

Foreign Currency Risk Management 1

- Foreign exchange markets
- Internal hedging techniques
- Forward rates
- Forward contracts
- Money market hedging
- Currency futures

Syllabus learning outcomes

- Assess the impact on a company to exposure in translation transaction and economic risks and how these can be **managed**.

Syllabus learning outcomes

- Evaluate, for a given hedging requirement, which of the following is **the most appropriate strategy**, given the nature of the underlying position and the risk exposure:
 - (i) The use of the forward exchange market and the creation of a money market hedge
 - (ii) Synthetic foreign exchange agreements (SAFE's)
 - (iii) Exchange-traded currency futures contracts
 - (iv) Currency options on traded futures
 - (v) Currency swaps
 - (vi) FOREX swaps

Syllabus learning outcomes

- Advise on the use of bilateral and multilateral **netting and matching as tools for minimising** FOREX transactions costs and the management of market barriers to the free movement of capital and other remittances.

Foreign Exchange Risk (FOREX)

The value of a company's assets, liabilities and cash flow may be sensitive to changes in the rate in the rate of exchange between its reporting currency and foreign currencies.

Currency risk arises from the exposure to the consequences of a rise or fall in the exchange rate

A company may become exposed to this risk by:

- Exporting or importing goods or services
- Having an overseas subsidiary
- Being a subsidiary of an overseas company
- Transactions in overseas capital market

Types of Foreign Exchange Risk (FOREX)

Transaction Risk (Exposure)

This relates to the gains or losses to be made when settlement takes place at some future date of a foreign currency denominated contract that has already been entered in to.

This is therefore the risk of an exchange rate changing between the transaction date and the subsequent settlement date on an individual transaction. This risk is primarily associated with imports and exports

The movement in rates could be favourable or adverse but the main concern for risk management is with the possibility and consequences of an adverse rate movement

Types of Foreign Exchange Risk (FOREX)

Translation Risk (Exposure)

This exposure occurs in multinational companies that have foreign subsidiaries with assets and liabilities denominated in foreign currency. For the purposes of preparing consolidated financial accounts, the financial statements of the foreign subsidiaries must be translated into the reporting currency of the parent multinational. Change in exchange rate results in translation gains or losses which can distort the reported results of the group.

There is no cash flow in or out of the company but can be managed by borrowing in local currency to fund investment.

Types of Foreign Exchange Risk (FOREX)

Economic Risk (Exposure)

This exposure is the degree to which a firm's present value of future cash flows is affected by fluctuations in exchange rates, and thus affecting the international competitiveness of the company.

This exposure comes in two ways:

Directly - this is where a firm's home currency strengthens making its products/services expensive in the eyes of its customers both home and abroad relative to competitors prices.

Indirectly - it is possible that a firm's home currency does not change relative to overseas' customers currency but rather the customer's currency strengthens against other competitor's currency. Imports from The competitors country into the customer's country will become cheaper

This risk can be minimised by diversifying internationally in terms of sales, location of production facilities, raw materials and financing.

Foreign exchange markets

Exchange rates

- An exchange rate is the price of one currency expressed in another currency
- The spot rate at time t_0 is the price for immediate delivery at t_0
- A forward rate at t_0 is a rate for delivery at time t_1
- This is different from whatever the new spot rate turns out to be at t_1
- HC = Home Currency
- FC = Foreign Currency

Foreign exchange markets

Term and base currencies

- **The base currency is that which is quoted to 1 unit**
- If a currency is quoted as say 1.5000US\$/£, the US\$ is the term (or reference) currency, the GBP£ is the base currency
- The spot exchange rate is \$1.5000 to £1.

Foreign exchange markets

Direct and Indirect quotes

- A **Direct Quote** is the amount of domestic (home) currency which is equal to one unit of the foreign currency.
- An **Indirect Quote** is the amount of foreign currency which is equal to one unit of the domestic (home) currency.

