EN.555.644.81.FA19 Introduction to Financial Derivatives   Course Modules   Module 12: BSM,
Jividends, and Applications   Review Test Submission: Self Check Quiz: Chapter 17

Review Test Submission: Self Check Quiz: Chapter 17

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Course	EN.555.644.81.FA19 Introduction to Financial Derivatives
Test	Self Check Quiz: Chapter 17
Started	11/18/19 3:48 PM
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Status	Completed
Attempt Score	0 out of 0 points
Time Elapsed	219 hours, 41 minutes
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1   0 out of 0 points

Which of the following describes what a company should do to create a range forward contract
in order to hedge foreign currency that will be received?

Selected Answer:	❌ a.	Buy a put and sell a call on the currency with the strike price of the put higher than that of the call
Answers:	a.	Buy a put and sell a call on the currency with the strike price of the put higher than that of the call
	✅ b.	Buy a put and sell a call on the currency with the strike price of the put lower than that of the call
	c.	Buy a call and sell a put on the currency with the strike price of the put higher than that of the call
	d.	Buy a call and sell a put on the currency with the strike price of the put lower than that of the call

Response
Feedback: The company wants to ensure that the price received for the foreign currency will
be between K_1 and K_2. It does this by buying a put option with strike price K_1 and
selling a call option with strike price K_2.

Question 2

0 out of 0 points

Which of the following describes what a company should do to create a range forward contract in order to hedge foreign currency that will be paid?

Selected Answer:	❌ a. Buy a put and sell a call on the currency with the strike price of the put higher than that of the call

Answers:	a. Buy a put and sell a call on the currency with the strike price of the put higher than that of the call
	b. Buy a put and sell a call on the currency with the strike price of the put lower than that of the call
	c. Buy a call and sell a put on the currency with the strike price of the put higher than that of the call
	✅ d. Buy a call and sell a put on the currency with the strike price of the put lower than that of the call

Response Feedback: The company wants to ensure that the price paid for the foreign currency will be between K_1 and K_2. It does this by selling a put option with strike price K_1 and buying a call option with strike price K_2.

Question 3

0 out of 0 points

What should the continuous dividend yield be replaced by when options on an exchange rate are valued using the formula for an option on a stock paying a continuous dividend yield?

Selected Answer:	❌ a. The domestic risk-free rate

Answers:	a. The domestic risk-free rate
	✅ b. The foreign risk-free rate
	c. The foreign risk-free rate minus the domestic risk-free rate
	d. None of the above

Response Feedback: The continuous dividend yield, q, should be replaced by the foreign risk rate, rf.

Question 4

0 out of 0 points

Suppose that the domestic risk free rate is r and dividend yield on an index is q. How should the put-call parity formula for options on a non.dividend.paying stock be changed to provide a put-call parity formula for options on a stock index? Assume the options last T years.

Selected
Answer:
❌ a.
The stock price is replaced by the value of the index multiplied by exp(qT)

Answers:
a. The stock price is replaced by the value of the index multiplied by exp(qT)

b. The stock price is replaced by the value of the index multiplied by exp(rT)

✅ c.
The stock price is replaced by the value of the index multiplied by exp(-qT)

d. The stock price is replaced by the value of the index multiplied by exp(rT)

Response Feedback: S_0 is replaced by $S_0 e^{-qT}$

Question 5

0 out of 0 points

A portfolio manager in charge of a portfolio worth $10 million is concerned that stock prices might decline rapidly during the next six months and would like to use put options on an index to provide protection against the portfolio falling below $9.5 million. The index is currently standing at 500 and each contract is on 100 times the index. What position is required if the portfolio has a beta of 1?

Selected Answer: ❌ a. Short 200 contracts

Answers: a. Short 200 contracts

                ✅ b. Long 200 contracts

                c. Short 100 contracts

                d. Long 100 contracts

Response   The number of contracts required is 10,000,000/(500x100)=200. A long position in
Feedback: puts is required because the contracts must provide a positive payoff when the
                market declines.

Question 6

0 out of 0 points

A portfolio manager in charge of a portfolio worth $10 million is concerned that the market might decline rapidly during the next six months and would like to use put options on an index to provide protection against the portfolio falling below $9.5 million. The index is currently standing at 500 and each contract is on 100 times the index. What should the strike price of options on the index be the portfolio has a beta of 1?

Selected Answer: ❌ a. 425

Answers: a. 425

b. 450

✅ c. 475

d. 500

Response   When the portfolio declines in value by 5%, the index can be expected to decline
Feedback: in value by 5%. The strike price should therefore be 0.95x500=475.

Question 7

0 out of 0 points

A portfolio manager in charge of a portfolio worth $10 million is concerned that the market
might decline rapidly during the next six months and would like to use put options on an index
to provide protection against the portfolio falling below $9.5 million. The index is currently
standing at 500 and each contract is on 100 times the index. What position is required if the
portfolio has a beta of 0.5?

