Free Questions for 8006

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Question 1

Question Type: MultipleChoice

An investor expects stock prices to move either sharply up or down. His preferred strategy should be to:

Options:

A- buy a butterfly spread

B- buy a condor

C- buy a collar

D- buy a straddle

Answer:

D

Explanation:

Straddles and strangles are strategies that would benefit from sharp movement in option prices, regardless of direction. These comprise a long call and a long put, which would benefit regardless of whether prices rise or fall. The only time they would lose money would be

when prices stay constant.

A collar would gain when stock prices fall, and not when they rise. Since our investor does not have a view on the direction of the movement, this strategy will not work for him.

A butterfly spread or a condor would gain when prices stay range-bound, so that cannot be a useful strategy.

Therefore Choice 'd' is the correct answer.

Question 2

Question Type: **MultipleChoice**

The value of which of the following options cannot be less than its intrinsic value

Options:

A- a Bermudan put

B- a European put

C- an American put

D- a European call

Answer:

C

Explanation:

Note that intrinsic value of an option is the difference between the value of the underlying and the strike price of the option.

European options can only be exercised at expiry, and Bermudan options only at certain dates during the life of the option. Therefore the option may be valued at less than intrinsic value if the earliest possible exercise date is not very close. An American option however can be exercised at any time prior to expiry, which means that its value can never fall below its intrinsic value. Because if it did, arbitrageurs would buy the option and immediately exercise it to get a risk free profit. It does not matter whether the option is a call or a put - therefore the correct answer is Choice 'c'.

Question 3

Question Type: MultipleChoice

An investor enters into a 4 year interest rate swap with a bank, agreeing to pay a fixed rate of 4% on a notional of $100m in return for receiving LIBOR. What is the value of the swap to the investor two years hence, immediately after the net interest payments are

exchanged? Assume the 2 year swap rate is 5%, and the yield curve is also flat at 5%

Options:

A- $1,859,410

B- $1,904,762

C- -$1,859,410

D- -$1,904,762

Answer:

A

Explanation:

The swap can be valued by using the new swap rate of 5%. The investor is paying fixed and receiving LIBOR, and can effectively get out of his position by entering into a swap to receive 5% and pay LIBOR. This will leave him/her with a net cash flow of 1% for two years, ie $1m for 2 years that can be discounted to the present using the rates provided, ie =(1/1.05 + 1/(1.05^2)) = $1,859,410.

Detailed explanation:

An Interest Rate Swap exchanges fixed interest flows for floating rate flows. The floating rate leg is tied to some reference rate, such as LIBOR. The parties exchange net cash flows periodically. Conceptually, an interest rate swap is the combination of a fixed coupon bond

and a floating rate note. The party receiving the fixed rate is long the fixed coupon bond and short the FRN, and the party receiving the floating rate is long the FRN and short the fixed coupon bond.

An interest rate swap can be valued as the difference between the two hypothetical bonds. FRNs sell for par at issue time as they pay whatever the current rate is, subject to periodic resets. Therefore immediately after a payment is made on a swap, the value of the FRN component is equal to its par value. The bond can be valued by discounting its cash flows. The difference between the two represents the value of the swap. When the swap is entered into, the fixed rate leg is set in such a way that the value of the hypothetical bond is equal to that of the FRN, and the swap is valued at zero. The rate at which the fixed rate leg is set is called the swap rate. Over its life, market rates change and the value of the fixed coupon bond equivalent in our swap diverges from par (whereas the FRN stays at par - at least right after payments are exchanged and the new floating rate is set for the next period). Thus the swap acquires a non-zero value.

There are two ways to value a swap. If interest rates for the future are known, the bond and the FRN can be valued and their difference will be equal to the value of the swap. Sometimes, the current swap rates are known. In such a case, the swap can be valued by imagining entering into an opposite swap at the new swap rate, which will leave a residual fixed cash flow for the remaining life of the swap. This residual cash flow can be valued and that represents the value of the swap. For example, if a 4 year swap was entered into exchanging an annual fixed 5% payment on a notional of $100m for a floating payment equal to LIBOR, and at the end of year 1 the swap rate is 6%, then the party paying fixed can choose to enter into a new swap to receive 6% and pay LIBOR. All cash flows between the old and the new swap will offset each other except a net receipt of 1% for the next 3 years. This cash flow can be valued using the current yield curve and represents the value of the swap.

Question 4

Question Type: MultipleChoice

An investor enters into a 4 year interest rate swap with a bank, agreeing to pay a fixed rate of 4% on a notional of $100m in return for receiving LIBOR. What is the value of the swap to the investor two years hence, immediately after the net interest payments are exchanged? Assume the current zero coupon bond yields for 1, 2 and 3 years are 5%, 6% and 7% respectively. Also assume that the yield curve stays the same after two years (ie, at the end of year two, the rates for the following three years are 5%, 6%, and 7% respectively).

Options:

A- $2,749,326

B- -$2,749,326

C- $3,630,846

D- - $3,630,846

Answer:

C

Explanation:

The swap can be valued by valuing the two individual components of the swap.

The fixed rate bond equivalent in the swap is valued at =4/1.05 + 104/(1.06^2) = $96,369,154.

