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EN.555.644.81.FA19 Introduction to Financial Derivatives   Course Modules   Module 5: Interest Rate

.utures - ED & US   Review Test Submission: Module 5 Self Check Quiz

Review Test Submission: Module 5 Self Check Quiz

User	IAN MICHAEL MCGROARTY
Course	EN.555.644.81.FA19 Introduction to Financial Derivatives
Test	Module 5 Self Check Quiz
Started	9/30/19 5:08 PM
Submitted	9/30/19 5:23 PM
Status	Completed
Attempt Score	0 out of 0 points
Time Elapsed	14 minutes
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1   0 out of 0 points

Which of following is applicable to corporate bonds in the United States?

Selected Answer: ✅ c. 30/360

Answers: a. Actual/Actual

b. Actual/360

✅ c. 30/360

d. Actual/365

Response Feedback: Correct. Corporate bonds in the U.S are usually quoted with a 30/360 day count. This means that there are assumed to be 30 days per month and 360 days per year when the length of an accrual period is calculated.

Question 2   0 out of 0 points

It is May 1. The quoted price of a bond with an Actual/Actual (in period) day count and 12% per annum coupon (paid semiannually) in the United States is 105. It has a face value of 100 and pays coupons on April 1 and October 1. What is the cash price?

Selected Answer: ✅ b. 105.98

Answers: a. 106.04

                    ✅ b. 105.98

                       c. 106.00

                       d. 106.02

Response   Correct. The cash price is the quoted price plus accrued interest. There are 30
Feedback: actual days between April 1 and May 1 and 183 actual days between April 1
            and October 1. In this case the quoted price is 105 and the accrued interest is
            0.06×100×30/183=0.98. The answer is therefore 105.98.

Question 3

0 out of 0 points

It is May 1. The quoted price of a bond with a 30/360 day count and 12% per annum coupon
in the United States is 105. It has a face value of 100 and pays coupons on April 1 and
October 1. What is the cash price?

Selected Answer: ❌ a. 106.04

Answers: a. 106.04

                       b. 105.98

                    ✅ c. 106.00

                       d. 106.02

Response   Incorrect. The cash price is the quoted price plus accrued interest. There are 30
Feedback: assumed days between April 1 and May 1 and 180 assumed days between April
            1 and October 1. In this case the quoted price is 105 and the accrued interest is
            0.06×100×30/180 = 1.00. The answer is therefore 106.00.

Question 4

0 out of 0 points

The most recent settlement bond futures price is 103.5. Which of the following four bonds is
cheapest to deliver?

Selected Answer: ✅ c. Quoted bond price = 131; conversion factor = 1.2500.

Answers: a. Quoted bond price = 110; conversion factor = 1.0400.

                       b. Quoted bond price = 160; conversion factor = 1.5200.

                    ✅ c. Quoted bond price = 131; conversion factor = 1.2500.

                       d. Quoted bond price = 143; conversion factor = 1.3500.

Response   Correct. The cost of delivering a bond is the quoted bond price minus the most
Feedback: recent settlement price times the conversion factor. This is 2.36, 2.68, 1.625,
            and 3.275 for bonds in A, B, C, and D, respectively. The bond in C is therefore
            cheapest to deliver.

Question 5

0 out of 0 points

Which of the following is NOT an option open to the party with a short position in the Treasury bond futures contract?

Selected Answer:	❌ a. The ability to deliver any of a number of different bonds.
Answers:	a. The ability to deliver any of a number of different bonds.
	b. The wild card play.
	c. The fact that delivery can be made any time during the delivery month.
	✅ d. The interest rate used in the calculation of the conversion factor.
Response Feedback:	Incorrect. A, B, and C describe options that the party with the short position has. D does not.

Question 6

0 out of 0 points

A trader enters into a long position in one Eurodollar futures contract. How much does the trader gain when the futures price quote increases by 6 basis points?

Selected Answer:	✅ a. $150
Answers:	✅ a. $150
	b. $60
	c. $600
	d. $6
Response Feedback:	Correct. The trader gains $25 for each basis point. The gain is therefore 25×6 or $150.

