



# DOES THE USE OF CALL OPTIONS ON FOREIGN CURRENCY PRODUCE BETTER HEDGING RESULTS THAN THE USE OF CURRENCY FUTURES FOR IMPORTERS IN INDIA?

**Dr. Pinakin Jaiswal**

Associate Professor

Drs. Kiran and Pallavi Patel Global University

## **Abstract :**

Importers are worried about exchange rate fluctuation that leads to weakening of domestic currency against the foreign currency. A weak Indian rupee against the US\$ could mean shelling out higher amount of Indian rupees to pay US\$ import bills. To hedge this risk the importers have conventionally used Forward contracts offered by banks in India. However, with the introduction of the exchange-traded derivatives, two more choices viz. Call options and Futures on foreign currency were made available. This paper aims to see if use of Call option hedge produces a better result for the importer than the use of a Futures hedge. The result was gauged based on the exchange rate realized using the hedges. The lower the rate realized, better it is for the importer. A paired t-test was conducted and it was observed that there is no statistically significant difference observed in the exchange rates realized between the Call option hedge and the Futures hedge.

## **Introduction**

Importers in India are faced with exchange rate fluctuation risk. If the rupee weakens against the foreign currency they would have to pay more of the domestic currency i.e. Indian Rupees (INR) to buy the foreign currency. To hedge this risk, conventionally, the importers rely on the Forward contracts on foreign currency that are offered by the banks. However with the introduction of exchange-traded derivative products the choice available for hedging the foreign currency exposure has widened. This paper aims to compare the results obtained for notional hedges created using Call options on US\$ and Futures contract on US\$.

A Call option on foreign currency is a contract that gives the right to holder of the call to buy a stated amount of foreign currency at a future date. The exchange rate (price of foreign currency) at which the holder can buy the foreign currency is fixed at time of buying the call and this price is termed as the Strike price of the option. The buyer of the Call option has to pay Premium for buying the Call option.

In a Futures contract on foreign currency the importer would agree to buy a stated quantity of the foreign currency units at a future date, the exchange rate of which is fixed at the time of entering into the contract. On the said date i.e. expiry of the contract the importer would have to buy the stated amount of foreign currency by the paying the agreed exchange rate.

## **Objective of the research**

This paper aims to probe whether the results produced by a hedge using a Call option is better than the one set up using the Currency futures. The Call option has the advantage that if the Rupee strengthens against US\$ and trades below the Strike price of the option on the date of expiry, the importer is not bound to exercise the option. The advantage of lower exchange rate could be gained by the importer. Against this the loss the importer would incur is the premium paid for the option. This flexibility is not available in the Futures contract. Even if the exchange rate falls below the contracted price in the spot market, the importer would not be able to avail of this advantage. Given this seeming advantage is it advisable to use Call option rather than Futures contract?

**Research Methodology**

Based on the objective of the research the hypothesis was formulated:

$H_0$  : There is no difference in the exchange rates realized between the hedge formulated using Call options and Currency Futures

$H_1$  : The hedge formed using Call options provides a better result for the importer when compared to the Futures hedge

To test the hypothesis a paired t-test was used with a significance level of 5% ( $\alpha = 0.05$ ).

**Data Collection and Analysis**

To test the hypothesis, a notional hedge using the call options was formed. The hedge was initiated at the beginning of the month and was closed / lifted at the end of the month. The importer was assumed to buy/long on a Call option at beginning of the month by paying a premium at closing price of the first trading day of the month. The options chosen were near to At-the-money situation. The spot exchange rate for US\$-INR was taken from the website [www.xe.com](http://www.xe.com) . The strike price chosen for the Call option was close to the spot exchange rate. A simultaneous hedge for the importer was initiated on the same day using the Currency futures. The expiry of Call option and the Futures contract was for a date near the end of the month. The hedge was lifted at the expiry of the contract and the exchange rates realized for the importer were as follows:

Exchange rate realized for the importer using Call option = Spot exchange rate on date of lifting hedge – (gain made on Call option hedge)

Exchange rate realized for the importer using Currency Futures = Spot exchange rate on date of lifting hedge – (gain made on Futures hedge)

It should be noted that a gain made on hedge formed would work to the advantage of the importer as it would reduce the rate realized for the importer implying that the importer needs to pay less of domestic currency (INR) to buy foreign currency (US\$). The lesser the exchange realized for the importer better it would be for him. The data for closing prices of the Call option and Futures were collected from National Stock exchange's (NSE's) website, in Historical prices section.

