FUNDING THE PROJECT, INTEREST RATE RISK

Borrowings, cash, short term investments and hedging the interest rates
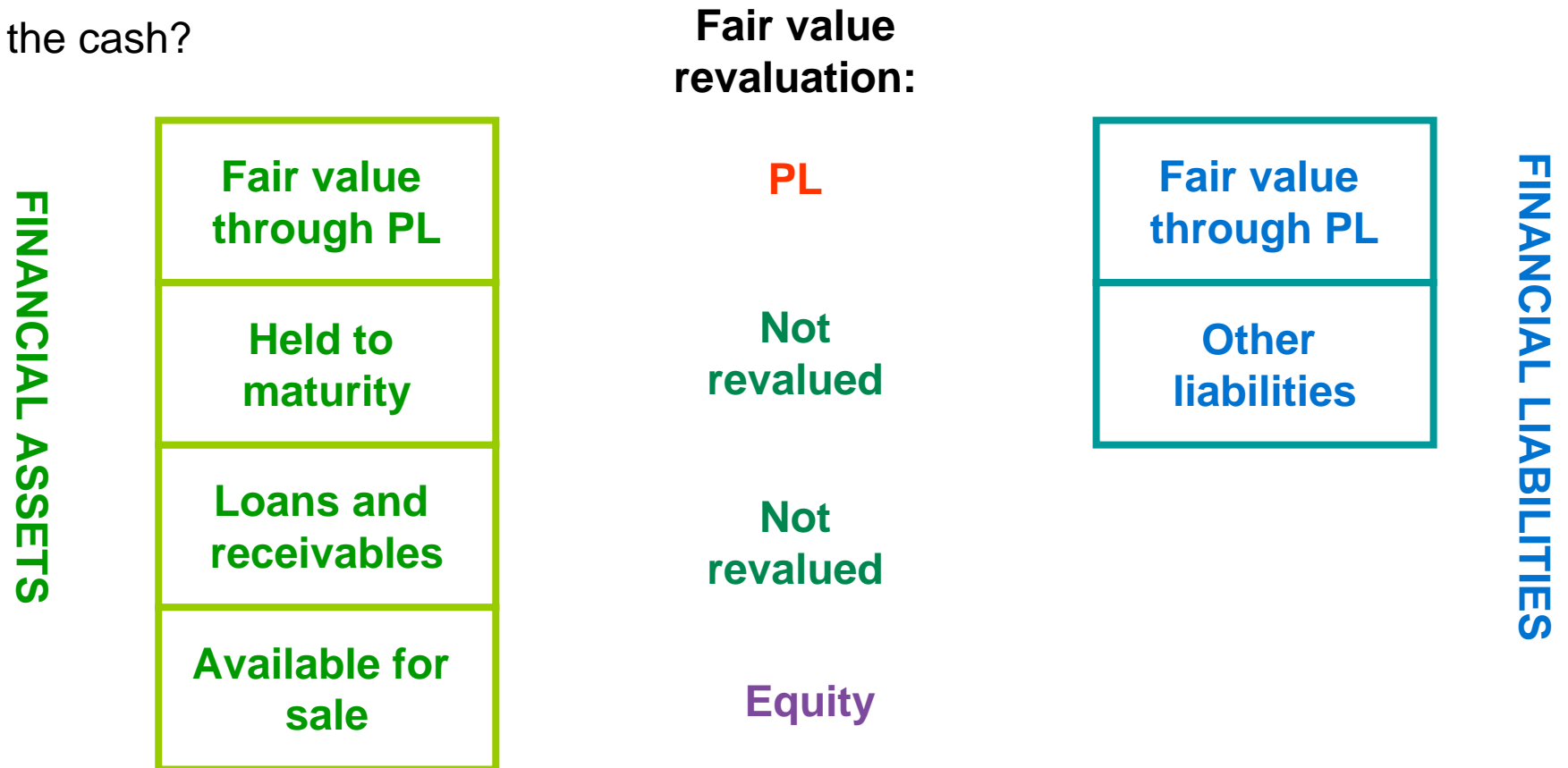
Funding the project

- Engine arranges a bank borrowing of £10m, with a bullet repayment in 4 years

- Expects interest rates to rise soon – enters into an interest rate swap ('IRS')

- Draws on the loan but does not need the cash for 6 months – invests in high quality corporate bonds

- Later sells the bonds and spends cash on incremental CAPEX for the project

Financial Instruments Measurement Categories – IAS 39

-How would the borrowing be classified?

-And the cash?

FINANCIAL ASSETS

Fair value through PL
Held to maturity
Loans and receivables
Available for sale

Fair value revaluation:

PL

Not revalued

Not revalued

Equity

FINANCIAL LIABILITIES

Fair value through PL
Other liabilities

How would a loan (or a deposit) be recorded at inception?

At fair value…

And Interest

£60

Principal

£1,000

Receive now

Loan @ inception

Interest (coupon)

