Finding and Evaluating Trade Strategies

Justin Kay

Mechanical vs. Discretionary

-TWO SIDES OF ONE COIN

- Discretionary trades utilize more “feelings” on how the market is going to move.
  - Not that it’s entirely based on feelings, as all traders use indicators, metrics, and signals to one extent or another.
  - No one can predict market movements with finality.
  - But, if you trade long enough, your learned intuition may lead you to be right more often than you’re wrong (~51% of the time).
  - But that’s hard when you’re starting out.
  - It’s also hard when the market changes (interest rates, VIX levels, political policies, wars . . .).

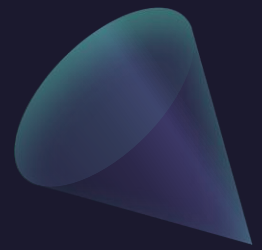
Mechanical vs. Discretionary

-TWO SIDES OF ONE COIN

- Mechanical trades utilize more “math.”
  - What are the odds the market will do X? What do I get if I win? What do I get if I’m wrong? What is the Expected Value (EV) over a large number of trades? Am I able to actually trade long enough to see the odds play out?
  - Some consider it finding “market mis-pricings” or “imbalances.”
  - Typically involves more leg work upfront (not always) compared to discretionary.
  - With discretionary, a large part of the analysis is done when the trade ends (but not all). With mechanical, the analysis is only halfway over when the trade ends.

Statistics for Dummies

-COIN FLIP



- If I was willing to allow you to bet on a standard coin flip, where you win $1.00 if it's "heads" and lose $1.00 if it's "tails", would you play?
  - You have a 50% chance of making $1.00, and a 50% chance of losing $1.00.
  - Your EV is $0 ($1.00x0.50 + -$1.00x0.50 = $0.00).
- What if you didn't know if it's a standard coin?
  - You probably want to look at some examples, and see if it's random or fixed.
  - Because otherwise, you don't know if your EV is positive or negative ($1.00x? + -$1.00x(1-?) = ?)

Statistics for Dummies

-COIN FLIP

- Let's say we flip a coin two times to see the results.
- What are our possible results?
  - The first one is heads, the second one his heads.
  - The first one is heads, the second one is tails.
  - The first one is tails, the second one is heads.
  - The first one is tails, the second one is tails.

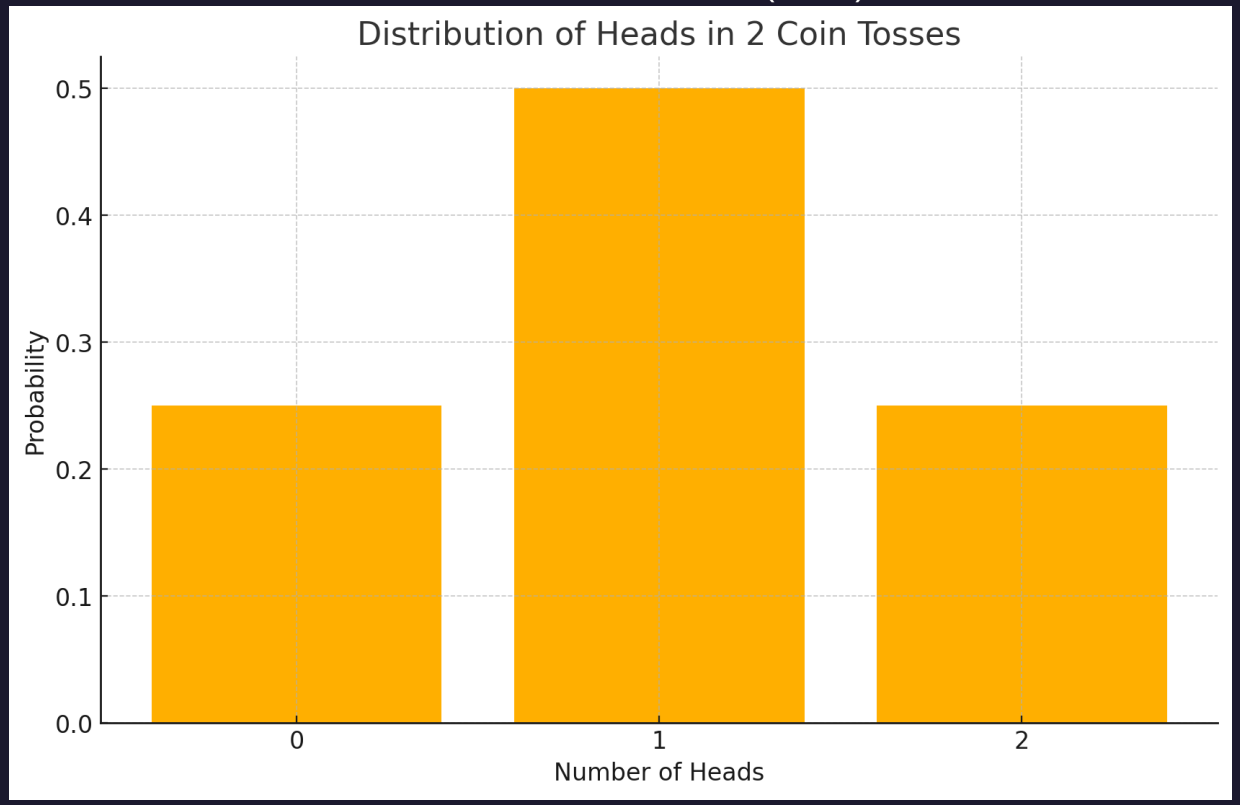
- 2 Heads: 1 Chance
- 1 Heads 1 Tails: 2 Chances
- 2 Tails: 1 Chance