For example:

The spot exchange rate of \$1.5000 to £1 is direct quote for a US based company and an indirect quote for a UK based company

The equivalent of $1/1.500 = £0.6667$ to \$1 is direct quote for a UK based company and an indirect quote for US based company

Foreign exchange markets

Bid and offer price

- **Bid price** is price at which bank is willing to buy currency
- **Offer/ask price** is price at which bank is willing to sell currency
- **Spread** is the difference between the bid and offer price

	\$/£	1.5230	1.6025
US – based Co	Direct	SELL £1 for \$1.5230	BUY £1 for \$1.6025
UK – based Co	Indirect	BUY \$1.5230 for £1	SELL \$1.6025 for £1

Note:

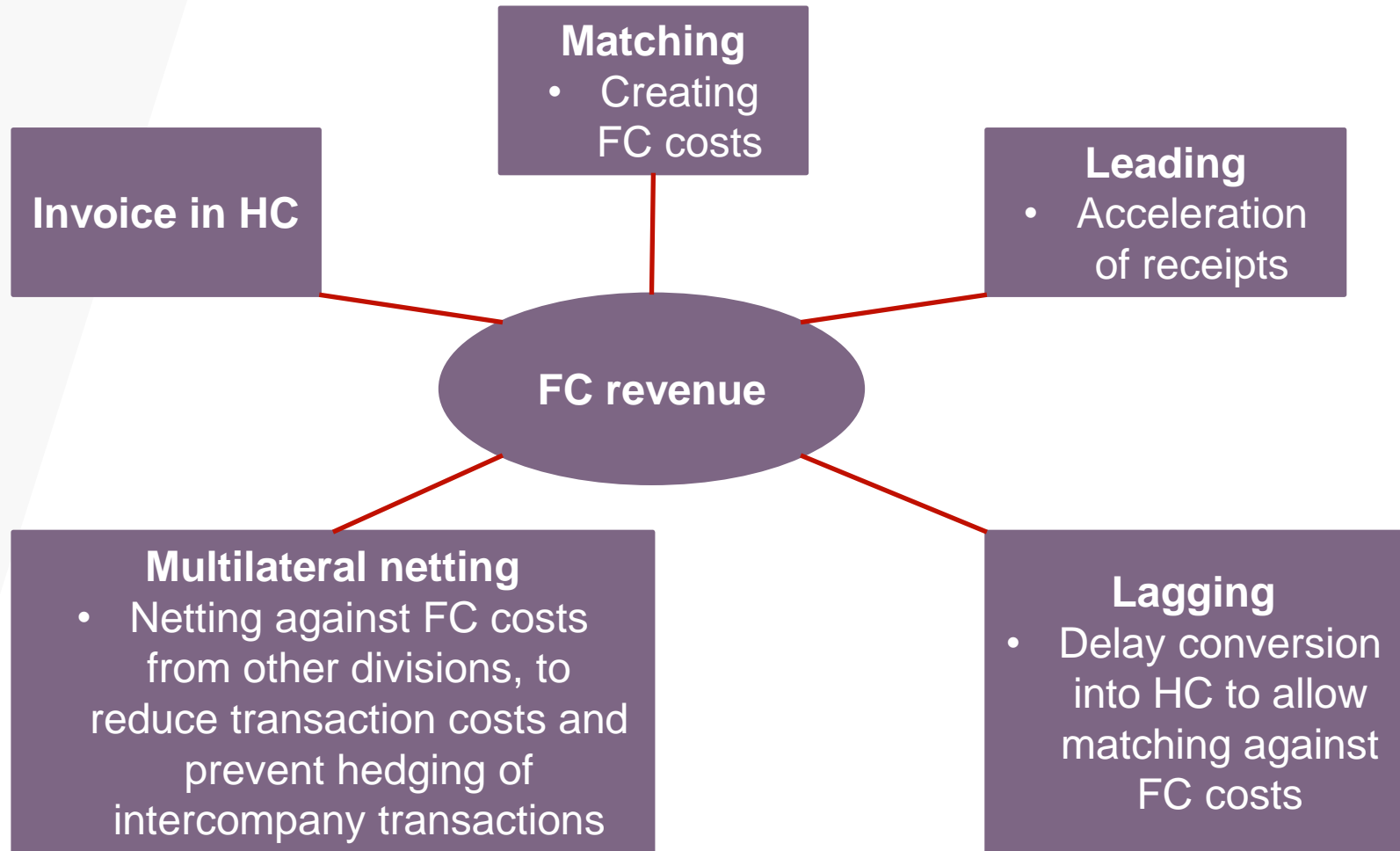
Whichever way the bank always wins.