£60   £60   £60

Year 1   Year 2   Year 3   Year 4   Time

- £1,000

Discounting at 6%

Total future cash flows: £1,240
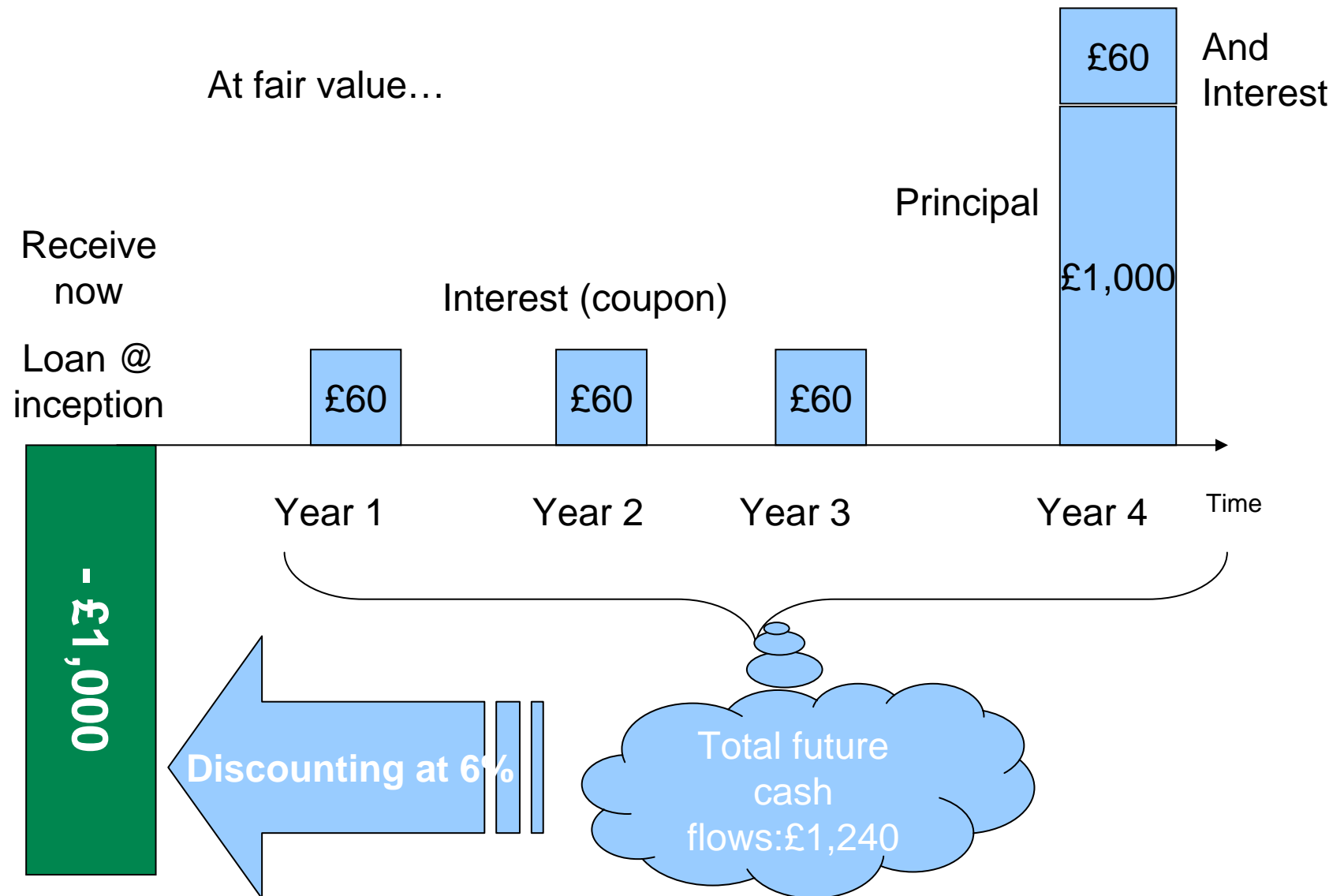
How would the investment in bonds be classified?
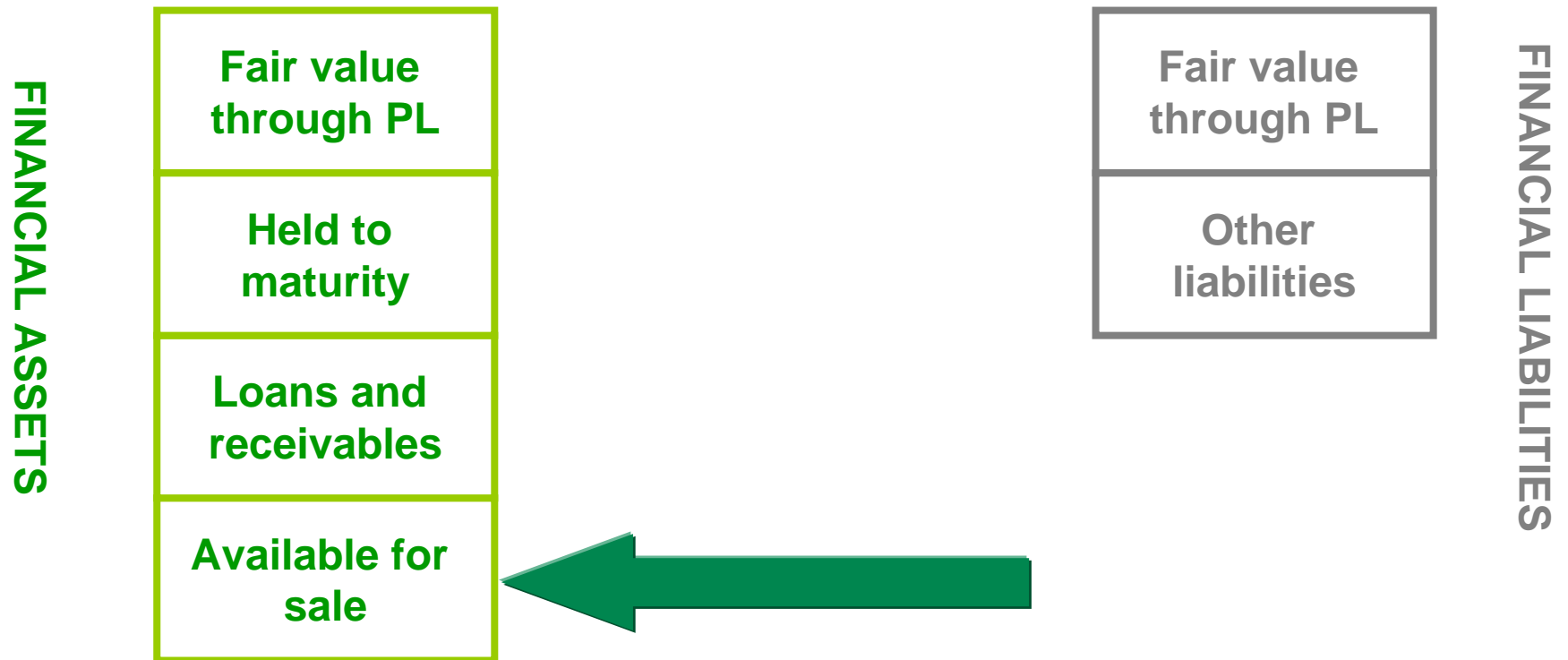
Corporate Bond Investment : Change in Fair Value due to Change in Market Interest Rates

@ end of year 1

And Interest

£60

Principal

£1,000

Future Interest (coupon)

