



IMPLIED VOLATILITY NEWBIE GUIDE

隐含波动率
新手指引



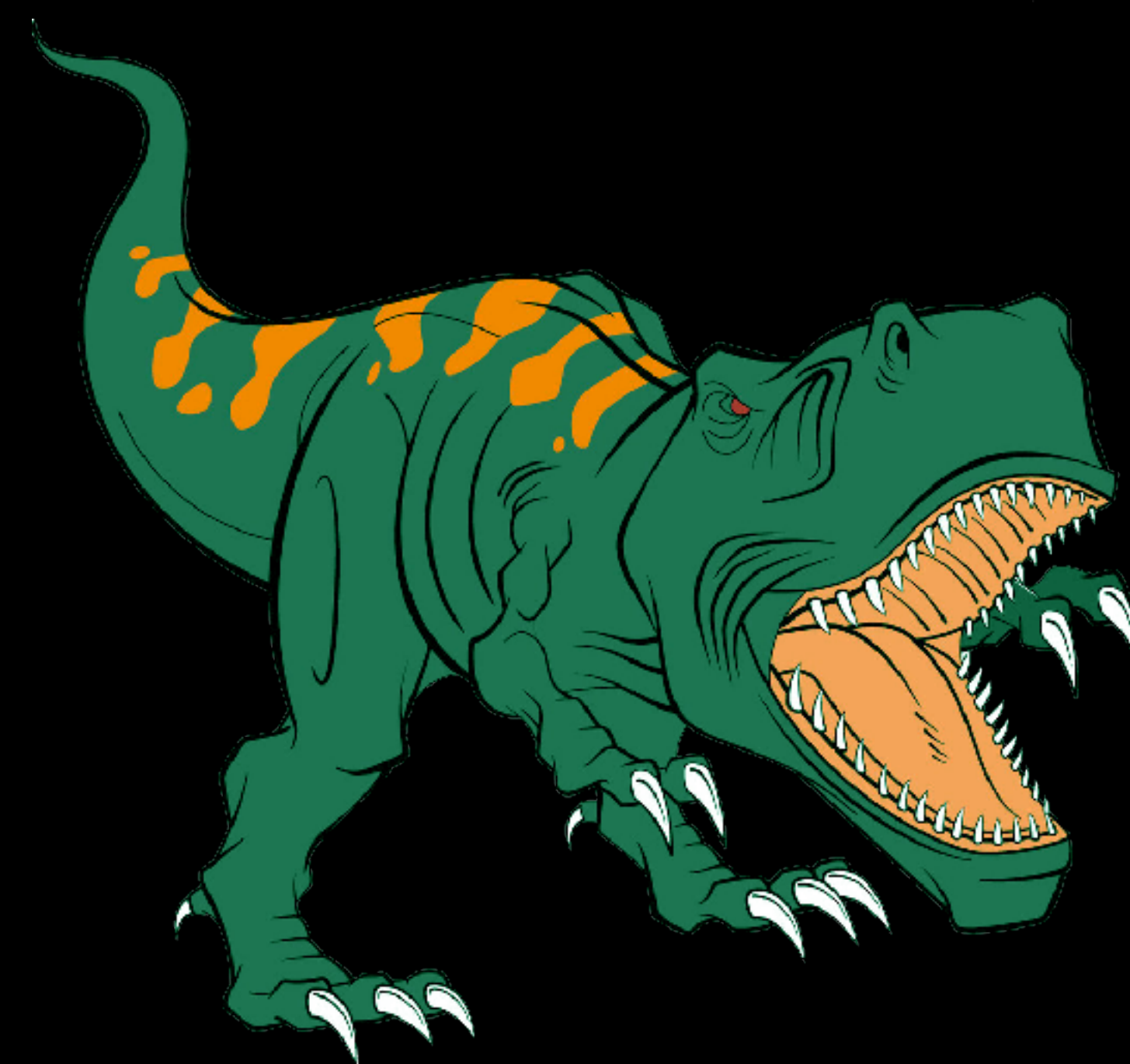
IMPLIED VOLATILITY NEWBIE GUIDE

隐含波动率 新手指引

2023
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版本

Let's Dive into Implied Volatility

- 没有理论照耀的实践是无效率的，没有实践反馈的理论苍白无力
- 期权市场的核心是什么？
- 这是新手指引，超越入门所需





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SIT-TIGHT 占用50分钟





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回到定价模型

- Chicken & Egg Problem

底层证券价格 = S

合约执行价 = X

合约到期日 = T

隐含波动率 = σ

无风险收益率 = R_f

现金股息率 = d

Why

Theo
Price

Real
Quote

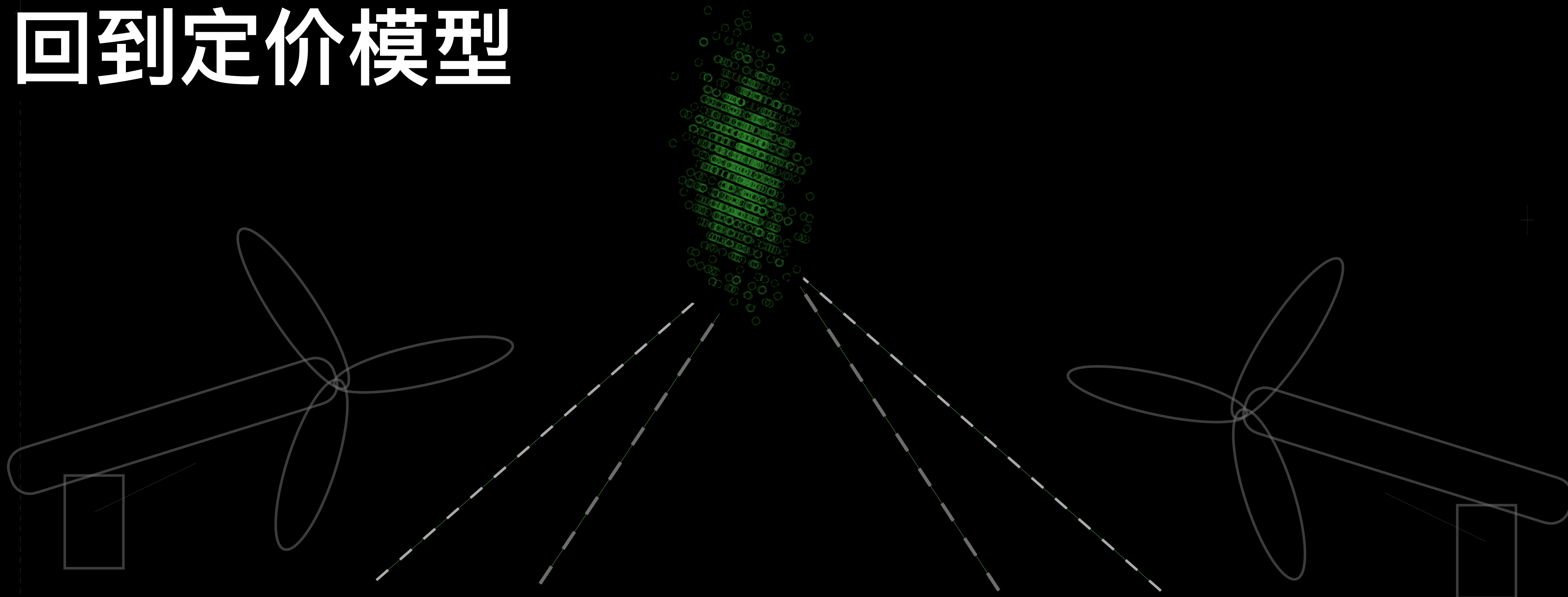


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File Account Help DATA @ IBKRPRO 19:58:52

New Window IBot Feedback FYI Aa Contact Us Help / Ticker Lookup 30.50 +0.51 (+1.70%)

MGM Calls and Puts 30.50 +0.51 (+1.70%)

Expand All LIST VIEW 10 STRIKES 3 MONTHS SMART MGM 100

CALLS										DESCRIPTION	PUTS												
OPTN ...	VOLUME	BID	ASK	MARK	TIME	VALUE (%)	DELTA	THETA	IV	CLOSE	STRIKE	IV	CLOSE	THETA	DELTA	TIME	VALUE (%)	MARK	BID	ASK	VOLUME	OPTN ...	
▼ SEP 30 '22 (3 DAYS)											IV: 61.7%												
♦ 2.14	2.43 ♦	2.20	0.19	(75.79%)	0.856	-0.069	177.434%	28	69.259%	-0.067	-0.144	0.20	(79.78%)	0.22	♦ 0.20	0.23 ♦							
		1.78						28.5						0.28									
♦ 1.39	1.47 ♦	1.41	0.44	(175.52%)	0.711	-0.097	62.743%	29	65.804%	-0.095	-0.289	0.41	(163.55%)	0.43	♦ 0.41	0.44 ♦							
♦ 1.04	1.22 ♦	1.08	0.59	(235.36%)	0.612	-0.106	64.924%	29.5	62.832%	-0.104	-0.388	0.57	(227.38%)	0.60	♦ 0.57	0.62 ♦							
♦ 0.78	0.84 ♦	0.81	0.78	(311.15%)	0.503	-0.109	62.832%	30	63.348%	-0.106	-0.498	0.74	(295.19%)	0.82	♦ 0.79	0.84 ♦							
♦ 0.55	0.59 ♦	0.57	0.55	(219.40%)	0.392	-0.103	62.725%	30.5	56.711%	-0.100	-0.609	0.52	(207.43%)	1.08	♦ 1.07	1.12 ♦							
