

AN ANALYSIS PERFORMANCE OF CURRENCY DERIVATIVES DURING PANDEMIC - BLACK SCHOLES MODEL

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ABSTRACT

The introduction of Currency Derivatives in India is a landmark decision which is likely to be a boon for importers, exporters and companies with Forex exposure. These Derivative products have a wide scope with their special features tailored to match customer requirements. Black Scholes model, is a mathematical model for pricing an options contract. In particular, the model estimates the variation over time of financial instruments. It assumes these instruments (such as stocks or futures) will have a lognormal distribution of prices.

Keywords: *Volatility, Currency Indices, NSE Derivatives Exchange Rate, Cross Rate, Black Scholes Model.*

Introduction

COVID-19 and lockdowns have presented the world with an unprecedented challenge and its economic fallout both in India and globally is likely to be severe, albeit temporary, in our opinion. Governments and Central Banks across the world proactively unleashed significant fiscal and monetary measures to cushion the impact of the same. While these measures have helped the financial markets to stabilize, to a large extent, but the macro economic impact of COVID-19 led disruption has been material over the past 6 months. In view of this, this monthly commentary contains a detailed review of macroeconomic situation than usual.

Global economy: All major countries had imposed lockdown to varying degrees and thus, the GDP growth of most countries in the current year will be significantly impacted Since March 2020, however, increasingly countries are reopening while simultaneously putting some safety measures to keep the infection from growing rapidly. Economic activity improving month on month in most countries is the great sign. Hence, Central Banks' balance sheet is likely to expand significantly during the year. Further, massive fiscal spending, especially by advanced economies, is likely to cushion the impact on growth but will widen global fiscal deficit to 14% of GDP, IMC said this.

Importance of Derivatives

Derivatives are very important contracts, not just from the investors' point of view but also from the overall economics point of view. They not only help the investor in hedging his risks, diversifying his portfolio, but also it helps in global diversification and hedging against inflation and deflation.

Importance of Currency Derivatives

From the point of view of currency derivatives, underlying would mean the currency exchange rate. Derivatives help in hedging your portfolio against any risk, they can also be used productively for speculation and arbitrage. Hedging – The primary reason why people enter into an agreement is hedging. Currency futures on USD-INR were introduced for trading and subsequently the Indian rupee was allowed to trade against other currencies such as euro, pound sterling and the Japanese yen. Currency Options was introduced on October 29, 2010.

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Further, Options trading on EURINR, GBPINR and JPYINR was also introduced on February 27, 2018. Cross Currency Futures and Options contracts on EUR-USD, GBP-USD and USD-JPY are also introduced on February 27, 2018. So total four currency will be allowing for trading.

Role of NSE as : Clearing & Settlement

A Clearing Member (CM) of NSE Clearing has the responsibility of clearing and settlement of all deals executed by Trading Members (TM) on NSE, who clear and settle such deals through them.

Review of Literature

Dr. E.V.P.A.S.Pallavi "A New Era of Currency Derivatives Market in India", e-ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 6, Issue 3. Ver. III (May.-Jun. 2015), PP 36-40, The main theme of this paper is to assess the development of currency derivatives in India. In order to study the growth of the currency derivatives, the number of contracts traded, trading volume and open interest at NSE are studied. The currency derivatives have received a good response from the investors as well as the hedgers. Currently, only resident Indians (including individuals, companies and financial institutions) can trade in the four currency pairs available in the local market-dollar/rupee, pound/rupee, euro/rupee and yen/rupeeMcKenzie,

D Gerace, Z. Subedar "An empirical investigation of the Black Scholes model: evidence from the Australian Stock Exchange" Australian Accounting Business and Finance Journal . 1(4), 2007. Available at:<http://ro.uow.edu.au/aabfj/voll/iss4/5>: This paper evaluates the probability of an exchange traded European call option being exercised on the ASX200 Option Index. The results also provide evidence that the use of implied volatility and a jump-diffusion approach, which increases the tail properties of the underlying lognormal distribution, improves the statistical significance of the Black-Scholes model.

Beckers (1980) tested the Black-Scholes assumption that the historical instantaneous volatility of the underlying stock is a function of the stock price, using S&P index option 1972-1977. Beckers (1980) finds the underlying stock is an inverse function of the stock price.

Rubinstein (1944) illustrates that the implied volatility for S&P 500 index options negatively skewed and leptokurtic. Jackwerth and Rubinstein (1996) show the distribution of the S&P 500 before 1987 exert lognormal distribution, but since have deteriorated to resemble leptokurtosis and negative skewness.

Sanju (2018) indicate Currency derivatives are money related contracts between the purchaser and seller including the exchange of two monetary standards at a future date, and at a stipulated rate. Currency Derivatives Trading is reasonable for those keen on diminishing their foreign exchange rate risk. Currency Derivatives in India give a heap of opportunities to various players. Accept this open door to effectively deal with your international exchange rate risk with currency trading in India..