Question 7

0 out of 0 points

The bonds that can be delivered in a Treasury bond futures contract are

Selected Answer:	❌ a. Assets that provide no income.
Answers:	a. Assets that provide no income.
	✅ b. Assets that provide a known cash income.
	c. Assets that provide a known yield.
	d. None of the above.

Response Feedback:	Incorrect. A bond is an asset that provides a known cash income (the coupons).

Question 8

0 out of 0 points

An ultra T-bond futures contract is one where...

Selected Answer:	✔ a. Bonds with maturities greater than 25 year can be delivered.
Answers:	✔ a. Bonds with maturities greater than 25 year can be delivered.
	b. Bonds with maturities greater than 15 years can be delivered.
	c. Bonds with maturities less than 10 years can be delivered.
	d. Bonds with maturities less than 3 years can be delivered.
Response Feedback:	Correct. In the ultra T-bond futures contract bonds with maturities over 25 years can be delivered.

Question 9

0 out of 0 points

A portfolio is worth $24,000,000. The futures price for a Treasury note futures contract is 110 and each contract is for the delivery of bonds with a face value of $100,000. On the delivery date the duration of the bond that is expected to be cheapest to deliver is 6 years and the duration of the portfolio will be 5.5 years. How many contracts are necessary for hedging the portfolio?

Selected Answer:	✖ a. 100
Answers:	a. 100
	✔ b. 200
	c. 300
	d. 400
Response Feedback:	Incorrect. The contract price is 110,000. The number of contracts is (24,000,000×5.5)/(110,000×6.0)=200

Question 10

0 out of 0 points

Which of the following is true?

Selected Answer:	✖ d. The futures rates calculated from a Eurodollar futures quote are sometimes greater than and sometimes less than the corresponding forward rate.
Answers:	a.

The futures rates calculated from a Eurodollar futures quote are always less than the corresponding forward rate.

b.
The futures rates calculated from a Eurodollar futures quote should equal the corresponding forward rate.

✅ c.
The futures rates calculated from a Eurodollar futures quote are always greater than the
corresponding forward rate.

d.
The futures rates calculated from a Eurodollar futures quote are sometimes greater than and sometimes less than the corresponding forward rate.

Response Feedback: Incorrect. The futures rate must be reduced by a convexity adjustment to get the forward rate.

Question 11

0 out of 0 points

How much is a basis point?

Selected Answer: ✅ c. 0.01%

Answers: a. 1.0%

b. 0.1%

✅ c. 0.01%

d. 0.001%

Response Feedback: Correct. A basis point is 0.01%.

Question 12

0 out of 0 points

Which of the following day count conventions applies to a US Treasury bond?

Selected Answer: ✅ b. Actual/Actual (in period)

Answers: a. Actual/360

✅ b. Actual/Actual (in period)

c. 30/360

d. Actual/365

Response Feedback: Correct. Actual/Actual (in period) is used for US Treasury bonds. This means that the interest earned during a period that lies between two coupon payment dates is calculated by dividing the actual number of days in the period by the number of days between the coupon payments and multiplying the result by the next coupon payment.

Question 13

0 out of 0 points

What is the quoted discount rate on a money market instrument?

Selected Answer:	❌ d.
	The risk-free rate used to calculate the present value of future cash flows from a bond.

Answers:	✅ a.
	The interest rate earned as a percentage of the final face value of a bond.
	b. The interest rate earned as a percentage of the initial price of a bond.
	c.
	The interest rate earned as a percentage of the average price of a bond.
	d.
	The risk-free rate used to calculate the present value of future cash flows from a bond.

Response Feedback: Incorrect. The quoted discount rate is the interest earned as a percentage of the final face value.

Question 14

0 out of 0 points

Which of the following is closest to the duration of a 2-year bond that pays a coupon of 8% per annum semiannually? The yield on the bond is 10% per annum with continuous compounding.

