ANALYSIS

This section focuses on the analysis of open interest and the number of contracts traded for all four currency futures contracts on the National Stock Exchange. We've also examined the fluctuations in the value of the Rupee against various currencies. Let's delve into the insights gathered through this analysis. Below, you'll find a detailed explanation of the growth in open interest and traded contracts:

I. Open Interest and Volume of Contracts Traded

Open interest refers to the total number of active contracts that market participants hold at the end of each trading day. It indicates how many futures contracts remain unexercised, unexpired, or unfulfilled. This metric is essential for confirming trends and potential trend reversals in the futures markets, as it reflects the flow of capital entering the market.

To understand the total open interest, we consider either the total number of buyers or sellers since each contract consists of both a buyer and a seller. The daily report on open interest reveals whether the number of contracts has increased or decreased on that particular day. When open interest is rising, it signals that new capital is entering the market, suggesting that the current trend is likely to persist. Conversely, a drop in open interest suggests that positions are being liquidated, indicating that the prevailing price trend may be nearing its end. Additionally, if open interest stabilizes after a significant price uptick, it can serve as an early indicator that a bullish or upward trend might be losing momentum.

The number of contracts traded on a stock exchange is a key indicator of its overall growth, specifically for currency futures. Below are the figures detailing open interest and trading volume for various currency futures contracts.

Starting with the EURO-INR currency futures, Figure 1 illustrates a notable trend. Up until December 2010, both open interest and the volume of contracts traded showed a decline. Although there was a slight increase starting in January 2011, this was followed by another downward trend that began in August 2011. Such patterns raise concerns about the growth potential of currency futures in this area.

The correlation between open interest and contracts traded is calculated at +0.14. This suggests a weak but positive relationship, indicating that the growth of EURO-INR currency futures has not been satisfactory. A broader examination of other currency futures reveals that they have generally performed well, making the underwhelming performance of the EURO-INR futures stand out as a point of concern.

TABLE 1- Volume and Open Interest for EURO- INR Currenct Future Since February 2010-

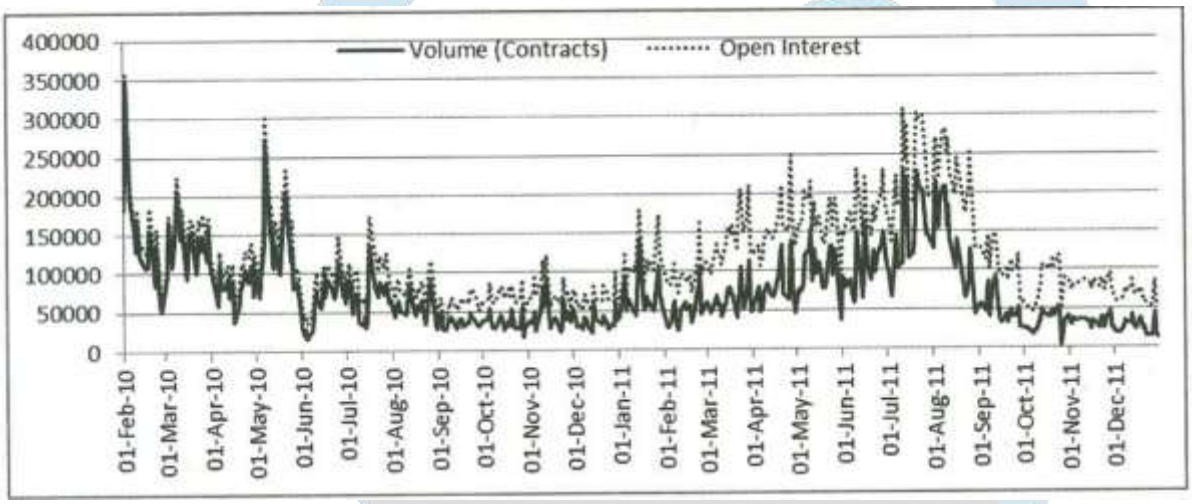


Table 2 presents the open interest and volumes for GBP-INR currency futures, illustrating a consistent growth trend in this market. Both open interest and contracted volumes have been on the rise, signalling a positive outlook. However, it's important to note that there has been a decline in these metrics since August 2011. The correlation coefficient of +0.76 reinforces a strong positive relationship between open interest and contracted volumes, further affirming the robust performance of GBP-INR currency futures.

