Question #1 of 10

Question ID: 1587617

Sheila manages a $100 million fixed-income portfolio. The portfolio duration is currently 4.9, and she would like to increase it to 5.7. She selects a swap with a net duration of 6.1. Based only on the information provided, which of the following statements is *least likely* correct?

A) Sheila should select a swap with a notional principal of approximately $13 million to achieve the desired duration. ✗

B) Sheila should have a pay-floating/receive-fixed position in the swap. ✗

C) Sheila should have a receive-floating/pay-fixed position in the swap. ✓

Explanation

Because Sheila wants to increase the duration of the portfolio, she should have a pay-floating/receive-fixed position in the swap with a notional principal of $13,114,754, as computed here:

$$\text{Notional principal} = \$100{,}000{,}000 \times [(5.7 - 4.9) / 6.1] = \$13{,}114{,}754$$

(Module 7.5, LOS 7.e)

Related Material

SchweserNotes - Book 2

Question #2 of 10

Question ID: 1587549

Which of the following statements regarding covered call options on an underlying stock is *most correct*?

A) The maximum loss is equal to the purchase price of the stock less the call premium. ✓

B) The strategy is used to generate additional portfolio income by speculating that the underlying stock price will change significantly. ✗

C) The breakeven price is equal to the strike price of the stock less the call premium. ✗

Explanation

The maximum loss is the cost of the stock, offset by the premium earned by selling the call. The maximum loss is denoted as $S_0 - C_0$.

The breakeven price is equal to the cost of the stock less the call premium, denoted as $S_0 - C_0$.

(Module 6.3, LOS 6.b)

Related Material

SchweserNotes - Book 2

Grid Co., a trading company headquartered in the United States, decides to expand its operations to Asia by opening Grid Asia, a new office in Singapore. Jim Xenjou, an experienced derivatives trader, joins Grid Asia. During the following year, Grid Asia generates a return beating the market, and Xenjou was appointed as Grid Asia's investment lead.

Last week, during a meeting between Xenjou and Grid Asia's investment committee, Xenjou's suggestion to short a 6-month futures contract on Singaporean Treasury bonds was approved. **Exhibit 1: Selected Information Pertaining to the Bonds That Can Be Delivered Under the Futures Contract** includes information on bonds that can be purchased to be delivered by Grid Asia under the terms of the futures contract.

Exhibit 1: Selected Information Pertaining to the Bonds That Can Be Delivered Under the Futures Contract

	Bond A	Bond B	Bond C
Cash dirty price at futures maturity	SGD 134	SGD 135	SGD 137
Futures* settlement price	SGD 138	SGD 140	SGD 142
Conversion factor (CF)	0.9910	0.9801	0.9756

*Size of futures contract is SGD 500,000.

Grid Asia's Singaporean corporate bond portfolio is valued at SGD 60 million. The portfolio has a modified duration of 5 and a basis point value (BPV) of SGD 30,000. In anticipation of higher interest rate levels, Xenjou receives the approval to short 22 Eurobond futures contracts; the cheapest-to-deliver (CTD) bond underlying the contracts has a modified duration of 8, a BPVCTD of SGD 90, and a conversion factor of 0.96. Two months later, the interest rate increases by 1.5%.

Xenjou would like to decrease the modified duration of Grid Asia's Japanese fixed-income portfolio from 7 to 4. He enters an interest rate swap upon receiving the approval of the investment committee. The market value of the Japanese fixed-income portfolio is JPY 5.81 billion. The swap is settled semiannually, will expire in 2 years, has a modified duration of –2, and has a fixed rate of 1.8%. Expecting the floating rate to be 1.85% at the first settlement date, Xenjou asks one of the associates to report the expected net payment on the first settlement date.

Doubting that the Japanese stock market is in a bubble, Xenjou purchases a Nikkei 225 VI futures contract—a volatility futures contract based on the volatility index (VI) of the Nikkei 225. He asks Olivia Goh, one of the associates, to approximate the roll yield on the contract. Goh finds it difficult to estimate the roll yield; instead, she reports that the difference between the Nikkei 225 VI futures price and the Nikkei 225 VI is positive.

Question #3 - 6 of 10

Question ID: 1551876

Based on **Exhibit 1: Selected Information Pertaining to the Bonds That Can Be Delivered Under the Futures Contract**, which of the three bonds should *most likely* be purchased to be delivered by Xenjou at the maturity of the futures contract?

