



Mechanics of Options Markets

Chapter 8

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Outline

- Types of options
- Option positions
- The underlying asset
- Option specifications, quotes, and trading
- Margin
- Executive stock options and warrants
- Over the counter market

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Types of Options

- A call is an option to buy
- A put is an option to sell
- A European option can be exercised only at the end of its life
- An American option can be exercised at any time

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Terminology

- Expiration date or maturity is the date the option contract is terminated
- Strike price is the price the parties in the contract agree to buy or sell the underlying asset
- Option premium or price is the value of the option contract

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Option Positions

- Option positions
 - Long call
 - Long put
 - Short call or write a call
 - Short put or write a put

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Notation

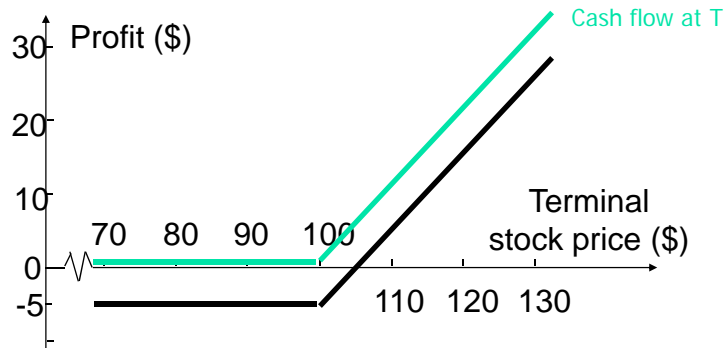
- X = Strike price
- S = Price of the underlying asset
- C = call option value
- P = put option value
- T = time at maturity
- t = time t before maturity
- *Example:* S_T = Price of asset at time T

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Long Call on eBay

Profit from buying one eBay European call option:
option price = \$5, strike price = \$100, option life = 2 months

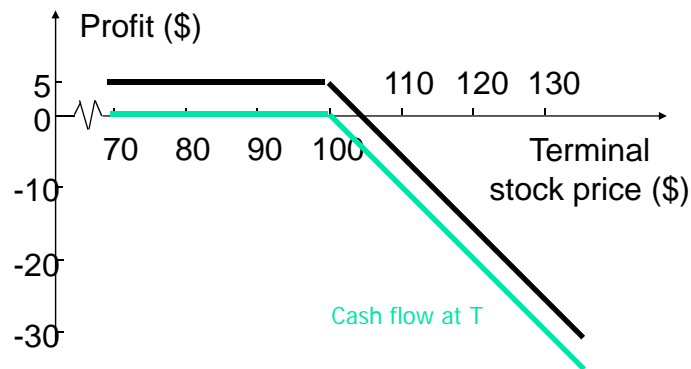


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Short Call on eBay

Profit from writing one eBay European call option:
option price = \$5, strike price = \$100

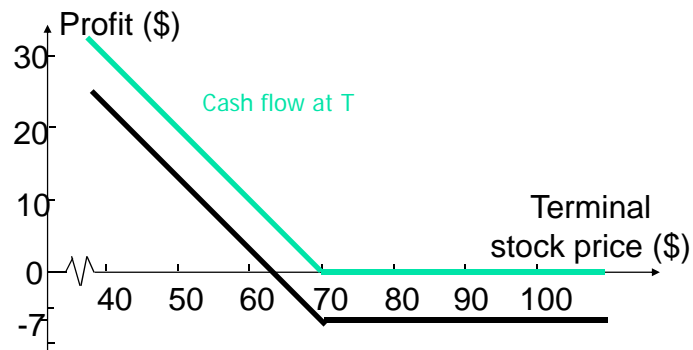


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Long Put on IBM

Profit from buying an Oracle European put option:
option price = \$7, strike price = \$70