- 2 Heads: 1 Chance
- 1 Heads: 2 Chances
- 0 Heads: 1 Chance

Statistics for Dummies

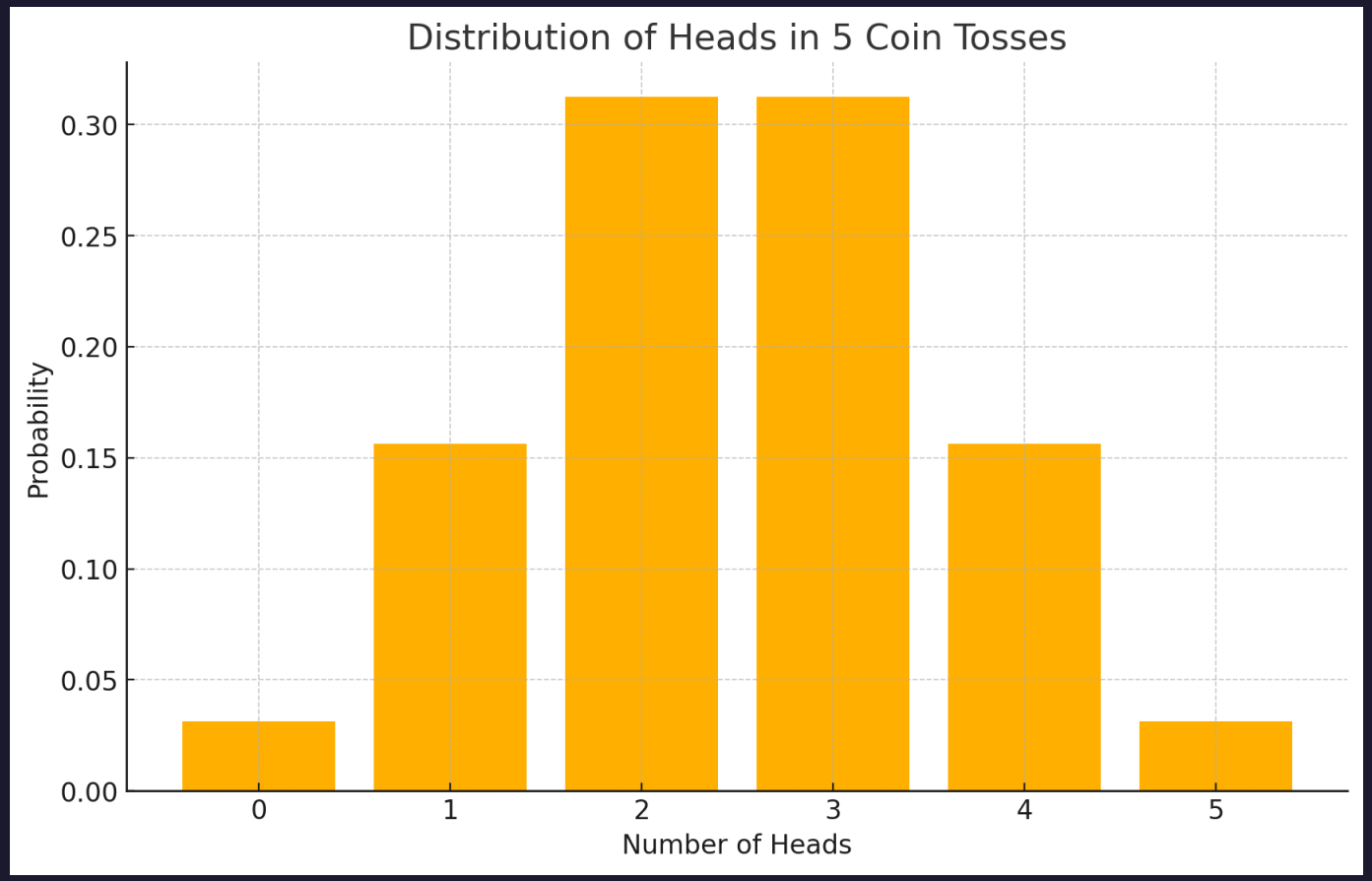
-COIN FLIP

- 2 Heads: 1 Chance (25%)
- 1 Heads: 2 Chances (50%)
- 0 Heads: 1 Chance (25%)



Statistics for Dummies

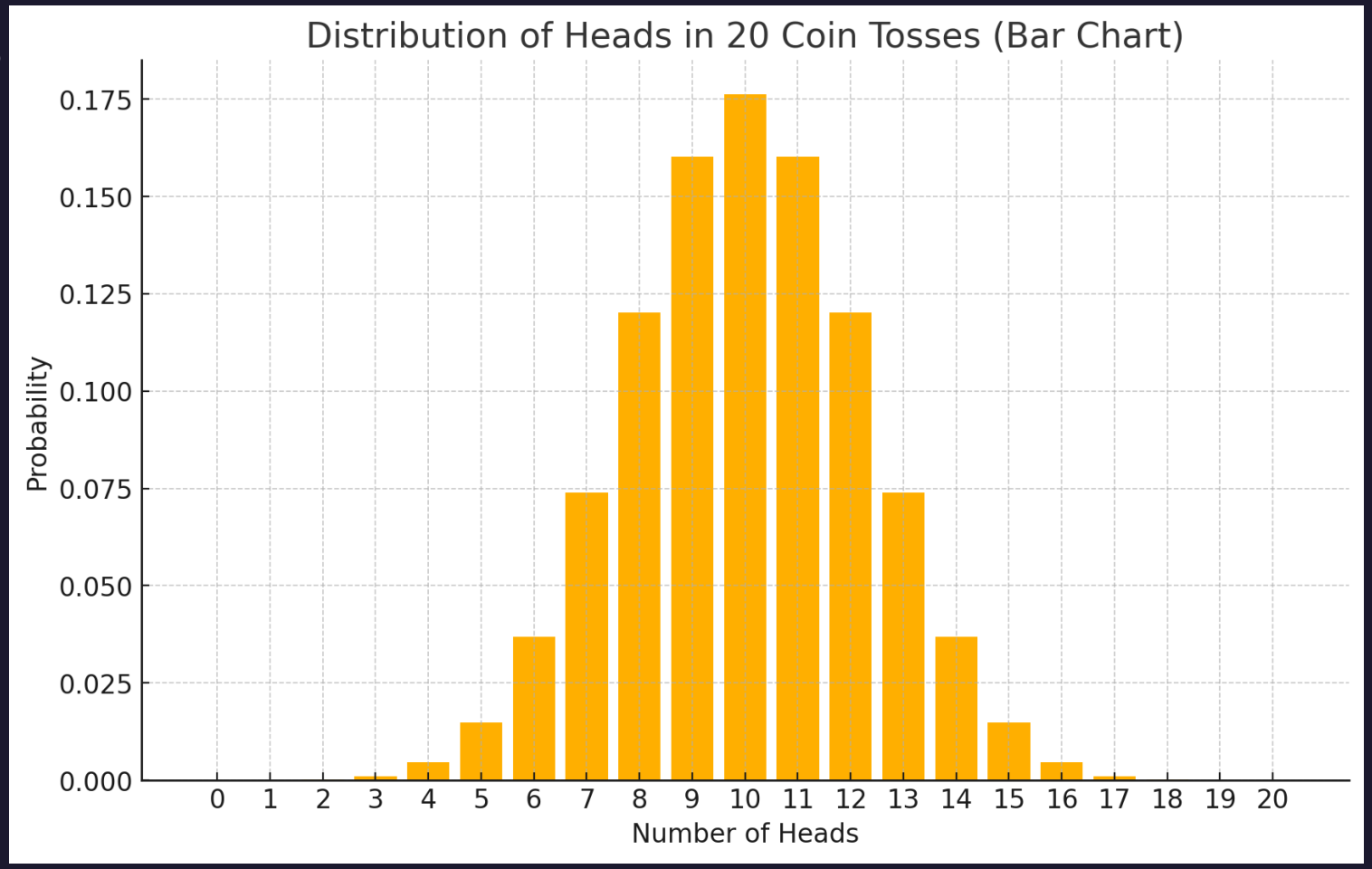
-COIN FLIP



- 5 Heads: 1 Chance (3.1%)
- 4 Heads: 5 Chances (15.6%)
- 3 Heads: 10 Chances (31.2%)
- 2 Heads: 10 Chances (31.2%)
- 1 Heads: 5 Chances (15.6%)
- 0 Heads: 1 Chance (3.1%)

