

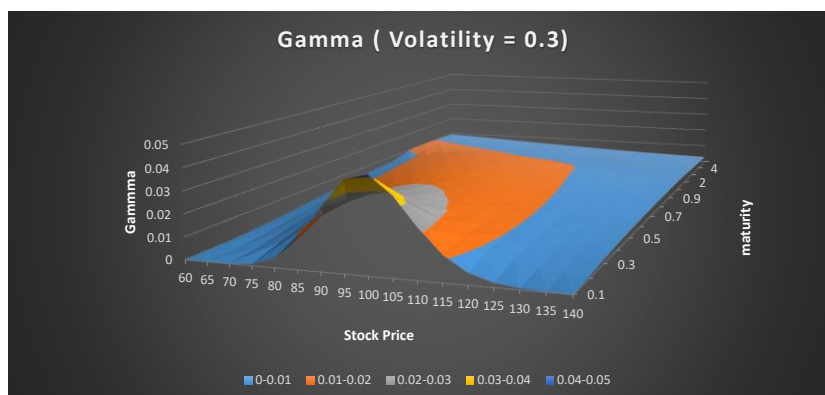
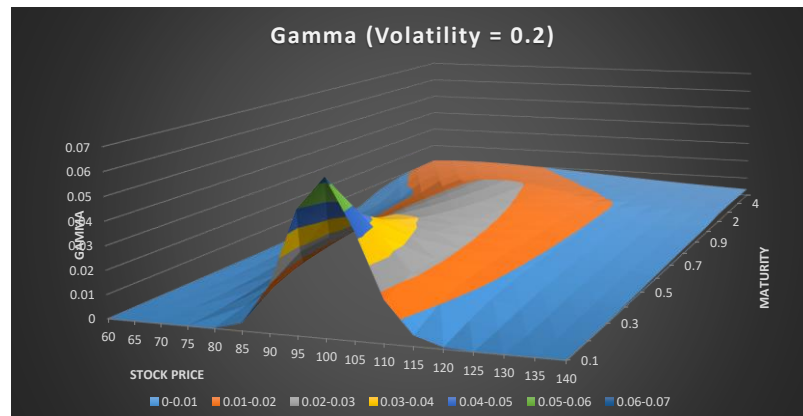
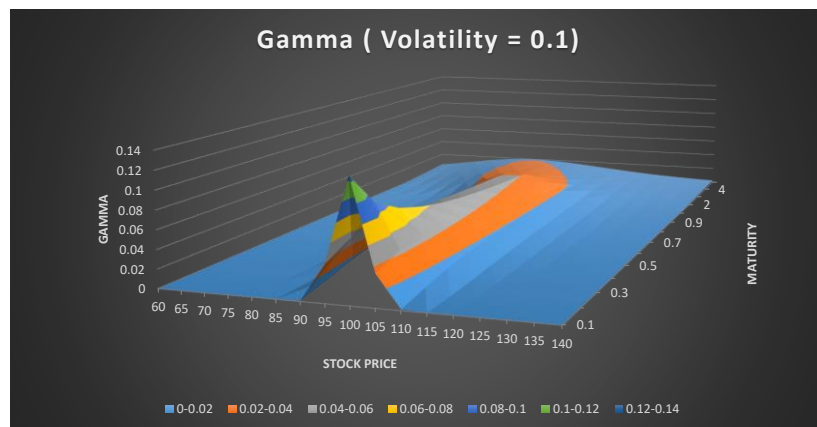
Report n.4

