

Option Valuations

Lesson 2

Beginner Options Teaching Lessons

Understanding Option Pricing

All Rights Reserved
Copyright © 2021

SHADOWTRADER

The content in this presentation is presented for educational purposes only. It should not be considered as a recommendation to buy or sell a security. Therefore, information in no way should be considered investment advice. Trading options involves risk and may not be suitable for all investors. All rights and obligations of options instruments should be fully understood by individual investors before entering any trade.

Topics for this Lesson:

Understanding the Options Chain

Bid/Ask Pricing

Options Price Determinants

Intrinsic vs Extrinsic Valuation

Good or Bad Options ???

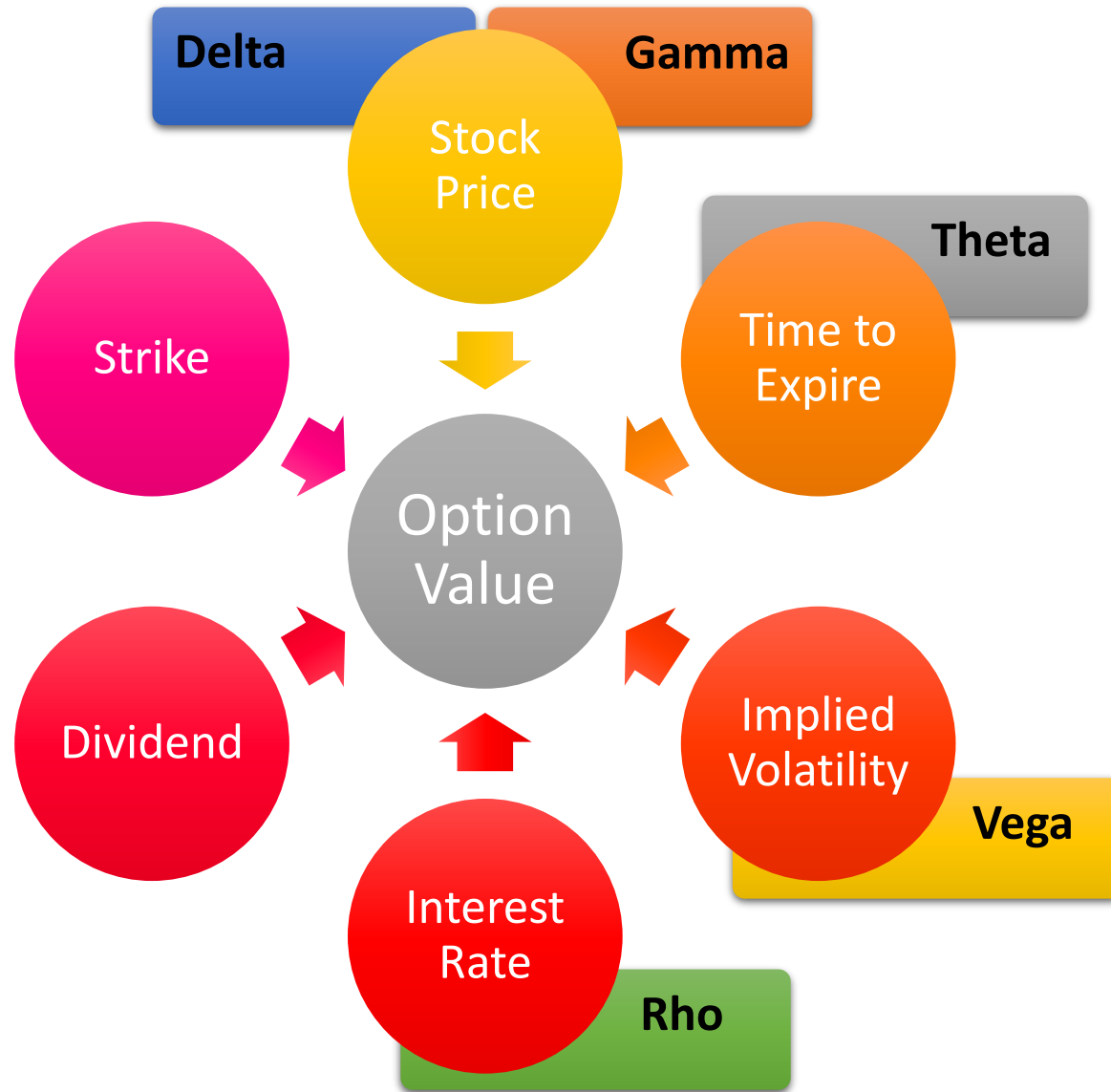
The Call option and The Put option:

- How are they displayed and what do the typical columns mean?

