

Basic Options Concepts

TRADING EQUITY OPTIONS



Covered Call
Generate Income



Protective Put
Limit Downside



Vertical Spread
Defined Risk



Naked Option
Higher Risk / Higher Reward

Profit / Loss



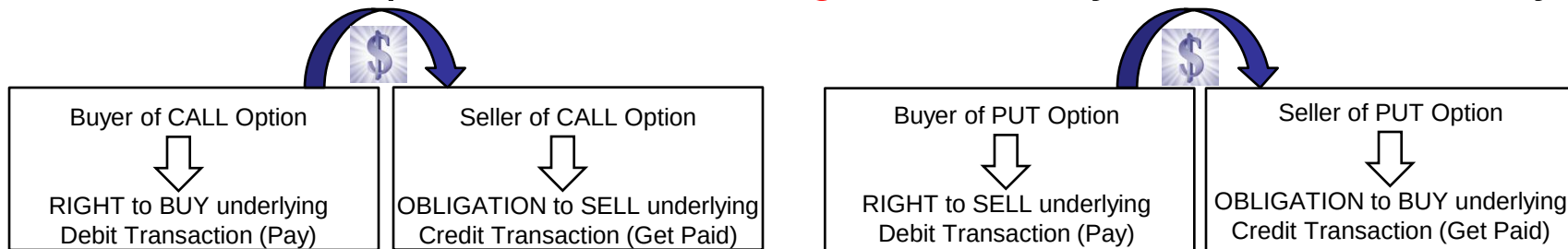
Calls	Strike	Puts
12.60	430	4.20
9.80	435	6.10
7.20	440	8.50
5.10	445	11.20
3.40	450	14.80

Topic Summary

- Puts and Calls, Rights and Obligations
- Long and Short options
- Intrinsic and Extrinsic Value
- ATM, OTM, ITM
- Volume and Open Interest
- Option Spreads
- The Normal Distribution, Standard Deviation, and Fat Tails
- The Option Pricing Model
- Volatility and Expected Move
- Risk vs. Reward

Puts and Calls

- Puts and Calls are contracts between a buyer and a seller.
- A Call is the **Right to Buy** the underlying at a specific price on or before a specific date.
- A Put is the **Right to Sell** the underlying at a specific price on or before a specific date.
- The buyer of an option has the **Right** to buy or sell the underlying.
- The seller of an option has the **Obligation** to buy or sell the underlying



Long and Short

In the STOCK world:

- We are **LONG** an underlying stock if we have **PAID** to acquire shares.
- We are **SHORT** an underlying stock if we have **SOLD** shares in a stock that we don't own, (we have temporarily borrowed it). We have an obligation to acquire shares of the stock at a later date to return them to the party from whom we borrowed them.

In the Options world:

- We are **LONG** an option if we have **PAID** for the **RIGHT** to buy or sell the underlying per the contract terms. This is called **BUYING** the contract.
- We are **SHORT** an option if we have **BEEN PAID** to assume the **OBLIGATION** to buy or sell the underlying per the contract terms. This is called **SELLING** the contract.

ATM, ITM, OTM and Intrinsic vs. Extrinsic

Option contract value = **Intrinsic** value + **Extrinsic** value

Intrinsic value = Contract value at expiry **Extrinsic** Value = Time Value

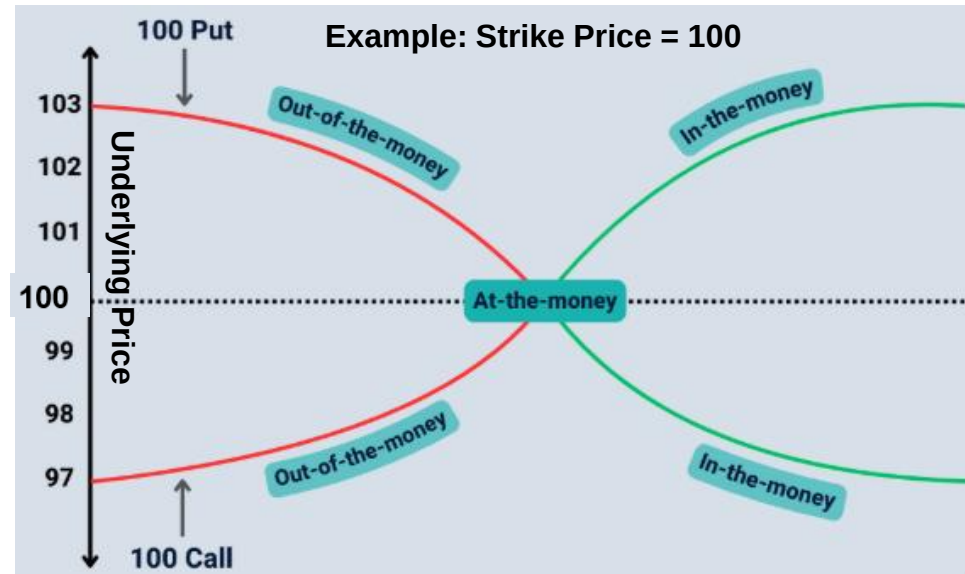
- Put & Call options are **AT THE MONEY** (ATM) if strike price=underlying price

- CALL** options are **IN THE MONEY** (ITM) if underlying price > strike price. We say that the option has **INTRINSIC** as well as **EXTRINSIC** value.

