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A Closer Look
Hedge accounting with financial options and structured derivatives

Introduction

This month the International Accounting Standards Board (IASB) issued a draft of the new proposals for hedge accounting under IFRS. These long awaited reforms will eventually form part of the new standard on financial instrument accounting, IFRS 9, and are expected to be effective from 1 January 2015. The draft will be available on the IASB website until early December.

The IASB has proposed a number of significant changes to the current IAS 39 hedge accounting requirements. The overall effect will be more opportunities to apply hedge accounting and consequently less profit or loss volatility arising from risk management activities. To date, the restrictive accounting rules has led to some companies not applying hedge accounting or in some cases changing their risk management approach to become eligible. Hence, the lifting of these restrictions could prompt changes in risk management and more application of hedge accounting.

To highlight the practical effect of some of the new proposals we have written a series of examples contrasting the current IAS 39 requirements with the new proposals. This publication is the first in that series and will explore the changes to:

- the accounting of financial options designated as hedging instruments; and
- the hedge effectiveness assessment requirements.

The next in the series will consider changes to the eligibility of risk component hedging for non-financial items.

The examples below compare the proposed new hedge accounting rules with IAS 39 in respect of a hedging relationship which includes one of the following four hedging instruments:

- A vanilla forward contract.
- A vanilla purchased option.
- A zero-premium collar (or zero-cost collar).
- A zero-premium structured option contract (or "forward extra" contract).[1]

The examples below focus on an exposure to oil price risk, however, the principles in this paper could equally apply to other price or rate risk (eg foreign currency risk).

For simplicity it is assumed there is no basis risk between the oil specified in the derivative and the forecast purchase. Note that the numbers used in these examples are for illustrative purposes only. All hedging instruments are net settled in cash.

The risk management objective

The following examples consider an entity that is exposed to price changes of oil because it buys oil in the spot market to use in its business. For simplicity it is assumed that the oil is consumed and the cost expensed on the day it is physically received.

The risk management policy approved by the board of directors allows the entity to either fix the price of oil using forward contracts or protect itself from rising oil prices using purchased financial options. The risk management objective is to ensure the overall price achieved, including any fees or option premiums, is equal to or better than the budgeted price (internally set).

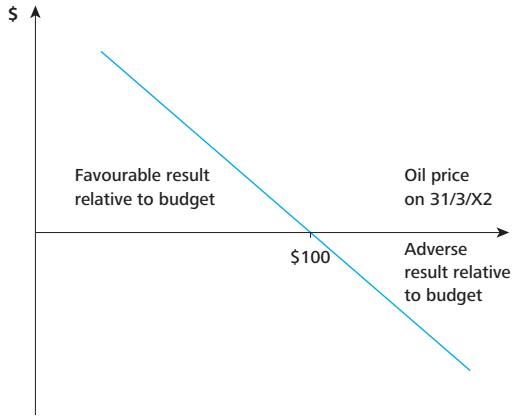
Budgeted prices will be higher than the projected forward rate at the time the budget is set. Hence there will be some discretion over which hedging instruments to use (ie the budgeted price has some headroom for option premiums to be incurred). Due to the entity's in-house expertise it itself has a view on future oil prices which will influence the hedging strategy adopted within the boundaries of the budgeted price.

1 The options described in this paper are European style options which can only be exercised at maturity and are based on the contingent features (i.e. the 'triggers') being met at maturity

Description of specific hedged item

The specific item hedged is a highly probable forecast purchase of 100k barrels of oil to be purchased in the spot market on 31 March 20X2. The date that the hedge is entered into is 1 July 20X1 and the entity's year-end is 31 December 20X1. The graph below shows the profile of the exposure to oil prices relative to the budget price of $100.

Figure 1. Forecast cost/benefit relative to budgeted price of $100



Hedging with a vanilla forward contract

The table below summarises the terms of the forward contract. The contract locks in the price of oil for 100k barrels at the forward rate (on the trade date) of $90 per barrel and has a fair value of nil at inception. The graphs below illustrate the pay-off profile of this instrument and the net result when combined with the hedged risk based on budgeted price.