Value now

Already happened

£60

£60

Year 1

Year 2

Year 3

Year 4

Time

Was £1,000

Now £901,

FV loss: £99

- £901

Discounting at 10%

Total future cash flows: £1,180
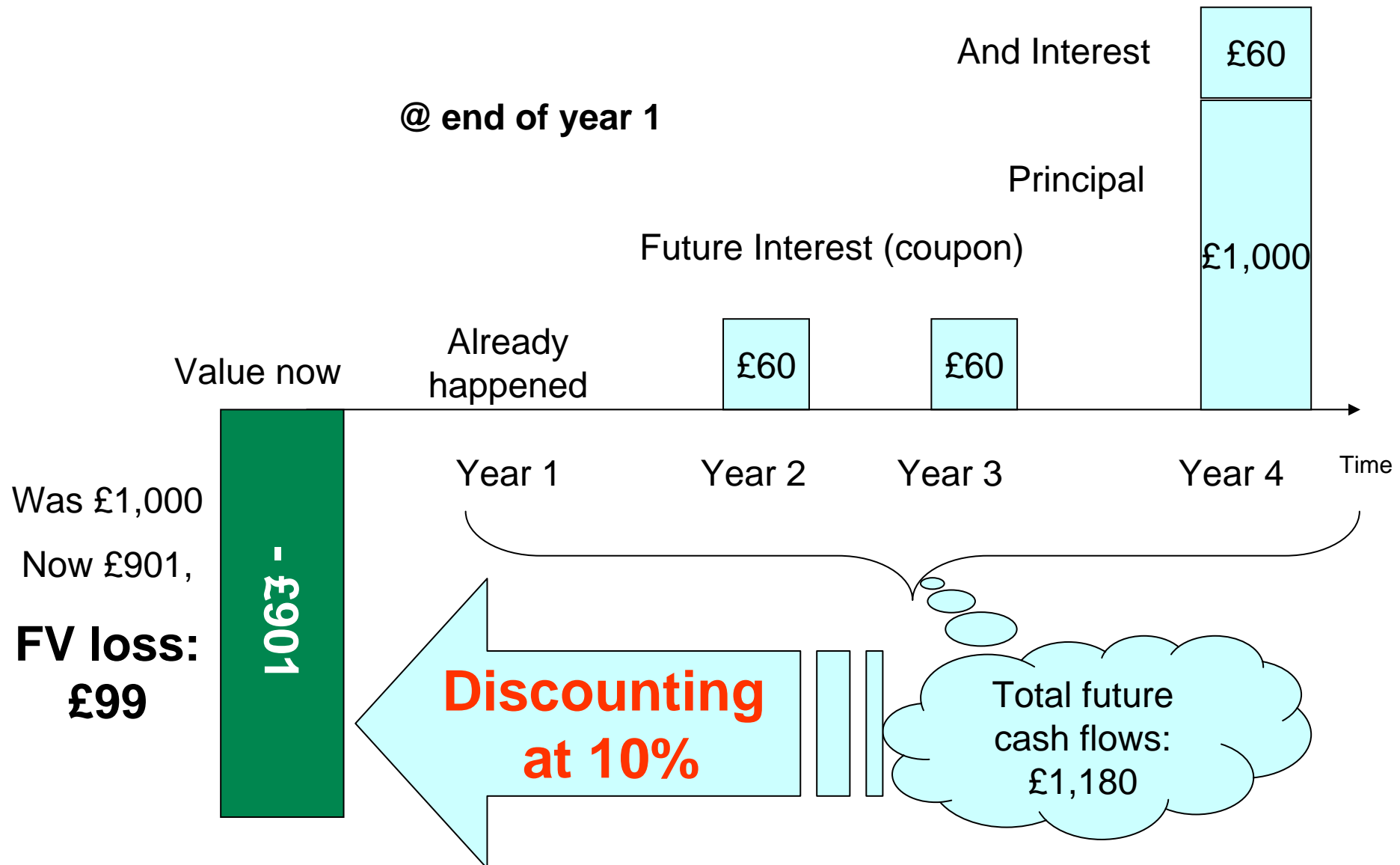
Available for Sale: ongoing

Equity   **Profit or loss**

£99
Fair value
Revaluation
loss

£60
Interest

Available for Sale: on sale of the investment

Equity

Profit or loss

£99
Fair value
Revaluation
loss

Funding the project – interest rate risk

- Borrowed £10m, bullet 4 years

- Expects interest rates to rise– enters into an interest rate swap

Interest rate exposure

Balance sheet

+ £10m Operating assets	- 10m Floating rate debt

Profit & Loss account

+ Fixed revenue (uncorrelated with i%)	- Floating interest
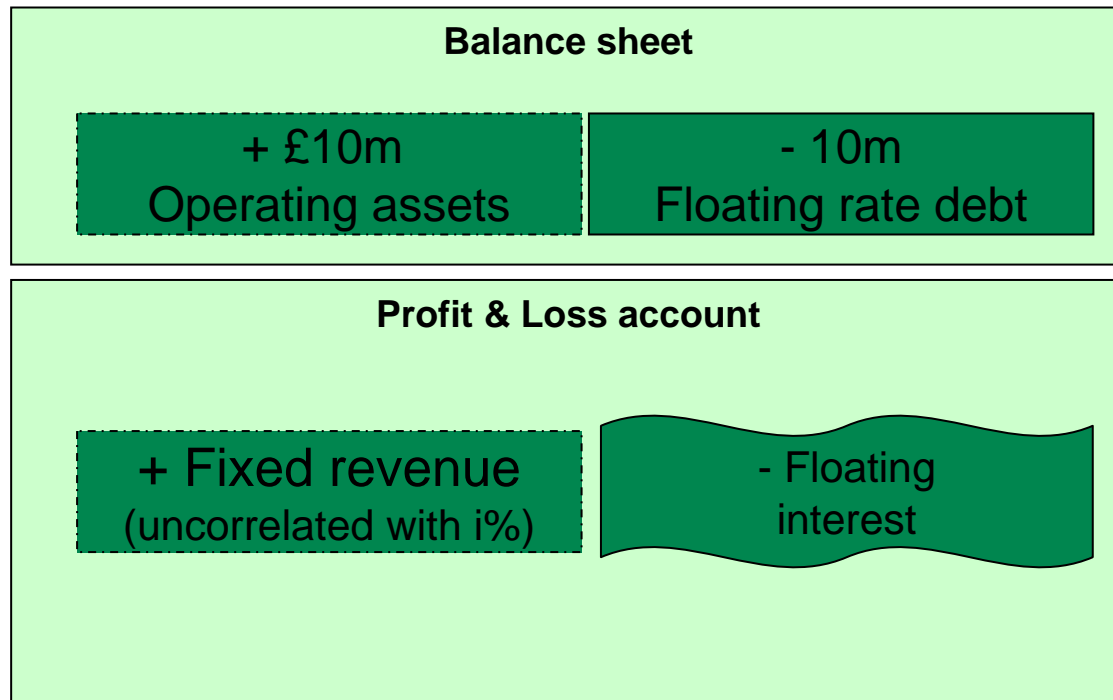
Cash Flow & Accounting Volatility