Report 4
Mojtaba Amini
2041518

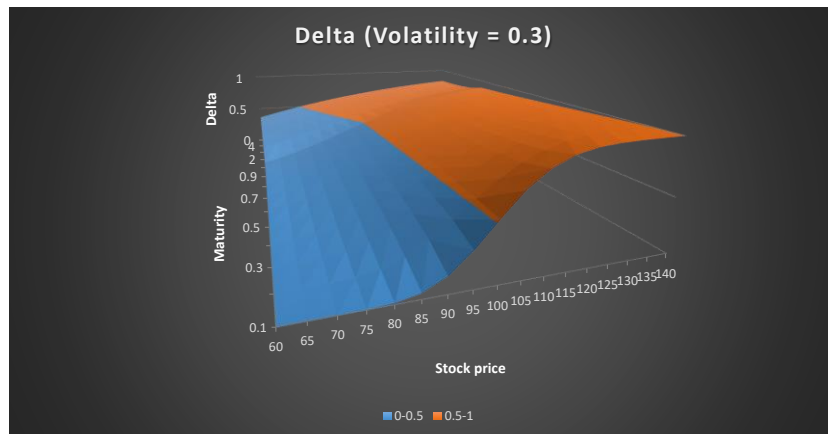
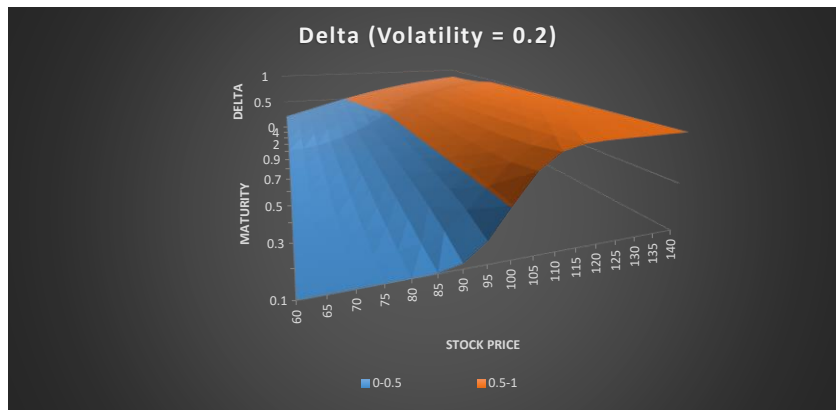
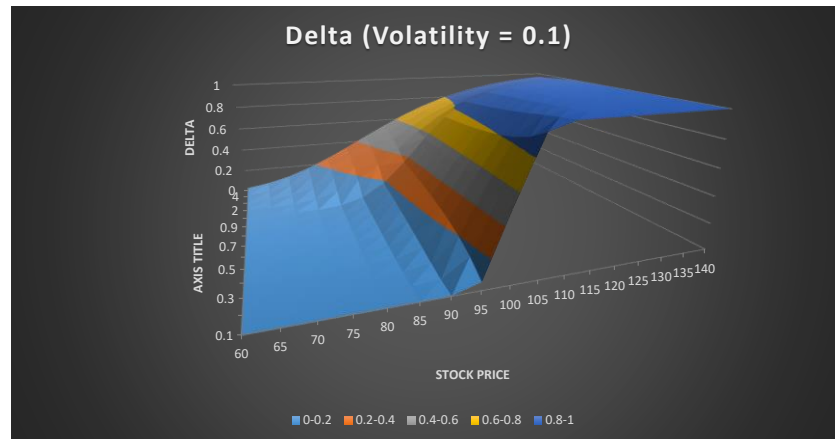
Part 1 (Theoretical)

