**Week1 Seminar Questions**

1. You put $1000 in the bank at a continuously compounded rate of 5% for one year. At the end of this first-year rates rise to 6%. You keep your money in the bank for another eighteen months. How much money do you now have in the bank including the accumulated, continuously compounded, interest?

Solution:

The total money accumulated in the bank is:

$1000 \* \* = $1150.27

1. An investor buys a European put on a share for $3. The stock price is $42 and the strike price is $40. Under what circumstances does the investor make a profit? Under what circumstances will the option be exercised? Draw a diagram showing the variation of the investor’s profit with the stock price at the maturity of the option.

Solution:

The investor makes a profit if the price of the stock on the expiration date is less than $37. In these circumstances, the gain from exercising the option is greater than $3. The option will be exercised if the stock price is less than $40 at the maturity of the option. The variation of the investor’s profit with the stock price in the figure below.

图表

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1. An investor sells a European call on a share for $4. The stock price is $47 and the strike price is $50. Under what circumstances does the investor make a profit? Under what circumstances will the option be exercised? Draw a diagram showing the variation of the investor’s profit with the stock price at the maturity of the option.

Solution:

The investor makes a profit if the price of the stock is below $54 on the expiration date. If the stock price is below $50, the option will not be exercised, and the investor makes a profit of $4. If the stock price is between $50 and $54, the option is exercised and the investor makes a profit between $0 and $4. The variation of the investor’s profit with the stock price is as shown in the figure below.

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4. a. What is a lower bound for the price of a 4-month call option on a non-dividend-paying stock when the stock price is $28, the strike price is $25, and the risk-free interest rate is 8% per annum?

b. What is a lower bound for the price of a 1-month European put option on a nondividend-paying stock when the stock price is $12, the strike price is $15, and the risk-free interest rate is 6% per annum?

Solution:

a. 28 -25e-0.08\*1/3=$3.66

b. 15e-0.06\*1/12-12=$2.93

1. The price of a non-dividend-paying stock is $19 and the price of a 3-month European call option on the stock with a strike price of $20 is $1. The risk-free rate is 4% per annum. What is the price of a 3-month European put option with a strike price of $20?

Solution:

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6.

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Prove equation 11.7.

Solution:

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