

Derivatives, Measurement and Hedge Accounting

IAS 39

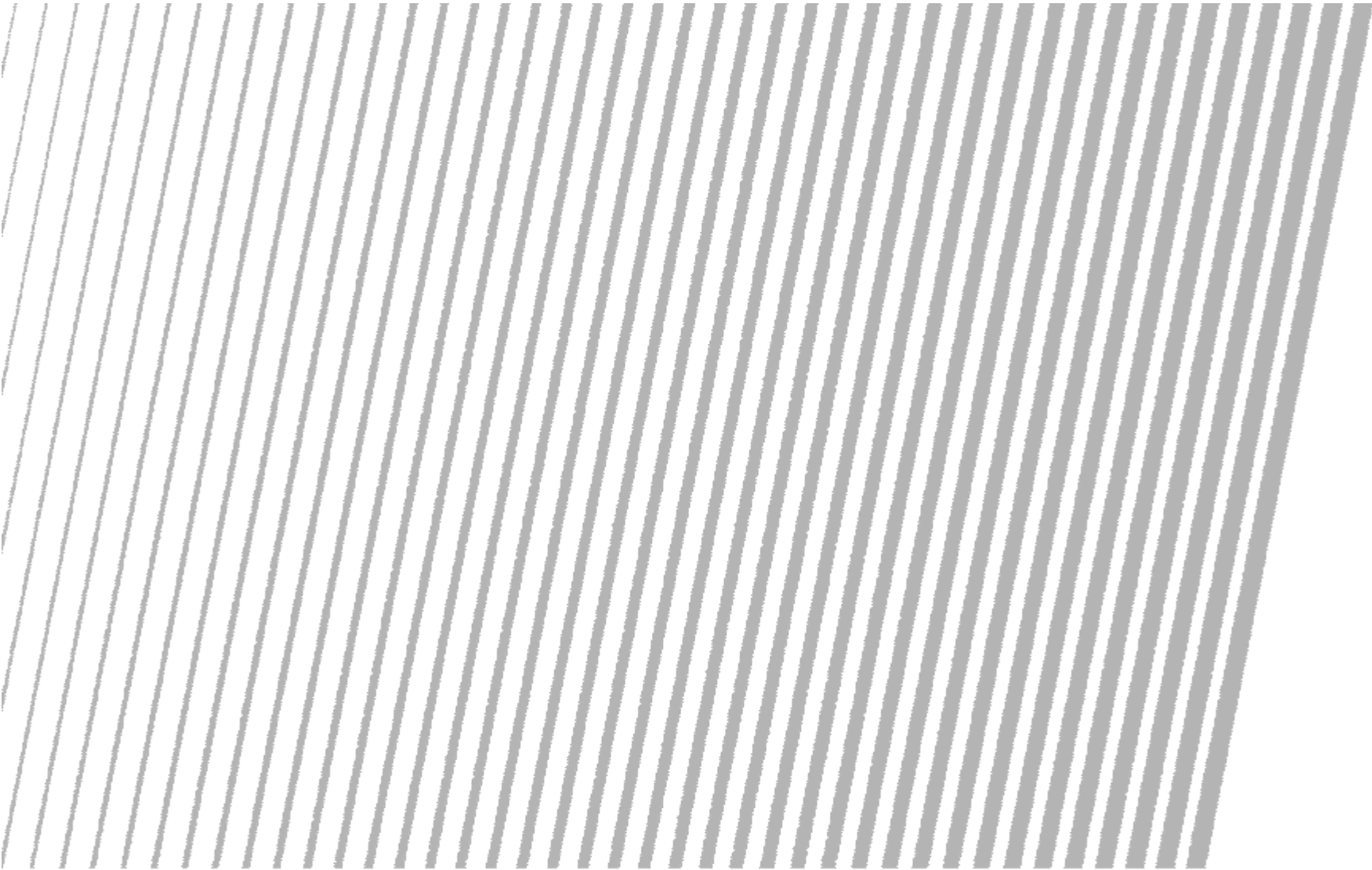
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 **ERNST & YOUNG**
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Derivatives



Derivatives

Definition

A derivative is a financial instrument or other contract with all three of the following characteristics:

- a) its value changes **in response** to the change in an **underlying variable** (e.g. a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable)

Derivatives

Definition (cont'd)

- b) it requires **no initial net investment or an initial net investment that is smaller** than would be required for other types of contracts that would be expected to have a similar response to changes in market factors; and
- c) it is **settled at a future date.**

Common examples of derivatives are: forward contracts, interest rate swap, currency swap, futures, options, etc.

Derivatives

Examples that show the underlying and notional amount

Derivative	Underlying	Notional amount
Foreign exchange forward	Exchange rate	Number of currency units
Interest rate swap	Interest index	Stated reference amount
Commodity option	Commodity price	Specified quantity of commodity

Derivatives

Accounting treatment

- ▶ Carried at fair value through profit and loss (FVPL), unless hedge accounting is applied

Initial measurement

- ▶ At fair value
- ▶ Fair value will often be equal to zero at initial recognition date, except when
- ▶ A premium will be paid / received for entering into the derivative (such as options contract). The premium represents the fair value of the derivative and is accounted for on the balance sheet, rather than to be expensed / accounted for as a revenue.

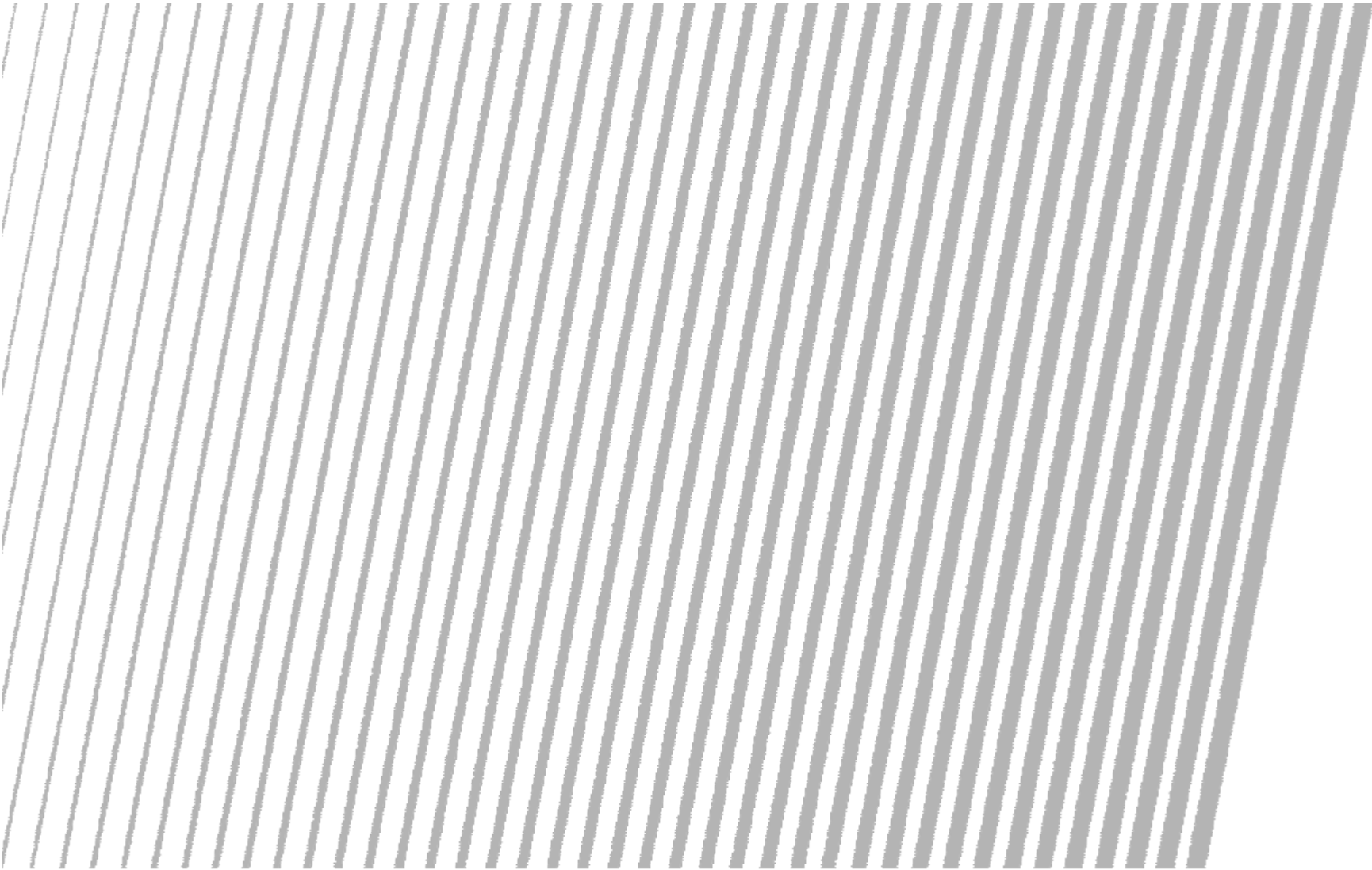
Derivatives

Accounting treatment (cont'd)

Subsequent measurement

- ▶ Revalued at fair value at every balance sheet date (this will result in the 'amortization' of the premium paid / received).
- ▶ Unless hedge accounting is applied, all changes in fair value must be recorded in current year P/L.

