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Risk Management on Foreign Exchange

Chartered Accountancy
Strategic Level
Corporate Finance & Risk Management (CFRM)

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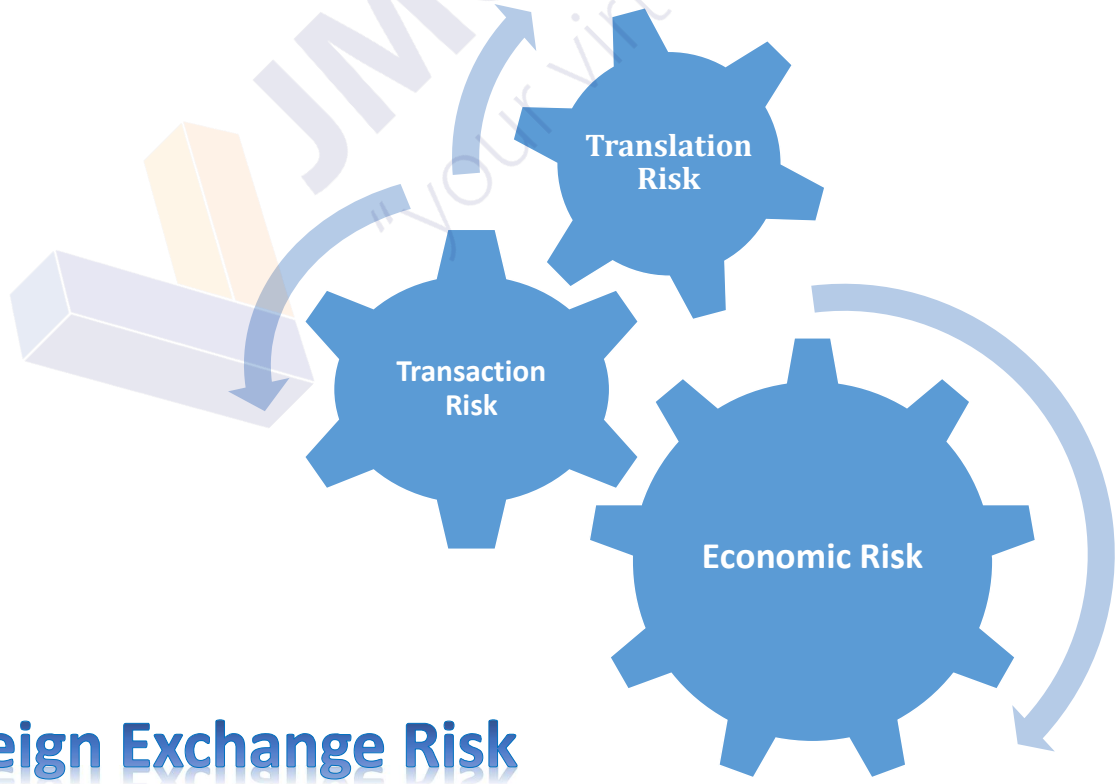
Tutorial - 08

Corporate Finance and Risk Management
STRATEGIC LEVEL

Risk Management
-Foreign Exchange-

Samira Anthony



Foreign Exchange Risk

Exchange rates

- An **exchange rate** is the rate at which a currency can be traded in exchange for another currency.
- The **spot exchange rate** is the rate at which currencies can be bought or sold for **immediate delivery**.
- The **forward rate** is an exchange rate set for currencies to be exchanged at a future date.

HOW TO PRESENT……

- A **direct quote** is the amount of domestic currency which is equal to one foreign currency unit.

LKR176 : US$1,

- An **indirect quote** is the amount of foreign currency which is equal to one domestic currency unit.

LKR1 : US$0.00568.

EX:

- To convert $1,000 to rupees using the direct quote (Rs. 176:$1): $1,000 □ 176 =Rs. 176,000.
- To convert $1,000 to rupees using an indirect quote ($0.00568:Rs.1): $1,000/0.00568 = Rs. 176,000 (corrected for rounding).

How forex will present

- Foreign currency rate will present from the trader(bank) presepective

Ex. $1=LKR 198:201

Bank will buy $ at 198 & bank will sell $ at 201

1. Importer: need to pay $. Therefore he will sell LKR and buy $ from bank. Then bank will sell $ at 201
2. Exporter: need to convert his $ income into LKR. Therefore, he will sell $ and buy LKR. Then bank will buy $ at LKR 198

1USD =LKR	198	201		199.5
	BUY	SELL		mid
	BID	ASK		
		OFFER		
	Spread is LKR 3 (201-198)			
	Therefore, we can say			
	1$ = 199.5 +or - 1.5			

Bid and offer prices

The **bid price** is the rate at which the bank is willing to ***buy*** the currency.

The **offer** (or **ask**) **price** is the rate at which the bank is willing to ***sell*** the currency.

If an importer has to pay a foreign supplier in a foreign currency, they might ask their bank to sell them the required amount of the currency.

For example, suppose that a bank's customer, a Sri Lankan trading company, has imported goods for which it must now pay $10,000.

(a) In order to pay the bill, the company must obtain (buy) $10,000 from the bank. In other words, the bank will sell $10,000 to the company.

(b) When the bank agrees to sell US$10,000 to the company, it will tell the company what the spot rate of exchange will be for the transaction. If the bank's selling rate (known as the '**offer**', or '**ask**' price) is, say, $0.0057for the currency, the bank will charge the company:

$$\frac{\$10,000}{\$0.0057 \textit{per}\ \text{Rs.}1} = \textit{Rs}\ 1,754,385$$

If a Sri Lankan exporting company receives $10,000 from a customer, the company will want to sell the dollars to obtain Sri Lankan rupees (its home currency). The bank will therefore buy the dollars at a quoted **bid price**. If the bank quotes a **bid** price of, say, $0.0060 for the currency the bank will pay the exporter:

$$\frac{\$10,000}{\$0.0060\ \textit{per}\ \text{Rs.}1} = \textit{Rs}.\ 1,666,667$$

Note that the bank buys the dollars for less than it sells them; in other words it makes a net profit on the transactions. In this case, the net profit is Rs. 87,718.

The rule is that banks buy (currency) low and sell high.

QUESTION — Bid-offer

Calculate how many dollars an exporter would receive or how many dollars an importer would pay, ignoring the bank's commission, in each of the following situations, if they were to exchange currency at the spot rate.

(a) A US exporter receives a payment from a Danish customer of 150,000 kroner.

(b) A US importer buys goods from a Japanese supplier and pays 1 million yen.

Spot rates are as follows.

	Bank sells (offer)		*Bank buys (bid)*
$/Danish Kr	6.7659	–	7.1041
$/Japanese Yen	108.696	–	114.130

ANSWER

(a) The bank is being asked to buy the Danish kroners and will give the exporter:

$$\frac{150{,}000}{7.1041} = \$21{,}114.57 \text{ in exchange}$$

(b) The bank is being asked to sell the yen to the importer and will charge for the currency:

$$\frac{1{,}000{,}000}{108.696} = \$9{,}199.97$$

Spread

The difference between the bid price and the offer price is known as the spread.

One of the easiest ways to find the closing (end of day) exchange rates is to use the financial press.

The difference between the bid price and the offer price, covering dealers' costs and profit, is called the **spread**. The spread can be quoted in different ways.

Rs. 175.44/$. +/- 0.0005 or Rs.174.4395 – 175.4405/$.

QUESTION **Exchange rates**

PTA Inc, a US-based company, is engaged in both import and export activities. During a particular month, PTA sells goods to GH plc, a Sri Lankan company, and receives Rs. 5 million. In the same month, PTA imports goods from a Sri Lankan supplier, which cost Rs. 5 million.

