CIMA P3 SECTION D – MANAGING FINANCIAL RISK

THE PUTS, THE CALLS AND THE DREADED 'SELECT ALLs'

Example long form to OT approach

Here is my favourite long form question on Interest rate risk management**:**

Assume you are the Treasurer of AB, a large engineering company, and that it is now May 20X4. You have forecast that the company will need to borrow £2 million in September 20X4 for 6 months. The need for finance will arise because the company has extended its credit terms to selected customers over the summer period. The company's bank currently charges customers such as AB plc 7.5% per annum interest for short-term unsecured borrowing. However, you believe interest rates will rise by at least 1.5 percentage points over the next 6 months. You are considering using one of four alternative methods to hedge the risk:

(i) A traded interest rate option (cap only); or

(ii) A traded interest rate option (cap and floor); or

(iii) Forward rate agreements; or

(iv) Interest rate futures; or

You can purchase an interest rate cap at 93.00 for the duration of the loan to be guaranteed. You would have to pay a premium of 0.2% of the amount of the loan. For (ii) as part of the arrangement, the company can buy a traded floor at 94.00.

Required:

Discuss the features of using each of the four alternative methods of hedging the interest rate risk, apply to AB and advise on how each might be useful to AB, taking all relevant and known information into account. (16 marks)

So **Step 1** – gain an understanding of the subject matter and make sure you can apply it to a long form question …so

(i) **A traded interest rate option (cap only) – THE FEATURES**

- An interest rate option grants the buyer of it, the right, but **not the obligation,** to deal at an agreed interest rate (strike price) at a future maturity date.

- On the date of the expiry of the option, the buyer must decide whether or not to exercise the right.

- Clearly the buyer of an option to borrow will not wish to exercise it if the market rate is now **below that specified in the option agreement.**

- it is not a binding commitment on the option holder.

- These contracts can be bought from the **LIFFE** (The LONDON INTERNATIONAL FINANCIAL FUTURES AND OPTIONS EXCHANGE)

- The contract sizes available are £1,000,000 and they last three months

IF A COMPANY NEEDS TO HEDGE BORROWING AT SOME FUTURE DATE IT SHOULD PURCHASE PUT OPTIONS TO SELL FUTURES – This is because they are paying interest (learn this)

Application To AB

With a traded interest rate option AB can set an interest rate **cap**. This will set an interest rate **ceiling** so AB will remove the uncertainty of a really high interest rate. They keep the upside risk as if interest rates fall, they do not need to exercise the option.

To use a traded interest rate option AB will need to make decisions -the time limit must be specific, with an agreed settlement date or expiry date, say six months exactly from the contract/transaction date.

- AB could buy a September option
- They will need to buy 4 contracts (£2m/£1m x 6months /3 months = 4 contracts)
- Strike price is 7% (expressed as 93.00
- Because they have interest to pay they need to purchase an interest- paying **PUT contract**
- **REMEMBER A PUT IS A RIGHT TO SELL (e bay analogy applies!)**

If AB buys this put optionat a cap strike price of 7% (and a notional principal amount of £2 million for six months), for expiry in September, it will exercise its option (to sell) if the interest rate at expiry is higher than 7%. It will then receive the interest value of the difference (on £2 million for six months) between the actual interest rate (six-month LIBOR) and the cap rate of 7%.

Usefulness of the instruments to AB

- As a result, AB is able to cap the benchmark interest rate between LIBOR and 7%.
- Arranging this cap would cost £4,000 (0.2% of £2 million), which is equivalent to interest of 0.4% on £2 million for six months. The premiums payable on interest rate options can be expensive and must be paid up-front,
- This is payable whether or not AB exercises the option.
- This instrument will help AB to hedge against the risk of a rise in interest rates. It removes the major uncertainty and caps the downside risk (the risk that interest rates will go up) at 7% interest.
- Upside risk of interest rates falling is maintained by AB

Step 2… Think about how this could be asked as an OT…. Same scenario, but instead of a long form question your question could be:

OT example 1: **To set up this hedge which of the following will apply? Select all that apply.**