The data was collected on a monthly basis for the year 2021. Eleven months data was utilized i.e. from February,2021 till December 2021. The numerical data has been rounded off to four decimal places.

The exchange rate realized using the above formulas is tabulated in the Table 1.

**Table 1:** Exchange rate realized for the importer when a Notional hedge was employed using Call option and Futures contract between February 2021 and December 2021

Date of Initiation of Hedge	Call Option Premium on date of initiation	Futures exchange rate on date of Initiation	Date of Lifting of Hedge	Exchange rate on date of Lifting hedge	Call Option Premium on date of lifting hedge	Futures exchange rate on date of Lifting	Exchange rate realized in Call option hedge	Exchange rate realized in Futures hedge	Difference in the exchange rate realized
01-Feb-21	0.505	73.3225	24-Feb-21	72.3951	0.0025	72.3175	72.8976	73.4001	1.0826
01-Mar-21	0.65	73.7625	26-Mar-21	72.6270	0.0025	72.4125	73.2745	73.9770	1.5645
01-Apr-21	0.5525	73.55	28-Apr-21	74.4842	1.165	74.415	73.8717	73.6192	-0.7958
03-May-21	0.9825	74.335	27-May-21	72.6085	0.0025	72.625	73.5885	74.3185	1.6935
01-Jun-21	0.595	73.165	28-Jun-21	74.3155	1.47	74.215	73.4405	73.2655	-0.9495
01-Jul-21	0.53	74.75	28-Jul-21	74.5482	0.0025	74.43	75.0757	74.8682	0.4382
02-Aug-21	0.4925	74.5575	27-Aug-21	73.4844	0.0025	74.1325	73.9744	73.9094	-0.2231
01-Sep-21	0.4675	73.2725	28-Sep-21	74.2188	0.9	73.8725	73.7863	73.6188	-0.2537
01-Oct-21	0.35	74.2975	27-Oct-21	75.0224	0.6925	74.94	74.6799	74.3799	-0.5601
01-Nov-21	0.585	75.16	26-Nov-21	75.1104	0.0025	74.6975	75.6929	75.5729	0.8754
01-Dec-21	0.5925	75.145	29-Dec-21	74.5629	0.005	74.74	75.1504	74.9679	0.2279

## Findings and Conclusion

The results obtained using the paired t-test for the exchange rates realized using both type of hedges are contained in Table 2.

**Table 2:** Paired t-test results for hedges, obtained using MS-Excel, for both type of hedges for the eleven months in 2021

	Exchange rate realized in Call option hedge	Exchange rate realized in Futures hedge
Mean	74.130225	74.172497
Variance	0.7909467	0.5281868
Observations	11	11
Pearson Correlation	0.8992546	
Hypothesized Mean Difference	0	
df	10	
t Stat	<b>-0.3542145</b>	
P(T<=t) one-tail	<b>0.3652667</b>	
t Critical one-tail	1.8124611	
P(T<=t) two-tail	0.7305333	
t Critical two-tail	2.2281388	

The observed p-value of **0.3652667 is greater than 0.05 ( $\alpha$ )** hence there isn't sufficient evidence to reject the Null hypothesis. The Null hypothesis thus stands accepted.

Based on the paired t-test result it is concluded that advantage of a Call option, in having the flexibility of not exercising it in case Rupee strengthens, may not translate into a gain for the importer in terms of realizing a lower exchange rate (paying less INR to buy US\$).

### Limitations of the Research

The conclusion to the effect that there is no difference in the exchange rate realized using Call option hedge and a Currency Futures hedge may be affected due to following reasons, among other things:

- i) The data is collected for eleven months for 2021. It is probable that data for other years may provide a different insight.
- ii) The options chosen were close to At-money- situation. If, In-the-money or Out-of-money options are chosen it remains to be seen if the same results would be obtained.
- iii) The charges like brokerage, commission, taxes etc. that would apply in the real world have not been taken into consideration.

### Bibliography

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