NVIDIA:
A VOLATILITY STRATEGY

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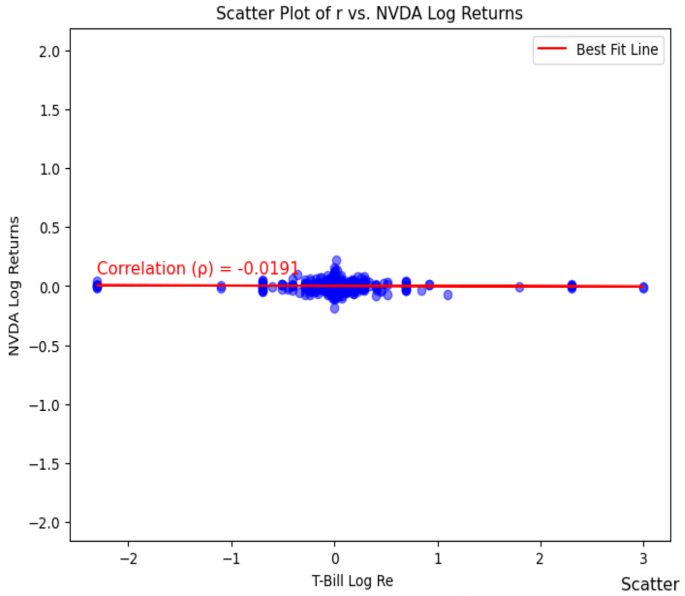
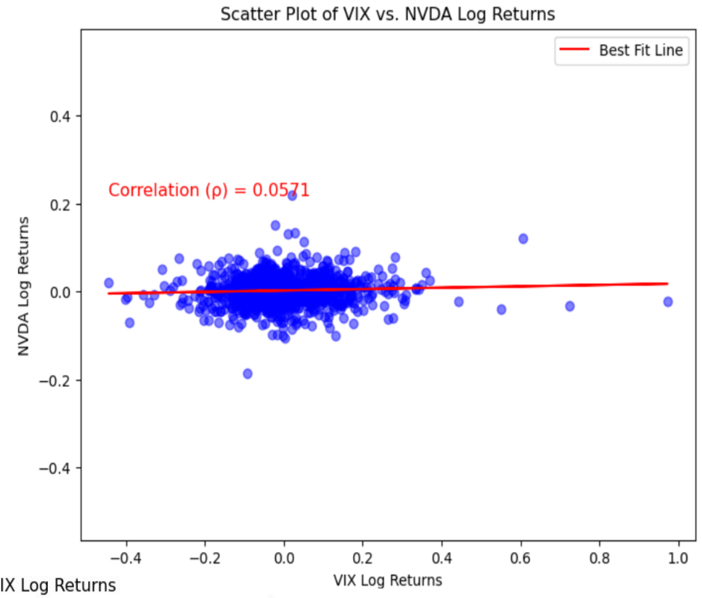
INTRODUCTION

WHY NVIDIA ?



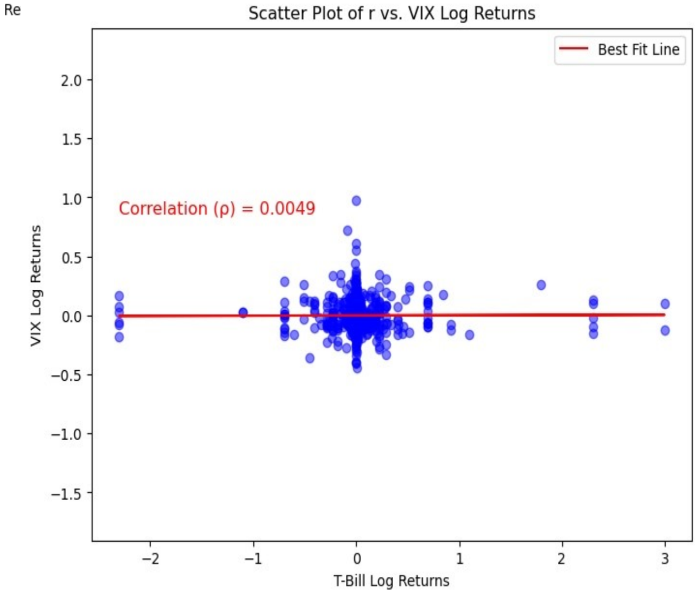


Highly Volatile

Market Leadership in AI

Liquid Options Market

Sensible to Macro-Factors



STRATEGY – OUTLOOK

Our Exposure

- **Vega Positive**
- **Gamma Neutral**

Our Hedging

- **Delta Neutral**

Trade

What We Sell

To Our Client:
5x Double Knock-In Barrier Call
4x Down-and-In Digital Barrier Put

What We Buy

From Listed Options:
5x Strangle
From an Investment Bank:
1x Strip

STRATEGY – TRADE DETAILS

What we sell

- Double Knock-In Barrier Call Options (Maturity: 3 Months):
  - Strike: $121 Lower Barrier: $105 Upper Barrier: $140
  - Strike: $120 Lower Barrier: $108 Upper Barrier: $142
  - Strike: $119 Lower Barrier: $107 Upper Barrier: $131

- Double Knock-In Barrier Call Options (Maturity: 1 Month):
  - Strike: $119 Lower Barrier: $110 Upper Barrier: $136
  - Strike: $120 Lower Barrier: $112 Upper Barrier: $137

- Down-and-In Digital Barrier Put Options (Maturity: 1 Month):
  - Strike: $100 Payout: $20
  - Strike: $102 Payout: $15
  - Strike: $108 Payout: $10
  - Strike: $108 Payout: $8

What we buy

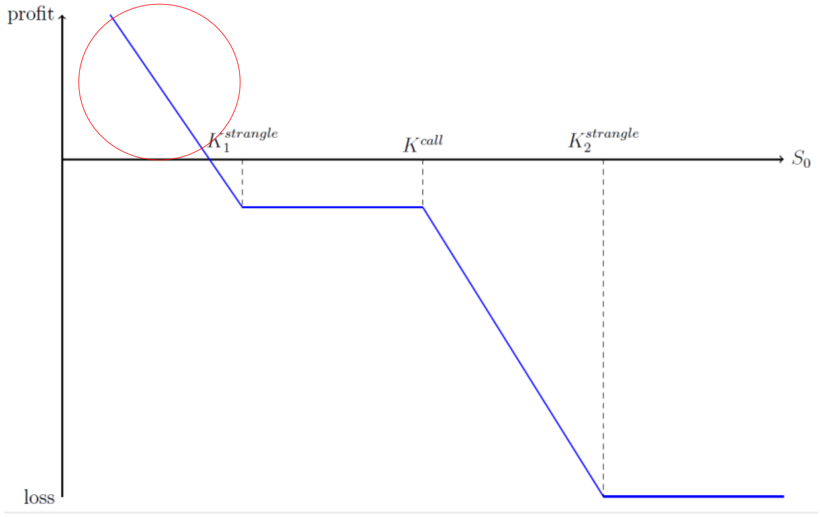
- Strangles (Maturity: 3 Months):
  - Lower Strike: $116 Upper Strike: $126
  - Lower Strike: $115 Upper Strike: $125
  - Lower Strike: $114 Upper Strike: $124

