

Term of Examination	Foreign Direct Investment and International Financial Management	Foreign Exchange Exposure and Risk Management	Term of Examination	Foreign Direct Investment and International Financial Management	Foreign Exchange Exposure and Risk Management
Nov 2003		5(b) & (c)			
May 2004		4(b)			
Nov 2004	6(b)(i)	4(c), 6(d)	Nov 2008		4(a)&(b),5(a)
May 2005		4(a)	Jun 2009		4(a),(b)&(c)
Nov 2005	2(c), 4(d)	3(b), 4(c)			
May 2006	6(c)	4(b)	Nov 2009	3(c)	5(a)
Nov 2006		3(a)&(b), 4(b)	May 2010		3(b)
May 2007	3(c)	2(a), 3(b)	Nov 2010		6(a)
Nov 2007		3(c), 6(c)			
May 2008	4(b)	5(b)	May 2011		7(c)
Nov 2008	3(a), 6(b)	3(a), 5(a)	Nov 2011		1(b),2(b),5(b),7(e) 1(c),5(a),7(d),7(e)
Jun 2009		5(a)	May 2012		
Nov 2009	3(c)(i)	4(b)	Nov 2012	7(c)	1(d),3(b)
May 2010		4(b)	May 2013	5(b),7(d)	1(a)
Nov 2010	7(c)	3(b)	Nov 2013		1(c), 2(b),6(b),7(b)

Remember: Unless otherwise specified you are Indian and start all your workings from Indian Rupee...

Foreign Exchange Exposure and Risk Management

Different Currencies and their symbol

Country	Currency	Symbol
Australia	Dollar	A\$
Canada	Dollar	Can \$
Denmark	Krone	Dkr
EMU	Euro	€
Finland	Markka	FM
India	Rupee	Rs.
Iran	Rial	RI
Japan	Yen	¥
Kuwait	Dinar	KD
Mexico	Peso	Ps
Norway	Krone	NKr
Saudi Arabia	Riyal	SR
Singapore	Dollar	S\$
South Africa	Rand	R
Sweden	Krona	Skr
Switzerland	Franc	SFr or CHF
United Kingdom	Pound	£
United States	Dollar	\$

1. The price of a bond just before a year of maturity is \$ 5,000. Its redemption value is \$ 5,250 at the end of the said period. Interest is \$ 350 p.a. The Dollar appreciates by 2% during the said period. Calculate the rate of return.

(4 Marks) (May 2012)

Answer Return= 12.24%

Alternatively it can also be considered that \$ appreciation will be applicable to the amount of principal as well. The answer therefore could also be 14.24%

2. XYZ Bank, Amsterdam, wants to purchase Rs. 25 million against £(Pound) for funding their Nostro account and they have credited LORO account with Bank of London, London.

Calculate the amount of £'s credited. Ongoing inter-bank rates are per \$, Rs. 61.3625/3700 & per £, \$ 1.5260/70.

(4 Marks) (November 2013) Answer: £ 267,500

3. Nostro, Vostro and Loro Accounts (4 Marks) (May 2012)

In interbank transactions, foreign exchange is transferred from one account to another account and from one centre to another centre. Therefore, the banks maintain three types of current accounts in order to facilitate quick transfer of funds in different currencies. These accounts are Nostro, Vostro and Loro accounts meaning “our”, “your” and “their”. A bank’s foreign currency account maintained by the bank in a foreign country and in the home currency of that country is known as Nostro Account or “our account with you”. For example, An Indian bank’s Swiss franc account with a bank in Switzerland. Vostro account is the local currency account maintained by a foreign bank/branch. It is also called “your account with us”. For example, Indian rupee account maintained by a bank in Switzerland with a bank in India. The Loro account is an account wherein a bank remits funds in foreign currency to another bank for credit to an account of a third bank.

4. You sold Hong Kong Dollar 1,00,00,000 value spot to your customer at Rs. 5.70 & covered yourself in London market on the same day, when the exchange rates were

US\$ 1	=	H.K.\$	7.5920
		7.5880	
Local inter bank market rates for US\$ were			
Spot US\$ 1	=	Rs. 42.70	42.85

Calculate cover rate and ascertain the profit or loss in the transaction. Ignore brokerage.

(4 Marks) (November 2005) Answer: Profit to bank is Rs. 5,29,000

5. A Bank sold Hong Kong Dollars 40,00,000 value spot to its customer at Rs. 7.15 and covered itself in London Market on the same day, when the exchange rates were:

US\$ = HK\$ 7.9250/7.9290

Local interbank market rates for US\$ were

Spot US\$ 1 = Rs. 55.00/55.20

You are required to calculate rate and ascertain the gain or loss in the transaction. Ignore brokerage.