Hedging foreign exchange risk

Internal Hedging techniques

- Do nothing
- Invoice in own (home) currency
- Leading and lagging
- Matching
- Multilateral netting

Internal methods



Multilateral netting

This is where the mutual indebtedness between group members and other parties can be reduced. This will reduce transaction costs and prevent hedging of intercompany transactions

Advantages

- Transaction costs are reduced due to fewer transactions as a result of the netting
- Where there are exchange controls limiting currency flows across borders, offsetting balances can minimise overall exposure.
- Where other non-group members are included in the netting, hedging cost and counterparty risk is reduced.

Multilateral netting

Disadvantages

- Some jurisdictions do not allow netting arrangements and there may be taxation and other cross border issues to resolve.
- Netting relies upon all liabilities being accepted particularly where external parties are involved and the central treasury may have difficulty exercising the strict control that the procedure requires.
- Where the base currency is generally weak against the other currencies for a sustained period, subsidiary results could be distorted.
- There will be costs in establishing the netting agreement as well as the need to re-invoice or re-contract particularly where third parties are involved.

Multilateral netting

Why some jurisdictions may or may not allow nettings

- Multilateral netting aims to minimise the number of transactions taking place in a country's banks and so leads to lesser fees for a country's banks. So governments who disallow multilateral netting aim to maximise fee income for their local banks.
- Some governments on the other hand allow it with the view of encouraging more multinationals, so that the lost fee income could be compensated by the additional business and employment that these multinationals bring.

Question: Multilateral netting

Assume you are a financial manager of a multinational company A based in the UK which has subsidiary companies B based in Europe (currency €), C based in the United States (currency US\$). It also has a foreign currency balance outstanding with a non-group company D based in Japan (currency ¥JPY).

The following, is a summarised list of year end indebtedness:

Owed by	Owed to	Amount (millions)
A	B	€42
A	C	\$25
B	C	€10
B	D	¥450
C	A	£15
C	D	\$35
D	A	¥300
D	B	€15

Multilateral netting

The following spot rates are available to A

\$/£1	€/£1	JPY/£1
1.5500 -1.5700	1.4500 -1.4900	130 -134

You are considering managing the currency exposure using multilateral netting from the UK and that all settlements will be made in Pound sterling using the spot mid-rates.

Required:

Using the transactions matrix approach (tabular format) establish the net indebtedness that would require external hedging.

Multilateral netting

Steps:

1. Convert all amount (currency flows) into a common (base) currency
2. Set up a table with the name of each subsidiary or company across the top and down the side
3. Input all converted amounts from one company to another into the table
4. Add across and down the table to identify the total amount payable and receivable by each party
5. Compute the net payable or receivable by each party

Multilateral netting

Owed by	Owed to	m	mid-spot rates	Equivalent (m)
A	B	€42	1.47	28.6
A	C	\$25	1.56	16
B	C	€10	1.47	6.8
B	D	¥450	132	3.4
C	A	£15	1	15
C	D	\$35	1.56	22.4
D	A	¥300	132	2.3
D	B	€15	1.47	10.2

Multilateral netting

Table

		Owed to			Owed by
	A	B	C	D	
A		28.6	16		44.6
B			6.8	3.4	10.2
C	15			22.4	37.4
D	<u>2.3</u>	<u>10.2</u>	—	—	12.5
Receivable	17.3	38.8	22.8	25.8	
Payable	<u>(44.6)</u>	<u>(10.2)</u>	<u>(37.4)</u>	<u>(12.5)</u>	
Net	-27.3	28.6	-14.6	13.3	

A will receive £14.6m from **C** and pay £28.6m and £13.3m to **B** and **D** respectively.

External hedging Methods

External hedging techniques

- Forward Market
- Money market
- Traded futures
- Options on traded futures
- Currency swaps
- FOREX swaps

Forward Market Hedge

Forward Market Hedge

- An over-the counter (OTC) transaction
- The forward market is where a company can buy or sell a currency at a predetermined exchange rate and a fixed future date.

Forward contracts

Forward Exchange Contract is:

- A firm and binding contract between a bank and its customer
- For the purchase/sale of a specified quantity of a stated foreign currency
- At a rate fixed at the time the contract is made
- For performance at a future time agreed when contract is made

Forward rates

Forward rates as adjustments to spot rates

- Forward rate cheaper – quoted at **discount**
- Forward rate more expensive – quoted at **premium**
- Add discounts, or subtract premiums from spot rate

Synthetic Foreign Exchange Agreements (SAFEs)

This is a type of forward currency exchange rate agreement but unlike the usual currency forward, no cash or physical delivery of currencies takes place.