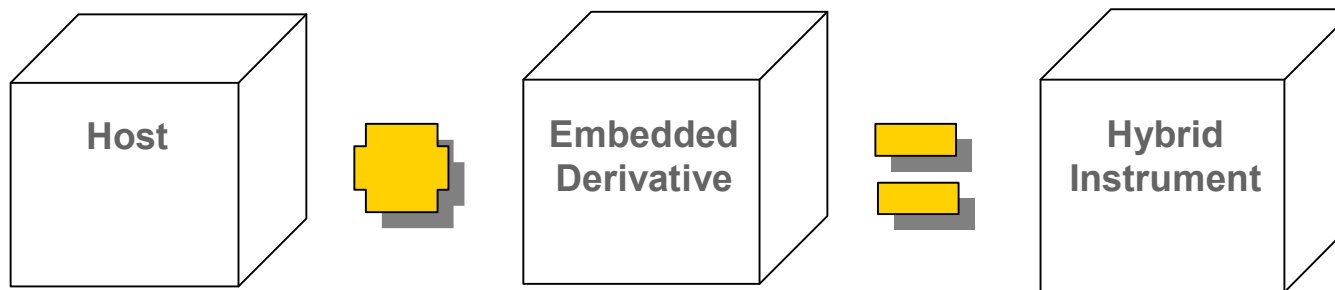
Embedded derivatives



Embedded derivatives

Definition

A component of a hybrid (combined) instrument that includes both a derivative and a host contract – with the effect that some of the cash flows of the combined instrument vary in a similar way to a stand-alone derivative.



Embedded derivatives

Definition (cont'd)

Example of host contracts – non derivative financial instruments

- ▶ Financial assets
 - ▶ Investments
 - ▶ Loans
- ▶ Financial liabilities
 - ▶ Deposits
 - ▶ Debt instruments
- ▶ Equity instruments
 - ▶ Equity shares

Embedded derivatives

Definition (cont'd)

Embedded derivatives exclude the following:

- ▶ Derivatives that are contractually transferable from their host contract;
- ▶ Derivatives that are with a different counterparty than the host contract; and
- ▶ Derivatives embedded in another derivative.

Embedded derivatives are often “hidden” in their host instrument, and their identification may prove difficult.

Embedded derivatives

Sample of products

- ▶ Structured products
 - ▶ Callable notes
 - ▶ Equity linked notes
 - ▶ Credit linked notes
 - ▶ Inverse floater
 - ▶ Collateralized debt obligation (CDO)
- ▶ Convertible bond

Embedded derivatives

Sample of products (cont'd)

- ▶ Structured deposit (deposit with return based on equity index)
 - ▶ This is the equivalent of having a derivative (option) on the underlying equity index

- ▶ Loan with renewal term based on a fixed interest rate (fixed at the initial inception of the loan)
 - ▶ This is the equivalent of having a derivative (option) on the interest rate at the time of renewal

How to account for embedded derivatives?

Embedded derivatives

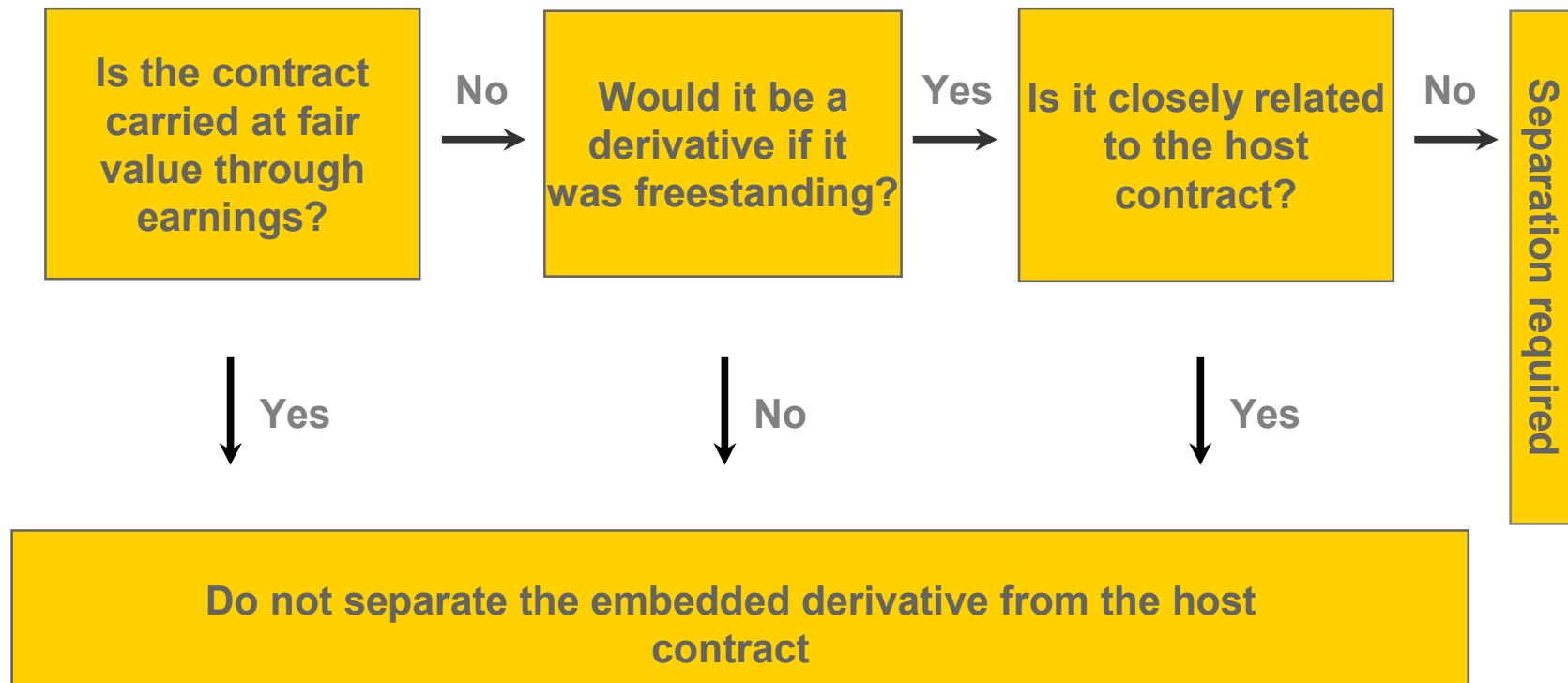
Accounting treatment

An embedded derivative shall be separated from the host contract and accounted for as a derivative if all of the following criteria are met:

- ▶ The characteristics and risks of the embedded derivative are **not** closely related to those of the host contract
- ▶ A separate instrument with the same terms would meet the definition of a derivative
- ▶ The contract is not remeasured at fair value through earnings

Embedded derivatives

Separation criteria



Embedded derivatives

Definition and example of “Closely related”

What is “closely related” to its host contract?

- ▶ It means that the economic characteristics and risks of the embedded derivative are “similar” to those of the host contract

Example of “closely related”

- ▶ Embedded derivatives in host debt instrument based on interest rate or interest rate index unless:
 - ▶ The holder would not recover substantially all of its recognized investment; or
 - ▶ Embedded derivatives could at least double the holder’s initial rate of return on the host contract and could result in a rate of return at least twice of the market return on a similar debt instrument without embedded derivatives
- ▶ A floor or cap on a debt instrument is out of the money at inception

Embedded derivatives

Definition and example of “not closely related”

Example of “not closely related”

- ▶ Equity or commodity index embedded in host debt instrument
- ▶ Equity conversion feature in host debt instrument
- ▶ Call, put or prepayment option embedded in debt instrument, unless the exercise price is equal to the instrument’s amortized cost on exercise date
- ▶ Credit derivatives embedded in debt instrument

“Closely related” embedded derivatives or not?

1. Bond with coupon and/or principal repayments based on an inflation index
2. Bond with a coupon of 12% minus 3 month LIBOR
3. Bond with interest rate cap/floor/collar

“Closely related” embedded derivatives or not?

- | |
|---|
| 4. Deposit with the option to extend maturity date by another 3 years at the then market rate |
| 5. Puts/calls embedded in debt instrument |
| 6. Interest rate linked to an index other than interest (e.g. equity index) |

“Closely related” embedded derivatives or not?

7. Coupon interest is i) at 6% p.a. for each calendar day where 6-month USD LIBOR rate is between 0.00% and 6% or ii) 0% for each calendar day where 6-month USD LIBOR rate is outside the range of 0.00% and 6%.