You have to show the calculations for exchange rate up to four decimal points. **(5 Marks) (May 2013)**

Answer: Gain to bank is Rs. 7,38,800

6. You, a foreign exchange dealer of your bank, are informed that your bank has sold a T.T. on Copenhagen for Danish Kroner 10,00,000 at the rate of Danish Kroner 1 = Rs. 6.5150. You are required to cover the transaction either in London or New York market. The rates on that date are as under:

Mumbai-London	Rs. 74.3000	Rs. 74.3200
Mumbai*-New York	Rs. 49.2500	Rs. 49.2625
London-Copenhagen	DKK 11.4200	DKK 11.4350
New York-Copenhagen	DKK 07.5670	DKK 07.5840

In which market will you cover the transaction, London or New York, and what will be the exchange profit or loss on the transaction? Ignore brokerages. **(5 Marks) (November 2013)**

* In question paper it was wrongly printed as London

Answer: The transaction will be covered through London which gets maximum profit of Rs. 7,119 or lower cover cost by (65,10,176-65,07,881) = Rs. 2295

7. The following 2-way quotes appear in the foreign exchange market:

	Spot	2-months forward
RS/US \$	Rs.46.00/Rs.46.25	Rs.47.00/Rs.47.50

Required:

(i) How many US dollars should a firm sell to get Rs.25 lakhs after 2 months?

- (ii) How many Rupees is the firm required to pay to obtain US \$ 2,00,000 in the spot market?
(iii) Assume the firm has US \$ 69,000 in current account earning no interest. ROI on Rupee investment is 10% p.a.
Should the firm encash the US \$ now or 2 months later? **(6 Marks) (June 2009) (M)**

Answer

- (i) US \$ 53191.489
(ii) Rs.92,50,000
(iii) It is better to encash the proceeds after 2 months and get opportunity gain(Rs.16,100).

Decision Making: Rule is compare at same point of time

8. 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. /\$) : 48.35 /48.36

3-Months forward rate (Rs./\$) : 48.81 /48.83

The importer seeks your advice. Give your advice. **(6 Marks) (November 2011)**

Answer

Pay Immediately: Rs. 6522555

Pay after 3 Months: 6427249

Hint: Timing of cash flow to be compared should be same.

9. Z Ltd. importing goods worth USD 2 million, requires 90 days to make the payment. The overseas supplier has offered a 60 days interest free credit period and for additional credit for 30 days an interest of 8% per annum.
The bankers of Z Ltd offer a 30 days loan at 10% per annum and their quote for foreign exchange is as follows:

	Rs.
Spot 1 USD	56.50
60 days forward for 1 USD	57.10
90 days forward for 1 USD	57.50

You are required to evaluate the following options:

- (i) Pay the supplier in 60 days, or
(ii) Avail the supplier's offer of 90 days credit. **(8 Marks) (November 2012)**

Answer

Pay the supplier in 60 days = 115,151,667

Availing supplier's offer of 90 days credit = 115,766,648

Dealers Commission:

10. On January 28, 2010 an importer customer requested a bank to remit Singapore Dollar (SGD) 25,00,000 under an irrevocable LC. However, due to bank strikes, the bank could effect the remittance only on February 4, 2010. The interbank market rates were as follows:

	January, 28	February 4
Bombay US\$1	= Rs. 45.85/45.90	45.91/45.97
London Pound 1	= US\$ 1.7840/1.7850	1.7765/1.7775
Pound 1	= SGD 3.1575/3.1590	3.1380/3.1390

The bank wishes to retain an exchange margin of 0.125%. How much does the customer stand to gain or lose due to the delay?

(Calculate rate in multiples of .0001)

(8 Marks) (May 2005), (5 Marks) (November 2011)

Answer

loss to the importer = Rs. 2,28,250

An importer requests his bank to extend the forward contract for US\$ 20,000 which is due for maturity on 30 th October, 2010, for a further period of 3 months. He agrees to pay the required margin money for such extension of the contract.

Contracted Rate – US\$ 1= Rs. 42.32 The US Dollar quoted on 30-10-2010:-

Spot – 41.5000/41.5200

3 months' Premium -0.87% /0.93%

Margin money for buying and selling rate is 0.075% and 0.20% respectively.

Compute:

- The cost to the importer in respect of the extension of the forward contract, and
- Rate of new forward contract. **(4 Marks) (November 2010) (M)**

Answer

(i) The contract is to be cancelled on 30-10-2010	at the spot buying rate of US\$ 1
	= Rs. 41.5000
Less: Margin Money 0.075%	= Rs. <u>0.0311</u>
	= <u>Rs.41.4689</u> or Rs. 41.47
US\$ 20,000 @ Rs. 41.47	= Rs. 8,29,400
US\$ 20,000 @ Rs. 42.32	= <u>Rs. 8,46,400</u>
The difference in favour of the Bank/Cost to the importer	<u>Rs. 17,000</u>
(ii) The Rate of New Forward Contract	
Spot Selling Rate US\$ 1	= Rs. 41.5200
Add: Premium @ 0.93%	= <u>Rs. 0.3861</u>
	= Rs. 41.9061
Add: Margin Money 0.20%	= <u>Rs. 0.0838</u>
	= <u>Rs. 41.9899</u> or Rs. 41.99