Below is a look at an option “chain” as shown on the ThinkorSwim platform

AMZN	7	AMAZON COM INC COM	1843.06	-1.01 -0.05%	B: 1842.56 A: 1843.00	NASDAQ	Company Profile	
Underlying								
Trade Grid								
Option Chain								
Filter: Off Spread: Single Layout: Volume, Open Interest								
CALLS								
Strikes: 14								
PUTS								
Volume Open.Int Bid X Ask X Exp Strike Bid X Ask X Volume Open.Int								
18 APR 19 (4) 100 20.03% (±33.656)								
102	266	24.80 N	26.10 N	18 APR 19	1827.5	9.10 Z	9.35 Z	138 85
709	779	23.20 N	24.25 P	18 APR 19	1830	9.80 N	10.20 Z	584 550
169	211	21.60 N	22.55 Q	18 APR 19	1832.5	10.45 N	11.10 H	159 155
288	340	20.05 N	21.10 Z	18 APR 19	1835	11.55 M	12.15 N	426 229
167	106	18.65 N	19.65 N	18 APR 19	1837.5	12.40 N	13.10 H	303 140
1,631	1,236	17.20 N	18.10 Z	18 APR 19	1840	13.55 Z	14.30 N	1,225 604
432	223	15.95 N	16.65 Q	18 APR 19	1842.5	14.80 P	15.50 N	359 131
1,830	800	14.65 N	15.35 M	18 APR 19	1845	15.85 N	16.70 N	800 314
1,186	361	13.50 N	13.90 Z	18 APR 19	1847.5	17.10 N	18.05 N	495 159
4,187	2,176	12.35 N	12.95 X	18 APR 19	1850	18.55 Z	19.45 N	1,494 958
257	153	11.30 N	12.10 X	18 APR 19	1852.5	20.05 Q	20.80 N	77 68
471	540	10.25 N	10.85 X	18 APR 19	1855	21.35 N	22.35 N	186 86
93	47	9.35 N	10.00 N	18 APR 19	1857.5	22.85 N	23.95 N	38 37
827	1,011	8.50 N	8.80 P	18 APR 19	1860	24.45 N	25.60 N	198 211
26 APR 19 (12) 100 (Weeklys) 36.99% (±101.882)								
3 MAY 19 (19) 100 (Weeklys) 33.88% (±116.174)								
10 MAY 19 (26) 100 (Weeklys) 31.77% (±126.822)								
17 MAY 19 (33) 100 30.48% (±136.715)								

Brief look at the Options Price Determinants



Forces determining an option's price?

Two components to options pricing:

Options Pricing

Extrinsic: Includes everything greater than intrinsic value



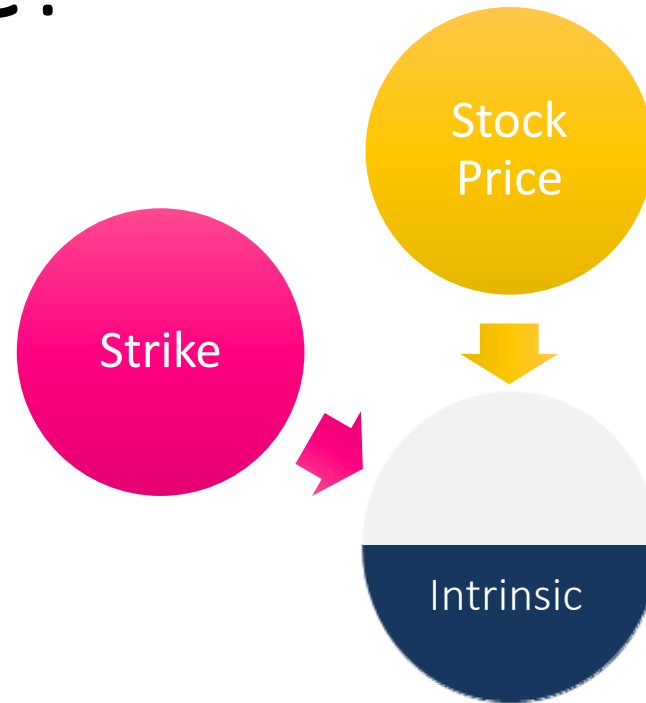
Intrinsic: Amount that an option is in the money