Parameters	Value
r	1%
K	100
V	20%

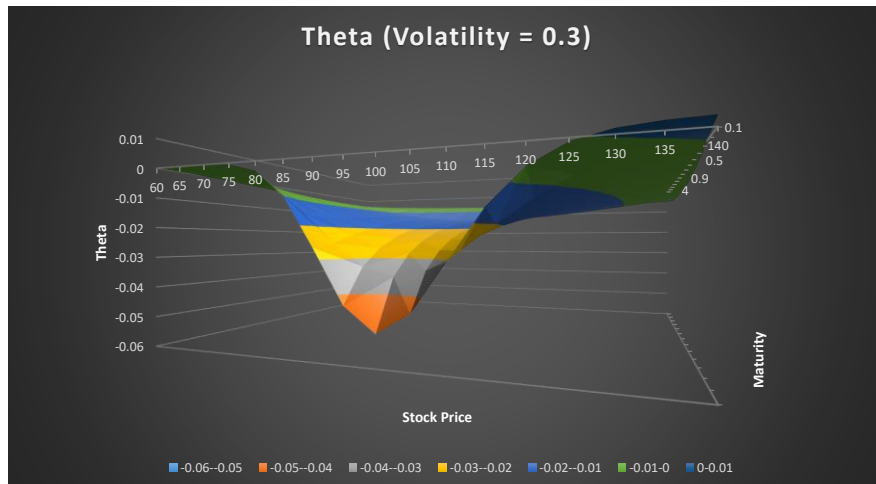
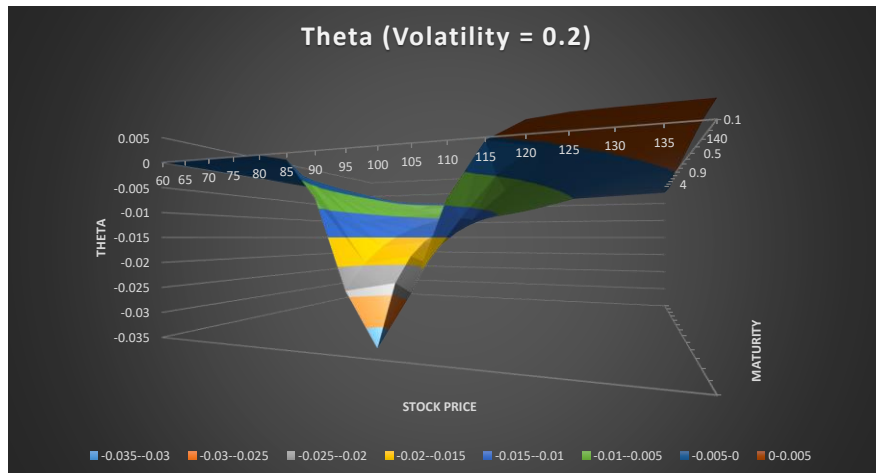
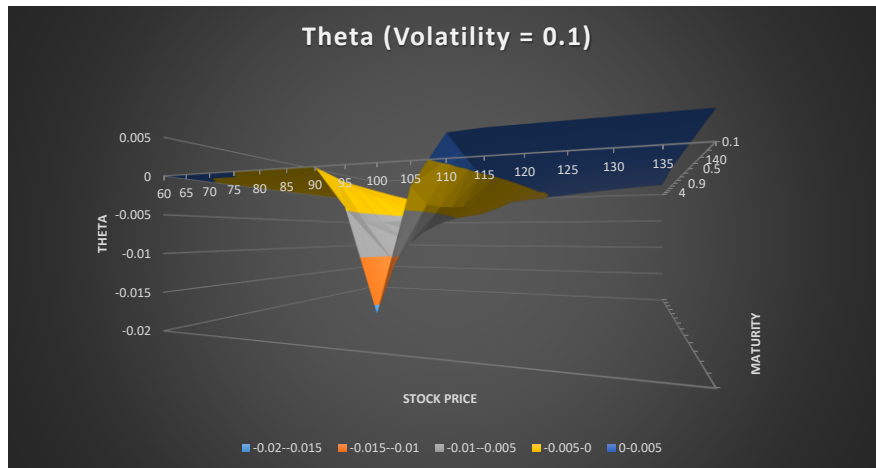
Gamma



