



Trading Strategies Involving Options

Chapter 10

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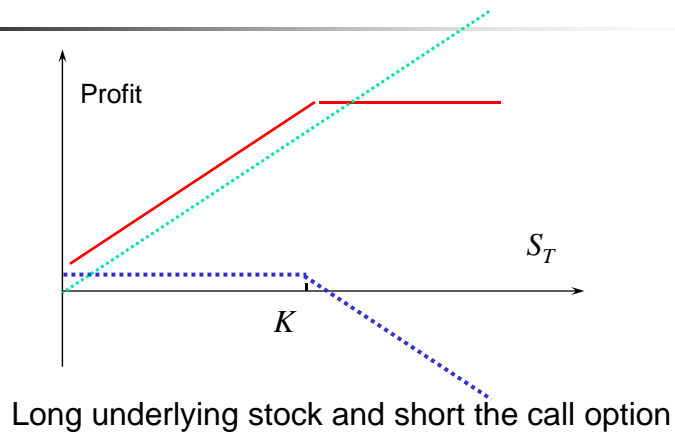


Outline

- Trading strategies involving one option
- Trading strategies involving 2 or more options of the same type (A spread)
- Trading strategies involving a combination of options: Take a position in a mixture of calls & puts (A combination)

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Covered call



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Covered Calls

- Combine **Long Stock** with **Sale of Call**
- Choose Strike around (usually just above) current Stock Price
- Protects Stock Price from loss less than call premium
- Guarantees Sale Price ($K + \text{Prem Recv'd}$)

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Writing Calls to Generate Income

- Can be very conservative or very risky, depending on the remainder of the portfolio
- An attractive way to generate income with foundations, pension funds, and other portfolios that will always hold the stock used in the cover
- A very popular activity with individual investors
- Writing calls may not be appropriate when
 - Option premiums are very low
 - The option is very long-term

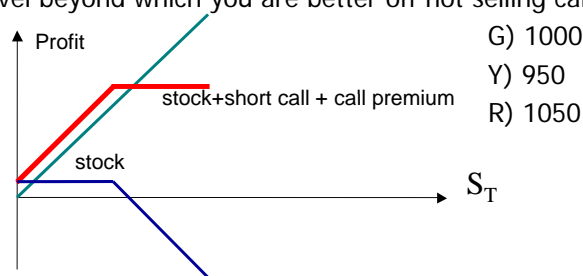
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Concept check

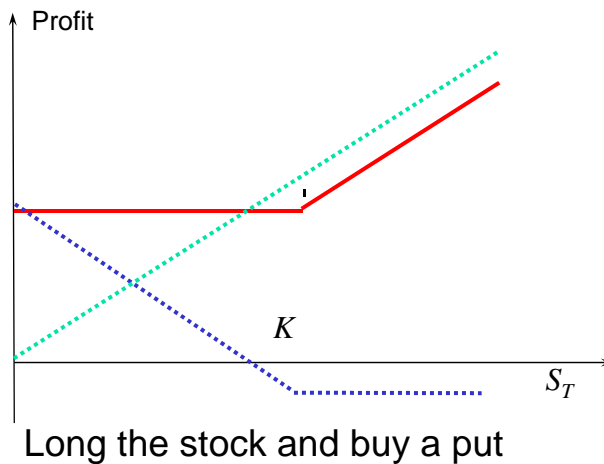


- You are a portfolio manager that holds a diversified market portfolio. You do not think the stock market is going to increase much in the near future (1 month). You want to add income to your portfolio by selling call options on the index. The strike price is 1000 and the premium=\$50. What is the break even index level beyond which you are better off not selling calls?



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Protective put



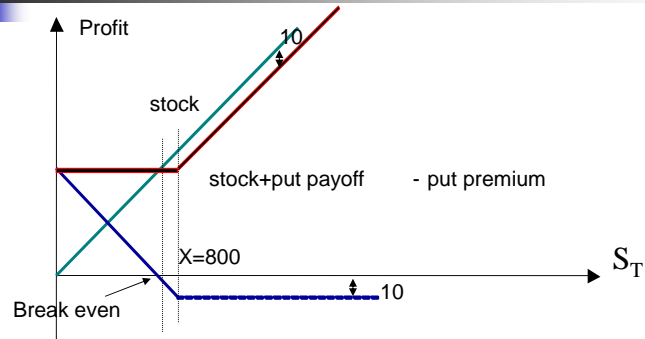
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Protective Put