11. A company is considering hedging its foreign exchange risk. It has made a purchase on 1st. January, 2008 for which it has to make a payment of US \$ 50,000 on September 30, 2008. The present exchange rate is 1 US \$ = Rs. 40. It can purchase forward 1 US \$ at Rs. 39. The company will have to make a upfront premium of 2% of the forward amount purchased. The cost of funds to the company is 10% per annum and the rate of corporate tax is 50%. Ignore taxation. Consider the following situations and compute the Profit/Loss the company will make if it hedges its foreign exchange risk:

- If the exchange rate on September 30, 2008 is Rs. 42 per US \$.
- If the exchange rate on September 30, 2008 is Rs. 38 per US \$. **(8 Marks) (May 2008)**

Answer: Gain = Rs. 1,08,075 (ii) Loss= Rs. 91,925

Cancellation of Contract: Same rule- Same point of Time(discussed in class)

12. A customer with whom the Bank had entered into 3 months forward purchase contract for Swiss Francs 1,00,000 at the rate of Rs. 36.25 comes to the bank after two months and requests cancellation of the contract. On this date, the rates are:

Spot	CHF 1 = Rs. 36.30	36.35
One month forward	36.45	36.52

Determine the amount of Profit/ Loss to the customer due to cancellation of the contract.**(4 Marks) (November 2004)**

Answer

Original contract for Swiss Francs 1,00,000 @ 36.25 –amount receivable by the customer To cancel the purchase contract 1 month before the due date –The contract will be cancelled at 1 month forward sale rate i.e. Swiss Francs 1 = 36.52 payable by the customer.

Hence, Swap profit / loss to the customer:

Rs. 36.52	payable by the customer
Rs. 36.25	receivable by the customer
Rs. 0.27	Net payable by the customer i.e. loss

Therefore, total loss to the customer is Swiss Francs 1,00,000 × Rs. 0.27 = Rs. 27,000

13. Following information relates to AKC Ltd. which manufactures some parts of an electronics device which are exported to USA, Japan and Europe on 90 days credit terms.

Cost and Sales information:

	Japan	USA	Europe
Variable cost per unit	Rs.225	Rs.395	Rs.510
Export sale price per unit	Yen 650	US\$10.23	Euro 11.99
Receipts from sale due in 90 days	Yen 78,00,000	US\$1,02,300	Euro 95,920

Foreign exchange rate information:

	Yen/Rs.	US\$/Rs.	Euro/Rs.
Spot market	2.417-2.437	0.0214-0.0217	0.0177-0.0180
3 months forward	2.397-2.427	0.0213-0.0216	0.0176-0.0178
3 months spot	2.423-2.459	0.02144-0.02156	0.0177-0.0179

Advice AKC Ltd. by calculating average contribution to sales ratio whether it should hedge it's foreign currency risk or not. **(8 Marks) (November 2007)**

Answer: If hedged Contribution is (Rs. 5,13,844 + Rs. 7,86,111 + Rs. 13,08,784)/10730000 = 19.56%

Similarly, if not hedged than average contribution to sales ratio is 19.17%

AKC Ltd. Is advised to hedge its foreign currency exchange risk.

Forward Contracts & market Expectation

14. ABC Co. have taken a 6 month loan from their foreign collaborators for US Dollars 2 millions. Interest payable on maturity is at LIBOR plus 1.0%. Current 6-month LIBOR is 2%*.

Enquiries regarding exchange rates with their bank elicits the following information:

Spot USD 1	Rs. 48.5275
6 months forward	Rs. 48.4575

(i) What would be their total commitment in Rupees, if they enter into a forward contract?

(ii) Will you advise them to do so? Explain giving reasons. **(10 Marks) (November 2003)**

***LIBOR rates quoted for per annum only.**

Answer

(i) Rs. 98,368,725

(ii) It is seen from the forward rates that the market expectation is that the dollar will depreciate. If the firm's own expectation is that the dollar will depreciate more than what the bank has quoted, it may be worthwhile not to cover forward and keep the exposure open.

If the firm has no specific view regarding future dollar price movements, it would be better to cover the exposure. This would freeze the total commitment and insulate the firm from undue market fluctuations. In other words, it will be

advisable to cut the losses at this point of time.

Given the interest rate differentials and inflation rates between India and USA, it would be unwise to expect continuous depreciation of the dollar. The US Dollar is a stronger currency than the Indian Rupee based on past trends and it would be advisable to cover the exposure.