A	AB will purchase a put option	TRUE
B	AB will purchase a call option	FALSE
C	AB will sell a put option	FALSE
D	AB will sell a call option	FALSE

Or …OT example 2: **To set up this hedge which of the following will apply? Select all that apply**

A	AB will purchase a put option	TRUE
B	AB will purchase a call option	FALSE
C	AB will buy 2 contracts	FALSE
D	AB will buy 4 contracts	TRUE
E	If interest rates go up AB will exercise its put option	TRUE
F	If interest rates go up AB will lapse its put option	FALSE

Or…OT example 3**: If interest rates increased which of the following would occur? Select all that apply.**

A	AB will exercise the put option	TRUE
B	Arranging this cap will have no cost	FALSE
C	AB will lose both upside and downside risk	FALSE
D	AB will lose downside risk only	TRUE
E	Arranging this cap will have a cost	TRUE
F	AB will not exercise the put option	FALSE

KEY SUMMARY

You are a borrower – you can cap youtr interest rate by buying a put

Using a collar

A traded Interest option (cap and floor)

As a borrower the reason for setting a floor on your interest rate is you will receive premium for doing so. Therefore your premium cost is netted to a lower figure as you are capping both downside risk and upside risk. We call this 'creating a collar'

To create a collar you still buy a put option as before, but in addition you are now also selling a call option

A call option is the right to buy a future, do here you are selling somebody else the right to buy a future from you.

If interest rates rise as before your put will give it a ceiling of 7% (93.00) and you will opt therefore to exercise the put option.

However if interest rates fall below 6% (94.00) the holder of the call option will wish to exercise the right to buy the future at a t 94.00 as the value of the future is increasing.

You create a interest rate ceiling of 7% and an interest rate floor of 6%

Application to AB

If AB buys this instrument at a cap strike price of 7% (and a notional principal amount of £2 million for six months), for expiry in September, it will exercise its option if the interest rate at expiry is higher than 7%. It will then receive the interest value of the difference (on £2 million for six months) between the actual interest rate (six-month LIBOR) and the cap rate of 7%.

However, in this case, if the interest rate falls below 6%, the option counterparty (a bank) will exercise a floor option, and require AB to pay the difference between the actual interest rate and 6%.

As a result, AB is able to fix the interest rate between 6% and 7%. So plus the cost of the collar.

Usefulness of the instruments to AB

The use of a cap and floor combination will allowAB to hedge against the risk of a rise in interest rates.

AB will keep the upside risk to the floor level of 6% so that AB can benefit from lower interest rates if they are between 6% and 7%. However, they are guaranteed to pay no more than 7% and this guarantee has to be paid for

Step 2… Think about how this could be asked as an OT…. Same scenario, but instead of a long form question your question could be:

OT example 1: **To set up a collar which of the following will apply? Select all that apply.**

A	AB will purchase a put option	TRUE
B	AB will purchase a call option	FALSE
C	AB will sell a put option	FALSE
D	AB will sell a call option	TRUE

Or …OT example 2: **To set up this hedge which of the following will apply? Select all that apply**

A	AB will purchase a put option	TRUE
B	AB will purchase a call option	FALSE
C	AB will sell a put option	FALSE
D	AB will sell a call option	TRUE
E	Selling a call means that someone else has the right to buy a future from you	TRUE
F	Selling a call means that you have the right to buy a future from someone else	FALSE

Or…OT example 3**: If AB wishes to manage its interest rate risk using a collar, which of the following are true? Select ALL that apply**

A	AB will reduce its premiums by using a collar	TRUE
B	Simultaneously buying a put and selling a call option creates a collar for AB	TRUE
C	Simultaneously selling a put and buying a call option will create a collar for AB	FALSE
D	A collar can be expressed as AB having a semi- fixed rate of interest	TRUE
E	AB will pay a maximum of 7% interest on this loan and a minimum of 6% interest	TRUE

KEY SUMMARY

You are a borrower –
you can arrange a maximum and a minimum cost to the company (a collar) by:

Purchase a put option and Selling a call option

Remember the chant:

Interest rates rise and interest rates fall
So purchase a put and sell a call

If you are worried about your dollar
Interest rate options can set a collar

Interest rates rise and interest rates fall
So purchase a put and sell a call

APPLY YOUR KNOWLEDGE

PU Ltd needs to borrow £4,000,000 (4m GBP) for two years They have agreed a loan with a variable rate of LIBOR plus 50 basis points. The are worried that interest rates are going to increase and so set up a collar that fixes a maximum effective borrowing cost for the company of 8.50% and a minimum effective borrowing cost of 7.50%

What does the collar consist of?