Trade date:	1 July 20X1
Maturity:	31 March 20X2
Nominal:	100k barrels of oil
Price:	$90
Premium:	Nil
Settlement:	Net cash settlement

Figure 2. Net gain/loss profile of forward contract

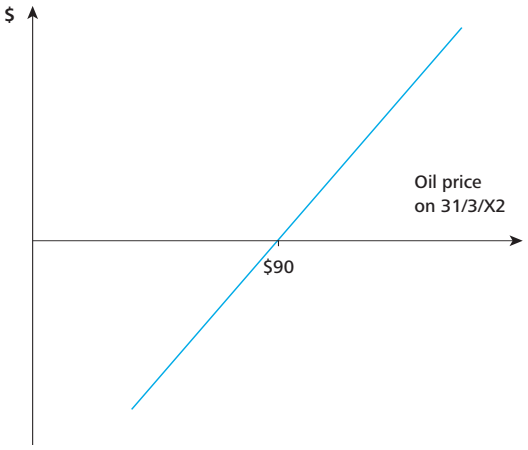
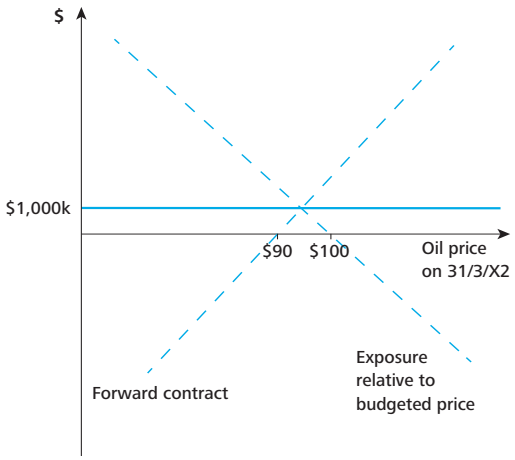


Figure 3. Net gain/loss relative to budgeted price of $100



The benefit of this hedging instrument is that the overall cost of oil is fixed at $90 per barrel and also has no initial outlay at inception of the hedge. However, this instrument does not allow the entity to participate in any potential favourable decrease in oil price.

Hedge accounting with this instrument under IAS 39

- Hedge accounting is straight forward with this instrument. The designated hedge would be a cash flow hedge of a highly probable forecast transaction and the hedge must be formally designated in a hedging relationship.
- Assuming matched terms, the hypothetical derivative (if this method for assessing effectiveness is used) will have the same terms as the actual hedging instrument and so effectiveness will be high. Effective gains or losses will be deferred in other comprehensive income (OCI) and reclassified to profit or loss when the hedged item affects profit or loss.
- A prospective effectiveness assessment will be required and in this case may be performed on a critical terms matching basis.
- A retrospective effectiveness assessment will be required to be performed on a quantitative basis.
- Actual hedge ineffectiveness, including the effects of credit risk if any, must be measured and recognised in profit or loss.

Hedge accounting with this instrument under proposed IFRS 9

The application of hedge accounting under IFRS 9 will be similar to IAS 39, however, some points to note include:

- Only prospective effectiveness will need to be assessed as retrospective effectiveness testing is not required under IFRS 9 (hedge ineffectiveness must still be measured).
- The hedging relationship may not be subsequently de-designated unless the hedging instrument is terminated or expires or there is a change in the risk management objective for the hedged item, hedging instrument or both.
- Additional hedge accounting disclosures will be required.

Hedging with a purchased financial option

This contract gives the entity the *option* to purchase 100k barrels of oil at the price of $95 per barrel. This option has an initial premium cost to the entity of $500k and is out of the money at inception. The overall protected price of this strategy is $100 per barrel ($95 protected price plus $5 premium per barrel ($500k/100k)).

The graphs below illustrate the net gain/loss of this instrument and the net result when combined with the hedged risk based on budgeted price.

Trade date:	1 July 20X1
Maturity:	31 March 20X2
Nominal:	100k barrels of oil
Strike price:	$100
Premium:	$500k
Settlement:	Net cash settlement