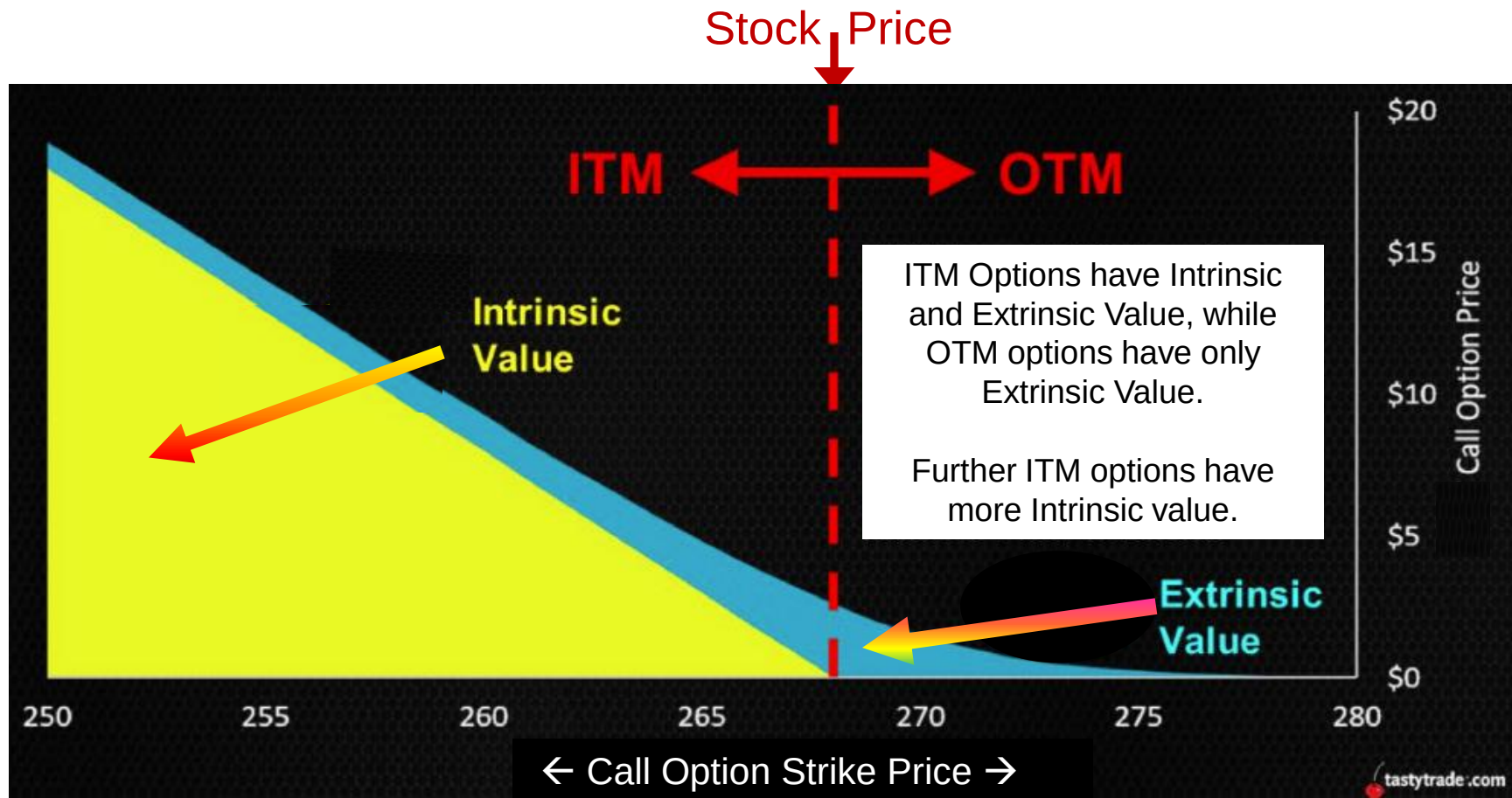
- CALL** options are **OUT OF THE MONEY** (OTM) if underlying price < strike price. The option has only **EXTRINSIC** value.

- PUT** options are **IN THE MONEY** (ITM) if underlying price < strike price. We say that the option has **INTRINSIC** as well as **EXTRINSIC** value.