Required

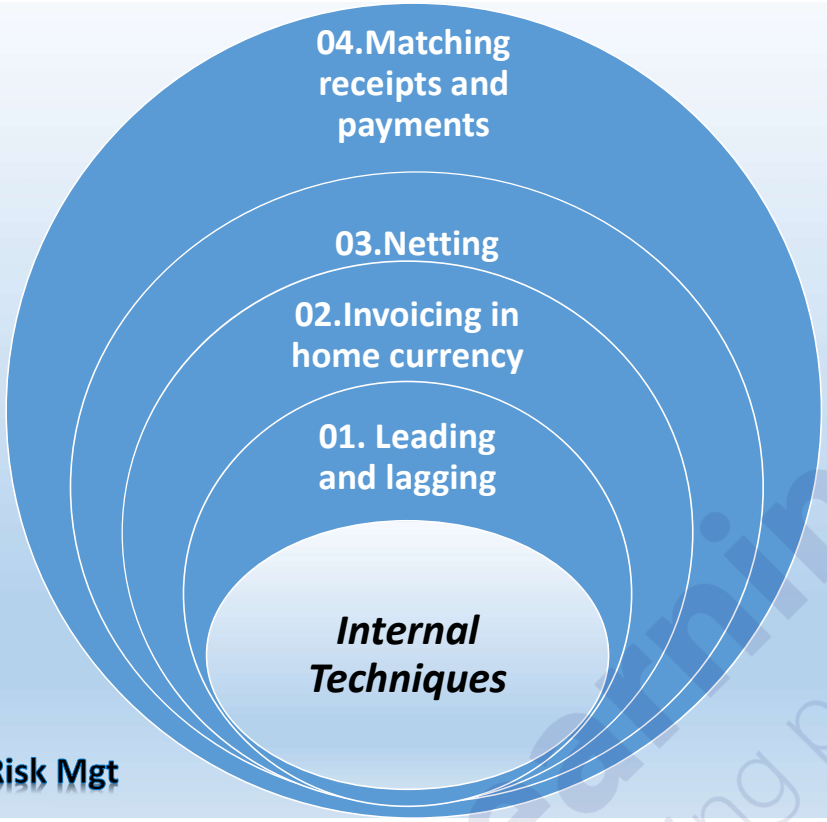
Calculate the dollar values of the Rupee receipt and payment if the exchange rates were Rs. 175.44/$ +/- 1.3.

ANSWER

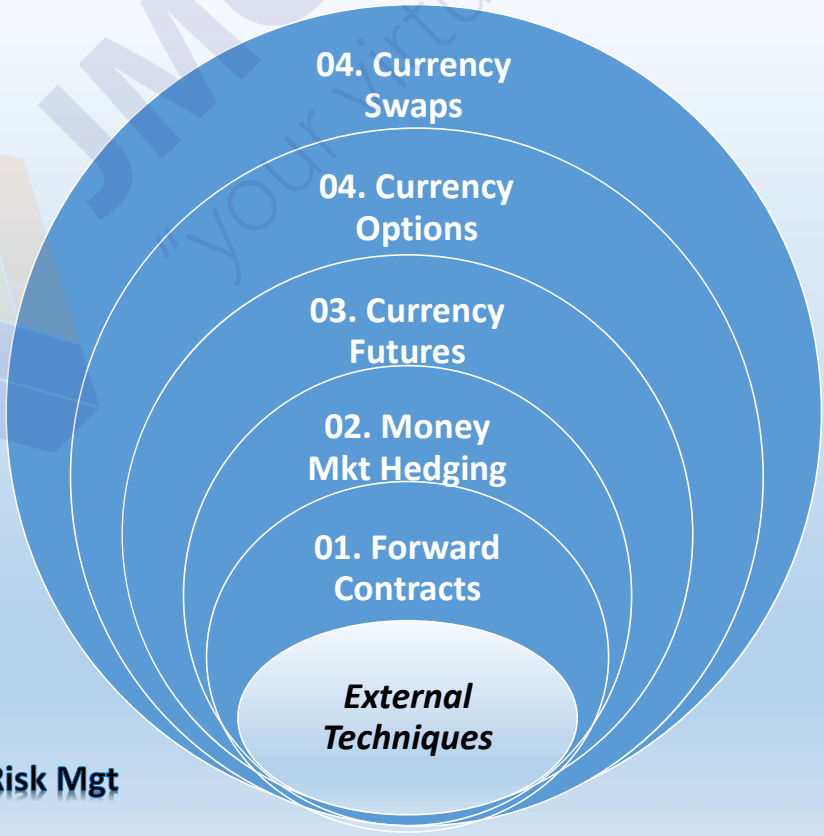
(a) As an exporter, PTA will pay a high rate to buy dollars (sell rupees) – that is, they will be quoted a rate of 175.44 + 1.3 = 176.74. PTA will therefore receive:

Rs. 5 million/174.74 = $28,614.

(b) As an importer, PTA will receive a low rate to sell dollars (buy rupees) – that is, a rate of 175.44 – 1.3 = 174.14. PTA will therefore pay Rs. 5 million/174.14 = $28,713.



Foreign Exchange Risk Mgt



Foreign Exchange Risk Mgt

❑ Leading and lagging

Leading involves **accelerating payments** to avoid potential additional costs due to currency rate movements.
Lagging is the practice of **delaying payments** if currency rate movements are expected to make the later payment cheaper.

W Inc – a company based in the US – imports goods from Sri Lanka. The company is due to make a payment of Rs. 50m to a Sri Lankan supplier in one month's time. The current exchange rate is as follows.

$1 = Rs. 170.44

(a) If the dollar is expected to appreciate against the SL rupee by 2% in the next month and by a further 1% in the second month, what would be W Inc's strategy in terms of leading and lagging, and by how much would the company benefit from this strategy?

(b) If the dollar was to depreciate against the SL rupee by 2% in the next month and by a further 1% in the second month, how would W Inc's strategy probably change and what would the resulting benefit be?

Solution

(a) **Dollar appreciating against the SL rupee**

If the dollar appreciates against the rupee, this means that the dollar value of payments will be smaller in two months' time than if payment was made when due. W Inc will therefore adopt a 'lagging' approach to its payment – that is, it will delay payment by an extra month to reduce the dollar cost.

Payment to SL supplier

	One month's time	*Two months' time*
Exchange rate (Rs./$)	Rs. 170.44 × 1.02 = Rs. 173.85	Rs. 173.85 × 1.01 = Rs. 175.59
$ value of payment	Rs. 50m/173.85 = $287,604	Rs. 50m/175.59 = $284,754

By delaying the payment by an extra month, W Inc will save $2,850.

(b) **Dollar depreciating against the SL rupee**

The opposite strategy should now be adopted. As the dollar depreciates, there is an incentive for W Inc to pay as soon as possible. The dollar value of rupee payments will increase as the dollar depreciates; therefore to save money, the company will want to pay on time.

Payment to SL supplier

	One month's time	*Two months' time*
Exchange rate ($/Rs)	Rs. 170.44 × 0.98 = Rs. 167.03	Rs. 167.03 × 0.99 = Rs. 165.36
$ value of payment	Rs. 50m/167.03 = $299,347	Rs. 50m/165.36 = $302,371

By paying on time, W Inc will save $3,024.

Companies should be aware of the potential **finance costs** associated with paying early and **loss of goodwill** from the supplier which may result in tighter credit terms in the future..

❑ Invoicing in home currency

One way of avoiding transaction risk is for an **exporter** to invoice **overseas customers in its own domestic currency**, or for an **importer** to arrange with its overseas supplier **to be invoiced in its home currency**.

(a) If a Hong Kong exporter is able to quote and invoice an overseas customer in Hong Kong dollars, then the transaction risk is transferred to that customer.
(b) If a Hong Kong importer is able to arrange with its overseas supplier to be invoiced in Hong Kong dollars, then the transaction risk is transferred to that supplier.

Although either the exporter or the importer avoids transaction risk, the other party to the transaction will bear the full risk. Who ultimately bears the risk may depend on bargaining strength or the exporter's competitive position (it is unlikely to insist on payment in its own currency if it faces strong competition).

An alternative method of achieving the same result is to negotiate contracts expressed in the foreign currency but at a pre-determined fixed rate of exchange.

❑ Matching receipts and payments

A company can reduce or eliminate its transaction risk exposure by matching receipts and payments. Wherever possible, a company that expects to make payments and have receipts in the same foreign currency should plan to **offset its payments against its receipts in that currency**. The process of matching is made simpler by having **foreign currency accounts** with a bank.

Offsetting (matching payments against receipts) will be **cheaper** than arranging a forward contract to buy currency and another forward contract to sell the currency, provided that:

- Receipts occur before payments
- The time difference between receipts and payments in the currency is not too long

Any differences between the amounts receivable and the amounts payable in a given currency may be covered by a forward exchange contract (covered later in this chapter) to buy or sell the amount of the difference.

