Question #1 of 79

The fixed-rate receiver in a plain vanilla interest rate swap has a position equivalent to a series of:

A) long interest-rate puts and short interest-rate calls.

B) long interest-rate puts.

C) short interest-puts and long interest-rate calls.

Explanation

The fixed-rate receiver has profits when short rates fall and losses when short rates rise, equivalent to buying puts and writing calls.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #2 of 79

The price of a forward contract:

A) depends on forward interest rates.

B) changes over the term of the contract.

C) is determined at contract initiation.

Explanation

The price of a forward contract is established at the initiation of the contract and is expressed in different terms, depending on the underlying assets. It is the price that makes the contract value zero, and depends on current interest rates through the cost-of-carry calculation.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #3 of 79

Consider a fixed-rate semiannual-pay equity swap where the equity payments are the total return on a $1 million portfolio and the following information:

- 180-day LIBOR is 4.2%
- 360-day LIBOR is 4.5%
- Div. yield on the portfolio = 1.2%

What is the fixed rate on the swap?

A) 4.5143%.

B) 4.4477%.

C) 4.3232%.

Explanation

$$\frac{\left(1 - \frac{1}{1.045}\right)}{\left(\frac{1}{1 + 0.042\left(\frac{180}{360}\right)} + \frac{1}{1 + 0.045\left(\frac{360}{360}\right)}\right)} = 0.022239 \times 2 = 4.4477\ \%$$

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Craig Champion, CFA, manages portfolios of U.S. securities for European investors. His clients have each hold different kinds of securities, and each has differing views with respect to hedging exchange rate risk.

Francois Levisque is a Belgian investor who holds a large diversified portfolio of U.S. equities. Levisque has a reputation for some success in timing the U.S. equity market. For example, he has often locked in gains on his portfolio with derivatives shortly before a market correction. Sometimes he also hedges his portfolio's currency risk.

Levisque has just instructed Champion to take a large short position in S&P 500 index, either with futures or with a forward contract. Champion notices that the futures price is less than the current spot price and consults with his colleague Danielle Silvers, CFA. Champion says he thinks that the futures price is less than the spot price because the dividend yield of the S&P 500 is greater than the Treasury Bill rate. Silvers says that it could just be backwardation.

Silvers also notes that the use of a forward contract might be a good idea because the contract will not attract the attention of other market participants who might react to Levisque's move.

Champion tells Silvers that the reason Levisque wants to hedge his equity position is that he thinks all U.S. interest rates will increase soon. This, he believes, is bearish for equities.

Ragnar Hvammen is a Norwegian investor with a large investment in oil-related assets that he often hedges with futures contracts. Champion notices that the price of an oil futures contract is usually higher than the spot price. Hvammen uses short-term borrowings in dollars, from both European and U.S. banks, to meet the liquidity needs of his oil investments, and he has Champion hedge these loan positions with Eurodollar futures.

Silvers suggests that Champion should consider using T-bill futures to hedge the loans from U.S. banks, and use Eurodollar futures only for the Eurodollar loans. Champion says he will look into that, as well as forward rate agreements, as alternative hedging tools for Hvammen.

Champion is also evaluating pricing of Euro-bund futures. Specifically, he is looking for pricing on a 1.2-year contract. The CTD is a 2.5% 10-year bund issued 1 year ago (just paid coupon) currently quoted at €104.10. The conversion factor for the bond is 1.08. At contract expiration, the underlying will have accrued interest of €0.42. Assume that the risk-free rate over the contract period is 1%.

Question #4 of 79

Champion and Silvers each gave a reason for why the futures price of the S&P 500 index might be less than the spot price. With respect to their statements, it is *most accurate* to conclude that:

A) neither statement is valid.

B) both statements are valid.

C) Champion's statement is invalid while Silver's statment is valid.

Explanation

The equation for the price of a futures contract on an equity index is $FP = S_0 \times e^{(R - \sigma) \times T}$, where σ is the dividend yield and R is the risk-free rate. If $R < \sigma$, then $FP < S_0$ and Champion is correct. Silvers could be correct in that backwardation is defined as $FP < S_0$, with the relationship being caused by the risk aversion of hedgers of long asset positions. Their risk aversion makes them willing to take short contracts at lower prices than otherwise might be the case.

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #5 of 79

For a futures contract on an asset with no storage costs, convenience yield, or other expected cash flows over the term of the contract, there should be a:

A) positive correlation between the futures price and interest rates and a negative correlation between the futures price and the spot price.

B) negative correlation between the futures price and interest rates and a positive correlation between the futures price and the spot price.

C) positive correlation between the futures price and both interest rates and the spot price.

Explanation

The equation for the no-arbitrage price of a futures contract with no storage costs, convenience yield, or other expected cash flows over the term of the contract is $FP = S_0 \times (1 + R)^T$, so the futures price is positively correlated with both the interest rate and the spot price.

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #6 of 79

Oil futures prices might be higher than the spot price because:

A) there are more benefits than costs to holding the asset.

B) there are more costs than benefits to holding the asset.

C) of reverse contango.

Explanation

In calculating the futures price, we would subtract the benefits of holding the asset, e.g., the present value of dividends and coupons, and add the costs of holding the asset. Oil does not pay a dividend, and there would be costs for holding oil. Contango describes the situation where the futures price exceeds the spot price, and there is not such thing as reverse contango.

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #7 of 79

The no-arbitrage futures price of the Euro-bond contract is *closest* to:

A) €102.85

B) €94.83

C) €110.61

Explanation

There will be 2 seminauunual coupon payments during the life of the futures contract: one in 6 months (t=0.5, T-t = 0.7) and one in one year (t=1, T-t = 0.2). Full price = €104.10 (since the bund just paid coupon, $AI_0 = 0$)

Step 1: compute the FV of 2 coupons: FVC = $(1.25 \times (1.01)^{0.7}) + (1.25 \times (1.01)^{0.2}) = 2.51$

Step 2: Compute Quoted Future price: QFP = [bund price × $(1 + R_f)^T - AI_T$ - FVC] /CF

$= (104.10 \times (1.01)^{1.2} - 0.42 - 2.51)/1.08 =$ €94.83

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #8 of 79

An index is currently 965 and the continuously compounded dividend yield on the index is 2.3%. What is the no-arbitrage price on a one-year index forward contract if the continuously compounded risk-free rate is 5%.

A) 991.4.

B) 991.1.

C) 987.2.

Explanation

The futures price $FP = S_0 e^{-\delta T} (e^{RT})$

$= S_0 e^{(R-\delta)T}$

$= 965e^{(.05-.023)}$

$= 991.4$

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #9 of 79

Which of the following is equivalent to a pay-floating USD receive-fixed EUR currency swap position?

A) A long position in a EUR bond coupled with the issuance of a USD-denominated floating rate note.

B) A short position in a EUR bond coupled with a long position in a USD-denominated floating rate note.

C) A short position in a EUR bond coupled with the issuance of a USD-denominated floating rate note.

Explanation

A long position in a fixed rate EUR bond will receive fixed coupons denominated in EUR. The short floating rate note requires USD denominated floating-rate payments. Combined, these are the same cash flow as a pay-floating USD receive-fixed EUR currency swap.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #10 of 79

The fixed-rate on a semiannual 2-year interest rate swap is *closest* to the:

A) coupon rate on a 2-year par bond with the same credit risk as the fixed-rate payer.

B) coupon rate on a 2-year par bond with the same credit risk as the reference rate.

C) current 180-day T-bill rate.

Explanation

The fixed-rate on a swap is calculated using the yield curve for the floating rate reference, usually London Interbank Offered Rate (LIBOR). Therefore, the fixed rate reflects the credit spread of that rate over the riskless rate of return.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #11 of 79

The fixed-rate payer in an interest-rate swap has a position equivalent to a series of:

A) long interest-puts and short interest-rate calls.

B) short interest-rate puts and long interest-rate calls.