Embedded derivatives

Frequency of review “Closely related”

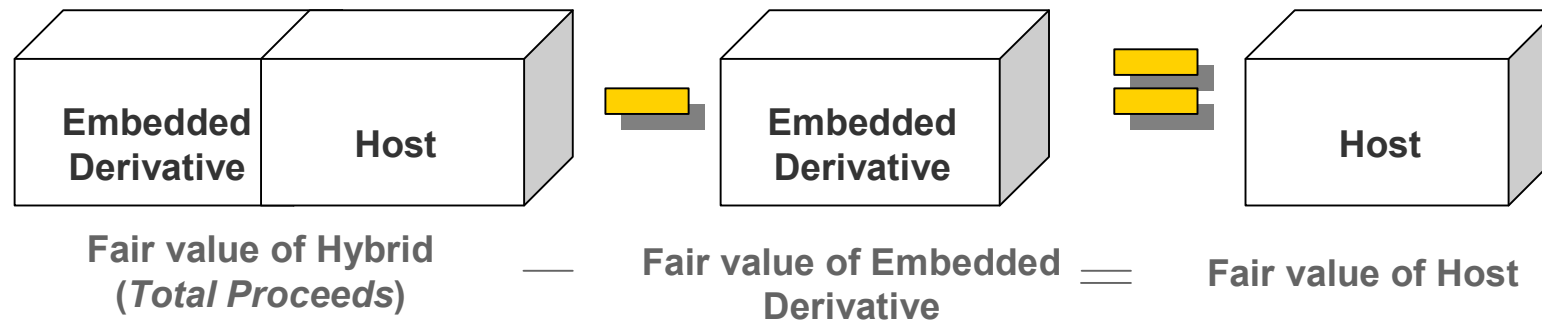
When is the review of “Closely related” performed?

- ▶ At inception of the contract?
- ▶ On an ongoing basis?
- ▶ At inception and on an ongoing basis?

Embedded derivatives

Accounting treatment

- ▶ Accounting treatment for embedded derivative (which is separated from the host contract): same as derivative
- ▶ When separating an embedded derivative, we should first allocate a value to the embedded derivative, and the balance is allocated to the host instrument (there are limited exceptions to this approach)



Fair value of hybrid at inception = price paid/received for the instrument

Embedded derivatives

Accounting treatment (cont'd)

- ▶ If we are unable to determine reliably the fair value of an embedded derivatives (e.g. embedded derivative is based on an unquoted equity instrument), fair value of the embedded derivative is the difference between the fair value of the hybrid instrument and the fair value of the host contract
- ▶ If the fair value of embedded derivative is unable to determine, the hybrid instrument is designated as at fair value through profit and loss
- ▶ Accounting treatment for host contract: depend on classification of FA, FL

Embedded derivatives

Valuing checklist

Process to value an embedded derivative:

- ▶ Determine if the embedded derivative is non-option based (for example, a swap, forward or future). If it is, its fair value is zero at initial recognition.
- ▶ If the embedded derivative was option based (or on subsequent valuations for non-option-based derivatives), determine if the fair value can be determined. If it can, determine the fair value of the embedded derivative and assign the residual value to the host.
- ▶ If the fair value of the embedded derivative could not be determined, determine if the fair value of the hybrid and of the host can be determined. If they can, the fair value of the embedded derivative is the difference.
- ▶ If the fair value of the hybrid and the host could not be determined, the hybrid contract is treated as held for trading and is valued as a single instrument. (This will be a rare occurrence).

Example

How to account for embedded derivative?

Example

- ▶ Investment in an Instrument issued at par and the principal repayment at maturity is guarantee.
- ▶ The tenor of the Instrument is 5 years, but can be early redeemed at the option of the issuer at the prevailing market value.
- ▶ The return is linked to the appreciation of an Equity Index Basket over the tenor of the Instrument, with a minimum return of 14% over its tenor.
- ▶ This Instrument is the equivalent of the following:
 - ▶ Note which bears a total contractual interest of 14% over its tenor (2.8% p.a.);
 - ▶ Call option on the Equity Index Basket; and
 - ▶ Early redemption option

Example

How to account for embedded derivative? (cont'd)

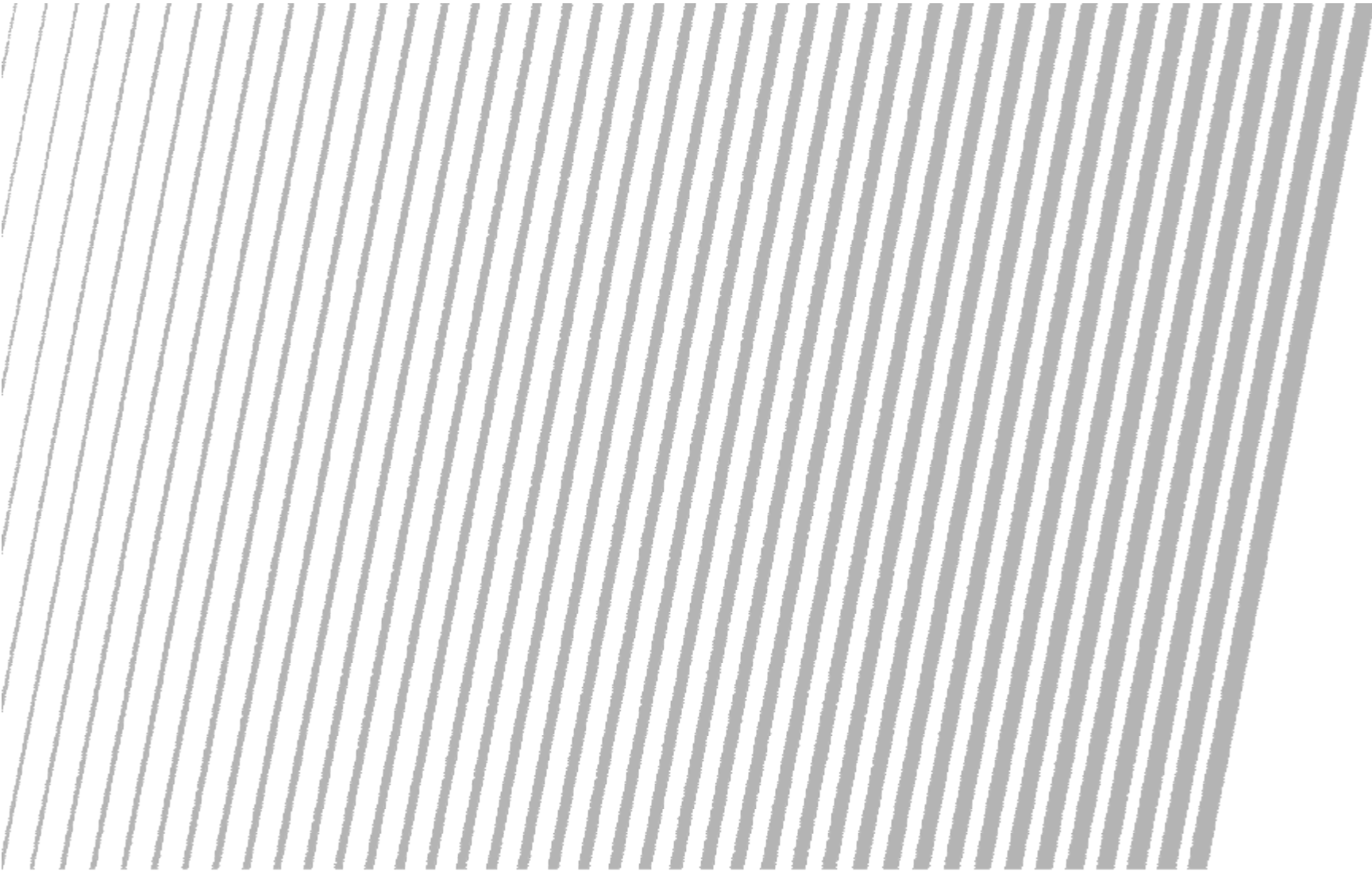
- ▶ How to account for the transaction?
 - ▶ The Call option is an embedded derivative to be bifurcated because not closely related to its host contract. It is to be accounted for at FVPL.
 - ▶ The early redemption option is not an embedded derivative since the redemption will be made at FV (therefore don't meet the definition of a derivative)
 - ▶ The Note can be carried at amortized cost with interest income recorded using the effective interest rate method.
 - ▶ The bifurcation of the embedded derivative should be done first by measuring the value of the Call option and then allocate the residual amount of the instrument to the Note. This will result in the carrying amount of the Note to be lower than its transaction cost (discount). The discount is to be amortized using the effective interest rate method.

Example

How to account for embedded derivative? (cont'd)

- ▶ How to account for the transaction?
 - ▶ Any interest received that exceed the EIR on the Note will be related to the embedded call option, and should be disclosed in the P&L as trading gains / losses.
 - ▶ Alternatively, the Instrument can just be recorded at FVPL.

Measurement



Measurement

Fair value at initial recognition

The best evidence of the fair value at initial recognition is the **transaction price** (i.e., the fair value of the consideration given or received) unless:

- ▶ The fair value of that instrument is evidenced by comparison with other observable current market transactions in the same instrument (ie, without modification or repackaging); or
- ▶ Based on a valuation technique whose inputs include only data from observable markets

Measurement

Fair value – active market

- ▶ Published price quotation in an active market is the best evidence of fair value and must be used to measure fair value where possible
 - ▶ Fair value of portfolio of financial instruments is the product of number of units of the instrument and its quoted market price
 - ▶ No block discounts allowed due to the size of the position

Measurement

Fair value – inactive markets

- ▶ When current bid or offer prices are unavailable, price of the most recent transaction provides evidence of fair value
 - ▶ If conditions have changed since the transaction the fair value reflects the change by reference to current prices or rates for similar financial instruments
 - ▶ If the entity can demonstrate that the last transaction is not fair value the price is adjusted

Measurement

Fair value – inactive markets (cont'd)

- ▶ For inactive markets, an entity establishes fair value using a valuation technique. For example:
 - ▶ Most recent arm's length transaction between knowledgeable, willing parties;
 - ▶ Reference to fair value of a similar instrument;
 - ▶ Discounted cash flow; or
 - ▶ Option pricing models.
- ▶ The valuation technique used must:
 - ▶ Incorporate all factors that market participants would consider in setting a price; and
 - ▶ Be consistent with accepted economic methodologies for pricing financial instruments.