Table 2- Volume and Open Interest for GBP-INR Currency Futures since Feb 2010

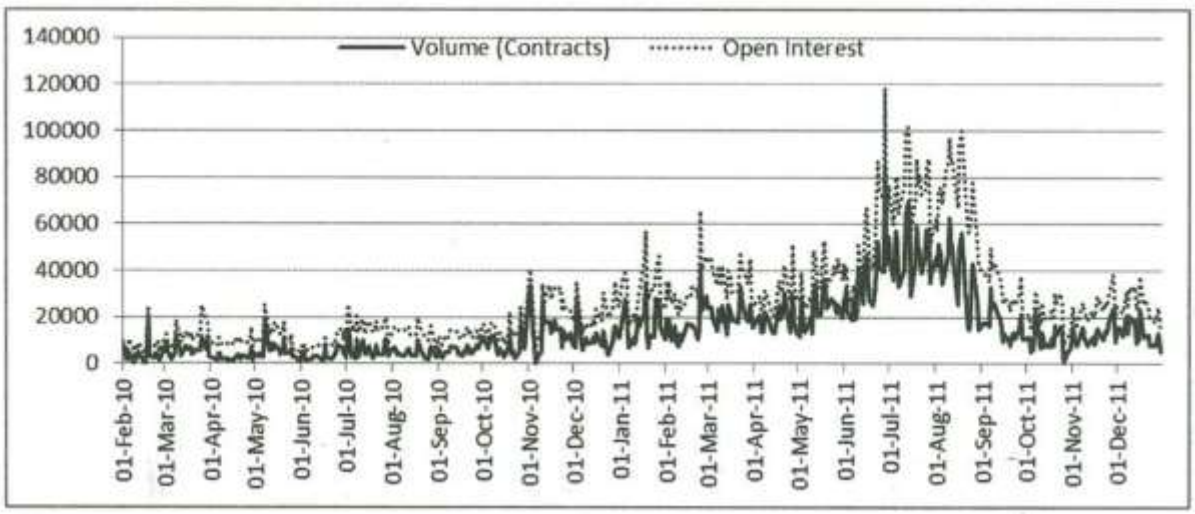
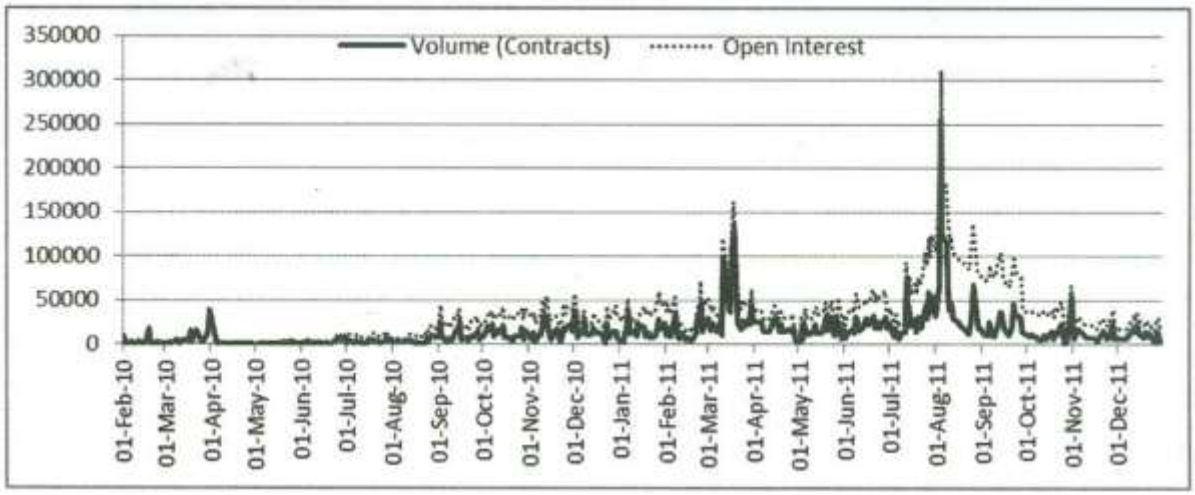


Table 3 illustrates the open interest and trading volumes of JPY-1NR currency futures, indicating a growth trend, albeit with some fluctuations. Notably, there was a significant decline in May 2010, followed by a recovery. A similar pattern emerged in 2011, where both volumes and open interest experienced a downturn starting in August. However, the correlation between open interest and trading volumes stands at +0.52, highlighting a notable increase in JPY-INR contracts during this period.