C) long interest-rate puts and calls.

Explanation

The fixed-rate payer has profits when short rates rise and losses when short rates fall, equivalent to writing puts and buying calls.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #12 of 79

For a 1-year quarterly-pay swap, an equivalent position with short puts and long calls would involve:

A) three put-call combinations expiring on the first three settlement dates of the swap.

B) put-call combinations expiring on each of the four settlement dates.

C) three put-call combinations on the last three settlement dates of the swap.

Explanation

Interest rate options pay one period after exercise. Options expiring on settlements at t = 1,2,3, will mimic the uncertain swap payments at t = 2,3,4.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

John Williams, CFA, works in the treasury department of Sam Smith Leisure Inc., a U.S. based manufacturer of gym equipment. Recently he has been considering using derivative instruments to lock in returns on excess cash flows that tend to accumulate in the final quarter of each year as demand for equipment peaks during that time.

He estimates that this year, in 60-days, the company will have $28.5 million in excess funds to invest for 90 days.

Williams is presenting to the board 60 days before the excess funds need to be deposited, which is also 30 days before the year end. He intends to suggest an FRA as a method of locking in a return on the deposit. He intends to make the following two statements in favor of using an FRA.

Statement 1

As we are depositing cash, committing to an FRA will generate a cash inflow on the date we enter into it.

Statement 2

If rates move in our favor, we will receive a cash payment at the end of the notional borrowing period.

Williams will present the hypothetical rates and LIBORs shown in Exhibit 1 to illustrate the result of using an FRA. Current 2x5 FRA price is 3.8%. All rates are annualized.

Exhibit 1 – FRA Price and Theoretical Future LIBOR rates

Predicted LIBOR rates	In 30 days	In 60 days	In 90 days	In 120 days	In 150 days
30-day LIBOR	3.9%	4.0%	4.2%	4.4%	4.5%
60-day LIBOR	4.1%	4.4%	4.5%	4.7%	4.8%
90-day LIBOR	4.2%	4.7%	4.8%	4.9%	5.2%
120-day LIBOR	4.5%	5.0%	5.2%	5.3%	5.5%
150-day LIBOR	4.8%	5.3%	5.4%	5.6%	5.9%

One key question that the CFO is likely to ask is the predicted value of the FRA at the year end.

Williams is also currently investigating a bond forward contract opened by a former employee 30 days ago, who in doing so overstepped his authority. Details of the contract are shown in exhibit 2.

Exhibit 2 – Bond Forward Contract At Initiation

Forward Price:	$1,050.52 per $1,000 par value
Contract Notional Value:	$100,000
Maturity:	Forward contract expires in 200-days
Underlying Bond:	US Treasury 6% coupon
Coupon Payments:	Coupon has just been paid, coupons paid every 182 days

Williams has discovered that the employee bought 15 contracts. The board is concerned about the potential losses and intends to ask the third party if they can buy their way out of the contract if the company has exposure of more than $235,000 at the year end. At that date the contract will have 110 days until maturity.

Williams intends to calculate the exposure using an annual risk-free rate of 3.8% and two price scenarios:

Scenario 1

The forward contract price at the year-end is 15% below the initial forward contract price.

Scenario 2

The forward contract price at the year-end is 10% below the initial forward contract price.

A board member has also asked Williams for an overview of equity swaps. The member is a trustee of a pension fund that is considering the use of an equity swap to manage the return on its equity portfolio.

The trustee stated in an e mail to Williams the fund is looking to turn equity returns into a guaranteed return for up to 4 years through the use of a quarterly equity for floating rate swap. He is interested in getting Williams' view on what would constitute a fair price for the swap.

Williams intends to reply with the following points:

Point 1

To turn equity returns into a guaranteed return the fund should enter into an equity for floating rate swap as the equity payer.

Point 2

It is not possible to quote a price for an equity for floating swap.

Finally Williams is to investigate the potential for Sam Smith Inc to use a currency swap to borrow and invest in a manufacturing facility in Europe. A bank has offered the company a fixed for fixed currency swap involving US dollars and Euros.

Some of the swap details are outlined in exhibit 3.

Exhibit 3 – Currency Swap

Initiation:	1st January
Spot rate at initiation:	USD/EUR 1.19
Settlement:	Quarterly
Principal:	USD 40,000,000
Fixed EUR rate:	1.5%
Fixed USD rate:	1.3%

Question #13 of 79

Which of Williams' statements regarding FRAs is most likely correct?

A) Only Statement 1 is correct

B) Neither statement is correct

C) Only Statement 2 is correct

Explanation

An FRA involves no initial cash flow as it is a commitment. The FRA will pay off at the date of expiry (the start of the notional borrowing period).

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #14 of 79

Using the price and predicted LIBOR rates in exhibit 1, which of the following is closest to the predicted value of the FRA at the year end?

A) -$62,000

B) -$85,000

C) -$100,000

Explanation

The year end is 30 days away. At that point the required FRA would be a 1X4 (90 days borrowing in 30 days time).

To value the FRA, first price this FRA to compare to the current FRA price.

30 day LIBOR at year end 3.9% x 30/360 = 0.325%

120 day LIBOR at year end 4.5% x 120/360 = 1.5%

FRA price = 1.015/1.00325 – 1 = 0.01171

Quoted annually = 0.01171 x 360/90 = 0.046848 = **4.685%**

Value = (3.8% - 4.685%) x $28.5 million x 90/360 = -$63,056

Discounted to year end = -$63,056/1.015 = **-$62,124**

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #15 of 79

Which of the scenarios tested by Williams would most likely lead the board to request a buy-out of the bond futures contract outlined in exhibit 2?

A) Both scenarios

B) Neither scenario

C) Scenario 1 only

Explanation

Scenario 1 bond price:	$1050.52 x 0.85	= $892.94
Value:	($892.94 - $1050.52) x 100,000/1,000	= -$15,758 per contract
Total exposure:	-$157.58 x 15	= -$236,370
Present Value at year end:	**-$236,370/1.038$^{110/365}$**	**= -$233,728**

Scenario 2 bond price:	$1050.52 x 0.90	= $945.47
Value:	($945.47 - $1,050.52) x 100,000/1,000	= -$10,505 per contract
Total exposure:	-$10,505 x 15	= -$157,575
Present Value at year end:	**-$157,575/1.038$^{110/365}$**	**= -$155,814**

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #16 of 79

How many of Williams' points regarding the proposed equity swap are correct?

A) Both points are correct

B) Only one of the points is correct

C) Neither point is correct

Explanation

If the trustee is looking to guarantee a return, then the fund should enter into an equity for fixed swap, not floating.

The price of a swap is the quoted fixed rate, hence this statement is correct. In the absence of a fixed rate it is not possible to quote a price.

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #17 of 79

Using the details shown in exhibit 3, under the terms of the currency swap at the first settlement date Sam Smith would most likely:

A) pay USD 130,000

B) pay EUR 150,000

C) pay EUR 126,050

Explanation

Sam Smith is using the currency swap to obtain EUR funding. It will therefore receive EUR (and pay USD) at the outset of the swap and pay EUR interest (and receive USD) at each settlement date.

The USD notional principal is 40,000,000. At a spot rate of 1.19 that equates to EUR 33,613,445

The interest payment is therefore 33,613,445 x 1.5% x 90/360 = **126,050**

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #18 of 79

Which of the following statements regarding cash flows at the final settlement date for the currency swap outlined in exhibit 3 is *most likely* correct?

A) Sam Smith Inc will receive USD 40,000,000 plus the USD interest payment

B) Without knowing the spot rates on the final settlement date, it is impossible to state the cash flows that occur

C) Sam Smith will pay USD 40,000,000 and receive the final USD interest payment

Explanation

Smith initially borrowed EUR and swapped USD. Throughout the swap, at each settlement date Smith will pay EUR interest and receive USD.

At the final settlement date, Smith will receive the final USD interest payment and receive the USD principal back.