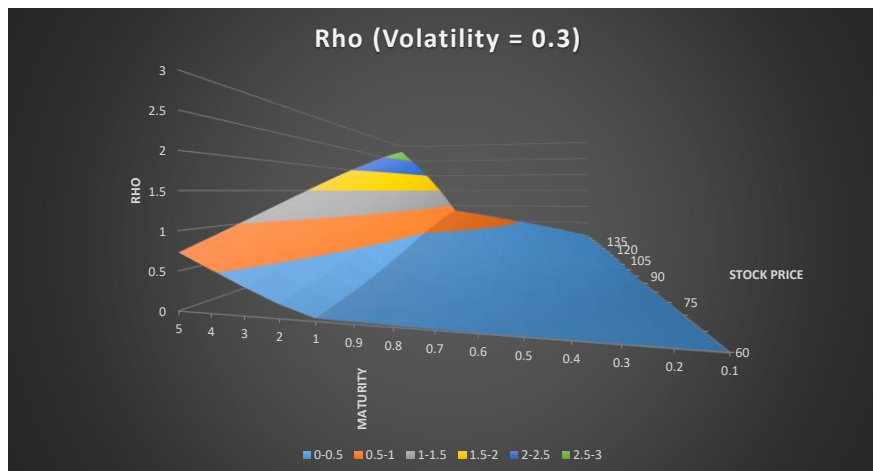
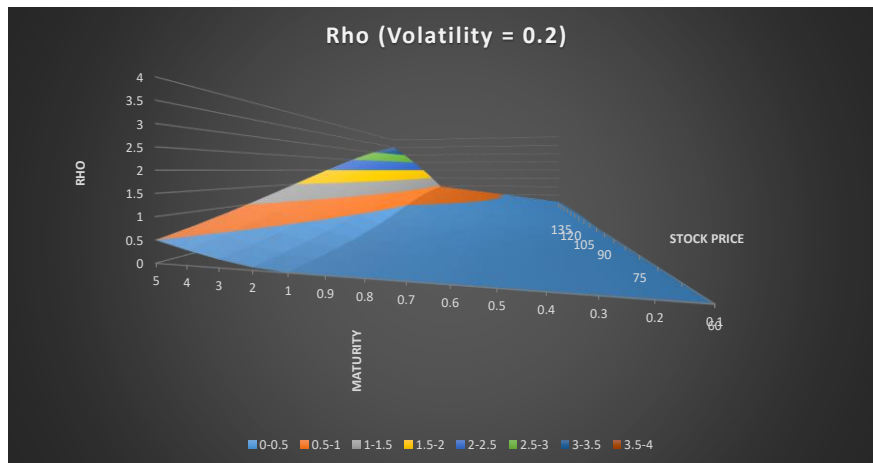
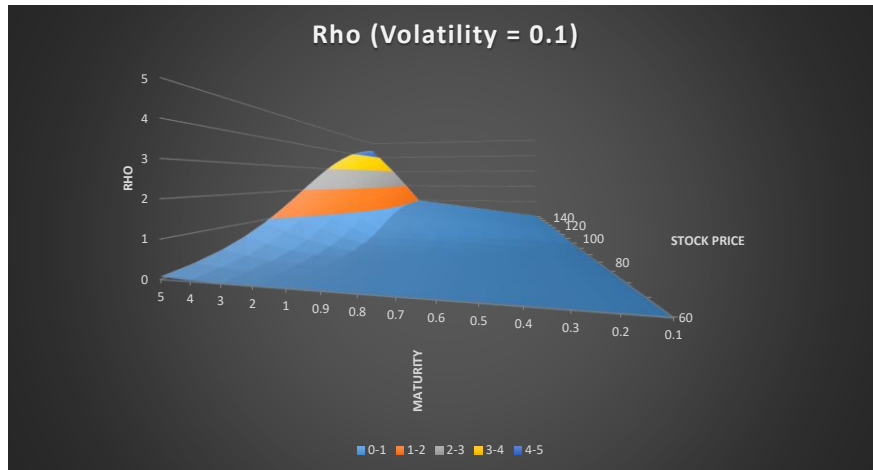
Delta



