Part 1

★ Purchasing Power Parity :-

- Prevention of commodity arbitrage.
- Relationship b/w exchange rate & inflation (i).
- Based on law of one price.

$$\frac{E(S_1)}{S_0} = \left[\frac{1+i_A}{1+i_B}\right]^n$$

Q.72	pg
cw 29	

$$\frac{E(S_1)}{S_0} = \frac{1+0.08}{1+0.04} \Rightarrow E(S_1) = 46 \times \frac{1.08}{1.04} = ₹47.77/\$$$

$$\frac{E(S_4)}{S_0} = \left[\frac{1+0.08}{1+0.04}\right]^4 \Rightarrow E(S_4) = 46 \times \left[\frac{1.08}{1.04}\right]^4 = ₹53.50/\$$$

Eg: $S_0 = ₹81.6450/\$$

Inflation forecast :-

	Year 1	Year 2	Year 3
India	6%	7%	8%
U.S.	2%	3%	5%

Calculate expected spot rate at the end of year 1, 2, 3 as per PPP.

Soln: $E(S_1) = 81.6450 \times \frac{1.06}{1.02} = ₹84.8468/\$$

$E(S_2) = 84.8468 \times \frac{1.07}{1.03} = ₹88.1418/\$$

$E(S_3) = 84.1418 \times \frac{1.08}{1.05} = ₹90.6601/\$$

:::: Concept :-

① If nominal interest rate = 9% & Inflation = 5%. What is the real interest rate ?

Real Interest rate ≅ 9 - 5 ≅ 4% (approx)

$= \frac{1.09}{1.05} - 1 = 3.81\%$ (exact)

Note : Inflation ka effect hatanese real ata h....

② S_0 (1 year ago) = ₹ 81.6250 / $ (S_{t-1})

Inflation : ₹ = 8%

$ = 3%

What should have been S_1 today ?

Should be S_1 = $81.6250 \times \frac{1.08}{1.03}$ = ₹ 85.5874 / $

Actual S_1 = ₹ 87.2520 / $

→ Real Appreciation / Depreciation of a currency :-

Given : Spot rate 1 year ago = S_{t-1} or S_0 = ₹ 96.20 / £

Spot rate today = S_t = ₹ 98.10 / £

Inflation : India = 8%

US = 3%

Q.1) Calculate the Real Effective Exchange Rate (REER) today

Exchange rate today is S_t = 98.10

However this includes effect of inflation. To get REER, we have to reverse the effect of inflation.

$$S_t^* = S_t \times \left[\frac{1+i_£}{1+i_₹}\right] = 98.10 \times \frac{1.03}{1.08} = 93.5583$$

Q.2) Has £ appreciated against ₹ ?

Apparently we find $S_t > S_0$

So £ seems to have appreciated. However, once we remove the effect of inflation from S_t & look at S_t^* we find that £ has depreciated in real terms.

Q.3) Calculate nominal as well as real appreciation / depreciation of £.

Nominal Appreciation of £ = $\frac{S_t - S_0}{S_0} \times 100 = \frac{98.10 - 96.20}{96.20} \times 100$

= 1.975%

Real depreciation of £ = $\frac{S_t^* - S_0}{S_0} \times 100 = \frac{93.5583 - 96.20}{96.20} \times 100$

= -2.746%

Q.4) Calculate nominal as well as real appreciation/depreciation of ₹.

Nominal depreciation of ₹ $= \frac{S_0 - S_t}{S_t} \times 100 = \frac{96.20 - 98.10}{98.10} \times 100$

$= -1.937\%$.

Real appreciation of ₹ $= \frac{S_0 - S_t^*}{S_t^*} \times 100 = \frac{96.20 - 93.5583}{93.5583} \times 100$

ICAI ne CW. Q. E. soln. book pg. 73 → me base me S_t^* nhi liya S_0 liya galat h... exam me 2 soln krna...

$= 2.824\%$.

Extra Q.	Pg
CW. soln.	73

① Nominal rate of return for US Investor:-

Step 1: Sold $ 2000000 1 yr ago @ ₹42.50/$ getting $2000000 \times 42.50 = ₹85000000$

Step 2: No. of sensex units purchased $= \frac{85000000}{3256}$

$= 26105$ units

Step 3: Sold sensex units today $= 26105 \times 3765$

$= ₹98287776$

Step 4: Purchase $ today @ ₹43.90/$ getting

$\frac{98287776}{43.90} = \$2239130$

Nominal Return $= \frac{2239130 - 2000000}{2000000} \times 100 = 11.95\%$.

