FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

Prof. (Dr.) Asheesh Pandey

Indian Institute of Foreign Trade, New Delhi

Introduction

The forex market is the market in which participants can buy, sell, exchange, and speculate on currencies.

FX Market Participants

The forex market is made up of Banks, Commercial Companies, Central Banks, Investment management firms, Hedge funds, and Retail Forex Brokers and Investors.

The Forex Market

The forex market is made up of two levels; the interbank market and the over-the-counter (OTC) market.

The interbank market is where large banks trade currencies for purposes such as hedging, balance sheet adjustments, and on behalf of clients.

The OTC market is where individuals trade through online platforms and brokers.

What are Foreign Exchange Rates?

Two ... ake

Spot transaction is an agreement between two parties to buy one currency against selling another currency at an agreed price for settlement on the spot date. Most spot market transactions have a T+2 settlement date.

Forward transaction is an agreement between you and the bank to purchase one currency against selling another currency at a fixed price for delivery on an agreed date in the future

Bid, Ask and Spread

Bid, Ask and Spread

A foreign exchange quotes are two-way quotes, expressed as a 'bid' and ask' rates.

Bid is the price at which the dealer/bank is willing to buy another currency.

The ask or offer is the rate at which the dealer/ bank is willing to sell another currency.

BID / ASK

BID, BUY – dealers/bank's buy price

ASK, SELL , OFFER – dealers/banks sell price

Bid, Offer and Spread

For example, a dealer may quote Indian rupees as Rs 79.80 - 79.90 vis-a-vis dollar.

That means that he is willing to buy dollars at Rs 79.80/$ (sell rupees and buy dollars), while he will sell dollar at Rs 79.90/$ (buy rupees and sell dollars).

The difference between the bid and the offer is called the spread.

The offer/ask is always higher than the bid as inter-bank dealers make money by buying at the bid and selling at the offer/ask

Bid / Ask & Spread

If you want to buy currency, you have to pay the higher ask price, but if you want to sell currency, you have to sell it at the lower bid price.

So if you were to buy currency, then immediately sell it back to the same dealer, the dealer would make money, and you would lose money.

Thus, the spread is the **transaction cost** of trading currency.

Quiz 1

John is an American traveller visiting Europe. The cost of purchasing euros at the airport is EUR 1 = USD 1.20 / USD 1.30 , John wants to buy EUR 15,000 , how many dollars he has to pay to the dealer .

A. USD 13000

B. USD 19,500

C. USD 18,000

D. USD 15,000

1

John is an American traveller visiting Europe. The cost of purchasing euros at the airport is EUR 1 = USD 1.20 / USD 1.30 , George wants to buy EUR 15,000 , how many dollars he has to pay to the dealer .

A. USD 13000

B. USD 19,500

C. USD 18,000

D. USD 15,000

Quiz 2

George is an American traveller returning from Europe. The cost of euros at the airport is EUR 1 = USD 1.20 / USD 1.30 , George wants to sell EUR 3,000 , how many dollars he will get from the dealer

A. USD 5,000

B. USD 3,600

C. USD 3,900

D. USD 3,000

2

George is an American traveller returning from Europe. The cost of euros at the airport is EUR 1 = USD 1.20 / USD 1.30 , George wants to sell EUR 3,000 , how many dollars he will get from the dealer