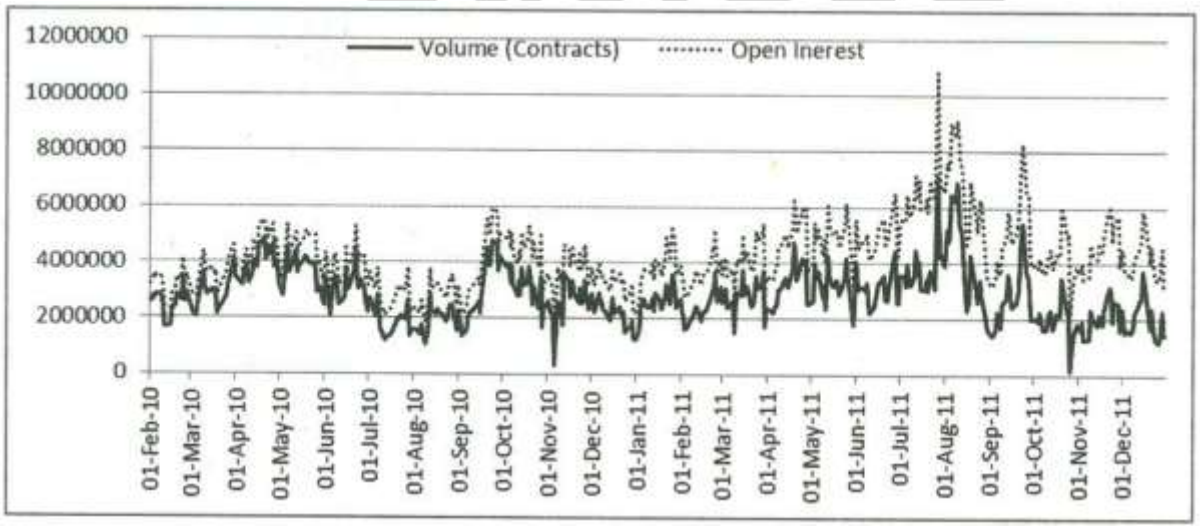
Table 3- Volume and Open Interest for JPY- INR Currency Fututres since February 2010



able 4 illustrates the open interest and contracted volumes for USD-INR currency futures, revealing a notable growth trend. However, similar to the other three currency futures contracts, we have observed a decline in both volumes and open interest for USD-INR since August 2011. The correlation coefficient of +0.81 indicates a strong relationship, highlighting that growth in open interest and contracted volumes has been significant. Over the past two and a half years, demand for USD-INR currency futures has remained robust.

Table 4: Volume and open interest for USD-INR currency futures since

February 2010



II. Daily Fluctuations in the Value of the Rupee:

Analysis indicates that the Yen has provided higher returns for investors when looking at maximum mean values. However, when factoring in both return and volatility, the US dollar stands out among these four currencies. In terms of volatility, the Rupee has shown greater fluctuation compared to the Yen, followed by the Pound, Euro, and then the US dollar. The US dollar, with its lower volatility and favourable average returns, appears to be the more stable option. For a comprehensive overview, please refer to Table A for detailed statistics.

	USD	GBP	EURO	JPY
Mean	0.0315	0.0253	0.0172	0.0666
Median	0.0215	0.0022	0.0414	0.0786
Standard Deviation	0.5238	0.7193	0.6754	0.8685
Sample Variance	0.2743	0.5174	0.4562	0.7542
Minimum	-2.621	-5.600	-2.343	-4.428
Maximum	1.9430	6.1943	2.8892	2.9984
No. of Observations	462	462	462	462

The assessment of the fluctuations in the value of the Rupee across the four currencies indicates that the returns are normally distributed and show no significant differences among them. The findings from the ANOVA can be found in Table B.

TABLE B: ANOVA RESULTS

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F- crit*
Between Groups	0.658	3	0.219	0.438	0.725	2.609
Within Groups	922.994	1844	0.501			
Total	923.652	1847				

III. Growth of the Currency Derivatives Segment

The currency derivatives segment at the National Stock Exchange (NSE) was launched in 2008, marking the beginning of a significant development in the market. As shown in Table 3, this segment has experienced impressive growth since its inception. In the 2008-09 fiscal year, the average daily turnover stood at Rs. 20284.05, which reflected strong acceptance among market participants. In the subsequent year, this figure skyrocketed by 632%, followed by a remarkable growth of 93% in 2010-11 and a more moderate increase of 35% in 2011-12.