Illustration:

Say 1\$= Rs. 100	Or We can say 1Rs. = \$ 0.01
Given that \$ increases by 10%	Given that \$ increases by 10%
So now 1\$= Rs. 110 (100+10%)	So now 1Rs. = \$ 0.01/110%=0.0090909..
Eg: Its like 10% on cost price	Eg: Its like 10% on sales price

Discount & Premium

15. Excel Exporters are holding an Export bill in United States Dollar (USD) 1,00,000 due 60 days hence. They are worried about the falling USD value which is currently at Rs. 45.60 per USD. The concerned Export Consignment has been priced on an Exchange rate of Rs. 45.50 per USD. The Firm's Bankers have quoted a 60-day forward rate of Rs. 45.20.

Calculate:

- (i) Rate of discount quoted by the Bank
(ii) The probable loss of operating profit if the forward sale is agreed to. **(4 Marks) (November 2004)**

Answer

- (i) Rate of discount quoted by the bank : 5.33%
(ii) Probable loss of operating profit: Rs. 30,000

16. The US dollar is selling in India at Rs.55.50. If the interest rate for a 6 months borrowing in India is 10% per annum and the corresponding rate in USA is 4%.

- (i) Do you expect that US dollar will be at a premium or at discount in the Indian Forex Market?
(ii) What will be the expected 6-months forward rate for US dollar in India? and
(iii) What will be the rate of forward premium or discount? **(5 Marks) (November 2012)**

Answer

- (i) Under the given circumstances, the USD is expected to quote at a premium in India as the interest rate is higher in India.
(ii) Rs. 57.13
(iii) Rate of premium: 5.87%

17. The United States Dollar is selling in India at Rs. 45.50. If the interest rate for a 6-months borrowing in India is 8% per annum and the corresponding rate in USA is 2%.

- (i) Do you expect United States Dollar to be at a premium or at discount in the Indian forward market?
(ii) What is the expected 6-months forward rate for United States Dollar in India; and
(iii) What is the rate of forward premium or discount? **(9 Marks) (May 2004)**

Answer

- (i) Under the given circumstances, the USD is expected to quote at a premium in India as the interest rate is higher in India.
(ii) 46.85
(iii) 5.93%

Interest Rate Arbitrage:

18. Given the following information:

Exchange rate – Canadian dollar 0.665 per DM (spot) Canadian dollar 0.670 per DM (3 months)

Interest rates – DM 7% p.a. Canadian Dollar – 9% p.a.

What operations would be carried out to take the possible arbitrage gains? **(8 Marks) (May 2006)**

Hint: By borrowing 2% cheaper fund(i.e. DM) you will lose 3.01% when you will need DM to be repaid. So better go for C\$.

Answer

In this case, DM is at a premium against the Can\$.

Premium = $[(0.67 - 0.665) / 0.665] \times (12/3) \times 100 = 3.01$ per cent Interest rate differential = $9\% - 7\% = 2$ per cent.

Since the interest rate differential is smaller than the premium, it will be profitable to place money in Deutschmarks the currency whose 3-months interest is lower.

Net arbitrage gain = 1025.15 – 1022.50 = Can\$ 2.65

19. Given the following information:

Exchange rate-Canadian Dollar 0.666 per DM (Spot) Canadian Dollar 0.671 per DM (3 months)

Interest rates-DM 8% p.a. Canadian Dollar 10% p.a.

What operations would be carried out to earn the possible arbitrage gains?

(8 Marks) (November 2010) (S)

Answer: Net arbitrage gain = =CAN \$ 2.66.

20. Spot rate 1 US \$ = Rs.48.0123

180 days Forward rate for 1 US \$ = Rs.48.8190 Annualised interest rate for 6 months – Rupee = 12% Annualised interest rate for 6 months – US \$ = 8%

Is there any arbitrage possibility? If yes how an arbitrageur can take advantage of the situation, if he is willing to borrow Rs.40,00,000 or US \$83,312. **(5 Marks) (November 2006)**

Hint: Borrow \$ because you are saving 4% in interest now when you repay \$ loan will cost you 3.36% more but then also it is beneficial.

Answer

Hence the gain is US \$ $(86,851.43 - 86,644.48) = \text{US\$ } 206.95$

OR

Rs.10,103 i.e., $(\$206.95 \times \text{Rs.}48.8190)$

21. A company operating in Japan has today effected sales to an Indian company, the payment being due 3 months from the date of invoice. The invoice amount is 108 lakhs yen. At today's spot rate, it is equivalent to Rs. 30 lakhs. It is anticipated that the exchange rate will decline by 10% over the 3 months period and in order to protect the yen payments, the importer proposes to take appropriate action in the foreign exchange market. The 3 months forward rate is presently quoted as 3.3 yen per rupee. You are required to calculate the expected loss and to show how it can be hedged by a forward contract. **(6 Marks) (November 2003)**

Answer:If the exchange rate risk is not covered with forward contract, the expected exchange loss is Rs. 3.33 lakhs. This could be reduced to Rs. 2.73 lakhs if it is covered with Forward contract. Hence, taking forward contract is suggested.

