

QUESTION - 54

Your Company has to make a US \$1 million payment in three months' time. The dollars are available now. You decide to invest them for three months and you are given the following information:

- (a) The US deposit rate is 8% per annum
 - (b) The sterling deposit rate is 10% per annum
 - (c) The spot exchange rate is \$1.80/pound
 - (d) The three month forward rate is \$1.78/pound.
- (i) Where should your company invest for better results?
 - (ii) Assuming that the interest rates and the spot exchange rate remain as above, what forward rate would yield an equilibrium situation?
 - (iii) Assuming that the US interest rate and the spot and forward rate remain as in the original question. Where would you invest if the sterling deposit rate were 14% per annum?
 - (iv) With the originally stated spot and forward rates and the same dollar deposit rate, what is the equilibrium sterling deposit rate?

(Page No. 79)

(i)

Option 1 Investment in US

$$\text{Cash Inflows} = \$1,000,000 (1.02) = \boxed{\$1,020,000}$$

Option 2 Invest in UK

• Convert \$ into £ at SR

$$\frac{\$1,000,000}{1.80} = \text{£} 555,555.56$$

• Invest £ @ 10% p.a. for 3 months

$$\text{Cash Inflows (£)} = \text{£} 555,555.56 \times 1.025 = \text{£} 569,444.45$$

Convert £ into \$ at FR

$$\text{£} 569,444.45 \times 1.78 = \boxed{\$1,013,611.21}$$

Invest in USA is better due to higher CI

①① Calculation FR as per FRP

$$\begin{aligned} f &= S \times \frac{1+r}{1+r} \\ &= \$1.80 \times \frac{1.02}{1.025} = \$1.79 \end{aligned}$$

(iii)

(i) Invest in US = \$1020000

(ii) Invest in UK = \$1023500

Investment in UK is better

(iv) £ Int Rate using IRP

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

$$1.78 = 1.80 \times \frac{1.02}{1+r}$$

$$r = \left(\frac{1.80 \times 1.02}{1.78} \right) - 1 \times 100 \times \frac{12}{3} = 12.58\% \text{ p.a.}$$

2. purchasing power parity (PPP)

- As per PPP, Exchange Rates depend on demand of Goods & Services of their countries.
- Suppose $1 \text{ pen} = ₹ 800 \text{ (India)}$
 $1 \text{ pen} = \$10 \text{ (USA)}$

As per PPP, Exchange Rate should be
 $\$10 = ₹ 800$
 $\$1 = ₹ 80$

Suppose Actual Exchange Rate

$$\underline{\$1} = ₹ 70$$

then there is a possibility of Arbitrage

Buy pen from USA ($\$10 \times 70$)
 $= ₹ 700$ & sell in India

at ₹ 800

$$\text{Gain} = ₹ 100$$

This process will continue till

$$\underline{\$1} = ₹ 80$$

₹/\$ 80



9% Inflation Rate

India = 12% P.P.

USA = 10% P.P.

- Calculate price of pen after 1 YEAR in India & USA
- Calculate 1 YEAR Exchange Rate

price of pen

$$\$10 \times 1.10 = 800 \times 1.12$$

$$\text{India} = ₹ 800 (1.12) = ₹ 896$$

$$\text{USA} = \$10 (1.10) = \$11$$

$$₹/\$ = \frac{₹ 896}{\$11} = 81.45$$

As per PPP, Currency of a country having Lower Rate of Inflation will be stronger than currency of a country having higher Rate of Inflation

As per PPP, Expected \$R is calculated as under

$$\begin{aligned} E(S) &= S \times \frac{1+i}{1+j} \\ &= ₹ 80 \times \frac{1.12}{1.10} \checkmark \\ &= ₹ 81.45 \end{aligned}$$

EXAMPLE - 60

SR ₹/\$ ₹50.00

Inflation Rate

India = 10% p.a.

USA = 8% p.a.

Calculate 1 & 2 year Exchange Rate.

(Page No. 12)

$$50 \times \frac{(1.10)^2}{(1.08)^2} = ₹51.87$$

$$E(S) = S \times \frac{1+i}{1+i}$$

1 YEAR

$$E(S) = ₹50 \times \frac{1.10}{1.08} = ₹50.93$$

2 YEAR

$$E(S) = ₹50.93 \times \frac{1.10}{1.08} = ₹51.87$$

QUESTION – 50

The rate of inflation in India is 8% per annum and in the U.S.A. it is 4%. The current spot rate for USD in India is ₹ 46. What will be the expected rate after 1 year and after 4 years applying the Purchasing Power Parity Theory.

(Study Material, PM & Exam May - 2010)

(Page No. 75)

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YEAR 1

$$46 \times \frac{1.08}{1.04} = 47.77$$

④

$$46 \times \frac{(1.08)^4}{(1.04)^4}$$

④

QUESTION – 51

The rate of inflation in USA is likely to be 3% per annum and in India it is likely to be 6.5%. The current spot rate of US \$ in India is ₹ 43.40. Find the expected rate of US \$ in India after one year and 3 years from now using purchasing power parity theory.

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(PM & Exam November – 2017)

(Page No. 75)

~~Solution~~

QUESTION - 47

- (i) Interest rates for 3 months in USA and Canada are as follows:

Currency	Borrow	Invest Interest
US \$	4%	2.5%
Canadian \$	4.5%	3.5%

- (ii) Can \$/ US \$ spot 1.235 ---- 1.240 c\$/s
3 months forward 1.255 ---- 1.260

Advice, the currency in which borrowing and lending for 3 months needs to be done for the US company. Take 3 months = 90/360 days.



(Exam Jan-2021)
(Page No. 71)

Borrowing Assume \$1000

Borrowing from US

Borrow \$1000 @ 4% p.a.
for 3 months

$$\text{Cash outflows} = \$1000 \times 1.01 = \boxed{\$1010}$$

Borrowing from Canada

Can \$ required to buy \$1000
at SR Can \$/ \$ 1.240

$$\$1000 \times 1.240 = \text{Can } \$1240 \text{ C.O.}$$

Borrow Can \$1240 from Canada
@ 4.5% for 3 months

$$\text{Cash outflows (Can \$)} = 1240 \times 1.01125 = \text{Can } \$1253.95$$

Cash outflows (\$) Can \$/ \$ 1.255

$$\frac{1253.95}{1.255} = \boxed{\$999.16}$$

Borrow from
Canada is better
due to Lower

Lending

① Lending in USA

Invest \$1000 @ 2.5% p.a. for 90 days

$$\text{Cash Inflow} = \$1000 \times 1.00625 = \boxed{\$1006.25}$$

② Lending in Canada

• Buy Can \$ from \$1000 at SR Can \$/\$ 1.235
 $\$1000 \times 1.235 = \text{Can } \1235

• Invest Can \$1235 @ 3.5% p.a. for 90 days

$$\text{Cash Inflows (can\$)} \quad 1235 \times 1.00875 = \text{Can } \$1245.81$$

$$\text{Cash Inflow (\$)} \quad \text{Can } \$/\$ = 1.260$$

$$\frac{1245.81}{1.260} = \boxed{\$988.74}$$

Lending in US
is better due
to higher
Cash Inflows.