♦ 0.38	0.40 ♦	0.39	0.38	(151.58%)	0.286	-0.090	65.211%	31	60.938%	-0.087	-0.715	0.34	(135.63%)	1.40	♦ 1.39	1.44 ♦							
♦ 0.25	0.29 ♦	0.27	0.25	(99.73%)	0.197	-0.072	60.099%	31.5	60.630%	-0.069	-0.804	0.10	(39.89%)	1.78	♦ 1.65	1.81 ♦							
♦ 0.16	0.19 ♦	0.17	0.16	(63.83%)	0.129	-0.054	59.757%	32	60.469%	-0.052	-0.872	0.00	(0.00%)	2.19	♦ 2.00	2.26 ♦							
♦ 0.10	0.12 ♦	0.11	0.10	(39.89%)	0.082	-0.040	60.289%	32.5	58.766%	-0.037	-0.919	0.00	(0.00%)	2.62	♦ 2.46	2.67 ♦							
▼ OCT 07 '22 (10 DAYS)											IV: 57.2%												
♦ 2.48	2.69 ♦	2.51	0.53	(63.43%)	0.759	-0.049	55.686%	28	62.008%	-0.047	-0.241	0.46	(55.05%)	0.49	♦ 0.46	0.52 ♦							
		2.14						28.5						0.62									
♦ 1.77	1.90 ♦	1.80	0.82	(98.13%)	0.648	-0.056		29	58.709%	-0.053	-0.352	0.75	(89.75%)	0.79	♦ 0.75	0.82 ♦							
♦ 1.46	1.59 ♦	1.48	1.01	(120.87%)	0.584	-0.057	59.350%	29.5	58.574%	-0.055	-0.417	0.92	(110.10%)	0.96	♦ 0.92	1.00 ♦							
♦ 1.19	1.25 ♦	1.21	1.19	(142.41%)	0.516	-0.058	58.698%	30	57.362%	-0.055	-0.485	1.11	(132.84%)	1.19	♦ 1.16	1.22 ♦							
♦ 0.95	1.00 ♦	0.98	0.95	(113.69%)	0.447	-0.056	57.692%	30.5	56.592%	-0.054	-0.554	0.88	(105.31%)	1.46	♦ 1.43	1.50 ♦							
♦ 0.74	0.83 ♦	0.79	0.74	(88.56%)	0.378	-0.053	56.175%	31	55.782%	-0.050	-0.624	0.64	(76.59%)	1.77	♦ 1.69	1.80 ♦							
♦ 0.57	0.64 ♦	0.61	0.57	(68.21%)	0.316	-0.050	55.731%	31.5	53.449%	-0.047	-0.685	0.42	(50.26%)	2.09	♦ 1.97	2.13 ♦							
♦ 0.43	0.51 ♦	0.47	0.43	(51.46%)	0.258	-0.044	54.752%	32	53.851%	-0.042	-0.744	0.38	(45.48%)	2.45	♦ 2.43	2.49 ♦							
♦ 0.32	0.38 ♦	0.35	0.32	(38.30%)	0.201	-0.038	54.397%	32.5	49.715%	-0.035	-0.801	0.08	(9.57%)	2.83	♦ 2.63	2.88 ♦							
▶ OCT 14 '22 (17 DAYS)											IV: 56.0%												