Money Market Hedge

22. An exporter is a UK based company. Invoice amount is \$3,50,000. Credit period is three months. Exchange rates in London are :

Spot Rate	(\$/£) 1.5865 – 1.5905
3-month Forward Rate	(\$/£) 1.6100 – 1.6140

Rates of interest in Money Market :

	Deposit	Loan
\$	7%	9%
£	5%	8%

Compute and show how a money market hedge can be put in place. Compare and contrast the outcome with a forward

contract. (6 Marks) (November 2008) (S), (7 Marks) (November 2009) (M)

Answer

Using forward rate, amount receivable is £2,16,852.54

Amount received through money market hedge = £2,17,904.45

So, money market hedge is beneficial for the exporter

23. An Indian exporting firm, Rohit and Bros., would be cover itself against a likely depreciation of pound sterling. The following data is given :

Receivables of Rohit and Bros	£500,000
Spot rate	Rs. 56.00/£
Payment date	3-months
3 months interest rate	India : 12 per cent per annum UK : 5 per cent per annum
What should the exporter do? (6 Marks) (November 2008) (S)	

Answer

The only thing lefts Rohit and Bros to cover the risk in the money market. (Rs. 28,483,950)

Forward Rates

24. 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 Rs. 46. What will be the expected rate after 1 year and after 4 years applying the Purchasing Power Parity Theory. (4 Marks)(May 2010)

Ans:47.84 and 53.81

25. (i)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 Rs. 43.40. Find the expected rate of US \$ in India after one year and 3 years from now using purchasing power parity theory. (4 Marks) (November 2008) (S)

(ii) On April 1, 3 months interest rate in the UK £ and US \$ are 7.5% and 3.5% per annum respectively. The UK £/US \$ spot rate is 0.7570. What would be the forward rate for US \$ for delivery on 30th June? (4 Marks)

Answer (i) Rs. 47.9761 (ii)UK £0.7645 / US\$

26. The following table shows interest rates for the United States dollar and French francs. The spot exchange rate is 7.05 francs per dollars. Complete the missing entries:

	3 Months	6 Months	1 Year
Dollar interest rate (annually compounded)	11½%	12¼%	?
Franc interest rate (annually compounded)	19½	?	20%
Forward franc per dollar	?	?	7.5200
Forward discount per franc per cent per year	?	-6.3%	

Answer:

Forward discount on franc per cent per year -6.7%

Forward discount on franc per cent for 3 months

= -6.7/4 or -1.675%

Forward franc per dollar

= 7.17

6 months

= 7.28

Forward francs per dollar francs

1 Year

Franc interest rate =

20%

(annually
compounded)

Dollar interest rate = $1.20 \times 0.9374 - 1 = 1.125 - 1 = 0.125$ or 12.5%

Currency Arbitrage

27. Followings are the spot exchange rates quoted at three different forex markets:

USD/INR 48.30 in Mumbai

GBP/INR 77.52 in London

GBP/USD 1.6231 in New York

The arbitrageur has USD 1,00,00,000. Assuming that there are no transaction costs, explain whether there is any arbitrage gain possible from the quoted spot exchange rates. **(6 Marks, November 2008)**

Answer: USD 112,968.26

Understanding Market Quotes:

28. You have following quotes from Bank A and Bank B:

	Bank A	Bank B
SPOT	USD/CHF 1.4650/55	USD/CHF 1.4653/60
3 months	5/10	
6 months	10/15	
	GBP/USD	
SPOT	1.7645/60	GBP/USD 1.7640/50
3 months	25/20	
6 months	35/25	

Calculate :

(i) How much minimum CHF amount you have to pay for 1 Million GBP spot?

(ii) Considering the quotes from Bank A only, for GBP/CHF what are the Implied Swap points for Spot over 3 months?

(6 Marks) (June 2009) (S)

Hint: Even though quotes are 1CHF= \$ 1.4650/1.4655, students should interpret it as 1\$ = CHF1.4650/1.4655 because \$ is stronger.

Note: GBP is stronger than \$.

Answer

(i) Amount payable CHF 25,86,600

(ii) Spot rate Bid rate	GBP 1 = CHF 1.4650 * 1.7645	= CHF 2.5850
Offer rate	GBP 1 = CHF 1.4655 * 1.7660	= CHF 2.5881
GBP / USD 3 months swap points are at discount		
Outright 3 Months forward rate GBP 1	= USD 1.7620	/ 1.7640

USD / CHF 3 months swap points are at premium	
Outright 3 Months forward rate USD 1	= CHF 1.4655 / 1.4665
Hence Outright 3 Months forward rate GBP 1	= CHF 2.5822 / 2.5869

Spot rate GBP 1 = CHF 2.5850 / 2.5881 Therefore 3 month swap points are at discount of 28/12.

29. Leading & Lagging (4 Marks- November 2011)

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.

In forex market Leading and lagging are used for two purposes:-

(1) **Hedging foreign exchange risk:** A company can lead payments required to be made in a currency that is likely to appreciate. For example, a company has to pay \$100000 after one month from today. The company apprehends the USD to appreciate. It can make the payment now. Leading involves a finance cost i.e. one month's interest cost of money used for purchasing \$100000.

