

QUESTION – 41

If the present interest rate for 6 months borrowings in India is 9% per annum and the corresponding rate in USA is 2% per annum, and the US\$ is selling in India at ₹ 64.50/\$.

Then:

- ✓ (i) Will US\$ be at a premium or at a discount in the Indian forward market?
- ✓ (ii) Find out the expected 6-months forward rate for US\$ in India.
- ✓ (iii) Find out the rate of forward premium/discount.

H.W
H.W COPY

(Exam November – 2017)

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QUESTION - 38

The following table shows interest rates for the United States Dollar and French Franc. The spot exchange rate is 7.05 Franc per Dollar. Complete the missing entries:

FF/\$ 7.05

FF/\$ 7.05	3 Months	6 Months	1 Year
Dollar interest rate	11.5%	12.25%	?
(annually compounded)	11 1/2 %	12 1/4 %	?
Franc interest rate	19.5%	?	20%
(annually compounded)	19 1/2 %	?	20%
Forward Franc per Dollar	?	?	7.5200
Forward discount per Franc	?	6.3%	!
percent per year	?	6.3%	!

(Practice Manual)

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3 Months

$$F = S \times \frac{1+r}{1+r}$$

ICAI

$$F = FF 7.05 \times \frac{1 + (0.195 \times \frac{3}{12})}{1 + (0.115 \times \frac{3}{12})}$$

$$= FF 7.05 \times \frac{1.04875}{1.02875}$$

$$= FF 7.19$$

Conceptual

$$FF 7.05 \times \frac{(1.195)^{3/12}}{(1.115)^{3/12}}$$

$$= FF 7.17$$

② Discount per ff

$$Disc. = \frac{S - F}{F} \times 100 \times \frac{12}{3}$$

$$= \frac{7.05 - 7.19}{7.19} \times 100 \times \frac{12}{3} = 7.79\%$$

Disc. in ff

6 Months

① Forward Rate

$$\begin{aligned}\text{Disc. in } ff &= \frac{S - f}{f} \\ - 0.0315 &= \frac{7.05 - f}{f} \\ - 0.0315f &= 7.05 - f \\ &= \frac{7.05}{0.9685} \\ &= ff 7.28\end{aligned}$$

② ff Int Rate

$$\begin{aligned}f &= S \times \frac{1+r}{1+r} \\ 7.28 &= 7.05 \times \frac{1+r}{1.06125} \\ r &= \left(\frac{7.28 \times 1.06125}{7.05} \right) - 1 \times 100 \times \frac{12}{6} \\ &= 19.17\% \text{ p.a.}\end{aligned}$$

1 YEAR

① Dollar Int Rates

$$F = S \times \frac{1+r}{1+r}$$

$$7.52 = 7.05 \times \frac{1.20}{1+r}$$

$$r = \left[\frac{7.05 \times 1.20}{7.52} \right] - 1$$

$$= 12.5\% \text{ p.a.}$$

② Disc. in ff

$$\text{Disc.} = \frac{S-f}{f} \times 100$$

$$= \frac{7.05 - 7.52}{7.52} \times 100$$

$$= 6.25\% \text{ p.a.}$$

Disc. in ff

Covered Interest Arbitrage (CIA) (Most Imp)

If forward premium is not equal to Interest Rate difference, then there is a possibility of Covered Interest Arbitrage [IRP]

$$\frac{F}{S} = \frac{1+r}{1+r^*}$$

EXAMPLE - 57

Spot Rate ₹/\$ = ₹ 60

1 Year FR ₹/\$ = ₹ 61.50

Interest Rates

India = 12% p.a.

USA = 8% p.a.

Calculate arbitrage gain if you can borrow ₹ 60,00,000 or \$ 1,00,000.

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• premium in \$

$$\frac{F - S}{S} \times 100 = \frac{61.50 - 60}{60} \times 100$$
$$= 2.5\% \text{ P.Q.}$$

• Negative Intt Rate difference

$$12 - 8 = 4\% \text{ p.a.}$$

Action

Since Negative Intt Rate difference is more than premium in \$, hence Invest in India & borrow from US

Today

- Borrow \$100,000 from US @ 8% P.A. for 1 YEAR
- Convert \$100,000 into ₹ at SR
 $\$100,000 \times ₹60 = ₹60,00,000$
- Invest ₹60,00,000 in India @ 12% P.A. for 1 YEAR
- forward cover

After 1 YEAR

$$\text{Cash Inflows} = ₹60,00,000 (1.12) = ₹67,20,000$$

Convert ₹67,20,000 into \$ at ₹61.50

$$\text{Cash Inflows (\$)} = \frac{67,20,000}{61.50} = \$1,09,268.29$$

$$\text{Cash Outflows} = \$1,00,000 \times 1.08 = \$1,08,000.00$$

$$\text{Arbitrage Gain} = \underline{\$1,268.29}$$

$$\begin{aligned}\text{Arbitrage Gain (₹)} &= \$1,268.29 \times 61.50 \\ &= ₹78,000\end{aligned}$$

EXAMPLE – 58

Spot Rate ₹/\$ = ₹ 60

1 Year FR ₹/\$ = ₹ 63.25

Rate of Interest

India = 12% p.a.

USA = 8% p.a.

You can borrow ₹ 60,00,000 or \$ 1,00,000.

Calculate arbitrage.

H.w Arbitrage
Gain = ?

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EXAMPLE - 59

Spot Rate \$/£ = 1.2575

6 Months FR

 \$/£ = 1.2650

Rate of Interest

USA = 5% p.a.

UK = 4% p.a.

You can borrow £ 1,00,000 or \$ 1,25,750.
Calculate arbitrage.

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Premium in £

$$\begin{aligned}\text{premium} &= \frac{F - S}{S} \times 100 \times \frac{12}{6} \\ &= \frac{1.2650 - 1.2575}{1.2575} \times 100 \times \frac{12}{6} \\ &= 1.19\% \text{ premium in £}\end{aligned}$$

Negative Intt Rate difference

$$\text{Intt Rate diff.} = 5 - 4 = 1\%$$

Action

Since premium in £ is more than Negative Rate of Intt, hence Invest in £ & Borrow \$

process

Today

- Borrow \$125750 from US @ 5% p.a. for 6 months
- Convert \$ into £ at SR $\frac{\$125750}{1.2575} = £100000$
- Invest £100000 in UK @ 4% p.a. for 6 months.

After 6 months

Cash Inflows in £ ($£100000 \times 1.02$) = £102000

Convert £102000 at FR

$$C.I. \text{ in } \$ (\£102000 \times 1.2650) = \$129030$$

$$C.O. \text{ in } \$ (\$125750 \times 1.025) = \$128893.75$$

$$\text{Arbitrage Gain} = \underline{\$136.25}$$

$$\text{Arbitrage Gain (£)} = \frac{\$136.25}{1.2650} = £107.71$$

Imp

Eg

₹/\$ 80.25 SR
1 YEAR FR ₹/\$ 78.45

Intt Rate

USA = 10% P.A.

India = 8% P.A.

$$\text{premium in ₹} = \frac{S - F}{F} \times 100$$

$$= \frac{80.25 - 78.45}{78.45} \times 100$$

$$= 2.29\%$$

$$\text{Intt Rate diff} = 10 - 8 = 2\%$$

Invest in ₹