- Strangles (Maturity: 1 Month):
  - Lower Strike: $112 Upper Strike: $122
  - Lower Strike: $115 Upper Strike: $125

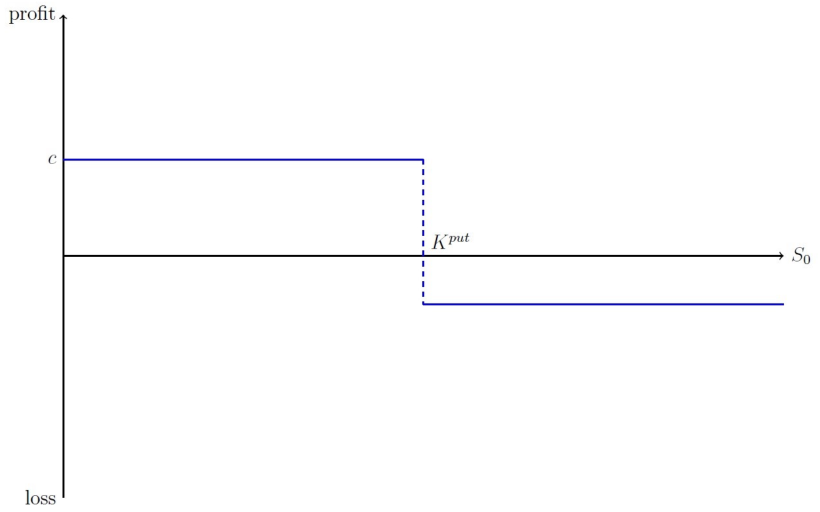
- Strip (Maturity: 1 Month):
  - Call Strike: $118
  - Call Strike: $122
  - Call Strike: $124
  - Call Strike: $125

STRATEGY – PAYOFF AND GREEKS

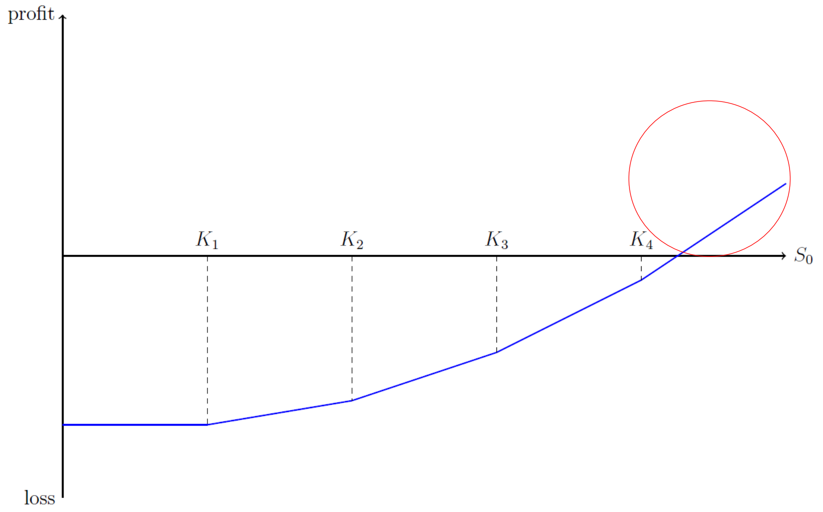
DOUBLE BARRIER + STRANGLE



DOWN-AND-IN DIGITAL BARRIER



STRIP



Greeks

	Short strategy	Long strategy	Overall Portfolio
Δ	-2.3677	2.9234	**0.6392**
Γ	0.0509	0.2221	**0.2533**
V	270.4806	233.1494	**504.0157**
Θ	130.4107	688.1608	**908.0132**

