Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps

Q.1145 ZE Bank enters into a plain vanilla swap contract with Lux Financiers with the intent of receiving floating-rate payments. In these circumstances, ZE Bank *most likely* takes the:

A. Short position.

B. Pay-fixed side.

C. Pay-floating side.

The correct answer is **B.**

In a plain vanilla swap or interest rate swap, two private parties, usually firms or financial institutions, agree to exchange a floating interest rate for a fixed rate. The party that wants to receive floating-rate payments while making fixed-rate payments on the notional principal is called the pay-fixed side.

C is incorrect. The pay floating side is the party that wants to receive fixed rate payments and make floating-rate payments.

A is incorrect. A short position occurs when an investor sells borrowed securities intending to buy them back at a future date. An investor who takes a short position is bearish, i.e., they believe that the security's price will go down soon.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.3349 Tiara Enterprises (TIEN) has just announced its plans to establish a facility in New York, USA, to meet the increased demand for its products. TIEN plans to fund the expansion with debt and in order to hedge the risk of borrowing, TIEN has entered into a plain vanilla interest rate swap with a notional principal of $50 million. TIEN would make semiannual payments at the rate of 12% with the counterparty making floating rate payments at the Euribor rate. Assuming a 360-day year, if the Euribor was 13.5% on the last settlement date and is 11.0% on the current settlement date, the amount that TIEN would receive on the current settlement date is *closest to*:

A. $250,000.

B. $375,000.

C. $3,375,000.

The correct answer is **B.**

TIEN's payment:

$$(\$50 \text{ million}) \times (\frac{180}{360}) \times (12\%) = \$3,000,000$$

Counterparty's payment:

$$(\$50 \text{ million}) \times (\frac{180}{360}) \times (0.135) = \$3,375,000$$

Therefore, TIEN would receive a net amount of $375,000.

Note that the amount payable under the floating leg of the swap is based on the interest rate at time **t-1**.

A is incorrect. It suggests TIEN would receive $250,000, which does not align with the corrected calculations based on the current Euribor rate.

C is incorrect. It vastly overestimates the amount TIEN would receive, not aligning with the calculations based on the given interest rates and the terms of the swap.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.3372 Which of the following statements is *most likely* correct regarding credit default swaps (CDS)?

A. They represent exchange-traded derivatives.

B. The CDS seller is betting on the borrower not defaulting.

C. The credit protection buyer has an underlying loan obligation which requires protection.

The correct answer is **B.**

The CDS seller receives compensation in the form of premium income and in return agrees pay out a percentage of the notional amount if a credit event occurs.

A is incorrect. CDSs are over-the-counter derivatives.

C is incorrect. The protection buyer is a lender who seeks credit protection on a loan advanced to a third party. They do not have an outstanding obligation; rather, they expect interest and debt repayments from the security's issuer.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4169 Peter Gregg enters into a floating-for-fixed 5-year swap contract to hedge against a decline in interest rates. He agrees to pay the six-month MRR and receive the 4% fixed interest rate over a notional principal of $5 million. Assuming that the sixth-month MRR is 2.3%, the swap's periodic settlement value from Peter's perception in six months is *most likely*:

A. A. $42,500

B. B. $85,000

C. C. $100,000

The correct answer is **A.**

The periodic settlement value from Peter's perspective, who is the fixed rate receiver) can be obtained using the equation below.

$$\begin{aligned}\text{Periodic Settlement Value} &= \text{Fixed rate-Floating rate} \times \text{Notional Principal} \times \text{Period} \\ &= (4\% - 2.3\%) \times 5,000,000 \times 0.5 = 42,500\end{aligned}$$

Peter will receive $42,500. His net value is positive since the present value of fixed payments to be received exceeds that of floating payments to be paid.

B is incorrect. $85,000 has been obtained by assuming that the payments are made after one year and not after six months.

C is incorrect. $100,000 is the amount received by Peter, not the contract's value.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4171 To hedge against increasing interest rates, Laura Smith, an investor, should *most likely* enter into which of the following swaps?