Measurement

Valuation technique considerations

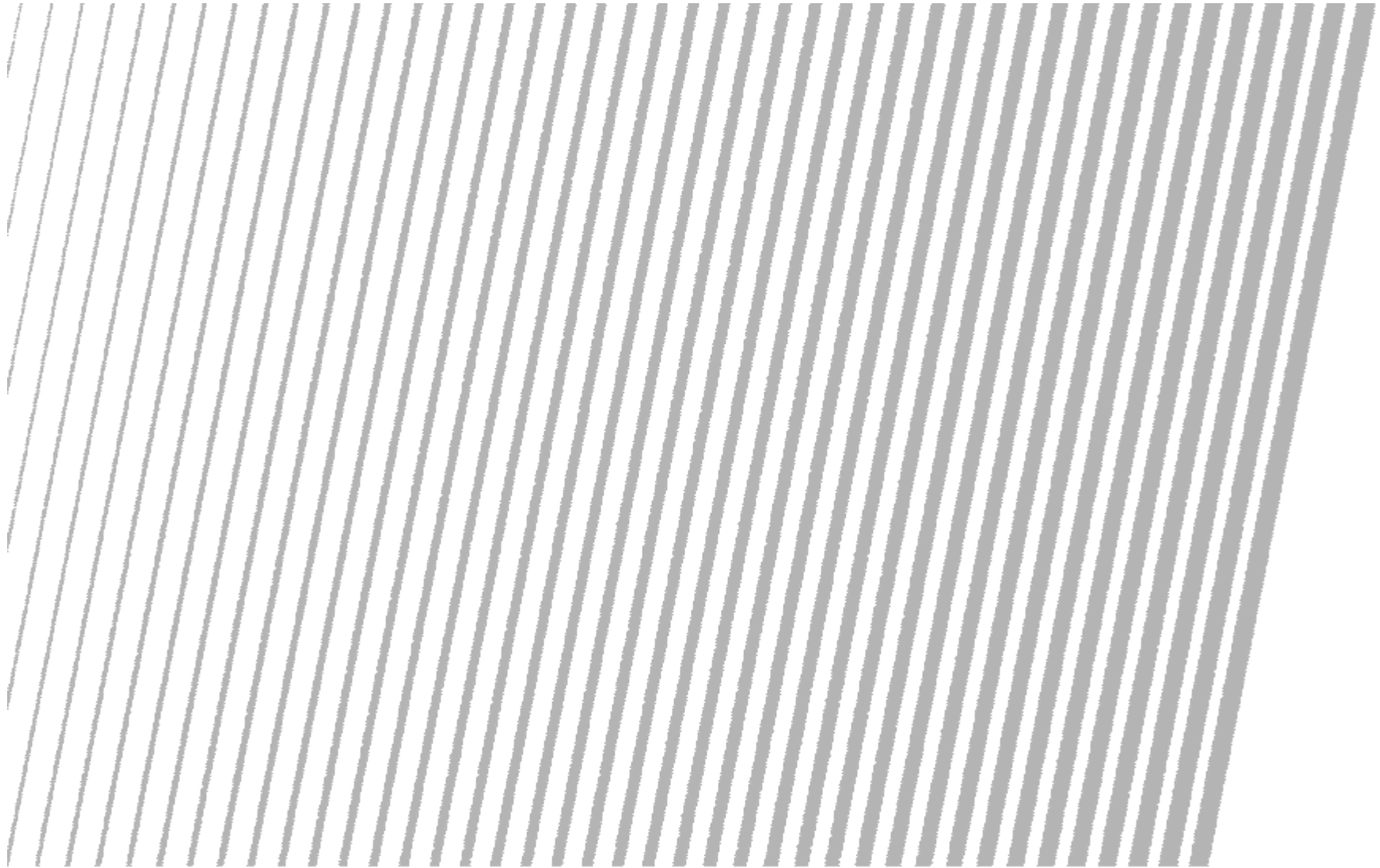
- ▶ No specific valuation technique under IAS39
- ▶ Commonly used by market participants
- ▶ Maximum use of market inputs
- ▶ Incorporate all factors that would consider in pricing
- ▶ Reliable estimates of price obtained in actual market transactions
- ▶ Periodically test the validity of the valuation technique

Measurement

Practical issue – price quoted from counterparty

- ▶ Obtain valuation price from various counterparties
- ▶ Understand counterparty's model
- ▶ Compare with subsequent settlement or recent transactions

Hedge accounting



Hedge accounting

- ▶ Refresh – measurement of financial instruments
- ▶ Hedging (definition, hedged items, hedging instruments)
- ▶ Hedge relationship and accounting treatment for qualifying hedge
- ▶ Hedge effectiveness
- ▶ Hedge documentation
- ▶ Hedge termination
- ▶ Practical issues

Refresh – measurement of financial assets

Instrument	Measurement	Changes in value
Trading (including derivative assets)	Fair value	P&L
Available for sale	Fair value	Shareholders' equity
Loans and receivable	Amortised cost	P&L (only if impaired)
Held to maturity	Amortised cost	P&L (only if impaired)

Refresh – measurement of financial liabilities

Instrument	Measurement	Changes in value
Trading (including derivative liabilities)	Fair value	P&L
All other liabilities	Amortised cost	Not applicable

Hedge accounting

What is it?

Designation of a hedging instrument that have a value that is expected, wholly or partly to offset changes in the value or cash flow of a hedged position.

The two main components are:

- ▶ Hedged items
- ▶ Hedging instruments

Hedge accounting

Why do we need it?

To correct for:

- ▶ Measurement differences
- ▶ Performance reporting differences
- ▶ Recognition differences
- ▶ Existence differences

Hedge accounting

Hedged items – what does qualify

- ▶ A recognized asset or liability
- ▶ An unrecognized firm commitment
- ▶ A highly probable forecast transaction
- ▶ A net investment in foreign operation
- ▶ Only FA and FL could be designated as hedged items (except for some cases when non FA or non FL may be designated)

that exposes the bank to risk of changes in fair value or future cash flows and is designated as being hedged

Hedge accounting

Hedged items – what does not qualify

- ▶ Net positions and “overall risks”
- ▶ Inter-company items (except FX risk not eliminated on consolidation)
- ▶ Items that create a risk exposure but do not affect P&L:
 - ▶ Held-to-maturity investments for interest rate risk
 - ▶ Firm commitment to acquire a business
 - ▶ Internal transactions that are cancelled on consolidation

Hedge accounting

Hedging instruments

An instrument whose fair value or cash flows are expected to offset changes in the fair value or cash flows of the designated hedged item. Includes:

- ▶ **A derivative**, or proportion thereof (except for written options that can only be designated against purchased options)
- ▶ A combination of two or more derivatives, or proportions thereof
- ▶ A non-derivative **financial instrument**, or proportion thereof, but only in the case of foreign exchange risk
- ▶ Only those hedging instruments executed with an **external party**

Hedge accounting

Hedging instruments (cont'd)

Partial hedges

- ▶ Can designate a portion of the hedge instrument but not for a portion of its life
- ▶ Combination of derivatives can be designated as hedge instrument including when fully offsetting