A	With the collar, the company has bought a series of consecutive interest rate put options at a strike price of 8% and sold a series of matching call options at 7%	TRUE
B	With the collar, the company has bought a series of consecutive interest rate put options at a strike price of 8% and bought a matching series of call options at 7%)	FALSE
C	With the collar, the company has bought a series of consecutive interest rate put options at a strike price of 8% and sold a matching series of call options at 8%	FALSE
D	With the collar, the company has bought a series of consecutive interest rate put options at a strike price of 8% and bought a matching series of call options at 8%	FALSE

YT Ltd needs to borrow £5,000,000 (4m GBP) for three years. They have agreed a loan with a variable rate of LIBOR plus 50 basis points. The are worried that interest rates are going to increase and so wish set up a collar.

What does the collar consist of?

A	Buying a cap and buying a floor	FALSE
B	Buying a cap and selling a floor	TRUE
C	Selling a cap and selling a floor	FALSE
D	Selling a cap and buying a floor	FALSE

FRA's

So **Step 1** – gain an understanding of the subject matter and make sure you can apply it to a long form question …so

Forward rate agreements

FRA

An FRA is an over-the-counter instrument that can be arranged with a bank, fixing the interest rate on a notional principal amount for a given period of time, in this case six months. The notional six-month interest period would start from an agreed date in September, in four months' time, so the FRA would be a 4v10 FRA. FRAs are only available for quite large principal amounts (at least $1million) and can be arranged up to about two years into the future.

A company wishing to fix an interest rate for borrowing should buy an FRA.

Application to AB

Here, AB should buy a 4v10 FRA on a notional principal amount of £2 million. The bank would specify an interest rate for the FRA, which might be about 7.5% in this case.

The FRA is not an agreement to borrow the funds required. AB must arrange to borrow the £2 million separately. AB will borrow £2 million at the current market rate of interest in September, whatever this happens to be. The FRA would be settled by:

- a payment from the bank to AB if the benchmark interest rate (here probably the six-month LIBOR rate) is higher than the FRA rate; or
- a payment from AB to the bank if the benchmark rate is lower than the FRA rate.

The hedge works because the interest payment on the actual borrowing plus or minus the settlement amount for the FRA should fix the overall effective borrowing cost for AB. For example, if the interest rate does rise by 1.5 percentage points to 9% and AB borrows at this higher rate, it would receive a payment under the FRA agreement worth the equivalent of about 1.5%, thereby reducing the net borrowing cost to about 7.5% (depending on the actual rates that apply).

Usefulness of an FRA

This instruments can help AB to hedge against the risk of a rise in interest rates.

FRAs and futures are binding contracts, so that the hedge effectively fixes the borrowing cost. The interest rate guarantee is a form of option, so that AB can benefit from lower interest rates if they are between 6% and 7%. However, the guarantee has to be paid for.

All three instruments are arranged for a fixed amount and a fixed borrowing period, which means that a hedge might not be perfect. For example, if it turns out that AB needs to borrow

£2.5 million for seven months starting in five months' time, none of the hedges would be perfect

Step 2… Think about how this could be asked as an OT…. Same scenario, but instead of a long form question your question could be:

> Assume you are the Treasurer of AB, a large engineering company, and that it is now May 20X4. You have forecast that the company will need to borrow £2 million by the end of September 20X4 for at least 6 months. The need for finance will arise because the company has extended its credit terms to selected customers over the summer period. The company's bank currently charges customers such as AB Plc. 7.5% per annum interest for short-term unsecured borrowing. However, you believe interest rates will rise by at least 1.5 percentage points over the next 6 months. You are considering using a forward rate agreement to hedge the risk:

Which of these are features of using forward rate agreements (FRA's) to hedge AB's interest rate risk?