- PUT** options are **OUT OF THE MONEY** (OTM) if underlying price > strike price. The option has only **EXTRINSIC** value.



Intrinsic and Extrinsic Value for Call Option



Volume and Open Interest

- When we buy or sell an option contract, the **VOLUME** increases by the number of contracts traded (same number are bought and sold when traded).
- If we bought or sold the option as an **OPENING** position, and the counterparty also bought or sold the option as an **OPENING** position, the **OPEN INTEREST** increases by the number of contracts that were traded.
- If we bought or sold the option as an **OPENING** position, and the counterparty bought or sold the option as a **CLOSING** position, the **OPEN INTEREST** remains unchanged.
- If we bought or sold the option as a **CLOSING** position, and the counterparty bought or sold the option as a **CLOSING** position, the **OPEN INTEREST** decreases by the number of contracts that were traded.
- The **OPEN INTEREST** is computed at the end of each trading session.
- The **VOLUME** is continuously updated throughout the trading session.

Volume and Open Interest for a 1 Contract Trade

Buyer	Opening Trade	Opening Trade	Closing Trade	Closing Trade
Seller	Opening Trade	Closing Trade	Opening Trade	Closing Trade
Volume	+1	+1	+1	+1
Open Interest	+1	No Change	No Change	-1

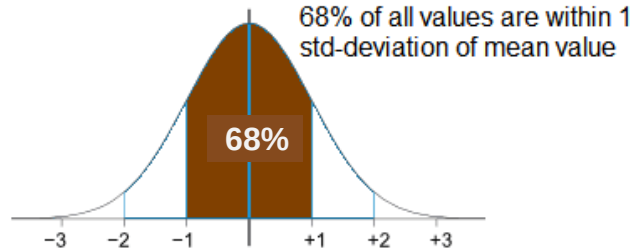
Option Basics and Buying Power

- A single option contract controls 100 shares of the underlying.
- Since each contract controls 100 shares, we say that it has “leverage”.
- All option trades have risk; sometimes you can lose much more money than it cost you to enter the trade (depending on trade type).
- Your broker will require you to have cash on deposit in your trading account to cover the risk that the trade moves against you.
- Your total account value at any time is called the “Net Liquidation” value.
- The amount of money that the broker reserves for your losses is called the “Buying Power Reduction” (BPR). You are not allowed to trade these \$\$.
- Your Net Liq minus the BPR is how much \$\$ you have left for new trades.
- When buying power falls to zero, you have no more liquidity, and the broker will require you to add \$ to your account or make you close part of your risk.