Zuzana Janková "Drawbacks and Limitations of Black-Scholes Model for Options Pricing" Journal of Financial Studies & Research ISSN: 2166-000X; Black-Scholes model is considered the biggest success in financial theory both in terms of approach and applicability. This paper explores the weaknesses in this model and illustrates some consideration when dealing with such models.

H.Reynaerts & M.Vanmaele "A Sensitivity Analysis for the Pricing of European call Options in a Binary Tree Model" This model is very general in the sense that it can be applied if one describes it by fuzzy numbers in option. The conclusion is that the price option is a strictly increasing function of the volatile.

Objective of Study

- To identify present situation of currency derivatives in capital market use of black scholes model.
- To analyze movement of different currency derivatives.

Sample Universe

The sampling universe is the total number of items/events from which you can select or sample for statistical analysis and description. Here, MCX AND MCX-SX all indices.

Sample Unit: Currency Derivatives:

- INR-USD
- INR-EURO
- INR-GBP
- INR-CNY

Sample Period: Pandemic Period

Here, An investigation on gold and currency derivatives for 1 year from 1-JAN-2020 to 31-DEC-2020.

Hypothesis of Study

H₀: There is positive relationship between currency segments

H₁: There is negative relationship between currency segments

Data Collection

I have used secondary data for analysis of currency derivatives, using nseindia.com

Tool of Analysis

The black schools model is used to calculate a theoretical call option and put option using the five key determinants of an option's price: stock price, volatility, time to expiration, and short term interest rate. The second part of the study will have as core analysis of gold and different currency by the black schools model, which will be studied, given due – term of option.

$$C = SN(d_1) - E e^{-rt} N(d_2)$$

The buy-and-hold strategy for gold is superior to a managed and diversified portfolio including more parts of the precious metals sector? Not necessarily. During most of the analyzed period, its compare with SENSEX which means that the less volatile part of the precious metals market simply doesn't decline as much as the other index. But, once the bull market truly resumes, the more volatile parts of the precious metals market would be likely to take the lead.

Forex Currency**INR-USD**

Particular	Call Premium	Put Premium
Upper Limit	4.88	2.57
Lower Limit	5.29	2.29

In forex market this INR - USD is mostly traded currency. Here, same as spot price and exercise price difference call premium upper limit of USD is 4.88 while it lower limit is 5.29 Same with put premium. Table saw in between January 2020 to December 2020 it highly fluctuated and decrease at end of year.

INR-EURO

Particular	Call Premium	Put Premium
Upper Limit	4.74	4.26
Lower Limit	5.08	3.92

EURO is currency of 17 country of euro zone. In forex market this INR - EURO is second most traded currency. Here, same as spot price and exercise price difference call premium upper limit of EURO is 4.74 while it lower limit is 5.08 Same with put premium. Table saw in between January 2020 to December 2020 it highly fluctuated and made stable at end of year.

INR-GBP

Particular	Call Premium	Put Premium
Upper Limit	6.54	3.55
Lower Limit	5.83	4.12

GBP is currency of England. In forex market this INR – GBP is third most traded currency. Here, same as spot price and exercise price difference call premium upper limit of GBP is 96.58 while it lower limit is 5.83 Same with put premium. Table saw in between January 2020 to December 2020 it highly fluctuated and nearly make stable at end of year.

INR-JPY

Particular	Call Premium	Put Premium
Upper Limit	3.84	3.26
Lower Limit	4.35	2.79

CNY is currency of China. In forex market this INR – CNY is rarely traded currency. Here, same as spot price and exercise price difference call premium upper limit of CNY is 3.84 while it lower limit is 4.35 Same with put premium. Table saw in between January 2020 to December 2020 it highly fluctuated and decrease at end of year.

Finding & Conclusion

Like other futures, foreign exchange futures can be used for hedging or speculative purposes. A party who knows they will need a foreign currency at a future point, however, does not want to purchase the foreign currency at this point in time may buy FX futures. This will act as a hedged position against any volatility in the exchange rate. At the expiration date when they need to buy the currency, they will be guaranteed the FX futures contract's exchange rate. Similarly, if a party knows that they will receive a cash flow in the future in a foreign currency, they can use futures to hedge this position.

Currency futures are also often used by speculators. If a trader expects a currency to appreciate against another, they can buy FX futures contracts to try to gain from the shifting exchange rate. These contracts can also be useful for speculators because the initial margin that is held will generally be a fraction of the size of the contract. This allows them to essentially lever up their position and have more exposure to the exchange rate.

Currency futures can also be used as a check for interest rate parity. If interest rate parity does not hold, a trader may be able to employ an arbitrage strategy to profit purely from borrowed funds and the use of futures contracts. Investors looking to hedge a position often use currency forwards due to the ability to customize these over the counter contracts. Speculators often use currency futures due to the high liquidity and ability to leverage their position.

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