- Combine **Long Stock** with **Purchase of Put**
- Choose expiry to match horizon of desired protection of downside.
- Choose strike around (usually just above) current stock price
- Protects stock price from loss beyond put premium
- Very similar to car insurance (although everyone's strike is below the current car value due to deductibles)

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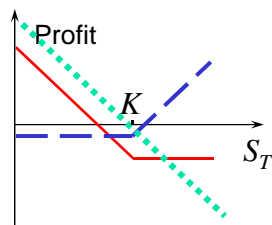
Example



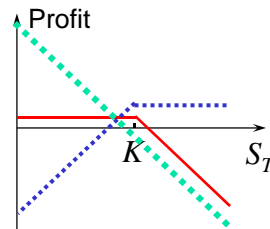
- Hold market index (S&P500). Buy option on the index with $X=800$. Let each option contract be 1 times the index. The premium = \$10. Break even = 790.

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Other positions



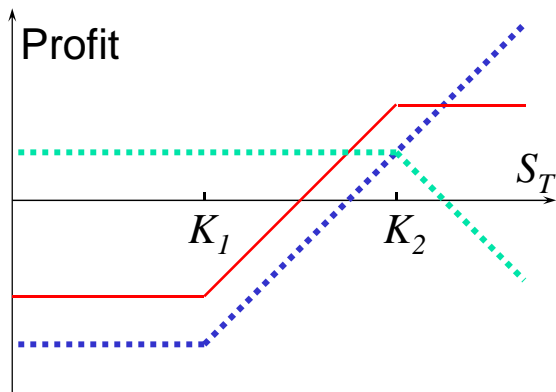
Short a stock when the price is at K and long a call with strike price K



Short a stock when the price is at K and short a put with strike price K

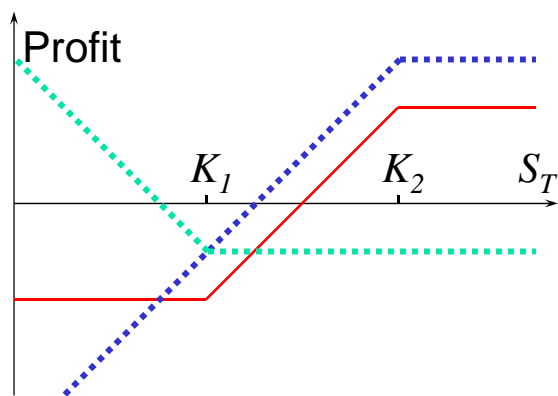
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Bull Spread Using Calls



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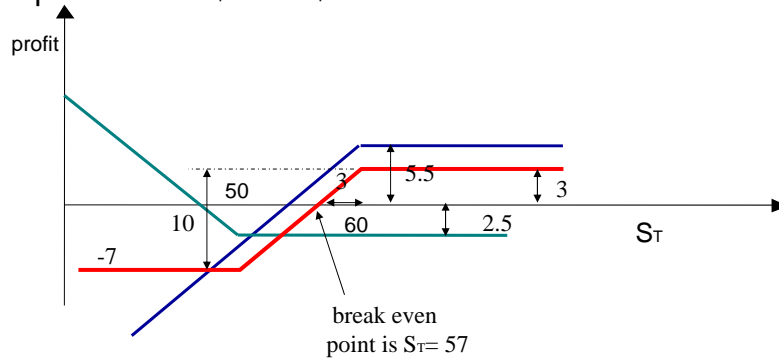
Bull Spread Using Puts



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Bull spread

- Example: buy a put with $X = \$50$ at $\$2.5$ and sell a put with $X = \$60$ at $\$5.5$.



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Bull spread

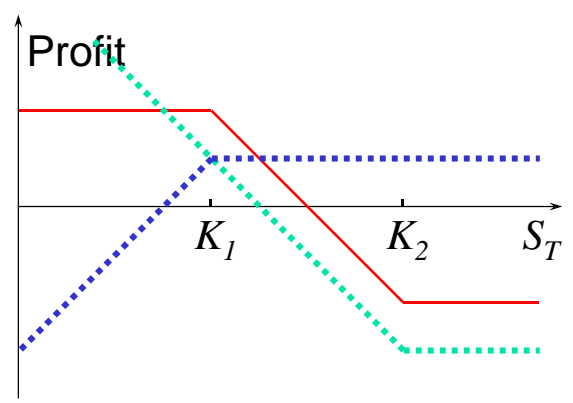
- Example: buy a put with $X = \$50$ at $\$2.5$ and sell a put with $X = \$60$ at $\$5.5$.