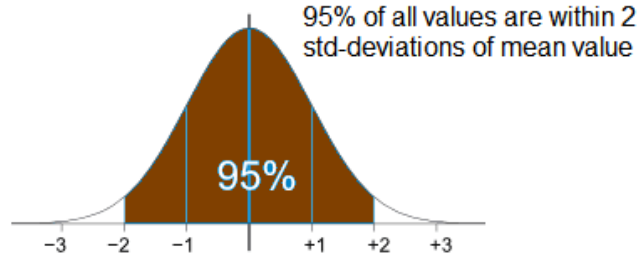
Probability: The Normal Distribution

Assumes that price has an equal chance of moving up or down

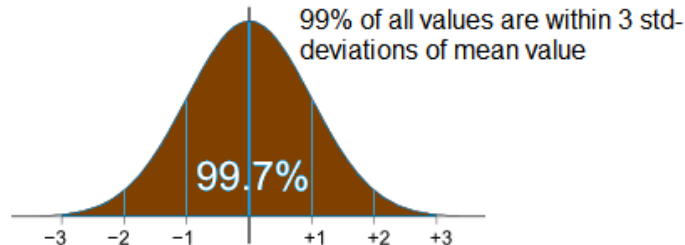
1 Standard
Deviation



2 Standard
Deviations

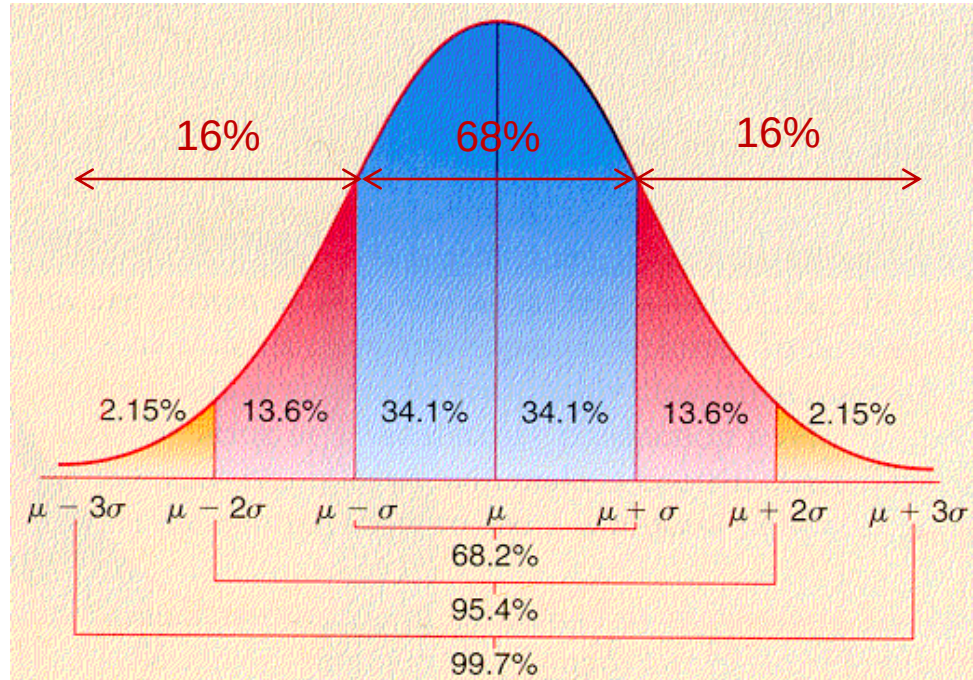


3 Standard
Deviations

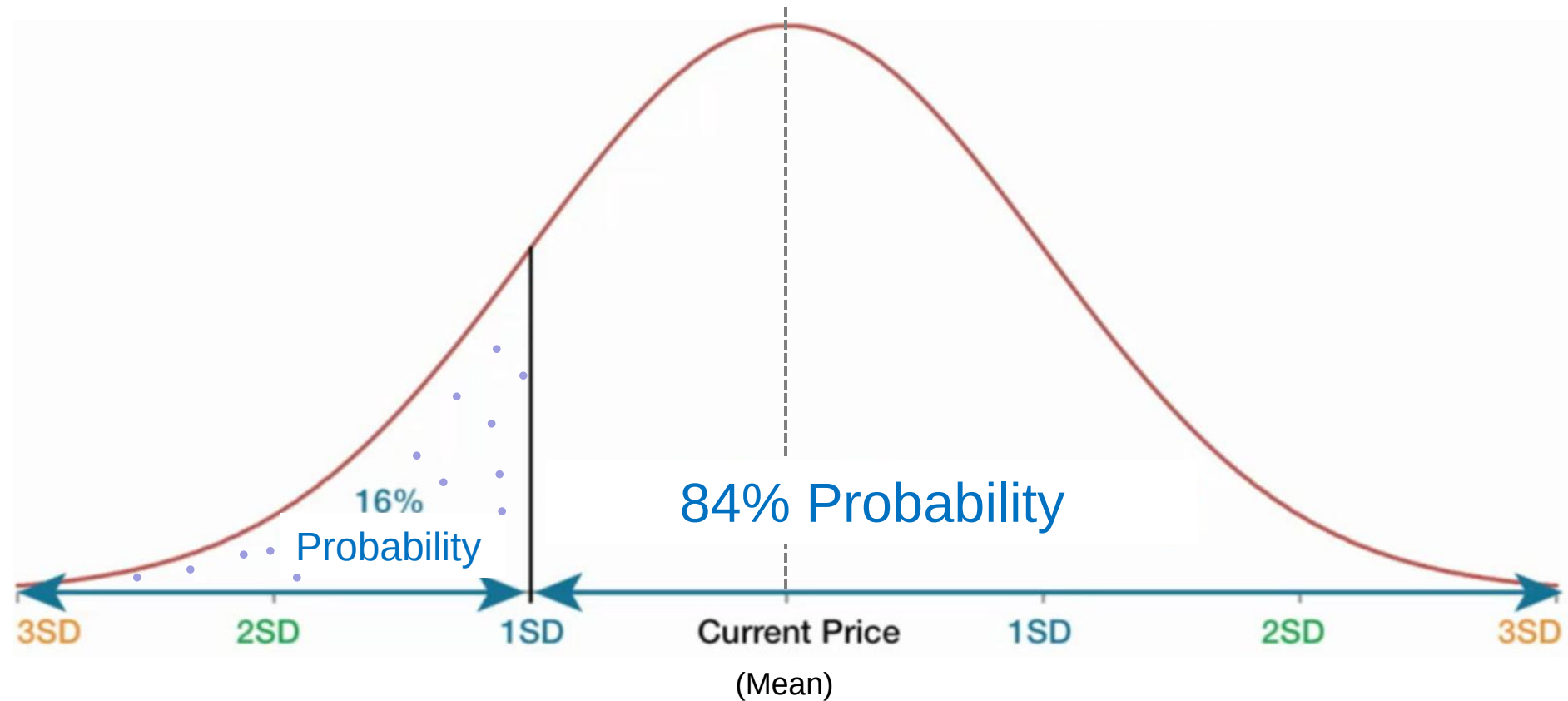


The Normal Distribution – 2-Sided

- One standard deviation contains expected price movement with 68% probability.
- This means that the probability of price closing **outside** of 1SD is 1 - 68% or 32%.
- Probability of closing >1SD away from the mean on downside or upside = 16%.

