期权波动率 (Option Volatility) 从入门到精通

#3 - 历史波动率和隐含波动率 Part I

SAM, PowerUpGammas

历史波动率 (Historical Volatility)

- 波动率：The propensity / nature of price change in a given period of time
- 假设一个股票每天上涨1%...
- HV = 100 * StDev (ROC (1-Day), 21) * sqrt (252)
- 已经发生事情的统计（完成时态）

Source: PowerUpGammas

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$BA 1-Day Return

Source: PowerUpGammas

股票在既定的回望周期内 (21 Day)，从平均值开始波动的（年化）百分比 = 26.6%


JEPI - Daily 1/20/2023 Open 52.318, Hi 52.6527, Lo 52.1077, Close 52.5953 (0.7%)
JEPI - Volatility = 11.95
股票在既定的回望周期内 (21 Day)，从平均值开始波动的（年化）百分比 = 4.4%
55
4.43986
Jul
Oct
2021
Apr
Jul
Oct
2022
Apr
Jul
Oct
2023
Apr
Jul

隐含波动率 (Implied Volatility)

- Implied (Plug computation) from option pricing model

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 = Rf
现金股息率 = d

Theo Price

Real Quote

- 市场对于未来12个月价格变动幅度的预期

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隐含波动率 (Implied Volatility)

BA PUT/CALLs (Side by Side) 211.02 +0.10 (+0.05%)

JUL 07 '23 2 DAYS | JUL 14 '23 9 DAYS | JUL 21 '23 16 DAYS | JUL 28 '23 23 DAYS | MORE

TABBED VIEW PUT/CALL 18 STRIKES SMART BA 100

IV: 22.2%

CALLS								STRIKE	PUTS								
OPTN ... VOLUME	BID	ASK	MARK	TIME VALUE (%)	DELTA	THETA	IV CLOSE		IV CLOSE	THETA	DELTA	TIME VALUE (%)	MARK	BID	ASK	VOLUME	OPTN ...
	21.45	22.00	21.74	0.49 (5.30%)	0.964	-0.057	30.929%	190	28.429%	-0.029	-0.036	0.20 (2.16%)	0.24	0.20	0.28		
	19.00	19.55	19.34	0.54 (5.84%)	0.949	-0.065	29.376%	192.5	27.469%	-0.038	-0.051	0.30 (3.24%)	0.33	0.30	0.36		
	16.70	17.15	16.97	0.74 (8.00%)	0.930	-0.074	28.891%	195	27.447%	-0.046	-0.070	0.43 (4.65%)	0.46	0.43	0.48		
	14.35	14.80	14.68	0.89 (9.62%)	0.902	-0.086	27.842%	197.5	25.878%	-0.058	-0.099	0.61 (6.60%)	0.65	0.61	0.70		
	12.20	12.60	12.46	1.24 (13.41%)	0.862	-0.099	25.100%	200	25.411%	-0.071	-0.139	0.89 (9.62%)	0.94	0.89	0.99		
	10.10	10.45	10.34	1.64 (17.73%)	0.809	-0.113	24.910%	202.5	24.641%	-0.085	-0.192	1.26 (13.62%)	1.32	1.26	1.37		
	8.15	8.50	8.38	2.19 (23.68%)	0.742	-0.125	23.490%	205	23.072%	-0.097	-0.261	1.78 (19.24%)	1.85	1.78	1.92		
	6.45	6.65	6.62	2.99 (32.33%)	0.660	-0.134	23.228%	207.5	22.626%	-0.106	-0.344	2.52 (27.25%)	2.59	2.52	2.66		
	5.00	5.10	5.04	4.04 (43.68%)	0.567	-0.138	25.380%	210	22.526%	-0.109	-0.438	3.45 (37.30%)	3.53	3.45	3.60		
	3.65	3.80	3.72	3.65 (39.46%)	0.468	-0.135	22.318%	212.5	22.308%	-0.107	-0.539	3.11 (33.62%)	4.72	4.65	4.80		
	2.61	2.76	2.68	2.61 (28.22%)	0.371	-0.126	22.294%	215	22.779%	-0.099	-0.639	2.06 (22.27%)	6.20	6.10	6.30		
	1.85	1.96	1.90	1.85 (20.00%)	0.284	-0.112	22.425%	217.5	22.900%	-0.085	-0.729	1.26 (13.62%)	7.95	7.80	8.05		
	1.29	1.39	1.34	1.29 (13.95%)	0.211	-0.095	22.518%	220	22.530%	-0.068	-0.806	0.71 (7.68%)	9.92	9.75	10.15		
	0.90	0.98	0.94	0.90 (9.73%)	0.153	-0.078	23.170%	222.5	24.032%	-0.051	-0.867	0.36 (3.89%)	12.06	11.90	12.30		
	0.62	0.68	0.65	0.62 (6.70%)	0.110	-0.063	23.337%	225	33.809%	-0.037	-0.913	0.11 (1.19%)	14.32	14.15	14.65		
	0.41	0.50	0.46	0.41 (4.43%)	0.080	-0.051	24.139%	227.5	27.682%	-0.025	-0.946	0.00 (0.00%)	16.68	16.50	17.00		
	0.32	0.36	0.34	0.32 (3.46%)	0.056	-0.040	24.555%	230	30.695%	-0.013	-0.972	0.00 (0.00%)	19.12	18.75	19.45		
	0.18	0.28	0.24	0.18 (1.95%)	0.040	-0.031	26.820%	232.5	26.885%	-0.004	-0.991	0.00 (0.00%)	21.58	21.20	21.85		

