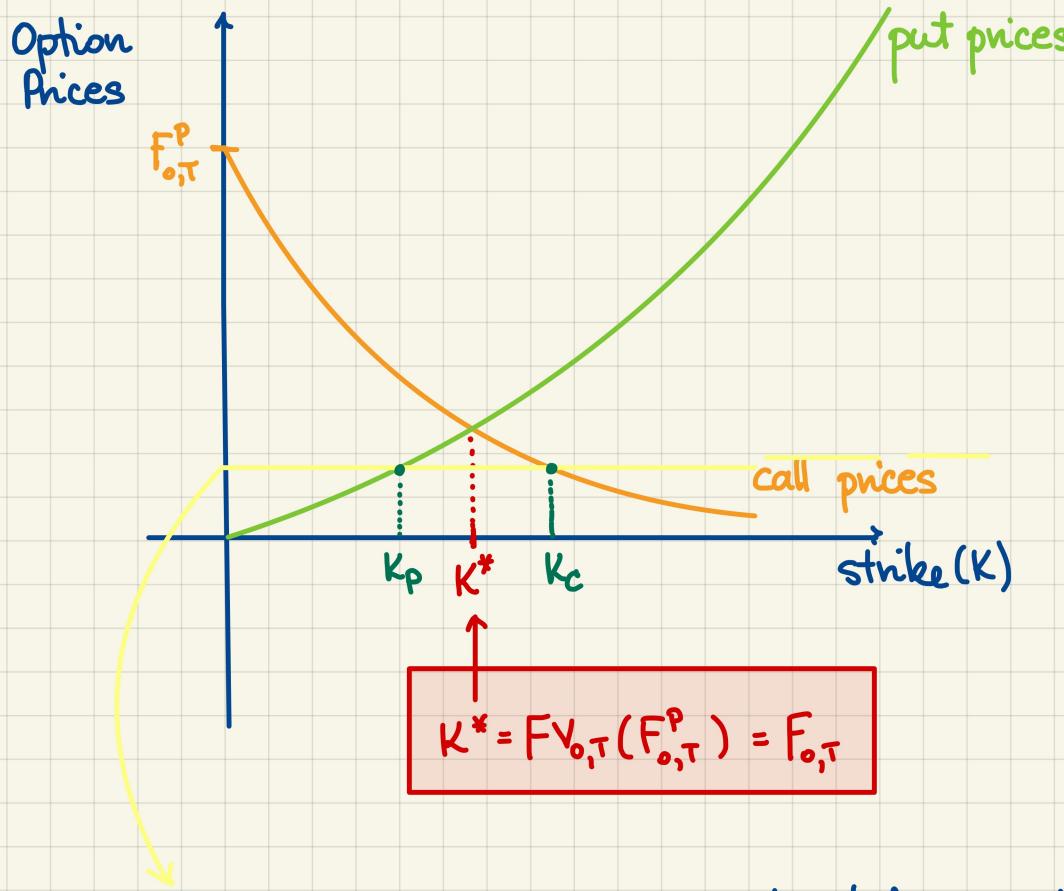


Zero-Cost Collars.



For any pair $K_p < K_c$ constructed as above, we obtain a (K_p, K_c) -collar whose cost is 0.

We have infinitely many zero-cost collars.

Ratio Spread.

Let $K_1 < K_2$.

- Long m calls w/ strike K_1
 - Write n calls w/ strike K_2
- } European; otherwise identical

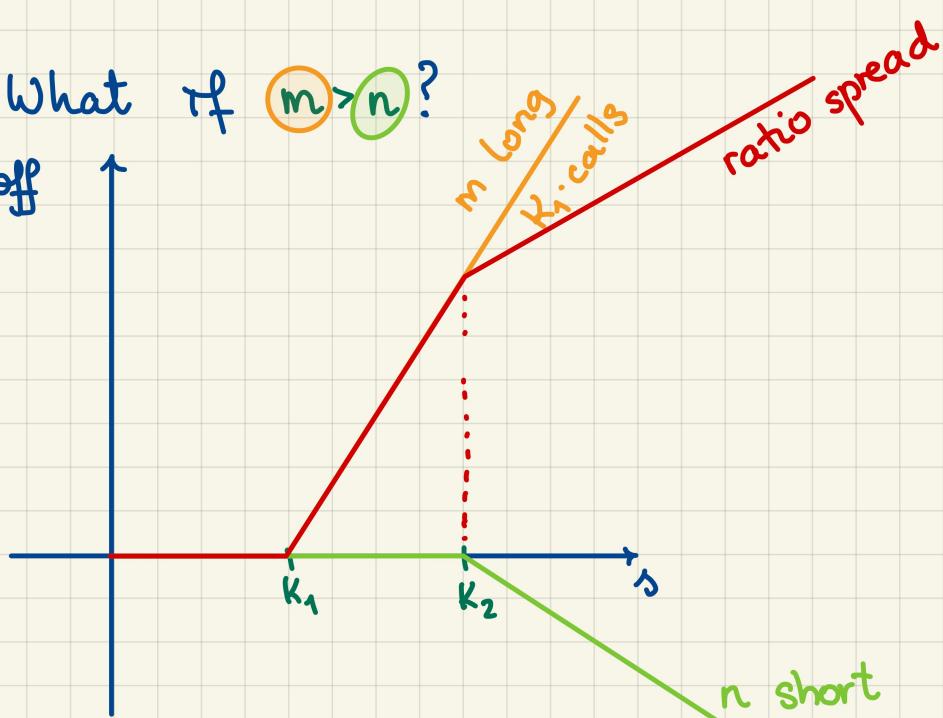
w/ m and n positive constants; usually integers.