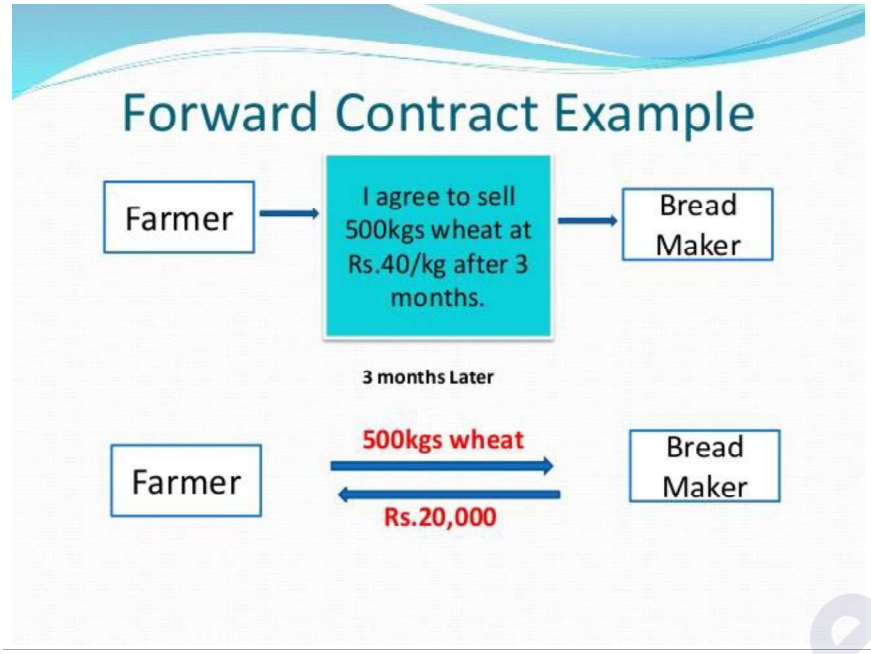
❑ Netting

Netting is a process in which credit balances are netted off against debit balances so that only the reduced net amounts remain due to be paid by actual currency flows.

Unlike matching, netting is not technically a method of managing transaction risk.

The objective is simply to save transactions costs by netting off inter-company balances before arranging payment. Many **multinational groups** of companies engage in **intra-group trading**. Where related companies located in different countries trade with each other, there is likely to be inter-company indebtedness denominated in different currencies.

❑ Forward contracts



What is a forward contract?.....

A **forward exchange contract** is:

(a) An immediately firm and binding contract, e.g. between a bank and its customer, which must be exercised regardless of the spot rate at the time of exercise

(b) For the purchase or sale of a specified quantity of a stated foreign currency

(c) At a rate of exchange fixed at the time the contract is made

(d) For performance (delivery of the currency and payment for it) at a future time which is agreed when making the contract (this future time will be either a specified date, or any time between two specified dates)

Forward contracts hedge against **transaction exposure** by allowing the importer or exporter to arrange for a bank to sell or buy a quantity of foreign currency at an **agreed future date**, at a **rate of exchange determined** when the **forward contract is made**. The trader will know in advance:

- How much local currency they will receive (if they are selling foreign currency to the bank)
- How much local currency they must pay (if they are buying foreign currency from the bank)

The current spot price is irrelevant to the outcome of a forward contract.

Forward rates as adjustments to spot rates	
Forward rate cheaper	Quoted at discount
Forward rate more expensive	Quoted at premium

Quotation of forward rates

In Section 2.4 we discussed the spread of spot rates, being the difference between the bid and offer prices. A similar situation applies to the quotation of forward rates – banks will quote a spread based on the forward bid and offer prices. For example, the €/$ 3-month forward rate might be quoted as:

€1 = $1.3495 - $1.3525 or

€1 = $1.3510 ± 0.0015

As with the spot rate, a company will always be offered the worst rate by the bank.

For example, if the company is selling € (that is, the bank is buying € and paying $) in three months' time, the bank will offer $1.3495. If the company is buying € (that is, the bank is buying $ and paying €) in three months' time, the bank will require $1.3525 for every € it sells.

Example: Forward contracts

It is now 31 March 20X1. Washington Inc, a US company, has purchased goods from AB plc, a Sri Lankan importer and exporter. Washington is due to pay Rs. 5m to AB in three months' time, and wants to hedge the foreign currency payment to reduce transaction risk.

The $/Rs. spot rates on 31 March 20X1 are $1 = Rs. 170.22 – Rs. 170.72.

The 3-month forward rates have been quoted. as $1 = Rs. 168.32 – Rs. 169.10

Calculate the amount in $ that Washington will have to pay if the company hedges the payment using a forward contract.

Solution

Washington will want to buy Rs (sell $) in three months' time, which means that the bank will be selling Rs and buying $. Washington will be offered the 'worst' rate; that is, the bank will pay Rs. 168.32 for each $ received from Washington.

The $ cost of the payment to AB plc will be:

Rs. 5m/168.32 = $29,705

Failure to satisfy a forward contract

A customer might be unable to satisfy a forward contract for any one of a number of reasons.

(a) An **importer** might find that:

(i) Their supplier **fails to deliver the goods** as specified, so the importer will not accept the goods delivered and will not agree to pay for them.

(ii) The **supplier sends fewer goods** than expected, perhaps because of supply shortages, and so the importer has less to pay for.

(iii) The supplier is **late with the delivery**, and so the importer does not have to pay for the goods until later than expected.

(b) An **exporter** might find the same types of situation, but in reverse, so that they do not receive any payment at all, or they receive more or less than originally expected, or they receive the expected amount, but only after some delay.

Close-out of forward contracts

If a customer cannot satisfy a forward exchange contract, the bank will make the customer fulfil the contract.

(a) If the customer has arranged for the bank to buy currency but then cannot deliver the currency for the bank to buy, the bank will:

(i) Sell currency to the customer at the spot rate (when the contract falls due for performance)

(ii) Buy the currency back, under the terms of the forward exchange contract

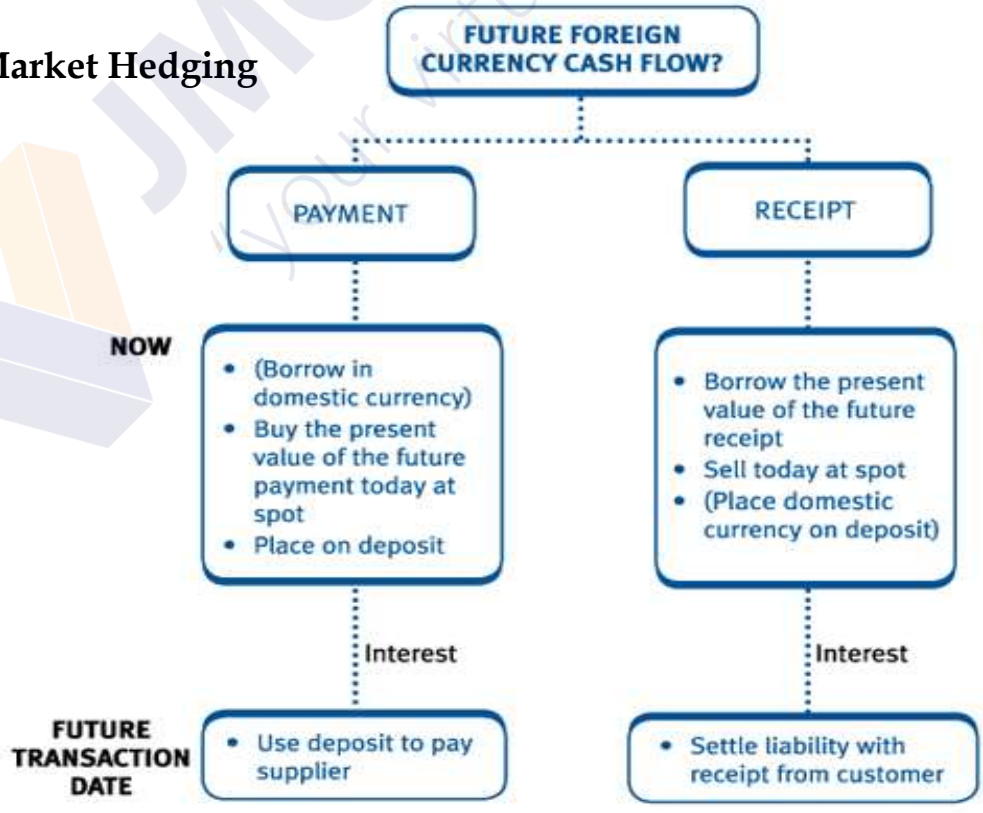
(**b) If the customer has contracted for the bank to sell them currency, the bank will:**

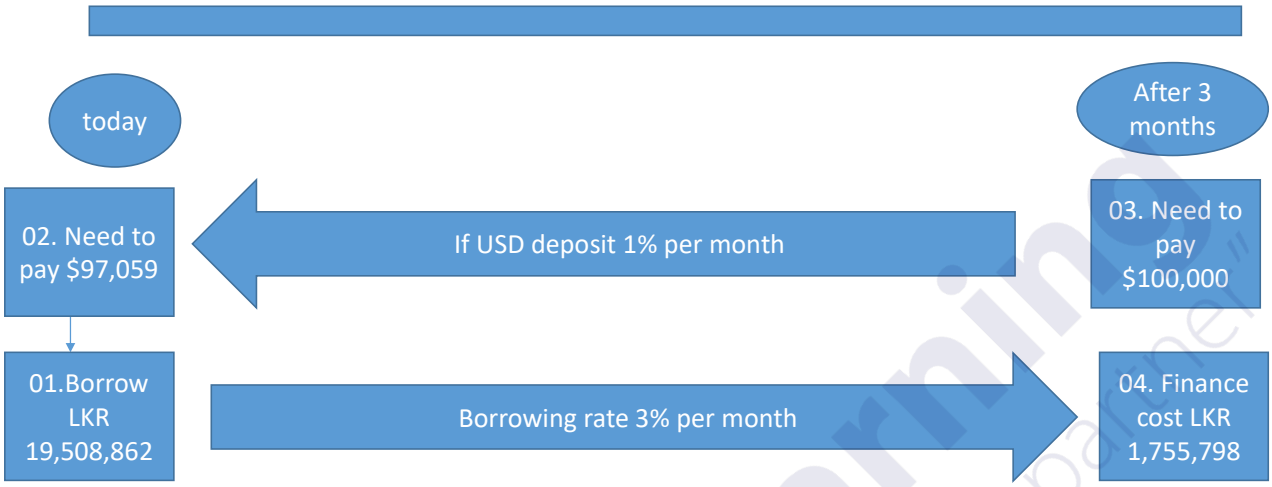
(i) Sell the customer the specified amount of currency at the forward exchange rate

(ii) Buy back the unwanted currency at the spot rate

Thus, the bank arranges for the customer to perform their part of the forward exchange contract by either selling or buying the 'missing' currency at the spot rate. These arrangements are known as **closing out** a forward exchange contract.