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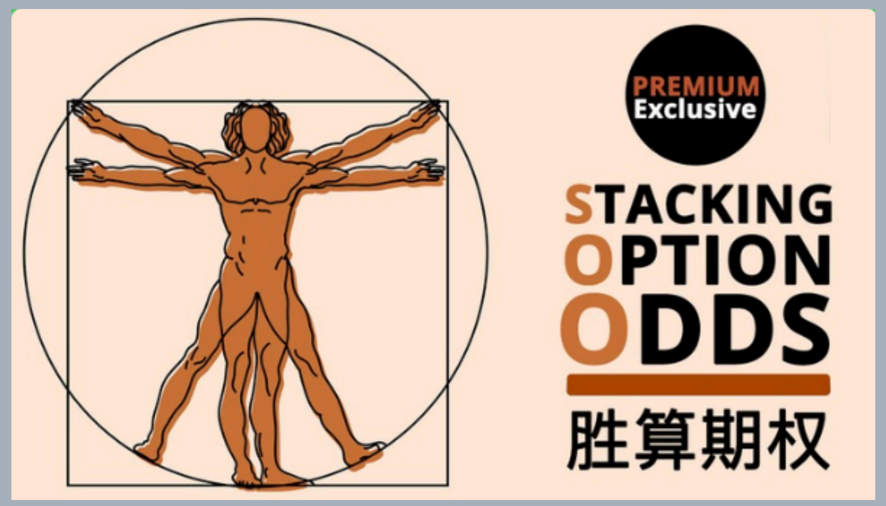
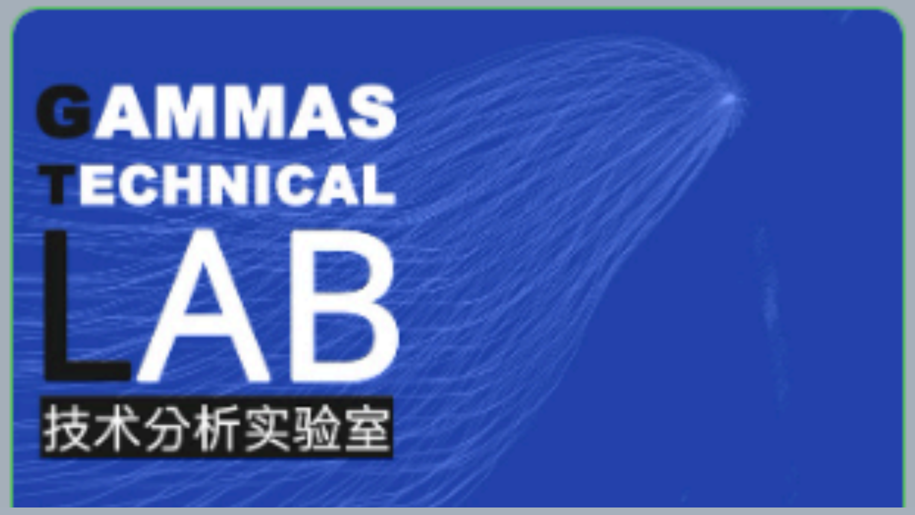
我们给你的不是一堆结论，而是逻辑；
不仅告诉你表面事实，而是强调背后原理。
你接受的一切信息，将构成你的思维方式；
不成体系的知识，将最终遗忘。





落脚点不同的波幅 (Volatility of Diff. Perspective)

- HV = 100 * StDev(Ln(1-Day ROC), 21) * sqrt (252)
  IV Expected Movement = 211 * 22.2% * sqrt (16 / 365)

- 不论是历史波动率还是期权隐含波动率，都是在以股价回报（或股价的对数）为正态分布的假设条件下的数学计算结果
  Nothing Fancy, just plain statistics