$$[\text{Option Price}] = [\text{Intrinsic Value}] + [\text{Extrinsic Value}]$$

=

-

Intrinsic value?

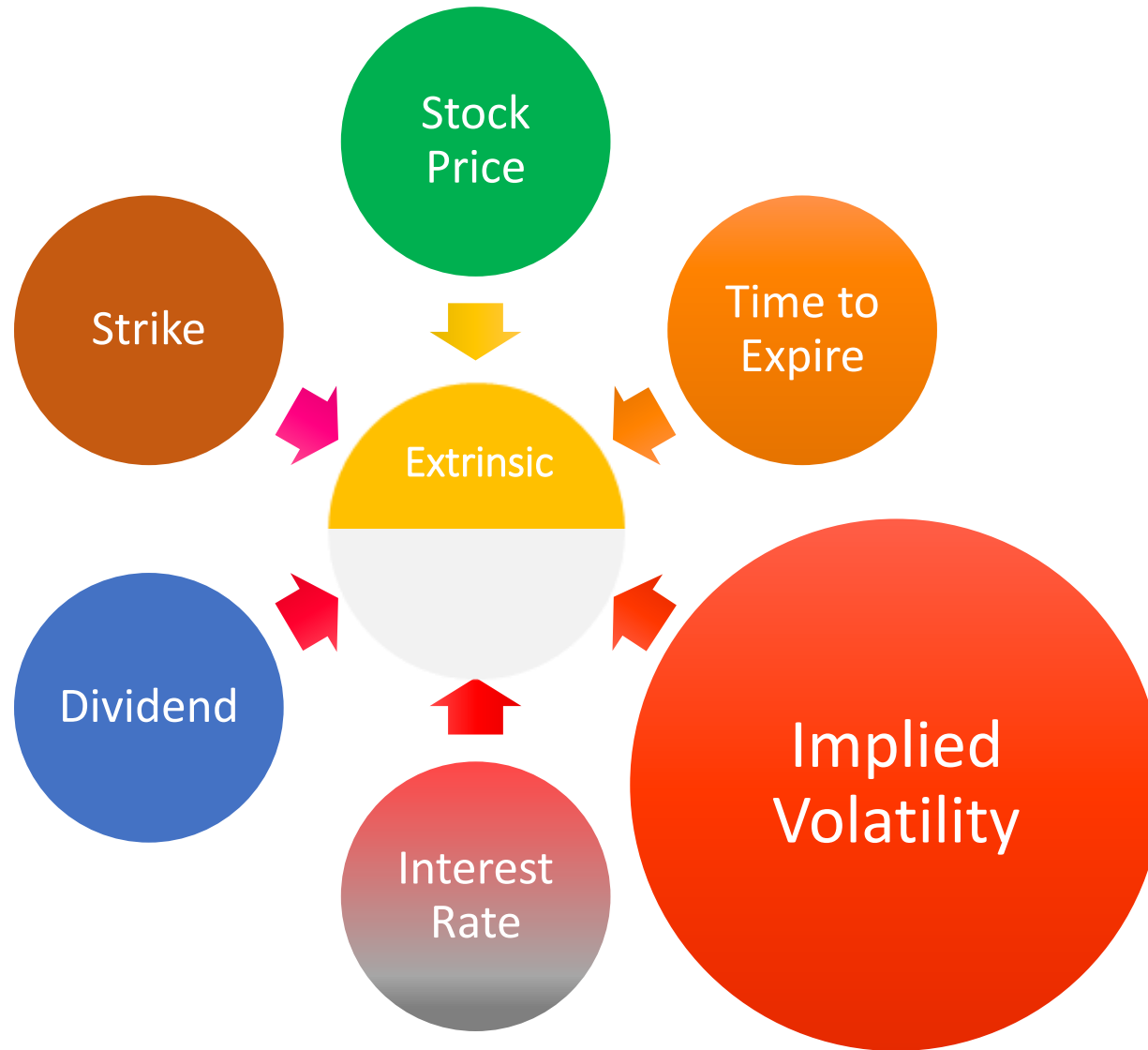


Out Of The Money options have no intrinsic value

In The Money options' intrinsic value is the difference between the strike and stock price

- Only two things impact **Intrinsic Value**:
 - **Stock Price** and **Strike**

What affects an option's **Extrinsic** price?



- What is extrinsic value?
- Extrinsic value is any other value in an options price above and beyond its Intrinsic Value
 - Extrinsic value = Option price – intrinsic value
 - The portion of an options premium that increases or decreases due to volatility, time and market risk
- What is market risk?
- Risk of loss based on the potential price change by the underlying asset as well as loss by time and volatility.

Focus: Extrinsic Value - Where Does it Come From?

- How is extrinsic value created?

The amount of extrinsic value is determined primarily by:

Supply and demand forces

- Market participants determine the price of the options through bid and ask until a contract price is agreed upon
- Overall market nervousness to possible price swings

How do we measure IV? Options Pricing Formulas

$$c = S_0 N(d_1) - X e^{-rT} N(d_2)$$

$$p = X e^{-rT} N(-d_2) - S_0 N(-d_1)$$

$$\text{where } d_1 = \frac{\ln(S_0 / X) + (r + \sigma^2 / 2)T}{\sigma \sqrt{T}}$$

$$d_2 = \frac{\ln(S_0 / X) + (r - \sigma^2 / 2)T}{\sigma \sqrt{T}} = d_1 - \sigma \sqrt{T}$$

Black-Scholes Model

c = Call Price

p = Put Price

S_0 = Equity Price

N() is the Normal Distribution Function

X = Strike Price

r = Risk Free Interest Rate

T = Time to Expiration

σ = Implied Volatility

Looks complicated. But let's break it down.