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2023
更新
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券商的“IV”读数不一致

- 使用的定价公式不同
- 同一类定价公式中的基础假设不同
-
- 相信你的数据，并持续一致使用

CALLS										PUTS										
OPTN	VOLUME	BID	ASK	MARK	TIME VALUE (%)	DELTA	THETA	IV	CLOSE	STRIKE	IV	CLOSE	THETA	DELTA	TIME VALUE (%)	MARK	BID	ASK	VOLUME	OPTN
										SEP 30 '22 (3 DAYS)										
		2.14	2.43	2.20	0.19 (75.79%)	0.856	-0.069	177.434%		28	69.259%	-0.067	-0.144	0.20 (79.78%)	0.22	0.20	0.23			
		1.39	1.47	1.41	0.44 (175.52%)	0.711	-0.097	62.743%		28.5										
		1.04	1.22	1.08	0.59 (235.36%)	0.612	-0.106	64.924%		29	65.804%	-0.095	-0.289	0.41 (163.55%)	0.43	0.41	0.44			
		0.78	0.84	0.81	0.78 (311.15%)	0.503	-0.109	62.832%		29.5	62.832%	-0.104	-0.388	0.57 (227.38%)	0.60	0.57	0.62			
		0.55	0.59	0.57	0.55 (219.40%)	0.392	-0.103	62.725%		30	63.348%	-0.106	-0.498	0.74 (295.19%)	0.82	0.79	0.84			
		0.38	0.40	0.39	0.38 (151.58%)	0.286	-0.090	65.211%		30.5	56.711%	-0.100	-0.609	0.52 (207.43%)	1.08	1.07	1.12			
		0.25	0.29	0.27	0.25 (99.73%)	0.197	-0.072	60.099%		31	60.938%	-0.087	-0.715	0.34 (135.63%)	1.40	1.39	1.44			
		0.16	0.19	0.17	0.16 (63.83%)	0.129	-0.054	59.757%		31.5	60.630%	-0.069	-0.804	0.10 (39.89%)	1.78	1.65	1.81			
		0.10	0.12	0.11	0.10 (39.89%)	0.082	-0.040	60.289%		32	60.469%	-0.052	-0.872	0.00 (0.00%)	2.19	2.00	2.26			
										32.5	58.766%	-0.037	-0.919	0.00 (0.00%)	2.62	2.46	2.67			
										OCT 07 '22 (10 DAYS)										
		2.48	2.69	2.51	0.53 (63.43%)	0.759	-0.049	55.686%		28	62.008%	-0.047	-0.241	0.46 (55.05%)	0.49	0.46	0.52			
		1.77	1.90	1.80	0.82 (98.13%)	0.648	-0.056			28.5										
		1.46	1.59	1.48	1.01 (120.87%)	0.584	-0.057	59.350%		29	58.709%	-0.053	-0.352	0.75 (89.75%)	0.79	0.75	0.82			
		1.19	1.25	1.21	1.19 (142.41%)	0.516	-0.058	58.698%		29.5	58.574%	-0.055	-0.417	0.92 (110.10%)	0.96	0.92	1.00			
		0.95	1.00	0.98	0.95 (113.69%)	0.447	-0.056	57.692%		30	57.362%	-0.055	-0.485	1.11 (132.84%)	1.19	1.16	1.22			
		0.74	0.83	0.79	0.74 (88.56%)	0.378	-0.053	56.175%		30.5	56.592%	-0.054	-0.554	0.88 (105.31%)	1.46	1.43	1.50			
		0.57	0.64	0.61	0.57 (68.21%)	0.316	-0.050	55.731%		31	55.782%	-0.050	-0.624	0.64 (76.59%)	1.77	1.69	1.80			
		0.43	0.51	0.47	0.43 (51.46%)	0.258	-0.044	54.752%		31.5	53.449%	-0.047	-0.685	0.42 (50.26%)	2.09	1.97	2.13			
		0.32	0.38	0.35	0.32 (38.30%)	0.201	-0.038	54.397%		32	53.851%	-0.042	-0.744	0.38 (45.48%)	2.45	2.43	2.49			
										32.5	49.715%	-0.035	-0.801	0.08 (9.57%)	2.83	2.63	2.88			
										OCT 14 '22 (17 DAYS)										



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2023
更新
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MGM +

Quote Panel

Financial Instrument	Bid Size	Bid	Ask	Ask Size	Last	Position
MGM	2	30.54	30.58	19	30.48	

Statistics

Financial Instrument	Opt. Volume	Pt/CII Vlm	Opt. Vlm Chn...	Hst. VI. Cls %	IV Last	IV Change	Pt/CII Intrst	IV Close	Hist. Vol. %	Hst. VI. Chng	52 Wk IV Prc...
MGM	0	0.00	0.000%	41.187%	54.8%	-0.079	1.33	54.830%	40.848%	-0.339	88%

Buttons

Add Underlying Preview Order/Check Margin Impact Close Position Reverse Position View Account

Trading

Orders Log Trades Portfolio Strategy Builder

Fnncl Instrmnt	Bid	Ask	Action	Quantity	Time in Force	Type	Lmt Price	Status	Volatility Cntn...	Vol Type	Rfrnc Px...	Hdg Ord...	Hdg Au...	Undrlyn...	Undrlyn...
Option Chains															

Expand All LIST VIEW 4 STRIKES 3 MONTHS SMART MGM 100 Load My Chains Clear Chains