❑ Money Market Hedging





Example: Money market hedge (1)

A Sri Lankan company owes a Danish supplier Kr3,500,000 in three months' time.
The spot exchange rate is Rs. 1 = Kr0.0044 – 0.0045. The company can borrow in Rs. for three months at 8.60% per annum, and can deposit kroner for three months at 10% per annum.

Required
Calculate the cost in SL rupees with a money market hedge.

Solution
The interest rates for three months are 2.15% to borrow in rupees and 2.5% to deposit in kroner. The company needs to deposit enough kroner now so that the total including interest will be Kr3,500,000 in three months' time. This means depositing:

Kr3,500,000/(1 + 0.025) = Kr3,414,634.
These kroner will cost Rs. 776,053,181 (spot rate 0.0044 – remember the company will always receive the worst rate). The company must borrow this amount and, with three months' interest of 2.15%, will have to repay:
Rs. 776,053,181 x (1 + 0.0215) = Rs. 792,738,324.

This can be shown in tabular form as follows.

	Importer			
	SL Rs.		Danish Kr	
Now	4	withdraw funds from SL account Kr3,414,634/0.0044 = Rs. 776,053,182	3	put money into Kr account Kr3,500,000/1.025 = Kr3,414,634
		8.6% × 3/12 = 2.15% (ie 1.0215)		10% × 3/12 = 2.5% (i.e. 1.025)
Three months	5	to compare to a forward Rs. 776,053,181 × 1.0215 = Rs. 792,738,325	1 2	pay Kr invoice from supplier 3,500,000 pay off with Kr deposit (3,500,000)

QUESTION — Money market hedge (1)

A Thai company owes a New Zealand company NZ$3,000,000, payable in three months' time. The current exchange rate is NZ$1 = Thai baht 19.0300 – 19.0500. The Thai company elects to use a money market hedge to manage the exchange risk.

The current annual borrowing and investing rates in the two countries are:

	New Zealand	*Thailand*
	%	%
Investing	2.5	4.5
Borrowing	3.0	5.2

Required

Calculate the cost to the Thai company of using a money market hedge.

ANSWER

	Importer			
	Thai Bt		New Zealand $s	
Now	4	withdraw funds from Thai account $2,981,366 × 19.0500 = Bt56,795,022	3	put money into NZ account $3,000,000/1.00625 = $2,981,366
		5.2% × 3/12 = 1.3% (ie 1.013)		2.5% × 3/12 = 0.625 (ie 1.00625)
Three months	5	to compare to a forward Bt56,795,022 × 1.013 = Bt57,533,357	1 2	pay $ invoice from supplier 3,000,000 pay off with $ deposit (3,000,000)

Cost of transaction using money market hedge = Bt57,533,357

Hedging foreign currency receipts

A US company is owed SFr 2,500,000 in three months' time by a Swiss company. The spot exchange rate is $1 = SFr 2.2498 – 2.2510. The company can deposit in dollars for three months at 8.00% per annum and can borrow Swiss francs for three months at 7% per annum. What is the receipt in dollars with a money market hedge and what effective forward rate would this represent?

Solution

	Exporter			
	US $		Swiss Fr	
Now	4	pay SFr loan into US account SFr2,457,002/2.2510 = $1,091,516	3	take out SFr loan SFr2,500,000/1.0175 = SFr2,457,002
		8% × 3/12 = 2% (i.e. 1.02)		7% × 3/12 = 1.75% (ie 1.0175)
Three months	5	to compare to a forward $1,091,516 × 1.02 = $1,113,346	1 2	receive SFr from export 2,500,000 pay off SFr loan with export revenue (2,500,000)

The exporter would receive $1,113,346.

❑ Currency futures

A **currency future** is a standardised contract to buy or sell a fixed amount of currency at a fixed rate at a fixed future date:

 Buying the futures contract means **receiving** the contract currency

 Selling the futures contract means **supplying** the contract currency

Foreign Currency Futures

- A ***foreign currency futures contract*** is an alternative to a forward contract
  - It calls for future delivery of a standard amount of currency at a fixed time and price
  - These contracts are traded on exchanges with the largest being the International Monetary Market located in the Chicago Mercantile Exchange

Features of currency futures

❑ Futures are **standardised** contracts that are traded on an organised exchange such as the Chicago Mercantile Exchange or ICE Futures Europe in London. At the time of writing, the Colombo Stock Exchange does not trade futures.

❑ The fact that they may not be traded in Sri Lanka does not mean, however, they are not available to Sri Lankan businesses for hedging purposes, as we shall see. Futures fix the exchange rate for a set amount of currency for a specified time period.

❑ When entering into a foreign exchange futures contract, no one is actually buying or selling anything – the participants are **agreeing** to buy or sell currencies on pre-agreed terms at a specified future date if the contract is allowed to reach maturity, which it rarely does. Futures are a **derivative** (their value derives from movements in the spot rate).

❑ Futures are generally **more liquid** and have **less credit risk** than forward contracts, as organised exchanges have clearing houses that guarantee that all traders in the futures market will honour their obligations.

Currency Futures contracts are assumed to mature at the end of March, June, September or December.

"Ticks"

The price of a currency future moves in '**ticks**'. A tick is the **smallest movement in the exchange rate** and is normally four decimal places.

Tick value = size of futures contract x **tick size**

For example, if a futures contract is for £62,500 and the tick size is $0.0001, the tick value is $6.25. (Note that the tick size and tick value are **always quoted in US dollars**.)

What this means is that for every $0.0001 movement in the price, the company will make a profit or loss of $6.25. If the exchange rate moves by $0.004 in the company's favour – which is 40 ticks (0.004/0.0001) – the profit made will be 40 x $6.25 = $250 per contract.

.

Examples of futures contract specifications – including tick size and tick value – are given below

Currency	Contract size	Price quotation	Tick size	Tick value per contract
British pound	£62,500	US$/£1	$0.0001	$6.25
Canadian dollar	C$100,000	US$/C$1	$0.0001	$10.00
Euro	€125,000	US$/€1	$0.0001	$12.50
Japanese yen	¥12,500,000	US$/¥100	$0.000001	$12.50
Swiss franc	SFr125,000	US$/SFr1	$0.0001	$12.50
Australian dollar	A$100,000	US$/A$1	$0.0001	$12.50

Basis risk

Basis risk is the risk that the price of a currency future will vary from the price of the underlying asset (the spot rate).

Basis is the **difference** between the **spot rate** and the **futures price**.

Basis risk is the risk that the price of a futures contract will vary from the spot rate as expiry of the contract approaches. It is assumed that the **difference** between the spot rate and futures price (the 'basis') **falls over time** but there is a risk that basis will not decrease in this predictable way (which will create an imperfect hedge). There is no basis risk when a contract is held to maturity.

In order to **manage** basis risk, it is important to choose a currency future with the **closest maturity date** to the actual transaction. This reduces the **unexpired basis** when the transaction is closed out.

Hedge efficiency

Hedgers who need to buy or sell the underlying currency or commodity do not use the margin to trade more than they otherwise would. They can use the futures markets quite safely, provided they understand how the system operates.

The only risk to hedgers is that the futures market does not always provide a perfect hedge. This can result from two causes.

(a) The first reason is that amounts must be **rounded to a whole number of contracts**, causing inaccuracies.

(b) The second reason is **basis risk –** as discussed above. The actions of speculators may increase basis risk.

A measure of **hedge efficiency** compares the profit made on the futures market with the loss made on the cash or commodity market, or vice versa.