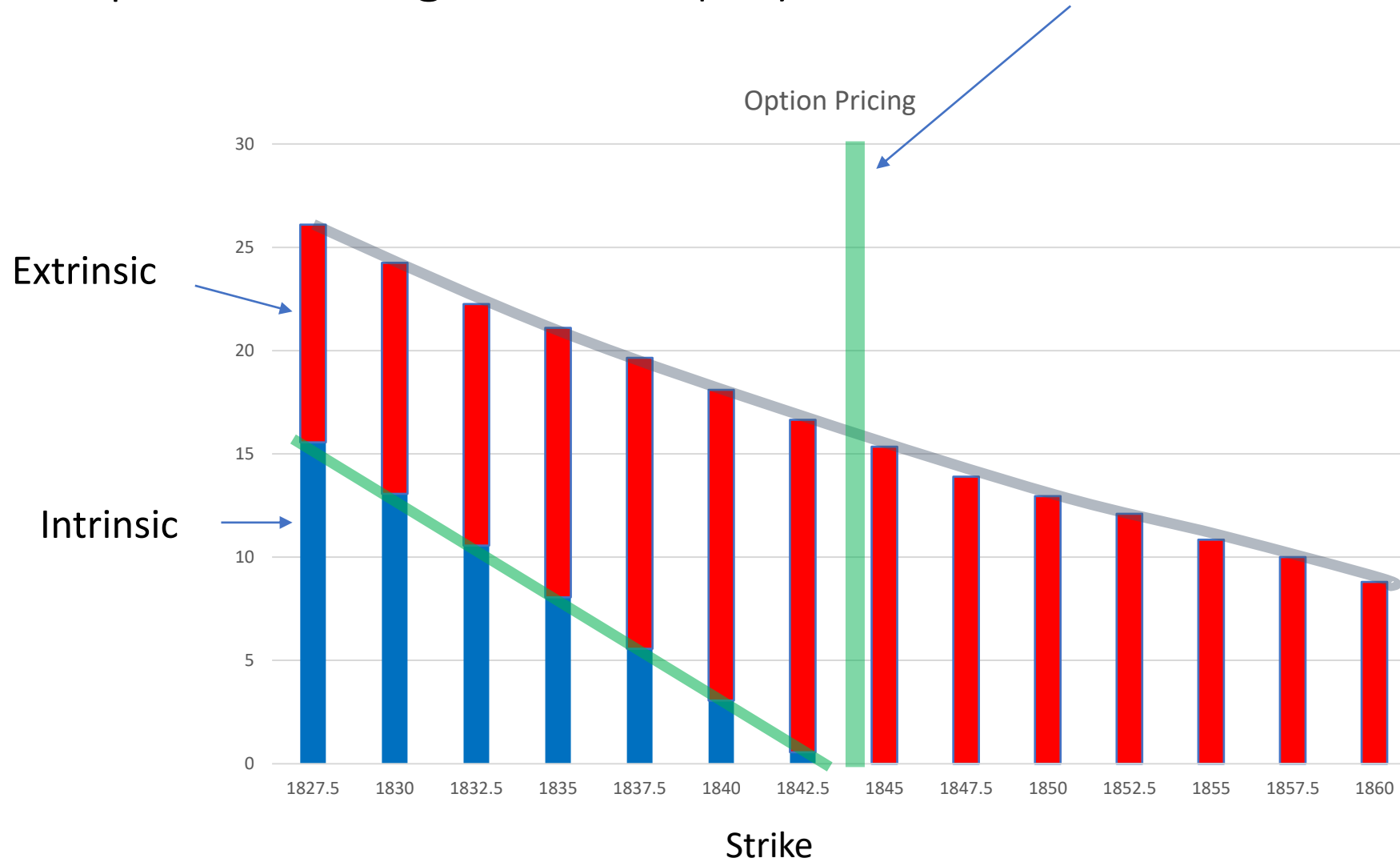
What do we know?

- Put and call price come from an options chain
- Equity price from the quote screen
- Normal distribution is just a function
- Strike is known
- Risk Free Interest Rate is known
- Time is from a calendar