A) Bond A.

B) Bond B.

C) Bond C.

Explanation

Xenjou should choose the cheapest-to-deliver bond—namely, the bond that maximizes the difference between the amount received and the amount paid at maturity of the futures contract.

First, calculate each bond's principal invoice amount as:

$$\text{principal invoice amount} = \frac{\text{futures settlement price}}{100} \times \text{CF} \times \text{size of the futures contract}$$

The principal invoice amount of Bond A $= \frac{138}{100} \times 0.9910 \times 500,000 = \text{SGD } 683,790.$

The principal invoice amount of Bond B $= \frac{140}{100} \times 0.9801 \times 500,000 = \text{SGD } 686,070.$

The principal invoice amount of Bond C $= \frac{142}{100} \times 0.9756 \times 500,000 = \text{SGD } 692,676.$

Next, calculate each bond's purchase cost as:

purchase cost = cash dirty price × futures contract size

The purchase cost of Bond A $= \frac{134}{100} \times 500,000 = \text{SGD } 670,000.$

The purchase cost of Bond B $= \frac{135}{100} \times 500,000 = \text{SGD } 675,000.$

The purchase cost of Bond C $= \frac{137}{100} \times 500,000 = \text{SGD } 685,000.$

Finally, calculate each bond's delivery gain/loss as the principal invoice amount – purchase cost.

Delivery gain/loss of Bond A = 683,790 – 670,000 = SGD 13,790.

Delivery gain/loss of Bond B =686,070 – 675,000 = SGD 11,070.

Delivery gain/loss of Bond C =692,676 – 685,000 = SGD 7,676.

The cheapest-to-deliver bond is Bond A, because the gain on delivering it is the highest among the three available bonds.

Compared to Bond A, Bond B has a lower delivery gain on settlement of the futures contract.

Among the three bonds, Bond C has the lowest delivery gain on settlement of the futures contract.

(Module 7.1, LOS 7.a)

Related Material

SchweserNotes - Book 2

Question #4 - 6 of 10

Question ID: 1551877

The decrease in the Singaporean fixed-income portfolio value that results from the 1.5% increase in the interest rate is *closest* to:

A) SGD 4.2 million. ✓

B) SGD 7.2 million. ✗

C) SGD 4.5 million. ✗

Explanation

The change in portfolio value is calculated as:

change in portfolio value = $-MD_T \times$ change in interest rate $\times$ MV

where MD_T is the portfolio target modified duration (the portfolio's duration after accounting for the futures position) and *MV* is the market value of the portfolio.

To derive MD_T, first calculate the target BPV of the portfolio (the BPV of the portfolio after accounting for the futures position) based on the following equation:

$$\text{BPVHR} = \frac{\text{BPV}_\text{T} - \text{BPV}_\text{P}}{\text{BPV}_\text{CTD}} \times \text{CF}$$

where *BPVHR* is the number of future contracts bought or sold, BPV_P is the BPV of the portfolio, BPV_T is the target BPV of the portfolio, BPV_{CTD} is the BPV of the cheapest-to-deliver bond under the futures contract, and *CF* is the conversion factor.

Rearranging the above equation:

$$\text{BPV}_\text{T} = \text{BPV}_\text{P} + \frac{\text{BPVHR} \times \text{BPV}_\text{CTD}}{\text{CF}} = 30,000 + \frac{-22 \times 90}{0.96} = \text{SGD } 27,937.5.$$

Next, calculate MD_T as:

$$\text{MD}_\text{T} = \frac{\text{BPV}_\text{T}}{0.01\% \times \text{MV}}$$

$$\text{MD}_\text{T} = \frac{27{,}937.5}{0.01\% \times 60{,}000{,}000} = 4.65625$$

Thus, the change in portfolio value = $-MD_T \times$ change in interest rate $\times$ MV = –4.65625 × 0.015 × 60,000,000 = –SGD 4,190,625.

The change in portfolio value is miscalculated by using the modified duration of the original portfolio without accounting for the change in modified duration due to the futures position as –5 × 60,000,000 × 0.015 = –SGD 4,500,000.