Example: Hedge efficiency

You are given the following details about the results of a hedge by an American company for a payment of SFr 650,000 in 30 days' time under two scenarios. In each case, compute the hedge efficiency. Assume today's spot rate is SFr1 = $1.03

The price quoted on the futures market for contracts expiring in two months time is $1.0162. Contract size is SFr125,000, and tick size is $12.50.

Number of contracts = 650,000/125,000 = 5.2, round to 5.

	Scenario 1		*Scenario 2*	
Futures hedge (5 contracts)	$/SFr	$	$/SFr	$
Today: buy 5 at	1.0162		1.0162	
In 30 days: sell 5 at	1.0467		1.0047	
Gain/(loss) per contract in ticks	305		(115)	
Total gain/(loss) on 5 contracts: 5 × $12.50 × no. of ticks		19,063		(7,187)
Cash transaction				
In 30 days: SFr 650,000 are actually bought at	1.0609	(689,585)	1.0177	(661,505)
Net cost of the Swiss francs		(670,522)		(668,692)

Solutions

The futures hedge gives slightly more or less than the target payment of $669,500 (SFr 650,000 × 1.03) because of hedge inefficiency. To compute the hedge efficiency in each case, compute gain/loss as a percentage. In scenario 1 the gain comes from the futures market. In scenario 2 the gain comes from the cash market.

Hedge efficiency

	$	$
Target payment (650,000 × 1.03)	669,500	669,500
Actual cash payment	689,585	661,505
Gain/(loss) on spot market	(20,085)	7,995
Futures gain/(loss)	19,063	(7,187)
Hedge efficiency	94.9%	111.2%

The hedge efficiency can be further analysed as follows.

In scenario 1, the futures market gave a gain of 305 ticks on 5 contracts. The spot market price lost 309 ticks on the equivalent of 5.2 contracts.

$$\text{Hedge efficiency} = \frac{305 \times 5}{309 \times 5.2} = 94.9\%$$

In scenario 2, the spot market gained 123 ticks on 5.2 contracts. The futures price lost 115 ticks on 5 contracts.

$$\text{Hedge efficiency} = \frac{123 \times 5.2}{115 \times 5} = 111.2\%$$

An alternative measure of the hedge efficiency on the futures market might be its success measured against the **results of using a forward contract**.

Margins and marking to market

There are two types of margin – **initial margin** and **variation margin**.

An **initial margin** is similar to a deposit. When a currency future is set up, the trader would be required to deposit some cash (the initial margin) with the futures exchange in a **margin account** – this acts as security against the trader defaulting on their trading obligations. This money will remain in the margin account as long as the currency future remains 'open'.

We mentioned above the process of calculating the profit or loss on a contract when there is movement in the exchange rate. This profit or loss is received into or paid from the margin account on a daily basis rather than in one large amount when the contract matures. This procedure is known as **marking to market**.

The futures exchange monitors the margin account on a daily basis. If the trader is making significant losses, the futures exchange may require additional margin payments known as **variation margins**. This practice creates uncertainty, as the trader will not know in advance the extent (if any) of such margin payments.

Which type of contract?

As mentioned above, one of the limitations of currency futures is that currencies can only be bought or sold on exchanges for US dollars. The basic rules for choosing the type of contract are given below.

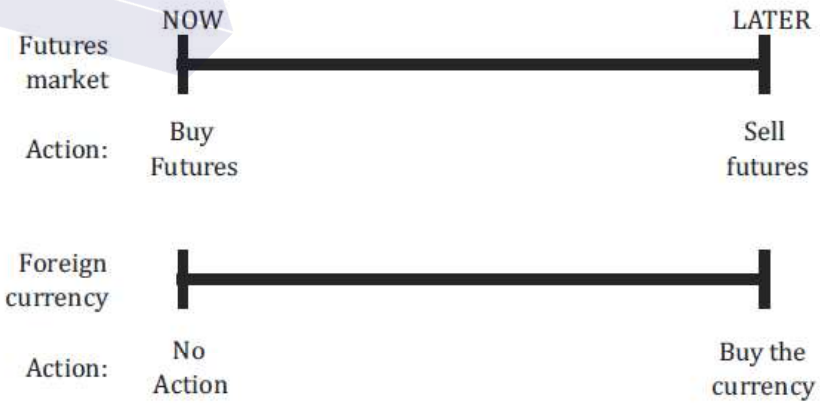
- ❑ **Making a payment in a foreign currency (not US$)**
- ❑ **Receiving foreign currency on a future date**
- ❑ **Non-American wishing to pay in US$ on a future date**
- ❑ **Non-American receiving US$ on a future date**

❑ **Making a payment in a foreign currency (not US$)**

If you are going to make a payment in a foreign currency (not US$) on a future date, you will have to **buy** that currency. To hedge, take the following action.

Step 1 **Buy** the appropriate **foreign currency futures** contracts **now** (just as you would with a forward contract).

Step 2 **Sell** the same number of **foreign currency futures** contracts on the date that you buy the actual currency (closing out).



❑ **Receiving foreign currency on a future date**

If you are going to receive money in a foreign currency on a future date, you will need to sell that currency. To hedge this position, take the following steps.

Step 1 **Sell** the appropriate **foreign currency futures** contracts **now**

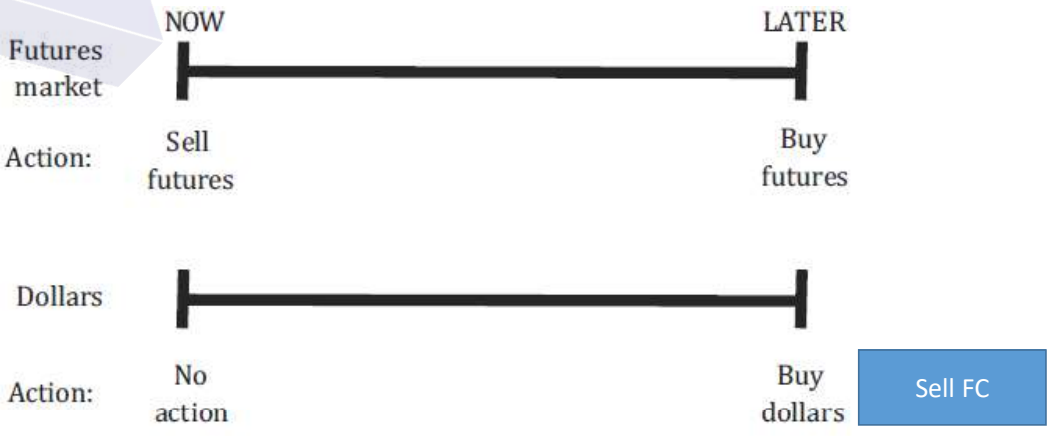
Step 2 **Buy** the same number of **foreign currency futures** contracts on the date that you sell the actual currency

❑ **Non-American wishing to pay in US$ on a future date**

If you are from a country outside the US and are going to make a future payment in US$, you will need to buy US$. To hedge, you cannot buy US$ futures, so you will have to sell your own currency's futures.

Step 1 Sell your home currency futures contracts now

Step 2 Buy the same number of home currency futures contracts on the date that you buy the US$



❑ **Non-American receiving US$ on a future date**

If you are from a country outside the US and are going to receive US$ on a future date, you will need to sell US$. To hedge, you cannot sell US$ futures, so you will have to buy your own currency's futures.

Step 1 Buy your home currency futures contracts now

Step 2 Sell the same number of home currency futures contracts on the date that you sell the US$

Dealing with a futures question

A number of possible stages are involved.

Step 1 **The setup process**

This may involve the following steps.

(a) **Choose which contract**

You must choose an expiry date after the underlying exposure.

(b) **Choose type of contract**

A company **owing €** will wish to buy this currency, so will **buy € futures**.

For example, a UK company receiving $ will wish to sell $ which is the same as buying £. As the contract is quoted in £ the company will **buy £ futures**.

(c) **Choose number of contracts**

To find the number of contracts required, we divide the amount being hedged by the size of the contract.

We may also have to calculate how much of the currency of the future is required. To find this, we use today's price for the futures contract and then divide by the size of the futures contract.

Step 2 **Estimate the closing futures price**

You should be given this in the question.

Step 3 **Hedge outcome**

(a) **Calculate futures market outcome**

This will be:

Movement in rate × Value of one contract × Number of contracts

(b) **Calculate net outcome**

Spot market payment or receipt translated at closing rate + Futures market profit/(loss)

The currency used for this calculation will be the opposite to the currency of the receipt/payment being hedged. Ultimately therefore, unless a dollar receipt or payment is being hedged, the value of the futures profit or loss will also have to be converted using the **closing spot rate**.

The gain or loss on the future will accrue during the contract. For exam purposes, you will take this gain or loss when the contract is terminated.