High Volatility

MAKE MONEY

Low Volatility

LOSE MONEY

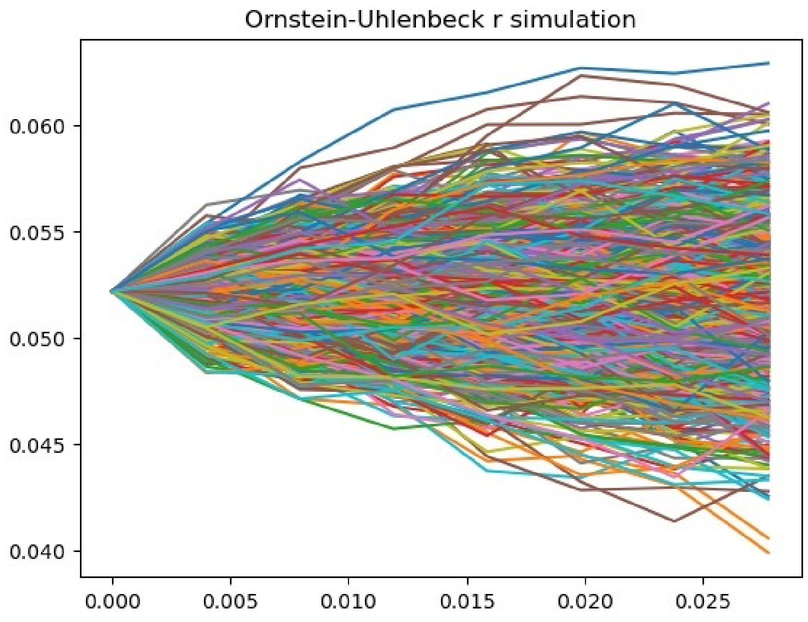
MONTE CARLO MODELING

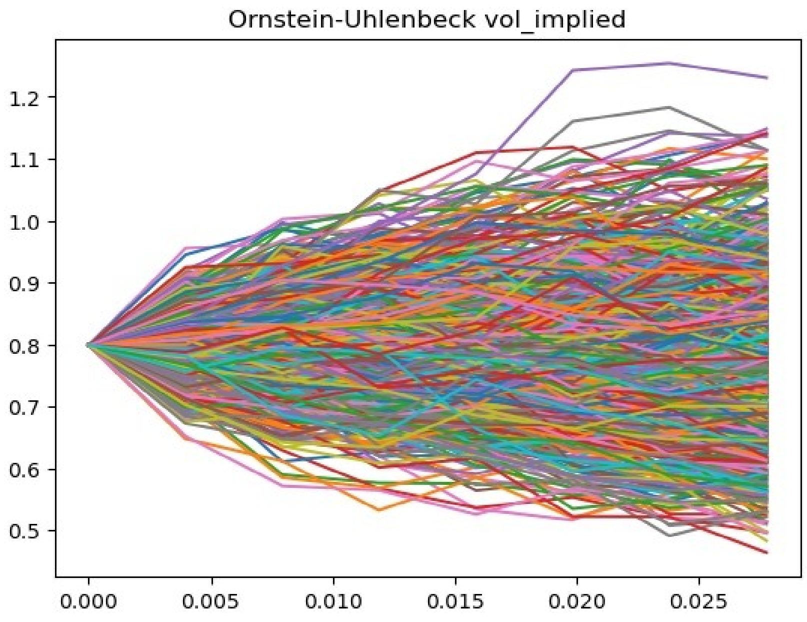
Heston Model

$$dS_t = r_t S_t dt + \sqrt{v_t} S_t dW_t^s$$

$$dr_t = k(\Theta - r_t)dt + \sigma_r dW_t^r$$

$$dv_t = k(\Theta - v_t)dt + \sigma_v dW_t^v$$



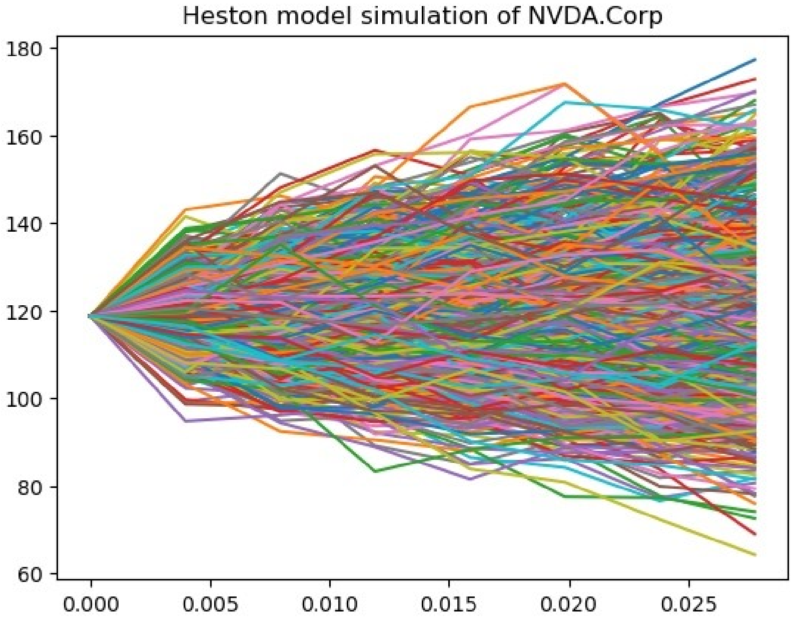


Heston Model

$$dS_t = r_t S_t dt + \sqrt{v_t} S_t dW_t^s$$

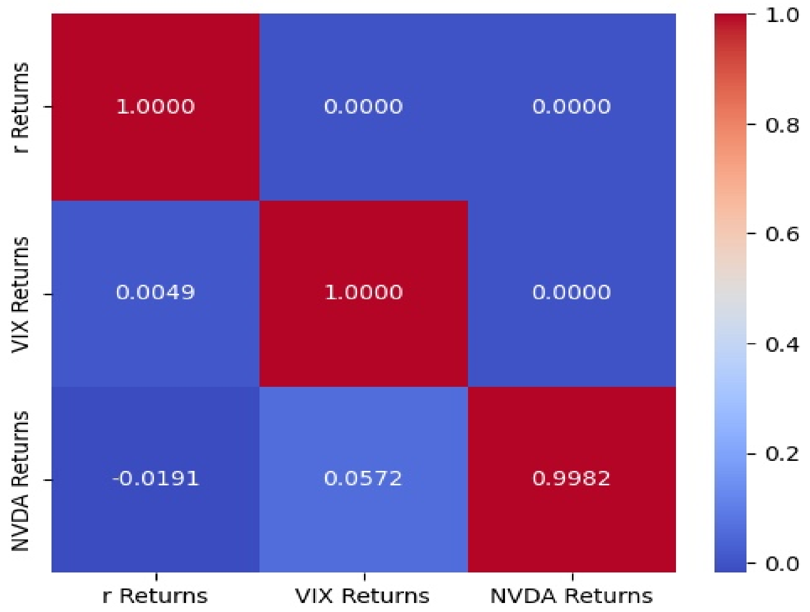
By Euler scheme

$$S_t = S_{t-1} + r_{t-1} S_{t-1} dt + \sqrt{v_{t-1}} S_{t-1} dW_t^s$$



By Cholesky decomposition

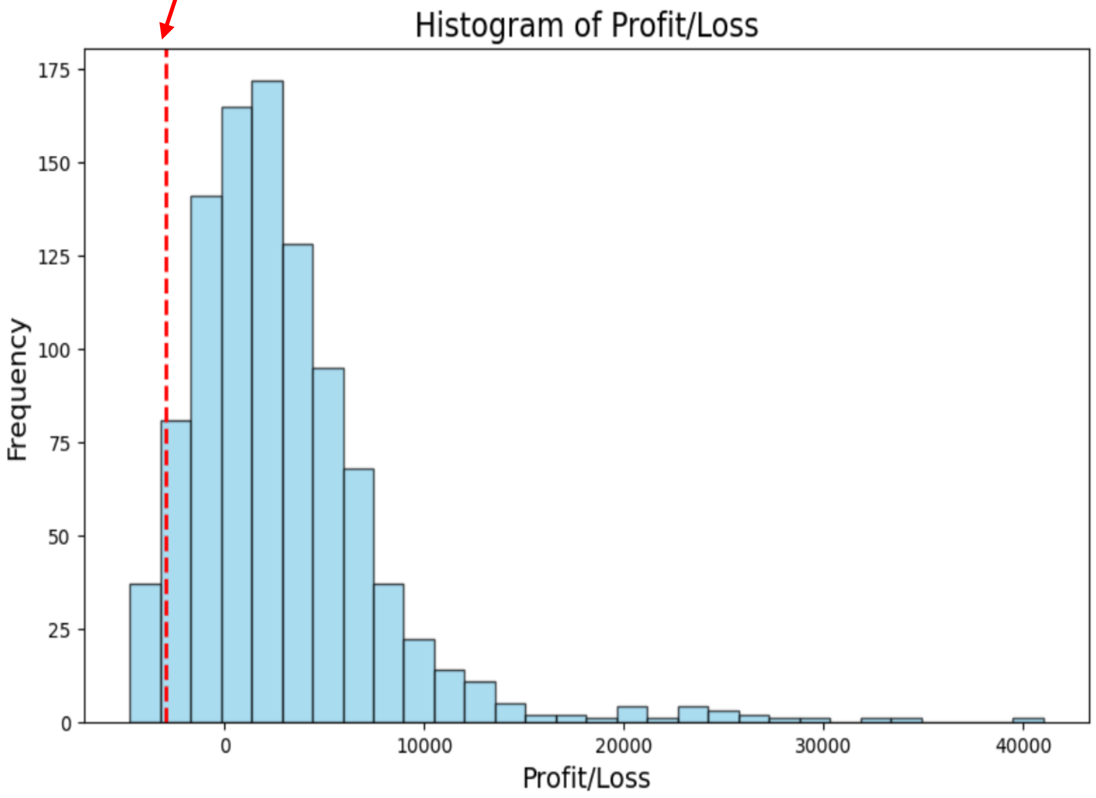
$$dW_t^s = -0.0191 dW_t^r + 0.0572 dW_t^{\mathrm{VIX}} + 0.9982 dW_t^{\mathrm{IV}}$$