CALLS							DESCRIPTION	PUTS						
BID x ASK	VOLUME	OPTN ...	DELTA	GAMMA	VEGA	THETA	STRIKE	BID x ASK	VOLUME	OPTN ...	DELTA	GAMMA	VEGA	THETA
							SEP 30 '22 (3 DAYS)	IV: 61.7%						
1.04 x 1.22			0.612	0.211	0.011	-0.106	29.5	0.57 x 0.62			-0.388	0.211	0.011	-0.104
0.78 x 0.84			0.503	0.225	0.011	-0.108	30	0.79 x 0.84			-0.498	0.225	0.011	-0.106
0.55 x 0.59			0.392	0.219	0.011	-0.102	30.5	1.07 x 1.12			-0.609	0.219	0.011	-0.100
0.38 x 0.40			0.286	0.198	0.010	-0.090	31	1.39 x 1.44			-0.714	0.198	0.010	-0.087
							OCT 07 '22 (10 DAYS)	IV: 57.2%						
1.46 x 1.59			0.584	0.132	0.020	-0.057	29.5	0.92 x 1.00			-0.417	0.133	0.020	-0.055
1.19 x 1.25			0.516	0.138	0.020	-0.058	30	1.16 x 1.22			-0.485	0.139	0.020	-0.055
0.95 x 1.00			0.447	0.139	0.020	-0.056	30.5	1.43 x 1.50			-0.554	0.140	0.020	-0.054
0.74 x 0.83			0.378	0.136	0.020	-0.053	31	1.69 x 1.80			-0.623	0.136	0.020	-0.050

三个层面 IV 读数

- 执行价层面- Plugged from pricing model
- 到期日层面 - Weighting Strike Level Reading
- 股票层面 - Weighting Strike and Expiration Level Reading



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2023
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股票的隐含波动率是高/低

- $\$ABC$ DTE30 IV = 35%, $\$XYZ$ DTE30 IV = 65%
- 金融市场，更有意义的是与“自己”对比



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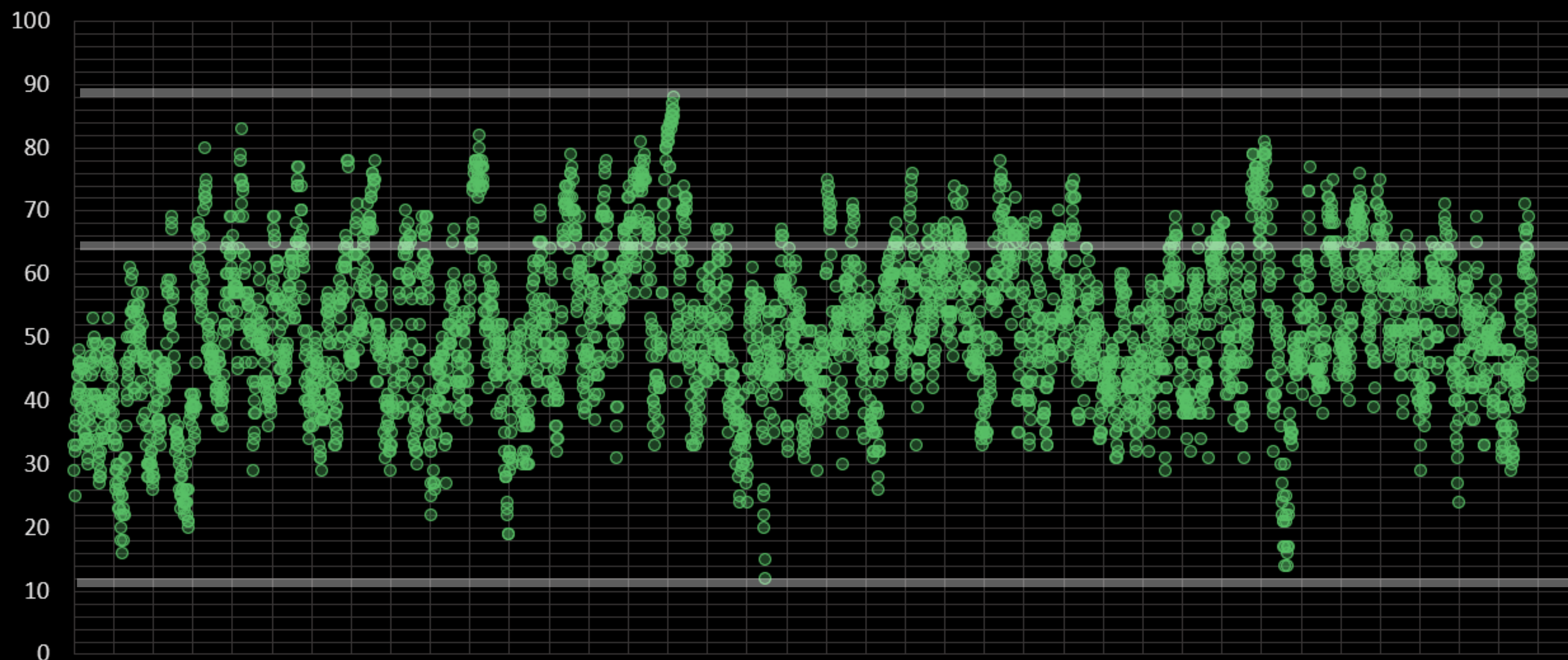
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通用思维 - 线性市场例子