A. Pay a fixed rate, and receive a fixed rate.

B. Pay a fixed rate and receive a floating rate.

C. Pay a floating rate and receive a fixed rate.

The correct answer is **B.**

Since the risk is towards an increase in interest rates, by paying the fixed rate and receiving the floating rate, Laura Smith will receive more if interest rates increase, thereby hedging her risk against a rise in interest rates.

A is incorrect. The trader is still exposed to the risk of increased interest rates by paying a fixed rate and receiving a fixed rate.

C is incorrect. A trader who enters into an interest rate swap that pays floating while receiving the fixed rate is trying to hedge against a decline and not an increase in interest rate.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4172 Which of the following *best* illustrates a scenario that leads to a fixed-rate receiver having a positive MTM value on the settlement day of a floating-for-fixed swap contract? The present value of the:

A. fixed payments to be received equals that of the floating payments to be paid.

B. fixed payments to be received is less than that of the floating payments to be paid.

C. fixed payments to be received is greater than that of the floating payments to be paid.

The correct answer is **C.**

A floating-for-fixed swap contract means that the receiver is getting the fixed rate and paying the floating rate over the notional principal.

Therefore, the value of a swap after inception from a fixed-rate receiver's perspective is given by the equation;

$$\sum \text{PV(Fixed Payments Received)} - \sum \text{PV(Floating Payments Received)}$$

For the above equation to be positive, the sum of the present value of the fixed payments received must be greater than the sum of the present value of the floating payments paid.

A is incorrect. This option suggests that the MTM value is positive when the present value of the fixed payments equals that of the floating payments. However, for the MTM value to be positive, the present value of the fixed payments must exceed the present value of the floating payments. Equality between these values would result in a neutral (zero) MTM value, not a positive one. The MTM value reflects the net benefit or cost of the swap to the fixed-rate receiver, and a positive value indicates a net benefit, which is not achieved through equality of payments.

B is incorrect. This option indicates that the MTM value would be positive when the present value of the fixed payments is less than that of the floating payments. The essence of a positive MTM value for the fixed-rate receiver is to have the fixed payments they receive be more valuable than the floating payments they make, which is not the case in this scenario. A positive MTM value signifies a favorable position for the fixed-rate receiver, which cannot be achieved if the fixed payments are less valuable.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4173 Consider the following exhibit:

Maturity	Annual coupon rate (%)	PV	YTM (%)	Zero rates (%)
1	1.25	98.5	2.46	2.46
2	1.75	98.0	2.86	2.90
3	2.25	97.5	3.12	3.20

The implied forward rate in two years is *most likely*:

A. 2.46%

B. 3.34%

C. 3.80%

The correct answer is **C.**

The general formula for the relationship between the two spot rates and the implied forward rate (IFR) is:

$$(1 + Z_B)^B = (1 + Z_A)^A \times (1 + IFR_{A,B-A})^{B-A}$$

Where:

Z_A = spot rate on short-term bond.

Z_B = spot rate on long-term bond.

$IFR_{A,B-A}$ = Implied forward rate between period A and period B, with a tenor of B-A.

$$(1 + IFR_{A,B-A})^{B-A} = \frac{(1 + Z_B)^B}{(1 + Z_A)^A}$$

$$\Rightarrow (1 + IFR_{2,3-2})^{3-2} = \frac{(1 + 0.032)^3}{(1 + 0.029)^2}$$

$$IFR_{2,1}{}^1 = 1.038 - 1 = 0.038 \text{ or } 3.80\%$$

A is incorrect. 2.46% is the zero rate in year zero.

B is incorrect. 3.34% is the implied forward rate in year one.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4174 A trader enters into a 5-year swap contract to pay the fixed rate and receive the 6-month floating rate. If the floating rate decreases below the fixed rate six months after contract inception, the trader will *most likely*?

A. Realize a loss and make a net payment.

B. Realize a loss and receive a net payment.

C. Realize a gain and receive a net payment.

The correct answer is **A.**

Since the trader is paying the fixed rate and receiving the floating, s(he) will realize a loss if the floating rate decreases below the fixed rate, i.e., s(he) will receive less than what s(he) will pay.

Since the principal in a swap contract is notional, the trader will make a net payment to the fixed-rate receiver.