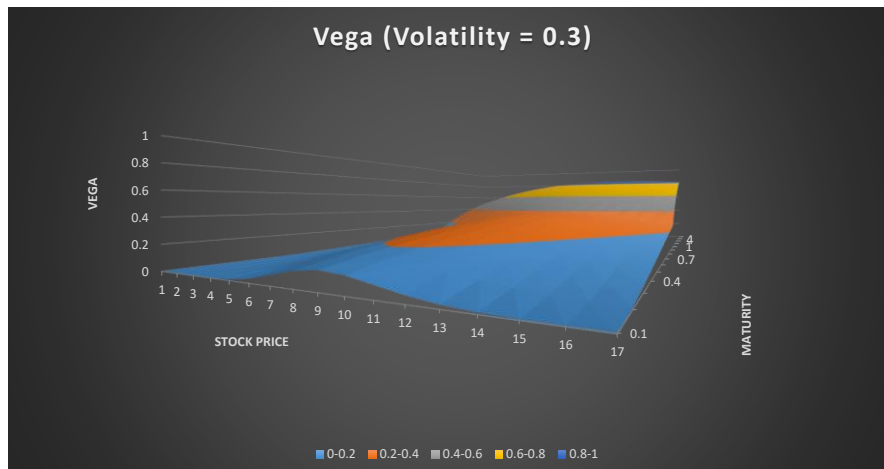
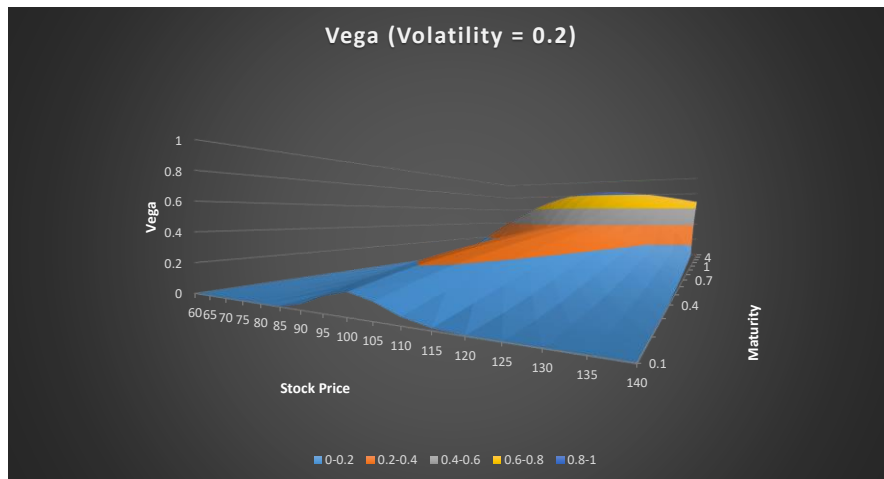
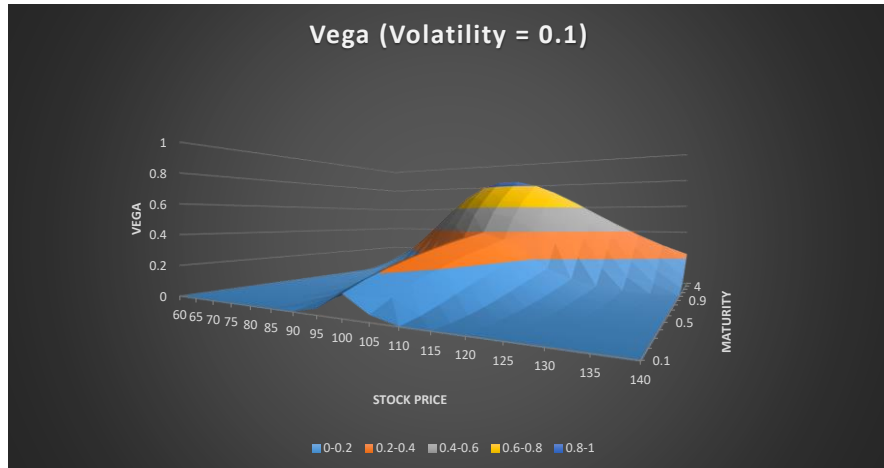
Theta