	$S_T < 50$	$50 < S_T < 60$	$S_T > 60$
Buy put	$50 - S_T$	0	0
Sell put	$-(60 - S_T)$	$-(60 - S_T)$	0
Premiums	3	3	3
Profit	-7	$-57 + S_T$	3
What is the break even point?			
		$-57 + S_T = 0 \rightarrow S_T = 57$	

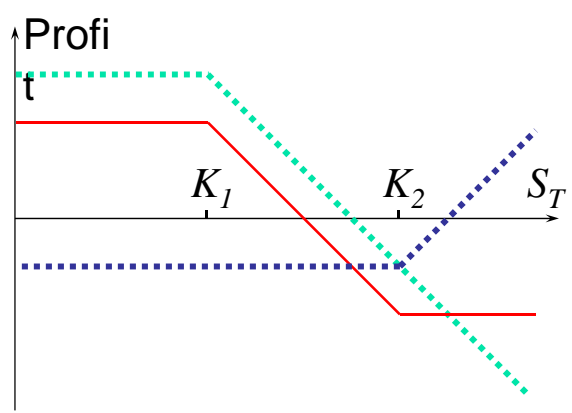
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Bear Spread Using Puts



Bear Spread Using Calls



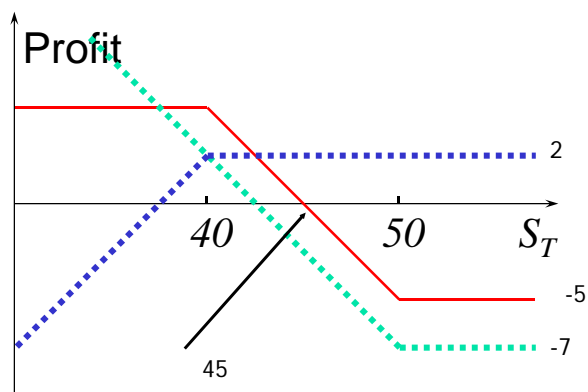
Concept check



- Use two put options with the same maturity to create a bear spread. One option has a strike price of 40 (price \$2) and the other has a strike price of 50 (price \$7).
What is the break even of the trading strategy?

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Bear Spread Using Puts



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Bull spread

	$S_T < 40$	$40 < S_T < 50$	$S_T > 50$
■ Buy put (50)	$50 - S_T$	$50 - S_T$	0
■ Sell put (40)	$-(40 - S_T)$	0	0
■ Premiums	-5	-5	-5
■ Profit	5	$45 - S_T$	-5
■ What is the break even point?	$45 - S_T = 0 \rightarrow S_T = 45$		

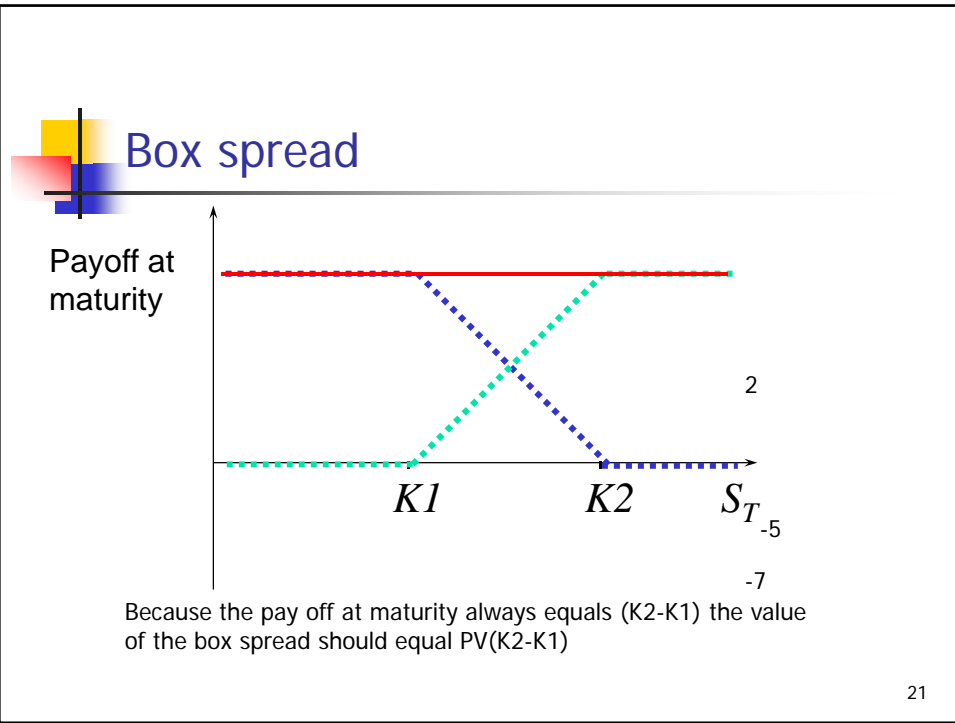
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Box Spread

- A combination of a bull call spread and a bear put spread
- If all options are European a box spread is worth the present value of the difference between the strike prices
- If they are American this is not necessarily so

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Concept check

- The options are for 2 months maturity and the interest rate is 8%. Is there an arbitrage opportunity in the option market list below?