Selected Answer: ❌ a. Short 200 contracts

Answers: a. Short 200 contracts

                    b. Long 200 contracts

                    c. Short 100 contracts

                    ✅ d. Long 100 contracts

Response   The number of contracts required is 0.5x10,000,000/(500x100)=100. A long
Feedback: position is required because the contracts must provide a positive payoff when
            the market declines.

Question 8

0 out of 0 points

A portfolio manager in charge of a portfolio worth $10 million is concerned that the market
might decline rapidly during the next six months and would like to use put options on an index
to provide protection against the portfolio falling below $9.5 million. The index is currently
standing at 500 and each contract is on 100 times the index. What should the strike price of
options on the index be the portfolio has a beta of 0.5? Assume that the risk.free rate is 10% per
annum and there are no dividends.

Selected Answer: ❌ a. 400

Answers: a. 400

                    b. 410

                    c. 420

                    ✅ d. 425

Response   The risk-free rate per six months is 5%. When the portfolio declines by 5% its
Feedback: return is per six months is 10% below the risk-free rate. The return on the index is
            therefore 20% below the risk-free rate. Its return is therefore -15%. The portfolio
            therefore declines to 500x0.85 = 425.

Question 9

0 out of 0 points

For a European put option on an index, the index level is 1,000, the strike price is 1050, the time to maturity is six months, the risk.free rate is 4% per annum, and the dividend yield on the index is 2% per annum. How low can the option price be without there being an arbitrage opportunity?

Selected Answer:	❌ a. $50.00
Answers:	a. $50.00
	b. $43.11
	c. $29.21
	✅ d. $39.16

Response Feedback: A lower bound for the put option price is $Ke^{-rT} - S_0 e^{-qT}$ In this case, K=1050, S_0=1000, T=0.5, r=0.04 and q=0.02. The lower bound is therefore $1050e^{-0.04\times0.5}$ - $1000e^{-0.02\times0.5}$=39.16. The put price cannot fall below this without there being an arbitrage opportunity.

Question 10

0 out of 0 points

For a European call option on a currency, the exchange rate is 1.0000, the strike price is 0.9100, the time to maturity is one year, the domestic risk.free rate is 5% per annum, and the foreign risk.free rate is 3% per annum. How low can the option price be without there being an arbitrage opportunity?

Selected Answer:	✅ a. 0.1048
Answers:	✅ a. 0.1048
	b. 0.0900
	c. 0.1344
	d. 0.1211

Response Feedback: A lower bound for the call option price is $S_0 e^{-r_f T} - Ke^{-rT}$. In this case, K=0.9100, S_0=1.0000, T = 1, r=0.05 and r_f=0.03. The lower bound is therefore $1.00e^{-0.03\times1}$ - $0.91e^{-0.05\times1}$=0.1048. The call price cannot fall below this without there being an arbitrage opportunity.

Question 11

0 out of 0 points

Index put options are used to provide protection against the value of the portfolio falling below a certain level. Which of the following is true as the beta of the portfolio increases?

Selected Answer: ❌ a. The cost of hedging increases

Answers: a. The cost of hedging increases

                    b. The required options have a higher strike price

                    c. The number of options required increases

                    ✅ d. All of the above

Response Feedback: As beta increases A, B, and C are all true.

Question 12

0 out of 0 points

Which of the following is NOT true about a range forward contract?

Selected
Answer: ❌ a.
                It ensures that the exchange rate for a future transaction will lie between two
                values

Answers: a.
                It ensures that the exchange rate for a future transaction will lie between two
                values

                b. It can be structured so that it costs nothing to set up

                ✅ c. It requires a forward contract as well as two options

                d.
                It can be used to hedge either a future inflow or a future outflow of a foreign
                currency

Response Feedback: A range forward contract requires two options only. A, B, and D are true.

Question 13

0 out of 0 points

A binomial tree with three-month time steps is used to value a currency option. The domestic and foreign risk-free rates are 4% and 6% respectively. The volatility of the exchange rate is 12%. What is the probability of an up movement?

Selected Answer: ✅ a. 0.4435

Answers: ✅ a. 0.4435

                    b. 0.5267

                    c. 0.5565

                    d. 0.5771

Response

Feedback: The parameter u is $e^{0.12\sqrt{0.25}} = 1.0618$ and $d = 1/u = 0.9418$. The probability of

an up movement is
$[e^{(0.04-0.06)\times0.25} - 0.9418]/[1.0618-0.9418] = 0.4435$

Question 14

0 out of 0 points

A binomial tree with one-month time steps is used to value an index option. The interest rate is 3% per annum and the dividend yield is 1% per annum. The volatility of the index is 16%. What is the probability of an up movement?

Selected Answer: ❌ a. 0.4704

Answers: a. 0.4704

                      ✅ b. 0.5065

                      c. 0.5592

                      d. 0.5833

Response Feedback: The parameter u is $e^{0.16\sqrt{1/12}} = 1.0473$ and d = 1/u = 0.9549. The probability

of an up movement is
$[e(0.03-0.01)\times1/12 - 0.9418]/[1.0473-0.9549] = 0.5065$

Question 15

0 out of 0 points

A European at-the-money call option on a currency has four years until maturity. The exchange rate volatility is 10%, the domestic risk-free rate is 2% and the foreign risk-free rate is 5%. The current exchange rate is 1.2000. What is the value of the option?