A. USD 5,000

B. USD 3,600

C. USD 3,900

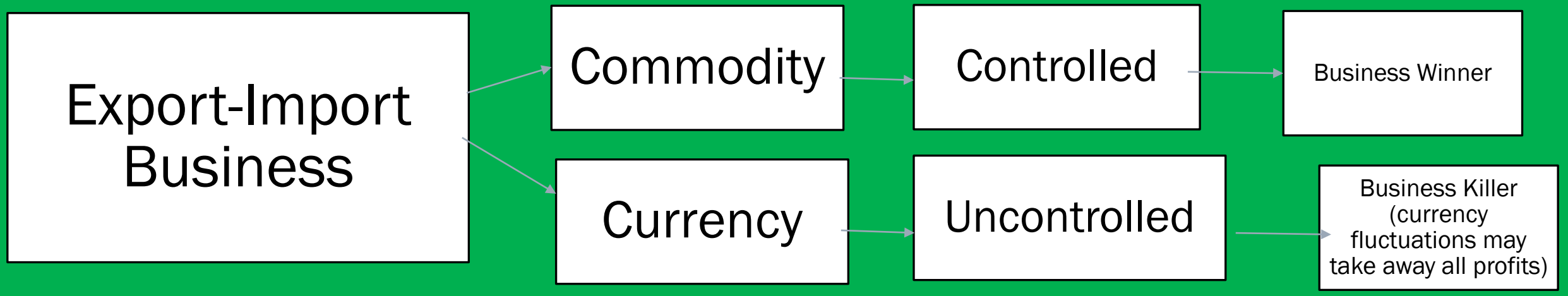
D. USD 3,000

FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

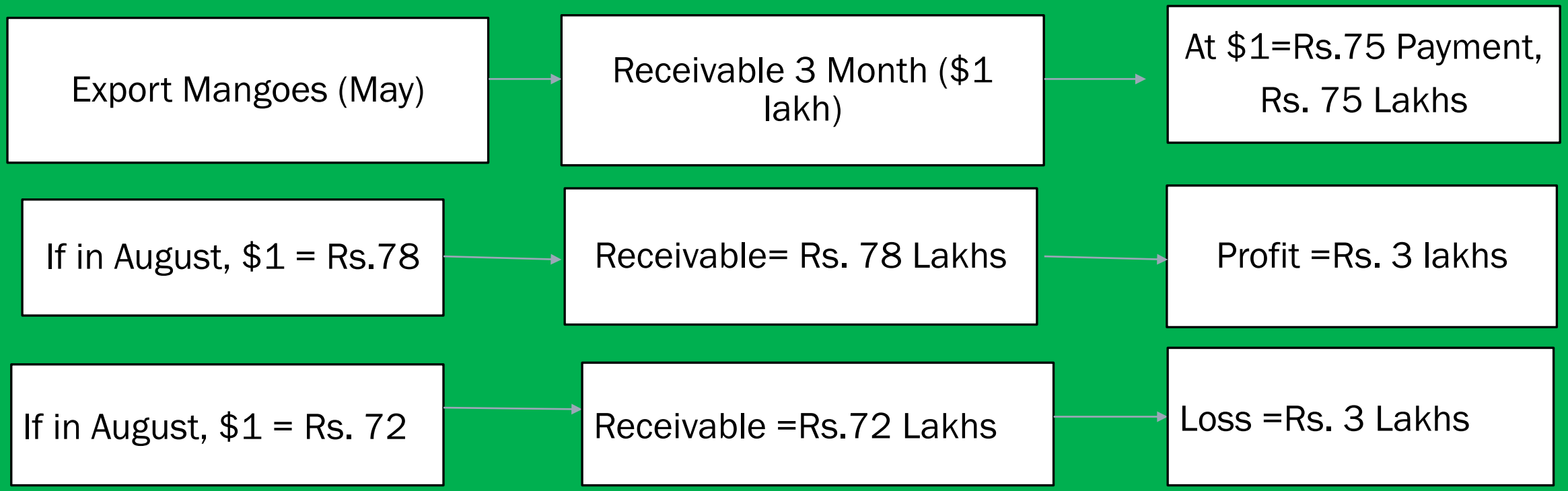
Foreign exchange (FX) risk is an intrinsic part of doing international business.

The values of major currencies constantly fluctuate against each other, creating income uncertainty for your business.

FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT



FOREIGN EXCHANGE EXPOSURE: UNHEDGED



Currency Price Effect

US $ Price	Importer	Exporter
75	Booking	Booking
78	Loss	Profit
72	Profit	Loss

Global Currency Markets

- ✓ One of the largest and most liquid in the world
- ✓ Daily turnover of $ 6.5 Trillion
- ✓ Main trading centers are
  - ✓ London (38%)
  - ✓ New York (18%)
  - ✓ Tokyo (06%)
  - ✓ Singapore (05%)
- ✓ Over 85% of all FX transactions involve 7 major currencies
- ✓ Market never sleeps and has its own rhythm (24/7)
- ✓ Starts in Sydney and ends in St. Francisco
- ✓ Markets: Spot, Forward, Futures and Options
- ✓ Currency Derivatives started in 1972 at CME

Source: BIS 2017 Report

ICICIdirect

Chicago Mercantile Exchange (CME)

USD to INR Chart

Dollar has appreciated 10% in last one year

• **1 USD = 82.2281 INR** Oct 18, 2022, 03:21 UTC

US Dollar to Indian Rupee

75-----82.50

https://www.xe.com/currencycharts/?from=USD&to=INR

USD to INR Chart

US Dollar to Indian Rupee

• **1 USD = 79.7802 INR** Aug 25, 2022, 02:58 UTC

12H 1D 1W 1M 1Y 2Y 5Y **10Y**

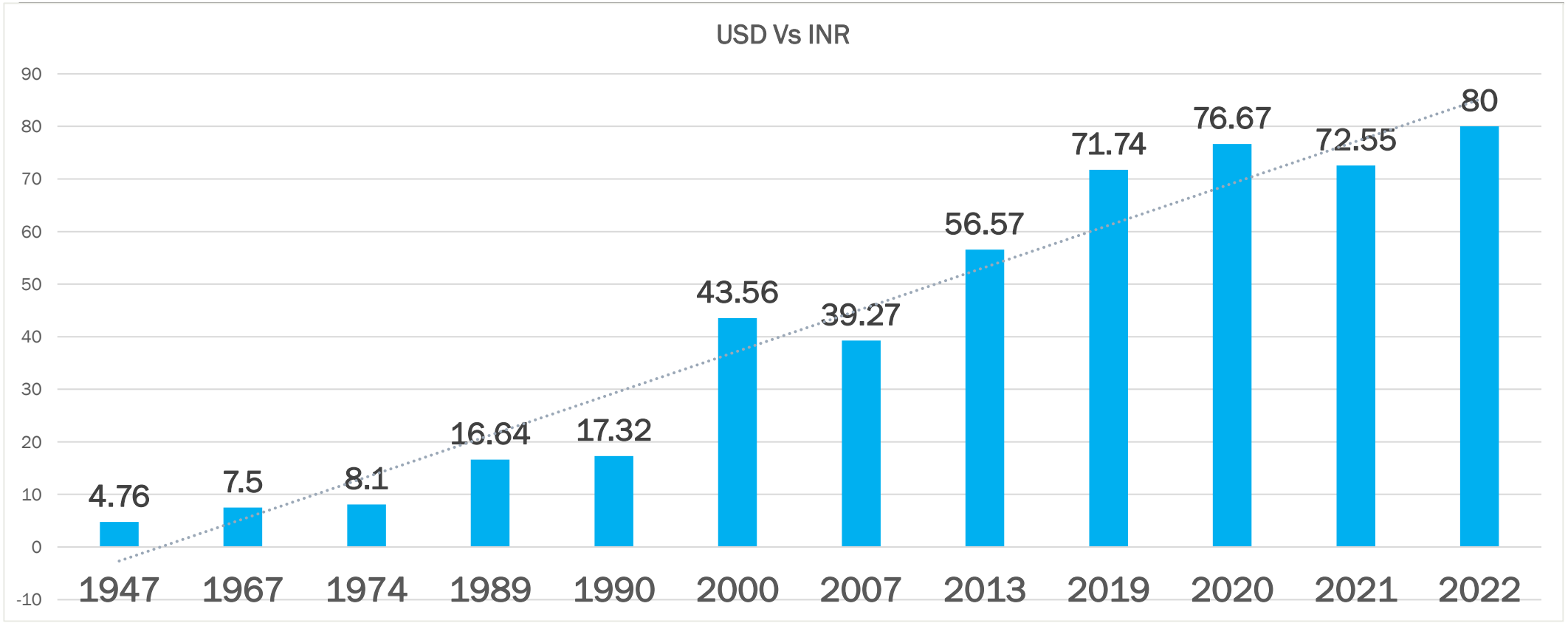
CompareRemit

1 USD to INR Rates from 1947-2021

CAGR = 4%

Data Source: Reserve Bank of India (RBI)

USD / INR Chart



FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

Many businesses like to eliminate this uncertainty by locking in future exchange rates.