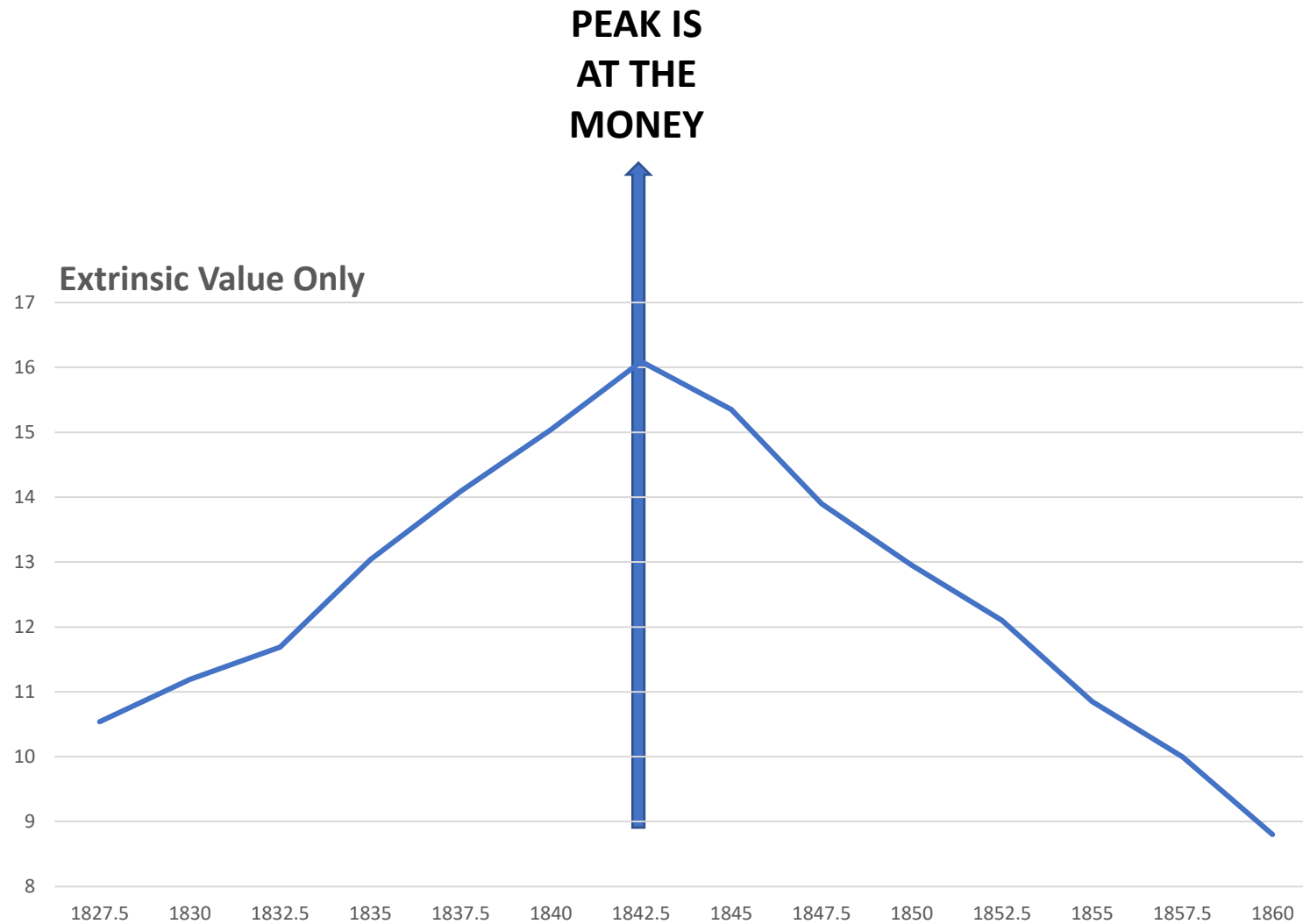
Implied Volatility is the only unknown Solve for implied volatility!

- Implied volatility (IV) is the market's expectation of the future price behavior of the equity for the life of the option being considered for an ATM valuation
- Implied volatility can only impact the EXTRINSIC value portion of an option's price – NOT the INTRINSIC value
- If implied volatility increases it indicates that the market expects the equity to become more volatile. This causes the value of both calls and puts to increase
- If implied volatility decreases it indicates the market expects the equity to become less volatile. This causes the value of both calls and puts to decrease
- **Equities do not have implied volatility**
- Only options have implied volatility
 - Each and every option has its own implied volatility

Options Pricing Curve - equity @ \$1843.06



Option Extrinsic Value Only



- When implied volatility is high, there will be MORE extrinsic value associated with an option's price because significant movement by the underlying equity is expected... options are more expensive -
- When implied volatility is low, there will be LESS extrinsic value associated with the option's price because there is little expected movement by the underlying equity... options are less expensive
- What affects Implied Volatility?
 - Earnings announcements
 - Takeover rumors
 - Brokerage downgrades/upgrades
 - Increased uncertainty
 - NEWS!

Bonus slide –

how to tell if it's worth using options on an
issue

What determines good option pricing – my take

- Using 30 day ATM options: A = ask price, B = bid price, S = spread
Subtract bid from ask to calculate spread: $A - B = S$
Divide spread by bid: $S/B = \text{ratio}$
Multiply ratio by 100 ratio * 100 = Percentage Spread
- 1-2% - very good
2-5% - usable but will cause spread loss on each Open and Close
5-10% - high caution zone, proceed with care as Open and Close loss is high
>10% - go somewhere else, pick another equity