- RSI = 65
- RSI Rank = $(65 - 10) / (90 - 10) = 68.8\%$

\$MGM - myRSI Scatter Plot





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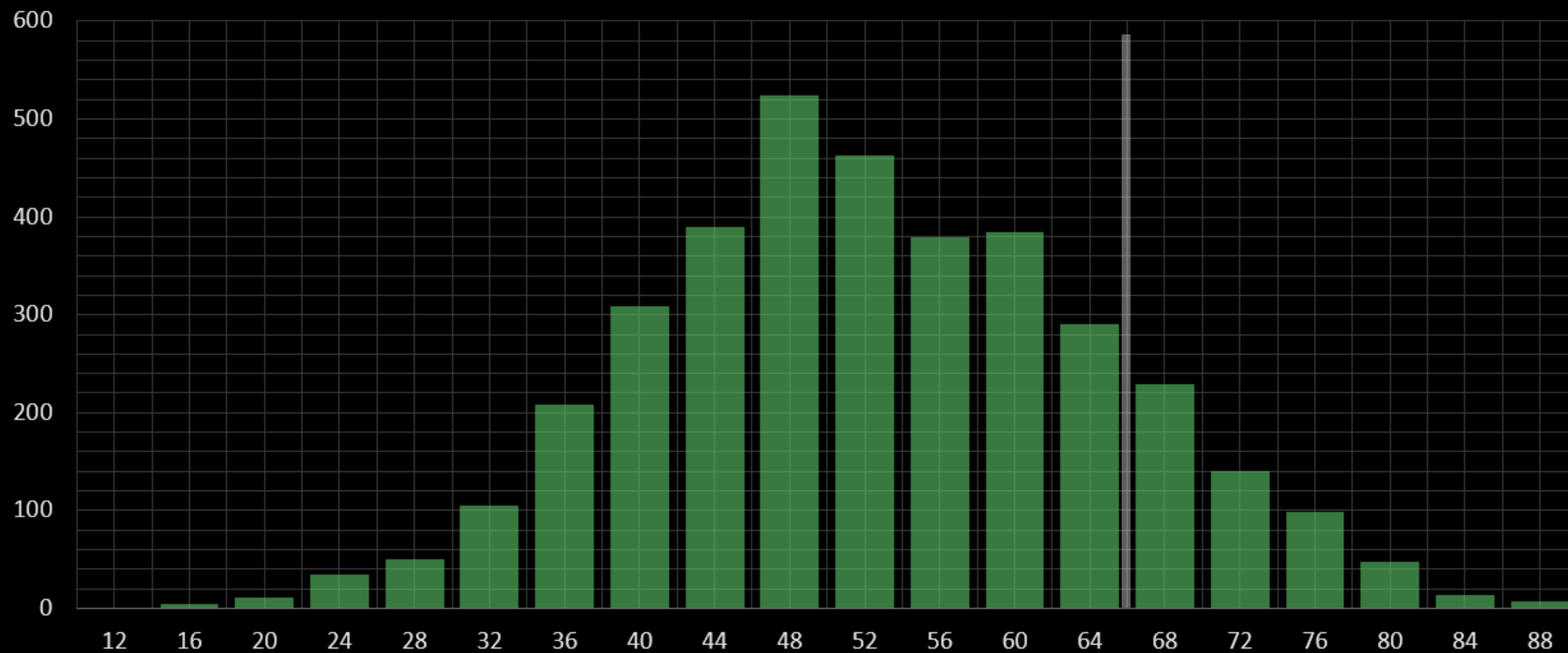
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通用思维 - 线性市场例子

- RSI = 65
- RSI Percentile = 91%

\$MGM - myRSI Histogram





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运用到隐含波动率

- **\$ABC DTE30 IV = 35%, \$XYZ DTE30 IV = 65%**
- **IV Rank / IV Percentile**——太阳底下没有新鲜事
- **检查你的券商 - Deal Breaker**
 - 是否可以展示 / 筛选 IV 的相对读数
 - 是否可以展示 Ticker Level 盈亏图
 - 是否可以展示 Portfolio Level 盈亏图
 - 是否有关于 Implied Volatility 的其他类型图表



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2023
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隐含波动率 = 未来波幅

MGM Calls and Puts 30.62 +0.63 (+2.10%)

EM = STK * IV * sqrt (DTE / 365)

Expand All LIST VIEW 10 STRIKES 3 MONTHS SMART MGM 100

CALLS										DESCRIPTION	PUTS											
OPTN ...	VOLUME	BID	ASK	MARK	TIME	VALUE (%)	DELTA	THETA	IV	CLOSE	STRIKE	IV	CLOSE	THETA	DELTA	TIME	VALUE (%)	MARK	BID	ASK	VOLUME	OPTN ...
											▶ SEP 30 '22 (3 DAYS)											
											▶ OCT 07 '22 (10 DAYS)											
											▶ OCT 14 '22 (17 DAYS)											
											▼ OCT 21 '22 (24 DAYS)											
♦ 2.90	3.05 ♦	2.97	0.95	(47.18%)	0.706	-0.033	57.898%	28	57.739%	-0.031	-0.295	0.89	(44.20%)	0.91	♦ 0.89	0.93 ♦						
♦ 2.26	2.42 ♦	2.32	1.31	(65.07%)	0.622	-0.035	53.258%	29	54.588%	-0.033	-0.379	1.23	(61.09%)	1.26	♦ 1.23	1.29 ♦						
♦ 1.97	2.08 ♦	2.03	1.52	(75.50%)	0.576	-0.036	54.790%	29.5	55.328%	-0.033	-0.425	1.44	(71.52%)	1.47	♦ 1.44	1.50 ♦						
♦ 1.71	1.81 ♦	1.76	1.71	(84.93%)	0.529	-0.036	54.963%	30	54.023%	-0.034	-0.472	1.63	(80.96%)	1.70	♦ 1.68	1.72 ♦						
♦ 1.46	1.56 ♦	1.51	1.46	(72.52%)	0.482	-0.035	54.125%	30.5	53.930%	-0.033	-0.520	1.38	(68.54%)	1.95	♦ 1.93	1.97 ♦						
♦ 1.24	1.32 ♦	1.28	1.24	(61.59%)	0.434	-0.034	53.622%	31	53.236%	-0.032	-0.568	1.14	(56.62%)	2.22	♦ 2.19	2.26 ♦						
♦ 1.05	1.13 ♦	1.09	1.05	(52.15%)	0.386	-0.033	53.039%	31.5	52.490%	-0.030	-0.617	0.96	(47.68%)	2.53	♦ 2.51	2.57 ♦						
♦ 0.90	0.94 ♦	0.92	0.90	(44.70%)	0.342	-0.031	52.555%	32	52.063%	-0.029	-0.660	0.74	(36.75%)	2.86	♦ 2.79	2.89 ♦						
♦ 0.72	0.79 ♦	0.75	0.72	(35.76%)	0.299	-0.030	51.813%	32.5	49.647%	-0.027	-0.704	0.60	(29.80%)	3.20	♦ 3.15	3.25 ♦						
♦ 0.59	0.64 ♦	0.62	0.59	(29.30%)	0.257	-0.027	53.939%	33	50.421%	-0.024	-0.747	0.45	(22.35%)	3.56	♦ 3.50	3.65 ♦						
											▶ OCT 28 '22 (31 DAYS)											
											▶ NOV 04 '22 (38 DAYS)											
											▶ NOV 18 '22 (52 DAYS)											
											▶ DEC 16 '22 (80 DAYS)											

- Price * Std
- Price * N * Std
- Duration Adjustment
- Price Range = STK +/- EM
- 思考：使用哪一个 IV？
>>> 定价原理 / 统计原理
- 拓展1：期权定价中的平方根
- 拓展2：置信区间 >>> N