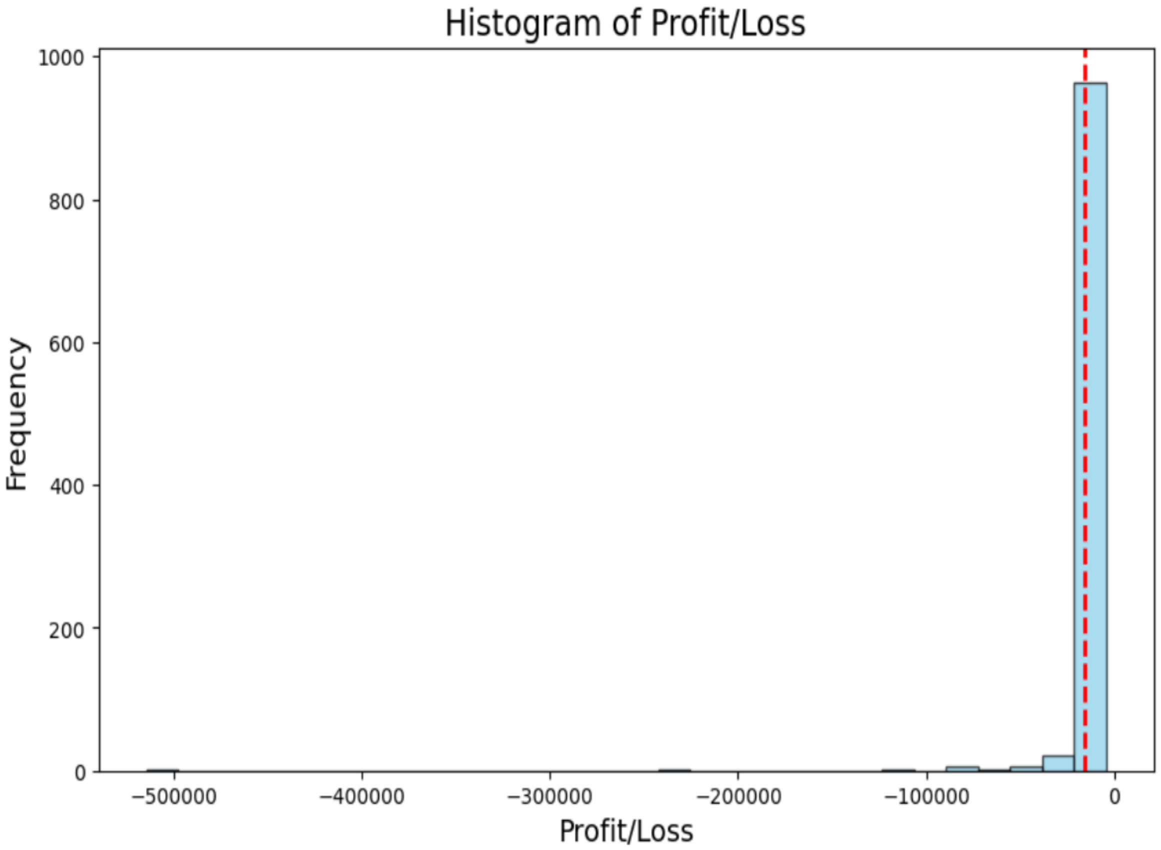


LIMITS – Value At Risk

VaR 95%	LAC	Limit Usage
$2,896.65	$10,000.00	28,97%

AI Demand P&L	STWL	WL Usage
$ -6,155.85	$ 11,586.60	53.13%





LIMITS – PORTFOLIO SENSITIVITIES

- The P&L increases in each scenario, except when there is a decrease in volatility.
- The results are in line with our strategy of exploiting high volatility.

Sensitivity Name	Factor Sensitivity	Limit	Limit Usage (%)
All Mkt. +1%	-62.2723	1,000	6%
All Mkt. +10%	388.6390	-5,000	Not applicable
All Mkt. -10%	2,969.2898	-5,000	Not applicable
Vola + 1%	136.8723	2,500	5%
Vola + 20%	2,849.1473	-5,000	Not applicable
Vola - 20%	-2,401.9247	-5,000	48.04%

LIMITS – FOCUS ON LONG & SHORT

- The Hedging (Long) Strategy is more sensitive to changes in stock price and volatility that the Sold (Short) Strategy

Sensitivity Name	Gross sensitivity Long	Gross Sensitivity Short
All Mkt. +1%	-1,403.4552	-185.2792
All Mkt. +10%	646.4979	-1.784,3217
All Mkt. -10%	-1,124.4268	2.443,4162
Vola + 1%	-1,369.6997	-19.8901
Vola + 20%	1,642.1558	-319.4687
Vola - 20%	-4,596.7815	668.3939

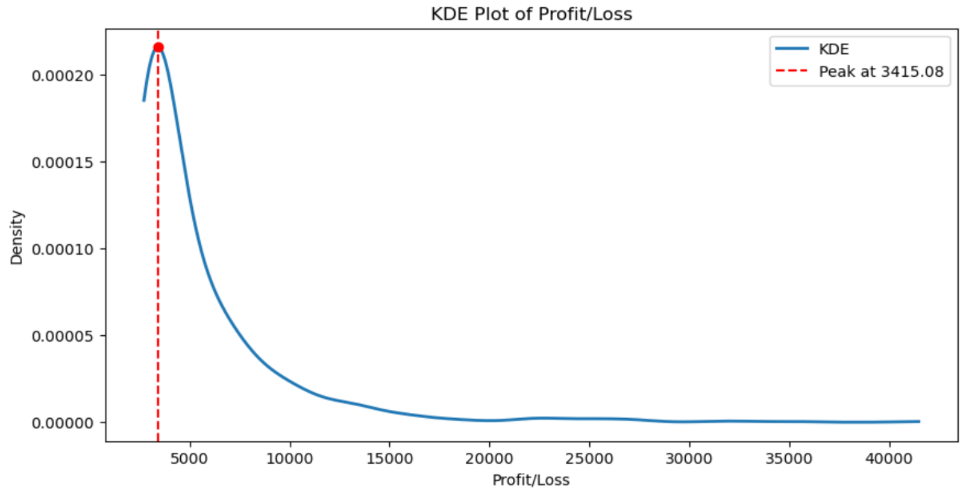
STRESS TEST SCENARIOS

Scenario	Volatility shock	Volatility	Simulated P&L
DeepSeek's AI Announcement *	+80%	150%	8,965.04
US-China trade war *	+25%	100%	3,415.08
Nvidia becomes a mature company with stable earnings **	-60%	30%	-4,985.65
AI demand continues steadily with low stable volatility **	-85%	10%	-6,155.85

* Historical scenario
** Hypothetical scenario

STRESS TEST SCENARIOS

US-China trade war



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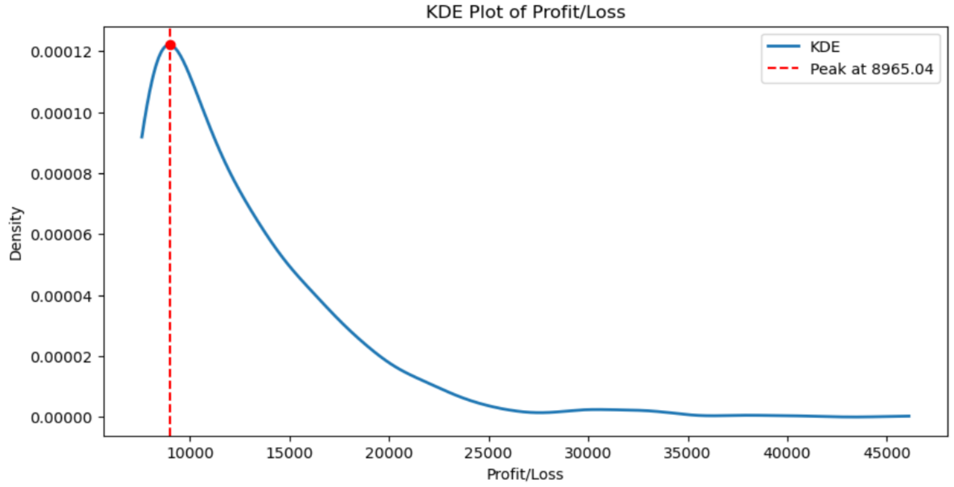
DeepSeek AI Announcement