A company may lag the payment that it needs to make in a currency that it is likely to depreciate, provided the receiving party agrees for this proposition. The receiving party may demand interest for this delay and that would be the cost of lagging. Decision regarding leading and lagging should be made after considering (i) likely movement in exchange rate (ii) interest cost and (iii) discount (if any).

(2) **Shifting the liquidity by modifying the credit terms between inter-group entities:** For example, A Holding Company sells goods to its 100% Subsidiary. Normal credit term is 90 days. Suppose cost of funds is 12% for Holding and 15% for Subsidiary. In this case the Holding may grant credit for longer period to Subsidiary to get the best advantage for the group as a whole. If cost of funds is 15% for Holding and 12% for Subsidiary, the Subsidiary may lead the payment for the best advantage of the group as a whole. The decision regarding leading and lagging should be taken on the basis of cost of funds to both paying entity and receiving entity. If paying and receiving entities have different home currencies, likely movements in exchange rate should also be considered.

30. NP and Co. has imported goods for US \$ 7,00,000. The amount is payable after three months. The company has also exported goods for US \$ 4,50,000 and this amount is receivable in two months. For receivable amount a forward contract is already taken at Rs. 48.90.

The market rates for Rs. and Dollar are as under:

Spot	Rs. 48.50/70
Two months	25/30 points
Three months	40/45 points

The company wants to cover the risk and it has two options as under :

- (A) To cover payables in the forward market and
(B) To lag the receivables by one month and cover the risk only for the net amount. No interest for delaying the receivables is earned. Evaluate both the options if the cost of Rupee Funds is 12%. Which option is preferable?

(8 Marks) (May 2012)

Answer	
(A) To cover payable and receivable in forward Market	
Amount payable after 3 months	\$7,00,000
Forward Rate	Rs. 48.45
Thus Payable Amount (Rs.) (A)	Rs. 3,39,15,000
Amount receivable after 2 months	\$ 4,50,000
Forward Rate	Rs. 48.90

Thus Receivable Amount (Rs.) (B)	Rs. 2,20,05,000
Interest @ 12% p.a. for 1 month (C)	Rs. 2,20,050
Net Amount Payable in (Rs.) (A) – (B) – (C)	Rs. 1,16,89,950

(B) Assuming that since the forward contract for receivable was already booked it shall be cancelled if we lag the receivables. Accordingly any profit/ loss on cancellation of contract shall also be calculated and shall be adjusted as follows:

Amount Payable (\$)	\$7,00,000
Amount receivable after 3 months	\$ 4,50,000
Net Amount payable	\$2,50,000
Applicable Rate	Rs. 48.45
Amount payable in (Rs.) (A)	Rs. 1,21,12,500
Profit on cancellation of Forward cost (48.90 – 48.30) × 4,50,000 (B)	Rs. 2,70,000
Thus net amount payable in (Rs.) (A) + (B)	Rs. 1,18,42,500

Since net payable amount is least in case of first option, hence the company should cover payable and receivables in forward market.

Note: In the question it has not been clearly mentioned that whether quotes given for 2 and 3 months (in points terms) are premium points or direct quotes. Although above solution is based on the assumption that these are direct quotes, but students can also consider them as premium points and solve the question accordingly.

31. Following are the details of cash inflows and outflows in foreign currency denominations of MNP Co. an Indian export firm, which have no foreign subsidiaries:

Currency	Inflow	Outflow	Spot rate	Forward rate
US \$	4,00,00,000	2,00,00,000	48.01	48.82
French Franc (FFr)	2,00,00,000	80,00,000	7.45	8.12
U.K. £	3,00,00,000	2,00,00,000	75.57	75.98
Japanese Yen	1,50,00,000	2,50,00,000	3.20	2.40

(i) Determine the net exposure of each foreign currency in terms of Rupees.

(ii) Are any of the exposure positions offsetting to some extent? **(4 Marks) (November 2006)**

Answer

(i) Net exposure of each foreign currency in Rupees

	Inflow	Outflow	Net Inflow	Spread	Net Exposure
	(Millions)	(Millions)	(Millions)		(Millions)
US\$	40	20	20	0.81	16.20
FFr	20	8	12	0.67	8.04
UK£	30	20	10	0.41	4.10
Japan Yen	15	25	-10	-0.80	8.00

(ii) The exposure of Japanese yen position is being offset by a better forward rate

32. XYZ Ltd. a US firm will need £ 3,00,000 in 180 days. In this connection, the following information is available:

Spot rate 1 £ = \$ 2.00

180 days forward rate of £ as of today = \$1.96

Interest rates are as follows:

	U.K.	US
180 days deposit rate	4.5%	5%
180 days borrowing rate	5%	5.5%

A call option on £ that expires in 180 days has an exercise price of \$ 1.97 and a premium of \$ 0.04.