Q: What if $m=n$?

→: Equivalent to: m bull spreads.

Q: What if $m > n$?

Payoff



ratio spread

m long
 K_1 -calls

ratio spread

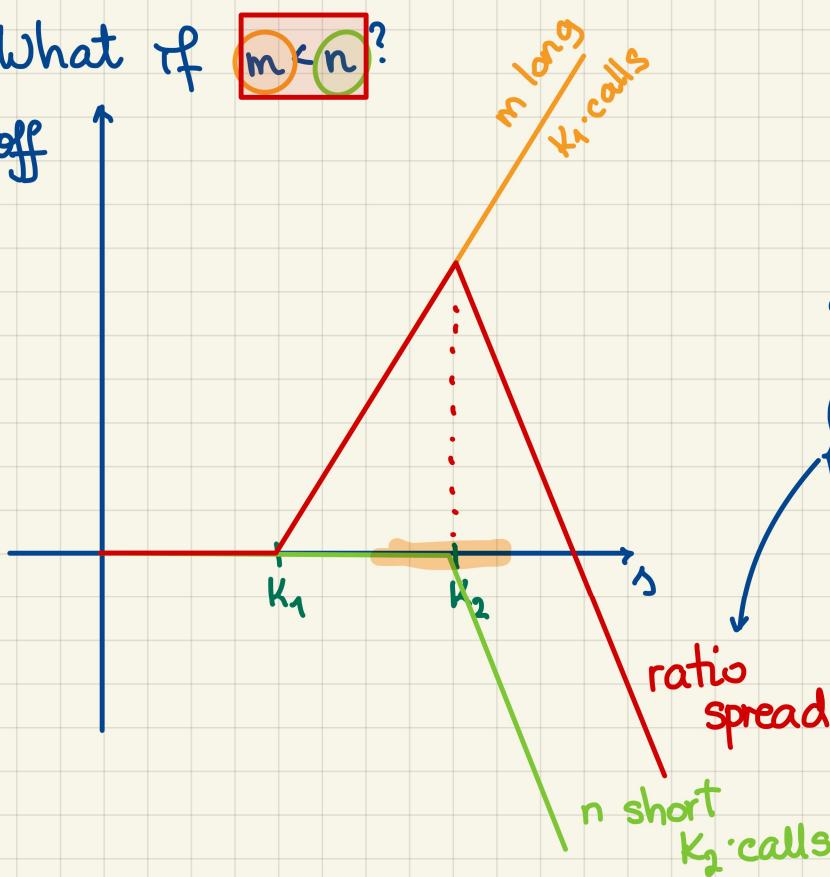
n short
 K_2 -calls

Q: Who would trade in this position?

- Use it to hedge a short position.
- Speculators on high prices.

Q: What if $m < n$?

Payoff



Speculator :

- low volatility
- low likelihood of low prices

38.

The current price of a medical company's stock is 75. The expected value of the stock price in three years is 90 per share. The stock pays no dividends.

You are also given

- i) The risk-free interest rate is positive.
- ii) There are no transaction costs.
- iii) Investors require compensation for risk.

The price of a three-year forward on a share of this stock is X , and at this price an investor is willing to enter into the forward.

Determine what can be concluded about X .

- (A) $X < 75$
- (B) $X = 75$
- (C) $75 < X < 90$
- (D) $X = 90$
- (E) $90 < X$

39.

Determine which of the following strategies creates a ratio spread, assuming all options are European.

