Foreign Exchange & Risk Management

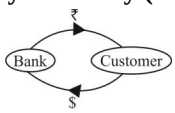
Currency : There are two types of currency	
Home Currency	**Foreign Currency**
A Currency which is used at home land is said to be home currency For India = ₹ "USA = $ " UK = £ "Japan = ¥	The Currency which is used other than home land is said to be Foreign Currency for India. $ (Dollar) £ (Pound) ¥ (Yen) are Foreign Currency

Quotation Currency : There are two types of Quotation of currency	
Direct Quote	**Indirect Quote**
A Quotation is said to be Direct Quote, in which there is number of Home Currency for 1 Unit of Foreign Currency. ₹/$ is 50 $ 1 = ₹50	A Quotation is said to be Indirect Quote in which to there is number of Foreign Currency for 1 Unit of Home Currency. ¥ / ₹ is 2.5343 ₹ 1 = ¥ 2.5343

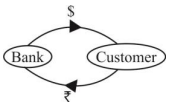
Quotation of bank: there are two types of quotation of bank.	
One way quote	**Two Way quote**
When bank has bid rate (buying rate) & And ask rate (selling rate) are same $ 1 = ₹ 55.63 £ 1 = ₹ 76.47	When bank has bid rate (buying rate) And ask rate (selling rate) are different **Bid rate** **Ask rate** $ 1 = ₹ 55.00 --- ₹ 55.60 £ 1 = ₹ 76.47 --- ₹ 76.50

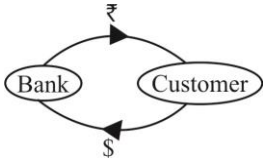
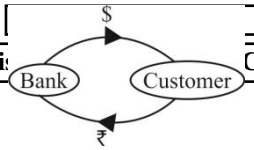
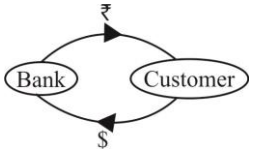
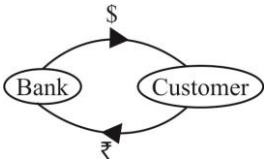
Bid rate Ask rate

2. Rule for choosing appropriate Quote in the case of two ways Quotation. $ 1 = ₹40.00 ----- ₹40.50
   (i) Think from the point of view of **Commodity Currency** & **Bank** which is Whole Seller of C.C. (Commodity Currency).
   (ii) The Currency which is written in Single unit is said to be **Commodity Currency (C.C.)** in above Two Way Quote **$ is C.C.** & **₹ is price of commodity Currency.**
   (iii) If **C.C. $** is coming to Bank it means Bank is going to buy the Commodity hence low rate (Bid rate) is applied i.e. $ 1 = ₹40.00



   (iv) If Commodity Currency is going from Bank it means bank is going to Sale the Commodity hence high rate (**Ask rate**) is applied. i.e. $ 1 = ₹40.50



$ 1 = ₹ 40 – ₹ 40.50	**₹ 1 = $ 0.023 - $ 0.025**
(i) Here **$** is Commodity Currency because **$** is written in Single Unit.  In above, Commodity Currency **$** is coming to bank it means bank is going to buy the Commodity hence low rate (**Bid rate**) is applied. **Here decision is taken from C.C. ($) & Bank**  In above, Commodity Currency **$** is going **from Bank** it means bank is going to sale the commodity hence high rate	**₹** is Commodity Currency because **₹** is written in Single Unit.  In above, Commodity Currency **₹** is going from bank it means bank is going to sale the Commodity hence high rate (**Ask rate**) is applied **₹ 1 = $0.025** **Here decision is taken from C.C. ₹ & Bank**  In above, Commodity Currency **₹** is coming to **bank** it means bank is going to buy the Commodity Currency **₹** Hence low rate (**Bid rate)** is applied **₹ 1 = $0.023**

(**Ask rate)** is applied	**$1= ₹40.50**	

Quotation after Appreciation or Depreciation

Quotation of Currency can be written in terms of **is** or **=**

₹ / $ is 50 ⇒ **₹ Per $ is 50**

$ 1 = ₹ 50

$1 = 50 × ₹1

₹ / $ = 50 ⇒ **$ 1 is equal to 50 times ₹ 1**

Whenever in **Question it is written as Appreciation / Strong / or depreciation / Weak** then Quotation should be written in equal terms.