Option	strike	Price (EU)
Call	60	0.26
Call	55	0.96
Put	60	9.46
Put	55	5.33

G) Yes
R) No

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Box spread



- How do you trade to take advantage of this arbitrage opportunity?

$$(K_2 - K_1) \exp(0.8 \times 2/12) = 4.934$$

Cost of setting up the box spread

$$C(55) - C(60) + P(60) - P(55) = 3.43$$

$$\text{Borrow } PV(K_1 - K_2) = 4.934$$

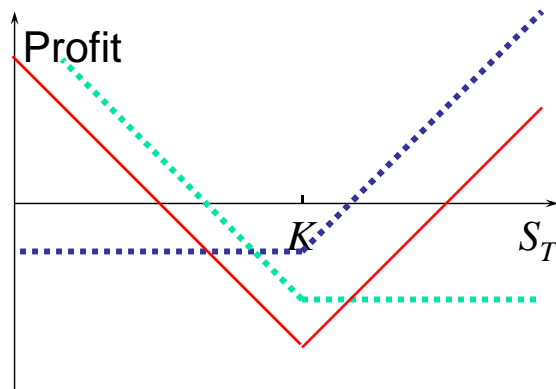
Use \$4.8 to purchase the box spread

Make \$0.15

At maturity use $K_2 - K_1$ from the box spread to pay off the loan

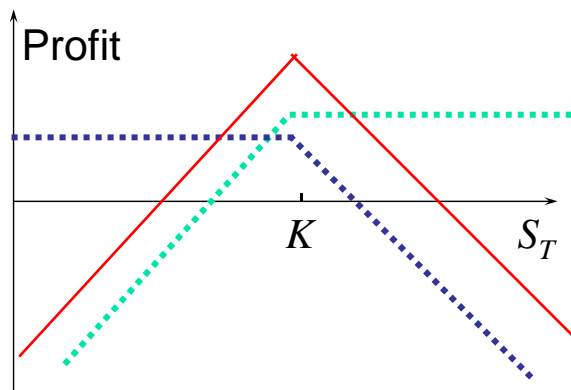
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A Straddle



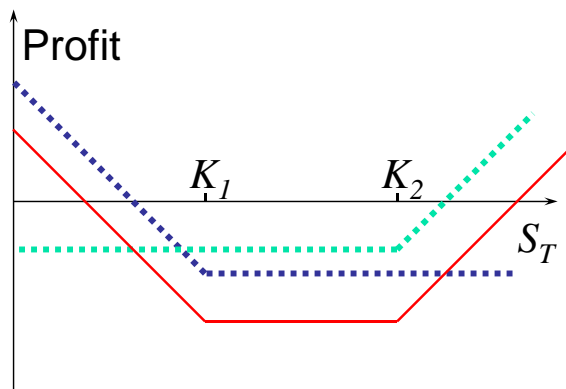
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A short Straddle



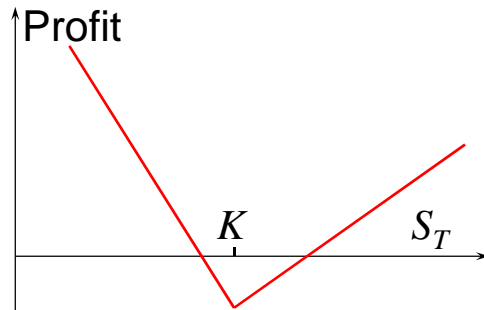
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A Strangle Combination



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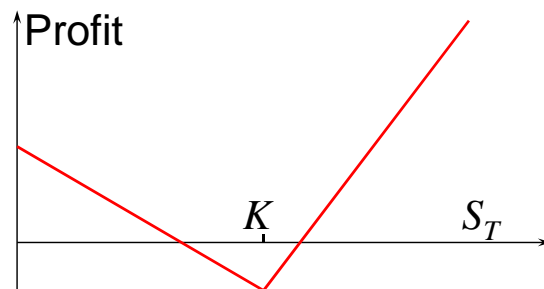
A Strip



Long one call option and
long 2 put options

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A Strap



Long one put option and
long 2 call options

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Concept check



- You long 2 call options and long a put option at the same strike price $K=40$. The put option price is \$5 and the call option price is \$3.5. What are the underlying stock prices that would make this strategy break even?