The change in portfolio value is miscalculated by using the modified duration of the CTD bond underlying the futures contract (rather than using the modified duration of the portfolio after accounting for the futures position) as –8 × 60,000,000 × 0.015 = –SGD 7,200,000.

(Module 7.1, LOS 7.a)

Related Material

SchweserNotes - Book 2

Question #5 - 6 of 10

Question ID: 1551878

The expected net amount paid or received on the first settlement date of the interest rate swap is *closest* to:

A) JPY 1.5 million. ✗

B) JPY 2.2 million. ✓

C) JPY 4.4 million. ✗

Explanation

To decrease the duration of the portfolio, Grid will enter a swap as the party paying the fixed interest rate and receiving the floating interest rate.

To calculate the amount exchanged if Grid used the swap, we need to start by calculating the notional amount of the swap, which is calculated using the following formula:

$$\mathrm{N_S} = \frac{\mathrm{MD_T} - \mathrm{MD_P}}{\mathrm{MD_S}} \mathrm{MV_P}$$

where N_S is the interest rate swap notional principal, MD_T is the target modified duration of the portfolio, MDP is the current modified duration of the portfolio, MD_S is the modified duration of the swap, and MV_P is the market value of the portfolio:

$$\mathrm{N_S} = \frac{4 - 7}{-2} \times 5.81 \text{ billion} = \text{JPY } 8.715 \text{ billion}$$

To decrease the duration of the portfolio, Grid will have to enter the swap as the fixed rate payer and the receiver of the floating rate.

On the first settlement date:

Amount due on the fixed rate of 1.8%:

$0.018 \times = \frac{180}{360} \times 8.715 \text{ billion} = \text{JPY } 78.435 \text{ million}$

Amount to be received: $0.0185 \times = \frac{180}{360} \times 8.715 \text{ billion} = \text{JPY } 80.614 \text{ million}$

Net cash inflow = 80.614 million – 78.435 million = JPY 2.179 million; this is the correct answer.

The cash flows on both legs of the swap are miscalculated using the market value of the portfolio instead of N_S. The amount paid is miscalculated as $0.018 \times = \frac{180}{360} \times 5.81 \text{ billion} = \text{JPY } 52.29 \text{ million}$ and the amount received is miscalculated as $0.0185 \times = \frac{180}{360} \times 5.81 \text{ billion} = \text{JPY } 53.74 \text{ million}$, resulting in net cash inflow = 53.74 million – 52.29 million = JPY 1.45 million.

The swap is assumed to be settled annually instead of semiannually, resulting in amount due = 0.018 × 8.715 billion = JPY 156.87 million, amount to be received = 0.0185 × 8.715 billion = JPY 161.23 million, and net cash inflow = 161.23 million – 156.87 million = JPY 4.36 million.

(Module 7.1, LOS 7.a)

Related Material

SchweserNotes - Book 2

Question #6 - 6 of 10

Question ID: 1551879

The positive difference between the VIX front- month futures price and the VIX spot price *most likely* indicates that the market is in:

A) backwardation and the roll yield is positive. ✗

B) backwardation and the roll yield is negative. ✗

C) contango and the roll yield is negative. ✓

Explanation

Because the front-month futures price is higher than the VIX spot price, the market is in contango.

When the market is in contango, the futures price will be pulled toward the spot rate as the futures contract becomes closes to its maturity, resulting in a negative roll yield.

Because the futures price is higher than the spot price, the market is in contango.

Because the futures price is higher than the spot price, the market is in contango. If the market were in backwardation, the roll yield would have been positive.

(Module 7.4, LOS 7.d)

Related Material

SchweserNotes - Book 2

Question #7 of 10

Question ID: 1587568

An investor is short 10 contracts of July $40 calls and short 10 contracts of July $40 puts on Alphastar shares. The investor does not own the underlying shares. Which of the following statements about the investor's position is *most accurate*?

A) The investor's risk exposure to a fall in Alphastar's share price is limited rather than unlimited. ✓

B) The investor is fully hedged against changes in Alphastar's share price. ✗

C) Increased volatility of Alphastar shares will result in rising call option values but falling put option values. ✗

Explanation

The investor has limited risk, should the share price fall: the maximum loss is the $40 exercise price. However, the investor is exposed to unlimited risk if the share price were to rise because the price increase is not capped. (Note that this short position in an equal number of calls and puts on the same underlying with the same expiry is called a short straddle position.)