(Study Session 14, Module 39.8, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #19 of 79

90 days ago the exchange rate was USD 0.83 per CDN and the term structure was:

	180 days	360 days
USD LIBOR	5.2%	5.6%
CDN LIBOR	4.8%	5.4%.

A 1 year, semi-annual settlement, fixed for fixed swap was initiated with 5.30% fixed for CDN and 5.52% fixed for USD on a principal of USD 1 million.

Current exchange rate is USD 0.84 per CDN and the yield curve is:

	90 days	270 days
USD LIBOR	5.2%	5.6%
Disc Factor	0.98717	0.95969
CDN LIBOR	4.8%	5.4%
Disc factor	0.98814	0.96108

What is the value of the swap to the USD interest payer?

A) $11,500.

B) $10,126.

C) -$3,472.

Explanation

CDN principal = 1,000,000/0.83 = CDN 1,204,819. CDN payments = (0.053/2) x 1,204,819 = CDN 31,928.

USD payment = 1,000,000 x (0.0552/2) = USD 27,600

Value of CDN payments = 31,928 x 0.98814 + (1,204,819 + 31,928) x 0.96108 = CDN 1220162

Value in USD = 1220162 x 0.84 = USD 1,024,936.

Value of USD payments = 27,600 x 0.98717 + 1,027,600 x 0.95969 = USD 1,013,423

Value to USD interest payer = $1,024,936 – $1,013,423 = $11,513

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #20 of 79

What is the value of a 6.00% 1x4 (30 days x 120 days) forward rate agreement (FRA) with a principal amount of $2,000,000, 10 days after initiation if $L_{10(110)}$ is 6.15% and $L_{10(20)}$ is 6.05%?

A) $700.00.

B) $767.40.

C) $745.76.

Explanation

The current 90-day forward rate at the settlement date, 20 days from now is:

([1+ (0.0615 x 110/360)]/[1+ (0.0605 x 20/360)] – 1) x 360/90 = 0.061517

The interest difference on a $2 million, 90-day loan made 20 days from now at the above rate compared to the FRA rate of 6.0% is:

[(0.061517 x 90/360) – (0.060 x 90/360)] x 2,000,000 = $758.50

Discount this amount at the current 110-day rate:

758.50/[1+ (0.0615 x 110/360)] = $745.76

(Study Session 14, Module 39.5, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #21 of 79

Consider a fixed-for-fixed 1-year $100,000 semiannual currency swap with rates of 5.0% in USD and 4.8% in CHF, originated when the exchange rate is $0.34. After the first settlement, the exchange rate is $0.35 and the term structure is:

	90 days	270 days
LIBOR	5.2%	5.6%
Swiss	4.8%	5.4%

What is the value of the swap to the USD payer?

A) -$2,719.

B) $2,937

C) $2,814.

Explanation

CHF periodic coupon (per 1 CHF) = 0.048/2 = 0.024

DF for 180 day CHF = 1 / (1 + 0.054 × (180/360)) = 1/1.027 = 0.9737

PV of CHF cash flows (per 1 CHF) = 0.9737 × 1.024 = 0.9971

At the current exchange rate the value is 0.9971 × 0.35 = USD 0.3490

The notional amount is 100,000/0.34 = 294,118 CHF so the dollar value of the CHF payments is 0.3490 × 294,118 = $102,647.

USD periodic coupon (per 1 USD) = 0.05/2 = 0.025

DF for 180 day USD = 1 / (1 + 0.056 × (180/360)) = 1/1.028 = 0.9728

PV of USD cash flows (per 1 USD) = 0.9728 × 1.025 = 0.9971

Value (for notional = $100,000) = 0.9971 × 100,000 = $99,710.

The value of the swap to the dollar payer is 102,647 - $99,710 = $2,937.

The value of the swap to the dollar payer is 103,750 – 101,031 = $2,719.

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #22 of 79

At contract initiation, the value of a forward contract:

A) is typically zero regardless of the price of the underlying asset. ✓

B) is set to 100 by convention. ✗

C) depends on the market price of the underlying asset. ✗

Explanation

Due to the no-arbitrage principle, the price of a forward contract is calculated to make the value of the contract zero at contract initiation. Neither the long nor the short typically makes any payment to enter into the forward agreement. A special case is an off-market forward where, for whatever reason, the contract price is not set equal to the no-arbitrage price, and the long or short position makes a payment to the opposite counterparty to offset the difference.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #23 of 79

A stock is currently priced at $110 and will pay a $2 dividend in 85 days and is expected to pay a $2.20 dividend in 176 days. The no arbitrage price of a six-month (182-day) forward contract when the effective annual interest rate is 8% is *closest* to:

A) $110.20. ✗

B) $110.00. ✗

C) $110.06. ✓

Explanation

In the formulation below, the present value of the dividends is subtracted from the spot price, and then the future value of this amount at the expiration date is calculated.

$$(110 - 2/1.08^{85/365} - 2.20/1.08^{176/365})\ 1.08^{182/365} = \$110.06$$

Alternatively, the future value of the dividends could be subtracted from the future value of the stock price based on the risk-free rate over the contract term.

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #24 of 79

At expiration, the value of a forward contract is:

A) always greater than or equal to zero.

B) the difference between the contract price and the market value of the underlying asset.

C) equal to the market price of the underlying asset.

Explanation

In a forward contract, the long is obligated to buy, and the short is obligated to sell, the underlying asset at the contract price. The difference between the contract price and the market price of the asset is what gives the contract value. The contract has a positive value at expiration to the long/short only if the contract price is below/above the market price.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #25 of 79

Consider a fixed-rate semiannual-pay equity swap where the equity payments are the total return on a $1 million portfolio and the following information:

- 180-day LIBOR is 5.2%
- 360-day LIBOR is 5.5%
- Dividend yield on the portfolio = 1.2%

What is the fixed rate on the swap?

A) 5.1387%.

B) 5.4197%.

C) 5.4234%.

Explanation

$$\frac{\left(1-\frac{1}{1.055}\right)}{\left(\frac{1}{1+0.052\left(\frac{180}{360}\right)}+\frac{1}{1+0.055\left(\frac{360}{360}\right)}\right)} = 0.027117 \times 2 = 5.4234\%$$

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #26 of 79

To initiate an arbitrage trade if the futures contract is underpriced, the trader should:

A) borrow at the risk-free rate, buy the asset, and sell the futures.

B) short the asset, invest at the risk-free rate, and buy the futures.

C) borrow at the risk-free rate, short the asset, and sell the futures.

Explanation

If the futures price is too low relative to the no-arbitrage price, buy futures, short the asset, and invest the proceeds at the risk-free rate until contract expiration. Take delivery of the asset at the futures price, pay for it with the loan proceeds and keep the profit. For Treasury bill (T-bills), shorting the asset is equivalent to borrowing at the T-bill rate.

(Study Session 14, Module 39.1, LOS 39.b)

Related Material

SchweserNotes - Book 4

Question #27 of 79

The no-arbitrage price of a futures contract with a spot rate of 990, a time to maturity of 2 years, and a risk-free-rate of 5% is *closest* to:

A) 1091

B) 792

C) 1040

Explanation

The no-arbitrage price of a futures contract is based on the spot rate, the time to maturity, and the risk-free-rate.

FP	$= S_0 \times (1 + R_f)^T$
	$= 990(1.05)^2$
	$= 1091$

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #28 of 79

An index is currently 876, the risk-free rate (R_f) is 7%, and the dividend yield on the index portfolio is 1.8%. Assuming that these are continuously compounded yields, the price of an 18-month index future is *closest* to:

A) 945.2.

B) 947.1.

C) 943.0.

Explanation

FP = 876 $e^{(0.07-0.018)1.5}$ = 947.1.

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #29 of 79

The floating-rate payer in a simple interest-rate swap has a position that is equivalent to:

A) issuing a floating-rate bond and a series of long FRAs.