(i) The Currency which is going to appreciate or depreciate assumed to be Commodity Currency other Currency is Price **like**

$ is appreciated by 20% Here, $ is **Commodity Currency** & **₹** is Price, it means we have to Pay 20% more **₹** to buy **$** $/ ₹(1+0.20)= 50 $/ ₹ = 50 × 1.20= 60 **$ 1= ₹ 60** = Quotation after 20% app^{n}. of $	**₹** is depreciation by 20%. Here **₹** is **Commodity Currency**, it means we have to pay 20% less **$** to buy **₹** (1 – 0.20) $/ ₹ = 50 $/ ₹ $\frac{50}{0.80}$ = 62.50 **$ 1= ₹ 62.50** = Quotation offer 20% depreciation ₹

Note : if $ is appreciate by 20% it doesn't mean ₹. depreciation by 20%

Cross Quotation

In the case of one way quote.

Case-I

A/B is 5
B/C is 2
⇒ A/B × B/C is 5 × 2 ⇒ A/C is 10

Case-II

A/B is 5 ---------- (i)
C/B is 0.5 ---------- (ii) ⇒ Find A/C

From (ii) B/C is $\frac{1}{0.5}$ ⇒ B/C is 2 ----------(iii)

From (i) & (iii) A/B × B/C is 5 × 2 ⇒ **A/C is 10**

In the case of two way quote.

Case-III

	Bid rate	----	Ask rate
A/B is	4	------	5
B/A is	$\frac{1}{4}$	------	$\frac{1}{5}$
B/A is	0.25		0.20

⇓

It is not Possible because Bid Rate is higher than Ask rate

Possible Quotation

	bid rate	-----	Ask rate
A/B is	4	-----	5
B/A is	$\frac{1}{5}$	-----	$\frac{1}{4}$

⇓

B/A is	0.20	-----	0.25

Exchange Margin

It is the extra amount or Percentage charged by the bank over & above the Inter Bank Quote.

Case-I To get bid rate Margin should be deducted
Actual Buying rate = Actual Bid rate = Bid rate (1 – Exchange Margin)

Case-II To get Ask rate Margin should be Added
Actual Selling rate = Actual Ask rate = Ask rate (1 + Exchange Margin)

Bid rate	**Ask rate**
$ 1 = ₹40.50 – 40.60 Bid Margin 0.06% **Actual Bid rate** $ 1 = 40.50 (1 – 0.0006)	$ 1 = ₹40.50 – 40.60 Ask Margin = 0.25% **Actual Ask rate** $ 1 = 40.60 (1 + 0.0025)

= 40.4757	$ 1 = 40.7015

SPOT RATE :

A Spot exchange rate is a rate at currencies are being traded for delivery on the Same day or at the Most within two days.

Forward Rate :

It is a rate decided today for future delivery of underlying assets in which one Party is willing to buy the underlying Assets & other Party is willing to Sale the underlying Assets.

Forward Premium / discount = % Change in value of currency = $\frac{\text{Charge}}{\text{Original}} \times 100$

SR, $1= ₹50 3 M FR, $ 1 = ₹40 ($ is discount, ₹ is Premium) 3 M FR, $ 1 = ₹55 ($ is Premium, ₹ is discount)	SR, ₹1 - $ 0.020 3 M FR, ₹1 = $ 0.018 (₹is discount, $ is Premium) 3 M FR, ₹1 = $ 0.022 ($ is discount, ₹is Premium)