Revenue uncorrelated to interest vs. floating interest on debt

Interest rate hedge – before IFRS (UK GAAP)

Balance sheet

+ £10m Operating assets	-£10m Floating debt

Profit & Loss account

+ Fixed revenue (uncorrelated with i%)	+ floating interest (swap)
	- floating interest (debt)
	- Fixed i% (swap)

- Fixed i%
+ floating i% SWAP
(FV)

= Smoother cash flows and accounting profits
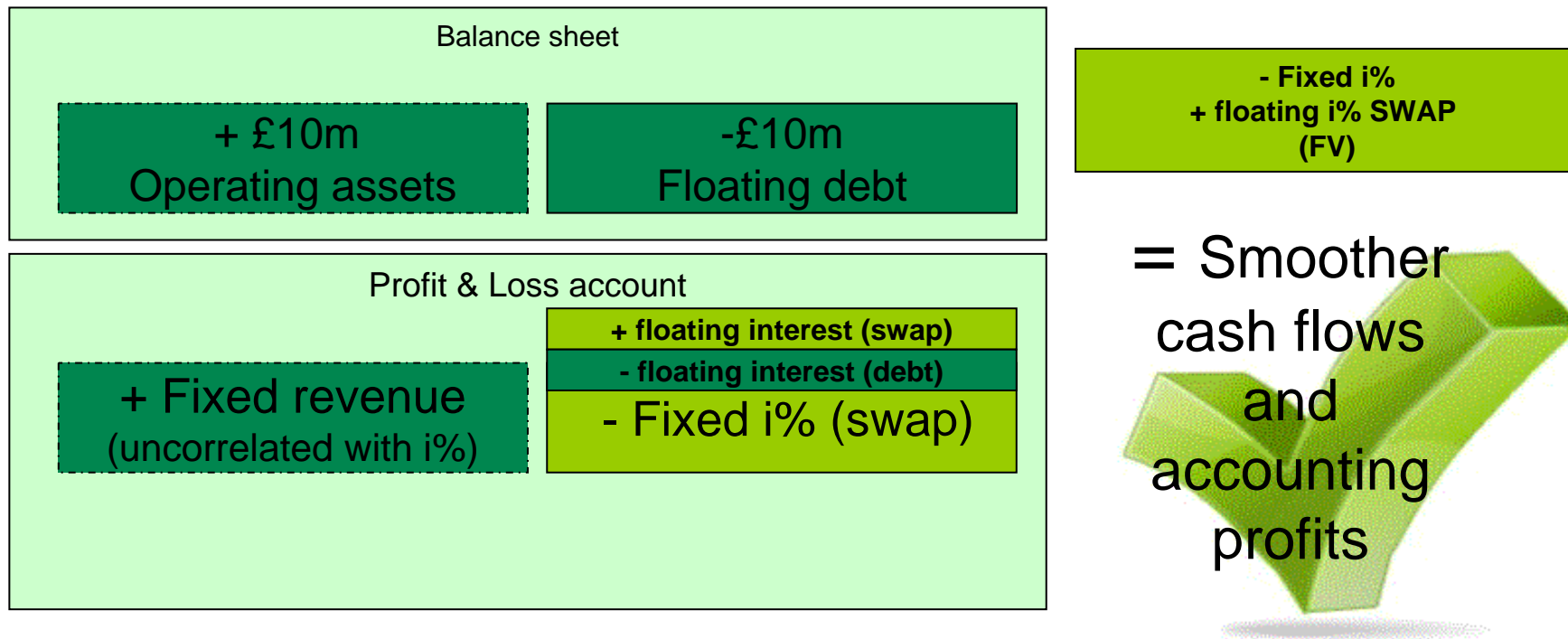
UK GAAP: swap is off BS, coupon accruals in P&L acct

Interest rate swap cash flow hedge - IFRS

Balance sheet

+ £10m Housing assets	- £10m Floating rate debt

£1.5m fair value - Pay Fixed + floating SWAP

=

Smoother Cash flows

Profit & Loss account

+ Fixed revenue (uncorrelated with i%)