Rho

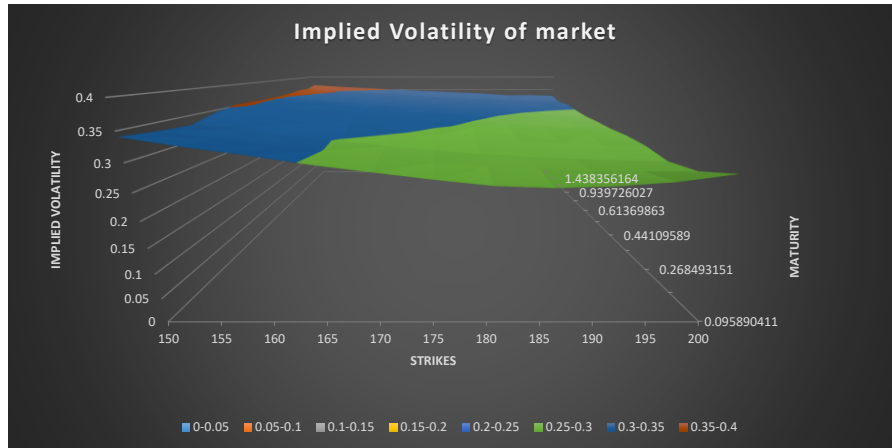


Vega

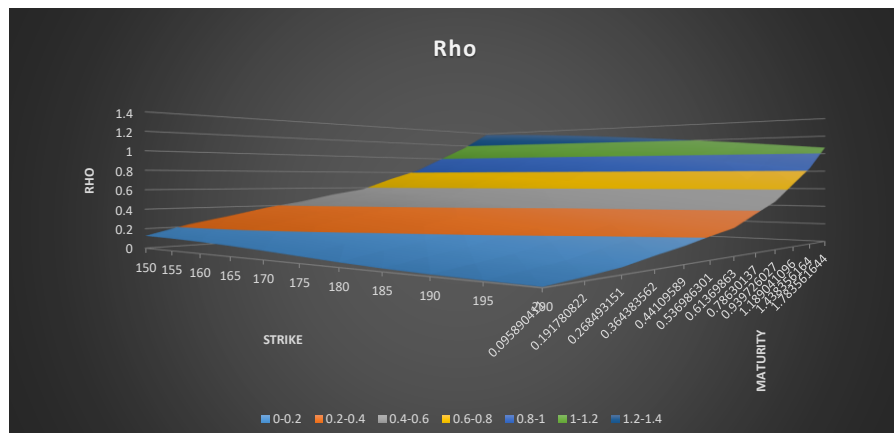
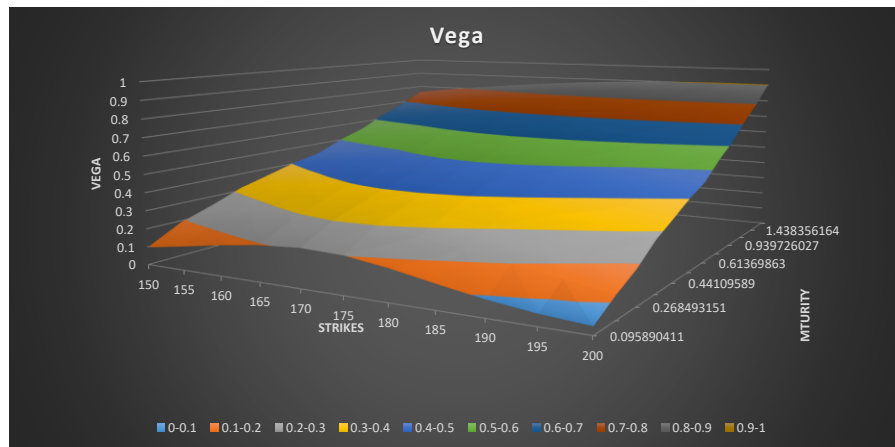