Statistics for Dummies

-COIN FLIP

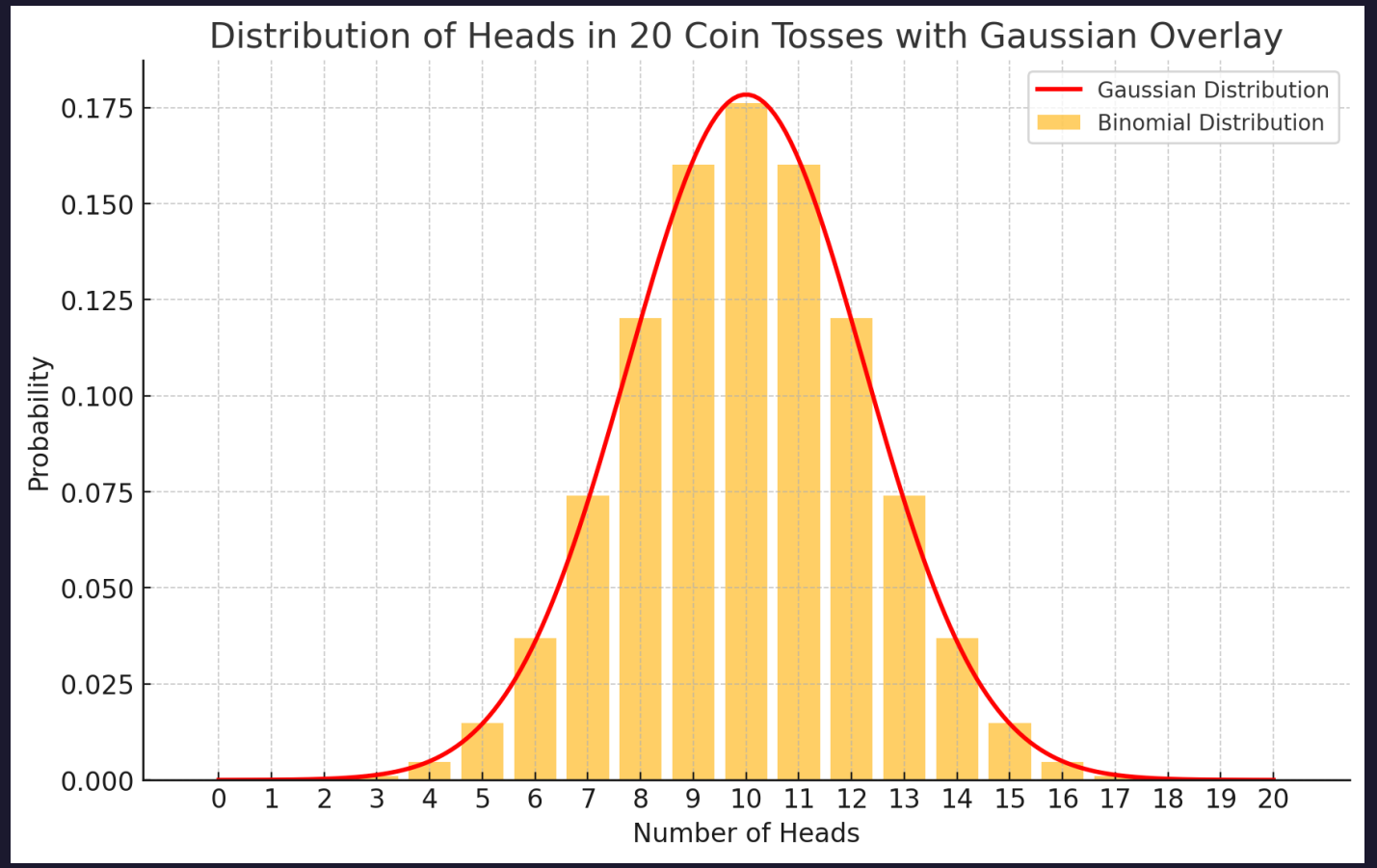


- 20 heads (0.000095%)
- 19 heads (0.00191%)

- 20 heads ~ 1 in 1 million
- 19 heads ~ 1 in 52,000
- 18 heads ~ 1 in 5,000

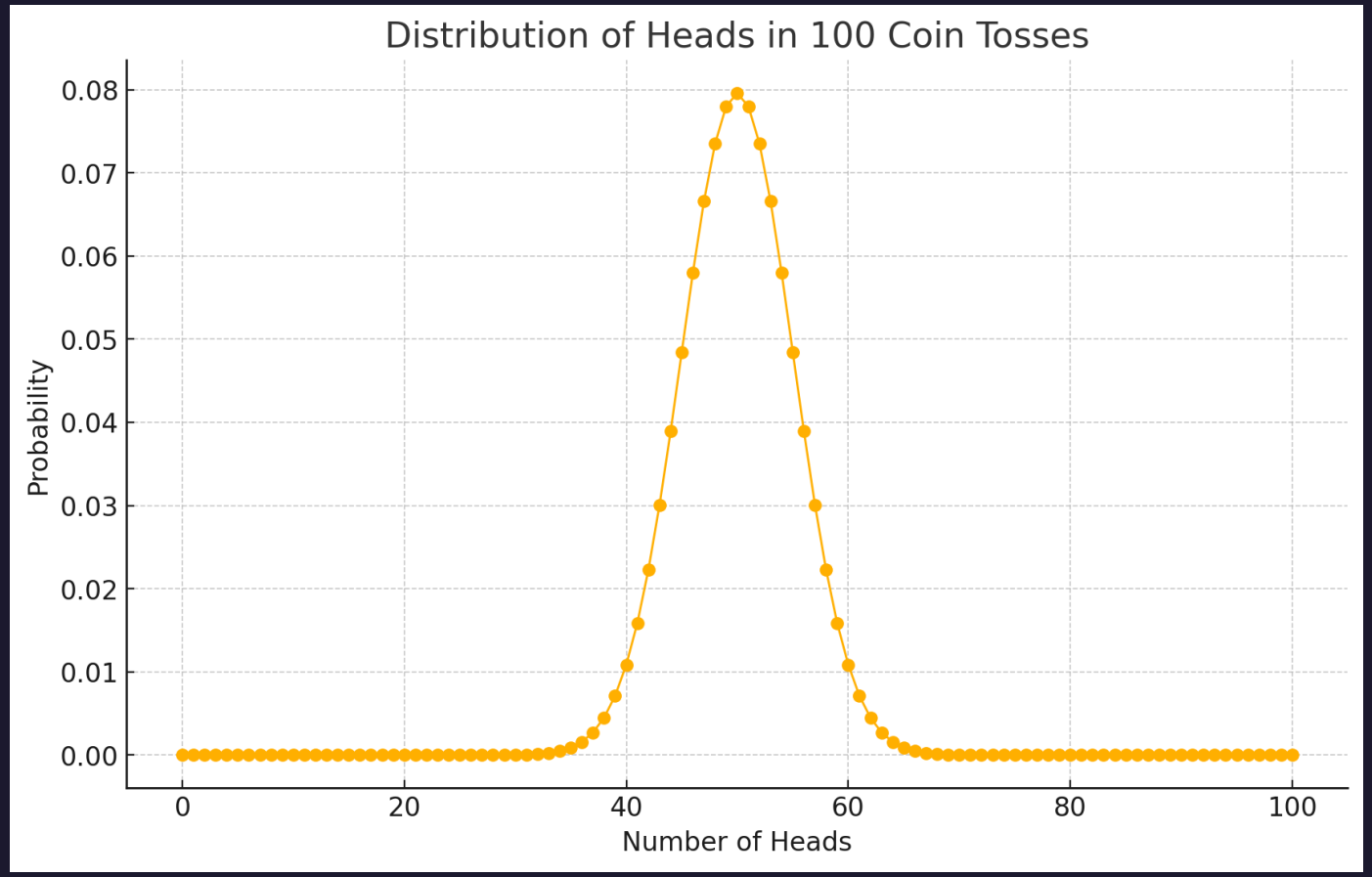
Statistics for Dummies

-COIN FLIP



Statistics for Dummies

-COIN FLIP



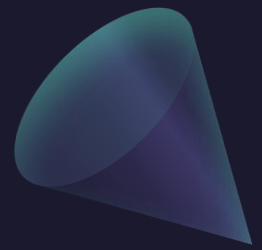
Real World Moves

-KEY TAKEAWAYS

- How would we be able to tell if a coin is “fixed” or not?
  - We can take a look at the statistical likelihood that the results are “random” or not.
- We can calculate the EV of a coin flip, or a trade, if we know the win rate. And we can know the win rate based on real world examples (for coins), or backtests (for market strategies).
- Once we have the real world examples, we can take a look at the odds that something happened, compared to how often it is *expected* to happen.