Like FRAs the underlying is on a notional amount of currency and the agreement calls for settlement of the net amount in US\$ between actual rate and the agreed non-deliverable forward rate.

To reduce exchange rate volatility, some governments have banned forward Forex trading. In such situations the SAFEs are used instead. SAFEs therefore enable a company to hedge against currency risk where the currency is not freely convertible. The cash settlement of the SAFE is often in a different currency that is freely trade able such as the US\$

Synthetic Foreign Exchange Agreements (SAFEs)

A company needs to buy \$2.6m worth of Brazilian Reals in 6 months time. Assuming the spot rate is Real/\$1.6812 and a non-deliverable forward rate has been agreed at Real/\$1.6900.

If in 6 months time the spot rate moves to Real/\$1.6795 then the counterparty will pay to the company

$$2.6 \text{ m} (1.6900 - 1.6795) = \mathbf{27,300 \text{ Reals}}$$

$$\text{The actual receipt in US\$ equivalent:} = 27300/1.6795 = \mathbf{\$16,254.8}$$

Forward contracts

Benefits of a forward contract

- A forward contract would not involve payment of a large premium upfront to the counterparty.
- A forward contract is a simple arrangement to understand
- A forward contract gives a certain receipt for the purposes of budgeting.

Forward contracts

Drawbacks of a forward contract

- A forward contract has to be fulfilled, even if the transaction which led to the forward contract being purchased is cancelled. Exchange rate movements may mean that the contract has to be fulfilled at an unfavourable rate.
- A forward contract does not allow the holder to take advantage of favourable exchange rate movements.
- A forward contract may only be available for a short time period, depending on what currencies are involved.

Money market hedging

The money market hedge works by arranging a lending or borrowing transaction now, with a settlement date being the same as the date when the future currency receipt or payment will occur.

- A money market hedge eliminates risk by ensuring that currency is translated immediately, at spot rate.

Money market hedging

Future foreign currency receipt (exporter)

1. Borrow now in foreign currency
2. Convert foreign currency loan to home currency at spot
3. Put home currency on deposit
4. When cash received
 - (i) Take cash from deposit
 - (ii) Repay foreign currency borrowing

Money market hedging

Future foreign currency payment (importer)

1. Borrow now in home currency
2. Convert home currency loan to foreign currency spot
3. Put foreign currency on deposit
4. When have to make payment
 - (i) Make payment from deposit
 - (ii) Repay home currency borrowing

Money market hedging – exporter

Zaika Co is a UK based company. It has imported goods worth \$330,000 from a US supplier for which payment is due in 4 months time. The company has decided to hedge its FOREX risk using the forward and money markets.

Exchange rates available to Zaika Co

Spot rate: \$/£	1.7120	1.7150
4 months forward rate: \$/£	1.7010	1.7030

Annual interest rates available to Zaika Co

	Borrowing rate	Investing rate
UK Sterling £	5%	3%
USA \$	4%	2%

Required:

Determine the outcome of the hedge using the forward and the money market hedge.

Money market hedging – importer

Forward market hedge:

Zaika Co will need to buy \$330,000 4 months forward at \$1.7010 per £1 which is legally binding:

Sterling cost: $\$330,000 / 1.7010 = \mathbf{\pounds 194,004}$

Money market hedging – importer

Money market hedge:

Zaika Co will need to invest (deposit) sufficient amount of US\$ that will mature to \$330,000 in 4 months time - (ie the PV of \$330,000 in 4 months' time).

$$\text{US\$ Amount} \times ((1 + (2\% \times 4/12))) = \$330,000$$

$$\text{US\$ Amount} = \$330,000 / 1.006667 = \$327,814$$

Zaika Co will need to buy \$327,814 at the spot

$$\text{Sterling cost} = \$327,814 / 1.7120 = \text{£}191,480$$

It is normal to assume that Zaika Co does not have these funds available and so would have to borrow £ on the money market

$$\text{Total cost } \text{£}191,480 ((1 + (5\% \times (4/12))) = \text{£}194,671$$

Currency futures

A foreign exchange futures contract is an agreement between two parties to buy (sell) a particular currency at a particular rate (fixed) on a particular future date.