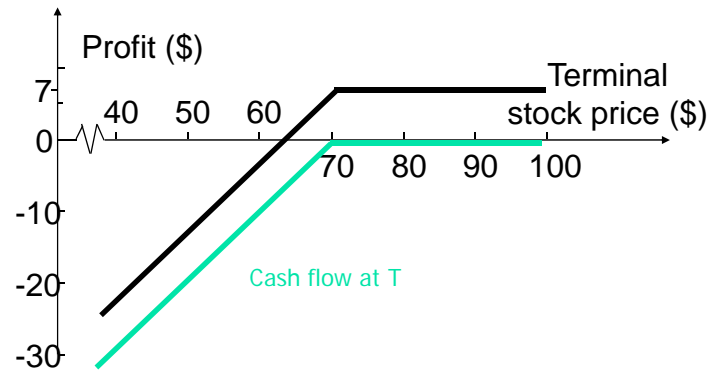


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Short Put on IBM

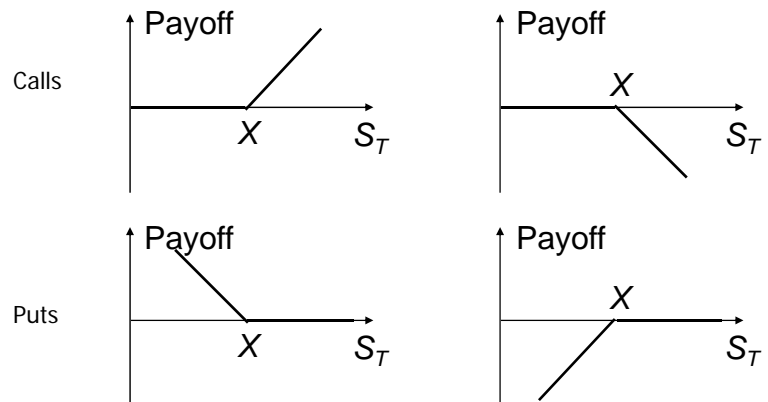
Profit from writing an IBM European put option: option price = \$7, strike price = \$70



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Payoffs from Options



Assets Underlying Exchange-Traded Options

- Stocks
- Foreign Currency
- Stock Indices
- Futures



Specification of Exchange-Traded Options

- Expiration date
- Strike price
- European or American
- Call or Put (option class)

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Terminology

- Option class: options of the same type (put or call) are referred to as option of the same class
- Option series consists of options of the same class and the same expiration date
- Intrinsic value is the maximum of zero and the value the option would have if it were exercised today

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Terminology

- Moneyness :
 - At-the-money option is an option with intrinsic value = 0
 - In-the-money option is an option with positive intrinsic value
 - Out-of-the-money option is an option with negative intrinsic value

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Terminology

- Moneyness :
 - A call option is in-the-money when $s_t > X$
 - A call option is out-of-the-money when $s_t < X$
 - A call option is at-the-money when $s_t = X$

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Concept check



When is a put option in-the-money, and when is a put option out-of-the-money?

G) $s_t < X$ and $s_t > X$

R) $s_t > X$ and $s_t < X$

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Dividends & Stock Splits

- Suppose you own N options with a strike price of K :
 - No adjustments are made to the option terms for cash dividends
 - When there is an n -for- m stock split,
 - the strike price is reduced to mK/n
 - the no. of options is increased to nN/m
 - Stock dividends are handled in a manner similar to stock splits

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Dividends & Stock Splits

- Consider a call option to buy 100 shares for \$20/share
- How should terms be adjusted for a 2-for-1 stock split?
 - The strike price is reduced to $\$20 \times (1/2) = \10
 - The number of contracts is increased to $100 \times (2/1) = 200$

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Dividends & Stock Splits

- Consider a call option to buy 100 shares for \$20/share
- How should terms be adjusted for a 5% stock dividend?
 - The strike price is reduced by 5% to $\$20 \times (.95) = \19
 - The number of contracts is increased by 5% to $100 \times (1.05) = 105$

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Concept check



- Consider a put option to sell 100 Intel shares at \$30. What should be adjusted for a 5% stock dividend?

G) $X = 28.5$ and $N = 95$

Y) $X = 28.5$ and $N = 105$

R) $X = 31.5$ and $N = 105$

where N is the number of contracts

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Market Makers

- Most exchanges use market makers to facilitate options trading
- A market maker quotes both bid and ask prices when requested
- The market maker does not know whether the individual requesting the quotes wants to buy or sell

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Margins

- Margins are required when options are sold
- When a naked option is written the margin is the greater of:
 - 1 A total of 100% of the proceeds of the sale plus 20% of the underlying share price less the amount (if any) by which the option is out of the money
 - 2 A total of 100% of the proceeds of the sale plus 10% of the underlying share price
- For other trading strategies there are special rules

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Warrants

- Warrants are options that are issued (or written) by a corporation or a financial institution
- The number of warrants outstanding is determined by the size of the original issue & changes only when they are exercised or when they expire
- Warrants are traded in the same way as stocks
- The issuer settles up with the holder when a warrant is exercised
- When call warrants are issued by a corporation on its own stock, exercise will lead to new treasury stock being issued

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Executive Stock Options

- Option issued by a company to executives
- When the option is exercised the company issues more stock
- Usually at-the-money when issued

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Executive Stock Options

- They become vested after a period of time (usually 1 to 4 years)
- They cannot be sold
- They often last for as long as 10 or 15 years
- Accounting standards are changing to require the expensing of executive stock options

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Convertible Bonds

- Convertible bonds are regular bonds that can be exchanged for equity at certain times in the future according to a predetermined exchange ratio
- Very often a convertible is callable
- The call provision is a way in which the issuer can force conversion at a time earlier than the holder might otherwise choose

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Over the counter market

- Trading over the phone
- Contracts are not standardized
- There is counter party risk
- It has grown to be larger than the exchange-traded option markets

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Summary

- Types of options
- Option positions
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- Margin
- Executive stock options and warrants
- Over the counter market