SR, $ 1 = ₹40 ⟵ 3 Months ⟶ **FR, $1= ₹50**

$ is Premium = % Change in $ Value = $\frac{\text{Change}}{\text{Original}} \times 100$

$$= \frac{FR - SR}{SR} \times 100 = \frac{50-40}{40} \times 100$$

Premium of $ = 25%

₹ is discount = % Change in ₹ Value = Change in $ amount = $\frac{\frac{1}{50} - \frac{1}{40}}{\frac{1}{40}} \Rightarrow \frac{\frac{1}{FR} - \frac{1}{SR}}{\frac{1}{SR}} = \frac{\frac{SR-FR}{FR \times SR}}{\frac{1}{SR}}$

$$= \frac{SR - FR}{FR} \times 100 = \frac{40-50}{50} \times 100 = -20\%$$

Discount of ₹ = 20%

Note: If Calculated Value is +ve $\Rightarrow$ Means Premium
If Calculated Value is –ve $\Rightarrow$ Means discount

#

Forward Premium or discount can be calculated using Interest rate

$$= \frac{\text{Periodic Interest rate of other Currency} - \text{PeriodicInterest rate of same currency}}{1 + \text{Periodic Interest rate of same currency}} = \frac{1 - I_0}{1 + I_S}$$

Interest rate Parity theorem : As per Interest rate Parity theorem there is relationship between exchange rate & Interest rate. The Currency having high Interest rate will depreciate in Future & the Currency having low Interest rate will appreciate in Future. At Equilibrium Forward Premium / discount using Interest rate & using Currency Exchange rate is equal.

Assumptions:-

1. That there is no difference between borrowing and deposit rate.
2. That there are no transactions cost.
3. That there is no bid-ask spread.
4. That there is no taxation.
5. That information is readily and freely available.
6. That no other factors affect the forward rate except the interest rates.

Relation between Sport rate, Forward rate & Interest rate

SR = Spot rate, FR = Forward rate	Is = Interest of Same Currency Io = Interest rate of other Currency
Forward Premium or discount when other Currency is Direct Quote = $\frac{FR - SR}{SR}$ ------- (i) Forward Premium or discount Using Interest rate $= \frac{I_0 - I_S}{1 + I_S}$ --------- (iii)	Forward Premium or discount when other Currency is Indirect Quote = $\frac{SR - FR}{FR}$ ---- (ii) Forward Premium or discount Using Interest rate = $\frac{I_0 - I_S}{1 + I_S}$ (iii)

At Equilibrium or I.R.P.T.

$$\frac{FR-SR}{SR}=\frac{I_0-I_S}{1+I_S}$$

Adding 1 in both sides

$$\frac{FR-SR}{SR}+1=\frac{I_0-I_S}{1+I_S}+1$$

$$\frac{FR-SR+SR}{SR}=\frac{I_0-I_S+1+I_S}{1+I_S}$$

$$\boxed{\frac{FR}{SR}=\frac{1+I_0}{1+I_S}}$$

where I_0 is Direct Quote Currency Interest

At Equilibrium or I.R.P.T.

$$\frac{SR-FR}{FR}=\frac{I_0-I_S}{1+I_S}$$

Adding 1 in both sides

$$\frac{SR-FR}{FR}+1=\frac{I_0-I_S}{1+I_S}+1$$

$$\frac{SR-FR+FR}{FR}=\frac{I_0-I_S+1+I_S}{1+I_S}$$

$$\boxed{\frac{SR}{FR}=\frac{1+I_0}{1+I_S}}$$

where I_0 is Indirect Quote Currency Interest

Interest rate differentia

Interest rate differentia states that if Spot rate & Forward rate are at equilibrium then Forward Premium or discount of Currency is equal to difference of Interest rate. In this case there is no Scope of any Interest arbitrage.

Possibility of Interest arbitrage

Assumed $I_\$$ = USA Interest rate = 8% p.a.
$I_₹$ = India Interest rate = 12% p.a.

Difference of Interest rate = 12% - 8% = 4% p.a.

(i) As per I.R.P.T. or Equilibrium there will be no Interest arbitrage when discount of ₹ using SR & FR is equal to difference of interest rate 4%.

(ii) If discount of ₹ is More than 4% it Means Premium of $ is More than 4% then Interest arbitrage is Possible For Gain we should borrowed ₹ @ 12% p.a. & Invest in USA @ 8% p.a. because arbitrager will have loss of interest by 4% but gain in currency exchange rate by more than 4%.