But some businesses regard exchange rate movements as a profit opportunity.

FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

The simplest risk management strategy for reducing foreign exchange risk is to make and receive payments only in your own currency.

FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

You might lose customers to competitors who offer more currency flexibility and your suppliers may be unwilling to accept payments in what is to them a foreign currency

So you may therefore find that competitive pressures force you to explore a risk management strategy that helps manage your foreign exchange risk more efficiently.

HEDGING CURRENCY RISK

HEDGING CURRENCY RISK : is a way for a company to minimize or eliminate **foreign exchange risk.**

***Internal Techniques*-within the business itself**

***External Techniques*- involve dealing with a third party**

Hedging Foreign Exchange Risk

Internal Techniques:

Leading and lagging

Invoicing in domestic currency

Netting

External Techniques:

Forwards

Futures

Options

Internal Techniques

Leading and Lagging-Leading means advancing a payment i. e. making a payment before it is due. Lagging involves postponing a payment i. e. delaying payment beyond its due date.

Example: X Ltd imports $1,00,000 goods from abroad

(current rate 1$ =Rs 75)
Payable after 6 months

X :Ltd expects $ to appreciate significantly in next 6 months . So X plans to pay the amount upfront

Internal Techniques

Leading and Lagging-Leading means advancing a payment i. e. making a payment before it is due. Lagging involves postponing a payment i. e. delaying payment beyond its due date.

For example an Indian Firm which is due to receive payments from it's customer in the UK, may press for prompt payment from the customer if it expects the INR to appreciate in future

when this happens we say that the Indian firm is leading it's receivables.

One pound = 102.5 ⟶ Rs 100

Internal Techniques

Invoicing in Domestic Currency- invoicing in domestic currency, an exporter can shift transaction risk to his customer abroad

X Ltd invoices Rs75,000 for their exports (at the time of export 1$ =Rs 75) Payment receivable after 6 months

1$ = Rs 70 after 6 months

X receives Rs 75,000

Importer has to pay $ 1071.42 as against $1000

Rs 75,000/70= $1071.42

Internal Techniques

***Netting*-Exposure netting** is a method of hedging **currency risk** by offsetting exposure in one currency with exposure in the same or another currency.

Example : X India Ltd owes $1,00,000 to its group company X USA Ltd for the goods supplied and X USA ltd also owes $ 80,000 for the services provided to X India Ltd

Internal Techniques

Netting-Exposure **netting** is a method of hedging **currency risk** by offsetting exposure in one currency with exposure in the same or another currency.

Example : X India Ltd owes $1,00,000 to its group company X UK Ltd for the goods supplied and X UK ltd also owes £ 78000 for the services provided to X India Ltd (1$ = £.78)

External Techniques- Derivative Instruments

FORWARD CONTRACTS

FUTURES CONTRACTS

OPTION CONTRACTS

Currency Forward Contract

Forward Contract

A forward contract is **a customized contract between two parties to buy or sell an asset at a specified price on a future date.**

A forward contract can be used for hedging or speculation, although its non-standardized nature makes it particularly apt for hedging.

Forward Contract

A currency forward is a customized, written contract between parties that sets a fixed foreign currency exchange rate for a transaction that will occur on a specified future date.

The future date for which the currency exchange rate is fixed is usually the date on which the two parties plan to conclude a buy/sell transaction of goods.

FORWARD CONTRACT

Thus, Salient features of Forward contract are:

1. Private deals b/w two parties to exchange cash in future
2. No cash flow at initiation of contract
3. Non-standardized contracts in self regulated forward market
4. Contract size and maturity period can be customized so it provides perfect hedge
5. Mostly interbank transactions traded over the counter

6. There is normally no insistence on margin as the bank and client know each other
7. High counter party risk which may lead to default

Understanding Currency Forward Contracts

Currency forward contracts are primarily utilized to hedge against currency exchange rate risk.