Currency futures have emerged as the standout performers within the currency derivatives arena, commanding 95% and 72% of the total market share here at the NSE. Currently, there are four currency futures contracts and one currency options contract being traded in this segment. Notably, the USD-[NR currency option] accounted for a substantial 28% share of the segment's activity in 2011-12, and it is anticipated to maintain this trajectory going forward.

Table C: Business Growth in the Currency Derivatives Segment of the National Stock Exchange

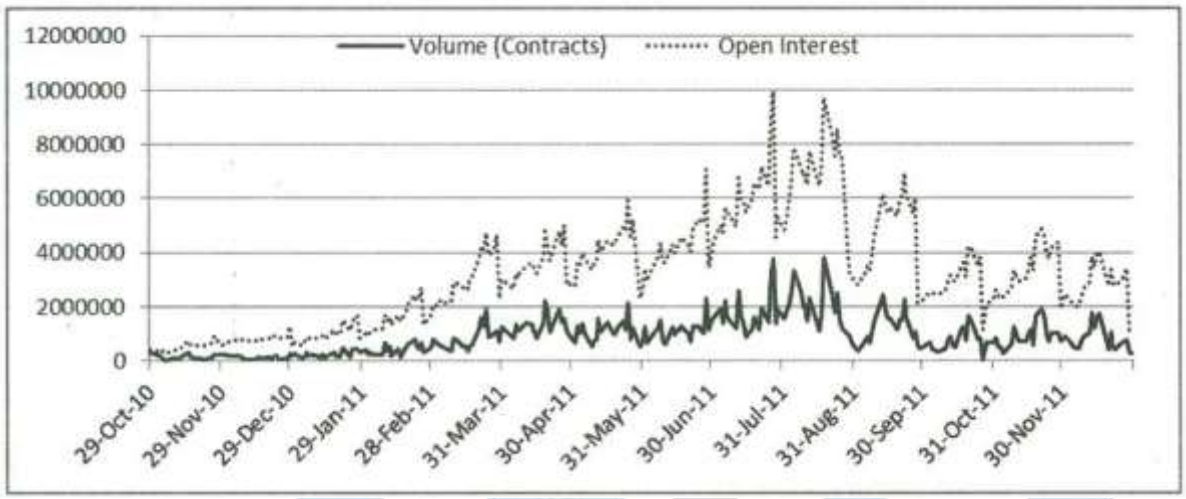
Year	No. of Contracts in Currency Futures	Per Cent of Total No. of contracts	No. of Contracts in Currency Option	Per Cent of Total No. of contracts	Total No. of contracts	Average Daily Turnover (in Rs.)	Per Cent Growth
2008-09	3,26,72,768	100	-	-	3,26,72,768	20284.05	
2009-10	37,86,06,983	100	-	-	37,86,06,983	148550.67	632
2010-11	71,21,81,928	95	3,74,20,147	5	74,96,02,075	287482.31	93
2011-12	70,13,71,974	72	27,19,72,158	28	97,33,44,132	389582.49	35

The total number of contracts has shown a consistent increase over the years; however, the growth rate of the average daily turnover has been on a downward trend. This decline in growth can be attributed to a decrease in the number of contracts traded across all four currency futures. The graphical data reveals a significant drop in both the number of contracts traded and the open interest for these four currency futures on the National Stock Exchange.