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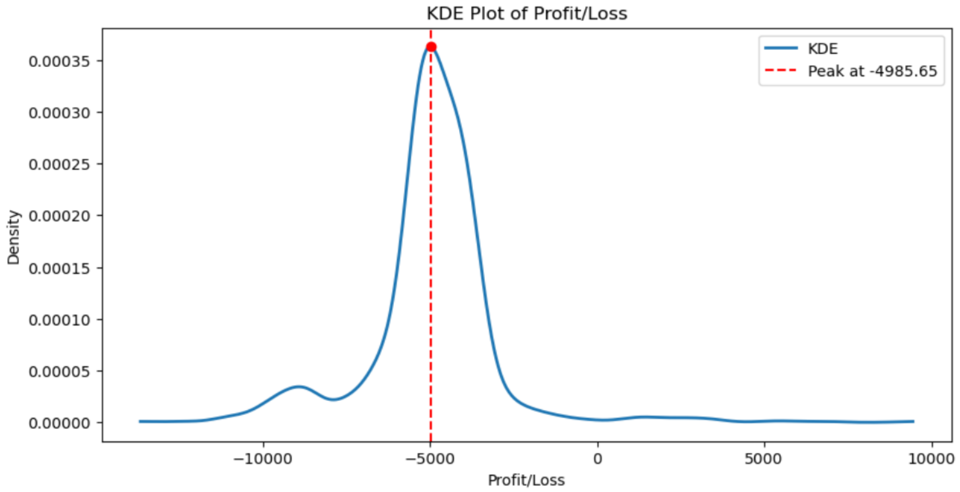
NVIDIA becomes «mature company»



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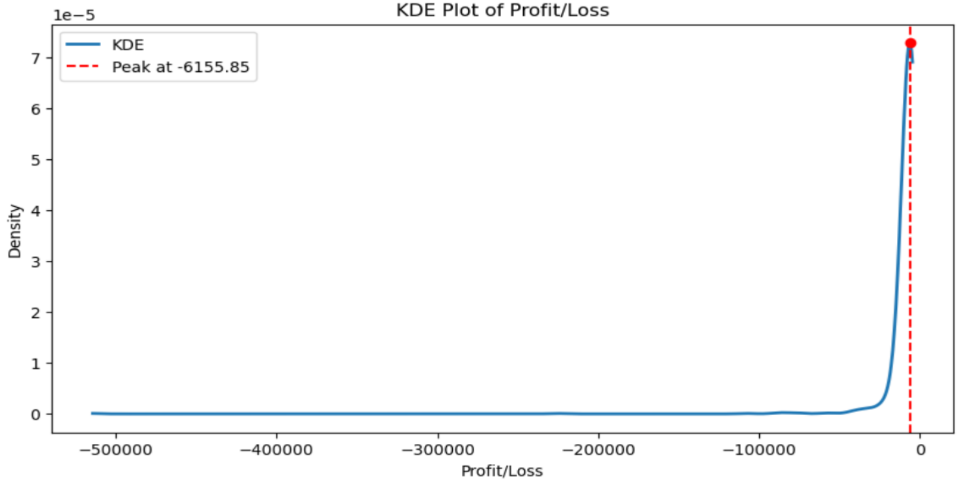
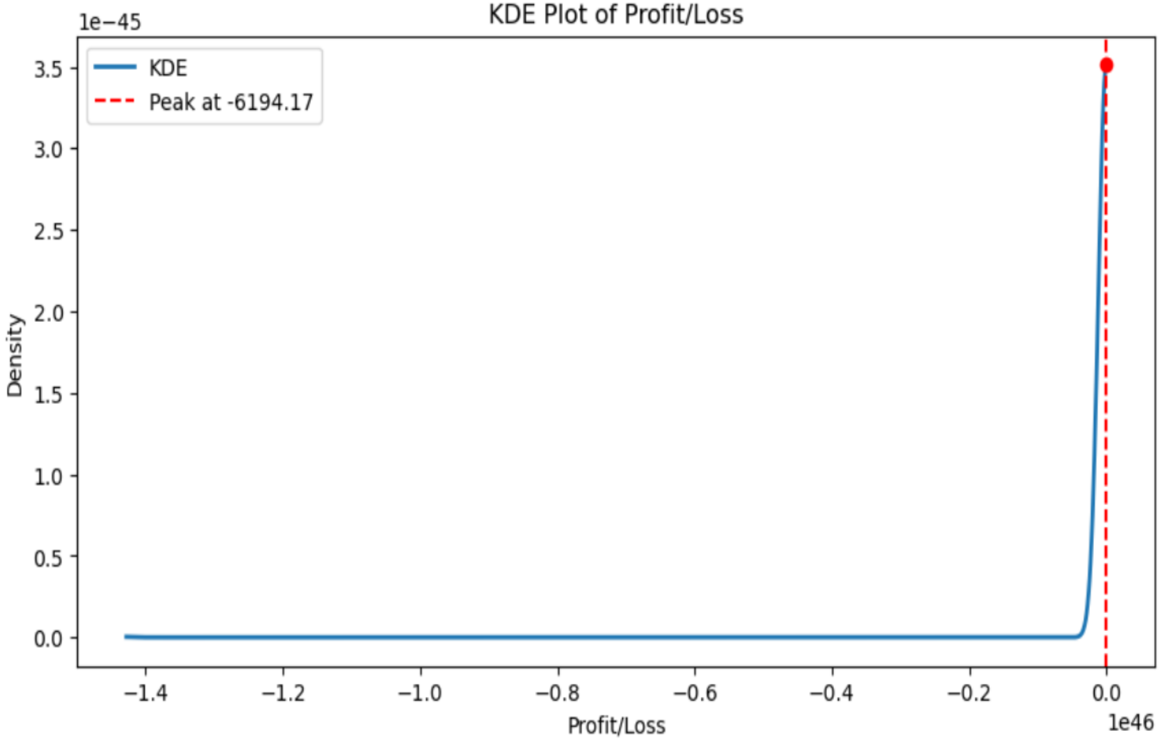
AI demand continues steadily