XYZ Ltd. has forecasted the spot rates 180 days hence as below:

Future rate	Probability
\$ 1.91	25%
\$ 1.95	60%
\$ 2.05	15%

Which of the following strategies would be most preferable to XYZ Ltd.?

- (a) A forward contract;
- (b) A money market hedge;
- (c) An option contract;
- (d) No hedging.

Show calculations in each case.

(8 Marks) (May 2007)

Answer

(a) Forward contract: Dollar needed in 180 days = \$5,88,000/-

(b) Money market hedge: \$ 6,05,741

(c) **Call option:**

Expected Spot rate in 180 days	Prem. /unit	Exercise Option	Total price per unit	Total price for £3,00,000xi	Prob. Pi	pixi
1.91	0.04	No	1.95	5,85,000	0.25	1,46,250
1.95	0.04	No	1.99	5,97,000	0.60	3,58,200
2.05	0.04	Yes	2.01*	6,03,000	0.15	90,450
						5,94,900

* (\$1.97 + \$0.04)

(Note: for simplicity we ignored timing of call premium)

(d) **No hedge option:**

Expected Future spot Rate	Dollar needed Xi	Prob. Pi	Pi xi
1.91	5,73,000	0.25	1,43,250
1.95	5,85,000	0.60	3,51,000
2.05	6,15,000	0.15	92,250
			5,86,500

The probability distribution of outcomes for no hedge strategy appears to be most preferable because least number of \$ are needed under this option to arrange £3,00,000.

33. Airlines Company entered into an agreement with Airbus for buying latest plans for a total value of F.F. (French

Francs) 1,000 Million payable after 6 months. The current spot exchange rate is INR (Indian Rupees) 6.60/FF. The Airlines Company cannot predict the exchange rate in the future. Can the Airlines Company hedge its Foreign Exchange risk? Explain by examples.

Answer

Airlines Company can hedge its foreign exchange risk by the following ways:

(i) Hedging through Forward Contract: The Company can take full forward cover against foreign exchange exposure and entirely hedge its risk. It can contract with a bank to buy French franc forward at an agreed exchange rate e.g. suppose the 6 months forward rate is INR 6.77/FF. The liability is fixed and the airlines can concentrate on operation. Cost of forward contract

$$= \frac{6.60}{6.60} - \frac{6.77}{6.60} \times \frac{360}{\text{days}}$$

(ii) Foreign Currency Option: Foreign currency option is the right (not an obligation) to buy or sell a currency at an agreed exchange rate (exercise price) on or before an agreed maturity period. The right to buy is called a call option and right to sell is put option. Suppose, the airlines wants to purchase a 6 months put option. The put option exercise rate (say) is INR 6.70. The Airlines will be required to pay a premium for purchasing the option say 5% of the value of put option INR 6700 $\times$ 0.05 = INR 335

Maximum final cost = 6700 + 335 = INR 7035

Suppose at the end of 6 months the exchange rate stay at INR 6.8/FF Airlines will exercise its put option hence it will sell (pay) INR 6.7

The exercise price to obtain one French Franc in this market, it will be required to pay INR 6.80.

Suppose exchange rate at the end of 6 months is INR 6.35, Airlines should not exercise its option. In the open market need to pay only INR 6.35 (instead of INR 6.70) to buy one FF. However, it has already paid the option premium.

(iii) Money Market Operations: Airlines can borrow in Indian Rupee an amount and get it converted in FFs at Spot Rate. This amount can be invested in France for 6 months so that this amount along with interest due on it become equal to FFs 1000 million and is used for making the payment. The loan in Indian Rupee can be repaid back after 6 months along with the interest due thereon. If interest rate parity holds, the difference in the forward rate and the spot rate is the reflection of the difference in the interest rates in two countries.

Thus Airlines will be able to hedge against the changes in the exchange rate. The problem with money market is that all markets are not open and all countries are not fully convertible.

34. A Ltd. of U.K. 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 USD 1.5617-1.5673

6 months' forward rate USD 1.5455 -1.5609

The borrowing rates in U.K. and U.S. are 7% and 6% respectively and the deposit rates are 5.5% and 4.5% respectively.

Currency options are available under which one option contract is for GBP 12,500. The option premium for GBP at strike price of USD 1.70/GBP is USD 0.037 (call option) and USD 0.096 (put option) for 6 months period.

The company has 3 choices:

- (i) Forward cover
- (ii) Money market cover, and
- (iii) Currency option

Which of the alternatives is preferable by the company?

(8 Marks) (May 2010) (M)

Answer

Thus total payment in:	
------------------------	--

(i)	Forward Cover	2,36,103 GBP
(ii)	Money Market	2,36,510 GBP
(iii)	Currency Option	2,27,923 GBP

The company should take currency option for hedging the risk.