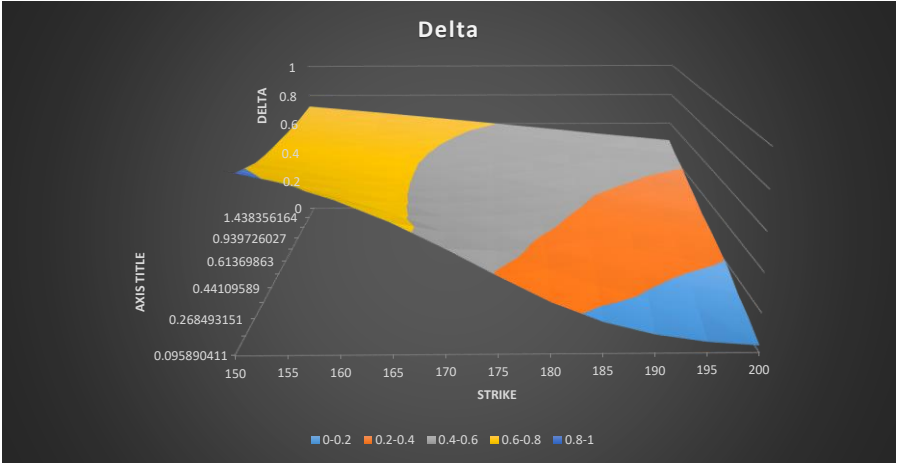
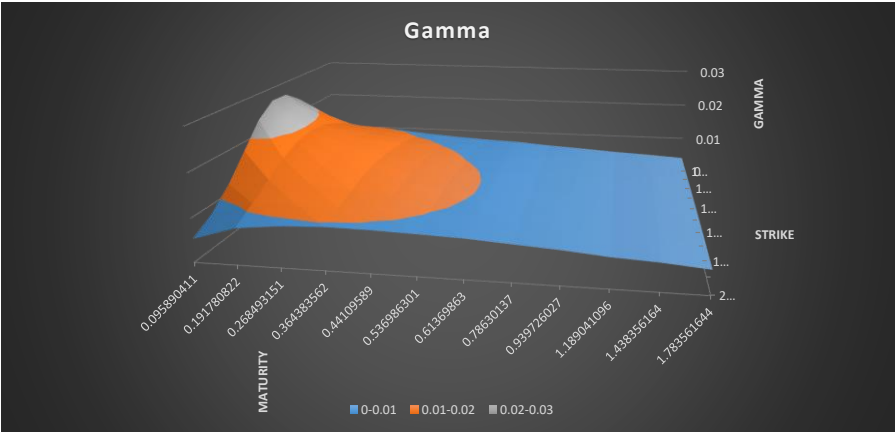
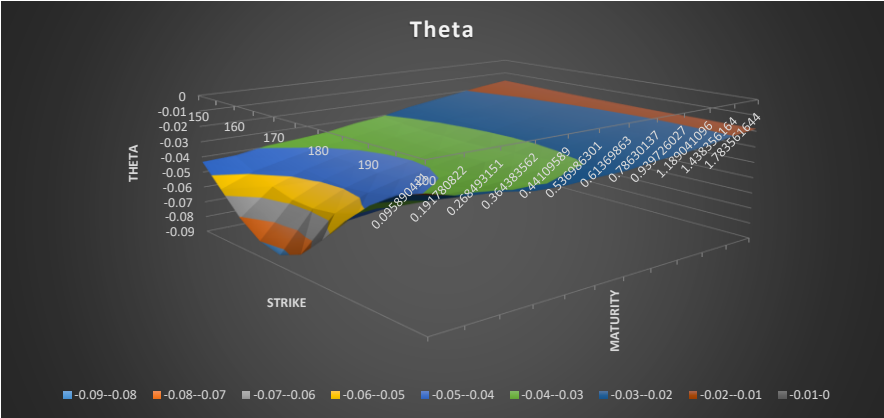
Part 2 (Emperical)