Hedge accounting

Hedge relationships

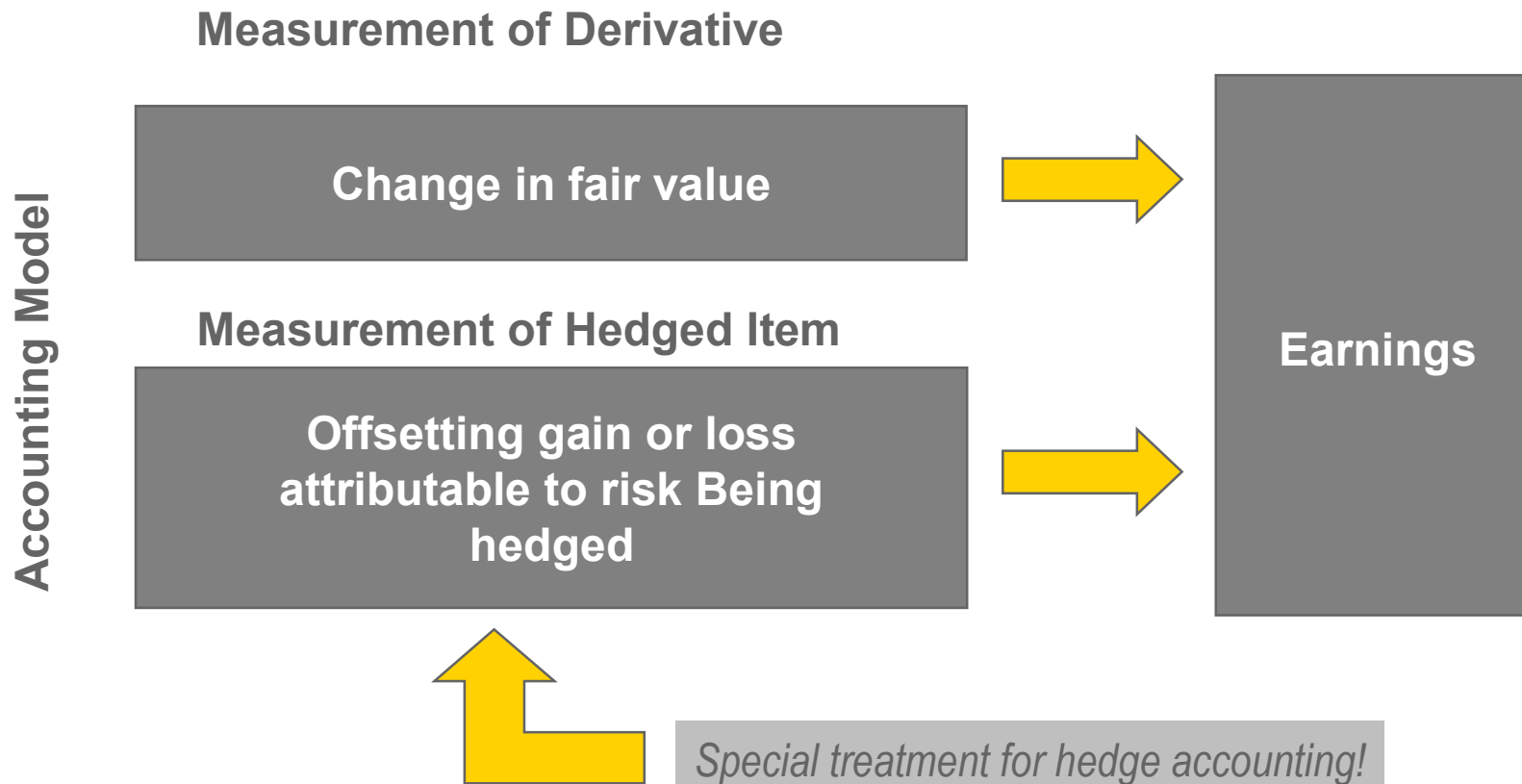
There are three types of hedges :-

- ▶ Fair value hedge
- ▶ Cash flow hedge
- ▶ Hedge of net investment in foreign operation

	Hedging instruments (derivatives)	Hedged items	Through
a) Fair value hedge	FV	FV	P/L
b) Cash flow hedge	FV	-	SE
c) Hedge of net investment	FV	-	SE

Hedge accounting

Fair value hedge accounting

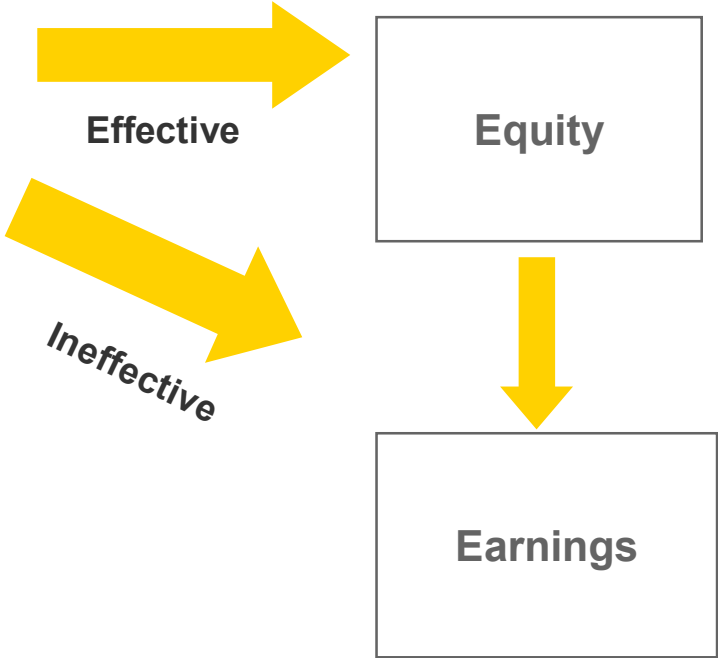


Hedge accounting

Cash flow hedge accounting

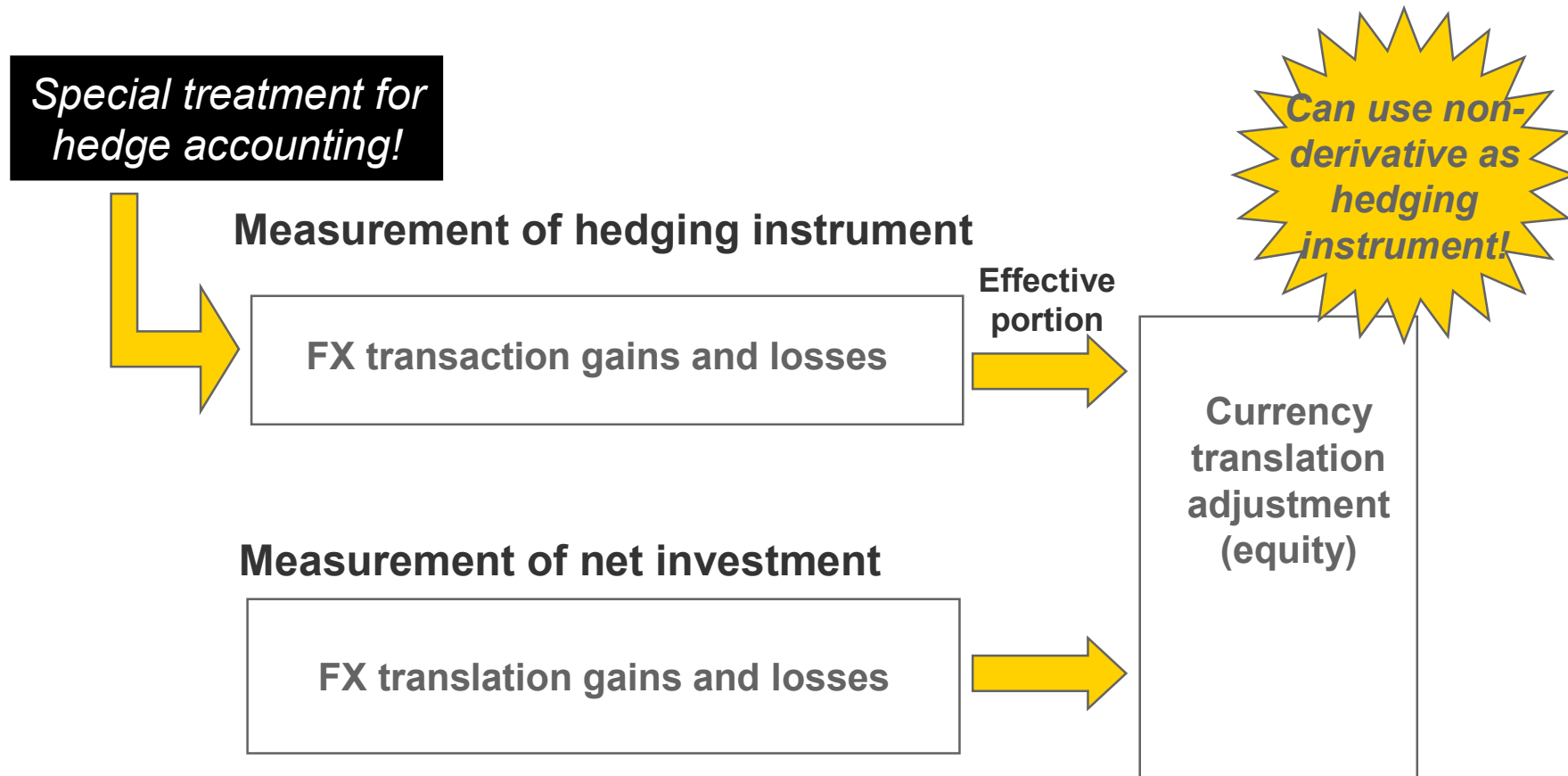
Measurement of Derivative

Change in Fair Value



Hedge accounting

Hedge of a net investment in foreign operation



Hedge accounting

Accounting treatment for qualifying hedges

Fair value hedges

1. Gain or loss on the hedging instrument is recognized immediately in P&L.
2. Hedged item is adjusted for change in fair value due to the hedged risk and the gain or loss recognized immediately in P&L.
3. By default, hedge ineffectiveness is captured immediately in P&L.

Cash flow hedges

1. Gain or loss on the hedging instrument that is fully effective is initially recognized in a separate component of equity.
2. No adjustment is made to the hedged item.
3. Gain or loss on the hedging instrument that is not effective is recognized immediately in P&L.

Hedge accounting

Accounting treatment for qualifying hedges

Fair value hedges (cont'd)

Cash flow hedges (cont'd)

4. Gain or loss in equity is transferred to P&L at the same time as the hedged item impacts P&L.
5. For a hedged forecasted transaction or firm commitment that results in the creation of an asset or liability, the amount in equity may first be transferred as an adjustment to the carrying basis of the asset or liability.

