MA 374 Lab 8

210123076

Karan Garg

Q1

SNo	Stock Name	Historical Volatility
1	^BSESN	0.126321
2	WIPRO.BO	2.52601
3	TCS.BO	1.91802
4	RELIANCE.BO	2.32248
5	INFY.BO	2.68743
6	TATAMOTORS.BO	4.41117
7	MARUTI.BO	0.88802
8	HEROMOTOCO.BO	1.38245
9	HDFCBANK.BO	1.37197
10	BAJFINANCE.BO	2.82509
11	BAJAJ-AUTO.BO	2.212
12	BAJAJ-AUTO.NS	2.21907
13	COLPAL.NS	1.59972
14	MPHASIS.NS	2.79934
15	ONGC.NS	2.32973
16	SIEMENS.NS	3.23093
17	TATAPOWER.NS	3.84129
18	TRENT.NS	3.59164
19	VEDL.NS	5.20818
20	VOLTAS.NS	1.98782
21	ZEEL.NS	3.20429

Historical Volatility of last month for NSE

SNo	Stock Name	Historical Volatility
1	^NSEI	0.126786
2	TATACHEM.NS	2.57538
3	ACC.NS	1.17173
4	MGL.NS	0.998757
5	GODREJIND.NS	1.16161
6	HINDZINC.NS	0.923135
7	IDEA.NS	5.31446
8	IGL.NS	1.913
9	LUPIN.NS	1.56311
10	MAHABANK.NS	2.39143
11	PAGEIND.NS	1.18488
12	AMBUJACEM.NS	2.27423
13	BANKBARODA.NS	2.36373
14	HAL.NS	2.89113
15	HAVELLS.NS	1.87511
16	ICICIGI.NS	2.3644
17	ICICIPRULI.NS	2.18536
18	INDIGO.NS	2.24343
19	IOC.NS	1.7094
20	JINDALSTEL.NS	4.59425
21	NAUKRI.NS	3.94163

There are too many stocks in our data, I am attaching screenshots for the first 5 stocks in this report. One may run the python code to see the output for the rest of the stocks

BSE:

For WIPRO.BO
Historical volatility for last 1 month = 2.5260138750845926

Strike price (K)	Call Option	Put Option
0.5*S0	384.522	121.97
0.6*S0	369.856	157.284
0.7*S0	356.76	194.169
0.8*S0	344.938	232.326
0.9*S0	334.169	271.537
1.0*S0	324.29	311.637
1.1*S0	315.171	352.499
1.2*S0	306.711	394.018
1.3*S0	298.827	436.114
1.4*S0	291.452	478.718
1.5*S0	284.528	521.774

For TCS.BO
Historical volatility for last 1 month = 1.9180195803695936

Strike price (K)	Call Option	Put Option
0.5*S0	2101.43	497.792
0.6*S0	1975.1	676.733
0.7*S0	1863.22	870.125
0.8*S0	1763.25	1075.42
0.9*S0	1673.24	1290.68
1.0*S0	1591.67	1514.39
1.1*S0	1517.35	1745.35
1.2*S0	1449.3	1982.57
1.3*S0	1386.72	2225.26
1.4*S0	1328.95	2472.76
1.5*S0	1275.44	2724.52

For RELIANCE.BO
Historical volatility for last 1 month = 2.322476719214693

Strike price (K)	Call Option	Put Option
0.5*S0	1406.36	412.414
0.6*S0	1343.98	539.245
0.7*S0	1288.42	672.895
0.8*S0	1238.41	812.094
0.9*S0	1193.01	955.901
1.0*S0	1151.5	1103.6
1.1*S0	1113.32	1254.63
1.2*S0	1078.02	1408.54
1.3*S0	1045.25	1564.98
1.4*S0	1014.7	1723.64
1.5*S0	986.116	1884.27

For INFY.BO
Historical volatility for last 1 month = 2.6874333533823473

Strike price (K)	Call Option	Put Option
0.5*S0	1051.32	351.454
0.6*S0	1015.72	449.089
0.7*S0	983.886	550.478
0.8*S0	955.081	654.9
0.9*S0	928.785	761.831
1.0*S0	904.604	870.877
1.1*S0	882.231	981.731
1.2*S0	861.423	1094.15
1.3*S0	841.986	1207.94
1.4*S0	823.758	1322.94
1.5*S0	806.606	1439.02