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Expected Move Calculator				
Stock Price	30.62	Standard Deviation		
Implied Volatility (Ann.)	54.50%	1	2	3
Contract DTE	24	68.2%	95.4%	99.7%
Expected Move		4.28	8.56	12.84
	Upper	34.90	39.18	12.84
	Lower	26.34	22.06	- 12.84



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Articles **Free Resource** School

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Free Tutorial File [Vol.3]

Heikin Ashi 图表是否具有市场优势

[YouTube](#) [Excel](#) [PDF](#)

计划之外, 情理之中, "夺命"期权卖水 (It is okay for Option Selling)

[YouTube](#) [PDF](#)

错误的交易认知, 无尽的深渊

[YouTube](#) [PDF](#)

夏季市场, 投资者是走是留 (Lazy Summer Drowsy Trader)

[YouTube](#) [PDF](#)

关于 VIX Index 的一些基础数据

[YouTube](#) [PDF](#)

Excel 会放在这里

Listen to Free Tutorial Audio [Vol.3]



- ▶ 1 PowerUpGammas-Heikin Ashi 图表是否具有市场优势 15:47
- ▶ 2 PowerUpGammas-计划之外, 情理之中, "夺命"期权卖水 (It is okay for Op... 11:27
- ▶ 3 PowerUpGammas-错误的交易认知, 无尽的深渊 17:34
- ▶ 4 PowerUpGammas-夏季市场, 投资者是走是留 (Lazy Summer Drowsy Tra... 11:26
- ▶ 5 PowerUpGammas-关于 VIX Index 的一些基础数据 6:33
- ▶ 6 PowerUpGammas-带期权交易者重新认识 \$GLD-作为资产组合对冲背后的... 14:40

eBook

Free Tutorial [Vol.2]

Free Tutorial [Vol.3]



IMPLIED VOLATILITY NEWBIE GUIDE

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2023
更新
版本



- 思考：哪个相对“准确”
- IV 就是期权的价格：
e.g, IV = 0 or 100%

STK = 30.62								
IV (Ann.)	61.70%	57.20%	56.00%	54.50%	54.80%	56.50%	54.90%	52.40%
DTE	3	10	17	24	31	38	52	80
Expected Move	1.71	2.90	3.70	4.28	4.89	5.58	6.35	7.51
Upper	32.33	33.52	34.32	34.90	35.51	36.20	36.97	38.13
Lower	28.91	27.72	26.92	26.34	25.73	25.04	24.27	23.11

59.529%
55.561%
51.592%
47.624%
43.655%
39.686%



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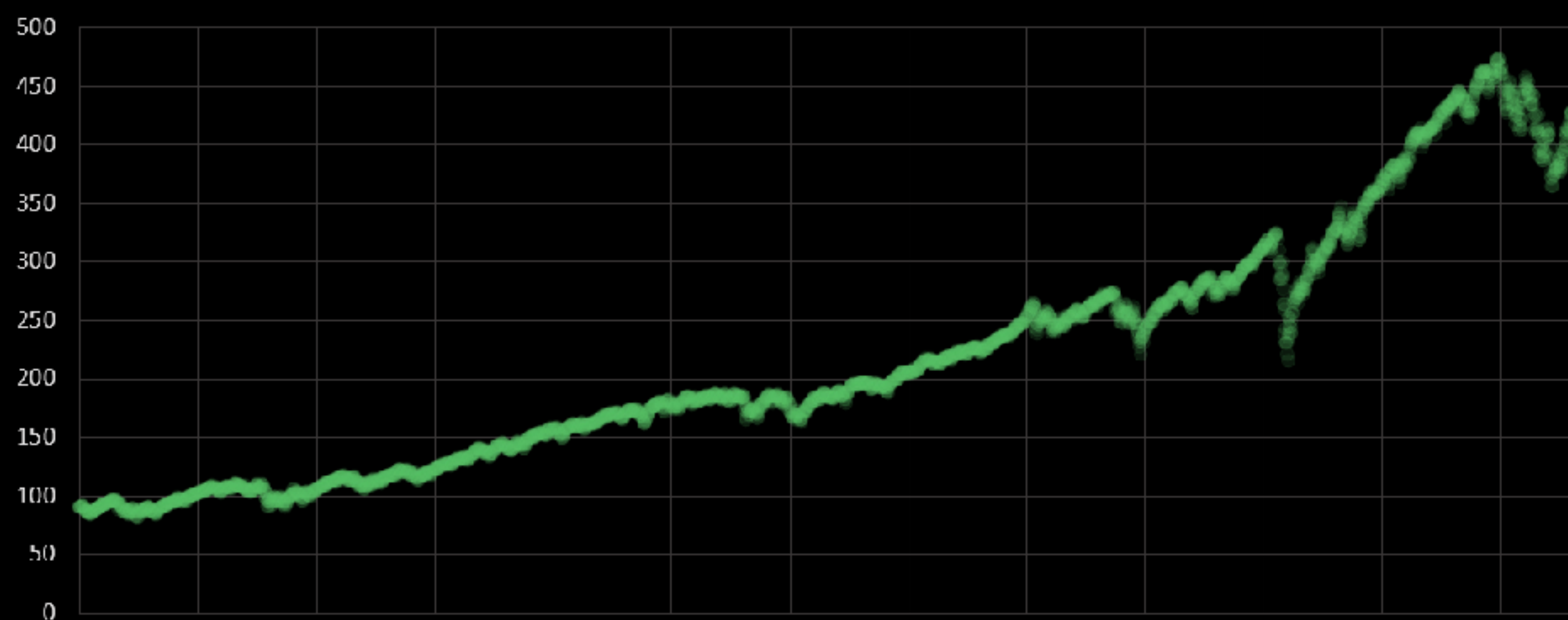
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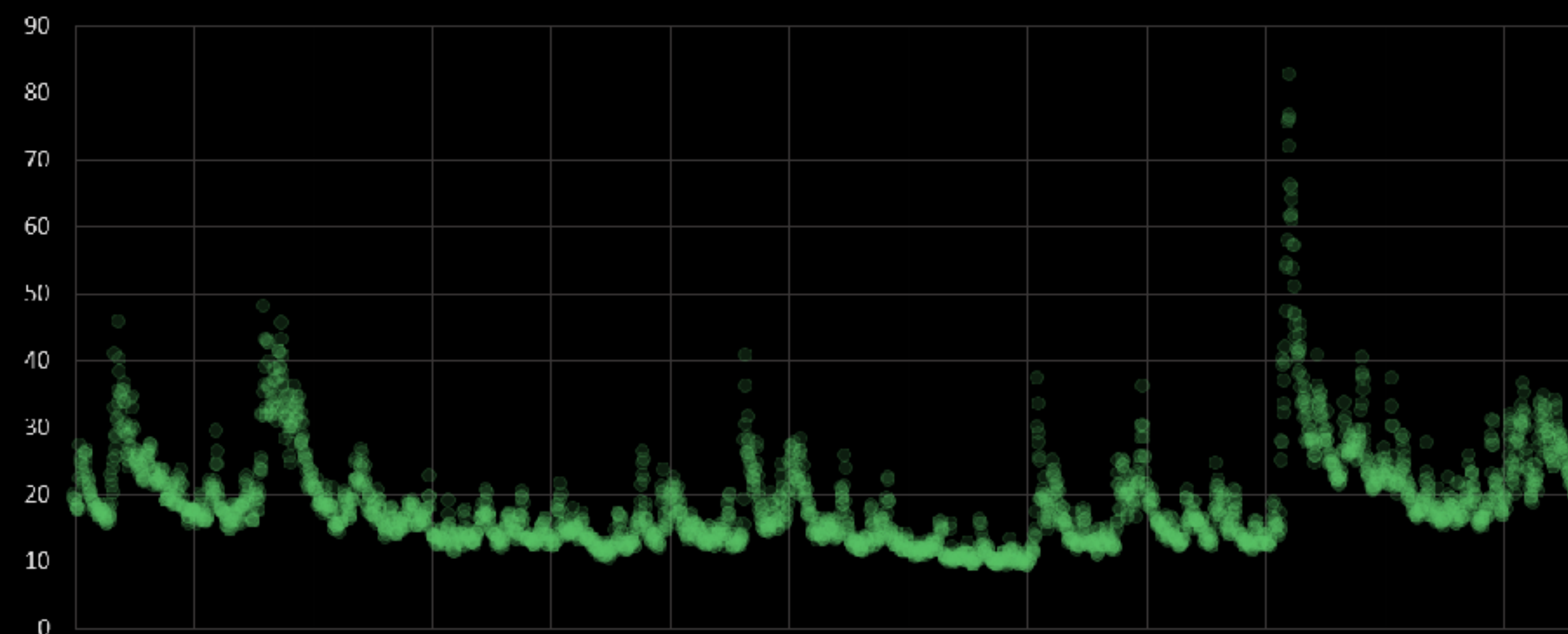
隐含波动率价格特性