B) a series of long forward rate agreements (FRAs).

C) a series of short FRAs.

Explanation

The floating-rate payer has a liability/gain when rates increase/decrease above the fixed contract rate; the short position in an FRA has a liability/gain when rates increase/decrease above the contract rate.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #30 of 79

Consider a one-year currency swap with semiannual payments. The payments are in U.S. dollars and euros. The current exchange rate of the euro is $1.30 and interest rates are

	180 days	360 days
USD LIBOR	5.6%	6.0%
Euribor	4.8%	5.4%

What is the fixed rate in euros?

A) 5.318%.

B) 2.659%.

C) 5.245%.

Explanation

The present values of 1 euro received in 180 days and 1 euro received in 360 days are:

$$1/(1 + 0.048 \times (180/360)) = 0.9766 \text{ and } 1/1.054 = 0.9488$$

The fixed rate in euros is (1 - 0.9488) / (0.9766 + 0.9488) = 0.026592 × (360/180) = 5.318%. The notional principal is 100,000/1.30 = 76,923 euros.

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #31 of 79

A swap is equivalent to a series of:

A) FRAs priced at market rates.

B) interest rate calls.

C) off-market FRAs.

Explanation

Since the fixed rate on the swap is the same at every settlement date, a series of FRAs at those fixed rates will have values that differ from zero to the extent the fixed rate and the zero-value rate differ. This makes them off-market FRAs.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #32 of 79

Consider a 1-year semiannual equity swap based on an index at 985 and a fixed rate of 4.4%. 90 days after the initiation of the swap, the index is at 982 and London Interbank Offered Rate (LIBOR) is 4.6% for 90 days and 4.8% for 270 days. The value of the swap to the equity payer, based on a $2 million notional value is *closest* to:

A) −$22,564

B) $22,564

C) $22,314

Explanation

$$= \frac{982}{985} - \frac{\frac{0.044}{2}}{1+\left(0.046\times\frac{90}{360}\right)} - \frac{\frac{0.044}{2}}{1+\left(0.048\times\frac{270}{360}\right)} - \frac{1}{1+\left(0.048\times\frac{270}{360}\right)}$$

$$= \frac{982}{985} - \frac{0.022}{1.0115} - \frac{0.022}{1.036} - \frac{1}{1.036}$$

$$= 0.996954 - 0.021750 - 0.021236 - 0.965251$$

$$= -0.0112821 \times 2,000,000 = -\$22,564$$

−$22,564 is the value to the fixed-rate payer, thus $22,564 is the value to the equity return payer.

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Wanda Brock works as an investment strategist for Globos, an international investment bank. Brock has been tasked with designing a strategy for investing in derivatives in Mazakhastan, an Eastern European country with impressive economic growth.

One of the first tasks Brock tackles involves hedging. Globos wants to hedge some of its investments in Mazakhastan against interest-rate and currency volatility. After a bit of research, Brock has gathered the following data:

- The U.S. risk-free rate is 5.5%, The Federal Reserve Board is expected to raise the fed funds rate by 0.25% in one week.
- The current spot rate for the Mazakhastanian currency, the gluck, is 9.4073G/$.
- Annualized 90-day LIBOR is 7.6%.
- Globos' economists expect annualized 90-day LIBOR to rise to 7.9% over the next 60 days.
- The Mazakhastan risk-free rate is 3.75Using the above data, Brock develops some hedging strategies, and then delivers them to Globos' futures desk.

After making some calculations, Brock assesses the arbitrage opportunities in Mazakhastan and passes the information on to the futures desk. Shortly afterward, she is informed that Globos' Mazakhastan subsidiary uses its silver holdings as collateral for business loans, which allows the unit to obtain a favorable interest rate.

Jonah Mason, one of Globos' traders, asks Brock for a few details about the Mazakhastan financial markets. Brock sends Mason a short e-mail containing the following observations:

- Standard & Poor's just raised Mazakhastan's sovereign debt to investment grade.
- New technological innovations and commercial expansion has substantially boosted the income of the average Mazakhastanian.

Before Mason receives the e-mail, he turns his attention to a memo about a futures contract a subordinate is considering. Unfortunately, the memo arrives without the summary page to the notes. Mason must deduce the nature of the hedge based on its characteristics: The risk-free rate used in calculating the futures price, and that price adjusted to account for individual future cashflows.

Question #33 of 79

The price of a 75-day gluck future should be *closest* to:

A) 9.3750G/$.

B) 0.1081$/G.

C) 9.4429G/$.

Explanation

To calculate the price of a currency future, use the following equation:

Spot exchange rate × (1 + domestic risk-free rate)^t / (1 + foreign risk-free rate)^t.

In this case, since the exchange rate is expressed in glucks per dollar, the Mazakhastan interest rate is considered domestic. Since we are pricing a 75-day future, the time variable "t" is 75/365.

9.4073G/\$ × $(1.0375)^{(75/365)}$ / $(1.055)^{(75/365)}$ = 9.3750G/\$.

(Study Session 14, Module 39.6, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #34 of 79

Based on the two characteristics of the futures contract in Mason's memo, which of the following does the contract refer to?

	Treasury bond futures?	Stock index futures?
A)	Yes	Yes
B)	Yes	No
C)	No	Yes

Explanation

Both Treasury bond futures and stock index futures require the use of the risk-free rate to determine price. But while the pricing of bond futures requires the discounting of individual coupons, the pricing of stock-index futures does not, instead using a continuously compounded dividend yield.

(Study Session 14, Module 39.6, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #35 of 79

Which of the following would be *most likely* to cause a contango situation with silver futures in Mazakhastan?

A) A shortage of warehouse space that drives up rental rates.

B) An increase in the availability of asset-backed loans.

C) A huge silver discovery.

Explanation

In a contango situation, futures prices are higher than the spot price. This normally occurs when there are no benefits to holding an asset, or when the costs of storing an asset are high enough to offset the benefits of holding the asset. An increase in the availability of asset-backed loans would increase the convenience yield of silver, which would not cause a contango situation. A silver discovery could have some effect on the price of silver, but should not affect a contango situation one way or another. On the other hand, an increase in storage costs would offset some of the convenience yield. We don't know whether such an increase in costs would be enough to make the net cost of holding silver positive, but any increase in costs could contribute to a contango situation.

(Study Session 14, Module 39.6, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #36 of 79

30 days ago, J. Klein took a short position in a $10 million (3X6) forward rate agreement (FRA) based on the London Interbank Offered Rate (LIBOR) and priced at 5%. The current LIBOR curve is:

- 30-day = 4.8%
- 60-day = 5.0%
- 90-day = 5.1%
- 120-day = 5.2%
- 150-day = 5.4%

The current value of the FRA, to the short, is *closest* to:

A) −$15,280.

B) −$15,495.

C) −$15,154.

Explanation

FRAs are entered in to hedge against interest rate risk. A person would buy a FRA anticipating an increase in interest rates. If interest rates increase more than the rate agreed upon in the FRA (5% in this case) then the long position is owed a payment from the short position.

Step 1: Find the forward 90-day LIBOR 60-days from now.

[(1 + 0.054(150 / 360)) / (1 + 0.05(60 / 360)) − 1](360 / 90) = 0.056198. Since projected interest rates at the end of the FRA have increased to approximately 5.6%, which is above the contracted rate of 5%, the short position currently owes the long position.

Step 2: Find the interest differential between a loan at the projected forward rate and a loan at the forward contract rate.

(0.056198 − 0.05) × (90 / 360) = 0.0015495 × 10,000,000 = $15,495

Step 3: Find the present value of this amount 'payable' 90 days after contract expiration (or 60 + 90 = 150 days from now) and note once again that the short (who must 'deliver' the loan at the forward contract rate) loses because the forward 90-day LIBOR of 5.6198% is greater than the contract rate of 5%.

[15,495 / (1 + 0.054(150 / 360))] = $15,154.03

This is the *negative* value to the short.