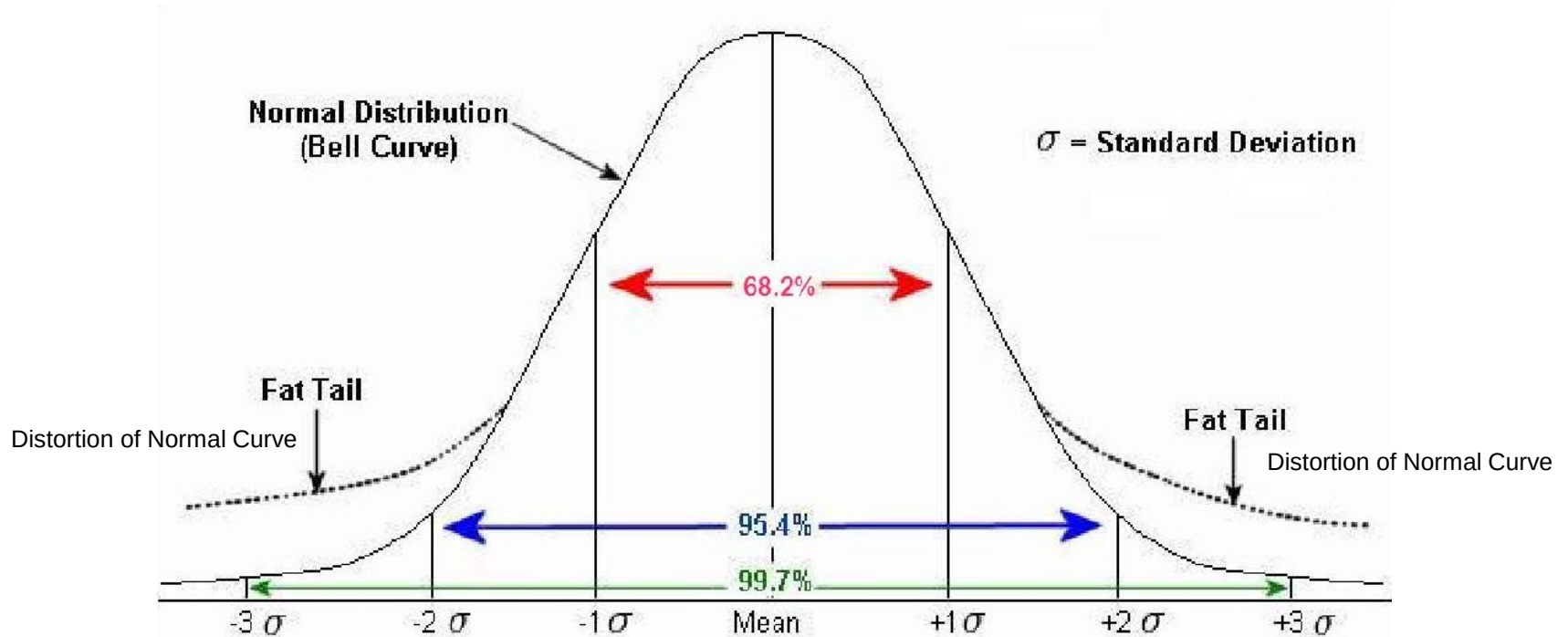


The Normal Distribution: One-Sided Probability of Price Closing >1SD away on ONE SIDE