B is incorrect. A loss necessitates the trader to make and not receive a net payment.

C is incorrect. The trader will realize a loss, not a gain. If the floating rate had increased above the fixed rate, the trader would have realized a profit and received a net payment.

CFA Level I, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (b): Contrast the value and price of swaps.

Q.4845 What happens if the market reference rate (MRR) is set at a rate higher than the agreed-on fixed rate for a fixed-rate payer on a swap or forward rate agreement (FRA)?

A. Realize a loss; pay; to

B. Realize a gain; receive; from

C. Realize a gain; pay; to

The correct answer is **B.**

Realize a gain if the MRR sets at a rate higher than the agreed-on fixed rate and will receive a net payment from the floating-rate payer. When the MRR sets at a rate higher than the agreed-on fixed rate, a fixed-rate payer on a swap or FRA realizes a gain and receives a net payment from the floating-rate payer.

A is incorrect. When the MRR is higher than the fixed rate, the fixed-rate payer actually realizes a gain, not a loss.

C is incorrect. When the MRR exceeds the fixed rate, the fixed-rate payer receives a net payment from the floating-rate payer, rather than paying.

CFA Level I, Topic 8 - Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (a): Describe how swap contracts are similar to but different from a series of forward contracts.

Q.4846 Which characteristic corresponds to the implied forward rate, or the breakeven reinvestment rate, for a period starting in the future?

A. Interest rate swap

B. Forward rate agreement

C. Both an interest rate swap and an interest rate forward contract

The correct answer is **B.**

The breakeven reinvestment rate, or implied forward rate, corresponds to a forward rate agreement, where the price of the contract represents this rate for a future period.

A is incorrect. While interest rate swaps involve future cash flows, the implied forward rate specifically corresponds to forward rate agreements.

C is incorrect. While both swaps and forward rate agreements have future cash flows, the implied forward rate is specifically associated with forward rate agreements.

CFA Level I, Topic 8 - Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (a): Describe how swap contracts are similar to but different from a series of forward contracts.

Q.4847 What features do interest rate swaps and forward rate agreements have in common regarding risk?

A. No counterparty credit risk

B. Interest rate risk

C. Counterparty credit risk

The correct answer is **C.**

Both interest rate swaps and forward rate agreements involve counterparty credit risk, as they are agreements between two parties, and default by one party poses a risk to the other.

A is incorrect. Both swaps and forward rate agreements involve counterparty credit risk; there is always a risk associated with the counterparties defaulting.

B is incorrect. While both swaps and forward rate agreements are related to interest rates, the question specifically refers to the risk aspect, which is counterparty credit risk.

CFA Level I, Topic 8 - Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (a): Describe how swap contracts are similar to but different from a series of forward contracts.

Q.4848 What is the characteristic unique to an interest rate swap?

A. Involves a series of future cash flows

B. No cash flow exchanged upfront

C. Constant fixed rate for multiple periods

The correct answer is **C.**

An interest rate swap is characterized by a constant fixed rate over multiple periods, unlike forward rate agreements, which involve single cash flow exchanges, and swaps have periodic settlements.

A is incorrect. Both interest rate swaps and forward rate agreements involve future cash flows.

B is incorrect. While it's true that no cash flow is exchanged upfront in both swaps and forward rate agreements, it's not a unique characteristic of interest rate swaps.

CFA Level I, Topic 8 - Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (a): Describe how swap contracts are similar to but different from a series of forward contracts.

Q.4849 Why do issuers and investors tend to prefer interest rate swaps over individual forward rate agreements?

A. Higher liquidity

B. Lower cost

C. Greater flexibility

The correct answer is **A.**

Interest rate swaps are preferred due to their greater liquidity compared to individual forward rate agreements, allowing for more efficient management of interest rate exposures.

B is incorrect. While interest rate swaps may or may not have lower costs compared to forward rate agreements, the primary reason for preferring swaps is their liquidity.

C is incorrect. While interest rate swaps do offer flexibility, liquidity is the primary reason for their preference over forward rate agreements.

CFA Level I, Topic 8 - Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps. LOS (a): Describe how swap contracts are similar to but different from a series of forward contracts.
