FINM2063 Introduction to Finance

Chapter 9 Exercises

Solutions

1. a. Intrinsic value of the call: $39 ‑ 35 = $4

b. Time premium for the call: $8 ‑ 4 = $4

c. As the price of the stock rises, the value of the call rises.

d. If the price of the stock declines, the most you could lose from purchasing the call is its price: $8.

e. The maximum possible profit from selling the call naked is its price: $8. To earn that profit the price of the stock must fall to $35 (or less).

f. The intrinsic value is $35 ‑ 35 = $0.

The loss on the position is $0 ‑ 8 = ($8)

g. The intrinsic value of the call is $0.

The profit from selling the call naked is $8 ‑ 0 = $8.

h. If the price of the stock is $46, the option is worth $11

($46 ‑ 35).

The profit from buying the call is $11 - 8 = $3.

i. If the price of the stock is $46, the loss from selling the call naked is $3 ($8 - 11).

1. This problem illustrates one of the most important uses for an option: the protective put. This strategy combines buying the stock and buying the put. It is a type of "insurance." That is, the strategy protects the investor from a decline in the value of the stock because the value of the put rises as the price of the stock declines.

Price of Profit on Profit on Net profit

the stock the stock the put

$20 ($9) $7 ($2)

25 (4) 2 (2)

30 1 (3) (2)

35 6 (3) 3

40 11 (3) 8

50 21 (3) 18

a. The maximum possible profit is unlimited.

b. The maximum possible loss is $2.

c. The position generates a profit as long as the price of the stock exceeds $32.

d. For the cost of the put, the investor limits the downside potential loss to $2, and the potential profit is reduced (at each price of the stock) by only the $3 cost of the put.

1. Imagine two stocks, each with a market price of $100. For each stock, you have an at-the-money call option with an exercise price of $100. Stock A’s price now falls to $50 and Stock B’s rises to $150. The value of your portfolio of call options is now:

|  |  |
| --- | --- |
|  | Value |
| Call on A | 0 |
| Call on B | 50 |
| Total | $50 |

Now compare this with the value of an at-the-money call to buy a portfolio with equal holdings of A and B. Since the average change in the prices of the two stocks is zero, the call expires worthless.

This is an example of a general rule: An option on a portfolio is less valuable than a portfolio of options on the individual stocks because, in the latter case, you can choose which options to exercise.

1. One way to profit from Hogswill options is to purchase the call options with exercise prices of $90 and $110, respectively, and sell two call options with an exercise price of $100. The immediate benefit is:

Cash inflow = (2 × $11) – ($5 + 15) = $2

Immediately prior to maturity, the value of this position and the net profit (at various possible stock prices) is:

|  |  |  |
| --- | --- | --- |
| Stock Price | Position Value | Net Profit |
| 85 | 0 | 0 + 2 = 2 |
| 90 | 0 | 0 + 2 = 2 |
| 95 | 5 | 5 + 2 = 7 |
| 100 | 10 | 10 + 2 = 12 |
| 105 | 5 | 5 + 2 = 7 |
| 110 | 0 | 0 + 2 = 2 |
| 115 | 0 | 0 + 2 = 2 |

Thus, no matter what the final stock price, we can make a profit trading in these Hogswill options.

It is very unlikely that you can identify such opportunities from data published in the newspaper. Someone else has most likely already noticed (even before the paper was printed, much less distributed to you) and traded on the information; such trading tends to eliminate these profit opportunities.