- 线性市场中，股价存在均值回归现象

\$SPY Reading (2010 ~ 2022)



\$VIX Reading (2010 ~ 2022)





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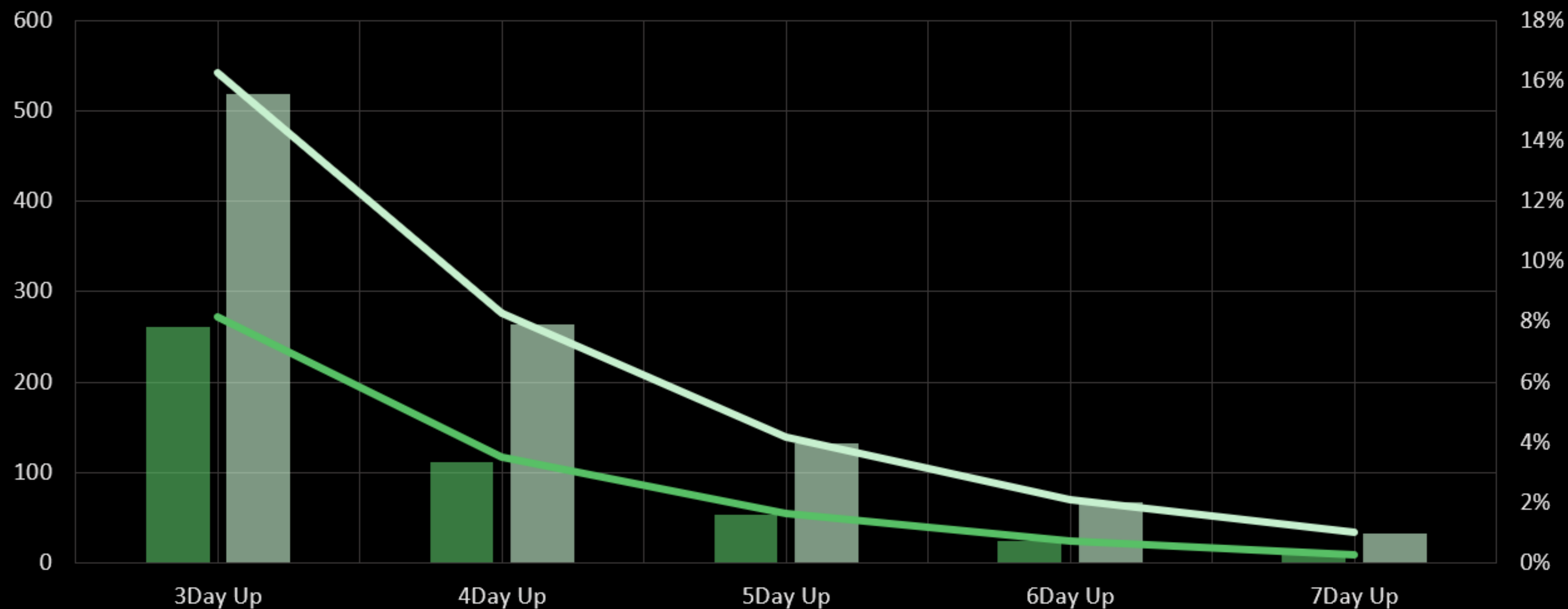
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隐含波动率价格特性