Example: Hedging

A US company buys goods worth €720,000 from a German company, payable in 30 days. The US company wants to hedge against the € strengthening against the dollar.

Current spot is €1 = $0.9215 – 0.9221 and the futures rate is 0.9245.

The standard size of a three-month € futures contract is €125,000.

In 30 days' time, the spot is €1 = 0.9345 – 0.9351. Closing futures price will be 0.9367.

Required

Evaluate the hedge.

Entity wants to buy Euro in one month and sell Futures in one month. Therefore, entity will buy futures today. $

Buy@ (0.9245)

Sell @ 0.9367

Gain 0. 0122 x 125000 x 6 = $ 9150

Actual payment in 30 days: 720000x0.9351 = ($673272)

Net Payment = $ 664,122

Solution

Step 1 **Setup**

(a) **Which contract?**

We assume that the three-month contract is the best available.

(b) **Type of contract**

We need to buy € or sell $. As the futures contract is in €, we need to buy futures.

(c) **Number of contracts**

$\frac{720,000}{125,000}$ = 5.76, say 6 contracts

Step 2 **Closing futures price**

We're told it will be 0.9367.

Step 3 **Hedge outcome**

(a) **Outcome in futures market**

Opening futures price	0.9245	Buy at low price
Closing futures price	0.9367	Sell at high price
Movement	0.0122	Profit

Futures profit/loss = 0.0122 × $125,000 × 6 contracts = $9,150

(b) **Net outcome**

	$
Spot market payment (720,000 × 0.9351)	673,272
Futures market profit	(9,150)
	664,122

In this instance, the risk feared was the risk that the payment would go up in $ terms, as you needed more $ to buy each € that you needed to pay the European supplier.

The risk has materialised, as in the end you need to pay $0.9351 to buy each € rather than $0.9221.

Buying the € futures has mitigated this loss because at the end you can sell them for more than you paid, as € have become more valuable.

You should remember the following table to help you with exam questions on futures.

Transaction on future date		Now		On future date	
Receive	currency	Sell	currency futures	Buy	currency futures
Pay	currency	Buy	currency futures	Sell	currency futures
Receive	$	Buy	currency futures	Sell	currency futures
Pay	$	Sell	currency futures	Buy	currency futures

Choosing between forward contracts and futures contracts

Although a foreign exchange **futures** contract is conceptually similar to a **forward** foreign exchange contract, there are important differences between the two instruments.

A futures market hedge attempts to achieve the same result as a forward contract, that is to fix the exchange rate in advance for a future foreign currency payment or receipt. As we have seen, hedge inefficiencies mean that a futures contract can only fix the exchange rate subject to a margin of error.

Forward contracts are agreed **'over the counter'** between a bank and its customer. Futures contracts are standardised and traded on futures exchanges.

Advantages of currency futures

- **Transaction** costs should be **lower** than for forward contracts.
- The **exact date** of **receipt** or **payment** of the currency does **not have to be known**, because the futures contract does not have to be closed out until the actual cash receipt or payment is made.
- Because future contracts are traded on exchange regulated markets, **counterparty risk** should be **reduced**, and buying and selling contracts should be easy.

Disadvantages of currency futures

- The **contracts cannot be tailored** to the user's exact requirements.
- **Hedge inefficiencies** are **caused** by having to deal in a whole number of contracts and by **basis risk**.
- **Only a limited number of currencies** are the subject of futures contracts (although the number of currencies is growing, especially with the rapid development of Asian economies).
- The **procedure for converting** between two currencies neither of which is the US dollar is twice as complex for futures as for a forward contract.
- Using the market will involve various **costs**, including brokers' fees.

In general, the disadvantages of futures mean that the market is much smaller than the currency forward market.

QUESTION — Futures

AB plc, a company based in the UK, imports and exports to the US. On 1 May it signs three agreements, all of which are to be settled on 31 October:

(a) A sale to a US customer of goods for $205,500
(b) A sale to another US customer for £550,000
(c) A purchase from a US supplier for $875,000

On 1 June the spot rate is £1 = 1.5500 – 1.5520 $ and the October forward rate is at a premium of 4.00 – 3.95 cents per pound. Sterling futures contracts are trading at the following prices:

Sterling futures (IMM) Contract size £62,500

Contract settlement date	*Contract price $ per £1*
Jun	1.5370
Sep	1.5180
Dec	1.4970

Tick size is $6.25.

Required

(a) **Calculate** the net amount receivable or payable in pounds if the transactions are covered on the forward market.

(b) **Demonstrate** how a futures hedge could be set up, and calculate the result of the futures hedge if, by 31 October, the spot market price for dollars has moved to 1.5800 – 1.5820 and the sterling futures price has moved to 1.5650.

ANSWER

(a) Before covering any transactions with forward or futures contracts, match receipts against payments. The sterling receipt does not need to be hedged. The dollar receipt can be matched against the payment giving a net payment of $669,500 on 31 October.

The appropriate spot rate for buying dollars on 1 May (bank sells low) is 1.5500. The forward rate for October is **spot – premium** = 1.5500 – 0.0400 = 1.5100.

Using a forward contract, the sterling cost of the dollar payment will be 669,500/1.5100 = £443,377. The net cash received on October 31 will therefore be £550,000 – 443,377 = £106,623.

(b) **Step 1** **Setup**

(a) **Which contract?**

December contracts

(b) **Type of contract**

Sell sterling futures in May; we sell the sterling to buy the $ we need.

(c) **Number of contracts**

Here we need to convert the dollar payment to £, as contracts are in £.

Using December futures price

$$\frac{669{,}500}{1.4970} = £447{,}228$$

$$\text{No of contracts} = \frac{£447{,}228}{62{,}500} = 7.16 \text{ contracts (round to 7)}$$

Step 2 **Closing futures price**

1.5650 (given in question)

Step 3 Result of futures market

(a) **Futures market outcome**

	$	
Opening futures price	1.4970	Sell
Closing futures price	1.5650	Buy
Movement	0.0680	Loss

Futures market loss = $0.0680 \times 62{,}500 \times 7 = \$29{,}750$

(b) Net outcome

	$
Spot market payment	(669,500)
Futures market loss	(29,750)
	(699,250)
Translated at closing spot rate	1.5800
The bank sells low hence we use the rate of 1.5800	£442,563

❑ Currency options

Currency options protect against adverse exchange rate movements while allowing the investor to take advantage of favourable exchange rate movements.

They are particularly useful in situations where the cash flow is not certain to occur (e.g. when tendering for overseas contracts).

Types of option – over-the-counter and exchange-traded

Companies can choose whether to buy either of the following.

(a) A tailor-made currency option from a bank, suited to the company's specific needs. These are **over-the-counter** (OTC) or **negotiated** options.

(b) A standard option, in certain currencies only, from an options exchange. Such options are **traded** or **exchange-traded** options.

Introduction

- A **currency option** is an agreement involving a right, but not an obligation, to buy or sell a certain amount of currency at a stated rate of exchange (the exercise price) at some time in the future.
- A forward exchange contract is an agreement to buy or sell a given quantity of foreign exchange, which **must be carried out** because it is a binding contract. However, some exporters might be uncertain about the amount of currency they will earn in several months' time.
- An alternative method of obtaining foreign exchange cover, which overcomes much of this problem, is the **currency option**. A currency option **does not have to be exercised**. Instead, when the date for exercising the option arrives, the importer or exporter can either exercise the option or let the option lapse.
- The exercise price for the option may be the same as the current spot rate, or it may be more favourable or less favourable to the option holder than the current spot rate.

As with other types of option, buying a currency option involves **paying a premium**, which is the most the buyer of the option can lose. The level of option premiums depends on the following factors:

- The exercise price
- The maturity of the option
- The volatility of exchange and interest rates
- Interest rate differentials, affecting how much banks charge

Basic terminology
as this will help you to interpret questions and make decisions regarding different types of options.

Call option – the right to buy (the contract currency)
Put option – the right to sell (the contract currency)

A **call option** gives the **buyer** of the option the **right to buy** the underlying currency at a **fixed rate of exchange** (and the **seller** of the option would be **required to sell** the underlying currency at that rate).
A **put option** gives the **buyer** of the option the **right to sell** the underlying currency at a **fixed rate of exchange** (and the **seller** of the option would be **required to buy** the underlying currency at that rate).

Exercise price – the price at which the future transaction will take place.
The exercise price is also known as the **strike price**. It is the price with which the prevailing spot rate should be compared in order to determine whether the option should be exercised or not.

In the money – where the option strike price is more favourable than the current spot rate.
At the money – where the option strike price is equal to the current spot rate.
Out of the money – where the option strike price is less favourable than the current spot rate.
For example, if a German company holds a call option to purchase Rs. with a strike price of €0.005 and the current spot rate is €0.004, the option is '**out of the money**', as the current spot rate is more favourable than the option strike price.
A **European option** can only be exercised at the date of expiry.
An **American option** can be exercised at any date up to and including the date of expiry.