(iii) If discount of ₹ is less than 4% in this Case Interest arbitrage is Possible. For Interest arbitrage we should borrowed from USA @ 8% p.a. & Invest in India @ 12% p.a. because arbitrager will have gain of interest by 4% but loss in currency exchange by lower than 4%.

Purchase Power Parity theorem (P.P.P.T.)

Purchase Power Parity theorem is Similar to Interest rate Parity theorem. In the case of Purchase power Parity theorem the Interest rate is replaced by **Inflation rate**.

One of the oldest theory dealing with exchange rate determination.

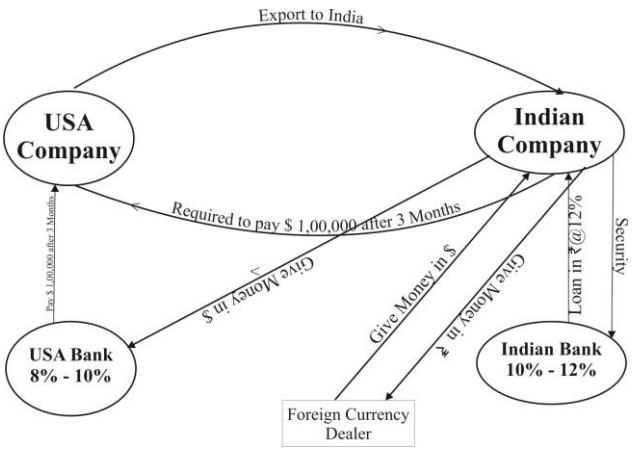
Assumptions:

1. That the goods being traded are identical in all respects.
2. That there are no transactions costs.
3. That there is no transaction costs, tariffs and duties on trade.
4. That there are no trade barriers (unlibralisation of economics)

MONEY MARKET OPERATION

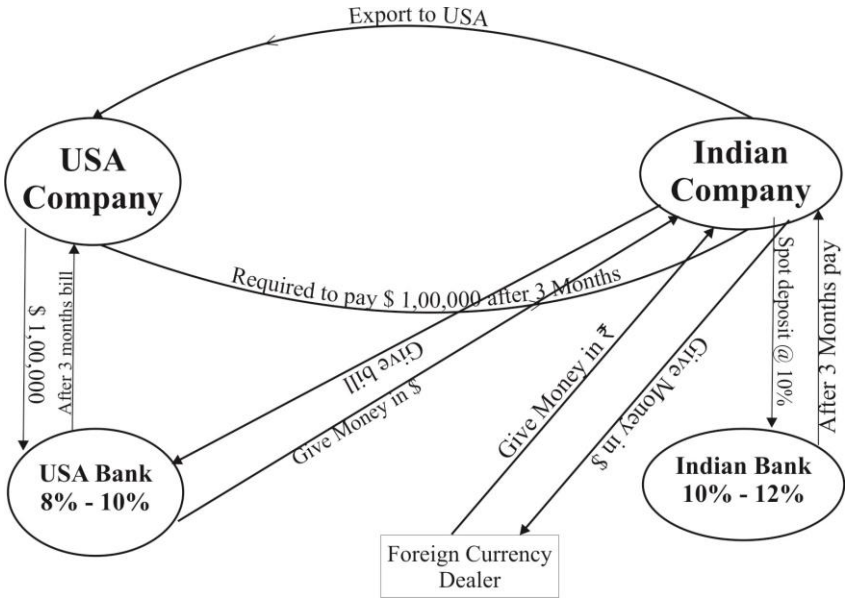
It is a risk management tool, through which future payment or receive of foreign currency is done at spot rate with the help of bank.