- Floating interest

Acct Volatility – Float interest and swap FV
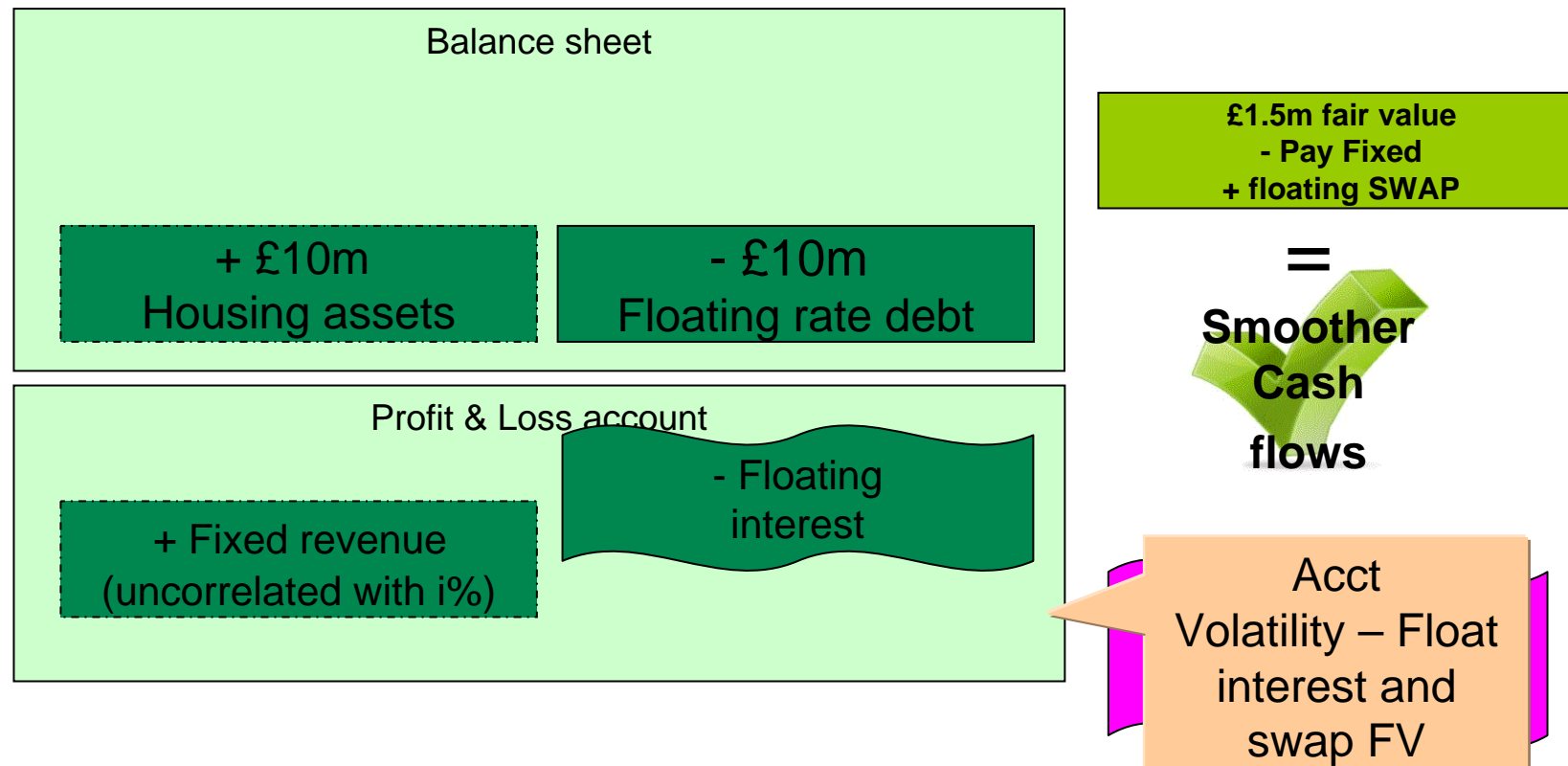
Assume swap fair value is £1.5m liability
Assuming hedge accounting not applied
Cash flow position is hedged
However P&L for the year will be volatile due to swap fair value movement

Cash flow hedge accounting

Balance sheet

Assets

Liabilities

£1.5m fair value
- Pay Fixed
+ floating SWAP

+ £10m
Operating assets

- £10m
Floating rate debt

Equity

Profit & Loss account

+ Fixed revenue
(uncorrelated with i%)

- Fixed interest
Charge (per the swap)

Release to P&L

Dr £1.5m change in FV
- Pay Fixed
+ floating SWAP
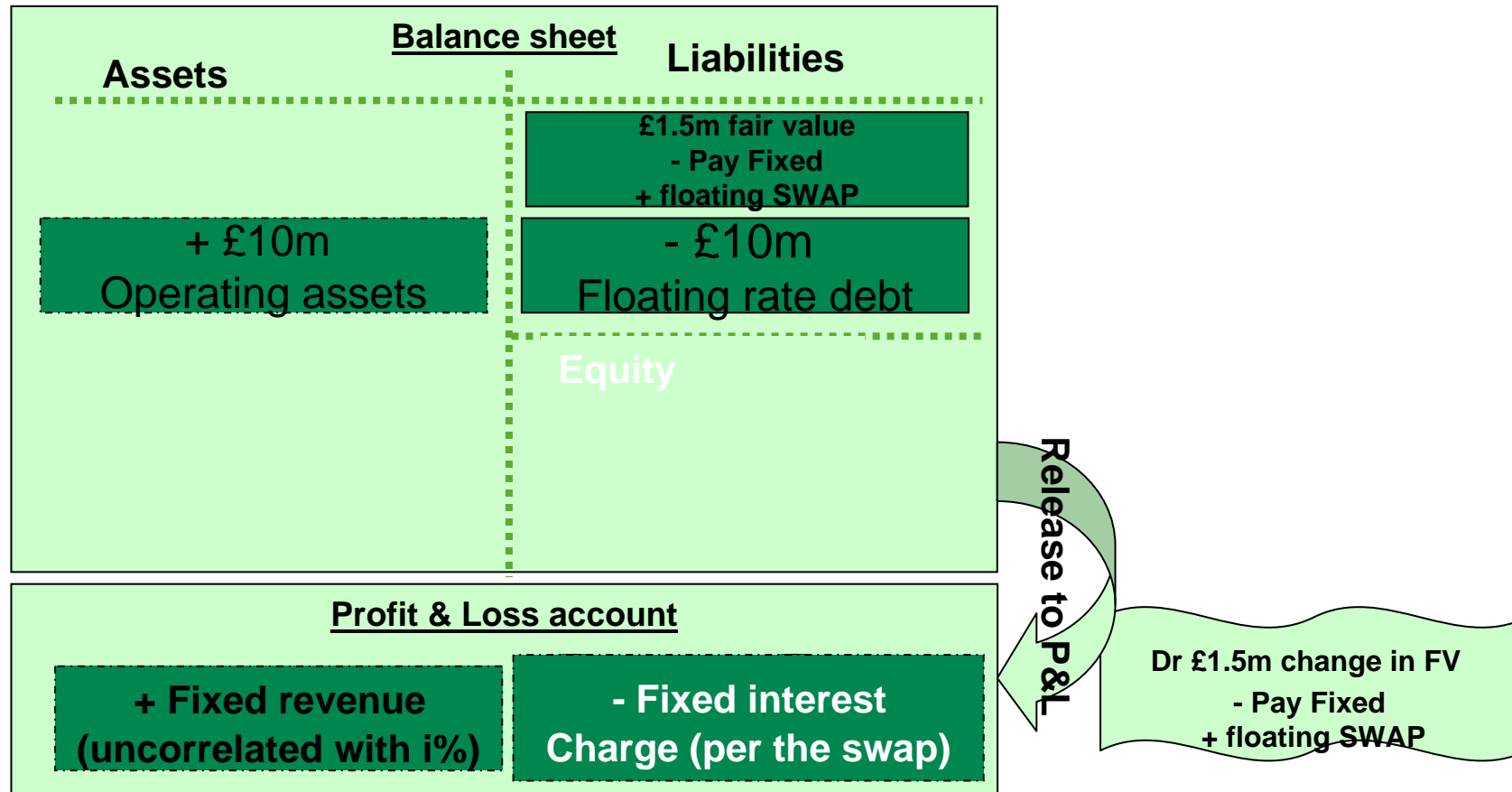
CFH accounting allows to "park" fair value of the swap in equity
And then release a portion to P&L to reflect the hedged rate