For TATAMOTORS.BO
Historical volatility for last 1 month = 4.411166487863147

Strike price (K)	Call Option	Put Option
0.5*S0	278.477	123.134
0.6*S0	275.903	150.132
0.7*S0	273.572	177.372
0.8*S0	271.435	204.806
0.9*S0	269.456	232.398
1.0*S0	267.611	260.125
1.1*S0	265.879	287.964
1.2*S0	264.246	315.903
1.3*S0	262.7	343.928
1.4*S0	261.23	372.029
1.5*S0	259.828	400.199

NSE:

For NAUKRI.NS
Historical volatility for last 1 month = 3.9416348224866113

Strike price (K)	Call Option	Put Option
0.5*S0	3433.04	1452.82
0.6*S0	3387.38	1784.12
0.7*S0	3346.13	2119.83
0.8*S0	3308.4	2459.05
0.9*S0	3273.56	2801.17
1.0*S0	3241.15	3145.72
1.1*S0	3210.81	3492.34
1.2*S0	3182.28	3840.76
1.3*S0	3155.32	4190.76
1.4*S0	3129.75	4542.15
1.5*S0	3105.42	4894.78

For JINDALSTEL.NS
Historical volatility for last 1 month = 4.594246904435654

Strike price (K)	Call Option	Put Option
0.5*S0	201.455	90.2761
0.6*S0	199.845	109.83
0.7*S0	198.385	129.535
0.8*S0	197.046	149.36
0.9*S0	195.805	169.283
1.0*S0	194.647	189.289
1.1*S0	193.559	209.365
1.2*S0	192.532	229.503
1.3*S0	191.559	249.694
1.4*S0	190.633	269.933
1.5*S0	189.75	290.213

For IOC.NS
Historical volatility for last 1 month = 1.709402887311567

Strike price (K)	Call Option	Put Option
0.5*S0	36.5326	7.41428
0.6*S0	33.9551	10.3798
0.7*S0	31.6798	13.6476
0.8*S0	29.6561	17.1669
0.9*S0	27.8443	20.898
1.0*S0	26.2126	24.8094
1.1*S0	24.7357	28.8755
1.2*S0	23.3926	33.0754
1.3*S0	22.1661	37.3919
1.4*S0	21.0419	41.8108
1.5*S0	20.0081	46.3199

Q3

For INDIGO.NS
Historical volatility for last 1 month = 2.2434302798089343

Strike price (K)	Call Option	Put Option
0.5*S0	1168.61	330.927
0.6*S0	1113.63	435.411
0.7*S0	1064.71	545.956
0.8*S0	1020.74	661.442
0.9*S0	980.869	781.037
1.0*S0	944.472	904.104
1.1*S0	911.049	1030.14
1.2*S0	880.199	1158.76
1.3*S0	851.598	1289.62
1.4*S0	824.978	1422.46
1.5*S0	800.117	1557.06