(Study Session 14, Module 39.5, LOS 39.b)

Related Material

SchweserNotes - Book 4

Question #37 of 79

The price of a 3 × 5 forward rate agreement (FRA) is the:

A) 2-month implied forward rate 5 months from today.

B) 2-month implied forward rate 3 months from today.

C) 3-month implied forward rate 5 months from today.

Explanation

The notation for FRAs is unique. There are two numbers associated with an FRA: the number of months until the contract expires and the number of months until the underlying loan is settled. The difference between these two is the maturity of the underlying loan. For example, a 3 × 5 FRA is a contract that expires in three months (90 days), and the underlying loan is settled in five months (150 days). The price of the 3 × 5 FRA is calculated by annualizing the implied forward rate. The implied forward rate is calculated from the 3-month rate and the 5-month rate.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #38 of 79

Which of the following is *equivalent* to a plain vanilla receive-fixed interest rate swap?

A) A short position in a bond coupled with the issuance of a floating rate note.

B) A short position in a bond coupled with a long position in a floating rate note.

C) A long position in a bond coupled with the issuance of a floating rate note.

Explanation

A long position in a fixed rate bond pays fixed coupons. The short floating rate note requires floating-rate payments. Together, these are the same cash flow as a receive-fixed swap.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #39 of 79

The value of the S&P 500 Index is 1,260. The continuously compounded risk-free rate is 5.4% and the continuous dividend yield is 3.5%. Calculate the no-arbitrage price of a 160-day forward contract on the index.

A) $562.91.

B) $1,310.13.

C) $1,270.54.

Explanation

$FP = 1,260 \times e^{(0.054 - 0.035) \times (160 / 365)} = 1,270.54$

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #40 of 79

Writing a series of interest-rate puts and buying a series of interest-rate calls, all at the same exercise rate, is equivalent to:

A) being the fixed-rate payer in an interest rate swap.

B) a short position in a series of forward rate agreements.

C) being the floating-rate payer in an interest rate swap.

Explanation

A short position in interest rate puts will have a negative payoff when rates are below the exercise rate; the calls will have positive payoffs when rates exceed the exercise rate. This mirrors the payoffs of the fixed-rate payer who will receive positive net payments when settlement rates are above the fixed rate.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #41 of 79

A plain vanilla interest-rate swap to the fixed-rate payer is equivalent to issuing a fixed-rate bond and:

A) selling a series of interest rate puts.

B) buying a floating-rate bond.

C) selling a series of interest rate calls.

Explanation

Paying fixed and receiving floating in a swap is equivalent to issuing a fixed-rate bond and investing the proceeds in a floating rate bond.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #42 of 79

Consider a 1-year, $5 million semiannual-pay fixed-rate equity swap initiated when the equity index is 750 and swap fixed rate is 3.7%. Equity index was at 760 at first settlement. It is now 270 days since inception of the swap and the index is at 767, 90-day LIBOR is 3.4% (DF = 0.99157) and 270-day LIBOR is 3.7% (DF = 0.9730). What is the value of the swap to the fixed-rate payer?

A) −$2,726.

B) −$3,520.

C) $3,478.

Explanation

For $100 notional, the value of the equity side is (767/760) x $100 = $100.921

Value of the seminannual –pay, fixed rate bond with 3.7% annual coupon =[100 + 3.7/2] x 0.99157 = $100.9914

Value of pay-fixed side = value of equity – value of fixed rate bond = $100.921 - $100.9914 = -$0.0704 (per $100 notional).

For $5 million notional, value = 50,000 x -0.0704 = -$3,520

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #43 of 79

Which of the following *best* describes the price of a forward contract? The forward price is:

A) always equal to the market price at contract termination.

B) the price that makes the values of the long and short positions zero at contract initiation.

C) always expressed in dollars.

Explanation

The forward price is the contract price of the underlying asset under the terms of the forward contract, and is the price that makes the values of the long and short positions zero at contract initiation. It is not the amount it costs to purchase the forward contract. The forward price is expressed in terms of the underlying asset, and may be a dollar value, exchange rate, or interest rate. The value of a forward contract comes from the difference between the forward contract price and the market price for the underlying asset. These values are likely to be different at contract termination, which will result in a profit for either the long or the short position.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Chantal DuPont is the CFO of Vetements Verdun, a manufacturer of specialty clothing and uniforms, located in northern France. The firm is currently undergoing an expansion which will require DuPont to draw down 25 million on Vetements Verdun's credit line as a 90-day bridge loan before the mortgage closes. The money will not be needed for 60 days, at which point the interest rate will be determined. The interest rate on the loan will be based off 90-day LIBOR.

DuPont is becoming concerned because of signs that interest rates may begin to rise. The firm cannot afford to have its borrowing costs increase significantly over current rates. In response to DuPont's concerns, the company's CEO, Viviane Lamarre, has asked DuPont to hedge the firm's borrowing costs, even if that entails some near-term outlays.

DuPont and Lamarre discuss entering into a forward rate agreement (FRA) to hedge Vetements Verdun's interest rate exposure on the credit line. Current LIBOR rates are:

Libor rate	
30-day	2.6%
60-day	2.8%
90-day	3.0%
120-day	3.2%
150-day	3.3%
180-day	3.4%

They decide to go forward with the hedge and DuPont enters into the appropriate FRA for the full amount of 25 million.

In the first 30 days of the FRA, the fixed income markets rally sharply. The new set of LIBOR rates, on the thirtieth day of the FRA, is:

Libor rate	
30-day	2.2%
60-day	2.4%
90-day	3.6%
120-day	3.8%
150-day	3.8%

180-day	3.8%

At the settlement date, the interest savings on the loan term is 23,750. DuPont tells Lamarre, "I am looking forward to cashing our settlement check for 23,750." Lamarre adds, "Yes, and on top of that we get to borrow for 90 days at a below-market rate." Both DuPont and Lamarre are pleased with their decision to hedge.

Question #44 of 79

Which statement *most* accurately describes a 2 x 3 forward rate agreement?

A) Two-month underlying interest rate on a contract settled in three months.

B) Contract expires in two months on an underlying loan settled in three months.

C) Underlying loan of two month maturity under a contract that expires in three months.

Explanation

A 2 x 3 forward rate agreement is a contract that expires in two months and the underlying loan is settled in three months. The underlying rate is a 30-day (1-month) rate on a 30-day (1-month) loan in 60 days (2 months).

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #45 of 79

Which forward rate agreement would *most* effectively hedge Vetements Verdun's exposure to LIBOR?

A) 3 x 2.

B) 2 x 3.

C) 2 x 5.

Explanation

Vetements Verdun needs to be hedged against 90-day LIBOR rates that will prevail 60 days from now. Such a hedge would require a two-month contract on three-month rates, to be settled in five months: a 2 x 5.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #46 of 79

Which value is *closest* to the price of the most effective hedge for Vetements Verdun?

A) 3.0%.

B) 3.3%.

C) 3.6%.

Explanation

The actual, unannualized rate on the 60-day loan is:

$$R60 = 0.028 \times 60/360 = 0.00467$$

The actual, unannualized rate on the 150-day loan is:

$$R150 = 0.033 \times 150/360 = 0.01375$$

So the rate on a 90-day loan to be made 60 days from now is:

$$FR\ (60,90) = ((1 + R150)/(1 + R60)) - 1$$

$$FR\ (60,90) = (1.01375/1.00467) - 1$$

$$FR\ (60,90) = 1.00904 - 1$$

$$FR\ (60,90) = 0.904\%$$

We annualize this rate using the formula:

$$0.904\% \times (360/90) = 3.62\%$$

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #47 of 79

What must the 90-day LIBOR rate have been at the expiration of the contract?

A) 3.4%.

B) 4.0%.

C) 3.6%.