Self Note: Nominal Return for Indian Investor

$= \frac{3765 - 3256}{3256} \times 100 = 15.63\%$

Real Return for Indian Investor

$= \left[\frac{1.1563}{1.09} - 1\right] \times 100 = 6.08\%$.

② Real apprn/deprn of ₹ :-

(a) $REER_{bid} = S_{i\,bid}^*$

$= S_{1bid} \times \frac{1+i_\$}{1+i_₹} = 42.2408$ ₹/$

∴ Real appreciation of ₹ based on bid rate

$= \frac{S_0 - S_1^*}{S_0} \times 100 = \frac{42.50 - 42.2408}{42.50} \times 100 = 0.6099\%$.

↖ wrong → icai

Self Note: Correct = $\frac{S_0 - S_1^*}{S_1^*} \times 100$

(b) $REER_{ask} = S_1^*{}_{ask} = S_{1ask} \times \frac{1+i_\$}{1+i_₹} =$ ₹/$ 42.2890

∴ Real appreciation of ₹ = $\frac{42.60 - 42.2890}{42.60} \times 100 = 0.73\%$.

↖ wrong → icai

③ Exchange Rate if PPP holds good :-

S_{1bid} as per PPP = $42.50 \times \frac{1.09}{1.05}$ = ₹44.12/$

S_{1ask} as per PPP = $42.60 \times \frac{1.09}{1.05}$ = ₹44.22/$

④ Real Return to an Indian Investor :-

= 6.08%.

Part-2

∴ Forward Cover vs. Money Market Cover :-

↓

Hedging

↓ ↓

Forward — S, r_A & r_B

FC payable — FC receivable

Code: IBB — BSI

① FC payable :- Invest, Buy, Borrow

Step 1 : Jo pay krna h $100000 6 m baad uska present value aaj invest krenge say $98000

Step 2: Buy $98000 spot using HC (₹)
Step 3: Borrow HC (₹)

② FC receivable :- Borrow, sell, Invest
Step 1: To aanewala h $100000 3 m baad uska present value aaj hi borrow krenge say $98000
Step 2: Sell $98000 spot getting HC. (₹)
Step 3: Invest HC (₹)

Q.63	Pg
CW·25	

Refer pdf / printout for exact Q. & solution where 3 month has expected receipts.

cancelled ~~For practice purpose we have modified the Q & assumed 3 month expected payment of £300000.~~

never think of Googly if word 'per' is given in exchange rate. £/€ = 1.7 googly ✓; £ per € = 1.7 googly ✗

① 1 month exposure :-
~~Alt 1:~~ A net amount of £100000 is receivable
Alt 1: Forward cover
Sell £100000 one month forward @ £1.7832/€
So inflow after 1 m = $\frac{100000}{1.7832}$ = €56078.96

(Self Note: £ receivable → £ sell i.e. € buy ∴ £/€ ask rate)

Alt 2: Money Market Cover Borrow - Sell - Invest (BSI)
Step 1: Borrow the present value of £100000
$\frac{100000}{(1+0.054\times 1/12)}$ = £99552.02

Step 2: Sell spot @ £1.7822/€ getting
$\frac{£99552.02}{£1.7822/€}$ = €55859.06

Step 3: Invest € @ 4.6% p.a. for 1 month.
Inflow after 1 month = 55859.06 × (1 + 0.046×1/12)
= €56073.19

∴ Advice - Forward cover is marginally better than MM cover. Hence, 1m exposure should be hedged via Forward cover.

② 3 months exposure :- £300000 receivable

Alt 1: Forward cover

Sell £300000 3m forward @ £1.785/€

So Inflow after 3m = $\frac{300000}{1.785}$ = €168067.22

Alt 2: Money Market Cover

Step 1 - Borrow present value of £300000

$\frac{300000}{(1+0.054\times 3/12)}$ = £296004.24

Step 2 - Sell £ spot @ £1.7822/€ getting

$\frac{296004.24}{1.7822}$ = €166089.24

Step 3 - Invest € @ 4.6% p.a. for 3 months.

€ Inflow after 3m = 166089.24 (1+0.054 x 3/12)

= €167999.26

∴ Advice - Forward cover is marginally better than MM cover. Hence, 3m exposure should be hedged via Forward cover.

Part-3

Q.60	pg
CW. 24	

Refer Soln in CW. Soln. pg. 37 discussed verbally ....