Hedge effectiveness test for IRS – an example

Cashflow Hypothetical Derivative Effectiveness Analysis Report

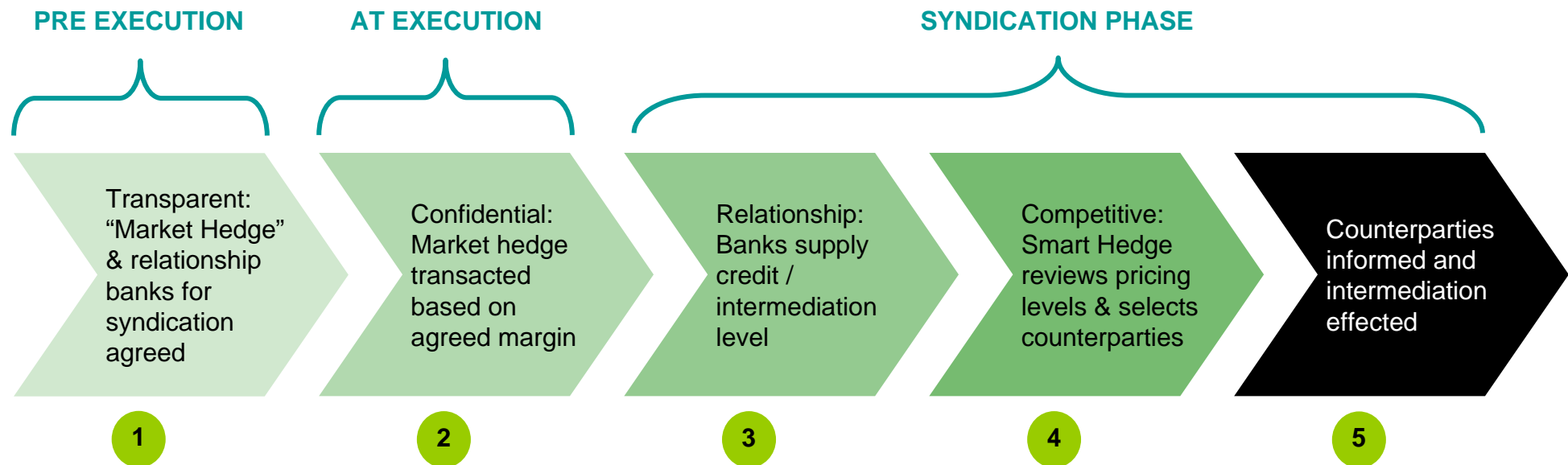|	
Designation Date:	13/05/11
Hedge Type:	Cashflow
Ratio Test:	from 0.800 to 1.250
Hedge Instrument Id:	1550 - 4 YR SWAP: PAY 1.99959% GBP RCV 3M LIBOR GBP 10.0 M MAT: 21-MAY-2015
Hypothetical Derivative Id:	1551 - 4 YR SWAP: PAY 1.99959% GBP RCV 3M LIBOR GBP 10.0 M MAT: 21-MAY-2015
Hedged Item Id:	1552 - 5 YR FLOATING RATE DEBT: PAY 3M LIBOR +XXX bp GBP 10.0 M MAT: 21-MAY-2017
Reporting Period:	13/05/2011 to 17/05/2012
Assessment Currency:	GBP

Period	Hedge Instrument Entire FMV	Periodic Change	Hypothetical Derivative Periodic Change	Cumulative Change	Ratio of Cumulative Change	Effective	Periodic Ineffective Portion Earnings	Periodic Effective Portion OCI
13/05/11	0							
30/06/11	-68,319	-68,319	-68,319	-68,319	1	Yes	0	-68,318.54
30/09/11	-283,371	215,052	-215,052	-283,371	1	Yes	0	-215,052.44
30/12/11	-291,953	-8,582	-8,582	-291,953	1	Yes	0	-8,581.92
30/03/12	-274,723	17,230	17,230	-274,723	1	Yes	0	17,229.77
Total for 13/05/2011 - 30/03/2012							0	-274,723.12

Key Phases Of A Swap Underwrite And Syndication

PRE EXECUTION

AT EXECUTION

SYNDICATION PHASE

Transparent: "Market Hedge" & relationship banks for syndication agreed	Confidential: Market hedge transacted based on agreed margin	Relationship: Banks supply credit / intermediation level	Competitive: Smart Hedge reviews pricing levels & selects counterparties	Counterparties informed and intermediation effected
1	**2**	**3**	**4**	**5**