Real World Moves

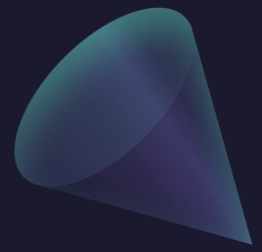
-HOW DOES THIS ACTUALLY HELP ME TRADE?



- The market itself is random. But it's not perfectly random. If it were perfectly random, you would be able to anticipate the outcome of a large number of stock moves. But if no one can predict the market, it's not entirely random.
- So we know there is something that can, possibly, be exploited.

Real World Moves

-HOW DOES THIS ACTUALLY HELP ME TRADE?



- The market itself gives you, every day, an anticipation of how far it thinks the market will move.
- An at the money put and call, added together, is the market's expected move (EM) by the expiration of the option.
- So if an option that expires at the end of the day has a put valued at $10 and a call valued at $11, the expected move is $21.

Real World Moves

-HOW DOES THIS ACTUALLY HELP ME TRADE?

- Not that the market *will* move $21 that day, but if the market is a voting machine, it's expected to move that much.
- If the current put and call are valued at $21, and someone thinks it will move more than that, they'll buy it. Which, in turn, will cause the price to go up (assuming more buyers than sellers). If someone thinks it will move less than that, they'll sell it. Which, in turn, will cause the price to go down (assuming more sellers than buyers).
- The current EM tells you what all the market participants have voted they think the market will move within that time period.

Real World Moves

-HOW DOES THIS ACTUALLY HELP ME TRADE?

- The same logic flows through the rest of the option chain.
- A 30Δ Put has a ~30% chance of expiring in the money (napkin math).
- I can apply the entire option chain to a chart, and it will give me a gaussian distribution, or a bell curve, of probabilities.
- The bell curve won't look exactly like the coin flip chart. Because the market goes up more often than it goes down, and when it goes down it goes down with much more force than when it goes up (historically). But it will still give you the same basic chart.

Real World Moves

-HOW DOES THIS ACTUALLY HELP ME TRADE?

- As a trader, I don't care if the market actually does or does not move as much as the EM. But as a trader, I want to see how often market participants are right.
- If an option is expected to land in the money 25% of the time, if it lands in the money only 20% of the time, there is an opportunity to sell that option and be right 5% more often than the market anticipates.
- If an option is expected to land in the money 25% of the time, if it lands in the money 30% of the time, there is an opportunity to buy that option and be right 5% more often than the market anticipates.

Real World Moves

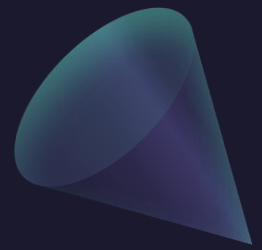
-HOW DOES THIS ACTUALLY HELP ME TRADE?

- The dirty secret is . . . Most traders are doing this already. They just don't know it.
- When you run a mechanical backtest, if it ends positively over sufficiently long periods of time, the trade is right more often than the probabilities indicated it should be (negating profit targets and stop losses).

Real World Moves - Expectations

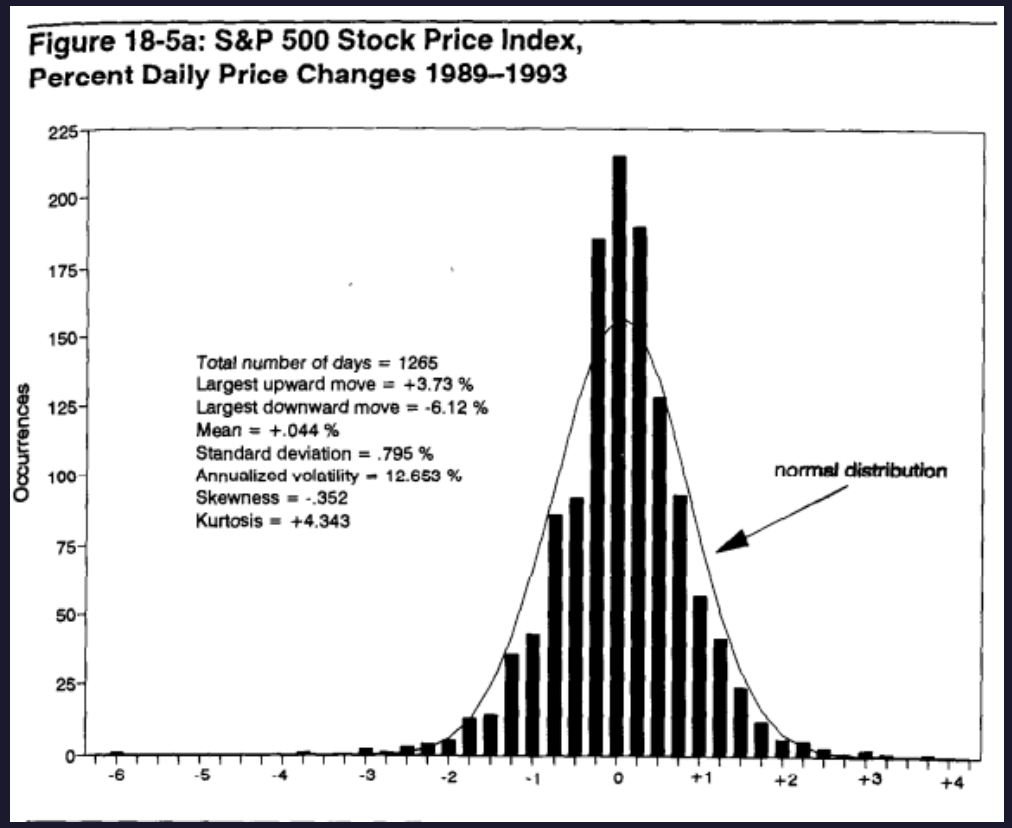
-HOW DOES THIS ACTUALLY HELP ME TRADE?

- But we can take this one step further, and back things out . . .