Export to India In the case of payment of foreign currency



1. Calculate equivalent $ required to deposit today to USA Bank to get $100000 after 3 Months, Low interest rate is applied. $P.V. = \frac{\$1,00,000}{1+\frac{0.08}{12}\times 3}$ = $ 98039.21
2. Take loan from home bank to purchase $ 98039.21 at spot rate $1 = ₹50 – ₹50.50
   $1 = ₹50.50
   $ 98039.21 = ₹50.50 × 98039.21 = ₹4950980
3. Pay Indian bank loan after 3 month with high interest rate : 49, $50,980\left(1+\frac{0.12}{12}\times 3\right)$ = ₹50,99,510

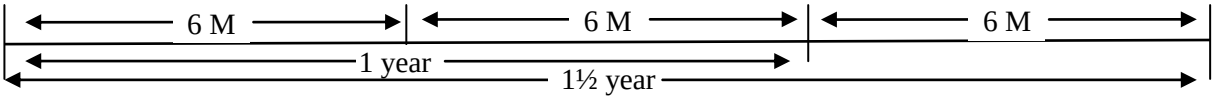
In the case of receive of foreign currency



1. Calculate P.V. of foreign currency at high Interest rate: $P.V. = \frac{\$1,00,000}{1+\frac{0.10}{12}\times 3} = \$\ 97,561$
2. Find Equivalent home currency at SR $ 1 = ₹ 50 – 50.50
   $ 1 = ₹ 50
   $ 97,561 = ₹ 97,561 × 50 = ₹ 48,78,049
3. Find future value of home currency at low interest rate; ₹ $48,78,049\left(1+\frac{0.10}{12}\times 3\right)$ = ₹ 50,00,000

ROLL - OVER OF FORWARD CONTRACTS

As per present **FEDAI** Rules, Indian Banks cannot enter into forward contracts of more than 6 months, However parties which have a foreign exchange exposure of a period more than 6 months in this case rupee role over contract is used to hedge the future payment or receipts.



Step 1	Step 2	Step 3
Take 6 months forward contacts	Cancel the existing forward contract as per provision of cancellation of forward contract & then taken for next 6 months forward contract.	Previous step is repeated till final due date incurred.

Geographical Arbitrage

Arbitrage means "**Risk Less Gain**" i.e. taking advantage of mismatching in prices of an asset in various markets.

1. If one way quote is given:- Arbitrage gain is possible from only one route i.e. gain in one route, then there must be loss in another route.
2. If two way quote is given:-

For Profit ⇒ Buying rate < Selling rate.

NOTE

Arbitrager will buy from bank & sale to bank

For profit of arbitrager.

Buying rate of arbitrager < Selling rate of arbitrager

⇩ ⇩

Selling rate of bank < buying rate of bank

(Ask rate) (Bid rate)

Above is not possible in one bank therefore for Geographical arbitrage there must be bid rate one bank higher than ask rate of other bank e.g.

Bank I	$1 = ₹ 40 – ₹ 42	$1 = ₹ 40 – ₹ 42
Bank II	$1 = ₹ 41 – ₹ 43	$1 = ₹ 43 – ₹ 44
No geographical arbitrage is Possible because ask rate is Higher than corresponding bid rate		Here geographical arbitrage is possible because bid rate of Bank II (₹ 43) is higher than ask rate (₹ 42) of Bank I.

LEADING BY AN EXPORTER.

An Indian exporter has to receive foreign currency in lieu of items exported to some other country after some time (not immediately) may decide to receive lead payment/Early payment from the foreign party to save himself from expected adverse movement of foreign exchange rates.

He may have to allow cash discount to the foreign importer on account of early payment being made by him. Also he should consider the interest to be earn on funds may available to him though early payment by the foreign party.

This method of hedging will be compared with other methods and the method involving highest cash inflows will be chosen.

It may have to allow cash discount to the foreign importer on account of early payment being made by him.

LEADING BY AN IMPORTER.

An Indian importer who is to pay foreign currency in lieu of items imported from some other country after some time (and not immediately) may decide to make lead payment/early payment to the foreign party to save himself from the expected adverse movement of foreign exchange rate.

He may negotiate for a cash discount to be allowed to him on account of early payment being made by him the foreign party. Also he should consider the opportunity cost of funds made available for early payment.

This method of hedging will be compared with other methods and the method involving list cash outflows will be consider

LAGGING

An importer/exporter may make/take payment by delaying the amount payable/receivable more than the due date of paying/receiving the amount due. This method of hedging will consider the interest payable by importer on account of lagging payments and interest receivable by exporter of account of receiving late payment.