The investor is not hedged against price changes in Alphastar shares. In fact, the investor will suffer losses if the share price declined or increased by more than the premiums received for the options. A rise in volatility will result in both rising call and put option prices (negative to the investor).

(Module 6.7, LOS 6.f)

Related Material

SchweserNotes - Book 2

Question #8 of 10

Question ID: 1587578

A U.S. firm that borrows dollars and uses a plain vanilla currency swap to obtain euros for an investment in Europe is *most likely* trying to:

A) lower borrowing costs.

B) create a synthetic pay-fixed dollar loan.

C) increase the duration of the position.

Explanation

Swaps can lower overall borrowing costs by allowing firms to borrow at a lower rate within their own country rather than paying a higher rate by borrowing directly in the foreign currency. For example, a U.S. borrower needing euros would have to pay a higher rate than a counterparty in Europe. The European counterparty can borrow at a lower rate and pass the savings on to the U.S. borrower, who passes similar savings back via borrowing dollars in the United States and exchanging them for the euros. None of the other answers make sense.

(Module 7.1, LOS 7.a)

Related Material

SchweserNotes - Book 2

Question #9 of 10

Question ID: 1587570

Melinda has a long position on 50,000 of DWD, Inc. (DWD). DWD is currently trading at $42 per share, and it is widely believed that DWD's price will not rise in the next year. She is concerned that the price could fall below $35. Assuming Melinda is seeking protection of her long position for the next year and wants to minimize her total costs, what is her *least likely* course of action?

A) Purchase a put with a strike price of $39 and sell a call with a strike price of $45.

B) Purchase a put with a strike price of $41 and sell a put with a strike price of $35.

C) Purchase a put with a strike price of $40.

Explanation

Purchasing a put with a strike price of $41 will provide her with downside protection if the stock price falls from the current price of $42. However, selling a put with a strike price of $35 exposes her to losses if the stock price falls below $35, just like she is concerned about. Therefore, purchasing a 41 put and selling a 35 put is not an appropriate course of action.

Purchasing a put with a strike price of $39 will provide her with downside protection if the stock price falls from the current price of $42. Selling a call with a strike price of $45 will provide her with some additional income because the stock price is not expected to rise. Therefore, this is a reasonable course of action.

Purchasing a put with a strike price of $40 will provide her with downside protection if the stock price falls from the current price of $42. Therefore, this is a reasonable course of action.

(Module 6.9, LOS 6.f)

Related Material

SchweserNotes - Book 2

Question #10 of 10

Question ID: 1587591

Samantha Holly is the fund manager of a German fixed-income fund. The fund has a market value of €90m and a modified duration of 14. Holly believes that the European central bank will end its policy of lower target interest rates and would like to reduce the duration of her portfolio. Holly has identified the following Bund future, which she would like to use:

Government Bond Futures	German Bund
Contract size	€100,000
Future price	€174.50
CTD price	€104.83
CTD conversion factor	0.5955
CTD modified duration	15.81

How many contracts will Holly need to sell to achieve a target duration of 8?

A) Sell 453 contracts.

B) Sell 326 contracts.

C) Sell 194 contracts.

Explanation

Holly wishes to achieve a target duration of 8 for her portfolio.

Step 1: Compute the basis point value of the portfolio ($BPV_{portfolio}$):

$BPV_{portfolio}$ = 14 × 0.0001 × €90,000,000 = €126,000

Step 2: Compute the basis point value of the target duration:

BPV_{Target} = 8 × 0.0001 × €90,000,000 = €72,000

Step 3: Compute the basis point value of the CTD (BPV_{CTD}):

BPV_{CTD} = 15.81 × 0.0001 × [(€104.83/100 × €100,000] = €165.74

Step 4: Compute the basis point value hedge ratio:

$$\text{BPV HR} = \frac{\text{BPV}_{\text{Target}} - \text{BPV}_{\text{Portfolio}}}{\text{BPV}_{\text{CTD}}} \times \text{CF} = \frac{€72{,}000 - €126{,}000}{€165.74} \times 0.5955 = -194.02 \approx -19$$

Holly will need to sell 194 Bund futures to achieve her target duration.

(Module 7.1, LOS 7.a)

Related Material

SchweserNotes - Book 2