The hedging/hedge accounting process

1. Defining the hedge structure

2. Testing it against IAS 39 criteria

3. Exploring the impact of not applying hedge accounting

4. Design desired solution

5. Producing hedge documentation

6. Prospective hedge effectiveness testing

7. Retrospective hedge effectiveness testing

8. Accounting journal entries

Reliable measurement of effectiveness

FORMAL DESIGNATION

formal hedge documentation + risk management policy

The hedge is expected to be and is highly effective
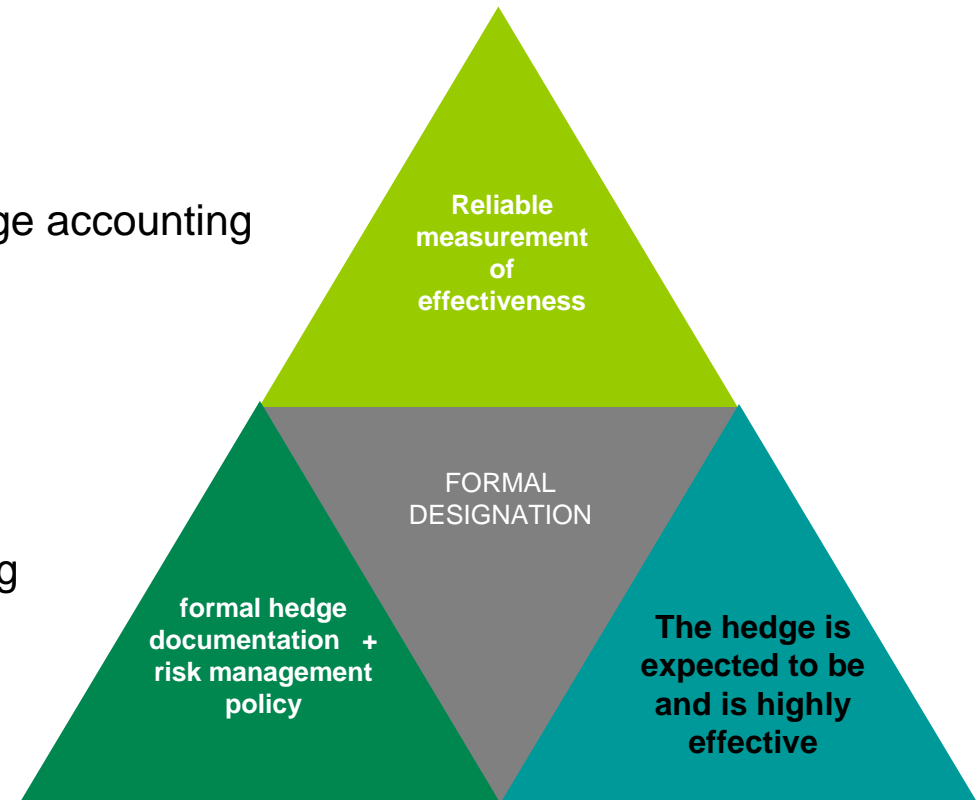
IAS 39 requires hedge effectiveness between 80-125%:

Requires hedge effectiveness between 80-125%:

No hedge accounting (P&L)

125% ─────────────────────────

Ineffectiveness to P&L

Hedge Effectiveness

100% ─────────────────────────

CF: No Ineffectiveness
FV: Ineffectiveness to P&L

80% ─────────────────────────

No hedge accounting (P&L)
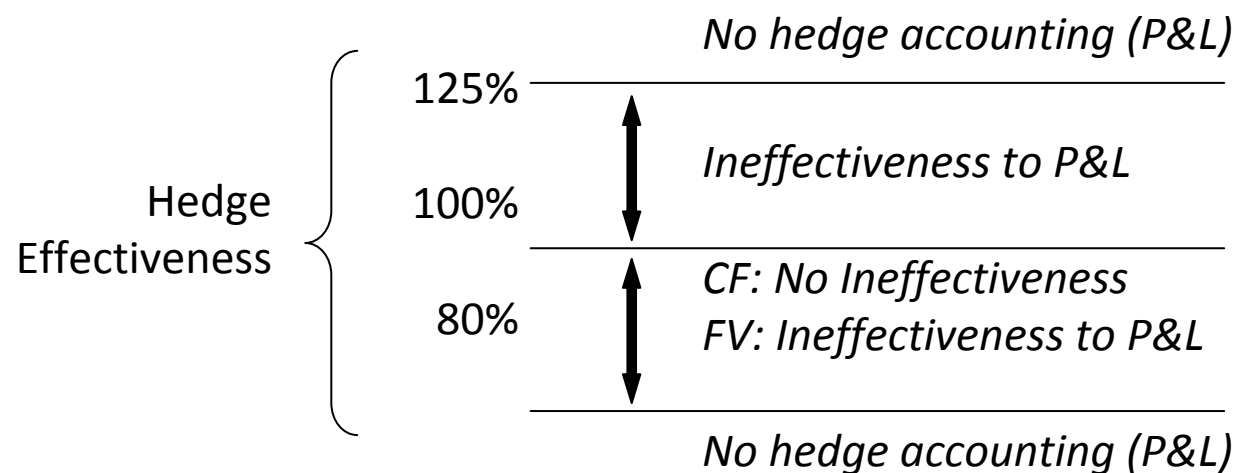
Regression parameters

R-squared >.8

Slope   0.8 to 1.25

IAS 39.96 Cash flow hedge lesser of the cumulative change

IAS 39 – Overview of the CFH and other models

Hedge Type	How is P&L fair value volatility neutralised	Timing of income statement recognition of deferred derivative gains/losses
Cash Flow Hedge	**Remove volatility from Income statement – post it to equity**	**When underlying cash flow occurs**
Net Invest. Hedge	Remove volatility from Income statement – post it to equity	Upon disposal of underlying net investment
Fair Value Hedge	Show fair value of underlying item in balance sheet and post changes to income statement to offset those of the derivative	N/A

Note: CFH and NIH still impact ratios involving equity and the reserves available for dividend payments

Objective is to remove volatility from the income statement

HEDGING THE FX RISKS OF THE PROJECT

Protecting the downside FX value of future cash flows

Hedging FX

Engine decides to use FX options to hedge FX risk of USD purchases

- Matching maturity and amount and currency

- Designated as cash flow hedges

- Intrinsic value basis

Delivery of components to Energy Ltd is delayed, the USD cash flows occur 2 months late

- Energy would need to amend the hypothtical derivatives, keep hedge relationship, little impact on effectiveness