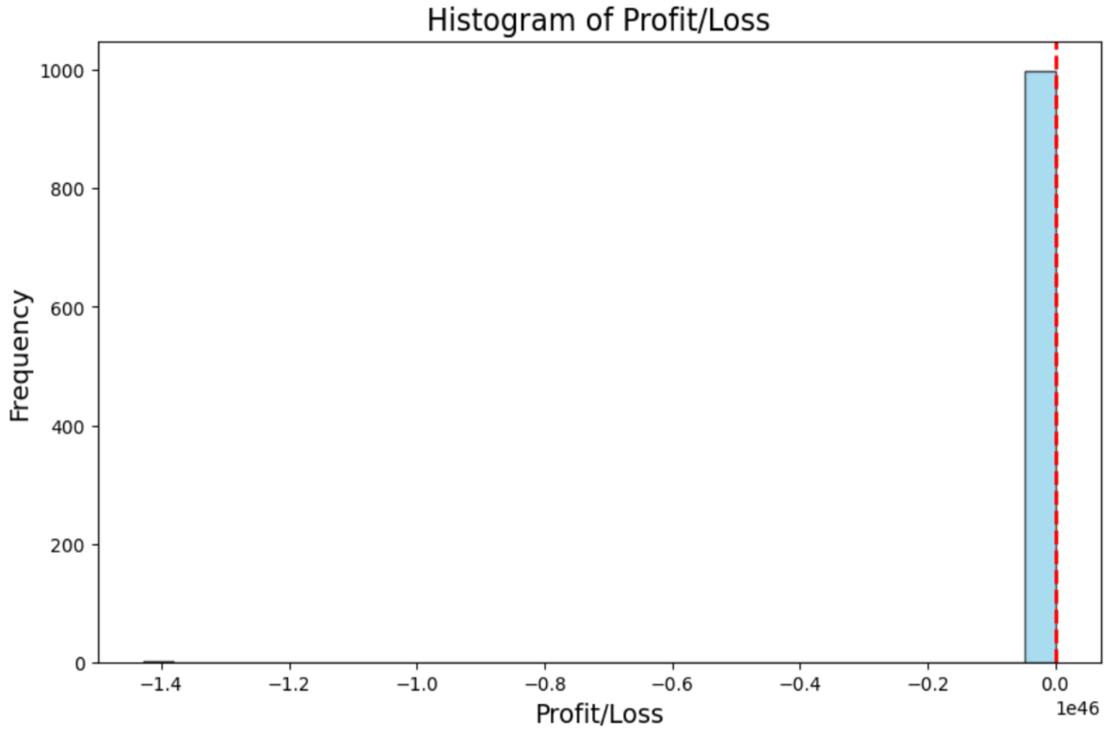


σ ↓

STRESS TEST SCENARIOS

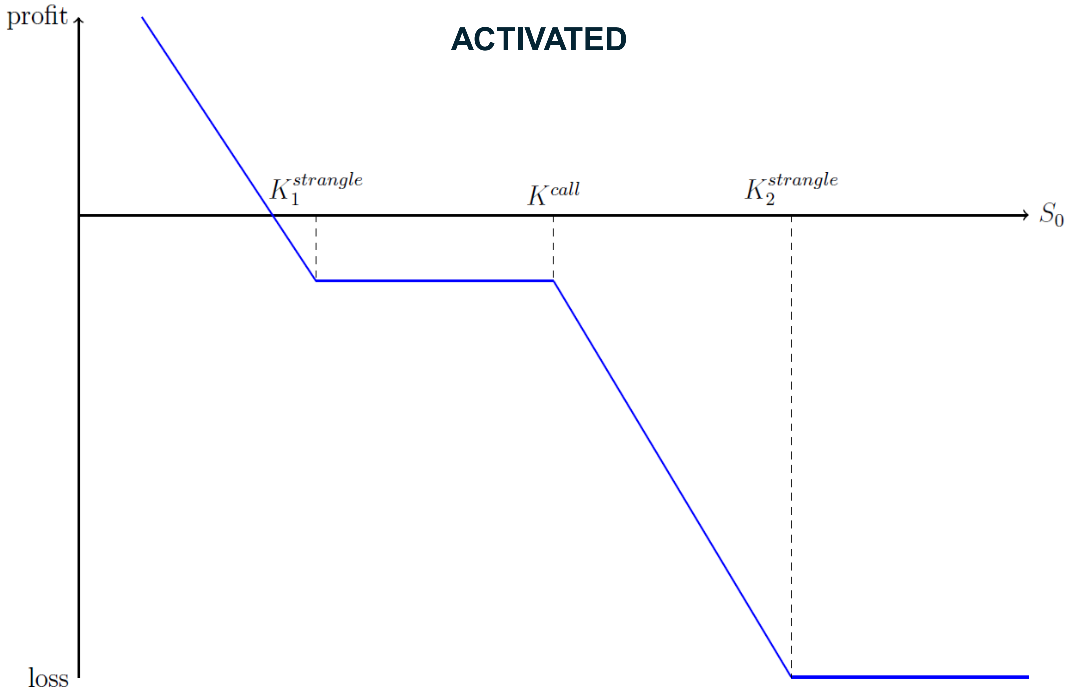
- Extreme case: Volatility ≈ 0
- Negative P&L
- The results are in line with our strategy of exploiting high volatility and losing in cases of very low volatility

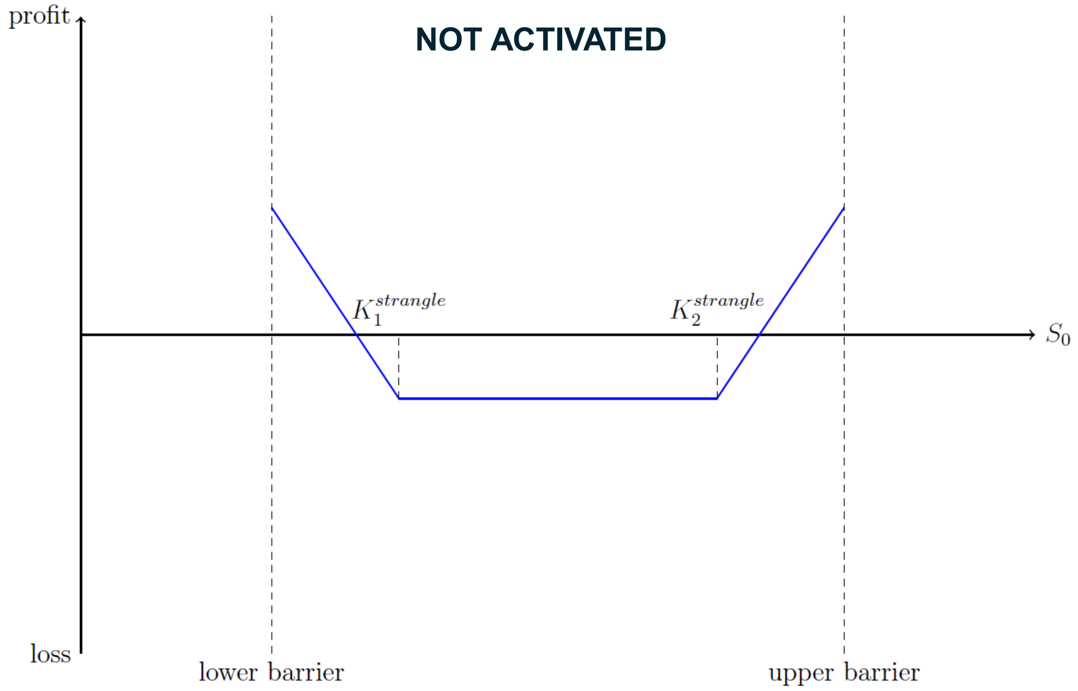




APPENDIX

APPENDIX: PAYOFF & PRICE: STRANGLE + DOUBLE BARRIER





$$\text{cdi} = S_0 e^{-qT} \cdot \left(\frac{H}{S_0}\right)^{2\lambda} \cdot N(y) - K e^{-rT} \cdot \left(\frac{H}{S_0}\right)^{2\lambda-2} \cdot N\left(y - \sigma\sqrt{T}\right)$$

$$\text{cui} = S_0 N(x_1) e^{-qT} - K e^{-rT} N\left(x_1 - \sigma\sqrt{T}\right) - S_0 e^{-qT} \left(\frac{H}{S_0}\right)^{2\lambda} [N(-y) - N(-y_1)] + k e^{-rT} \left(\frac{H}{S_0}\right)^{2\lambda-2} \left[N\left(-y + \sigma\sqrt{T}\right) - N\left(-y_1 + \sigma\sqrt{T}\right)\right]$$