Practice Questions

35. Illustration

On 25th March 2007, a customer requested his bank to remit DG 12,50,000 to Holland in payment of import of diamonds under an irrevocable LC. However due to bank strikes, the bank could affect the remittance only on 2nd Apr 2007. The inter bank market rates were as follows:

Place	25.03.2007	02.04.2007
Bombay [\$ / Rs. 100]	2.2873 - 2.2962	2.3063 - 2.3159
London[US\$/Pound]	1.9120 - 1.9135	1.9050 - 1.9070
DG/Pound	4.1125 - 4.1140	4.0120 - 4.0130

The bank wishes to retain an exchange margin of 0.25%. How much does the customer stand to gain or lose due to the delay?

Solution: Total Loss to the Company = Rs. 3,38,344

36. Illustration

You have the following quotes from Bank A and Bank B —

	Bank A	Bank B
Spot	USD/CHF 1.4650/55	USD/CHF 1.4653/60
3 Months	5/10	
6 Months	10/15	
Spot	GBP/USD 1.7645/60	GBP /USD 1.7640/50
3 Months	25/20	
6 Months	35/25	

Calculate —

- How much minimum CHF amount you have to pay for 1 Million GBP spot?
- Considering the quotes from Bank A only, for GBP / CHF, what are the Implied Swap Points for spot over 3 months?

Solution: To buy 1 Million GBP, the required CHF = CHF 386800

Determination of Swap Points based on Bank A Quotes alone The Spot Rates for GBP/CHF -

Bid GBP/CHF = $1.4650 \times 1.7645 = 2.5850$

Ask GBP/CHF = $1.4655 \times 1.7660 = 2.5881$

The Futures Rates for GBP/CHF -

Bid GBP /CHF = $1.4655 \times 1.7620 = 2.5822$

Ask GBP / CHF = $1.4665 \times 1.7640 = 2.5869$

The implied SWAP points is the difference between the Spot and Forward rates = **0.0028/0.0012 or 28/12.**

- In March, 2009, the Multinational Industries make the following assessment of dollar rates per British pound to prevail as on 1.9.2009:

\$/Pound	Probability
1.60	0.15
1.70	0.20
1.80	0.25
1.90	0.20
2.00	0.20

- (i) What is the expected spot rate for 1.9.2009?
(ii) If, as of March, 2009, the 6-month forward rate is \$ 1.80, should the firm sell forward its pound receivables due in September, 2009?

Answer: (i) the expected spot value of \$ for £ for September, 2009 would be \$ 1.81.

- (ii) If the six-month forward rate is \$ 1.80, the expected profits of the firm can be maximised by retaining its pounds receivable.

38. Outland Steel has a small but profitable export business. Contracts involve substantial delays in payment, but since the company has had a policy of always invoicing in dollars, it is fully protected against changes in exchange rates. More recently the sales force has become unhappy with this, since the company is losing valuable orders to Japanese and German firms that are quoting in customers' own currency. How will you, as Finance Manager, deal with the situation?

Answer

As a Finance Manager to deal with the situation two problems emerge – (i) the problem of negotiating individual contracts and (ii) managing the company's foreign exchange exposure.

The sales force can be allowed to quote in customer's own currency and hedge for currency risk by obtaining the forward contracts etc.

The finance manager can decide whether the company ought to insure. There are two ways of protecting against exchange loss. Firstly, by selling the foreign currency forward and secondly, to borrow foreign currency against the receivables, sell the foreign currency spot and invest the proceeds in the foreign currency say dollars. Interest rate parity theory tells us that in free market the difference between selling forward and selling spot should be exactly equal to difference between the interest on the money one has to pay overseas and the interest one earns from dollars.

39. "Operations in foreign exchange market are exposed to a number of risks." Discuss. **(3 Marks) (November 2007)**

Answer

A firm dealing with foreign exchange may be exposed to foreign currency exposures. The exposure is the result of possession of assets and liabilities and transactions denominated in foreign currency. When exchange rate fluctuates assets, liabilities, revenues, expenses that have been expressed in foreign currency will result in either foreign exchange gain or loss. A firm dealing with foreign exchange may be exposed to the following types of risks:

- (i) **Transaction Exposure:** A firm may have some contractually fixed payments and receipts in foreign currency, such as, import payables, export receivables, interest payable on foreign currency loans etc. All such items are to be settled in a foreign currency. Unexpected fluctuation in exchange rate will have favourable or adverse impact on its cash flows. Such exposures are termed as transactions exposures.
- (ii) **Translation Exposure:** The translation exposure is also called accounting exposure or balance sheet exposure. It is basically the exposure on the assets and liabilities shown in the balance sheet and which are not going to be liquidated in the near future. It refers to the probability of loss that the firm may have to face because of decrease in value of assets due to devaluation of a foreign currency despite the fact that there was no foreign exchange transaction during the year.
- (iii) **Economic Exposure:** Economic exposure measures the probability that fluctuations in foreign exchange rate will affect the value of the firm. The intrinsic value of a firm is calculated by discounting the expected future cash flow with appropriate discounting rate. The risk involved in economic exposure requires measurement of the effect of