Figure 4. Net gain/loss on purchased option

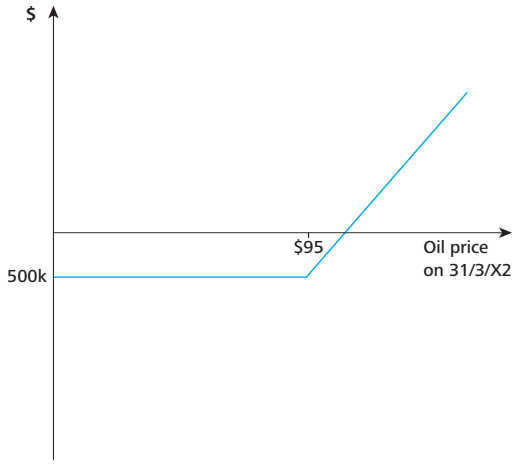
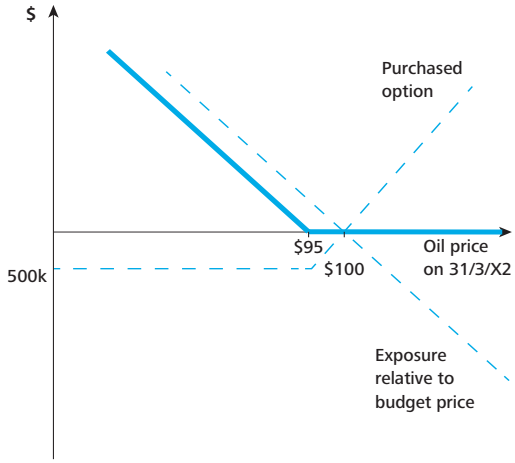


Figure 5. Net gain/loss relative to budgeted price of $100



The benefit of using purchased options to hedge is that the price of the oil is capped whilst allowing the entity to benefit from a subsequent fall in price. This benefit, however, comes at a cost as a premium is payable at the outset.

Hedge accounting with this instrument under IAS 39

- Hedge accounting is again relatively straight forward with this instrument. The instrument is an eligible hedging instrument as it is not a net written option. The designated hedge would be a cash flow hedge of a highly probable forecast transaction for price increases above the capped price of $95 per barrel (i.e. a one-sided risk). The hedge must be formally designated in a hedging relationship.
- The time value of the hedging instrument would usually be excluded from the hedging relationship to enhance hedge effectiveness as this time value is not replicated in the hedged item. Hence only intrinsic value of the hedging instrument would be designated in the hedge.
- The change in time value of the option would therefore be directly recognised in profit or loss on a fair value basis, hence giving rise to volatility in profit or loss.
- Assuming matched terms, the hypothetical derivative will have the same critical terms as the actual hedging instrument and so effectiveness for the designated intrinsic value will be high. Effective gains or losses will be deferred in OCI and reclassified to profit or loss when the hedged item affects profit or loss.
- A prospective effectiveness assessment will be required and in this case may be performed on a critical terms matching basis.
- A retrospective effectiveness assessment will be required to be performed on a quantitative basis.
- Actual hedge ineffectiveness must be measured and recognised in profit or loss.

Hedge accounting with this instrument under the proposed IFRS 9

- The main difference to the application of hedge accounting under the proposed IFRS 9 will be the accounting of the time value of the hedging instrument as noted below.
- Assuming matched terms between the hedging instrument and the hedged item, the change in time value of the option would be recognised in OCI until the occurrence of the forecast transaction (assumed to be the same date as maturity of the option).[2] Hence compared to IAS 39, the profit or loss volatility arising from the time value is eliminated and is instead recorded in OCI.
- At maturity the time value of the option will be nil, hence the amount accumulated in OCI will be $500k.
- When the forecast transaction occurs the accumulated time value, along with any intrinsic value deferred (i.e., if the option matures in-the-money) will be removed from equity and recorded as part of the hedged item which gets recognised in profit or loss. Hence the $500k cost of the option ultimately gets recorded in profit or loss but in a way that gives rise to less volatility in profit or loss.
- The additional IFRS 9 requirements in respect of effectiveness testing, de-designation and disclosures (as noted above for forward contracts) would also apply.

2 Note that this hedge is treated as a "transaction related hedge". The mechanics for a time-period related hedge are different. See paragraph B6.5.29 of the draft.

Hedging with a zero-premium collar

This contract is a combination of a purchased option and a written option. The terms of the purchased option are the same as the purchased option described above except the protected price is $100. The terms of the written option requires the entity to purchase 100k barrels of oil at the price of $80 per barrel if the option is exercised by the option holder (which will be the case if the market price per barrel is less than $80). The option premium that would be paid for the purchased option ($500) is offset by the premium that would be received ($500) under the written option resulting in the combined collar contract having a nil premium.

The graphs below illustrate the net gain/loss on this instrument and the net result when combined with the hedged exposure based on the budgeted price.