Real World Moves - Expectations

-SOURCE: OPTION VOLATILITY & PRICING BY SHELDON NATENBERG



Real World Moves - Results

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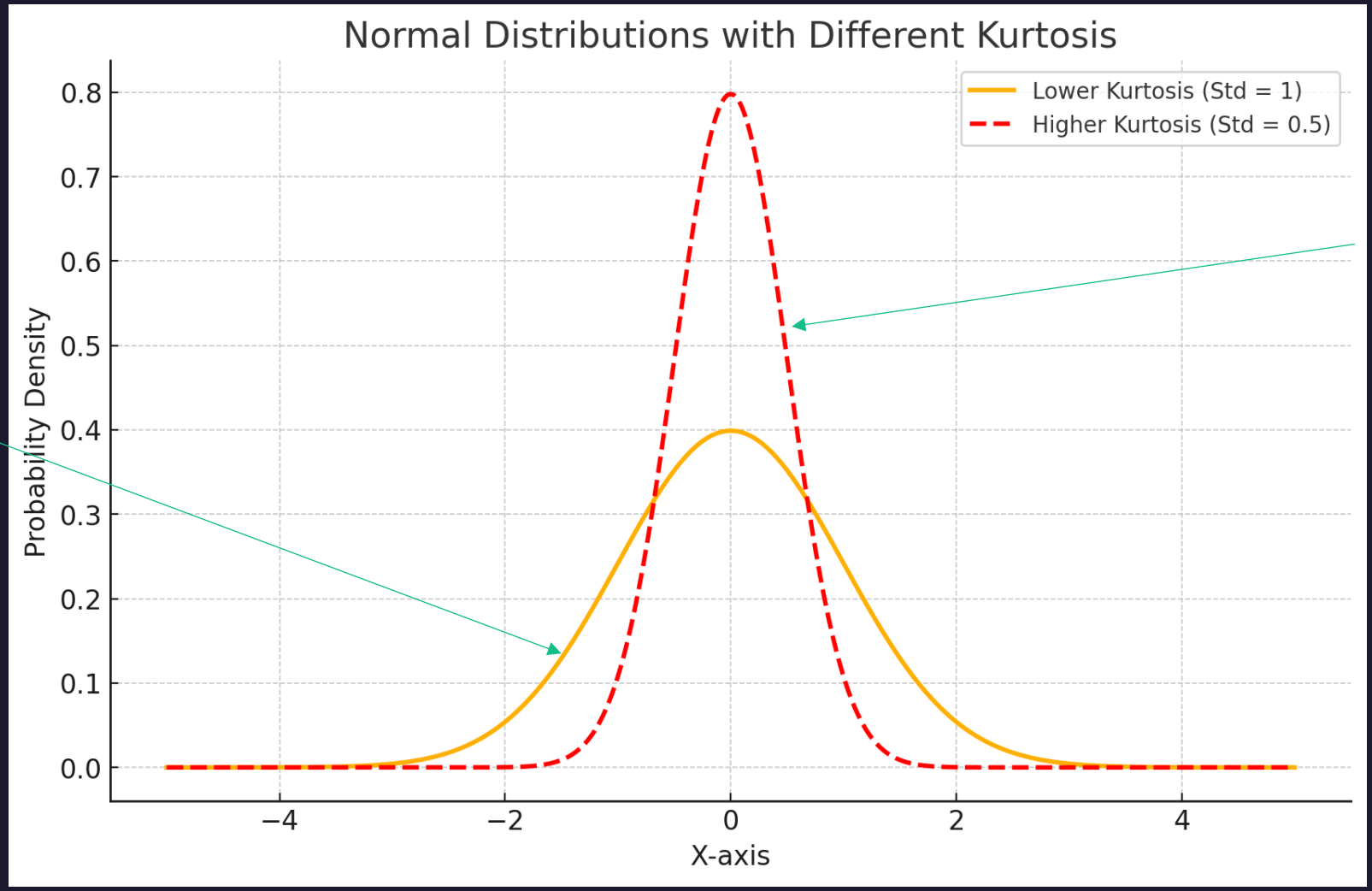
How the market *Thinks* it will move



How the market *actually* moves

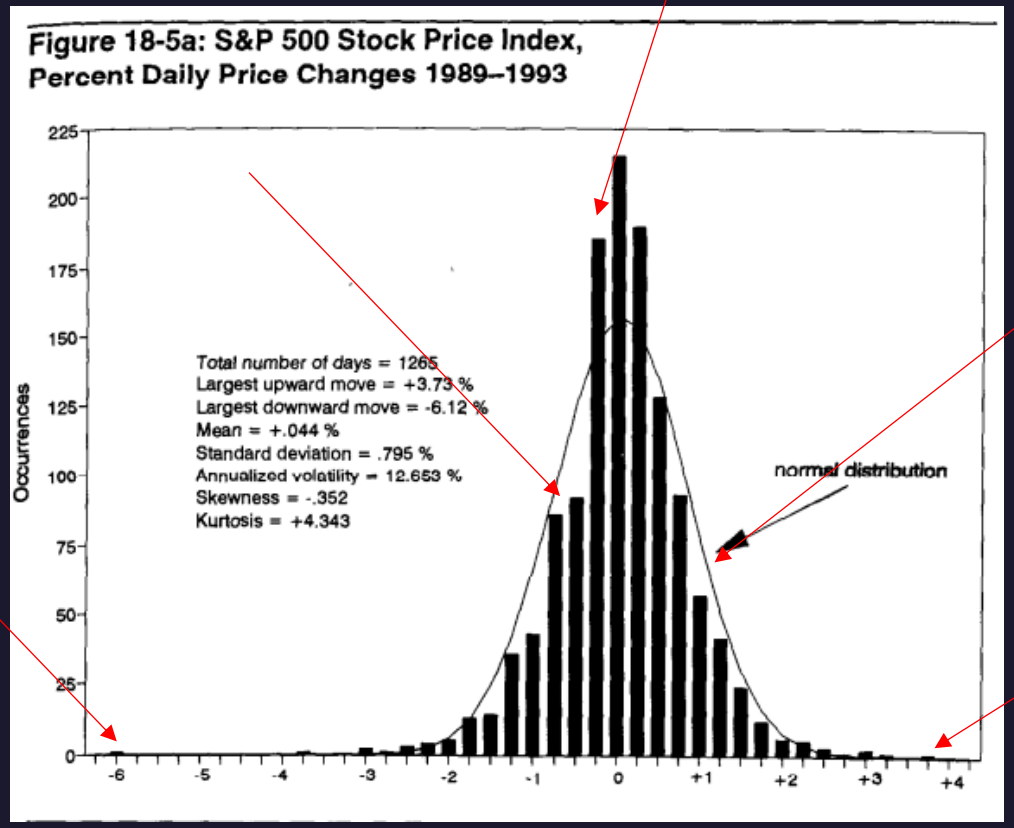
Real World Moves - Results

-HOW DOES THIS ACTUALLY HELP ME TRADE?

- The market has more small win and small loss days than the statistics indicate it should.
- The market has fewer moderate win days and loss days than the statistics indicate it should.
- The market has more large win and large loss days than the statistics indicate it should.