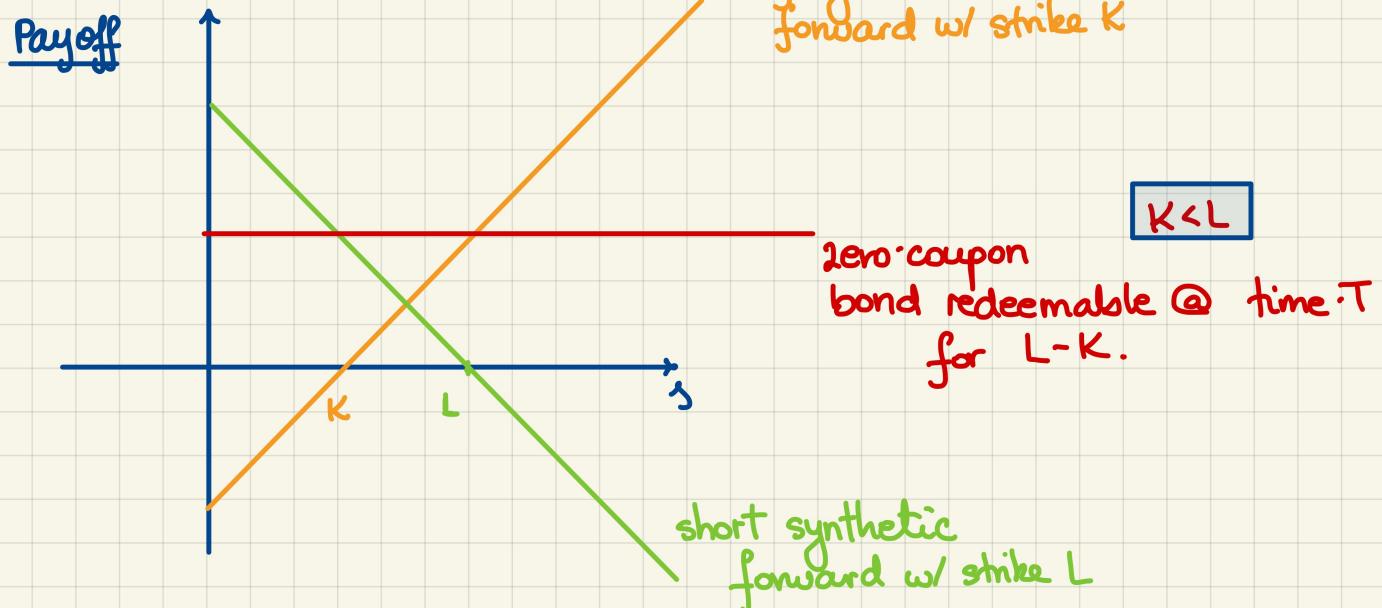
calendar spread

- (A) Buy a one-year call, and sell a three-year call with the same strike price.
- (B) Buy a one-year call, and sell a three-year call with a different strike price.
- (C) Buy a one-year call, and buy three one-year calls with a different strike price.
- (D) Buy a one-year call, and sell three one-year puts with a different strike price.
- (E) Buy a one-year call, and sell three one-year calls with a different strike price.

Box Spread.

... replicate a bond.

One simple construction.



Put-Call Parity:

- long a K-strike call
 - short a K-strike put
 - short an L-strike call
 - long an L-strike put
- Another construction for the box spread
- Yet another construction for the box spread.
- long (K,L) call bull spread
 - short (K,L) put bull spread

53.

For each ton of a certain type of rice commodity, the four-year forward price is 300. A four-year 400-strike European call option costs 110.

The continuously compounded risk-free interest rate is 6.5%.

Calculate the cost of a four-year 400-strike European put option for this rice commodity.

- (A) 10.00
- (B) 32.89
- (C) 118.42
- (D) 187.11
- (E) 210.00

54.

DELETED

55.

Box spreads are used to guarantee a fixed cash flow in the future. Thus, they are purely a means of borrowing or lending money, and have no stock price risk.

Consider a box spread based on two distinct strike prices (K, L) that is used to lend money, so that there is a positive cost to this transaction up front, but a guaranteed positive payoff at expiration.

Determine which of the following sets of transactions is equivalent to this type of box spread.

- (A) A long position in a (K, L) bull spread using calls and a long position in a (K, L) bear spread using puts. 
- (B) A long position in a (K, L) bull spread using calls and a short position in a (K, L) bear spread using puts.  
- (C) A long position in a (K, L) bull spread using calls and a long position in a (K, L) bull spread using puts.  
- (D) A short position in a (K, L) bull spread using calls and a short position in a (K, L) bear spread using puts.  
- (E) A short position in a (K, L) bull spread using calls and a short position in a (K, L) bull spread using puts.  