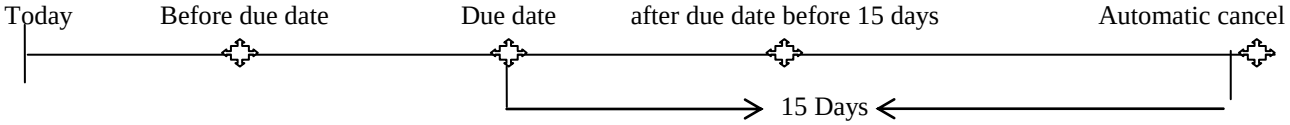
CANCELLATION OF FORWARD CONTRACT

Suppose a person enters into forward contract but due to some reason forward contract cannot be performed. In this case cancellation of forward contract is done.

There are four different situation in which cancellation is done:

1. Cancellation before due date.
2. Cancellation at due date.
3. Cancellation after due date.
4. Automatic cancellation.

Cancellation of forward contract is done with opposite transaction i.e. if forward contract is for sale of foreign currency than it is cancelled with purchase of foreign currency &then sale.

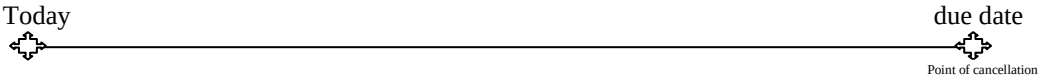


1. Cancellation before due date:

Today Before due date Due date

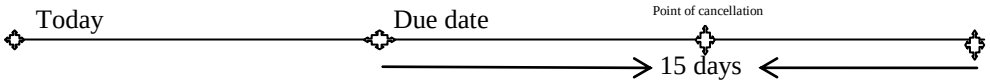
(I) 1st transaction is done as per forward rate.
(II) Opposite transaction is done at FR of due date from the date of cancellation.
(III) If there is any profit to bank i.e. loss of customer then bank will collect such profit at the time of cancellation and cancellation is completed.
(IV) If there is any profit of customer, bank will pay to customer at due date then cancelation is completed,

2. Cancellation at due date



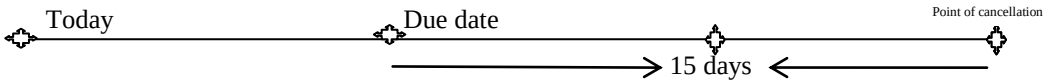
(I) 1st transaction is done as per forward contract.
(II) Opposite transaction is done at spot rate of due date.
(III) Profit &loss are set off as same date of cancelation.

3. Cancelation after due date



(I) 1st transaction is done as per forward rate.
(II) Opposite transaction is done at SR of cancelling date.
(III) If there is any profit of bank then it is collected by bank at the time of cancellation.
(IV) If there is any profit of customer it is not paid to bank because customer has approached after due date.

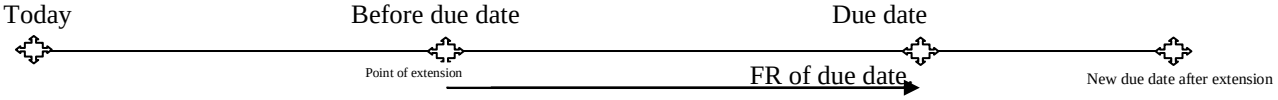
If customer doesn't approach for cancelation



In this case bank will cancelled itself the forward contract as per provision of cancellation of forward after 15days of due date.
If there is any national holiday then next working day will be the cancellation day.
If there is any profit to bank it is collected forcely but if there is any profit to customer it is not paid by bank.

Extension of Forward Contract

Existing contract is cancelled as per provision of cancelation of forward contract then new contract is made as per extension period at FR rate of extension



Early Delivery

A customer who has entered into a forward contract may approach the bank for early delivery in such case; the bank cancels the original forward contract &buy/sells to/from the customer at T.T./merchant the spot rate.