Explanation

Since Vetements Verdun is long the FRA, the market rate of interest at settlement must be higher than the price of the contract and the 23,750 has a positive value. The interest savings at the end of the loan term will be:

Interest savings = ((market rate × (90/360)) − (0.0362 × (90/360))) × 25,000,000

23,750 = ((market rate × 90/360) − 0.00905) × 25,000,000

0.000950 = market rate × 90/360 − 0.00905

0.0100 = market rate × 0.25

0.0400 = market rate

The market rate must have been 4.0%.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #48 of 79

Regarding the statements made by Lamarre and DuPont about the ultimate value of their hedge:

A) Lamarre's statement is incorrect; DuPont's statement is incorrect.

B) Lamarre's statement is correct; DuPont's statement is incorrect.

C) Lamarre's statement is incorrect; DuPont's statement is correct.

Explanation

The interest savings at the end of the loan term must be discounted back to the present value on the FRA settlement date:

Settlement payment = Present value of interest savings

Settlement payment = 23,750 / (1 + (0.040 × 90/360))

Settlement payment = 23,750 / (1 + 0.010)

Settlement payment = 23,750 / 1.010

Settlement payment = 23,515

The settlement check would be for 23,515. DuPont's statement is incorrect. Lamarre's statement is also incorrect because the settlement check represents the value of the below-market loan. The actual loan will be at the prevailing rate, and the settlement on the FRA will offset the interest cost on the loan.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #49 of 79

Thirty days into the FRA, what is the value of the contract from Vetements Verdun's perspective?

A) Owes 43,943.

B) Due 45,000.

C) Due 43,943.

Explanation

Since we have moved 30 days into the FRA, the new rate for the end of the contract is the 30-day rate (60 days originally minus 30 days passed) and the new rate for the settlement of the loan is the 120-day rate (150 days originally minus 30 days passed).

With that information, the pricing is straightforward:

The actual, unannualized rate on the 30-day loan is:

$$R30 = 0.022 \times 30/360 = 0.00183$$

The actual, unannualized rate on the 120-day loan is:

$$R120 = 0.038 \times 120/360 = 0.01267$$

The rate on a 90-day loan to be made 30 days from now is:

$$FR\ (30,90) = ((1 + R120) / (1 + R30)) - 1$$

$$FR\ (30,90) = ((1 + 0.01267) / (1 + 0.00183)) - 1$$

$$FR\ (30,90) = (1.01267 / 1.00183) - 1$$

$$FR\ (30,90) = 1.010820 - 1$$

$$FR\ (30,90) = 1.0820\%$$

We annualize this rate using the formula:

$$1.082\% \times (360/90) = 4.33\%$$

The interest saving is:

$$\text{Interest saving} = ((0.0433 \times 90/360) - (0.0362 \times 90/360)) \times 25{,}000{,}000$$

$$\text{Interest saving} = (0.01083 - 0.00905) \times 25{,}000{,}000$$

$$\text{Interest saving} = 0.00178 \times 25{,}000{,}000$$

$$\text{Interest saving} = 44{,}500$$

The interest "saving" is a positive 44,500. Discounting that back at the current 120-day rate we have:

$$\text{FRA value} = 44{,}500 / (1 + (0.038 \times 120/360))$$

$$\text{FRA value} = 44{,}500 / (1 + (0.012667))$$

$$\text{FRA value} = 44{,}500 / 1.012667$$

$$\text{FRA value} = 43{,}943$$

The value of the FRA to Vetements Verdun 30 days into the contract is 43,943. In other words, they are due 43,943.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #50 of 79

If the one year spot rate is 5%, the two-year spot rate is 5.5%, and the three year spot rate is 6%, the fixed rate on a 3-year annual pay swap is *closest* to:

A) 4.50%.

B) 5.65%.

C) 1.99%.

Explanation

The fixed rate on the swap is: $\dfrac{1-\dfrac{1}{1+0.06(3)}}{\dfrac{1}{1.05}+\dfrac{1}{1+0.055(2)}+\dfrac{1}{1+0.06(3)}}$

$$\frac{1-0.8475}{0.9524+0.9009+0.8475}$$

= 0.1525 / 2.7008 = 0.0565

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4

Question #51 of 79

The forward price in a 90-day forward contract on a non-dividend-paying stock currently (at contract initiation) selling for $55 when the 90-day risk-free rate is 5% is *closest* to:

A) $54.32.

B) $55.67.

C) $52.38.

Explanation

$FP = S_0 \times (1 + R_f)^T = \$55 \times (1.05)^{90/365} = \$55.67$

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #52 of 79

The current U.S. dollar ($) to Canadian dollar (C$) exchange rate is 0.7. In a $1 million currency swap, the party that is entering the swap to hedge existing exposure to C$-denominated fixed-rate liability will:

A) receive floating in C$.

B) pay C$1,428,571 at the beginning of the swap.

C) pay floating in C$.

Explanation

The party that is entering the swap to hedge existing exposure to C$-denominated fixed-rate liability will want to receive-fixed C$. They will pay 1,000,000/0.7 = C$1,428,571 (principal) at swap inception (in exchange for USD 1 million) and get the same amount (C$1,428,571) back at termination (in exchange for paying back the USD 1 million).

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #53 of 79

The price of a forward contract:

A) must be equal to the market price at contract termination.

B) is the settlement price for the underlying asset.

C) is equal to the value of the contract in equilibrium.

Explanation

The price of a forward contract is the price of the underlying asset that the long will pay to the short at settlement (for a deliverable contract). The value of a forward contract comes from the difference between the forward contract price and the market price for the underlying asset. This difference between price and value is a key concept to understand. A forward contract has only one price, which applies to both the long and to the short.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #54 of 79

The value of a futures contract between the times when the account is marked-to-market is:

A) never less than the value of a forward contract entered into on the same date.

B) the same as the contract price.

C) equal to the difference between the price of a newly issued contract and the settle price at the most recent mark-to-market period.

Explanation

Between the mark-to-market account adjustments, the contract value is calculated just like that of a forward contract; it is the difference between the price at the last mark-to-market and the current futures price, (i.e. the futures price on a newly issued contract). The mark-to-market of a futures contract is the payment or receipt of funds necessary to adjust for the gains or losses on the position. This adjusts the contract price to the 'no-arbitrage' price currently prevailing in the market.

(Study Session 14, Module 39.6, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #55 of 79

The price of an interest rate swap is the:

A) cost to purchase a swap.

B) market value of the swap.

C) fixed rate of interest.

Explanation

The price of an interest rate swap is quoted as the rate on the fixed-rate payments. The floating rate is a known reference rate, such as London Interbank Offered Rate (LIBOR), but does not need to be quoted.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #56 of 79

A U.S. firm (U.S.) and a foreign firm (F) engage in a 3-year, annual pay currency swap; The USD fixed rate at initiation was 5% while FC fixed rate was 4%. At the beginning of the swap, $2 million was paid by the U.S. firm and the exchange rate was 2 FC units per $1. At the end of the swap period the exchange rate was 1.75 FC units per $1.

At the end of year 1, firm:

A) F pays firm U.S. $200,000.

B) U.S. pays firm F 160,000 FC units.

C) U.S. pays firm F $200,000.

Explanation

Firm U.S. pays fixed 4% on FC = 0.04 × $2,000,000 × 2 FC units per $1 = 160,000 FC units.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #57 of 79

At the inception of a market-rate plain vanilla swap, the value of the swap to the fixed-rate payer is:

A) zero.

B) positive.

C) either positive or negative.

Explanation

A market-rate swap is priced so that the value to either side is zero at the inception of the swap.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #58 of 79

The theoretical price of a forward contract:

A) is the no-arbitrage price.

B) equals the long's expectation of the future price of the underlying asset.

C) is always greater than the current price of the underlying asset.