IV. Currency Options Traded on the National Stock Exchange: A Look at Currency Futures

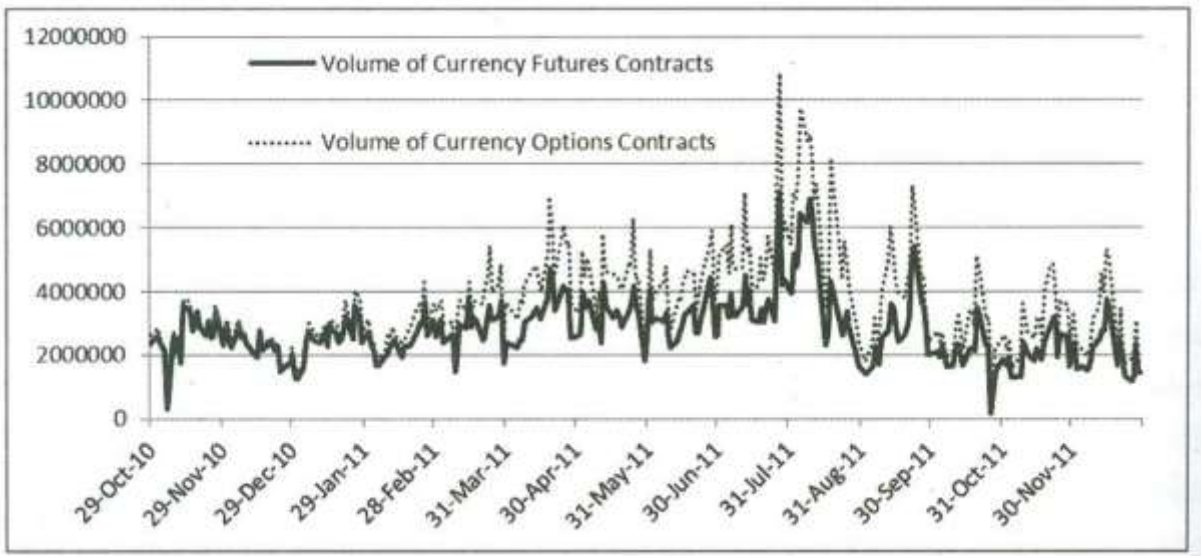
As seen in Table D, both the contracts traded and the open interest have shown a consistent upward movement. The strong correlation of +0.81 between these two factors indicates that the USD-INR currency options are leading the way in the currency derivatives market on the National Stock Exchange. This positive correlation and upward trend highlight the robust performance of currency option contracts.

TABLE 5- Volume and Open Interest for USD- INR Currency Options since October 2010



However, it's worth noting that since August 2011, the graph has shown a downward trajectory. A similar trend has been observed in four currency futures contracts within this segment. Therefore, it can be concluded that the overall currency derivatives market has not been performing favourably during the period from August 2011 to December 2011.

TABLE 6 Volume of Currency options and Currency Futures since October 2010-



A comparison has been made between the trading volumes and open interest of currency futures contracts and currency options contracts. As illustrated in Table F , the trading volumes for both currency options and futures have mirrored each other closely. The observed correlation of +0.70 indicates a strong relationship, suggesting that market participants tend to hold USD-INR futures and options in similar proportions.

TABLE 7- Open Interest for Currency Options and Currency Futures since October 2010

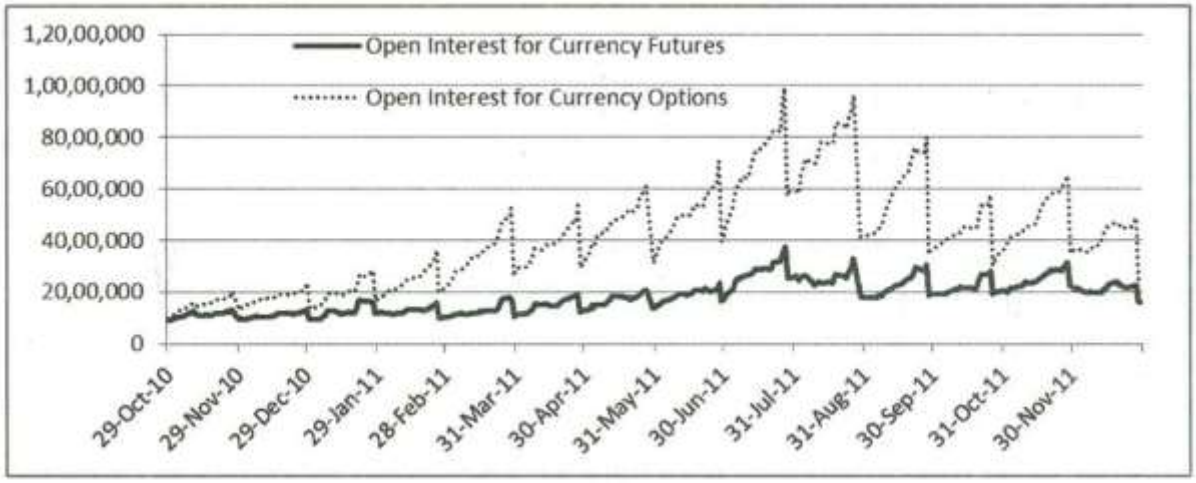


Table 7 shows the open interest for USD-INR futures and options. While the open interest for currency options is notably high, it has followed a trend consistent with that of currency futures. The strong positive correlation of +0.82 implies that the USD-INR futures and options are similarly favoured among participants in the currency derivatives market.