The FRN component will be valued at par as we are at a point where the rate has just been reset, ie $100m.

The investor is paying the fixed rate, and is therefore short the bond. He/she is receiving LIBOR, and is therefore long the FRN. The value of the swap to the investor therefore is +$100,000,000-$96,369,154 = $3,630,846

Detailed explanation:

An Interest Rate Swap exchanges fixed interest flows for floating rate flows. The floating rate leg is tied to some reference rate, such as LIBOR. The parties exchange net cash flows periodically. Conceptually, an interest rate swap is the combination of a fixed coupon bond and a floating rate note. The party receiving the fixed rate is long the fixed coupon bond and short the FRN, and the party receiving the floating rate is long the FRN and short the fixed coupon bond.

An interest rate swap can be valued as the difference between the two hypothetical bonds. FRNs sell for par at issue time as they pay whatever the current rate is, subject to periodic resets. Therefore immediately after a payment is made on a swap, the value of the FRN component is equal to its par value. The bond can be valued by discounting its cash flows. The difference between the two represents the value of the swap. When the swap is entered into, the fixed rate leg is set in such a way that the value of the hypothetical bond is equal to that of the FRN, and therefore the swap is valued at zero. The rate at which the fixed rate leg is set is called the swap rate. Over its life, market rates change and the value of the fixed coupon bond equivalent in our swap diverges from par (whereas the FRN stays at par - at least right after payments are exchanged and the new floating rate is set for the next period). Thus the swap acquires a non-zero value.

There are two ways to value a swap. If interest rates for the future are known, the bond and the FRN can be valued and their difference will be equal to the value of the swap. Sometimes, the current swap rates are known. In such a case, the swap can be valued by imagining entering into an opposite swap at the new swap rate, which will leave a residual fixed cash flow for the remaining life of the swap. This residual cash flow can be valued and that represents the value of the swap. For example, if a 4 year swap was entered into

exchanging an annual fixed 5% payment on a notional of $100m for a floating payment equal to LIBOR, and at the end of year 1 the swap rate is 6%, then the party paying fixed can choose to enter into a new swap to receive 6% and pay LIBOR. All cash flows between the old and the new swap will offset each other except a net receipt of 1% for the next 3 years. This cash flow can be valued using the current yield curve and represents the value of the swap.

Question 5

Question Type: MultipleChoice

The LIBOR square swap offers the square of the interest rate change between contract inception and settlement date. If LIBOR at inception is y, and upon settlement is x, the contract pays (x - y)2 for x > y; and -(x - y)2 for x

What of the following cannot be a value of the gamma of this contract?

Options:

A- -2

B- 1

C- 2

D- 0

Answer:

B

Explanation:

The LIBOR square is a (rare) derivative contract which pays, as mentioned in the question, the square of the interest rate move between two dates. If LIBOR at inception is y, and upon settlement is x, the contract pays (x - y)^2 for x > y; and -(x - y)^2 for x < y.

For any question that involves calculating delta or gamma, and the payoff is described in terms of variables as is the case here, remember that delta is always the first derivative and gamma is the second derivative. For this question, let us calculate the second derivative and see what the gamma is:

If x > y, then the payoff is (x - y)^2

The first derivative wrt x is 2(x - y)

The second derivative wrt x is 2.

ie, the gamma is 2

If x < y, then the payoff is -(x - y)^2

The first derivative wrt x is -2(x - y)

The second derivative wrt x is -2.

ie, the gamma is -2

If x = y, then the payoff is 0. Both the first and the second derivatives are zero. ie the gamma is 0.

Based on the above, we see that the contract can have a gamma of either 0, +2 or -2. 1 is not a possible value for gamma, and therefore Choice 'b' is the correct answer.

Question 6

Question Type: **MultipleChoice**

A large utility wishes to issue a fixed rate bond to finance its plant and equipment purchases. However, it finds it difficult to find investors to do so. But there is investor interest in a floating rate note of the same maturity. Because its revenues and net income tend to vary only predictably year to year, the utility desires a fixed rate liability. Which of the following will allow the utility to achieve its objectives?

Options:

A- Issue a floating rate note and hedge the risk of movements in interest rates by entering into an interest rate swap to pay fixed and receive floating

B- Buy a floating rate note and hedge the risk of movements in interest rates by entering into an interest rate swap to pay fixed and receive floating

C- Issue a floating rate note and immediately buy a similar floating rate note, together with a long position in interest rate futures

D- Issue a floating rate note and hedge the risk of movements in interest rates by entering into an interest rate swap to pay floating and receive fixed

Answer:

A

Explanation:

Choice 'a' is the correct answer as the issue of the floating rate note will provide the utility with the funds it needs, and the interest rate swap would offset the floating rate payment and leave it with a net fixed payment.

Choice 'd' is incorrect as the swap is in the wrong direction.

Choice 'c' is incorrect as buying and selling a floating rate bond would mean the utility will not have any funds that it wants to issue the note for, and combining it with interest rate futures would be just absurd.

Choice 'b' is incorrect as buying a floating rate note would use funds while the utility is trying to raise funds.