02/09/2018.

47.

An investor has written a covered call.

Determine which of the following represents the investor's position.

(A) Short the call and short the stock

(B) Short the call and long the stock

(C) Short the call and no position on the stock → NAKED WRITING!

~~(D)~~ Long the call and short the stock

~~(E)~~ Long the call and long the stock

European put options

Review:

0 ——— T... exercise date

long put

↓ $V_P(0)$... put premium

written put

K... strike/exercise price

The payoff of the put:

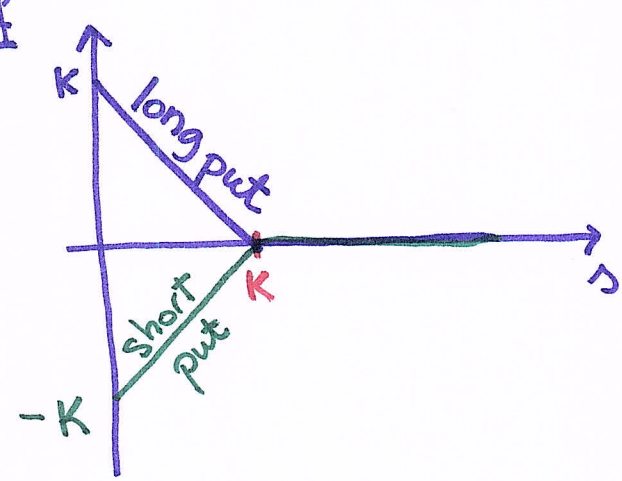
$$V_P(T) = (K - S(T))_+$$

$$\Downarrow$$

Payoff function:

$$v_P(s) = (K - s)_+$$

Payoff



75.

Determine which of the following risk management techniques can hedge the financial risk of an oil producer arising from the price of the oil that it sells.

✓ I. Short forward position on the price of oil ⟷ SELLING FORWARD!

✓ II. Long put option on the price of oil ⟷ RIGHT TO SELL!

III. Long call option on the price of oil

(A) I only

(B) II only

(C) III only

(D) I, II, and III

(E) The correct answer is not given by (A), (B), (C), or (D)

Hedging a long position w/ long put option.

For simplicity: non-dividend-paying stock is the underlying.

Start w/ an unhedged position:

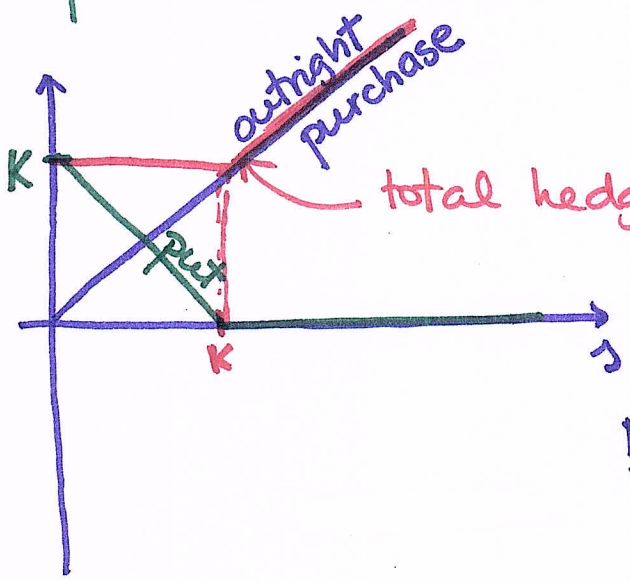
- outright purchase of 1 share

The hedge:

- long a put on the above asset

FLOOR.

Payoff curve:



total hedged portfolio: max(K, s)

Note: looks like a LONG CALL.

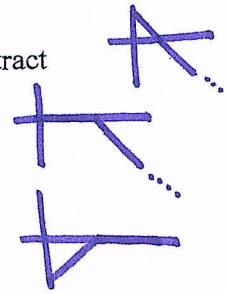
26.

Determine which, if any, of the following positions has or have an unlimited loss potential from adverse price movement in the underlying asset, regardless of the initial premium received.