Over-the-counter (OTC) options

Over-the-counter (OTC) options can be purchased directly and are normally **fixed date** (European) options.

Example: Options
It is now 1 March. R Inc, a US firm, anticipates that it may receive €6m from the sale of a European investment in June. It wishes to hedge this potential receipt using options. The current spot rate is $1 = €0.7106. June options with a value of €6m and an exercise price of €0.7200 can be purchased for a premium of $150,000.

Required
Calculate the outcome of the hedge in each of the following scenarios.
(a) The spot exchange rate in June is €0.6500
(b) The spot exchange rate in June is €0.7500
(c) The sale of the investment does not take place

Solutions

(a) The spot rate is better than the option rate, therefore the spot rate is used.
This will give a value of $9,230,769 or $9,080,769 after the premium (which is paid up front).

(b) The option rate is better than the spot rate, therefore the option will be exercised. This will give a value of $8,333,333 (or $8,183,333 after the premium).

(c) If the sale of the investment is abandoned, then the option is no longer necessary. It will be abandoned (as in (a) above). There is no point in exercising the option, as it would cost $8,443,568 to purchase the euros but R Inc would only receive $8,333,333 at the option price (before taking the premium into account). The cost to the company of abandoning the option will be the premium of $150,000.

Exchange-traded options

A company wishing to purchase an option to buy or sell sterling might use currency options traded on such US markets as the Nasdaq PHLX Exchange. The schedule of prices for £/$ options is set out in tables such as the one shown below.

Philadelphia SE £/$ options £31,250 (cents per pound)

	Calls			*Puts*		
Strike price	*Aug*	*Sep*	*Oct*	*Aug*	*Sep*	*Oct*
1.5750	2.58	3.13	–	–	0.67	–
1.5800	2.14	2.77	3.24	–	0.81	1.32
1.5900	1.23	2.17	2.64	0.05	1.06	1.71
1.6000	0.50	1.61	2.16	0.32	1.50	2.18
1.6100	0.15	1.16	1.71	0.93	2.05	2.69
1.6200	–	0.81	1.33	1.79	2.65	3.30

Note the following points.

(a) *What is the contract size?*

The contract size is £31,250.

(b) *What is the meaning of the numbers under each month?*

This is the cost in cents per £ (remember that the market is in the US) – for example, September call at a strike price of $1.6100 will cost $0.0116 × £31,250 = $362.50.

(c) *What is a put US$ per £ option?*

This is the option to sell £ (e.g. UK importer having to sell £ to obtain $ to pay a US supplier so used if need to buy $)).

(d) *Why is an August call at $1.5800 more expensive than an August call at $1.5900?*

$1.5800 is a better rate than $1.5900, therefore to secure such a rate will be more expensive.

(e) *Why is a call option exercisable in September more expensive than a call option exercisable in August but with the same strike price?*

This is because there is a longer period until the exercise date and it is therefore more likely that exercising the option will be beneficial. The difference also reflects the market's view of the direction in which the exchange rate is likely to move between the two dates.

Traded vs over-the-counter options

Both types of options have advantages over the other – the choice of option will depend on particular requirements.

|

Advantages of traded options

(a) Traded options are standard sizes and are thus 'tradable', which means they can be sold on to other parties if not required. OTC options are designed for a specific purpose and are therefore unlikely to be suitable for another party.

(b) Traded options are more flexible, in that they cover a period of time (American options), whereas OTC options are fixed date (European options).

Advantages of OTC options

a) OTC options can be agreed for a longer period than the standard two-year maximum offered by traded options. This gives greater flexibility and protection from currency movements in the longer term, should the transaction require it.

b) OTC options are tailored specifically for a particular transaction, ensuring maximum protection from currency movements. As traded options are of a standard size, the full amount of the transaction may not be hedged, as fractions of options are not available.

Choosing the correct type of option

The vast majority of options examples which we consider are concerned with **hedgers** who **purchase** options in order to reduce risk. We are seldom concerned with option writers who sell options.

So, given that we are normally going to **purchase** options, should we **purchase puts or calls**?

- A **US company receiving £** in the future and hence wishing to **sell £** in the future can hedge by **purchasing £ put options** (i.e. options to sell £).
- A **US company paying £** in the future and hence wishing to **buy £** in the future can hedge by **purchasing £ call options** (ie options to buy £).
- A **UK company receiving $** in the future and hence wishing to **sell $** in the future cannot hedge by purchasing $ put options as they do not exist. They therefore have to **purchase £ call options**.
- A **UK company paying $** in the future and hence wishing to **buy $** in the future cannot hedge by purchasing $ call options as they do not exist. They therefore have to **purchase £ put options**.

Option calculation technique

If an options calculation appears to be complicated, it is best to use a similar method to the method we used for futures to assess the impact of options.

Step 1 **Set up the hedge**

(a) Choose the contract date
(b) Decide whether put or call option is required
(c) Decide which exercise or strike price applies
(d) How many contracts are required
(e) Calculate premium (Price in table x 0.01) x Size of contract x Number of contracts

Step 2 **Ascertain closing price**

You should be given this in the question.

Step 3 **Calculate outcome of hedge**

You may have to calculate the outcome under more than one closing spot rate.
(a) Outcome in options market. This will include:
(i) Exercising the option
(ii) Cash flows on exercise
(iii) Converting amount uncovered/overcovered at spot rate

(b) Net outcome

Example: Hedging using traded currency options

A UK company owes a US supplier $2,000,000 payable in July. The spot rate is £1 = $1.5350–1.5370 and the UK company is concerned that the $ might strengthen.

The details for $/£ £31,250 options (cents per £1) are as follows.

Premium cost per contract:

	Calls			Puts		
Strike price	June	July	August	June	July	August
1.4750	6.34	6.37	6.54	0.07	0.19	0.50
1.5000	3.86	4.22	4.59	0.08	0.53	1.03
1.5250	1.58	2.50	2.97	0.18	1.25	1.89

Show how traded currency options can be used to hedge the risk at a strike price of 1.525. Calculate the sterling cost of the transaction if the spot rate in July is:

(a) 1.46–1.4620
(b) 1.61–1.6120

Solutions

Step 1 **Set up the hedge**

(a) Which date contract? July

(b) Put or call? Put, we need to put (sell) pounds in order to generate the dollars we need.

(c) Which strike price? 1.5250

(d) How many contracts

$$\frac{2{,}000{,}000 \div 1.525}{31{,}250} = 41.97, \text{ say } 42 \text{ contracts}$$

(e) Use July put figure for 1.5250 of 1.25. Remember it has to be multiplied by 0.01.

Premium = (1.25 × 0.01) × Contract size × Number of contracts

Premium = 0.0125 × 31,250 × 42

= $16,406 ÷ 1.5350 (to obtain premium in £)

= £10,688

We need to pay the option premium in $ now. Therefore the bank sells low at 1.5350.

Step 2 **Closing spot and futures price**

Case (a) $1.46

Case (b) $1.61

Step 3 **Outcome**

(a) **Options market outcome**

Strike price put	1.5250	1.5250
Closing price	1.46	1.61
Exercise?	Yes	No
Outcome of options position (31,250 × 42)	£1,312,500	–

Balance on spot market

	$
Exercise option (31,250 × 42 × 1.5250)	2,001,563
Value of transaction	2,000,000
Balance	1,563

Translated at spot rate $\frac{1,563}{1.46}$ = £1,071

(b) **Net outcome**

	£	£
Spot market outcome translated at closing spot rate $\frac{2,000,000}{1.61}$	–	(1,242,236)
Options position	(1,312,500)	–
Difference in hedge at closing rate	1,071	
The difference is a receipt as the amount owed was over-hedged		
Premium (remember premium has to be added in separately as translated at the opening spot rate)	(10,688)	(10,688)
	(1,322,117)	(1,252,924)

QUESTION — Currency options (1)

ET Co is a UK company that has purchased goods worth $2,000,000 from an American supplier. ET Co is due to make payment in three months' time. ET Co's treasury department is looking to hedge the risk using an over-the-counter option. A three-month dollar call option has a price of 1.4800.

Required

Ignoring premium costs, **calculate** the cost to ET Co if the exchange rate at the time of payment is:

(a) £1 = $1.4600
(b) £1 = $1.5000

ANSWER

As the option is an over-the-counter option, it is possible to have a dollar call option and to cover the exact amount.

(a) If the exchange rate is 1.4600, the option will be exercised and the cost will be:

$$\frac{2{,}000{,}000}{1.4800} = £1{,}351{,}351$$

(b) If the exchange rate is 1.5000, the option will not be exercised, and the cost will be:

$$\frac{2{,}000{,}000}{1.5000} = £1{,}333{,}333$$

QUESTION — Currency options (2)

Vinnick, an American company, purchases goods from Santos, a Spanish company, on 15 May on three months' credit for €600,000.