- G) 28 and 46
- Y) 28 and 52
- R) 35 and 47

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Bull spread

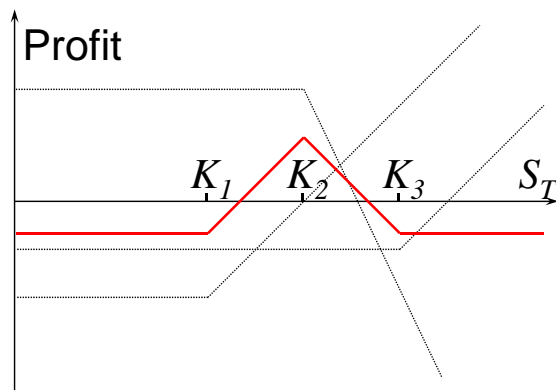
- Example: buy a put with $X= \$50$ at \$2.5 and sell a put with $X= \$60$ at \$5.5.

	$S_T < 40$	$S_T > 40$
Buy 1 put	$40 - S_T$	0
Buy 2 calls	0	$2(S_T - 40)$
Premiums	-12	-12

- Profit $28 - S_T$ $2S_T - 92$
- What are the break even points?
 $28 - S_T = 0 \rightarrow S_T = 28$ and $2S_T - 92 = 0 \rightarrow S_T = 46$

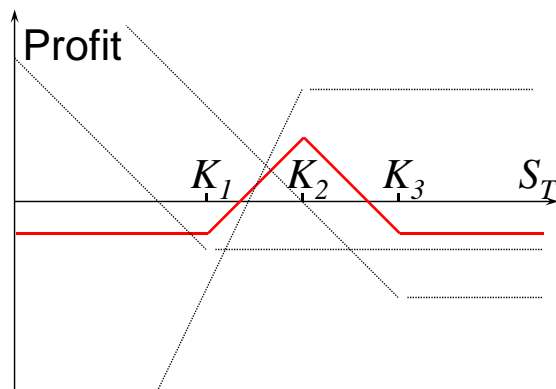
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Butterfly Spread Using Calls



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Butterfly Spread Using Puts



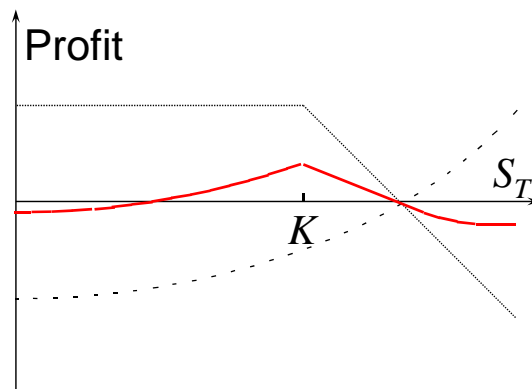
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Calendar spreads

- Calendar spreads are strategies that combine options of the same strike price but of different maturities
- Example: selling a call option with $K=X$ and buying another call option with longer maturity but also $K=X$.
- Since longer maturity options are more expensive, a calendar spread usually requires initial investment
- The profit diagrams are usually produced so that they show the profit when the shorter maturity option expires on the assumption that the longer maturity option is sold at that time.

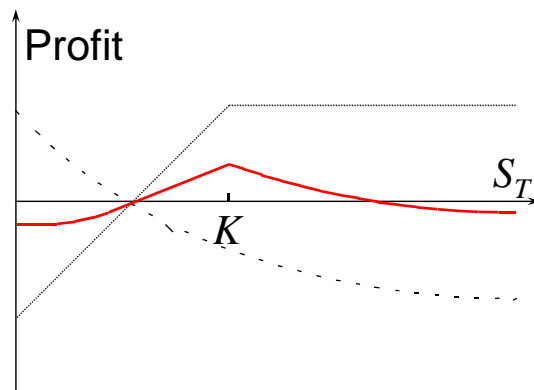
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Calendar Spread Using Calls



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Calendar Spread Using Puts



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Summary

- Trading strategies involving put and call options allow for a very flexible profit/loss patterns
- Options can be used to reduce risk of the original portfolio or to increase risk and speculate based on in investor's view of the underlying asset.
- Writing naked call or put option is a risky strategy

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