\$VIX vs. \$SPY Mean Reversion

VIX Count SPY Count VIX PCT SPY PCT





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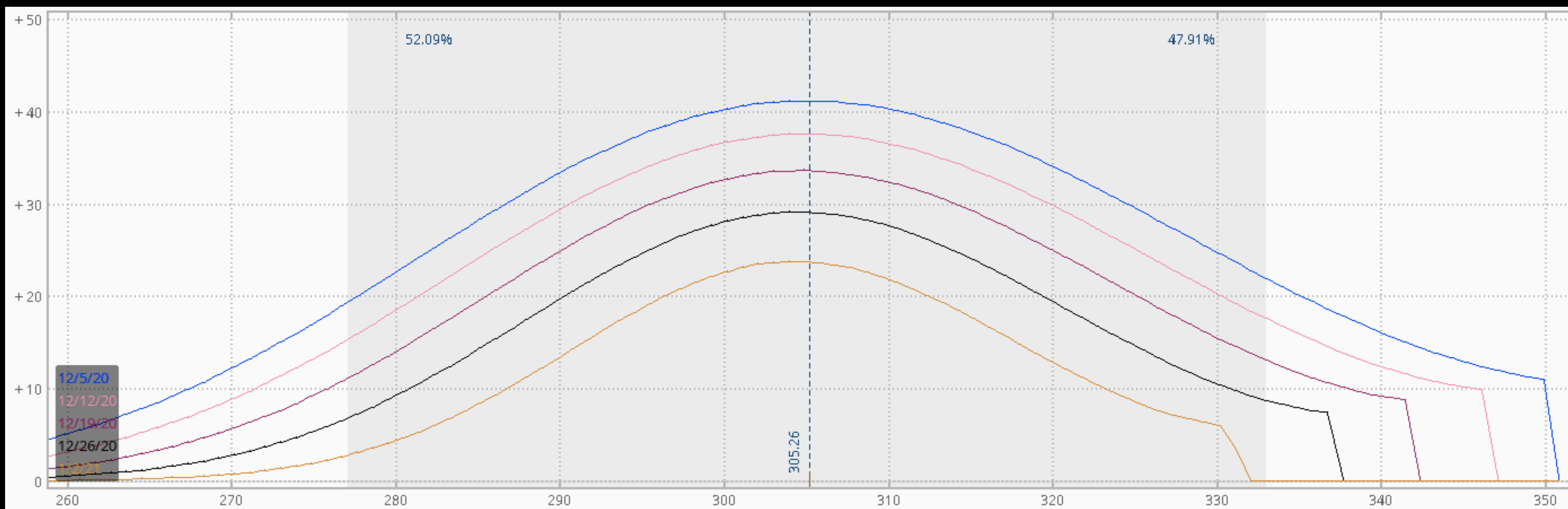
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隐含波动率高低何用

- 从 Vega 角度理解策略特性

- 思考：当隐含波动率较高的时候，不同的策略有什么回报特点

- 线性市场中，股价存在均值回归现象
- 期权市场中，隐含波动率均值回归特性更加明显
 - Linear Market: Buy dip, sell rally
 - Option Market: Buy (IV) dip, sell (IV) rally





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金科玉律——隐含波动率低买高卖？

- 与其听别人说，不如自己去算一算
 - 逻辑思辨对市场实践有帮巨大帮助
 - 利用数据辅助思考将如虎添翼
- 在不同 IVP 情况下使用 Option Selling 策略有何区别

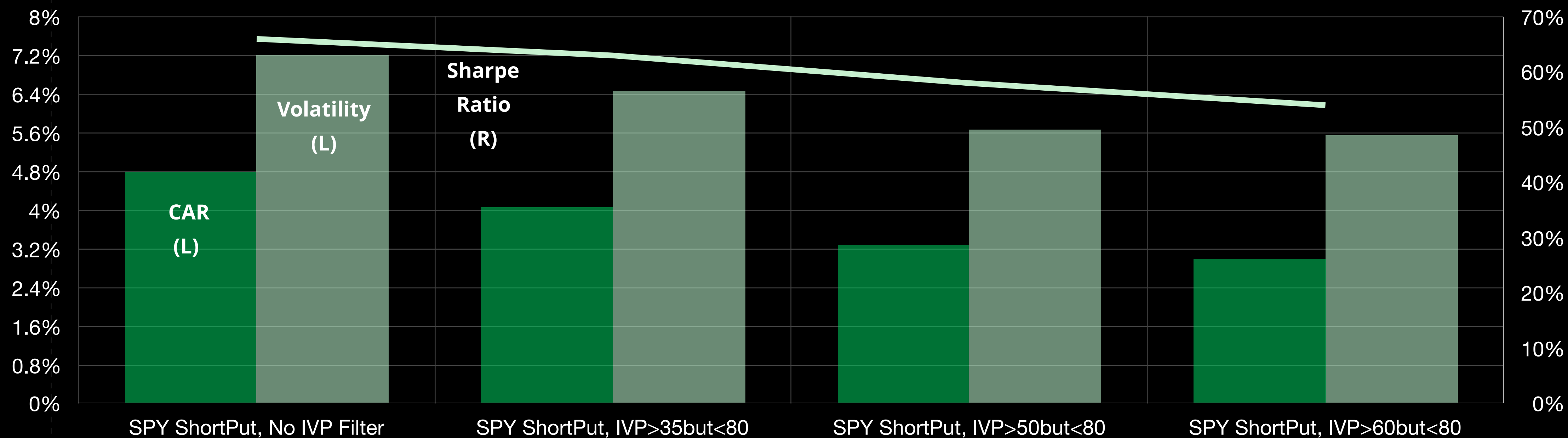


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\$SPY	CAR	Sharpe Ratio	Volatility
SPY ShortPut, No IVP Filter	4.79%	66%	7.21%
SPY ShortPut, IVP>35but<80	4.06%	63%	6.46%
SPY ShortPut, IVP>50but<80	3.28%	58%	5.67%
SPY ShortPut, IVP>60but<80	2.99%	54%	5.54%





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Let's Wrap It Up...

- **Implied Volatility 来源**——Theory simplifies complicated things
没有理论照耀的实践是无效率的，没有实践反馈的理论苍白无力
- **识别 Implied Volatility 高低**——Leverage linear market
- **解读 Implied Volatility 读数**——(Log)-Normal in statistics
- **Implied Volatility 特性**——Greeks, pricing model, strategies
- **刻意忽略真实市场**——Non-constant Implied Volatility across strikes



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