Fair value hedge

Example 1 - Without hedge accounting

Balance sheet

<u>Assets</u>		<u>Liabilities</u>	
Hedging instruments	FV	Bonds fixed interest	AC

P&L

Change value	Diff
--------------	------

Fair value hedge

Example 1 - With hedge accounting

Balance sheet

<u>Assets</u>		<u>Liabilities</u>	
Hedging instruments	FV	Bonds fixed interest	FV

P&L

0

Fair value hedge – interest rate risk

Example 1 (cont'd)

Fair Value	Float 8		Fixed 7		
	Valuation		P/L		
	<u>Derivative (P/L)</u>	<u>Loan (P/L)</u>		<u>Interest exp.</u>	<u>Loss</u>
	2 loss	(2) gain	Y 1	7	1
	1 loss	(1) gain	Y 2	7	1
	-	- gain	Y 3	7	1

Cash flow hedge

Example 2 - Without hedge accounting

Balance sheet

<u>Assets</u>		<u>Liabilities</u>	
Hedging instruments	FV	Bonds variable interest	AC

P&L

Change value	Diff
--------------	------

Cash flow hedge

Example 2 - With hedge accounting

Balance sheet				
<u>Assets</u>			<u>Liabilities</u>	
Hedging instruments	FV		Bonds variable interest	AC
			<u>Equity</u>	
			Change value	Diff
P&L				
	0			

Cash flow hedge – interest rate risk

Example 2 (cont'd)

Fair Value		Fixed 5		Float 4		
		Valuation		P/L		
	<u>Derivative FV.</u>	<u>SE</u>		<u>Interest exp.</u>	<u>Loss</u>	
loss	2		Y 1	4	1	
loss	1		Y 2	4	1	
loss	-		Y 3	4	1	

Hedge accounting

Examples of fair value hedge

- ▶ Fixed rate debt issued by the bank and hedged using a receive fixed/pay floating interest rate swap. *This protects the fair value of the debt against changes in interest rates*
- ▶ FCY loans and receivable hedged with forward contract. *This protects the fair value of the debt against changes in exchange rates.*
- ▶ Available for sale equity security hedged with a purchased put option. *This protects against a decline in fair value of the security below a pre-determined level (the strike price of the option)*
- ▶ Available for sale overseas debt security with a rate of 4% p.a. hedged with a cross currency interest rate swap. *This protects against a decline in fair value of the security against changes in exchange rates and interest rates.*

Hedge accounting

Examples of cash flow hedge

- ▶ Floating rate debt issued by bank and hedged using a receive floating/pay fixed interest rate swap. *This protects the future interest cash flows to be paid on the debt against changes in interest rates.*
- ▶ Forecasted USD foreign currency collection from loan in September hedged by a USD/THB forward contract. *This protects the THB cash flows to be received from this collection against changes in exchange rates*
- ▶ A firm commitment to buy fixed asset in 6-month time for a fixed USD foreign currency amount hedged by a USD/THB forward contract. *This protects the future THB cash flows to be paid against changes in exchange rate [Note – a hedge of Fx risk may be a fair value hedge or cash flow hedge]*

Hedge accounting

Quiz

What type of hedge model should be for each of the following, with pay fixed, receive variable interest rate swap?

- | |
|--|
| 1. AFS fixed rate bond |
| 2. HTM fixed rate bond |
| 3. Variable rate liability |
| 4. Forecast issuance of fixed rate liability |
| 5. Fixed rate liability |

Hedge accounting

Hedge strategy

Hedged Item	Hedging Instrument	Hedge Result	Type of Hedge
Fixed-rate FX instrument	Fixed for Fixed Cross Currency Swap	Fixed-rate functional currency instrument	Cash flow hedge (FX risk only)
Floating-rate FX instrument	Floating for Floating Cross Currency Swap	Floating-rate functional currency instrument	Fair value hedge (FX risk only)
Fixed-rate FX instrument	Fixed for Floating Cross Currency Interest Rate Swap	Floating-rate functional currency instrument	Fair value hedge (FX and interest risk)
Floating-rate FX instrument	Floating for Fixed Cross Currency Interest Rate Swap	Fixed-rate functional currency instrument	Cash flow hedge (FX and interest risk)

Hedge accounting

Key consideration

Hedge accounting is not mandatory under IAS 39. It is optional. It should be viewed as an opportunity for companies to manage their P&L with respect to the risks being hedged. This “opportunity” comes with a “cost”; strict criteria to allow for hedge accounting.

Hedge accounting

Economic hedge vs Hedge accounting

- ▶ These represents two distinct concepts:
- ▶ Economic hedge
 - ▶ Process of entering into a transaction in order to reduce the entity's exposure to risks (e.g. interest rate risk, currency risk, etc.)
- ▶ Hedge accounting
 - ▶ Application of special rules to account for the hedge transaction
- ▶ Not all economic hedges will qualify for hedge accounting under IAS39 because
 - ▶ Hedging of an overall risk or net positions is not allowed under IAS 39 even though from an economic stand point the hedge is appropriate
 - ▶ Economic hedge may not comply with the strict effectiveness requirements under IAS 39

Hedge accounting

Key steps to achieve a qualifying hedge

- ▶ Identify the hedged item
- ▶ Identify the nature of the risk being hedged
- ▶ Identify the hedging instrument
- ▶ Identify the type of hedge: fair value or cash flow
- ▶ Demonstrate that the hedge has and will continue to be effective
- ▶ Document the above hedging relationship, including the risk management objectives and strategy for undertaking the hedge
- ▶ Monitor effectiveness

Hedge effectiveness

Definition

Definition: The degree to which changes in the fair value or cash flows of the hedged items that are attributable to a hedged risk are offset by changes in the value or cash flow of the hedging instrument.

- ▶ The effectiveness of the hedging relationship must be proved at the outset of the hedging relationship.
- ▶ This is a key concept introduced in IAS 39 and one of the criteria required to achieve hedge accounting. It is proving the biggest challenge for some companies and banks.
- ▶ It must be measured at least every time a bank issues interim or annual financial statements.

Hedge effectiveness

Assessment of effectiveness

- ▶ Necessary condition for obtaining hedge accounting
- ▶ Dual test: prospective and retrospective
- ▶ Hedge documentation must state the method
- ▶ Method chosen must be applied consistently for
 - ▶ The whole life of the hedge
 - ▶ Similar types of hedges
- ▶ Actual results must be within a range of 80%-125%

Hedge effectiveness Test

There are two tests for hedge effectiveness:

- ▶ Prospective effectiveness – the hedge is expected to be highly effective at inception (almost fully offset) and on an ongoing basis
- ▶ Retrospective effectiveness – the hedge has actually been highly effective in the period (within the range of 80%–125%)

Hedge effectiveness

Test (cont'd)

Prospective effectiveness:

- ▶ No specified method for doing this, and common sense will dictate what level of work needs to be done
- ▶ If all critical terms match, a bank may conclude that the hedge will be effective both at inception and on an ongoing basis. The ongoing prospective test would therefore be limited to checking that key terms continue to match
- ▶ If not, a bank will need to select a suitable method, for example, regression analysis, Monte Carlo simulations, other statistical methods

Hedge effectiveness

Test (cont'd)

Retrospective effectiveness

- ▶ For a fair value hedge, this is typically done by comparing actual results and for a cash flow hedge by using the hypothetical derivative method
- ▶ Other methods of measuring effectiveness can also be used, for example, regression analysis
- ▶ Effectiveness is assessed either on a period-by-period or cumulative basis and IAS 39 requires that results are within 80%–125% for the hedge to be considered effective
- ▶ Careful selection of the testing method will reduce the chance of the hedging being ineffective. For example, a hedge is much more likely to be ineffective using a period-to-period rather than a cumulative testing basis

Hedge effectiveness

Example methodology

Acceptable methods for assessment of hedge effectiveness:

Method to assess effectiveness	Prospective	Retrospective
Critical terms match	X	
Stress testing	X	
Dollar offset method	X	X
Regression analysis	X	X

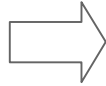
Hedge effectiveness

Example methodology – critical terms match

- ▶ Identifies those (critical) terms in hedged item and derivative most likely to cause ineffectiveness
- ▶ Effectiveness is assessed primarily by reference to whether critical terms match and continue to match
 - ▶ Other terms (e.g. credit risk) assessed on a qualitative basis
- ▶ Documentation of hedge effectiveness tests required
 - ▶ Do critical terms still match?
 - ▶ Are there any reasons why we don't believe the hedge is effective?