Real World Moves - Expectations

-SOURCE: OPTION VOLATILITY & PRICING BY SHELDON NATENBERG



Real World Moves - Expectations

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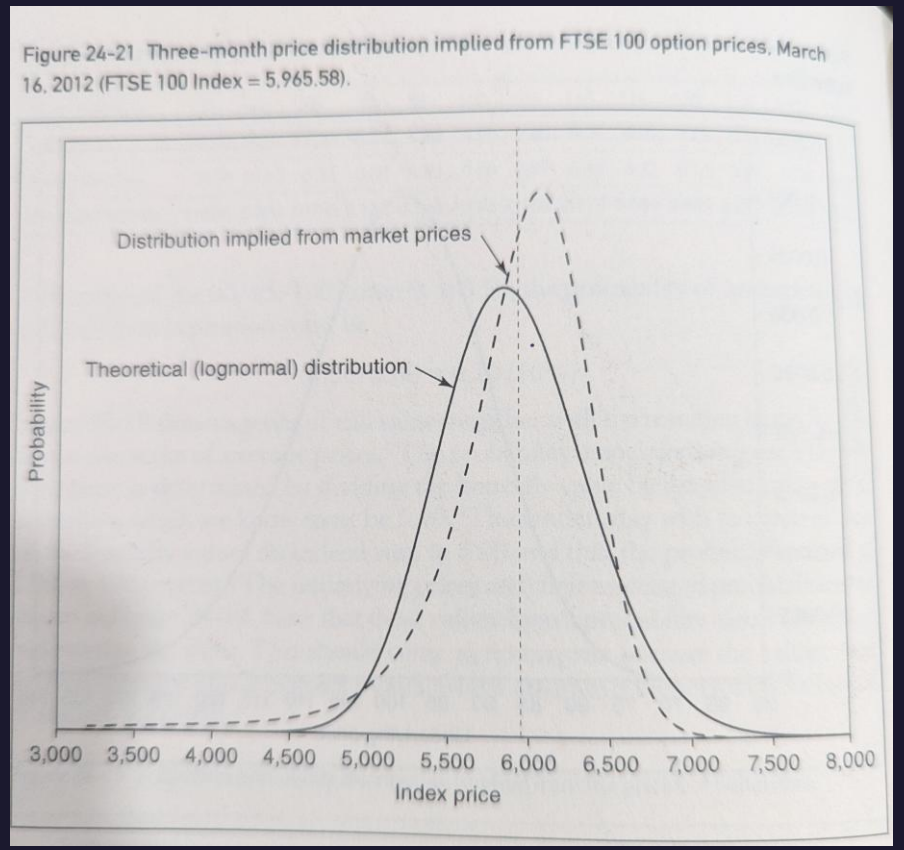
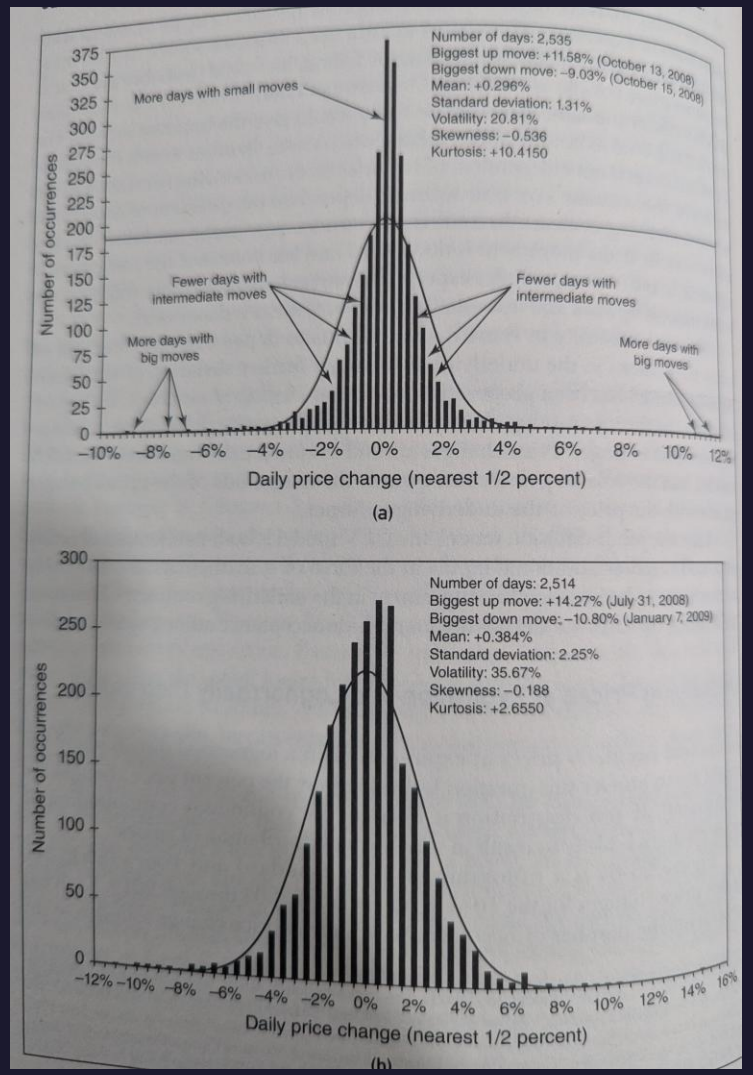




Top: S&P 500 January 2003 – December 2012
Bottom: Crude Oil

Real World Moves - Results

-DIRTY SECRET

- This isn't new information.
- It's been written about by a ton of people, most notably Natenberg and Mandlebrot.
- If you've done backtesting, you've seen it happening, although you may not have noticed it before.
    - If you ran a test on selling a 30 delta call, and saw it was profitable, then pushed it in and out up to 10 delta and 50 delta, and saw that it changed, you were observing the bell curve.

Real World Moves - Results

-DIRTY SECRET

- Buying ATM options are profitable, but provide a considerably wild ride and high volatility (with corresponding high drawdowns).
- Selling moderately OTM options are profitable, but can have instances and periods of time where it doesn't do as well.
- Buying deep OTM options are profitable, but the win rates are so low you can go years or decades without seeing a payout.

Real World Moves - Results

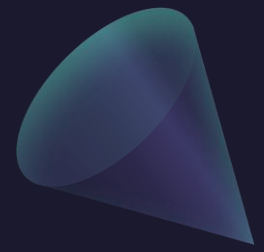
-DIRTY SECRET

- You can also combine various portions of these options to create combinations of strategies that take advantage of more than one of these characteristics.
- But . . . It's largely beyond the scope of this presentation.
- For more information, feel free to watch https://academy.optionomega.com/course/1dte-options-crashcourse or https://academy.optionomega.com/course/advanced-1dte-options-crash-course

Real World Moves

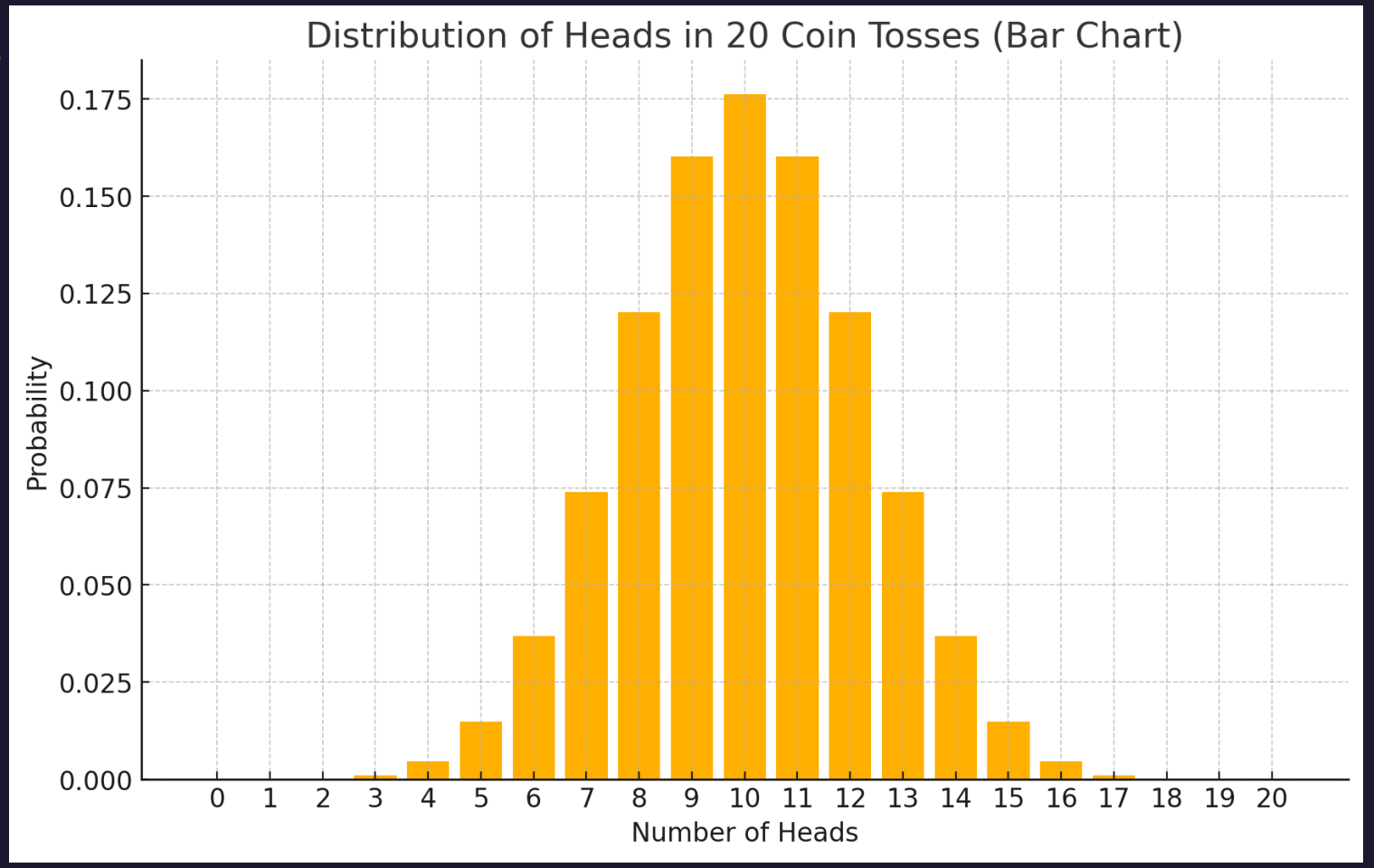
-KEY TAKEAWAYS

- Let's take it back to our probability curve.