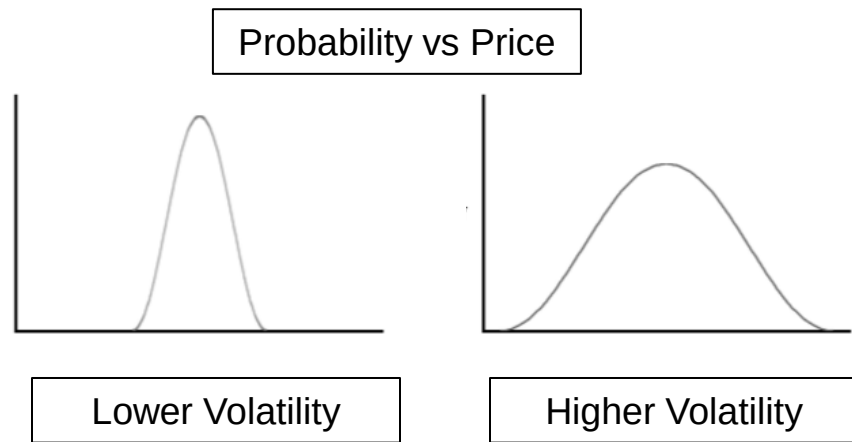
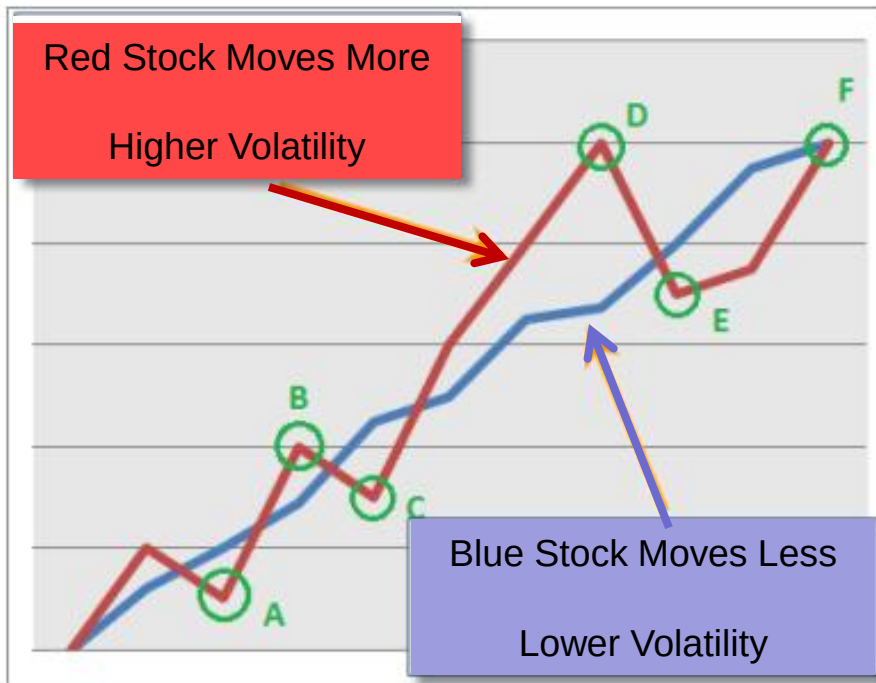
Are prices really normally distributed?

With stock prices, we find that there is a greater chance of making a large move than predicted by a normal distribution. We call these “fat tails”.



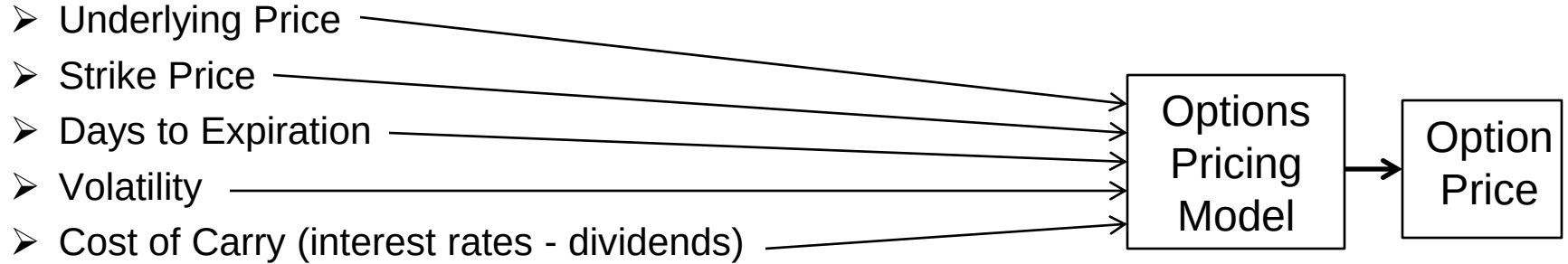
What is Volatility?

- Volatility represents the uncertainty of stock prices in the future.
- A stock with high volatility will move more than a stock with low volatility.



The Options Pricing Model

- Options pricing can be modeled; most common is called Black- Scholes.
- There are 5 inputs to the model:



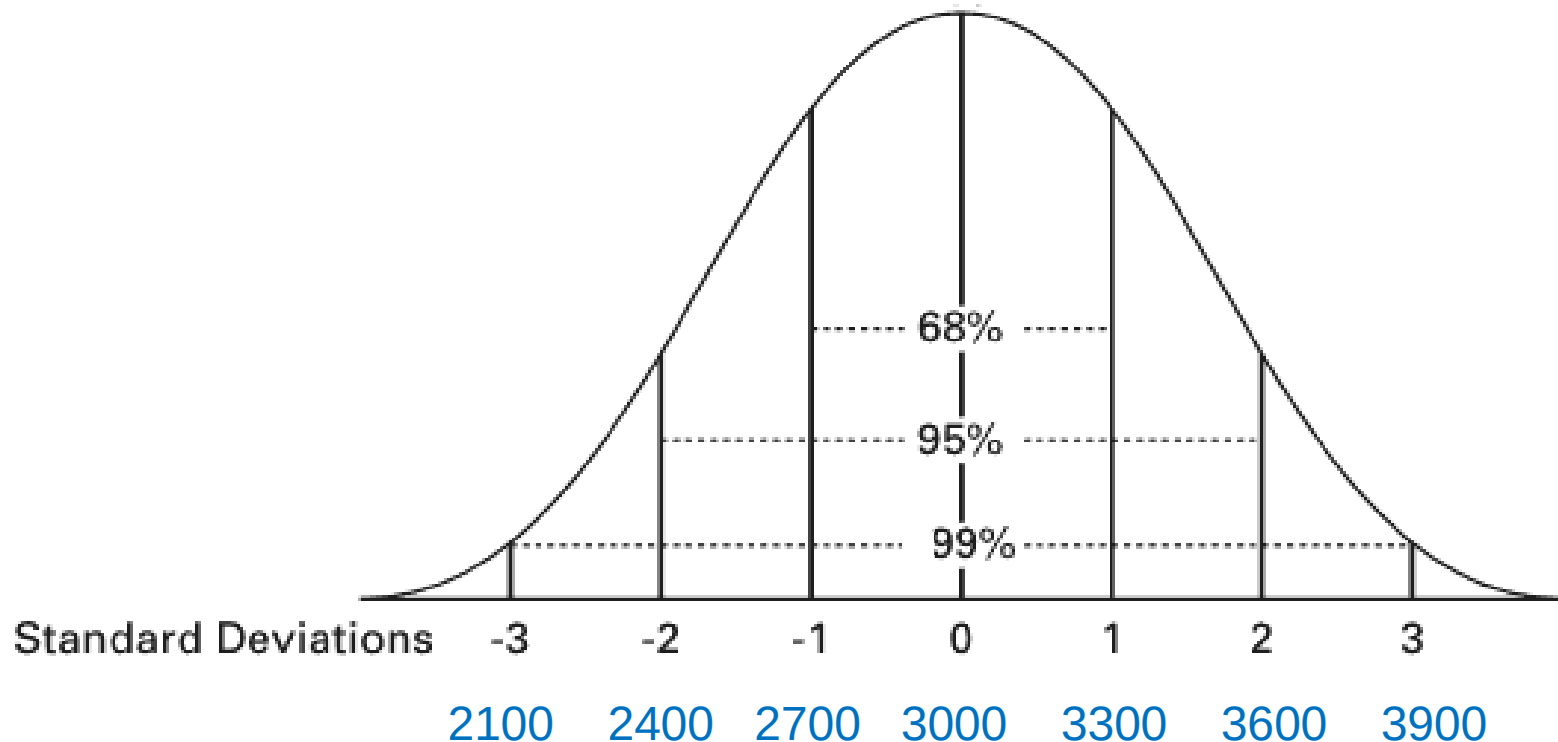
- Question: Which input is the least important / least relevant? The most?
- Question: Who sets the price of an option?

Volatility and Expected Move

- The width of the normal distribution is a measure of **VOLATILITY**.
- Volatility is **mean reverting**; it can **go** anywhere but it cannot **stay** there.
- As volatility increases, the expected movement of an underlying price increases, or one could say that **uncertainty** about price increases.
- There are 2 main types of volatility: **Historical (Realized)** Vol and **Implied** Vol
- Volatility is 1 of the 5 INPUTS to the option pricing model, but it is the only one that we do not know accurately. This is most interesting to traders.
- Since Implied Volatility is calculated from the prices set by buyers & sellers, and changes based on market conditions, it is really a model OUTPUT.
- IV tells us the 1SD expected percentage move in price (+/-) in **one year**.
- Once we know IV, we can *estimate* the expected price move at time in the future (not just one year).