EXPOSURE NETTING

In case an importer/exporter is engaged in imports from a country and export to that country, than the person may need the receipts with the payment of foreign currency in other to hedge his position &save itself from paying any spread to bank.
e.g. ABC co. has imported from U.S.A & required to pay $100000 & exported to USA required to receive $50,000 then Netting Exposure = $100000 - $50,000 =$50,000

INTERNATIONAL CASH MANAGEMENT

Cash management involves taking care of surplus cash (if any) or deficit of cash
There are two system of international cash management namely:
1. Centralize cash management.
2. Decentralize cash management

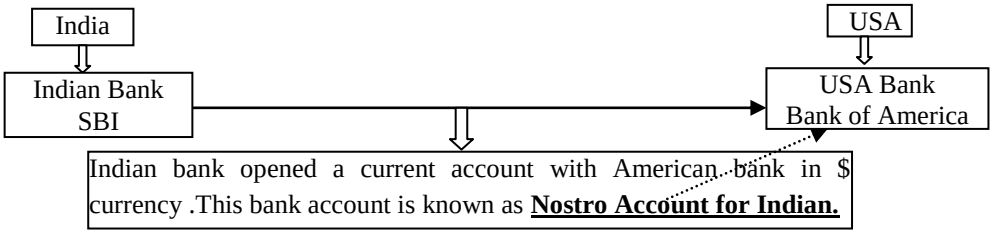
1. Centralize cash management: Under this system, the head office or holding company takes care of surplus and deficit cash at each branch/subsidiary company itself. The surplus of one branch/subsidiary Company will be transferred to the other branch/subsidiary company having deficit and if such surplus is insufficient to meet the cash requirement balance funds will be transferred/remitted by head office/holding Company to the subsidiary requiring cash infusion.
2. Decentralize cash management: Under this system the branch/subsidiary having surplus fund will remit funds to the head office/holdings company and interred deficit will be made/remitted by holding company/head office to the subsidiary company/branch office requiring cash infusion in case of deficit.

NOSTRO A\C; VOSTRO A\C & LORO A\C

1. NOSTRO A/c.

i. It is current A\C
ii. It is maintained by domestic bank\dealer with foreign bank in foreign currency.

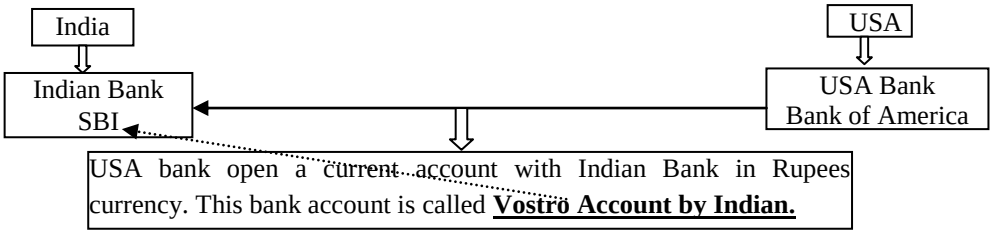
OURS ACCOUNT WITH YOU



2. VOSTRO A/c.

i. It is current A\C
ii. It is maintained by a foreign bank with domestic bank in rupee currency.

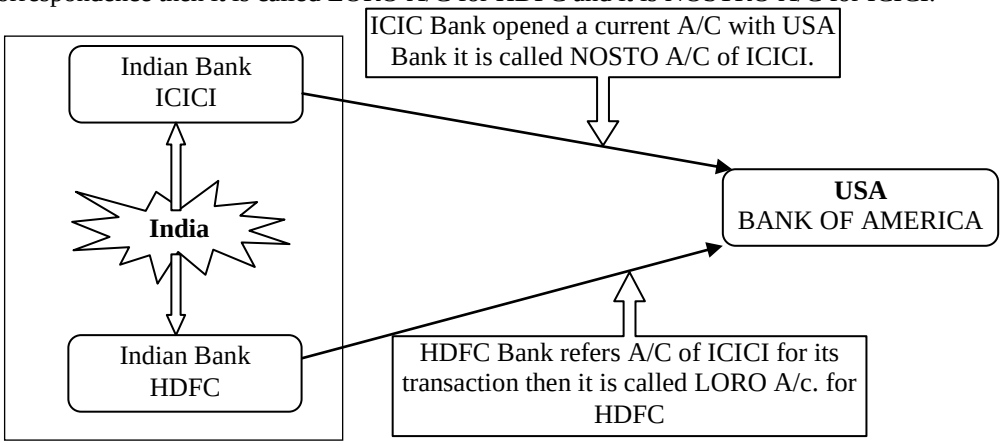
YOURS ACCOUNT WITH US



3. LORO A/c.

i. It is current A\C
ii. It is maintained by one domestic bank on behalf of other domestic bank in foreign bank in foreign currency.
iii. Loro A/C is Nostro A/C for one bank who opened the bank and LORO A/C for other bank who refers first one A/C