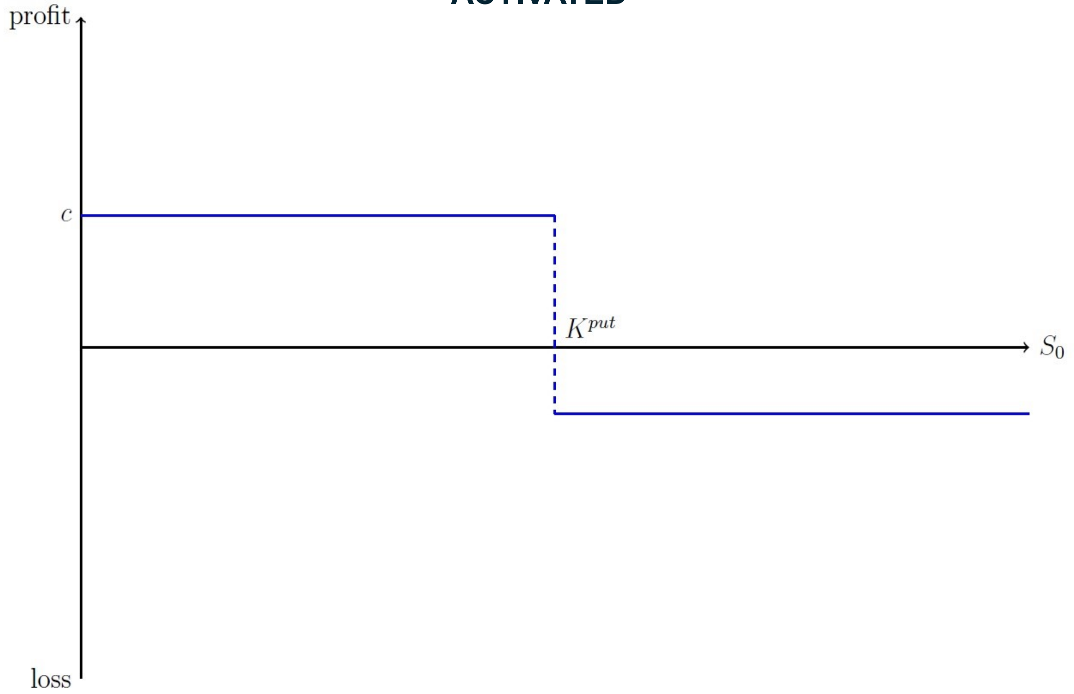
- **PARAMETERS:**

$x_1 = \frac{\ln\left(\frac{S_0}{H}\right)}{\sigma\sqrt{T}} + \lambda\sigma\sqrt{T}$ $\quad y_1 = \frac{\ln\left(\frac{H}{S_0}\right)}{\sigma\sqrt{T}} + \lambda\sigma\sqrt{T}$ $\quad y = \frac{\ln\left(\frac{H^2}{S_0 K}\right)}{\sigma\sqrt{T}} + \lambda\sigma\sqrt{T}$ $\quad \lambda = \frac{r - q + \frac{\sigma^2}{2}}{\sigma^2}$

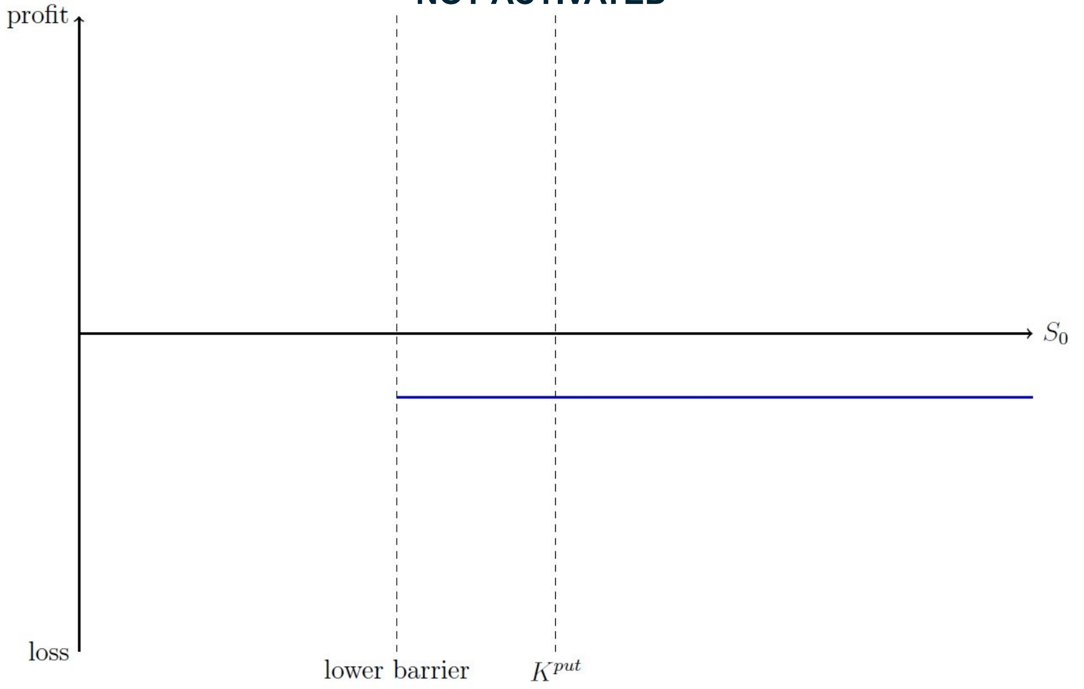
Assumption $\Rightarrow c_{corridor} = \frac{cui+cdi}{2}$