Options rolled into forwards

Forwards settled net

Hedge designation: FX options

Future US$
cash flow

-10 US$

May 2011 ——————→ Jan 2012

Time Value

Intrinsic
Value

Option to buy
+10 US$ buy £

May 2011 ——————→ Jan 2012
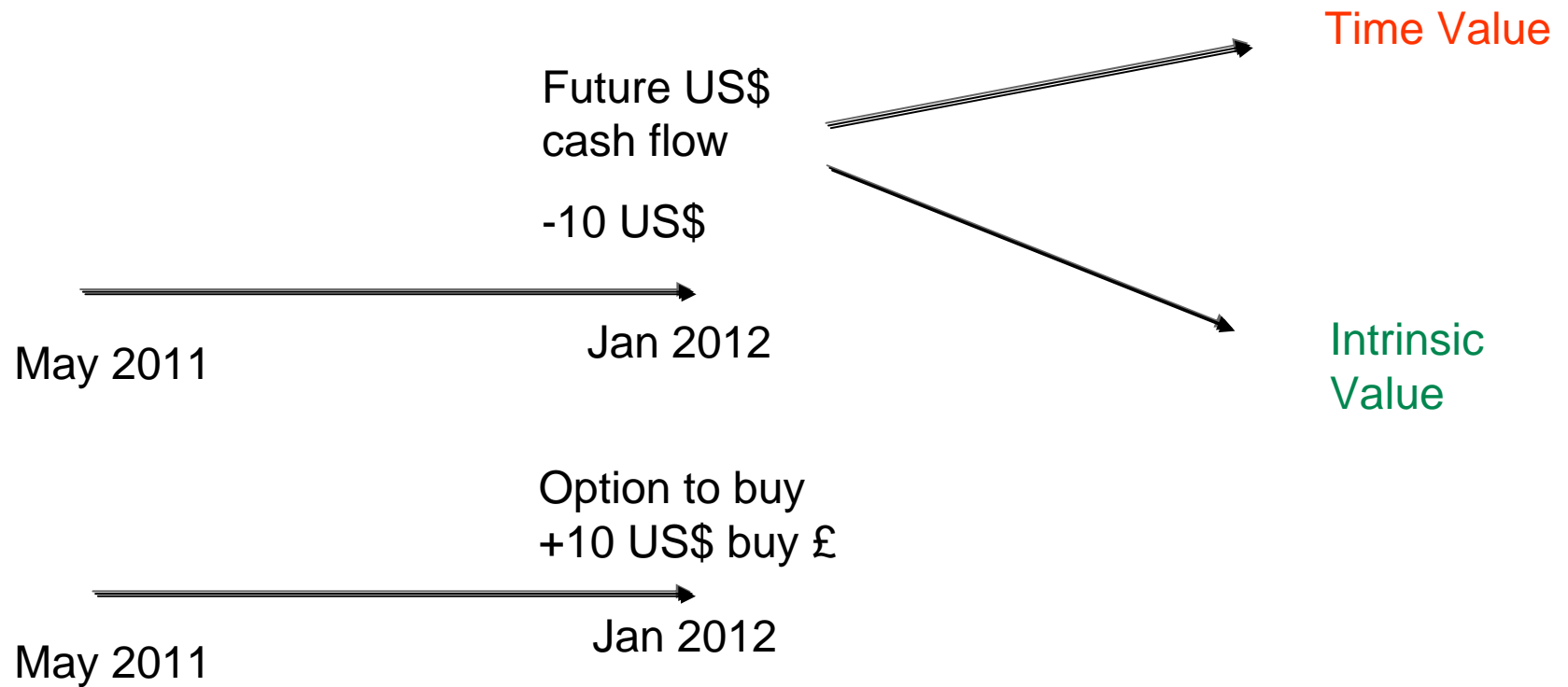
Hedge Effectiveness Report for an FX Option

Cashflow Hypothetical Derivative Effectiveness Analysis Report

Date Created:	16/05/12 05:26
Link Id:	444
HedgeAcct Standard:	IAS
Hedge Type:	Cashflow
Link Type:	Actual
Link Entity:	GBP ENTITY
Assessment Method:	Hypothetical Derivative
Prospective Assessment:	Cumulative Change
Retrospective Assessment:	Cumulative Change
Assessment Frequency:	Quarterly
Ratio Test:	from 0.800 to 1.250
Option Effectiveness Method:	Intrinsic
FX Effectiveness Method:	Spot Undiscounted
Hedge Instrument Id:	1547 - LONG 10.0 M USD CALL/GBP PUT STRIKE: 1.612765 EXPIRY: 17-JAN-2012
Hypothetical Derivative Id:	1548 - LONG 10.0 M USD CALL/GBP PUT STRIKE: 1.612765 EXPIRY: 17-JAN-2012
Hedged Item Id:	1549 - PAY 10.0 M USD ON 18-JAN-2012
Proportion:	100%
FX Risk:	Designated
Reporting Period:	13/05/2011 to 15/05/2012
Assessment Currency:	GBP

	Hedge Instrument	Hedge Value		Excluded Component		Included Component			Hypothetical Derivative INTRINSIC VALUE		Ratio of		Net Periodic Earnings TIME VALUE	Periodic Effective INTRINSIC VALUE Equity Cash flow hedge reserve
		Periodic Change				Included Component INTRINSIC VALUE			Included Component INTRINSIC VALUE					
	Entire FMV			Time Value	Periodic Change	Intrinsic	Periodic Change	Cumulative Change	Periodic Change	Cumulative Change	Cumulative	Effective		
13/05/11	216,087			216,087		0								
30/06/11	206,749	-9,337		182,181	-33,906	24,568	24,568	24,568	24,568	24,568	1	Yes	-33,905.53	24,568.22
30/09/11	274,209	67,460		74,741	-107,440	199,469	174,900	199,469	174,900	199,469	1	Yes	107,440.12	174,900.40
30/12/11	254,344	-19,865		2,014	-72,727	252,330	52,862	252,330	52,862	252,330	1	Yes	-72,727.31	52,861.84
30/03/12	0	-254,344		0	-2,014	0	-252,330	0	-252,330	0	1	Yes	-2,013.56	-252,330.46
Total for 13/05/2011 - 30/03/2012													-216,086.52	0

FX Option – Hedge Accounting Journals

Cashflow Hypothetical Derivative Effectiveness Analysis Report								
	Hedging Instrument				Ratio of		Net Periodic Earnings	Periodic Effective INTRINSIC VALUE
		Excluded Component		Included Component			TIME VALUE	Equity Cash flow hedge reserve
	Entire FMV	Time Value	Periodic Change	Intrinsic	Cumulative Change	Effective		
13/05/11	216,087	216,087		0				
30/06/11	206,749	182,181	-33,906	24,568	1	Yes	-33,905.53	24,568.22
30/09/11	274,209	74,741	-107,440	199,469	1	Yes	-107,440.12	174,900.40
30/12/11	254,344	2,014	-72,727	252,330	1	Yes	-72,727.31	52,861.84
30/03/12	0	0	-2,014	0	1	Yes	-2,013.56	-252,330.46
Total From May 2011 until maturity							-216,086.52	0