CONCLUSION

The Indian forex derivatives market expanded rapidly in the first decade of the 21st century, driven by regulatory reforms, increased trade, and financial liberalization. This study evaluates the growth, volatility, and efficiency of currency futures and options in India. The introduction of USD-INR futures in 2008 and additional currency futures in 2010 significantly boosted market activity. A strong +0.81 correlation between open interest and traded contracts for USD-INR futures highlights their rising popularity.

Currency futures have shown minimal volatility and steady returns, making them effective hedging tools. The correlation between open interest and trading volumes suggests that currency values follow a normal distribution, implying relatively low risk. Since their introduction in 2010, currency options have also gained traction. As the market continues to evolve, currency derivatives are expected to play an increasingly important role in the Indian economy, offering investors and businesses a reliable mechanism for managing exchange rate risks.

SCOPE OF THE STUDY

The study is focused on the Indian currency derivatives market, particularly the National Stock Exchange (NSE).

It covers currency futures and options, with an emphasis on USD-INR contracts.

The analysis spans multiple years to capture long-term trends in trading activity and volatility.

The study is relevant for traders, investors, regulators, and policymakers interested in understanding the evolution and efficiency of the currency futures market.

REFERENCES

Choudhari, N. 2009. Global Recession and its impact on Indian financial market. Retrieved from

www.aima-ind.org/.../Nidhi_Choudhari_24080982820095705178.pdf

Currency Futures (Reserve Bank) Directions, 2008

Currency Futures (Reserve Bank) (Amendment) Directions, 2010 Circulars of the RBI and the National Stock Exchange

Jaiswal, K. S. & Saha, D. 2009. Currency Futures Trading in India. Indian Journal of Finance, Vol. 3(4), pp 28-34

Naik, G. & Jain, S. K. 2002. Indian agricultural commodity futures market: A performance survey. Economic and Political Weekly. Vol. 37 (30). pp 3161-73

John, K., Koticha, A. and Subrahmanyam, M.G. (1991) The Micro-Structure of Options Markets: Informed Trading, Liquidity, Volatility and Efficiency. New York University Salomon Canter, New York.

Easley, D., O'Hara, M. and Srinivas, P.S. (1993) Option Volume and Stock Prices: Evidence on Where Informed Traders Trade. Working Paper, Cornell University.

Thenmozhi, M. and Thomas, S.M. (2007) Price Discovery and Volatility Spillover in Spot and Futures Market: Evidence from India. Indian Journal of Capital Market, 4, 1-28.

Guru, A. 2009. Forex derivative markets in India: Developments thus far and road ahead. Retrieved from SSRN: http://ssm.com/abstract=1420615

Damodaran, A. and Lim, J. (1991) The Effects of Option Listing on the Underlying Stocks' Return Processes. Journal of Banking & Finance, 15, 647-664.

Sakthivel, P. and Kamaiah, B. (2010) Price Discovery and Volatility Spillover between Spot and Futures Markets: Evidence from India. IUP Journal of Applied Economics, 9, 81-97.

Srinivasan, P. (2012) Price Discovery and Volatility Spillovers in Indian Spot-Futures Commodity Market. IUP Journal of Behavioural Finance, 9, 70-85.

Pandey, D. K. 2012. Currency futures traded on the National Stock Exchange. Indian Journal of Commerce. Vol. 65 (I). pp

CA Gandhi, G. S. 2006. Selecting a Suitable Currency Options Hedging Strategy for Managing Foreign Exchange Risk. The Chartered Accountant. November 2006. pp 773-78

Guru, A. 2009. Indian derivative markets: Some policy issues. Retrieved from SSRN: http://ssm.com/abstract=1428685

Patil, R. H. 2003. Exchange traded interest rate derivatives. Economic and Political Weekly. Money, Banking and Finance. Vol. 38 (8). pp 755-60