Selected Answer:	✅ c. 1.88
Answers:	a. 1.82
	b. 1.85
	✅ c. 1.88
	d. 1.92

Response Feedback: Correct. The duration of the bond is the weighted average of the times when cash flows are received with weights proportional to the present values of the cash flows. This is

$$\frac{4e^{-0.10\times.5}\times0.5 + 4\times e^{-0.10\times1}\times1 + 4\times e^{-0.10\times1.5}\times1.5 + 104\times e^{-0.10\times2}\times2}{4e^{-0.10\times.5} + 4\times e^{-0.10\times1} + 4\times e^{-0.10\times1.5} + 104\times e^{-0.10\times2}} = 1.88 \text{ years}$$

Question 15

0 out of 0 points

Which of the following is NOT true about duration?

Selected ✗ c.
Answer: Equals the weighted average of individual bond durations for a portfolio, where weights are proportional to the present value of bond prices.

Answers: a. It equals the years-to-maturity for a zero coupon bond.

b.
It equals the weighted average of payment times for a bond, where weights are proportional to the present value of payments.

c.
Equals the weighted average of individual bond durations for a portfolio, where weights are proportional to the present value of bond prices.

✓ d.
The prices of two bonds with the same duration change by the same percentage amount when interest rate moves up by 100 basis points.

Response Feedback: Incorrect. D is only approximately true. A, B, and C are exactly true.

Question 16
0 out of 0 points

The conversion factor for a bond is approximately...

Selected Answer: ✗ b. The price it would have if it paid coupons at 6% per annum.

Answers: ✓ a.
The price it would have if all cash flows were discounted at 6% per annum.

b. The price it would have if it paid coupons at 6% per annum.

c.
The price it would have if all cash flows were discounted at 8% per annum.

d. The price it would have if it paid coupons at 8% per annum.

Response Feedback: Incorrect. The calculation of the conversion factor involves discounting the cash flows on the bond at 6%.

Question 17
0 out of 0 points

The time-to-maturity of a Eurodollars futures contract is 4 years and the time-to-maturity of the rate underlying the futures contract is 4.25 years. The standard deviation of the change in the short term interest rate, $\sigma = 0.011$. What does the model in the text estimate as the difference between the futures and the forward interest rate?

Selected Answer: ✗ a. 0.105%

Answers: a. 0.105%

✅ b. 0.103%

c. 0.098%

d. 0.093%

Response
Feedback: Incorrect. With the notation in the text, the futures rate exceeds the forward rate by $0.5\sigma^2 T_1 T_2$. In this case $\sigma=0.011$, $T_1=4$ and $T_2=4.25$ so the difference between the forward and futures price is $0.5\times0.011\times4\times4.25=0.00103$.

Question 18

0 out of 0 points

A trader uses 3-month Eurodollar futures to lock in a rate on $5 million for six months. How many contracts are required?

Selected Answer: ❌ d. 20

Answers: a. 5

       ✅ b. 10

       c. 15

       d. 20

Response
Feedback: Incorrect. Each contract locks in the rate on $1 million dollars for three months. A six month instrument is approximately twice as sensitive to rate movements as a three month instrument because it has twice the duration. 2×5 = 10 contracts are therefore required.

Question 19

0 out of 0 points

In the U.S. what is the longest maturity for 3-month Eurodollar futures contracts?

Selected Answer: ❌ d. 20 years

Answers: a. 2 years

       b. 5 years

       ✅ c. 10 years

       d. 20 years

Response Feedback: Incorrect. Eurodollar futures have maturities out to 10 years.

Question 20

0 out of 0 points

Duration matching immunizes a portfolio against.

Selected Answer: ❌ a. Any parallel shift in the yield curve.

Answers: a. Any parallel shift in the yield curve.

                    b. All shifts in the yield curve.

                    c. Changes in the steepness of the yield curve.

          ✅ d. Small parallel shifts in the yield curve.

Response Feedback: Incorrect. Duration matching only protects against small parallel shifts. It does not provide protection against large parallel shifts and non-parallel shifts.

Tuesday, October 20, 2020 9:59:43 PM EDT

← **OK**