It protects the buyer or seller against unfavorable currency exchange rate occurrences that may arise between when a sale is contracted and when the sale is actually made.

However, parties that enter into a currency forward contract forego the potential benefit of exchange rate changes that may occur in their favor between contracting and closing a transaction.

Example of Forward Contract

A Ltd. of India has imported some chemical worth of USD 3,64,897 from one of the U.S. suppliers.

The amount is payable in six months time. The relevant spot and forward rates are:

Spot Rate

BID $1 = 74.2150

ASK $1= 74.2250

Six Months forward rate

BID $1 = Rs74.324

ASK$1= Rs 74.327

Forecasted Spot rates after six months

BID $1 = Rs74.720

ASK$1= Rs 74.860

Should he hedge his forex exposure or leave it unhedged ?

Solution

Amount payable in USD 3,64,897 after six months	Six Months forward rate BID $1 = Rs74.324 ASK$1= Rs 74.327	$3,64,897 X 74.327 =Rs 2,71,21,699

Solution

Forecasted Spot rates after six months	BID $1 = Rs74.720 ASK$1= Rs 74.860	Amount payable if not hedged $3,64,897X74.860 Rs 2,73,16,189

Solution

OPTION 1 : HEDGED	OPTION 2 : UNHEDGED	OPTION 1 is better so take a forward cover
Rs 2,71,21,699	Rs 2,73,16,189	

Exercise

XYZ Ltd. of India has imported some equipment worth of £ 5,00,000 from one of the UK. suppliers.	The amount is payable in six months time. The relevant spot and forward rates are:	Spot Rate BID £1 = 100.2150 ASK £1= 100.2250
Six Months forward rate BID £1 = Rs100.324 ASK£1= Rs 100.327	Spot rates after six months BID £1 = Rs100.720 ASK£1= Rs 100.860	Should he hedge his forex exposure or leave it unhedged ?

Solution

Amount payable in £ 5,00,000 after six months	Six Months forward rate BID £1 = Rs100.324 ASK £1= Rs 100.327	£ 5,00,000 X 100.327 = Rs 5,01,63,500

Solution

Spot rates after six months

BID $1 = Rs100.720

ASK$1= Rs 100.860

Amount payable if not hedged £5,00,000X 100.860

Rs 5,04,30,000

Outflow in rupee under both the options

OPTION 1 : HEDGED	OPTION 2 : UHEDGED	OPTION 1 is better so take a forward cover
Rs 5,01,63,500	Rs 5,04,30,000	

Exercise

An Indian importer has to settle an import bill for $ 1,30,000. The exporter has given the Indian exporter two options:

(i) Pay immediately without any interest charges

(ii) Pay after three months with interest at 5 percent per annum.

The importer's bank charges 15 percent per annum on overdrafts.

The exchange rates in the market are as follows:

Spot rate (Rs /$) : 74.35 /74.36

3-Months forward rate (Rs /$) : 74.81 /74.83

The importer seeks your advice. Give your advice.

Solution

If importer pays now, he will have to buy US$ in Spot Market by availing overdraft facility. Accordingly, the outflow under this option will be

Amount required to purchase

$1,30,000 X Rs 74.36 = 96,66,800,

Add: Overdraft Interest for 3 months @15% p.a. =Rs 3,62,505

Total outflow = Rs 1,00,29,305

*Spot rate (Rs /$) : 74.35 /**74.36***

Solution

If importer makes payment after 3 months then, he will have to pay interest for 3 months @ 5% p.a. for 3 month along with the sum of import bill.

Accordingly, he will have to buy $ in forward market. The outflow under this option will be as follows:

Amount of Bill = $1,30,000
Add: Interest for 3 months @5% p.a.= $1625= Total $ 1,31,625

Amount to be paid in Indian Rupee after 3 month under the forward purchase contract

Rs 98,49,498

US$ 1,31,625 X Rs 74.83

Outflow

option1 = Rs 1,00,29,305

Option 2 =Rs 98,49,498

Since outflow of cash is least in (ii) option, it should be opted for.