Explanation

The theoretical price of a forward contract is the future price of the underlying asset imposed by the no-arbitrage conditions. It can be less than the current price of the asset if the cost-of-carry is negative. Accrued interest is paid by the long at delivery under a bond forward, but is not included in the price quote, which is usually in terms of yield to maturity at the settlement date.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #59 of 79

Consider a forward contract on 1 million Mexican Pesos at \$0.08254/MXN. 60 days prior to expiration the U.S. risk-free rate is 5%, the Mexican risk-free rate is 6%, and the spot and forward rates are \$0.08211/MXN and \$0.08198 respectively. The value of the contract to the long MXN party is *closest* to:

A) \$553.

B) -\$297.

C) -\$553.

Explanation

$$V_t = \frac{[FP_t - FP](\text{contract size})}{(1+r_{PC})^T} = \frac{[0.08198 - 0.08254] \times (1{,}000{,}000)}{(1.05)^{(60/365)}} = -\$555.53$$

(Study Session 14, Module 39.6, LOS 39.b)

Related Material

SchweserNotes - Book 4

Question #60 of 79

price of \$1,310. Next coupon payment will be made in 150 days. The annual risk-free rate is 5%.

A) $1,305.22.

B) $1,270.79.

C) $1,333.50.

Explanation

Coupon = (1,000 × 0.08) / 2 = $40.00

Present value of coupon payment = $40.00 / $1.05^{150/365}$ = $39.21

Forward price on the fixed income security = ($1,310 - $39.21) × $(1.05)^{200/365}$ = $1,305.22

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #61 of 79

The price and value of a plain vanilla interest-rate swap are:

A) only equal at the inception of a swap contract.

B) never equal.

C) equal in equilibrium.

Explanation

The price of a swap is the fixed rate specified in the swap and is the same for the payer and the receiver. The value is the dollar value of the contract to the fixed-rate payer and is the opposite of the value to the floating-rate payer.

(Study Session 14, Module 39.7, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #62 of 79

A company has chosen to use a 6 x 9 FRA expiring in 6 months to mitigate the risk of paying a floating coupon on the bond issue. The current term structure for LIBOR is as follows:

Term	Interest Rate
180 days	5.65%
270 days	5.95%

What is the price of this forward rate agreement (FRA)?

A) 6.37%

B) 3.19%

C) $6.37

Explanation

The price of an FRA is the fixed rate. To determine the FRA's fixed rate, the following formula should be used:

$$\text{FRA price} = \left(\frac{1+r_Y P}{1+r_X P} - 1\right)\left(\frac{360}{Y-X}\right)$$

$$= \left[\frac{1+.0595\left(\frac{270}{360}\right)}{1+.0565\left(\frac{180}{360}\right)} - 1\right]\left(\frac{360}{90}\right) = \underline{\underline{0.0637}}$$

The FRA's fixed rate would be quoted as 6.37%.

The price of an FRA is given as a rate percentage, never as a dollar amount.

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #63 of 79

At the expiration of a futures contract, the difference between the spot and the futures price is:

A) equal to zero.

B) at its point of highest volatility.

C) always positive.

Explanation

The difference must be zero at expiration because both the spot price and the futures price are, at that point in time, the price of the underlying asset for immediate delivery.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #64 of 79

Consider a 9-month forward contract on a 10-year 7% Treasury note just issued at par. The effective annual risk-free rate is 5% over the near term and the first coupon is to be paid in 182 days. The price of the forward is *closest* to:

A) 1,037.27.

B) 965.84.

C) 1,001.84.

Explanation

The forward price is calculated as the bond price minus the present value of the coupon, times one plus the risk-free rate for the term of the forward.

$$(1{,}000 - 35/1.05^{182/365})\ 1.05^{9/12} = \$1{,}001.84$$

(Study Session 14, Module 39.3, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #65 of 79

Calculate the price (expressed as an annualized rate) of a 1x4 forward rate agreement (FRA) if the current 30-day rate is 5% and the 120-day rate is 7%.

A) 7.47%.

B) 7.63%.

C) 6.86%.

Explanation

A 1x4 FRA is a 90-day loan, 30 days from today.

The actual rate on the 30-day loan is: R30 = 0.05 x 30/360 = 0.004167

The actual rate on the 120-day loan is: R120 = 0.07 x 120/360 = 0.02333

FR (30,90) = [(1+ R120)/(1+ R30)] – 1 = (1.023333/1.004167) – 1 = 0.0190871

The annualized 90-day rate = 0.0190871 x 360/90 = .07634 = 7.63%

(Study Session 14, Module 39.4, LOS 39.a)

Related Material

SchweserNotes - Book 4

Frank Potter, CFA, a financial adviser for Star Financial, LLC has been hired by John Williamson, a recently retired executive from Reston Industries. Over the years Williamson has accumulated $10 million worth of Reston stock and another $2 million in a cash savings account. Potter has a number of unconventional investment strategies for Williamson's portfolio; many of the strategies include the use of various equity derivatives.

Potter's first recommendation involves the use of a total return equity swap. Potter outlines the characteristics of the swap in Table 1. In addition to the equity swap, Potter explains to Williamson that there are numerous options available for him to obtain almost any risk return profile he might need. Potter suggest that Williamson consider options on both Reston stock and the S&P 500. Potter collects the information needed to evaluate options for each security. These results are presented in Table 2.

Table 1: Specification of Equity Swap

Term	3 years
Notional principal	$10 million
Settlement frequency	Annual, commencing at end of year 1
Fairfax pays to broker	Total return on Reston Industries stock
Broker pays to Fairfax	Total return on S&P 500 Stock Index

Table 2: Option Characteristics

	Reston	S&P 500
Stock price	$50.00	$1,400.00
Strike price	$50.00	$1,400.00

Interest rate	6.00%	6.00%
Dividend yield	0.00%	0.00%
Time to expiration (years)	0.5	0.5
Volatility	40.00%	17.00%
Beta Coefficient	1.23	1
Correlation	0.4	

Table 3: Regular and Exotic Options (Option Values)

	Reston	S&P 500
European call	$6.31	$6.31
European put	$4.83	$4.83
American call	$6.28	$6.28
American put	$4.96	$4.96

Table 4: Reston Stock Option Sensitivities

	Delta
European call	0.5977
European put	-0.4023
American call	0.5973
American put	-0.4258

Table 5: S&P 500 Option Sensitivities

	Delta
European call	0.622
European put	-0.378
American call	0.621
American put	-0.441

Potter has also been asked to evaluate the interest rate risk of an intermediate size bank. The bank has a large floating rate liability of $100,000,000 on which it pays the London Inter Bank Offered Rate (LIBOR) on a quarterly basis. Potter is concerned about the significant interest rate risk the bank incurs because of this liability: since most of the bank's assets are invested in fixed rate instruments there is a considerable duration mismatch. Some of the bank's assets are floating rate notes tied to LIBOR, however, the total par value of these securities is significantly less than the liability position.

Potter considers both swaps and interest rate options. The interest rate options are 2-year caps and floors with quarterly exercise dates. Potter wishes to hedge the entire liability.

Potter has obtained the prices for an at-the-money 6 month cap and floor with quarterly exercise. These are shown in Table 6.

Table 6: At-the-Money 0.5 year Cap and Floor Values

Price of at-the-money Cap	$133,377
Price of at-the-money Floor	$258,510

Question #66 of 79

Williamson would like to consider neutralizing his Reston equity position from changes in Reston's stock price. Using the information in Tables 3 and 4 how many standard Reston European options would have to be bought/sold in order to create a delta neutral portfolio?

A) Sell 370,300 call options.

B) Buy 497,141 put options.

C) Sell 497,141 put options.

Explanation

Number of put options = (Reston Portfolio Value / Stock Price$_{Reston}$) / −DeltaPut

Number of put options = ($10,000,000 / $50.00) / −0.4023 = −497,141 meaning buy 497,141 put options.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #67 of 79

Williamson is very interested in the total return swap. He asks Potter how much it would cost to enter into this transaction. Which of the following is the *most likely* cost of the swap at inception?

A) $45,007.