Statistics for Dummies

-COIN FLIP



- 20 heads (0.000095%)
- 19 heads (0.00191%)

- 20 heads ~ 1 in 1 million
- 19 heads ~ 1 in 52,000
- 18 heads ~ 1 in 5,000

- August 1998 - DJA dropped 3 consecutive days. Odds were 1:20M
- 1997 DJA dropped 7.7%. Odds were 1:50M
- July 2022 3 out of 7 red days. Odds were 1:4T

Real World Moves

- If we have an operating strategy, and it's green (or red) in it's actual performance, how do you tell if the strategy is working like it's supposed to or not?
  - We can compare mechanical trades to backtests and see if it's performing like it "should."
  - If it matches up in performance, it doesn't mean the strategy is, or isn't, working though. lt just tells us there isn't a deviation between the live trading and the backtest.

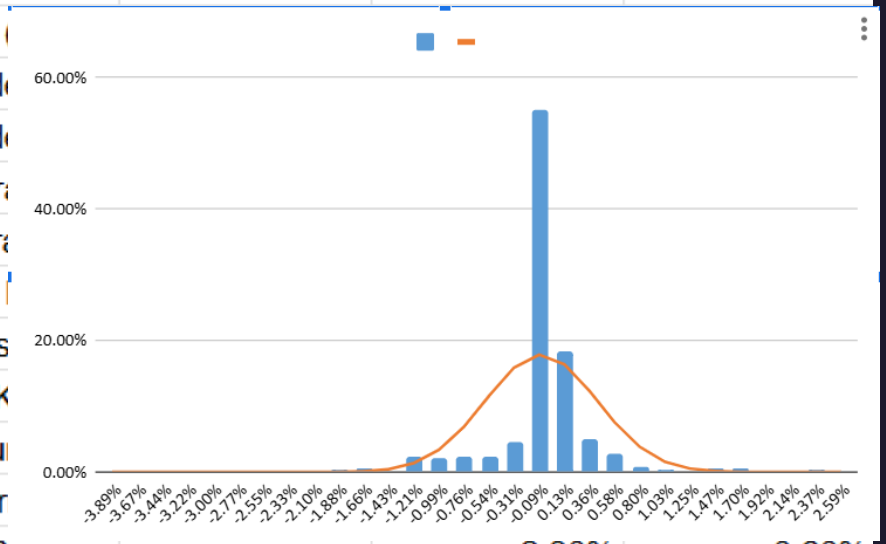
Real World Moves

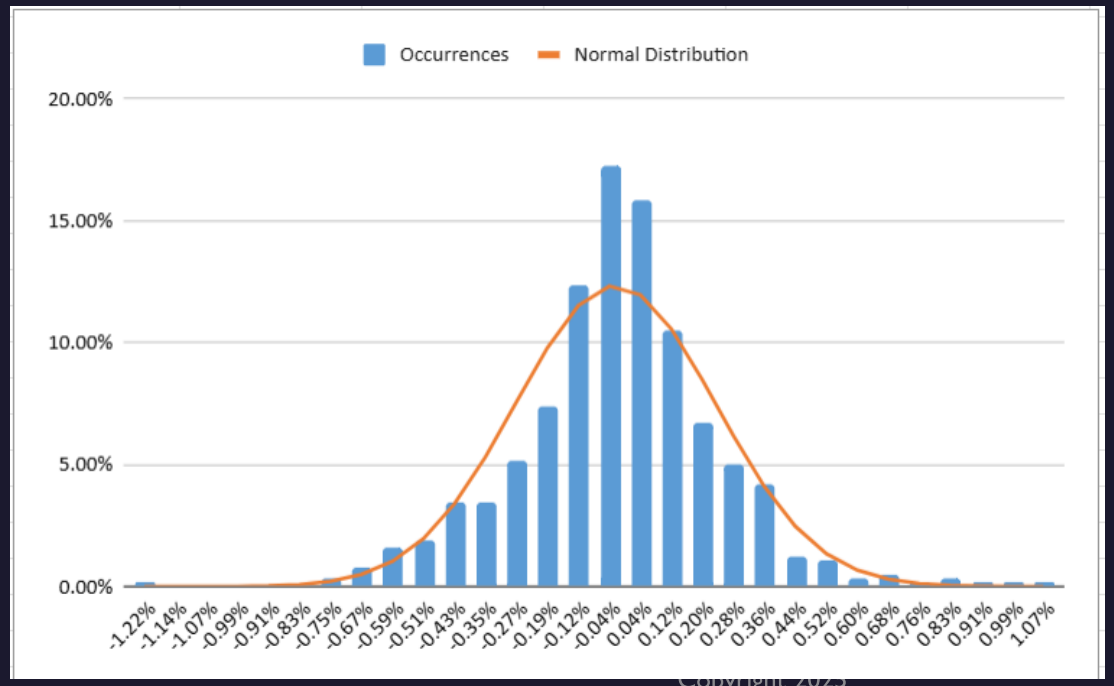
- If we have an operating strategy, and it's green (or red) in it's actual performance, how do you tell if the strategy is working like it's supposed to or not?
  - A massive green event doesn't mean the strategy is working like it should. You could be flipping 18 out of 20 heads, when you were planning on a normal distribution.
  - A massive red event doesn't mean the strategy isn't working like it should. You could be flipping 18 out of 20 tails, when you expected a normal distribution.
  - But both have an expectation of 1:5,000 events.

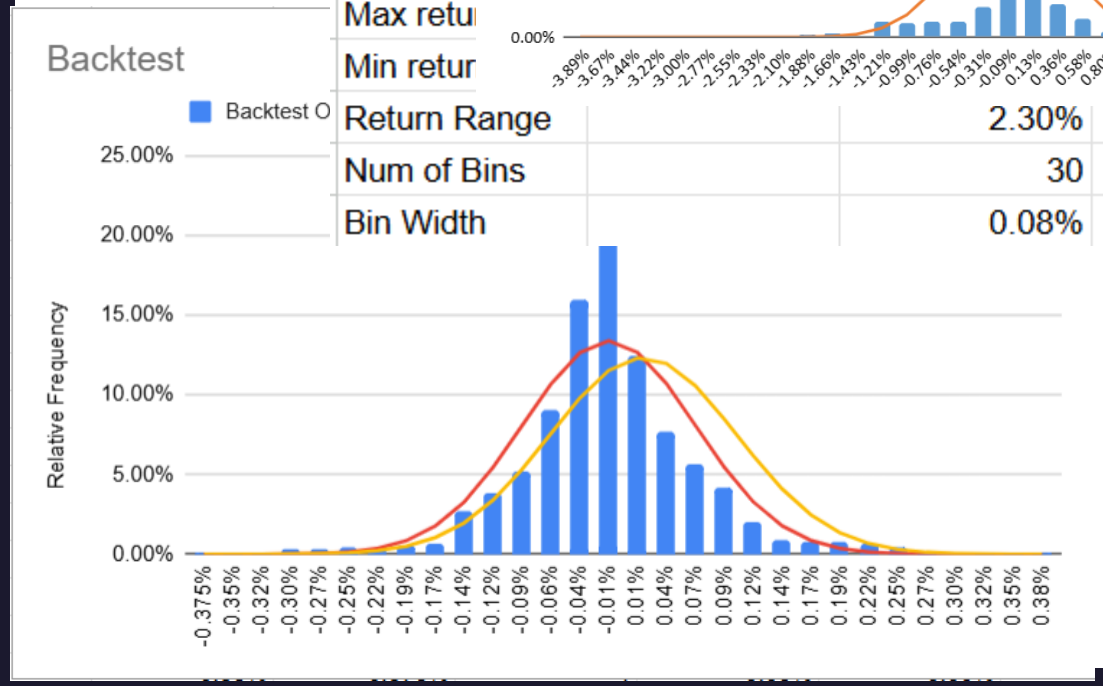
Real World Moves

- So what can we do to check the strategy?
  - Run a distribution chart, to see the skew and kurtosis of the strategy, an