For example: - ICICI opened current A/C with bank of America. If HDFC refer that A/C of ICICI for its correspondence then it is called LORO A/C for HDFC and it is NOSTRO A/C for ICICI.



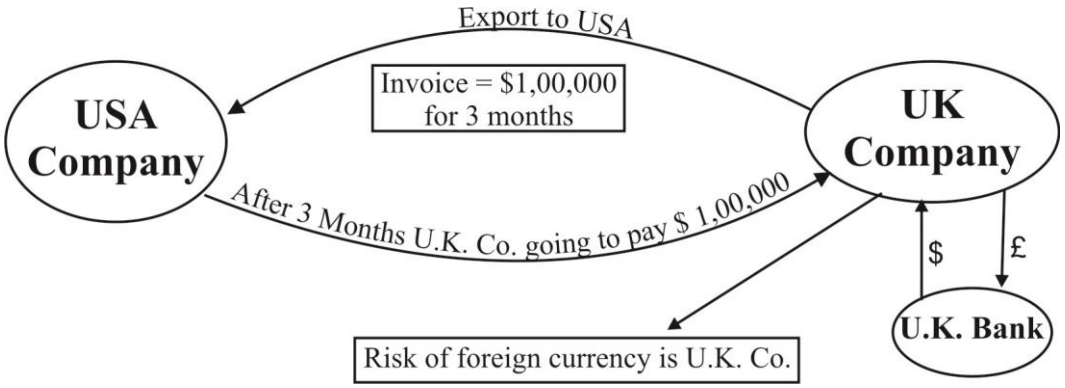
Forward spot differential / forward margin / swap point

The difference between forward rate & spot rate is known as swap point. The forward rateis calculated using Swap Point.

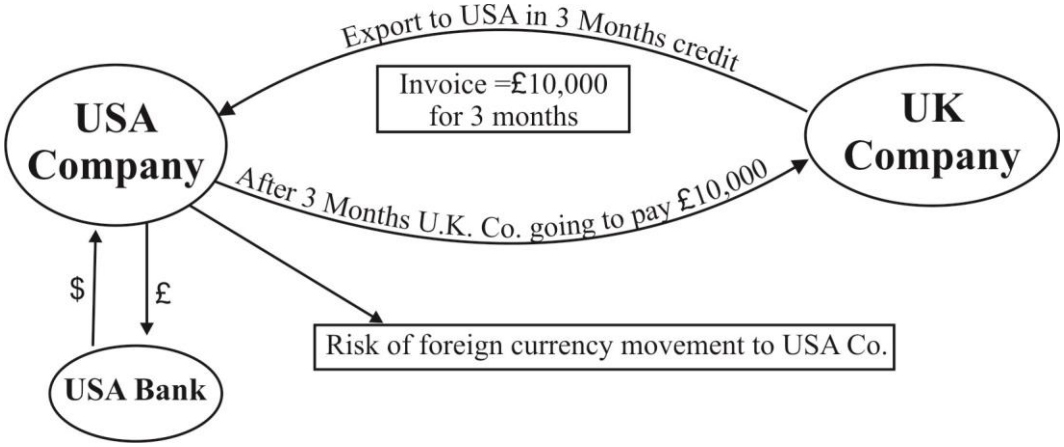
Rule 1. When Ask Swap is greater than Bid Swap Add Swap point in SR to get FR.
Rule 2. When Ask Swap is lower than Bid Swap less Swap point in SR to get FR.

Risk of Foreign Currency Movement

Case I.



Case II.



Case III.