Trade date:	1 July 20X1
Maturity:	31 March 20X2
Nominal:	100k barrels of oil
Upper strike price:	$100
Lower strike price:	$80
Premium:	nil
Settlement:	Net cash settlement

Figure 6. Net gain/loss on collar contract

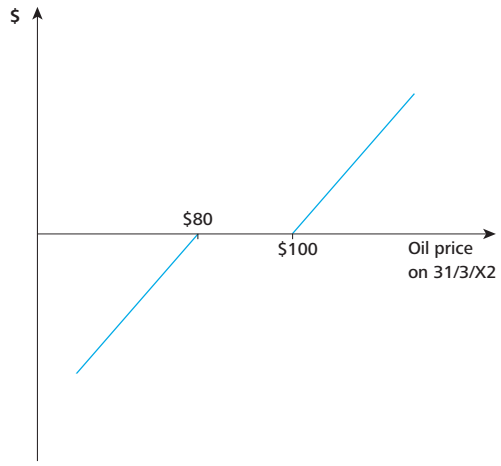
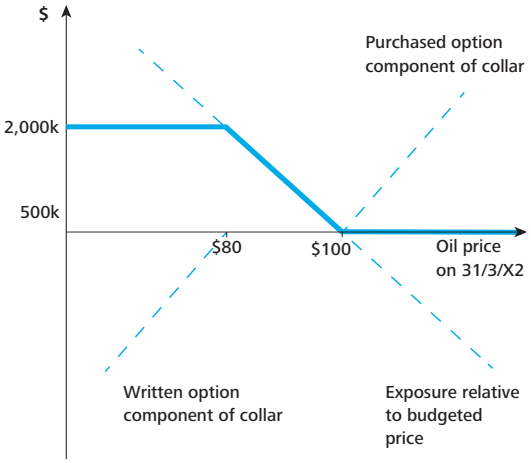


Figure 7. Net gain/loss relative to budgeted price of $100



This contract fixes the price of the oil within a range or "collar". This allows the entity to benefit from possible decreases in the price of oil per barrel down to $80 but also exposes the entity to possible increases in price of oil up to $100. Because of the inclusion of the written option this contract does not require any upfront premium to be paid although this comes at the cost of the limited "upside".

Hedge accounting with this instrument under IAS 39

- Hedge accounting for this contract is permitted as it is not a net written option (which could be the case if a net premium was received at inception).
- The application of hedge accounting is similar to that of the purchased option shown above, however the hedged risk would be for price increases above $100 and price decreases below $80 per barrel.
- Although there is no net premium to pay for this contract, the time value of each component option will change over time and not likely in equal and opposite amounts in any given accounting period. This can give rise to volatility in profit or loss.
- Note that the cumulative change in time value from inception to maturity for each component option will be equal and opposite because the initial time value on each option was the same and will decay to nil by maturity.

Hedge accounting with this instrument under the proposed IFRS 9

- Hedge accounting under IFRS 9 will be similar to the proposed IFRS 9 accounting noted above for the purchased option, except it is applied to the contract as a whole which includes both a purchased and written option with equal and opposite time value (at inception and maturity).
- The effect of using a zero premium collar is that the time value accumulated in OCI over the full term of the contract will be nil, hence there will be no time value to remove from equity on maturity of the contract. However, as the time value of the contract will change between the trade date and maturity, this will give rise to volatility in OCI.

Hedging with zero-premium structured option contract (or "forward extra" contract)

This instrument is a combination of two component derivatives. The first derivative is a purchased option to buy oil at a capped price of $100 (same as the purchased option noted above). This has a positive fair value at inception ($500k). The second derivative is a knock-in forward contract (or "contingent forward") to buy oil at a price of $100 if the price at maturity is $70 or less. Because of the contingent nature of this derivative and the negative pay-off profile (see graph below) this derivative is a written option which has a negative fair value at inception of $500k. The combined value of the two derivatives is nil at inception. The contract is net settled at maturity.

The purchased option component gives the holder the option to buy 100k barrels of oil at a price of $100 per barrel on 31 March 2012. Hence, if the price of oil is below $100 per barrel on 31 March 20X2 then the option will lapse unexercised.

The knock-in forward contract component *requires* the holder to buy 100k barrels of oil at a price of $100 per barrel on 31 March 2012 *if* the price of oil is equal to or lower than $70 per barrel on 31 March 20X2.