	Odte	Backtest
Arithmetic mean (daily)	0.02%	0.00044%
Geometric mean (daily)	0.02%	0.00042%
Goemetric mean (annualized)	4.78%	0.10711%
Variance (daily)	0.00%	0.00%
Std Dev (daily)	0.25%	0.06%
Std Dev (		
Downside		
Downside		
Sharpe ra		
Sortino ra		
Value at		
Skewnes		
Excess K		
Max retu		
Min retur		
Return Range	2.30%	0.60%
Num of Bins	30	30
Bin Width	0.08%	0.02%







Real World Moves

- So what can we do to check the strategy?
  - You can also check the pvalues (statistical significance) of the strategy results

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	3/15/2024	Two Tailed	Days	254	P	61.0%		
End Date	3/15/2025		Daily Win %	61.0%	B	1.43	Daily Win	57.5%
Net Liq	$1,000,000		Return	94.75%	E	48.2%	Return	9.5%
[redacted]	0.10	0.1067	CAGR	95.1%	K	0.34	CAGR	9.5%
	0.10	0.2431	Max DD	-4.9%	Worst Daily %	-2.60%	Max DD	-10.1%
	0.11	0.9823	MAR Ratio	19.5			MAR Ratio	0.9
	3.00	0.0419	Sharpe	4.61			Sharpe	0.73
DCs	0.92	0.0135	Correlation	0.31				
[redacted]	0.70	0.6203	Beta	0.33				
	0.00		Volatility	14.58%				
	1.00	0.8375	p Value	0.000006				
	1.50	0.1923						
0dte	1.03	0.0005						
[redacted]	0.60	0.0016						
	0.50	0.0098						
	0.10	0.0512						

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	3/1/2025	Two Tailed	Days	9	P	44.4%		
End Date	3/15/2025		Daily Win %	44.4%	B	0.63	Daily Win	55.6%
Net Liq	$1,000,000		Return	-2.64%	E	-27.7%	Return	-2.4%
[redacted]	0.00		CAGR	-58.9%	K	-0.44	CAGR	-55.5%
	0.00		Max DD	-4.1%	Worst Daily %	-3.20%	Max DD	-5.5%
	0.11	0.1725	MAR Ratio	14.5			MAR Ratio	10.1
	3.00	0.3466	Sharpe	-3.46			Sharpe	-2.70
DCs	0.92	0.0762	Correlation	0.20				
[redacted]	0.70	0.2988	Beta	0.15				
	0.00		Volatility	19.89%				
	1.00	0.0130	p Value	0.531103				
	1.50	0.7790						
0dte	1.03	0.6045						
[redacted]	0.60	0.8233						
	0.50	0.2568						
	0.00							

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	3/15/2023	Two Tailed	Days	507	P	60.4%		
End Date	3/15/2025		Daily Win %	60.4%	B	1.53	Daily Win	56.8%
Net Liq	$1,000,000		Return	406.29%	E	52.4%	Return	42.4%
[redacted]	0.10	0.0577	CAGR	125.0%	K	0.34	CAGR	19.3%
	0.10	0.2196	Max DD	-5.8%	Worst Daily %	-3.36%	Max DD	-10.3%
	0.11	0.5462	MAR Ratio	21.4			MAR Ratio	1.9
	3.00	0.0005	Sharpe	4.77			Sharpe	1.45
DCs	0.92	0.0004	Correlation	0.46				
[redacted]	0.70	0.1129	Beta	0.62				
	0.00		Volatility	17.22%				
	1.00	0.1834	p Value	0.000000				
	1.50	0.0032						
0dte	1.03	0.0000						
[redacted]	0.60	0.0100						
	0.50	0.0000						
	0.10	0.0268						

Real World Moves

- So what can we do to check the strategy?
  - You can also check the pvalues (statistical significance) of t

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	1/1/2024	Two Tailed	Days	104	P	52.9%		
End Date	6/1/2024		Daily Win %	52.9%	B	1.21	Daily Win	55.8%
Net Liq	$650,000		Return	3.94%	E	17.1%	Return	12.2%
[redacted]	0.00	#DIV/0!	CAGR	9.9%	K	0.14	CAGR	32.2%
	0.00		Max DD	-1.8%	Worst Daily %	-0.60%	Max DD	-5.5%
	0.00		MAR Ratio	5.6			MAR Ratio	5.9
	0.00		Sharpe	1.96			Sharpe	2.53
DCs	0.00		Correlation	-0.21				
[redacted]	0.00		Beta	-0.09				
	0.00		Volatility	4.82%				
	0.00		p Value	0.211679				
	0.00							
0dte	1.03	0.2117						
[redacted]	0.00							
	0.00							
	0.00							

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	1/1/2024	Two Tailed	Days	41	P	48.8%		
End Date	3/1/2024		Daily Win %	48.8%	B	1.10	Daily Win	63.4%
Net Liq	$650,000		Return	0.18%	E	2.3%	Return	9.2%
[redacted]	0.00	#DIV/0!	CAGR	1.1%	K	0.02	CAGR	72.3%
	0.00		Max DD	-1.8%	Worst Daily %	-0.60%	Max DD	-1.7%
	0.00		MAR Ratio	0.7			MAR Ratio	43.3
	0.00		Sharpe	0.29			Sharpe	4.86
DCs	0.00		Correlation	-0.31				
[redacted]	0.00		Beta	-0.11				
	0.00		Volatility	4.16%				
	0.00		p Value	0.908189				
	0.00							
0dte	1.03	0.9082						
[redacted]	0.00							
	0.00							
	0.00							

Portfolio Setup		p Values	Portfolio		PBEK		SPX	
Start Date	6/1/2023	Two Tailed	Days	252	P	60.7%		
End Date	6/1/2024		Daily Win %	60.7%	B	1.01	Daily Win	56.0%
Net Liq	$650,000		Return	20.18%	E	21.8%	Return	23.2%
[redacted]	0.00	#DIV/0!	CAGR	20.2%	K	0.22	CAGR	23.2%
	0.00		Max DD	-4.2%	Worst Daily %	-1.41%	Max DD	-10.3%
	0.00		MAR Ratio	4.8			MAR Ratio	2.3
	0.00		Sharpe	2.69			Sharpe	1.90
DCs	0.95	0.0008	Correlation	-0.11				
[redacted]	0.00		Beta	-0.07				
	0.00		Volatility	6.91%				
	0.00		p Value	0.007641				
	0.00							
0dte	1.03	0.1339						
[redacted]	0.00							
	0.00							
	0.00							

Thank You