For ICICIPRULI.NS
Historical volatility for last 1 month = 2.1853623595223577

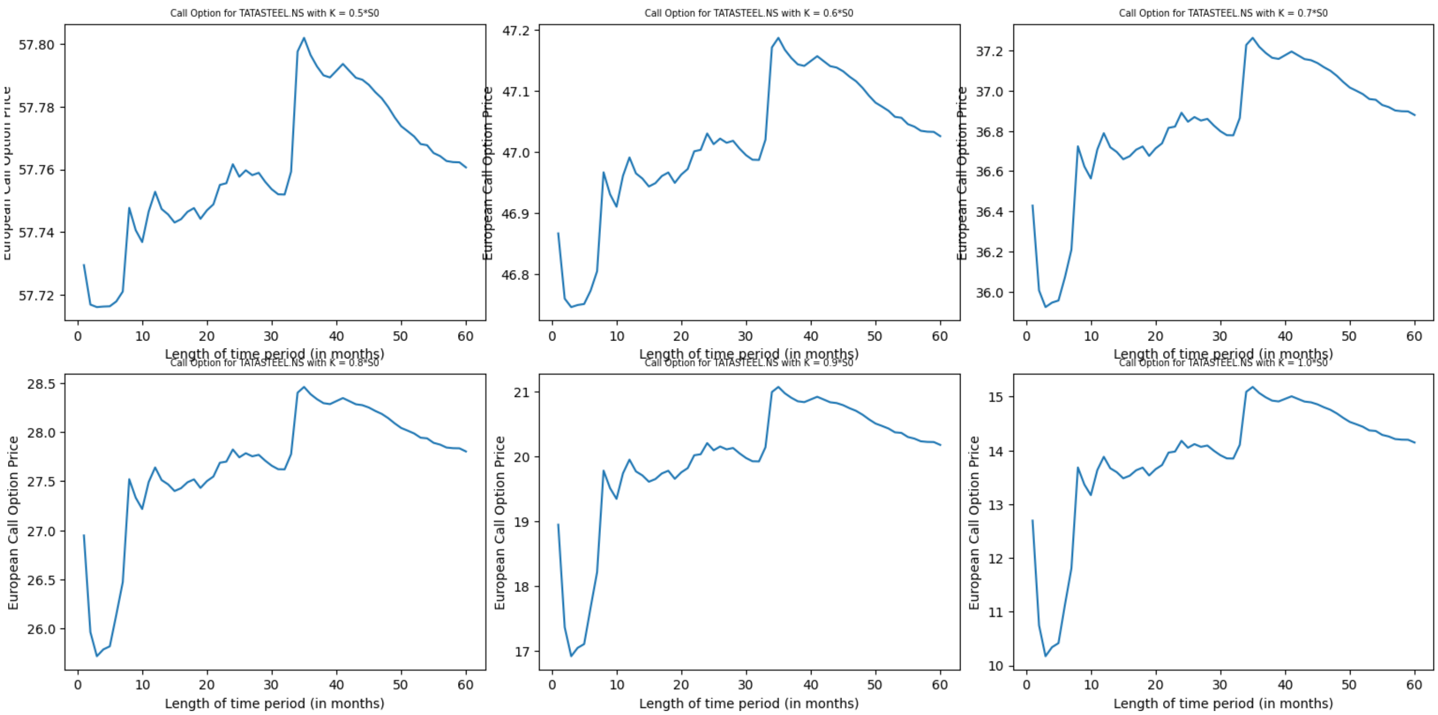
Strike price (K)	Call Option	Put Option
0.5*S0	308.537	85.0012
0.6*S0	293.378	112.394
0.7*S0	279.9	141.469
0.8*S0	267.795	171.917
0.9*S0	256.834	203.508
1.0*S0	246.838	236.066
1.1*S0	237.67	269.451
1.2*S0	229.219	303.552
1.3*S0	221.393	338.279
1.4*S0	214.119	373.558
1.5*S0	207.334	409.326