The combined effect of the two derivatives is that the entity has protected itself from price increases above $100 (the entity's budgeted price) but has allowed itself to participate in decreases in the oil price down to a limit of $70 per barrel (the "trigger" price for the contingent forward). The payoff profile of this derivative is shown in the following graph along with the net result based on the budgeted price.

The entity chooses to use this instrument because it expects the price of oil to fall over the period of the hedge, but not below $70 per barrel.

Trade date:	1 July 20X1
Maturity:	31 March 20X2
Nominal:	100k barrels of oil
Purchased option strike price:	$100
Contingent forward trigger price:	$70
Contingent forward strike price:	$100
Premium:	nil
Settlement:	Net cash settlement

Figure 8. Net gain/loss on forward extra contract

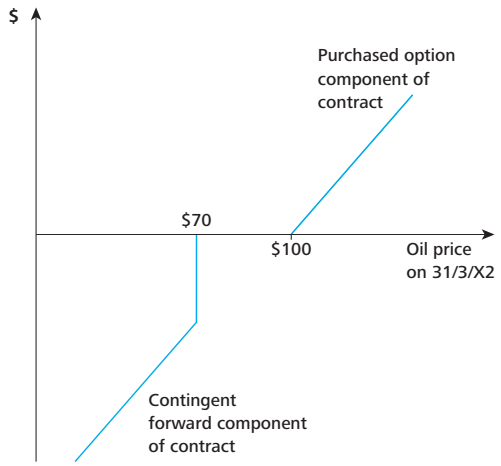
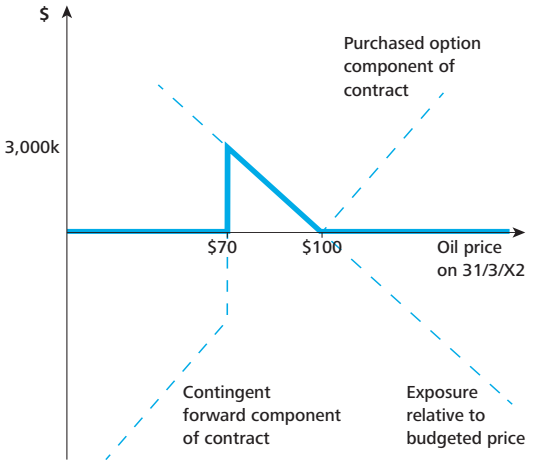


Figure 9. Net gain/loss relative to budgeted price of $100



Hedge accounting considerations under IAS 39

- The hedging instrument is an eligible hedging instrument as it is not a net written option. However, qualifying for hedge accounting under IAS 39 can be challenging for such hedging instruments. This is because the structured nature of the contract gives rise to hedge ineffectiveness that can cause a failure of the 80 to 125 per cent prospective and retrospective hedge effectiveness assessment requirements.
- This ineffectiveness arises from comparing the hedging instrument to a hypothetical derivative with different terms. Typically the hedge designation would be for price increases above $100 and decreases below $70 (other designations may be possible). With this designation the hypothetical derivative would be a collar with a cap of $100 and a floor of $70. This hypothetical derivative is different to the actual hedging instrument because the hypothetical derivative includes a written option with a strike price of $70, whilst the actual hedging instrument does not have this but instead has a contingent off-market forward contract with a contingent forward strike price of $100.
- More specifically, significant hedge ineffectiveness (in ratio terms) can arise when the price moves from within the window of $70 to $100 (which is where the price starts) to below $70. This is because the strike price jumps to $100 when the $70 barrier is breached.
- Similar to the options noted above, the time value of the option can be excluded from the hedging relationship, (however, this may not always be beneficial as including it could in some cases enhance effectiveness of the hedge).
- Due to the structured nature of the hedging instrument, effectiveness testing methods adopted may vary. For example, a simple ratio analysis (or "dollar offset") may not be sufficient to demonstrate compliance with the 80 to 125 per cent requirement for all movements in the hedged price. Instead, alternative methods such as regression analysis may be used to demonstrate compliance.
- In some cases it may not be possible to demonstrate effectiveness and hedge accounting may not be permitted.

Hedge accounting considerations under the proposed IFRS 9

The derivative is an eligible hedging instrument under IFRS 9 as it is not a net written option.