B) $340,885.

C) $0.

Explanation

Swaps are priced so that their value at inception is zero.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #68 of 79

Williamson likes the characteristics of the swap arrangement in Table 1 but would like to consider the options in Table 3 before making an investment decision. Given Williamson's current situation which of the following option trades makes the *most* sense in the short-term (all options are on Reston stock)?

A) Buy out-of-the-money call options.

B) Sell at-the-money-call options.

C) Buy at-the-money put options.

Explanation

Buying at the money put options greatly reduces Williamson's downside risk. Selling call options yields an option premium to the seller but does not deliver any downside protection and limits the upside potential of the portfolio.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #69 of 79

Potter analyzes alternative hedging strategies to address the risk of the bank's large floating-rate liability. Which of the following is the *most appropriate* transaction to efficiently hedge the interest rate risk for the floating rate liability without sacrificing potential gains from interest rate decreases?

A) Buy an interest rate cap.

B) Sell an interest rate cap.

C) Buy an interest rate collar.

Explanation

Buying a cap, combined with a floating rate liability, limits the exposure to interest rate increases (i.e. no exposure to interest rate increases above strike rate). The floating rate borrower will still benefit from interest rate decreases.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #70 of 79

Potter is now considering some of the bank's floating rate assets. Which of the following transactions is the *most appropriate* to minimize the interest rate risk of these assets without sacrificing upside gains?

A) Buy a floor.

B) Buy a collar.

C) Buy a cap.

Explanation

Buying a floor combined with a floating rate assets limits the exposure to interest rate decreases (i.e. no exposure to interest rate decreases below strike rate) while the floating rate holder is still able to benefit from interest rate increases. Ideally, Potter should consider matching the bank's asset position against the bank's liability position.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #71 of 79

The contract price of a forward contract is:

A) determined at the settlement date.

B) the price that makes the contract a zero-value investment at initiation.

C) always the present value of the expected future spot price.

Explanation

The contract price can be an interest rate, discount, yield to maturity, or exchange rate. The forward price is the future value of the spot price adjusted for any periodic payments expected from the asset. An example of when the forward price may be less than the spot price is in the case of an equity index contract where the dividend yield is greater than the risk-free rate.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #72 of 79

What is the difference between spot and futures prices? Spot prices are always:

A) delivered to meet the futures obligation at expiration.

B) lower than futures prices.

C) equal to the futures price at futures expiration.

Explanation

The difference between the spot and the futures price must be zero at expiration to avoid arbitrage.

(Study Session 14, Module 39.1, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #73 of 79

During the life of a forward contract, the value of the contract is *best* described as:

A) the difference between the future value of the spot price and the expected future price of the underlying asset.

B) the present value of the expected future price of the underlying asset.

C) the difference between the spot price and the present value of the forward price of the underlying asset.

Explanation

The value of a forward contract on an asset with no cash flows during its term is equal to spot − (forward price) / $(1 + R_f)^t$), the difference between the spot price and the present value of the forward price of the underlying asset.

(Study Session 14, Module 39.1, LOS 39.b)

Related Material

SchweserNotes - Book 4

Question #74 of 79

Which of the following is *equivalent* to a pay-fixed swap with a tenor of two years with semi-annual swap payments and a fixed rate of 6% (exchanged for LIBOR)? The notional principal is $100,000,000.

A) A strip of three forward rate agreements, which obligates the party to pay a fixed rate of 6% and receive six-month LIBOR on a notional principal of $100,000,000. ✓

B) A strip of two forward rate agreements, which obligates the party to pay a fixed rate of 6% and receive six-month LIBOR on a notional principal of $100,000,000. ✗

C) A forward rate agreement, which obligates the party to pay a fixed rate of 6% and receive six-month LIBOR on a notional principal of $100,000,000. ✗

Explanation

In an interest rate swap, the first payment is known with certainty and will be made at month 6. The determination dates for the floating rate will be at months 6, 12, and 18 and the corresponding payment dates will be at months 12, 18, and 24. These correspond to the three forward rate agreements.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #75 of 79

A portfolio manager holds 100,000 shares of IPRD Company (which is trading today for $9 per share) for a client. The client informs the manager that he would like to liquidate the position on the last day of the quarter, which is 2 months from today. To hedge against a possible decline in price during the next two months, the manager enters into a forward contract to sell the IPRD shares in 2 months. The risk-free rate is 2.5%, and no dividends are expected to be received during this time. However, IPRD has a historical dividend yield of 3.5%. The forward price on this contract is *closest* to:

A) $903,712.

B) $905,175.

C) $901,494.

Explanation

The historical dividend yield is irrelevant for calculating the no-arbitrage forward price because no dividends are expected to be paid during the life of the forward contract. In the absence of an arbitrage opportunity, the value of $S_0 - \left[\frac{FP}{(1+R_f)^T}\right]$ should be 0.

Therefore, FP = $S_0(1 + R_f)^T$

903,712 = 900,000$(1.025)^{2/12}$

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #76 of 79

Over the life of a swap, the price of the swap:

A) does not change.

B) is approximately equal to the market value of the swap.

C) fluctuates with changes in the yield curve.

Explanation

The price of a swap, quoted as the fixed rate in the swap, is determined at contract initiation and remains fixed for the life of the swap.

(Study Session 14, Module 39.7, LOS 39.c)

Related Material

SchweserNotes - Book 4

Question #77 of 79

Calculate the no-arbitrage forward price for a 90-day forward on a stock that is currently priced at \$50.00 and is expected to pay a dividend of \$0.50 in 30 days and a \$0.60 in 75 days. The annual risk free rate is 5% and the yield curve is flat.

A) \$49.49. ✓

B) \$48.51. ✗

C) \$50.31. ✗

Explanation

The present value of expected dividends is: $\$0.50 / (1.05^{30/365}) + \$0.60 / (1.05^{75/365}) = \$1.092$

Future price = $(\$50.00 - 1.092) \times 1.05^{90/365} = \$49.49$

(Study Session 14, Module 39.2, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #78 of 79

Suppose a forward rate agreement (FRA) calls for us to receive the six-month London Interbank Offered Rate (LIBOR) two years from now for a payment of a fixed rate of interest of 6%. Which of the following structures is equivalent to this long FRA? A long:

A) put and a short call on LIBOR with a strike rate of 6% and two years to expiration. ✗

B) call and a short put on LIBOR with a strike rate of 6% and two years to expiration. ✓

C) call on LIBOR with a strike rate of 6% and eighteen months to expiration. ✗

Explanation

Interest rate swaps can be replicated with a series of put and call positions with expiration dates on the payment dates of the swap. For a payer swap (where we pay fixed and receive floating), we need an option position that pays when floating rates increase and that requires a payment to be made when rates fall. A long interest rate call plus a short interest rate put would accomplish this. The strike rate of the options corresponds to the fixed rate of the FRA. The expiration of the option coincides with the determination date of the LIBOR-based payment which is paid two years from now.

(Study Session 14, Module 39.7, LOS 39.a)

Related Material

SchweserNotes - Book 4

Question #79 of 79

A $10 million 2-year semi-annual-pay LIBOR-based interest-rate swap was initiated 180 days ago when swap fixed rate was 3.8%. The fixed rate on the swap is now 3.4% and the term structure is as follows:

Days	LIBOR	Discount Factor
180	3.00%	0.98522
360	3.20%	0.96899
540	3.40%	0.95148
720	4.00%	0.92593

Value of the swap to the payer is *closest* to:

A) -$58,114.

B) -$45,633.

C) -$29,229.

Explanation

Sum of the discount factors for the three settlement dates remaining (180,360 and 540 days away) = 0.98522 + 0.96899 + 0.95148 = 2.9057

Value to payer = 2.9057 x [(0.034 – 0.038)/2] x $ 10 million = -$58,114

(Study Session 14, Module 39.7, LOS 39.d)

Related Material

SchweserNotes - Book 4