

# FOREX trade hedging and the determination of repo rates of the Central Bank

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## **FOREX investments based on currency hedging on the pricing of Brent Crude**

Let us consider a case where a 5% interest is approved by the treasury department, by the Bank of England. Then for 100 Sterling Pound, the amount accrued post interest is 105 Pounds after one year of maturity. Under the current scenario, where British Pounds are trading at 90.80 versus INR, a specific case can be taken with respect to the repo rate issued by the RBI.

Let us say, that if RBI issues repo rates at 7-8 % interest, then for 100 INR, a bond for 1-year accrues to 107 INR post maturity. At this Forex rates, 1 Pound transacted to India will have 90.80 INR as a value, which taken at 7% interest, will amount to 97.156 INR, or a rise in 6.356 INR.

If the same amount is kept in the vaults of the British treasuries, then 1 Pound will amount 1.05 Pounds, which will reflect a position of 90.80 INR versus 95.34 INR, with an accrual of 4.54 INR post maturity of the tenure.

Now, the difference is  $97.156 \text{ INR} - 95.34 \text{ INR} = 1.816 \text{ INR}$ , a marginal increase of the interests versus the England Treasury Bonds. Now, the ratio of the accrued earnings will be 1.816 INR to 90.80 INR which is 2% based on the base currency. Again, in broader terms, an accrual of INR 1.816 will be  $\text{INR } 1.816 / \text{INR } 95.34 = 1.89\%$  on behalf of Indian currency. Hence, a loss of Forex during flat conversion will amount to a Forex loss, if anything above 2% of the Forex deals with a 2% loss in conversion. Below the conversion charges of 1.89 %, the Forex will trade at a gain for the host country- namely India.

Forex are traded for Futures, Spots and Forwards which can be explained in these broader terms.

Let us say, we trade 1 USD in the market in India against Brent Crude, where 1 USD is 67.00 INR in India. Here is how we can hedge.

Assumptions are as follows.

1. The value of USD to INR is based at 67.00, and both positive and negative hedging takes place.
2. The value of USD to INR fluctuates for a period of time within a range of -8% to +9%, as assumed under hedging.
3. Another alternative is that the USD stays constant, while the hedging is positive or negative based on the hedging made.
4. Interest rates are assumed to be zero and any changes on accrued amount based on hedging is ruled out.
5. Spread for analysis taken is for a tenure of two years.

The spreadsheet below gives the positive note based on fluctuations and hedging.

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### Spread Sheet for hedging purposes under fluctuating INR versus USD or for spreads

| Serial Number | Tenure of the lock-in period for stretch of 2 years | Slide of USD against INR/ Hedging of currency for parking | Hedging Bias | Hedging Amount (calculated up to 2 decimal points)   | Hedging Accrued                             |
|---------------|---|---|--------------|--|---|
| 1             | 6 months  | 7%  | Positive     | $67.00 \times \frac{1}{2} \times (100 + \frac{7}{2}) / 100 = 34.68 \text{ INR}$            | (34.68 + 34.68 + 61.64) INR = 131.00 INR    |
| 1             | 6 months  | 7%  | Positive     | 34.68 INR  |   |
| 1             | 12 months   | 8%  | Negative     | $67.00 \times (100 - 8) / 100 = 61.64 \text{ INR}$   |   |
| 2             | 8 months  | 6%  | Positive     | $67.00 \times \frac{2}{3} \times (100 + (6 \times \frac{2}{3})) / 100 = 46.45 \text{ INR}$ | (46.45 + 46.45 + 23.52 + 34.68) = 151.1 INR |
| 2             | 8 months  | 6%  | Positive     | 46.45 INR  |   |
| 2             | 4 months  | 8%  | Negative     | $67.00 \times \frac{1}{3} \times (100 - 8 \times \frac{1}{3}) / 100 = 21.74 \text{ INR}$   |   |
| 2             | 4 months  | 8%  | Positive     | $67.00 \times \frac{1}{3} \times (100 + 8 \times \frac{2}{3}) / 100 = 23.52 \text{ INR}$   |   |
| 3             | 6 months  | 7%  | Positive     | $67 \times \frac{1}{2} \times (100 + 7 \times \frac{1}{2}) / 100 = 34.68 \text{ INR}$      | (34.68 + 47.05 + 60.02) = 141.75 INR        |
| 3             | 8 months  | 8%  | Positive     | $67 \times \frac{2}{3} \times (100 + 8 \times \frac{2}{3}) / 100 = 47.05 \text{ INR}$      |   |
| 3             | 10 months   | 9%  | Positive     | $67 \times \frac{10}{12} \times (100 + 9 \times \frac{10}{12}) / 100 = 60.02 \text{ INR}$  |   |

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Let us assume that the currency for hedging is USD, taken to be 67.00 INR.

At a flat rate of 2.0 % per annum for rates in the banks, the interest accrued in the US will be,  $2 \times 67.00 \times ((100 + 2.0 \times 2) / 100) \text{ INR} = 139.36 \text{ INR}$ .

Similarly, at a rate of interest of 3.0 %, the interest accrued is  $2 \times 67.00 \times ((100 + 3.0 \times 2) / 100) \text{ INR} = 142.04 \text{ INR}$ .

Similarly, at 0.5 percentage of points, the Federal Bank of the US can have a round off at  $67.00 \times 2.0 \times ((100 + 0.5 \times 2.0) / 100) = 135.34 \text{ INR}$ .

Hence, the Federal bank of the US can afford to keep interest rates above 1.0 % and below 3.0 %.

To hedge off against the currency fluctuations, all the three scenarios can be possible.

**Case 1:** Currency USD at a rate of nearly 0.7% for positive forwards can also be acceptable if US Dollars get stronger against INR, for more than a year, and hedging is done based on non-spot rates, based on the extrapolation of 134 versus 131 at nearly 0.3% interest rates, which is an assumption, versus hedging against a weaker dollar for a lot of time. 0.5% is the minimum rate of acceptance, once presumed. Otherwise, extrapolation and interpolation can be accrued.

**Case 2:** Currency USD at a rate of 0.5-3% can have better affect when hedged against stronger rupee for sometimes, with an extrapolation of 3.1% for an effect of 150 versus 142 versus 134 for 3%, 2% and nearly 1% respectively.

**Case 3:** Effective interest rates can be more than the given spot rate, where forwards and futures are traded and a maximum limit of 3.1% of interest that can actually be guaranteed for a stronger US Dollar which is holding strong for the next two years with an average appreciation of 7-8%. Hence, as calculated, 3.1% can be the maximum rate of interest for the US repo rate.