Hedge effectiveness

Example methodology – dollar offset method

<u>Fair value movement hedging instrument</u>	$\frac{10}{9}$		111%
Fair value movement hedged item			

Can be performed on a period-by period or a cumulative basis

- ▶ No matter which effectiveness method is selected, “ineffectiveness” must always be measured on a dollar offset basis
- ▶ Dollar offset doesn’t override results of another validly applied and documented assessment method

Hedge effectiveness

Example methodology – dollar offset method (cont'd)

Example

<u>Date</u>	<u>Fair Value of Derivative</u>	<u>Fair Value of Hedged Item</u>
1 January 20X3	THB 0	THB 500
31 March 20X3	THB 100	THB 410
30 June 20X3	THB 125	THB 389
30 Sept 20X3	THB 150	THB 370

Hedge effectiveness

Example methodology – dollar offset method (cont'd)

<u>Date</u>	<u>Fair Value of Derivative</u>	<u>Fair Value of Hedged Item</u>	<u>Effectiveness</u>
1 January 20X3	THB 0	THB 500	
31 March 20X3	THB 100	THB 410	100 /90= 111%
30 June 20X3	THB 125	THB 389	125/111= 113%
30 Sept 20X3	THB 150	THB 370	150/130= 115%

*Throughout the period, using the cumulative basis for effectiveness testing, the hedge remains effective (i.e. between 80-125%).
Thus, hedge accounting continues.*

Hedge effectiveness

Example methodology – regression method

Measuring effectiveness using regression

- ▶ Hedge effectiveness may be assessed on a cumulative basis using regression analysis
- ▶ If highly effective, hedge accounting may be continued for all periods regardless of whether actual changes in value for the current period were outside an 80-125% band of correlation
- ▶ Regression may be used for both the prospective evaluation
- ▶ The regression analysis calculations should generally incorporate the same number of data points on a rolling basis

Hedge effectiveness

Example methodology – regression method (cont'd)

General Regression formula

$$y = \alpha + \beta x + \varepsilon$$

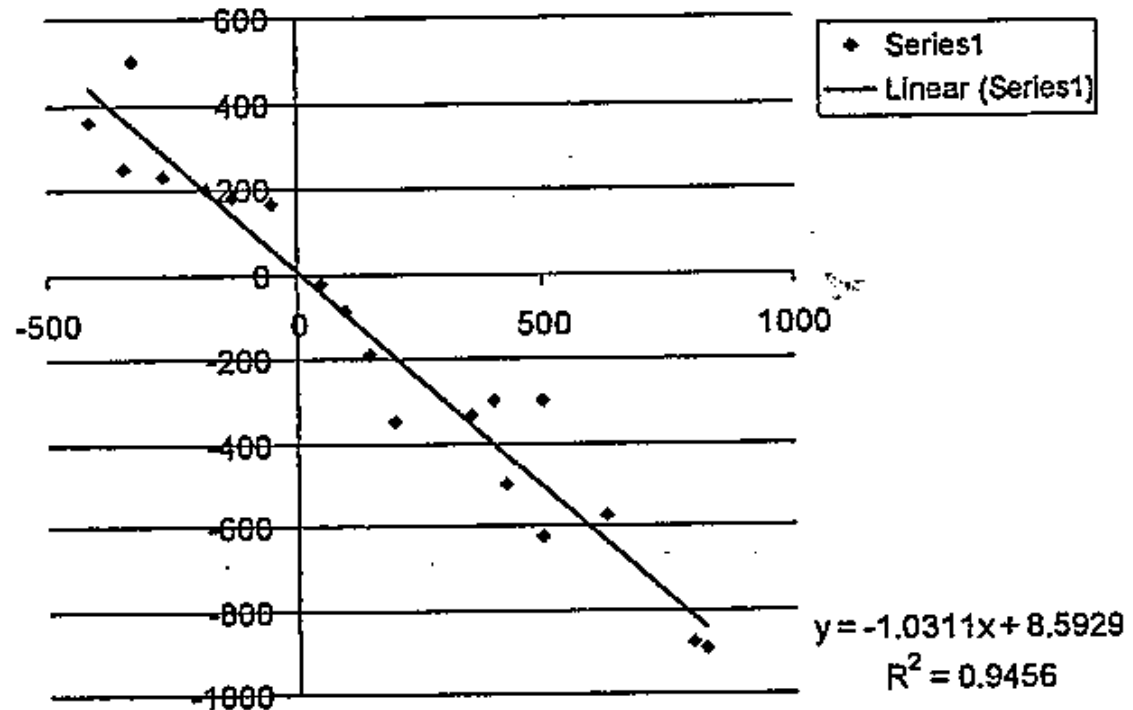
y: dependent variable
(or Δ hedged item)

x: independent variable
(or Δ hedging instrument)

α : intercept (value on y axis)

β : slope

ε : residual (or error term)



Hedge effectiveness

Example methodology – regression method (cont'd)

- ▶ R^2 = Key indicator of hedge effectiveness
 - ▶ The percentage of variance of the dependent variable that can be “explained” by the independent variable
 - ▶ Should be between 0.8 – 1.0
 - ▶ The higher R^2 the stronger the relationship is

Using R^2 output to calculate ‘ineffectiveness’

- ▶ Regression is only for assessing hedge effectiveness
- ▶ In effectiveness must be measured using actual fair value movements

Hedge effectiveness

Measurement of ineffectiveness

- ▶ Even if hedge is assessed as effective, any ineffectiveness needs to be recorded in P&L
- ▶ Fair value hedge: no need to calculate ineffectiveness separately, will go to P&L due to accounting entries
- ▶ Cash flow hedge: need to calculate ineffective portion
 - ▶ Effective portion in equity, remainder in P&L (ineffectiveness)
 - ▶ Equity = lower of cumulative change in fair value of hedging instrument and hedged item
- ▶ Net investment hedge: similar to cash flow hedge

Hedge effectiveness

Measurement of ineffectiveness (cont'd)

Common errors

- ▶ Hedge not 100% effective but no “ineffectiveness” recorded
- ▶ Cash flow hedges: recording of ineffectiveness where change in fair value of hedging instrument is smaller than the hedged item
- ▶ Fair value hedges: assumption that fair value changes attributable to the hedged risk = fair value changes of hedging instrument

Hedge accounting

Hedge documentation

- ▶ The final requirement is to document the hedge
- ▶ Specifically the documentation must set out the following key elements of a hedge relationship:
 - ▶ The entity's risk management strategy and objective for undertaking the hedge
 - ▶ Identification of the hedging instrument
 - ▶ Identification of the hedged item and hedged risk
 - ▶ Identification of the type of hedge relationship - cash flow or fair value
 - ▶ How the entity plans to assess hedge effectiveness
 - ▶ The date of designation

Hedge documentation

Example of fair value hedge documentation

- ▶ Bank O's functional currency is THB. On 1 January 2008, O borrowed USD50 million with a term of 5 years and annual coupon payment of 3%.
- ▶ Also on the same day, O enters into a 5-year cross-currency interest rate swap in which it will receive fixed USD at a rate of 3% on USD50 million and pay floating MLR minus 2% on THB1,575 million.
- ▶ There will be a final exchange of principal on maturity of the contract based on the initial USD1 : THB31.5 spot relationship between the Baht and USD (at maturity O will receive USD50 million and pay THB1,575 million).
- ▶ Both debt and swap pay annual coupons on December 31.

Hedge documentation

Example of fair value hedge documentation (cont'd)

Risk management objective and nature of risk being hedged	The objective of the transaction is to hedge the changes in the fair value of the foreign currency denominated debt related to changes in foreign currency exchange rates and the benchmark (USD Libor) interest rate.
Date of designation	1 January 2008
Hedging instrument	A five-year cross currency interest rate swap in which the bank will receive fixed USD at a rate of 3% on USD50 million and pay floating THB at MLR-2% on THB1,575 million. In addition, the agreement requires an exchange of the notional amounts at maturity.

Hedge documentation

Example of fair value hedge documentation (cont'd)

Hedged item	<p>The bank designates the cross-currency interest rate swap as a fair value hedge of the changes in the fair value of the loan due to both interest rate risk and foreign exchange risk.</p>
How hedge effectiveness will be assessed	<p>The hedge relationship is expected to be highly effective because the notional amount of the cross currency interest rate swap coincides with that of the debt and all cash flows coincide between the debt and the swap. Meanwhile USD Libor is deemed to be a component of the USD interest rate on the debt. Accordingly, no portion of the change in fair value of the cross-currency interest rate swap is expected to be ineffectiveness. Counterparty credit risk will be continuously monitored.</p>

Hedge accounting

Example of fair value hedge documentation (cont'd)

How hedge effectiveness will be measured

In accordance with fair value hedge accounting methodology under IAS39, the change in fair value of the debt attributable to changes in USD interest rate will be calculated and then this adjusted value will be remeasured at spot rate through earnings under IAS21. The change in the fair value of the cross currency interest rate swap is also recorded in earnings.

Hedge documentation

Example of cash flow hedge documentation

- ▶ Bank Z's functional currency is THB. On 1 January 2008, Z borrowed USD 100 million with a term of 5 years and annual coupon payment of 3%.
- ▶ Also on the same day, Z enters into a 5-year swap in which it will receive fixed USD at a rate of 3% on USD10 million and pay fixed THB at a rate of 4% on THB 315 million.
- ▶ There will be a final exchange of principal on maturity of the contract based on the original THB 31:USD 1 spot exchange rate.
- ▶ Both debt and swap pay annual coupons on December 31.

Hedge documentation

Example of cash flow hedge documentation (cont'd)

Risk management objective and nature of risk being hedged	The objective of the transaction is to hedge the changes in the cash flows of the foreign currency denominated debt related to changes in foreign currency exchange rates in order to fix the functional currency cash flows.
Date of designation	1 January 2008
Hedging instrument	A five-year cross currency swap in which the bank will receive fixed USD at a rate of 3% on USD50 million and pay fixed THB at a rate of 4% on THB1,575 million. In addition, the agreement requires an exchange of the notional amounts at maturity.