The hedge effectiveness requirements of IFSR 9 are different to IAS 39. IFRS 9 does not require an entity to demonstrate quantitative effectiveness within an offset range of 80 to 125 per cent. Instead IFRS 9 requires an entity to show that:

*i) there is an **economic relationship** between the hedged item and the hedging instrument;*
*ii) the effect of **credit risk** does not dominate the value changes that result from that economic relationship; and*
*iii) the **hedge ratio** of the hedging relationship is the same as that resulting from the quantity of hedged item that the entity actually hedges and the quantity of the hedging instrument that the entity actually uses to hedge that quantity of hedged item.*[3]

Therefore the challenges with demonstrating effectiveness within a narrow numerical band are removed and are replaced with a requirement to demonstrate an economic relationship between the hedged item and hedging instrument (with due consideration to the effect of credit risk) and show that the designated hedge ratio is appropriate.

The analysis below considers:

- How effectiveness assessment requirements of IFRS 9 would apply to this hedging relationship. In particular it considers whether an economic relationship exists and what the hedge ratio would be.
- How the time value of options would be treated.

3 However, that designation shall not reflect an imbalance between the weightings of the hedged item and the hedging instrument that would create hedge ineffectiveness (irrespective of whether recognised or not) in order to achieve an accounting outcome that is inconsistent with the purpose of hedge accounting.
(Draft: 6.4.1(c)(iii))

The designated hedged risk

The risk management objective of the entity is to protect itself against price increase above $100, whilst at the same time allowing it to enjoy price decreases to a limit of $70 (ie beyond the zero premium collar above), and hedging any movements in price below $70.

Consistent with the hedge designation under IAS 39 it is assumed that the designated hedged risk is price increases above $100 and decreases below $70. Time value of the contract (ie on both the purchased option and the contingent forward) is excluded from the hedge designation. The following assessment of the hedge effectiveness requirements is based on this designation and does not consider alternative designations that could be applied. Also for simplicity fair value changes due to changes in credit risk have been ignored, hence this component of the effectiveness requirements is assumed to be met. In practice this could disqualify hedge accounting or lead to hedge ineffectiveness measured in profit or loss.

The economic relationship

The proposed IFRS 9 states that *"the requirement that an economic relationship exists means that the hedging instrument and the hedged item have values that **generally move in the opposite direction because of the same risk**, which is the hedged risk. Hence, there must be an expectation that **the value of the hedging instrument and the value of the hedged item will systematically change in response to movements in either the same underlying** or underlyings that are economically related such that they respond in a similar way to the risk that is being hedged"*. (Draft: B6.4.3)

It also states that *"the assessment of whether an economic relationship exists includes an **analysis of the possible behaviour of the hedging relationship during its term** to ascertain whether it can be expected to meet the risk management objective"*. (Draft: B6.4.5)

To make this assessment it is necessary to consider the behaviour of the hedging instrument for changes in the hedged risks.

Price movements above $100

For price increases above $100, the intrinsic value of the purchased option fully offsets the change in value of the hedged risk and hence it can readily be demonstrated that an economic relationship exists. This is similar to the purchased option discussed above.

Price movements below $70

When the price moves below $70 the change in value of the derivative is opposite to the change in value of the hedged risk. However the quantum of offset depends on the starting point of the price and the range of movement in price.

For example consider the following price movements below $70 and the comparison of changes in fair value of the hypothetical derivative (discussed above) and the change in fair value of the intrinsic value of the contingent forward. In this example the forward prices (for 31 March 20X2) as at the following intervals are as follows:

As at date	Forward price for 31 March 20X2
1 June 20X1 (inception)	$90
30 September 20X1	$60
31 December 20X1	$40

Price movement	Change in fair value for period		Cumulative change in fair value		Period offset	Cumulative offset
	Hedged item	Hedging instrument	Hedged item	Hedging instrument		
$90 to $60	-$1,000k [100k * ($60 – $70)]	$4,000k [100k * ($100 – $60)]	-$1,000k [100k * ($60 – $70)]	$4,000k [100k * ($100 – $60)]	25%	25%
$60 to $40	-$2,000k [100k * ($40 – $60)]	$2,000k [100k * ($40 – $60)]	-$3,000k [100k * ($40 – $70)]	$6,000k [100k * ($100 – $40)]	100%	50%

This table shows that for these price movements there is always offset (both on a period basis and a cumulative basis) between the hedged item and hedging instrument, however, the level of offset in percentage terms varies. The ineffectiveness arises from a systematic difference of $3,000k fair value movement that arises on the hedging instrument but does not arise on the hedged item when the price moves from within the $70 to $100 window to below $70. This is because the strike price on the contingent forward is $100 and not $70.