Selected Answer: ❌ a. 0.98N(0.25)-1.11(0.05)

Answers: a. 0.98N(0.25)-1.11(0.05)

                      b. 0.98N(.0.3)-1.11N(-0.5)

                      ✅ c. 0.98N(-0.5)-1.11N(-0.7)

                      d. 0.98N(0.10)-1.11N(0.06)

Response Feedback: The formula is

$$c = S_0 e^{-r_f T} N(d_1) - Ke^{rT} N(d_2)$$

$$d_1 = \frac{1n(S_0/K) + (r - r_f + \sigma^2/2)T}{\sigma\sqrt{T}} \qquad d_2 = d_2 - \sigma\sqrt{T}$$

In this case $S_0 e^{-r_f T} = 1.2 e^{0.05 \times 4} = 0.9825$ and

$Ke^{-rT} = 1.2 e^{-0.02 \times 4} = 1.1077$

$$d_1 = \frac{1n(1)+(0.02-0.05+0.1^2/2)4}{0.1\sqrt{4}} = -0.5 \qquad d_2 = d_1 - \sigma\sqrt{T} = -0.7$$

Therefore the correct answer is C.

Question 16

0 out of 0 points

A European at.the.money put option on a currency has four years until maturity. The exchange rate volatility is 10%, the domestic risk.free rate is 2% and the foreign risk.free rate is 5%. The current exchange rate is 1.2000. What is the value of the option?

Selected Answer: ✓ a. 1.11N(0.7)-0.98N(0.5)

Answers: ✓ a. 1.11N(0.7)-0.98N(0.5)

b. 1.11N(-0.7)-0.98N(.0.5)

c. 1.11N(0.7)-0.98N(0.4)

d. 1.11N(-0.06)-0.98N(-0.10)

Response Feedback:

The formula is

$$p = Ke^{-rT}N(-d_2) - S_0 e^{-r_f T}N(-d_1)$$

$$d_1 = \frac{1n(S_0/K)+(r-r_f+\sigma^2/2)T}{\sigma\sqrt{T}} \qquad d_2 = d_1 - \sigma\sqrt{T}$$

In this case $S_0 e^{-r_f T} = 1.2 e^{-0.05 \times 4} = 0.9825$ and

$Ke^{-rT} = 1.2 e^{-0.02 \times 4} = 1.1077$

$$d_1 = \frac{1n(1)+(0.02-0.05+0.1^2/2)4}{0.1\sqrt{4}} = -0.5 \qquad d_2 = d_1 - \sigma\sqrt{T} = -0.7$$

The correct answer is therefore A.

Question 17

0 out of 0 points

Which of the following is true when a European currency option is valued using forward exchange rates?

Selected ✗ a.

Answer: It is not necessary to know the domestic interest rate or the spot exchange rate

Answers: a.
             It is not necessary to know the domestic interest rate or the spot exchange rate

             b. It is not necessary to know either the foreign or domestic interest rate

             c.
             It is necessary to know the difference between the foreign and domestic interest
             rates but not the rates themselves

             ✅ d.
             It is not necessary to know the foreign interest rate or the spot exchange rate

Response   The forward exchange rate contains all the information necessary about the
Feedback: foreign risk-free interest rate and the spot exchange rate. It is still necessary to
             know the domestic risk-free interest rate.

Question 18

0 out of 0 points

❌ 18. What is the size of one option contract on the S&P 500?

Selected Answer: ❌ a. 250 times the index

Answers: a. 250 times the index

                     ✅ b. 100 times the index

                     c. 50 times the index

                     d. 25 times the index

Response Feedback: One option is on 100 times the index

Question 19

0 out of 0 points

❌ The domestic risk-free rate is 3%. The foreign risk-free rate is 5%. What is the risk-neutral growth rate of the exchange rate?

Selected Answer: ❌ a. +2%

Answers: a. +2%

                     ✅ b. -2%

                     c. +5%

                     d. +3%

Response Feedback: The growth rate is 3% minus 5% or -2%.

Question 20

0 out of 0 points

What is the same as 100 call options to buy one unit of currency A with currency B at a strike price of 1.25?

Selected Answer:	❌ a. 100 call options to buy one unit of currency B with currency A at a strike price of 0.8
Answers:	a. 100 call options to buy one unit of currency B with currency A at a strike price of 0.8
	b. 125 call options to buy one unit of currency B with currency A at a strike price of 0.8
	c. 100 put options to sell one unit of currency B for currency A at a strike price of 0.8
	✅ d. 125 put options to sell one unit of currency B for currency A at a strike price of 0.8
Response Feedback:	Buying 100 units of A with 125 units of B is the same a selling 125 units of B for 100 units of A.

Wednesday, November 27, 2019 7:29:46 PM EST

← **OK**