

CÂU HỎI LUYỆN TẬP

DERIVATIVES CFA LEVEL 2

Question 1: At the inception of a market-rate plain vanilla swap, the value of the swap to the fixed-rate payer is:

- A. positive.
- B. zero.
- C. either positive or negative.

Passage (Question 2-5):

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 2-5: Which statement most accurately describes a 2 x 3 forward rate agreement?

- A. Contract expires in two months on an underlying loan settled in three months.
- B. Two-month underlying interest rate on a contract settled in three months.
- C. Underlying loan of two month maturity under a contract that expires in three months.

Question 3-5: Which forward rate agreement would most effectively hedge Vetements Verdun's exposure to LIBOR?

- A. 3 x 2.
- B. 2 x 5.
- C. 2 x 3

Question 4-5: Which value is closest to the price of the most effective hedge for Vetements Verdun?

- A. 3.3%.
- B. 3.6%.
- C. 3.0%.

Question 5-5: What must the 90-day LIBOR rate have been at the expiration of the contract?

A. 3.6%.

B. 4.0%.

C. 3.4%.

Question 6: 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. pay C\$1,428,571 at the beginning of the swap.

B. pay floating in C\$.

C. receive floating in C\$.

Question 7: 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. 6.86%.

C. 7.63%.

Question 8: 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 MRR	5.6%	6.0%
MRR	4.8%	5.4%

What is the fixed rate in euros?

A. 5.318%.

B. 2.659%.

C. 5.245%.

Question 9: The contract price of a forward contract is:

A. always the present value of the expected future spot price.

B. determined at the settlement date.

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

Question 10: Writing a series of interest-rate puts and buying a series of interest-rate calls, all at the same exercise rate, is equivalent to:



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- A. being the floating-rate payer in an interest rate swap.
- B. being the fixed-rate payer in an interest rate swap.
- C. a short position in a series of forward rate agreements.

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1. B	2. A	3. B	4. B	5. B	6. A	7. C	8. A	9. C	10. B
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Question 1: B

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

Question 2: A

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).

Question 3: B

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.

Question 4: B

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

$$R_{60} = 0.028 \times 60/360 = 0.00467$$

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

$$R_{150} = 0.033 \times 150/360 = 0.01375$$

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

$$FR(60,90) = ((1 + R_{150})/(1 + R_{60})) - 1$$

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

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

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

We annualize this rate using the formula:

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

Question 5: B

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:

$$\text{Interest savings} = ((\text{market rate} \times (90/360)) - (0.0362 \times (90/360))) \times 25,000,000$$

$$23,750 = ((\text{market rate} \times 90/360) - 0.00905) \times 25,000,000$$

$$0.000950 = \text{market rate} \times 90/360 - 0.00905$$

$$0.0100 = \text{market rate} \times 0.25$$

$$0.0400 = \text{market rate}$$

The market rate must have been 4.0%.

Question 6: A

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 $1,000,000/0.7 = \text{C\$}1,428,571$ (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).

Question 7: B

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

$$\text{The actual rate on the 30-day loan is: } R_{30} = 0.05 \times 30/360 = 0.004167$$

$$\text{The actual rate on the 120-day loan is: } R_{120} = 0.07 \times 120/360 = 0.02333$$

$$FR(30,90) = [(1 + R_{120})/(1 + R_{30})] - 1 = (1.023333/1.004167) - 1 = 0.0190871$$

$$\text{The annualized 90-day rate} = 0.0190871 \times 360/90 = .07634 = 7.63\%$$

Question 8: A

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

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

$$\text{The fixed rate in euros is } (1 - 0.9488) / (0.9766 + 0.9488) = 0.026592 \times (360/180) = 5.318\%.$$

$$\text{The notional principal is } 100,000/1.30 = 76,923 \text{ euros.}$$

Question 9: C

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.

Question 10: B

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



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mirrors the payoffs of the fixed-rate payer who will receive positive net payments when settlement rates are above the fixed rate.