*3-Months forward rate (Rs /$) : 74.81 /**74.83***

Exercise

XYZ Ltd. of India has exported some equipment worth of $ 3,00,000 from one of the supplier.	**The amount is receivable in six months time. The relevant spot and forward rates are:**	Spot Rate BID $1 = 76.21**50** ASK $1= 76.2250
Six Months forward rate BID $1 = Rs77.324 ASK$1= Rs 77.327	Expected Spot rates after six months BID $1 = Rs76.124 ASK$1= Rs 76.128	Should he hedge his forex exposure or leave it unhedged ?

Solution

Amount receivable $ 3,00,000 after six months	Six Months forward rate BID $1 = Rs77.324 ASK $1= Rs 77.327	$ 3,00,000 X 77.324 = Rs2,31,97,200

Solution

Expected Spot rates after six months

BID $1 = Rs76.124

ASK$1= Rs 76.128

Amount receivable if not hedged
$3,00,000X 76.124

Rs 2,28,37,200

Inflow in rupee under both the options

OPTION 1 : HEDGED	OPTION 2 : UHEDGED	OPTION 1 is better so take a forward cover
Rs 2,31,97,200	Rs 2,28,37,200	

Currency Futures Contract

CURRENCY FUTURES

These are financial contracts that obligate the contracts' buyers to purchase an asset at a pre-agreed price on a specified future date.

Of the two parties, one agrees to buy (who takes long position) while other agrees to sell taking short position.

CURRENCY FUTURES

Future contracts are

(i) standardized contracts

(ii.) between two parties who do not necessarily know each other

(iii) guaranteed for performance by an intermediary known as Stock Exchange

The exchange determines the size of the contract, price to be quoted, delivery location and limits on the amount by which the future price can move in any one day.

CURRENCY FUTURES

Future contracts are Settled on Mark to Market basis (MTM) and are cash settled

Buyers and seller are required to deposit an initial margin which is around 5% of the value of the contract

In the futures market, margin refers to the initial deposit of "good faith" made into an account in order to enter into a futures contract.

Currency Futures in India

In India the stock exchange provides foreign exchange risk management The contracts available are:

Futures Contracts in USD-INR,	EUR-INR,	GBP-INR
and JPY-INR.	(maximum of 12 monthly contracts)	To make the markets for USDINR futures deeper and more liquid, NSE has now launched weekly currency futures on the USDINR.

Contract Size (Lot size)

1000USD **USDINR**	1000 EURO EURINR	1000Pounds GBRINR
	1,00,000 Yens JPYINR	

Example on Hedging Using Currency Futures for Importer

XYZ is an Importer. On 15th Nov 2021, XYZ Limited wish to book its outwards remittance for 31st Dec 2021 worth $100,000.

On 15th Nov

$ Futures is trading at 74.60 (LTP)

Expiry on 31st Dec

No of Contracts (100,000/$1000): 100

Buy Currency Futures 100 contracts at

$1= 74.60

Margin 3% = INR 2,23,800 (74,60,000 *3%)

What would be the cost to importer if on maturity RBI Reference rate is:

a. 75.90

b. 73.60

LTP : Last trading price

Spot rate on 15th Nov 1$ =Rs 74.27

Month End 31st Dec : Case 1

Assume USD/INR **75.90** (RBI Ref Rate)	Cash Profit = (75.90-74.60)*1,00,000 = INR 1,30,000	Margin will get released
Importer has to pay Rs 75,90,000 on 31st Dec at spot rate	Net outflow = Rs 75,90,000 - 1,30,000 = Rs 74,60,000	He is hedged and fixed his payment @74.60/$

Month End 31st Dec : Case 2

Assume USD/INR **73.60** (RBI Ref Rate)	Loss: = (73.60-74.60)*1,00,000 = INR 1,00,000	Margin will get released
Importer will pay Rs 73,60,000 on 31st Dec at spot rate	Net outflow = Rs 73,60,000 +1,00,000 = Rs 74,60,000	He is hedged and fixed his payment @74.60/$

Example on Hedging Using Currency Futures for Exporter

XYZ is an exporter. On 15th Nov 2021, XYZ Limited wish to book its inward remittance for 31st Dec. 2021 worth $100,000.