Example of SPX and the Normal Distribution

SPX index is at 3000, IV=10%, so 1SD = +/- 300. Expected price 1 year out is shown:



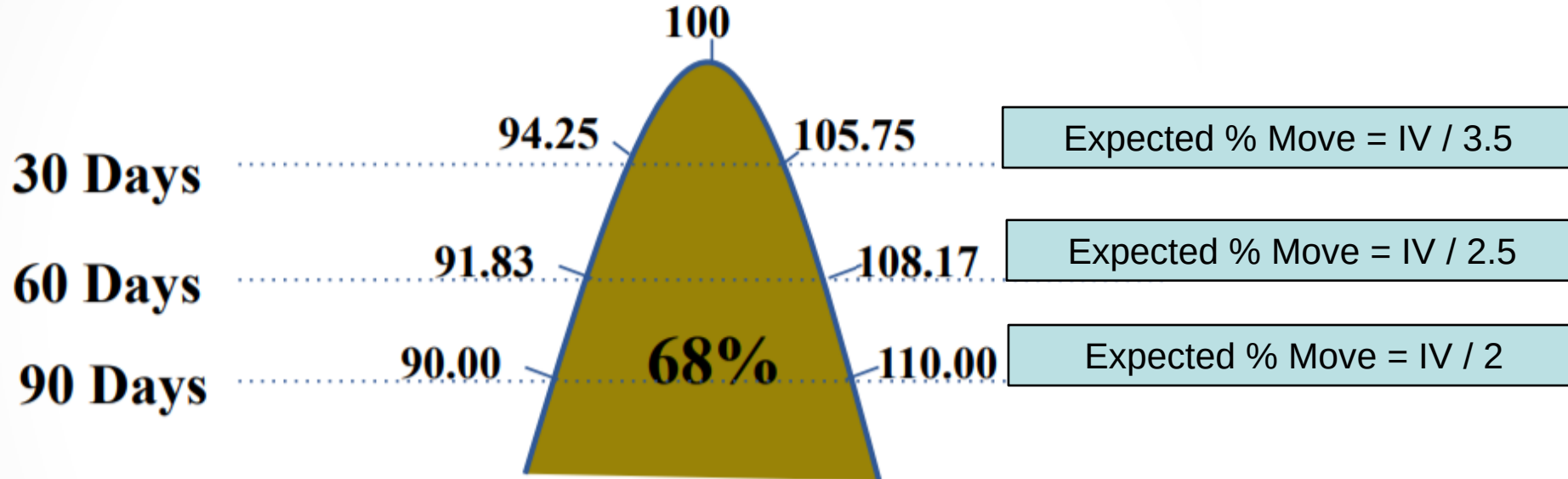
Implied Volatility and % Expected Move

- % Expected Move = $IV * \text{Sqrt}(DTE / 365)$ → Lets you estimate the % move based on IV
- Quick Estimation from above formula:
 - 1 Day % expected move = $IV / 19.1$ → 1 day expected move is about 1% with a 19.1% IV
 - 30 Day % expected move = $IV / 3.5$; 60 Day = $IV / 2.5$; 90 Day = $IV / 2$
- Question: A stock has IV = 38%. Current price is \$200. How much can you expect the stock to move in one day?

- Question: A stock has IV = 25%. Current price is \$200. How much can you expect the stock to move in 60 days?

Expected Moves for Different Time Frames

Expected Move for Stock at \$100/share, IV=20%
Note increase in uncertainty as DTE increases



Risk vs. Reward

The desired Risk (POP) must be weighed
against Potential Reward (ROC)



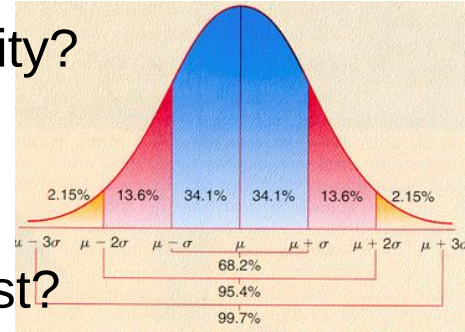
Probability of Success and Risk / Reward

The Game: Binary Outcome; You always either win \$100 or lose your bet. Your Bet Size (and Max Loss) is determined by the probability you choose.

Probability of Winning	Bet Size = Risk = Max Loss	Win	Lose	Summary
50%	\$100	\$100	Entire Bet	Risk 1 to make 1
60%	\$150	\$100	Entire Bet	
66.7%	\$200	\$100	Entire Bet	
80%	\$400	\$100	Entire Bet	
87.5%	\$700	\$100	Entire Bet	
90%	\$900	\$100	Entire Bet	
95%	\$1900	\$100	Entire Bet	
99%	\$9900	\$100	Entire Bet	

Discussion: Questions for Next Session

- If IV is an input to the options pricing model, why don't we know what it is?
- What probability of profit would you like to see in your trading?
- What does it mean if we say that a stock has an implied volatility of 10%?
- What are the chances of a stock closing **outside** the 2SD expected move?
- What are the chances of a stock closing **above** the -1 SD expected move?
- What is the difference between historic and implied volatility?
- If volatility rises, will it help or hurt our options position?
- Is it better to be a buyer or seller of options?
- Can volume of options traded be greater than open interest?
- If HV is greater than IV, would you tend to want to buy or sell options?



HOMEWORK: If doing the tastylive Beginners Options Course, do **Section 1: Option Basics**.