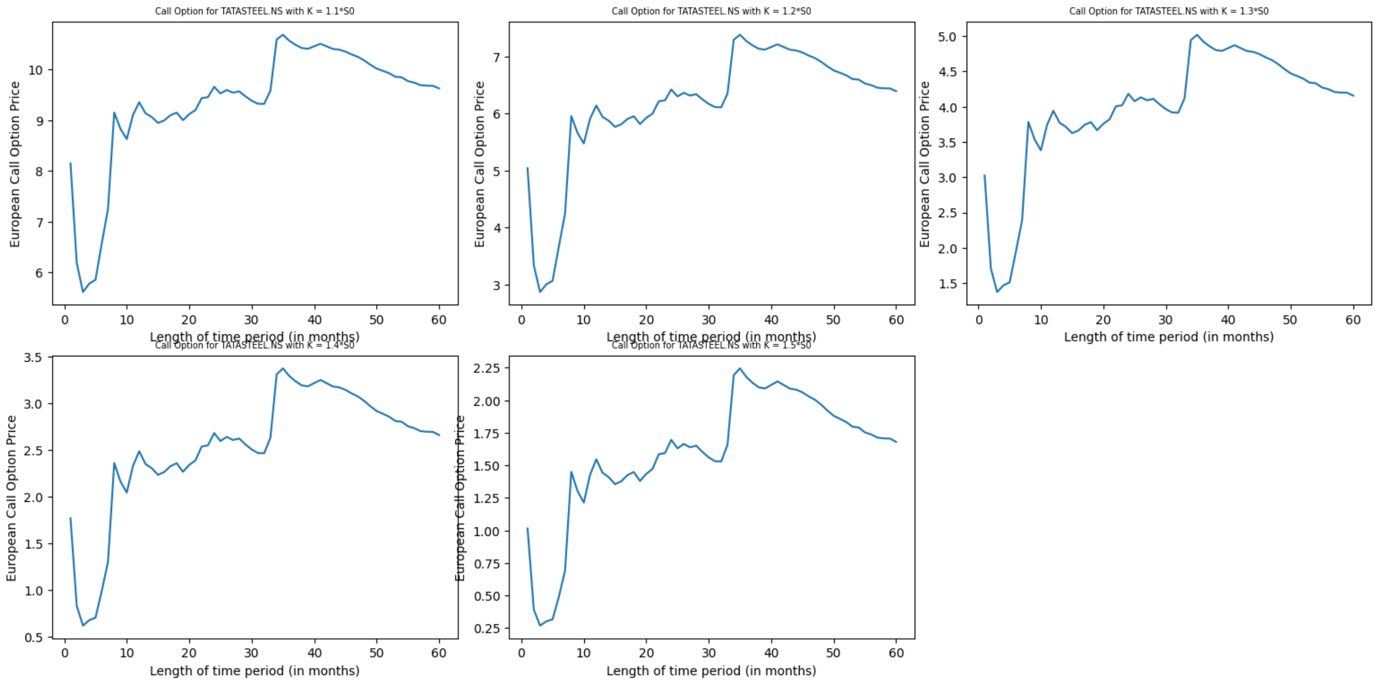
Q3

Again there are too many stocks in our data, I am attaching screenshots for the first 2 stocks of both bse/nse in this report. One may run the python code to see the output for the rest of the stocks.

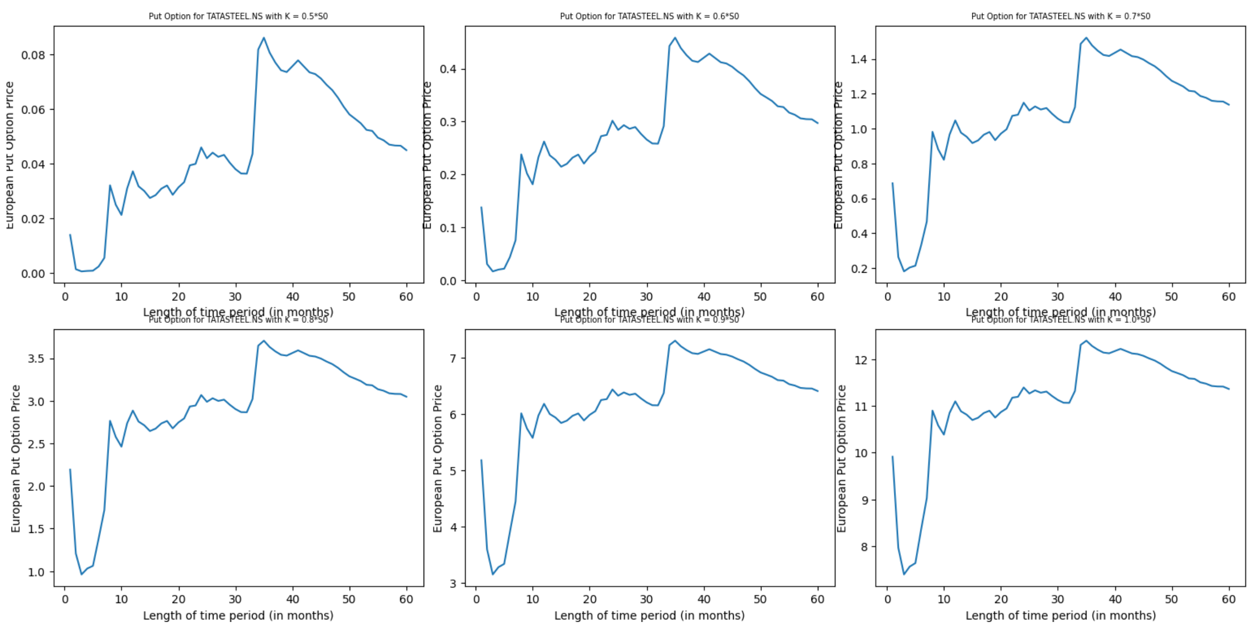
BSE:

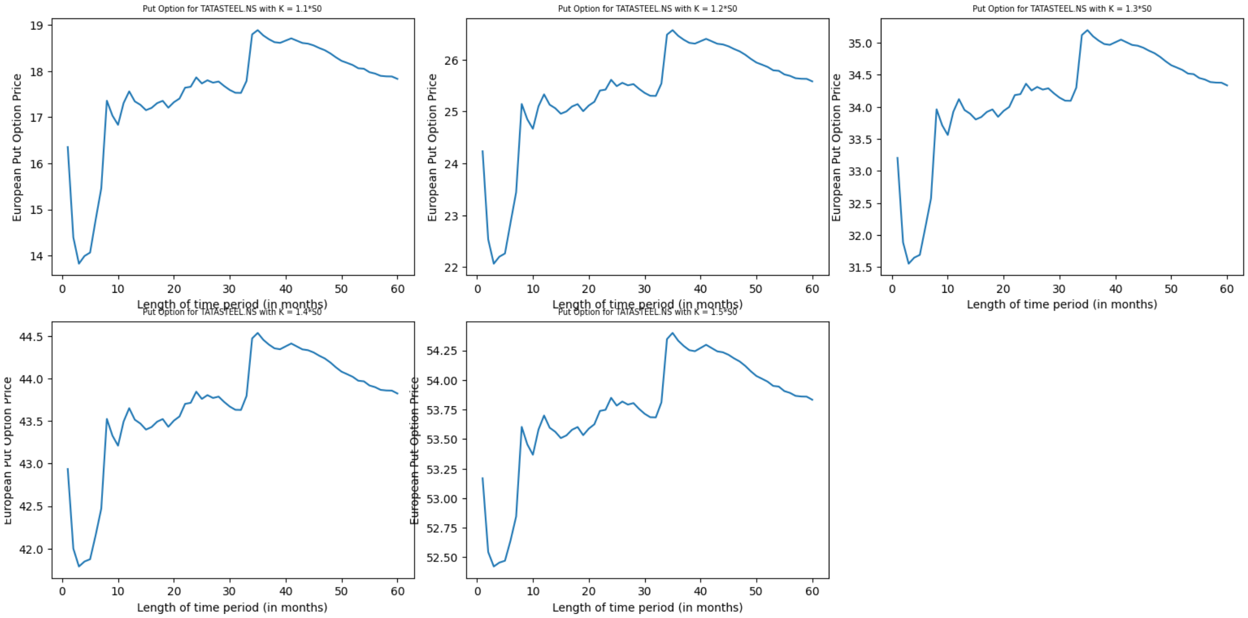
1) TATASTEEL
    a) Call Option



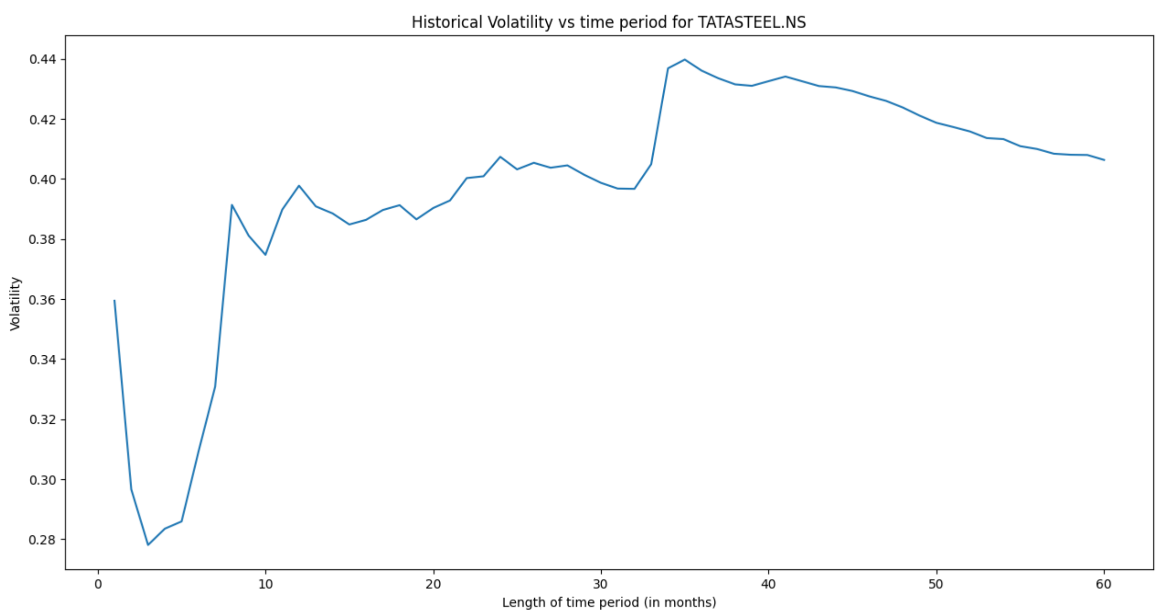

Call Option for TATASTEEL.NS with K = 1.1*S0
Call Option for TATASTEEL.NS with K = 1.2*S0
Call Option for TATASTEEL.NS with K = 1.3*S0
Call Option for TATASTEEL.NS with K = 1.4*S0
Call Option for TATASTEEL.NS with K = 1.5*S0
European Call Option Price
Length of time period (in months)

b) Put Option


Put Option for TATASTEEL.NS with K = 0.5*S0
Put Option for TATASTEEL.NS with K = 0.6*S0
Put Option for TATASTEEL.NS with K = 0.7*S0
Put Option for TATASTEEL.NS with K = 0.8*S0
Put Option for TATASTEEL.NS with K = 0.9*S0
Put Option for TATASTEEL.NS with K = 1.0*S0
European Put Option Price
Length of time period (in months)