$ Futures is currently trading at 74.60

Expiry on 31st Dec

No of Contracts (100,000/$1000): 100

Sell Currency Futures 100 contracts at

$1= 74.60

Margin 3% = INR 2,23,800 (74,60,000 *3%)

What would be the cost to exporter if on maturity RBI Reference rate is:

a. 73.10

b. 75.60

Spot rate on 15th Dec , 1$ =Rs 74.27

Month End 31st Dec : Case 1

Assume USD/INR **73.10** (RBI Ref Rate)	Cash Profit = (73.10-74.60)*1,00,000 = INR 1,50,000	Margin will get released
Exporter will get Rs 73,10,000 on 31st Dec at spot rate	Net Receipts = Rs 73,10,000 + 1,50,000 = Rs 74,60,000	He is hedged and fixed his receipts @74.60/$

Month End 31st Dec: Case 2

Assume USD/INR **75.60** (RBI Ref Rate)	Loss: = (74.60-75.60)*1,00,000 = INR 1,00,000	Margin will get released
Exporter will get Rs 75,60,000 on 31st Dec at spot rate	Net Receipts = Rs 75,60,000-1,00,000 = Rs 74,60,000	He is hedged and fixed his receipts @74.60/$

Difference between Forward and Futures Contract

Difference between Forward and Futures

S.No.		Forward	Future
1	Trading Location	Over the Counter	Exchange Traded
2.	Regulation	Self-Regulating	RBI, SEBI
3.	Frequency of delivery	Mostly by actual delivery	Cash Settled
4.	Size of Contract	Tailormade	Standardized
5.	Delivery Date	Tailormade	Standardized
6.	Transaction Cost	Bid-Ask Spread	Negotiated brokerage Fees
7.	Margins	Not required normally	Initial and Maintenance margins required
8.	Settlement	On the Maturity Date by actual deliver	Daily on MTM basis, cash settled

Cash flows under forward and Futures:

Value of forward contract changes from the time the contract is entered to the time when it matures because the spot rate the time of contract and its maturity changes

Forward contracts are settled on maturity while futures contract are settled daily on MTM basis

Thus cash flows on forward contract are different from cash flows on futures contract

For example a forward and a futures contract on USD was entered by importer on date 1 (D1) to buy USD at exchange rate of USD/INR 74 for settlement on date 4.

Cash flows to forward and future transactions are shown as:

Cash flows under forward and Futures:

Cash flows of Forward Contract

Date	Forward Rate (USD/INR)	Settlement price (USD/INR)	Cash Flows from Forward (INR)
D1	74.00	72.00	0
D2	74.00	73.00	0
D3	74.00	75.00	0
D4	74.00	76.00	76-74=2

Cash flows of Futures Contract

Date	Forward Rate (USD/INR)	Settlement price (USD/INR)	Cash Flows from Forward (INR)
D1	74.00	72.00	(2)
D2	72.00	73.00	1
D3	73.00	75.00	2
D4	75.00	76.00	1

Options Contract

Options Contract

Buyer has the right to buy while seller has the obligation to sell

Value derived by the underlying security

Option Price: Premium

Types of options

Call Option	Put Option
Option to buy security (Long)	Option to sell security (short)

Types of options

European Option

Settled on Expiry of contract

(In India European options are traded)

American Option

Settled on before or end of expiry of contract

Call Option

Call options provide the holder the right (but not the obligation) to purchase an underlying asset at a specified price (the **strike price or exercise price**), for a certain period of time.

If the stock fails to meet the strike price before the expiration date, the option expires and becomes worthless.

Investors buy calls when they think the share price of the underlying security will rise or sell a call if they think it will fall.

Selling an option is also referred to as "writing" an option.