Target	Date	Price
Apple Inc. (AAPL)	4/9/2022	170.09

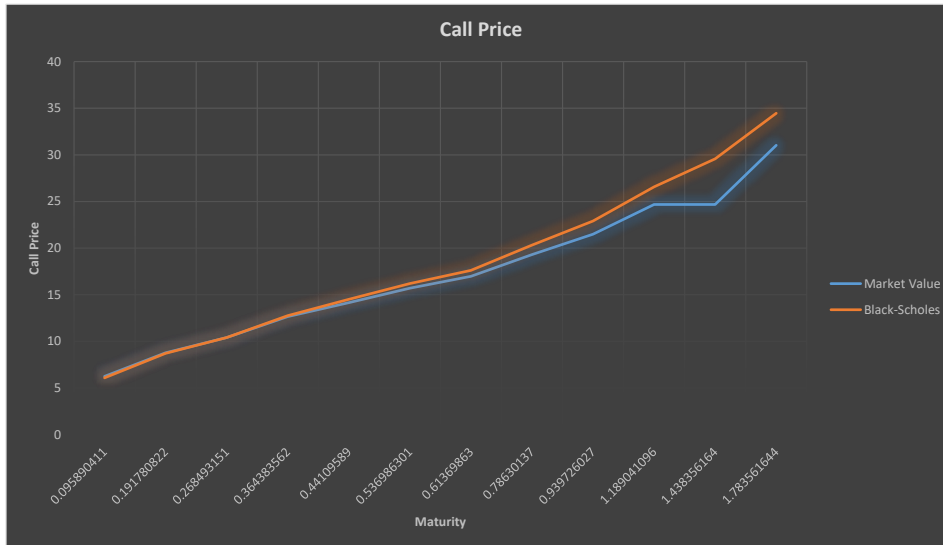


In the above 3D plot the smile can be seen for different maturity. As we going far from the asset price, smile is more visible to us.





Part 3 (Emperical)



Strike	Last Price	Bid	Ask	mid	Implied Volatility	BS call
T	0.09589		r	0.009618		
170	6.25	6.2	6.3	6.25	0.2841	6.087546
T	0.191781		r	0.009777		
170	8.75	8.75	8.8	8.775	0.2869	8.715493
T	0.268493		r	0.009724		
170	10.35	10.35	10.45	10.4	0.2889	10.40134
T	0.364384		r	0.011043		
170	12.5	12.6	12.7	12.65	0.3032	12.76397
T	0.441096		r	0.012361		
170	13.91	14.05	14.25	14.15	0.3118	14.49791
T	0.536986		r	0.01368		
170	15.67	15.6	15.8	15.7	0.3139	16.18928
T	0.613699		r	0.014897		
170	16.95	16.85	17.1	16.975	0.318	17.61052
T	0.786301		r	0.017329		
170	19.05	19.15	19.45	19.3	0.3207	20.31553
T	0.939726		r	0.020182		
170	21.05	21.35	21.65	21.5	0.3272	22.90782
T	1.189041		r	0.021241		
170	24.5	24.45	24.9	24.675	0.3351	26.56856
T	1.438356		r	0.023359		
170	24.5	24.45	24.9	24.675	0.3351	29.58193
T	1.783562		r	0.025477		
170	30.63	30.65	31.4	31.025	0.3473	34.46021