Hedge documentation

Example of cash flow hedge documentation (cont'd)

Hedged item	The bank designates the cross-currency swap as a cash flow hedge of the changes in the cash flows of the loan resulting from foreign currency risk
How hedge effectiveness will be assessed	<p>Because the notional amount of the cross-currency swap equals that of the debt and all cash flow dates and interest rates coincide between the debt and the swap, it is concluded that there should be no ineffectiveness in the hedge design.</p> <p>However, every period the bank will assess the counterparty credit risk and the continued probability of the hedged cash flows as to amount and timing.</p>

Hedge accounting

Example of cash flow hedge documentation (cont'd)

How hedge effectiveness will be measured

Ineffectiveness will be measured using the 'hypothetical derivative' method. This method compares the change in fair value of the designated hedging instrument to the change in fair value of the hypothetical derivative that has terms that exactly match the critical terms of the hedged item.

Because the notional amount of the cross-currency swap equals that of the debt, and all cash flow dates and interest rates coincide between the debt and the swap, the actual hedging instrument being used in this case is the same as 'hypothetical swap' with exactly matching terms.

Hedge accounting

Termination of hedge relationship

- ▶ Hedge qualification criteria no longer satisfied
 - ▶ Forecast transaction is no longer probable
 - ▶ Effectiveness is outside the 80-125% threshold
- ▶ Derivative expires or is sold, terminated, or exercised
- ▶ Hedge designation is removed by management

Hedge accounting

Termination of hedge relationship (cont'd)

- ▶ Fair value hedge:
 - ▶ Future gains or losses on the hedging instrument continues to be recognized immediately in P&L
 - ▶ The hedged item is no longer adjusted for its change in fair value
 - ▶ Amortise the life to date mark-to-market on the hedged item over the remaining life of the hedging instrument using effective interest rate
- ▶ Cash Flow Hedge:
 - ▶ Amounts remain in equity until hedged item impacts earnings unless it is probable that the forecast transaction will not occur (generally recognised in earnings immediately)
- ▶ Subsequent changes in the fair value of the derivative are recognised immediately in profit or loss (if de-designated or no longer effective)

Hedge accounting

Practical issues

Hedging issued debt

- ▶ Options embedded in debt which require separation will introduce P&L volatility
- ▶ Call features in interest rate swaps or debt

Hedging net investments in foreign operations

- ▶ Combination of debt and derivative designated as hedging instrument
- ▶ Permitted hedging instruments

Hedge accounting

Practical issues (cont'd)

Hedging foreign exchange exposure

- ▶ Is it more beneficial to not apply hedge accounting?
- ▶ Carefully choose hedge model
- ▶ Avoid tandem hedges
- ▶ Choose method of assessing effectiveness

Treasury centre hedging

- ▶ Hedging for other entities within the Group
- ▶ Internal derivatives must be linked to external counterparty
- ▶ Segment reporting

Hedge accounting

Practical issues (cont'd)

Hedged items

- ▶ The requirement for all items in a group to share the same risk exposure prohibits the hedging of a net position (also prohibited by the effectiveness testing requirements)
- ▶ However virtually all Banks, and many other companies, manage their risk on a net basis!!

Hedge accounting

Practical issues (cont'd)

Portfolio hedge

- ▶ IAS 39 suggests the same result can be achieved by hedging of portion of the gross position

Assets	100
Liabilities	(90)
Net position	10
Hedging instrument	10

- ▶ Instead of designating the hedging instrument as a hedge of the net position of 10, it should be designated as a hedge of 10 out of the 100 gross position
- ▶ In reality, the hedged item is unlikely to correspond perfectly to any of the gross positions. The requirement for all items in a group to share the same risk exposure prohibits the hedging of a net position (also prohibited by the effectiveness testing requirements)

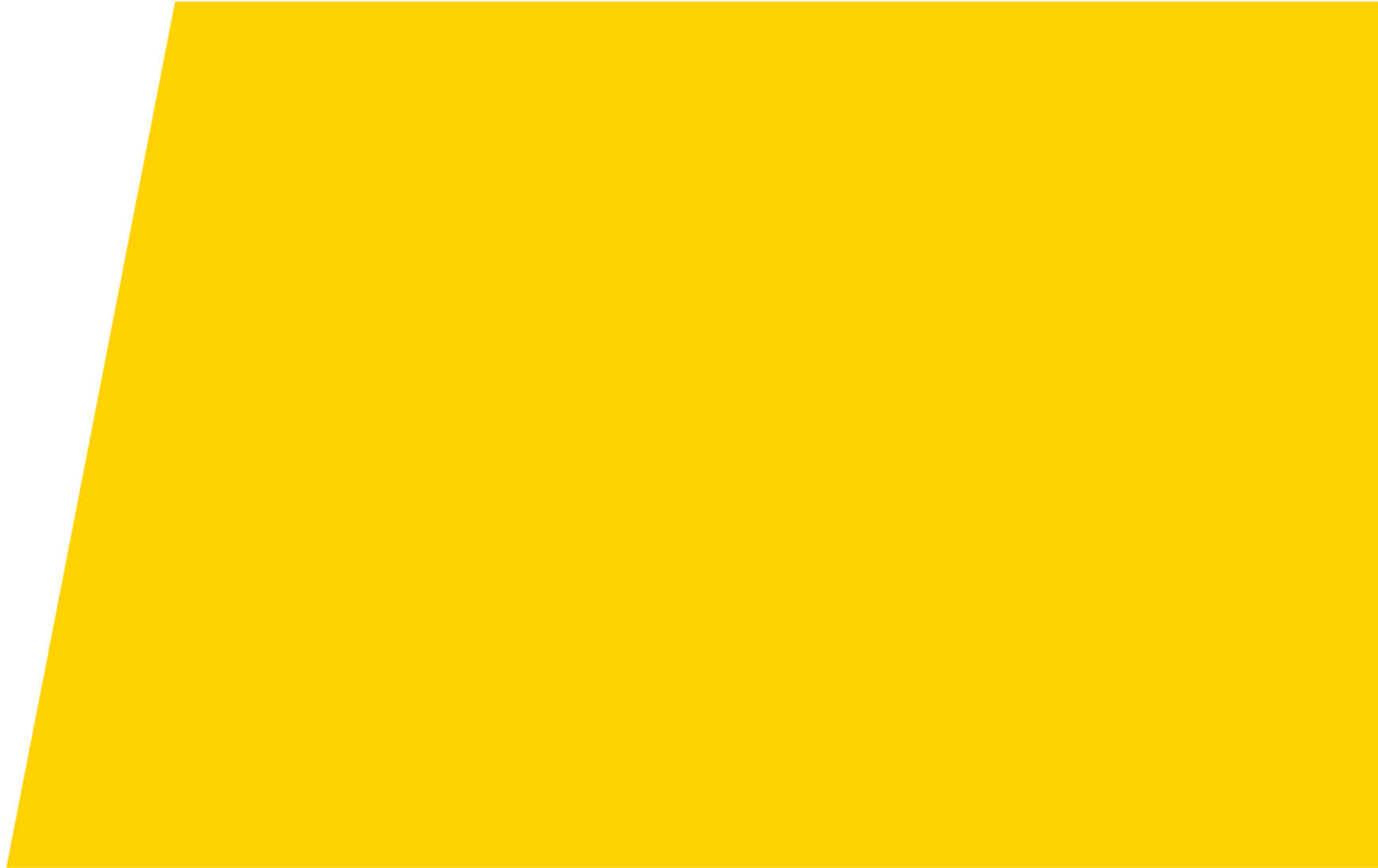
Hedge accounting

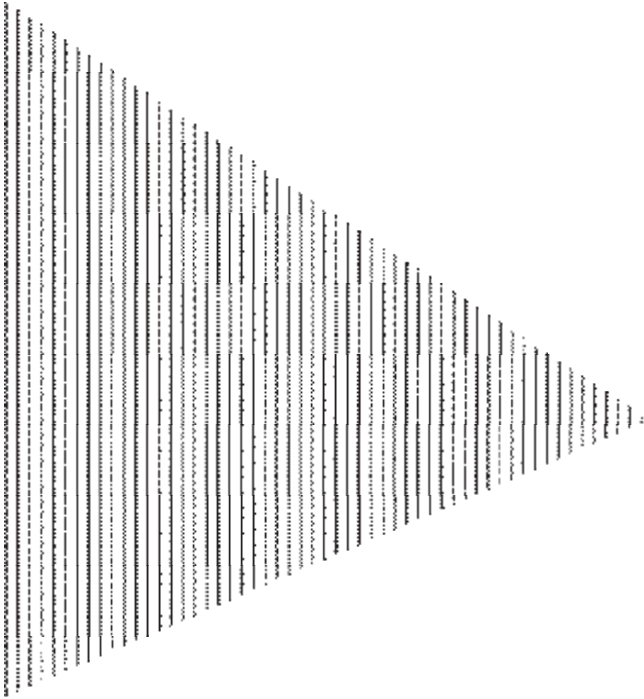
Practical issues (cont'd)

Hedge effectiveness

- ▶ To assign hedged risk – including or excluding credit spread/margin
 - ▶ Loan carries an interest rate of 6-month USD Libor + x%, the margin of x% represents credit spread of the borrower
 - ▶ To hedge only interest component (USD Libor component) or including credit spread
 - ▶ Hedge effectiveness would be increased should the designated hedged item be the interest component only, especially during the widen of credit spread
- ▶ Hedge effectiveness assessment
 - ▶ Illiquid currency (e.g. CNY) makes the valuation less reliable
 - ▶ Periodic or cumulative approach

Q&A





Thank you

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