Call Option: Example

Reliance Industries is trading at 2361. (Feb. 15, 2022)

The call option is as follows: Strike price = 2300, Expiry Date = Feb. 24, 2022,Premium on the call = Rs. 81.50

In this case, the buyer of the Reliance call today has to pay the seller of the Reliance call Rs. 81.50 for the right to purchase IBM at Rs.2300 on or before Feb.14,2022. If the buyer decides to exercise the option on or before expiry date, the seller will have to deliver Reliance shares at a price of Rs.2300 to the buyer.

Put Option

Put options give the holder the right to sell an underlying asset at a specified price (the strike price).

The seller (or writer) of the put option is obligated to buy the stock at the strike price.

Investors buy puts if they think the share price of the underlying stock will fall, or sell one if they think it will rise.

Example on Hedging Using Currency Options for Importer

XYZ is an Importer.	On 15th Nov 2021, XYZ Limited wish to book its outwards remittance for 29th Dec 2021 worth $100,000.	Option Strike price 74.25 is available at premium of Rs 0.25 Expiry on 29th Dec
No of Contracts (100,000/$1000): 100	Buy Call option 100 contracts at $1= 74.25	Option Premium = INR 25,000 (1,00,000 *0.25)

Spot rate on 15th Nov 1$ =Rs 74.27

Month End 29th Dec : Case 1

Assume USD/INR **75.75** (RBI Ref Rate)

Cash Profit = (75.75-74.25)*1,00,000 = INR 1,50,000-25000= 1,25,000

Importer has to pay Rs 75,75,000 on 29th Dec at spot rate

Net outflow = Rs 75,75,000 - 1,25,000 = Rs 74,50,000

He is hedged and fixed his payment @74.50-./$

Month End 29th Dec : Case 2

Assume USD/INR **73.00** (RBI Ref Rate)	He will not exercise his right	Loss = Rs 25,000
Importer will pay Rs 73,00,000 on 29th Dec at spot rate	Net outflow = Rs 73,00,000 +25,000 = Rs 73,25,000	He gets the gain on Rs appreciation

Example on Hedging Using Currency Options for Exporter

XYZ is an exporter.	On 15th Nov 2021, XYZ Limited wish to book its inward remittance for 29th Dec 2021 worth $100,000.	Option Strike price 74.25 is available at premium of Rs 0 .25 Expiry on 29th Dec
No of Contracts (100,000/$1000): 100	Buy Put option 100 contracts at $1= 74.25	Option Premium = INR 25,000 (1,00,000 *0.25)

Spot rate on 15th Nov 1$ =Rs 74.27

Month End 29th Dec : Case 1

Assume USD/INR **73.00** (RBI Ref Rate)	He will exercise his right	Gain 74.25-73.00= 1.25= 1,25,000 - 25000= Rs 1,00,000
Exporter will receive Rs 73,00,000 on 29th Dec at spot rate	Net inflow = Rs 73,00,000 +1,00,000 = Rs 74,00,000	He is hedged at Rs 74.00

Month End 29th Dec : Case 2

Assume USD/INR **75.75** (RBI Ref Rate)

He will not exercise his right and losses Rs 25,000 premium

Exporter will receive Rs 75,75,000 on 29th Dec at spot rate

Net inflow = Rs 75,75,000 - 25,000 = Rs 75,50,000

He gains on $ appreciation

Review of Techniques for Hedging Transaction Exposure

HEDGING TECHNIQUE	TO HEDGE PAYABLES	TO HEDGE RECEIVABLES
Futures hedge	Purchase a currency futures contract (or contracts) representing the currency and amount related to the payables.	Sell a currency futures contract (or contracts) representing the currency and amount related to the receivables.
Forward hedge	Negotiate a forward contract to purchase the amount of foreign currency needed to cover the payables.	Negotiate a forward contract to sell the amount of foreign currency that will be received as a result of the receivables.
Money market hedge	Borrow local currency and convert to currency denominating payables. Invest these funds until they are needed to cover the payables.	Borrow the currency denominating the receivables, convert it to the local currency, and invest it. Then pay off the loan with cash inflows from the receivables.
Currency option hedge	Purchase a currency call option (or options) representing the currency and amount related to the payables.	Purchase a currency put option (or options) representing the currency and amount related to the receivables.

THANKS