APPENDIX: PAYOFF & PRICE: DOWN-AND-IN DIGITAL PUT

ACTIVATED



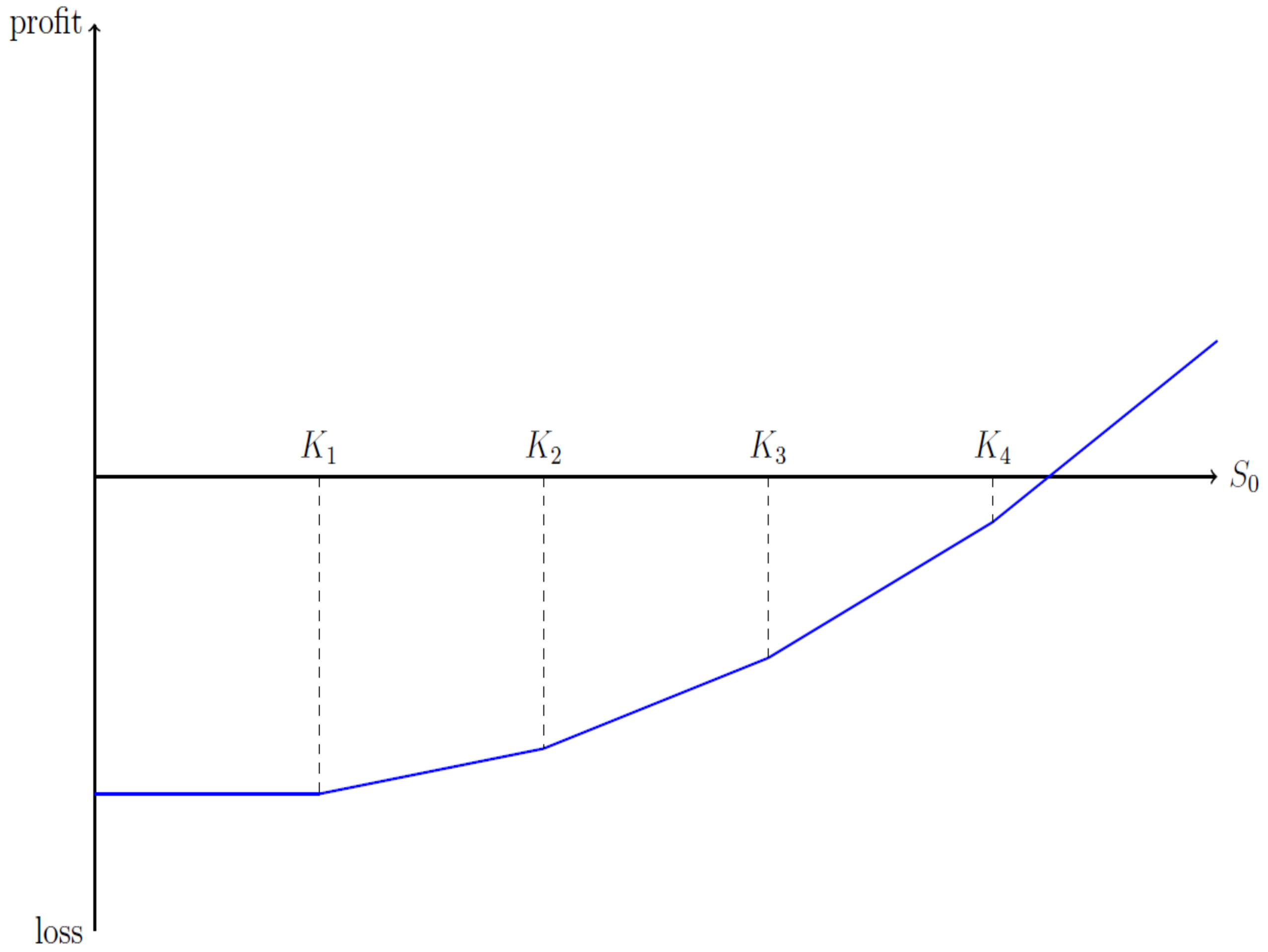
NOT ACTIVATED



$$\mathrm{DGT}^{PUT} = ce^{-rT}(P_d - P_{bi})$$

$$P_d = N\left(\frac{\left(\ln\left(\frac{S_0}{K}\right) + r + \frac{\sigma^2}{2}\right)}{\sigma\sqrt{T}}\right) \qquad P_{bi} = \left(\frac{B}{S_0}\right)^{\frac{2\left(r-\frac{\sigma^2}{2}\right)}{\sigma^2}} N\left(\frac{\left(\ln\left(\frac{B^2}{S_0K}\right)-\frac{\sigma^2}{2}\right)}{\sigma\sqrt{T}}\right)$$

APPENDIX: PAYOFF & PRICE: STRIP



$$P^{strip} = \sum_{i=1}^{4} P_i^{call}$$

$$P^{call} = S_0 N\left(d_{1,i}\right) - e^{-rT} K_i N(d_{2,i})$$

$$d_{1,i} = \frac{\ln\left(\frac{S_0}{K_i}\right) + \left(r + \frac{\sigma^2}{2}\right)}{\sigma\sqrt{T}}$$

$$d_{2,i} = d_{1,i} - \sigma\sqrt{T}$$

APPENDIX: PORTFOLIO FEATURES

Number of units	Option type	Strike price	Time to expiration	Price of the strategy (BS)	Delta	Gamma	Vega	Theta	Rho
1	Double Barrier (LT)	121	0.2579	14.3411	-0.1726	-0.0074	-23.2885	0.0000	0.0000
1	Double Barrier (LT)	120	0.2579	15.8714	-0.1532	-0.0077	-24.5037	0.0000	0.0000
1	Double Barrier (ST)	119	0.0595	11.1016	-0.1650	-0.0093	-12.7809	0.0000	0.0000
1	Double Barrier (ST)	119	0.0595	11.8626	-0.1495	-0.0097	-13.4381	0.0000	0.0000
1	Double Barrier (ST)	120	0.0595	13.9180	-0.1261	-0.0090	-13.7217	0.0000	0.0000
1	Knock In Digital Put (ST)	100	0.0595	13.2276	-0.5523	0.0334	307.4115	52.4865	-43.3880
1	Knock In Digital Put (ST)	102	0.0595	10.0085	-0.4154	0.0256	22.5961	36.8790	-34.7113
1	Knock In Digital Put (ST)	108	0.0595	5.9664	-0.3334	0.0188	16.2488	21.3663	-28.8946
1	Knock In Digital Put (ST)	108	0.0595	4.3757	-0.3002	0.0163	11.9570	19.6789	-23.3647
Total				100.6729	-2.3677		270.4806		

Number of units	Option type	Strike Price Call	Strike Price Put	Time to expiration	Price of the strategy (BS)	Delta	Gamma	Vega	Theta	Rho
1	Strangle (LT)	126	116	0.2579	24.6800	0.1212	0.0214	49.6562	49.9384	-2.9425
1	Strangle (LT)	125	115	0.2579	24.0500	0.1744	0.0242	49.0918	48.8659	-0.9606
1	Strangle (ST)	124	114	0.0595	15.3900	0.1878	0.0386	26.5519	110.2331	0.6021
1	Strangle (ST)	122	112	0.0595	16.1500	0.2568	0.0349	25.6652	112.1802	1.2496
1	Strangle (ST)	125	115	0.0595	14.9700	0.1491	0.0405	26.9437	108.4943	0.2380
1	Strip	124. 122	125.118	0.0595	54.0500	2.1177	0.0428	55.6262	347.8907	17.2167
Total					149.2900	3.0070		233.5351		

APPENDIX: HESTON MODEL

Heston Model

$$dS_t = r_t S_t dt + \sqrt{v_t} S_t dW_t^s$$

$$dr_t = k(\vartheta - r_t)dt + \sigma_r dW_t^r$$

$$dv_t = k(\vartheta - v_t)dt + \sigma_v dW_t^v$$

$$dW_t^s = -0.0191 dW_t^r + 0.0572 dW_t^{\text{VIX}} + 0.9982 dW_t^{\text{IV}}$$

$$S_t = S_{t-1} + r_{t-1} S_{t-1} dt + \sqrt{v_{t-1}} S_{t-1} dW_t^s$$