Vinnick is unsure in which direction exchange rates will move, so has decided to buy options to hedge the contract at a rate of $1 = €0.7700.

The details for €10,000 options at 0.7700 are as follows.

Calls			Puts		
July	August	September	July	August	September
2.55	3.57	4.01	1.25	2.31	2.90

The current spot rate is 0.7800.

Required

Calculate the dollar cost of the transaction if the spot rate in August is:

(a) 0.7500
(b) 0.8000

ANSWER

Step 1 **Set up the hedge**

(a) Which contract date? August

(b) Put or call? Call – we need to buy euros.

(c) Which strike price? 0.7700

(d) How many contracts?

$$\frac{600{,}000}{10{,}000} = 60$$

(e) Use August call figure of 3.57. Remember it has to be multiplied by 0.01.

Premium = (3.57 × 0.01) × Contract size × Number of contracts

Premium = 0.0357 × 10,000 × 60 = $21,420

Step 2 **Closing spot and futures prices**

Case (a) 0.75

Case (b) 0.80

Step 3 **Outcome**

(a) **Options market outcome**

Strike price call	0.77	0.77
Closing price	0.75	0.80
Exercise?	Yes	No
Outcome of options position	€600,000	-

(b) **Net outcome**

	$	$
Spot market outcome translated at closing spot rate (600,000/0.80)	-	(750,000)
Options position (600,000/0.77)	(779,221)	-
Premium	(21,420)	(21,420)
	(800,641)	(771,420)

The following table will be helpful to remember when answering exam questions on currency options.

Transaction on future date		Now		Option on future date	
Receive	currency	Buy	currency put	Sell	currency
Pay	currency	Buy	currency call	Buy	currency
Receive	$	Buy	currency call	Buy	currency
Pay	$	Buy	currency put	Sell	currency

Note that this table only applies to **traded** options. It would be possible to purchase a dollar put or call option over the counter.

Currency options vs forward and futures contracts

A hedge using a currency **future** will produce approximately the same result as a currency **forward** (subject to hedge inefficiencies). When comparing currency options with forward and futures contracts, we usually find the following.

(a) If the **currency movement is adverse**, the option will be exercised. However, the hedge will **not normally be as good** as that of forward or futures contracts – this is due to the premium cost of the option.

(b) If the **currency movement is favourable**, the option will not be exercised. The hedge will **normally be better** than that of forward or futures contracts, as the option allows the holder to profit from the improved exchange rate.

❑ Currency swaps

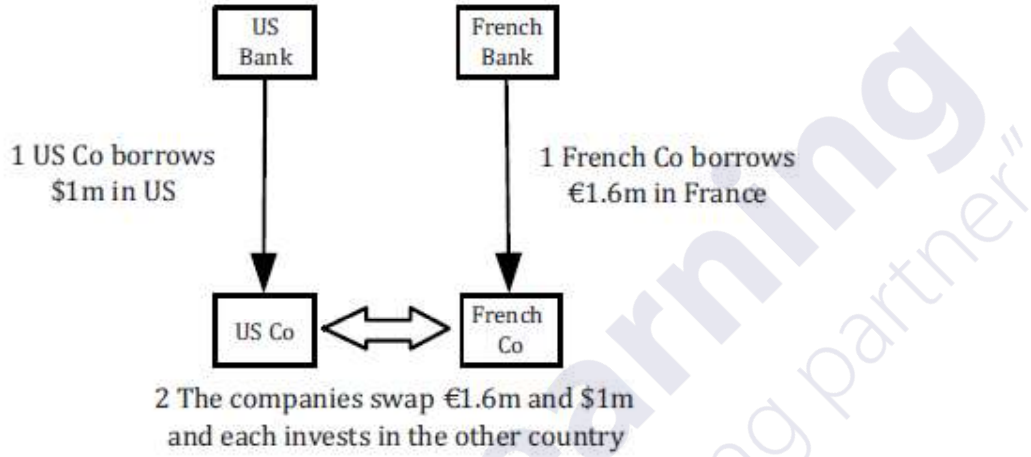
Currency swaps effectively involve the exchange of debt from one currency to another. Currency swaps can provide a **hedge** against exchange rate movements for longer periods than the forward market and can be a means of obtaining finance from new countries.

Swap procedures

- A **swap** is an arrangement whereby two organisations contractually agree to exchange payments on different terms, for example in different currencies, or one at a fixed rate and the other at a floating rate.
- In a **currency swap**, the parties agree to swap equivalent amounts of currency for a period. This effectively involves the exchange of debt from one currency to another. Liability on the main debt (the principal) is not transferred and the parties are liable to **counterparty risk**: if the other party defaults on the agreement to pay interest, the original borrower remains liable to the lender.
- In practice, most currency swaps are conducted between banks and their customers.
- An agreement may only be necessary if the swap were for longer than, say, one year.

Example: Swapping currencies

Consider a US company X with a subsidiary Y in France which owns vineyards. Assume a spot rate of $1 = €0.7062. Suppose the parent company X wishes to raise a loan of €1.6 million for the purpose of buying another French wine company. At the same time, the French subsidiary Y wishes to raise $1 million to pay for new up-to-date capital equipment imported from the US. The US parent company X could borrow the $1 million and the French subsidiary Y could borrow the €1.6 million, each effectively borrowing on the other's behalf. They would then swap currencies.



Benefits of swaps

(a) **Flexibility**

Swaps are **easy to arrange** and are **flexible**, since they can be arranged in any size and are reversible.

(b) **Cost**

Transaction costs are low, only amounting to legal fees, since there is no commission or premium to be paid.

(c) **Market avoidance**

The parties can **obtain the currency they require** without subjecting themselves to the **uncertainties** of the foreign exchange markets.

(d) **Access to finance**

The company can gain **access to debt finance in another country** and currency where it is little known, and consequently has a poorer credit rating, than in its home country. It can therefore take advantage of lower interest rates than it could obtain if it arranged the currency loan itself.

(e) **Financial restructuring**

Currency swaps may be used to **restructure the currency base** of the company's liabilities. This may be important where the company is trading overseas and receiving revenues in foreign currencies, but its borrowings are denominated in the currency of its home country. Currency swaps therefore provide a means of reducing exchange rate exposure.

(f) **Conversion of debt type**

At the same time as exchanging currency, the company may also be able to **convert fixed rate debt** to **floating rate or vice versa**. Thus it may obtain some of the benefits of an interest rate swap in addition to achieving the other purposes of a currency swap.

(g) **Liquidity improvement**

A currency swap could be used to **absorb excess liquidity** in one currency which is not needed immediately, to create funds in another where there is a need.

Disadvantages of swaps

(a) **Risk of default by the other party to the swap (counterparty risk)**
If one party became **unable to meet its swap payment obligations**, this could mean that the other party risked having to make them itself.
(b) **Position or market risk**
A company whose main business lies outside the field of finance should **not increase financial risk** in order to make **speculative gains**.
(c) **Sovereign risk**
There may be a risk of **political disturbances or exchange controls** in the country whose currency is being used for a swap.
(d) **Arrangement fees**
Swaps have arrangement fees payable to third parties. Although these may appear to be cheap, this is because the intermediary accepts **no liability** for the swap. (The third party does however suffer some spread risk, as they warehouse one side of the swap until it is matched with the other, and then undertake a temporary hedge on the futures market.)

Example: Currency swap

Step 1 ET Co, a Sri Lankan company, wishes to invest in Germany. It borrows Rs. 200 million from its bank and pays interest at 5%. To invest in Germany, the Rs. 200 million will be converted into euros at a spot rate of Rs. 1 = €0.005. The earnings from the German investment will be in euros, but ET Co will have to pay interest on the swap. The company arranges to swap the Rs. 200 million for €1m million with ZRS Co, a company in the eurozone. ZRS Co is thus the counterparty in this transaction. Interest of 6% is payable on the €1 million. ET Co can use the €1 million it receives to invest in Germany.

Step 2 Each year when interest is due:

(a) ET Co receives from its German investment cash remittances of €60,000 (€1 million □ 6%).

(b) ET Co passes this €60,000 to ZRS Co so that ZRS Co can settle its interest liability.

(c) ZRS Co passes to ET Co Rs. 10 million (Rs. 200 million □ 5%).

(d) ET Co settles its interest liability of Rs. 10 million with its lender.

Step 3 At the end of the useful life of the investment, the original payments are reversed with ET Co paying back the €1 million it originally received and receiving back from ZRS Co the Rs. 200 million. ET Co uses this Rs. 200 million to repay the loan it originally received from its UK lender.