Select **ALL** that apply

A	A company wishing to fix an interest rate for borrowing should sell an FRA	FALSE
B	The FRA is not an agreement to borrow the funds required. AB must arrange to borrow the £2 million separately	TRUE
C	An FRA is an exchange traded instrument	FALSE
D	An FRA is an 'over the counter' instrument	TRUE
E	An FRA will fix the interest rate on a notional principal amount for a given period of time, in this case six months	TRUE
F	An FRA will allow AB to still take advantage of an advantageous movement in interest rates	FALSE
G	FRAs are only available for quite large principal amounts (at least $1million)	TRUE
H	FRA's can be arranged up to about two years into the future.	TRUE
I	A company wishing to fix an interest rate for borrowing should buy an FRA.	TRUE

STIRs – Interest rate futures

So **Step 1** – gain an understanding of the subject matter and make sure you can apply it to a long form question …so

STIRS (Short- term interest rate futures)

Short-term interest rate futures are exchange-traded instruments. A short sterling future is a notional three-month deposit of £500,000, traded on LIFFE.

A company wishing to fix a rate for borrowing should sell interest rate futures.

Application to AB

Since AB wants to hedge the borrowing cost for £2 million for six months, it should sell 8 futures [(£2 million/£500,000) × (6 months/3 months)] and set up a 'short hedge'. It could sell either September or December futures, depending on when the interest period will begin, and when the September futures contract expires during the month.

The interest rate is in the price of the future. Prices are quoted at 100 minus the interest rate, so if AB were to sell September futures, say, at 92.50, this would 'fix' its borrowing rate at 7.5%. As the future approaches settlement date, if the interest rate has risen to 9%, the market price of September futures should have moved to about 91.00. AB could then close its position by buying 8 September futures, and making a profit of 1.50 (150 points) on each contract of its futures dealing. A profit of 150 points on 8 futures would be worth £15,000 (150 points × 8 contracts × £12.50 per point). This is equivalent to interest at 1.5% on £2 million for six months.

AB would borrow £2 million at the market rate. If this is 9%, the net borrowing cost would be 9% less the value of the profit on futures trading (1.5%) giving a net effective interest cost of 7.5%.

Usefulness of the instruments to AB

Since interest rate futures are only available in standardised amounts and dates, they are less flexible than FRAs, and so possibly less attractive to AB.

Step 2… Think about how this could be asked as an OT…. Same scenario, but instead of a long form question your question could be:

Assume you are the Treasurer of AB, a large engineering company, and that it is now May 20X4. You have forecast that the company will need to borrow £2 million by the end of September 20X4 for at least 6 months. The need for finance will arise because the company has extended its credit terms to selected customers over the summer period. The company's bank currently charges customers such as AB Plc. 7.5% per annum interest for short-term unsecured borrowing. However, you believe interest rates will rise by at least 1.5 percentage points over the next 6 months. You are considering using a forward rate agreement to hedge the risk:

Which of these are features of using STIRS - short term interest rate futures to hedge AB's interest rate risk?

Select **ALL** that apply

A	Short-term interest rate futures are exchange-traded instruments.	TRUE
B	A short sterling future is a notional three-month deposit of £500,000, traded on LIFFE	TRUE
C	A company wishing to fix a rate for borrowing should sell interest rate futures	TRUE
D	A company wishing to fix a rate for borrowing should buy interest rate futures	FALSE
E	Since AB wants to hedge the borrowing cost for £2 million for six months, it should sell 8 futures	TRUE
F	Since AB wants to hedge the borrowing cost for £2 million for six months, it should sell 4 futures	FALSE
G	AB will close its position by buying futures	TRUE
H	AB will close its position by selling futures	FALSE
I	Interest rate futures are more flexible than FRA's	FALSE