- Like a forward currency contract, a futures contract locks the buyer into an exchange rate.
- Like interest rate future, currency futures are also issued on a 3-month rolling, cycle maturing-expiring at the end of **March, June, September** and **December**.
- As usual, the **initial transaction position** in the futures market is **reversed to close out**.

Which contract to buy or sell?

- It is normal to buy or sell the contract that expires/matures on or after the underlying exposure date.

Currency futures

Futures terminology

- **Buying contract** means receiving contract currency
- **Selling contract** means supplying contract currency
- **Closing out** a futures contract means entering a second futures contract that reverses the effect of the first
- **Contract size** is the fixed minimum quantity that can be bought/sold
- **Settlement date** is the date when trading on a futures contract ceases and accounts are settled
- **Basis is spot price** – futures price
- **Basis risk** is the risk that futures price movement may differ from underlying currency movement

Currency futures

To buy or sell futures at start (ie identifying your opening position)

Step 1:

Identify the contract currency. (ie the currency in which the contract size is expressed)

Step 2:

Action to be taken by company	Opening position	Closing position
Receive (Buy) contract currency	Buy futures	Sell futures
Supply (Sell) contract currency	Sell futures	Buy futures

Currency futures

Set up process

(a) **Decide to buy or sell futures at start**

(b) **Choose which contract** (settlement date after date currency needed)

(c) **Estimate the closing futures price:**

Basis = opening spot rate - opening futures price

Closing futures price = Opening spot \pm unexpired basis

(ie adjust the spot assuming basis declines evenly over life of contract)

Currency futures

(d) **Calculate the number of contracts** to buy or sell:

= Amount exposed in contract currency / Contract size

Where amount exposed is in a currency other than the contract currency, convert to contract currency equivalent using estimated closing futures price or opening futures price

If number of contracts contracts don't cover amount to be hedged, convert remainder at spot price on day of exercise or with a formal forward contract if available.

(e) **Hedge outcome (cash flows)**

	Home currency
Amount hedged x or / estimated closing future price	XX
± Outcome of any remainder	<u>X(X)</u>
	XX

Question – traded futures

Zaika Co is a UK based company. It has imported goods worth \$330,000 from a US supplier for which payment is due in 4 months time. The company has decided to hedge its FOREX risk using traded futures.

Exchange rates available to Zaika Co

Spot rate: \$/£	1.7120	1.7150
4 months forward rate: US\$/£	1.7010	1.7030
Exchange traded currency futures size £12,500 available to Zaika Co		
Price quotations	US\$/£1	£/US\$1
3 month – expiry	1.6970	
6 month – expiry	1.6820	

Required:

Determined the outcome of the hedge using the futures market hedge.

Currency futures

Set up process

(a) Decide to buy or sell futures at start

Zaika Co needs to sell £ to buy US\$: Sell £ futures in 4 months time

(a) **Choose which contract** (settlement date after date currency needed). Sell 6 months expiry contracts at \$1.6820/£1 since 3 months is too short.

(b) Estimate the closing futures price:

$$\text{Basis} = 1.7120 - 1.6820 = 0.0300$$

$$\text{Closing futures price} = 1.7120 - ((4/6) \times 0.03) = \mathbf{1.6920}$$

(assuming basis declines evenly at monthly intervals over life of contract)

Currency futures

(d) Calculate the number of contracts to buy or sell:

$$\text{\$330,000} / 1.6920 = \text{£195,035}$$

$$= \text{£195,035} / \text{£12,500} = 15.60 \text{ contracts, hedge 15 contracts}$$

	\$
Amount exposed	330,000
Amount hedged: (15 x £12,500 x \$1.6920)	<u>317,250</u>
Under hedged	12,750

(e) Hedge outcome (cash flows)

	£
$\text{\$317,250} / 1.6920$	187,500
Buy \$12,750 forward \$1.7010	<u>7,496</u>
Total cost	194,996

Currency futures

Advantages of futures

- Transaction costs lower than forward contracts
- Exact date of receipt or payment doesn't have to be known
- Futures contract not closed out until cash receipt/payment made
- Low counterparty risk
- As contracts are traded, buying and selling should be easy

Currency futures

Disadvantages of futures

- Can't tailor to user's exact needs
- Only available in limited number of currencies
- Hedge inefficiencies