For example, if the strike price was $70, then if the price moved from $70 to $65 then the contract would be $500k out of the money. However, because in this case the trigger is $70 but the strike price is $100, if the price moves from $70 to $65 the contract would be $3,500k out of the money.

This systematic difference of $3,000k is not considered to negate the overall economic relationship that exists because offset is still achieved (as shown in the table above) and hence hedge accounting is permitted. However, this systematic difference of $3,000k could potentially influence the hedge ratio designated as discussed below.

The hedge ratio

IFRS 9 requires that *"the hedge ratio of the hedging relationship must be the same as that resulting from the quantity of the hedged item that the entity actually hedges and the quantity of the hedging instrument that the entity actually uses to hedge that quantity of hedged item"*. (Draft: B6.4.8)

Furthermore, *"the designation of the hedging relationship using the same hedge ratio as that resulting from the quantities of the hedged item and the hedging instrument that the entity actually uses shall not reflect an imbalance between the weightings of the hedged item and the hedging instrument that would create hedge ineffectiveness (irrespective of whether recognised or not) in order to achieve an accounting outcome that is inconsistent with the purpose of hedge accounting. Hence, for the purpose of designating a hedging relationship an entity must adjust the hedge ratio that results from the quantities of the hedged item and the hedging instrument that the entity actually uses if that is needed to avoid such an imbalance."* (Draft: B6.4.9)

In this case, the entity actually hedges 100k barrels of forecast oil purchases with the hedging instrument over a nominal of 100k barrels. Therefore, the starting point would be to assume that the ratio of derivative to the forecast purchase should be 100% (ie one to one hedge ratio).

However, as shown above this hedge designation can give rise to a systematic difference of $3,000k when the price moves below $70. Hence it is necessary to determine whether this is *"inconsistent with the purpose of hedge accounting"*.

IFRS 9 states *"examples of relevant considerations in assessing whether an accounting outcome is inconsistent with the purpose of hedge accounting are:*

a) whether intended hedge ratio is established to avoid recognising hedge ineffectiveness for cash flow hedges or to achieve fair value hedge adjustments for more hedged items with the aim of increasing the use of fair value accounting, but without offsetting fair value changes of the hedging instrument; and

b) whether there is a commercial reason for the particular weightings of the hedged item and the hedging instrument even though that creates hedge ineffectiveness". (Draft: B6.4.10)

In this case the ratio of one-to-one does not attempt to avoid recognising ineffectiveness. In fact, as shown in the table, maintaining this ratio can only give rise to an over-hedge which is measured and recognised as hedge ineffectiveness. Furthermore there is a commercial reason for using this contract to hedge the exposure, despite it giving rise to hedge ineffectiveness when the price declines below $70. That commercial reason is to reduce the premium payable on the combined purchased option and to allow the entity to participate in price decreases down to $70.

Therefore it is determined that a hedge ratio of one-to-one is appropriate.

Treatment of Time Value

In the example of the vanilla purchased options and the zero-premium collar it was possible to defer all of the change in the time value of the option in OCI because the terms of the options matched the hedged risk.

In this example of the forward extra contract the terms of the option do not exactly match the terms of the hedged risk. This is because of the difference in the trigger price ($70) and strike price ($100) in the floor component of the contract.

Given the hedge designation for price increases above $100 and below $70, the terms of the matching options would be purchased and written option with a strike (and trigger) of $100 and $70 respectively. This gives rise to a difference between the actual written option and the option that matches the hedged risk (i.e. the "aligned option").

As a result the time value of each contract may be different at different points in time. For example, the time value of the actual option at inception is -$500k whilst the time value of the aligned option would be less. As a result of this difference the change in time value of the actual contract may not be fully deferred in OCI in any given accounting period and hence will mean some volatility in profit or loss.[4]

Conclusion

The hedging strategy would be eligible to be designated for hedge accounting under IFRS 9 on a one-to-one basis. Hedge ineffectiveness arising from this hedging relationship would be measured and recognised in profit or loss, along with any mismatch in time value, that is not eligible for deferral.

4. Note that this treatment of the time value is based on the assumption that only the intrinsic value of the option has been designated. If the time value of the option had been included in the hedge designation a different accounting outcome would arise.

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