✓ I. Short 1 forward contract

✓ II. Short 1 call option

✗ III. Short 1 put option



(A) None

(B) I and II only

(C) I and III only

(D) II and III only

(E) The correct answer is not given by (A), (B), (C), or (D)

27.
DELETED

28.
DELETED

Covered put:

- written put
- short sale of underlying

Algebraically:

The payoff is:

$$\underbrace{-(K-s)_+}_{\text{written/short put}} \underbrace{-s}_{\text{short sale}} = \begin{cases} -K+s-s=-K & \text{IF } K>s \\ -s & \text{IF } K\le s \end{cases}$$

$$= -\max(s,K)$$

48.

For a certain stock, Investor A purchases a 45-strike call option while Investor B purchases a 135-strike put option. Both options are European with the same expiration date. Assume that there are no transaction costs.

If the final stock price at expiration is S, Investor A's payoff will be 12.

Calculate Investor B's payoff at expiration, if the final stock price is S.

(A) 0

(B) 12

(C) 36

(D) 57

(E) 78

Investor A: Payoff function

$$(s-K)_+$$

In particular:

$$(S-45)_+ = 12$$

$$\Rightarrow S > 45 \Rightarrow S = 45+12 = 57$$

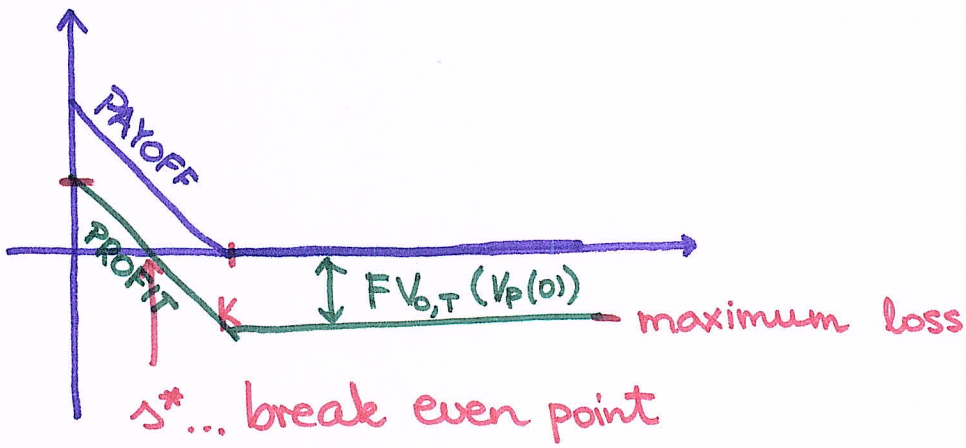
Investor B: Payoff function:

$$(K_p - s)_+ = (135-s)_+$$

$\Rightarrow$ answer: $(135-S)_+ = 78 \Rightarrow$ E.

Profit:

$V_P(0)$ ... put premium



s^* ... break even point

$$s^* = K - FV_{0,T}(V_P(0))$$

49.

The market price of Stock A is 50. A customer buys a 50-strike put contract on Stock A for 500. The put contract is for 100 shares of A.

Calculate the customer's maximum possible loss.

$\hookrightarrow FV_{0,T}(V_P(0))$

(A) 0

(B) 5

(C) 50

(D) 500

(E) 5000

Assuming 0 interest rate:

35.

A customer buys a 50-strike put on an index when the market price of the index is also 50.

The premium for the put is 5. Assume that the option contract is for an underlying 100 units of the index.

Calculate the customer's profit if the index declines to 45 at expiration.

(A) –1000

(B) –500

(C) 0

(D) 500

(E) 1000

Payoff : $(50-s)_+$

$\Rightarrow$ for $s=45$:

$(50-45)_+ = 5$

$\Rightarrow$ Total payoff : $5 \times 100 = 500$

$\Rightarrow$ Profit = Payoff − FV(500) = 500 − FV(500) = 0

Assume a 0 interest rate.

12.

$T = \frac{1}{2}$

Consider a European put option on a stock index without dividends, with 6 months to expiration and a strike price of 1,000. Suppose that the effective six-month interest rate is 2%, and that the put costs 74.20 today.

$j = 0.02$

$K = 1{,}000$

$V_P(0) = 74.20$

Calculate the price that the index must be in 6 months so that being long in the put would produce the same profit as being short in the put.

We seek the BREAK-EVEN POINT:

$$s^* = K - FV_{0,T}(V_P(0))$$

(A) 922.83

(B) 924.32

~~(C) 1,000.00~~

~~(D) 1,075.68~~

~~(E) 1,077.17~~

$$s^* = 1{,}000 - 74.20(1.02) = 924.32$$

$\Downarrow$

B.