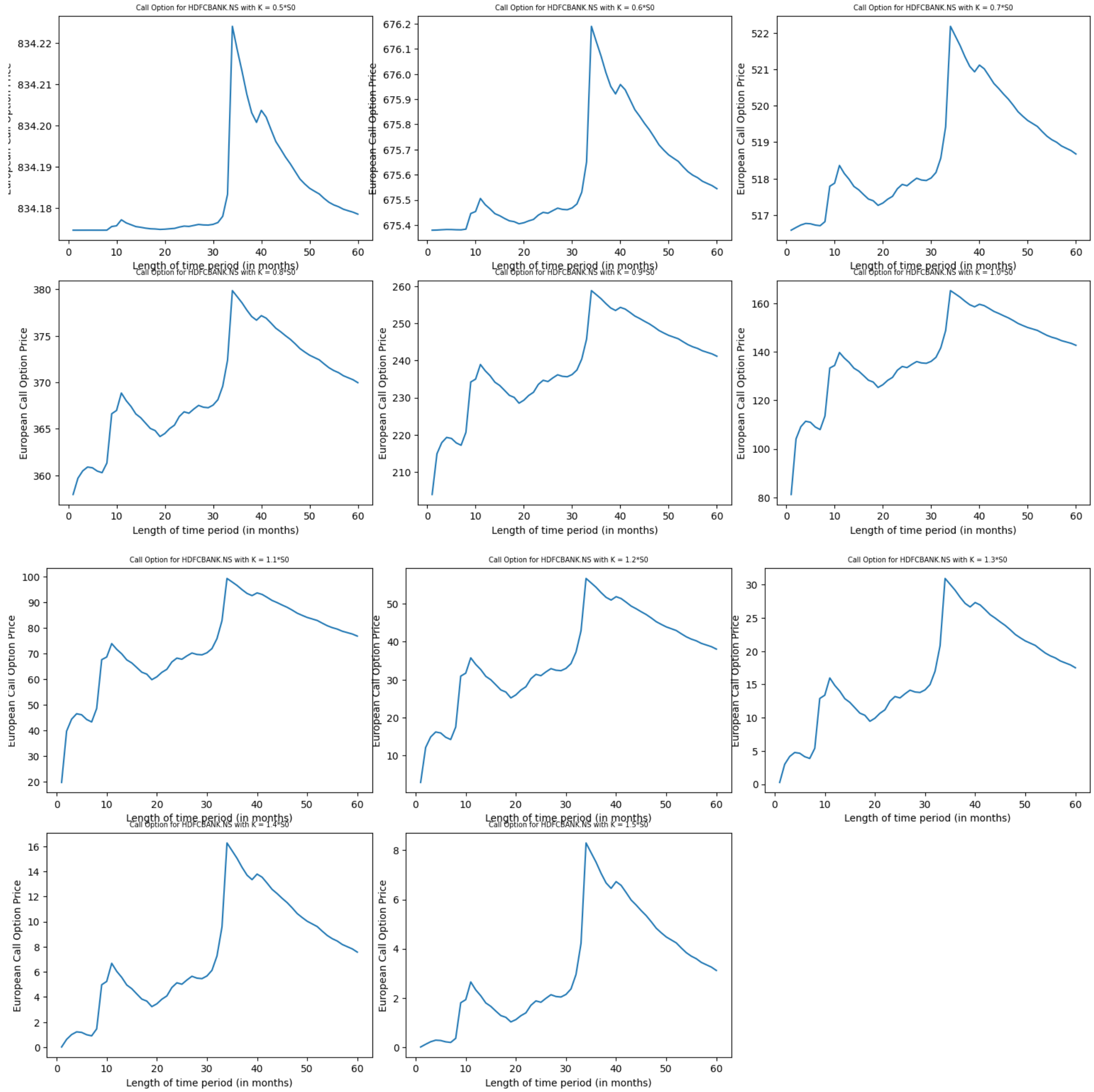


c) Volatility Graph

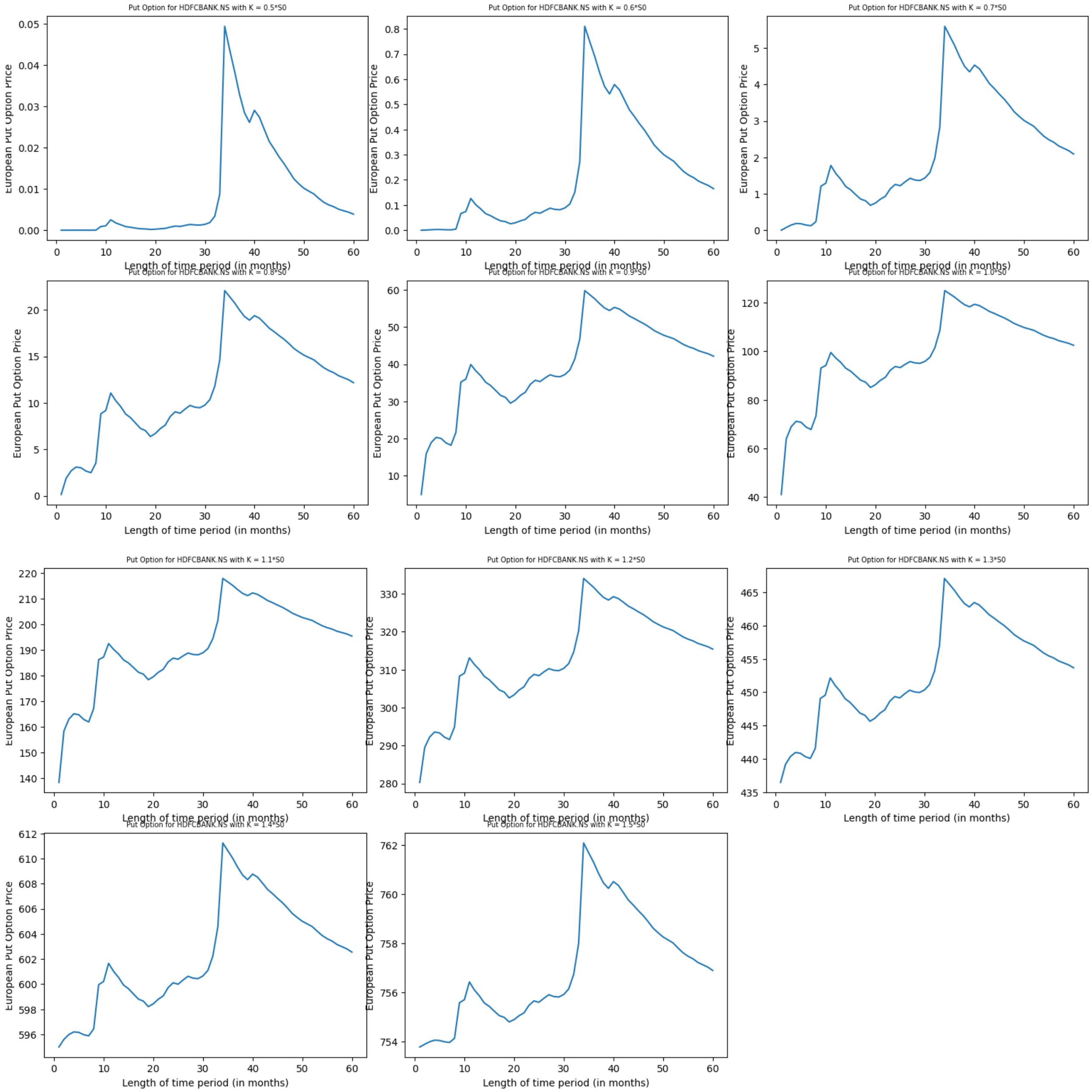


2) HDFC BANK

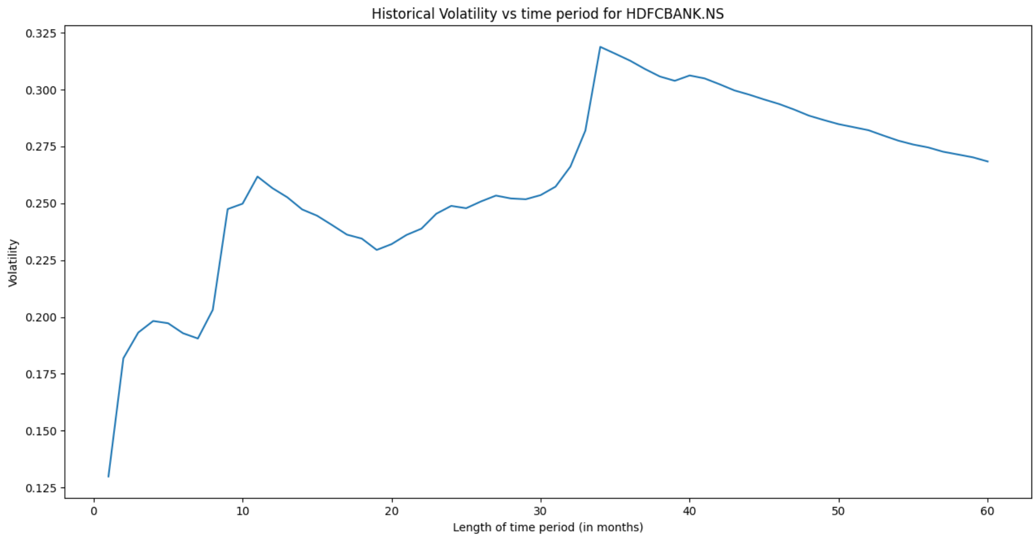
a) Call Option


Call Option for HDFCBANK.NS with K = 0.5*S0
Call Option for HDFCBANK.NS with K = 0.6*S0
Call Option for HDFCBANK.NS with K = 0.7*S0
Call Option for HDFCBANK.NS with K = 0.8*S0
Call Option for HDFCBANK.NS with K = 0.9*S0
Call Option for HDFCBANK.NS with K = 1.0*S0
Call Option for HDFCBANK.NS with K = 1.1*S0
Call Option for HDFCBANK.NS with K = 1.2*S0
Call Option for HDFCBANK.NS with K = 1.3*S0
Call Option for HDFCBANK.NS with K = 1.4*S0
Call Option for HDFCBANK.NS with K = 1.5*S0
European Call Option Price
Length of time period (in months)

b) Put Option



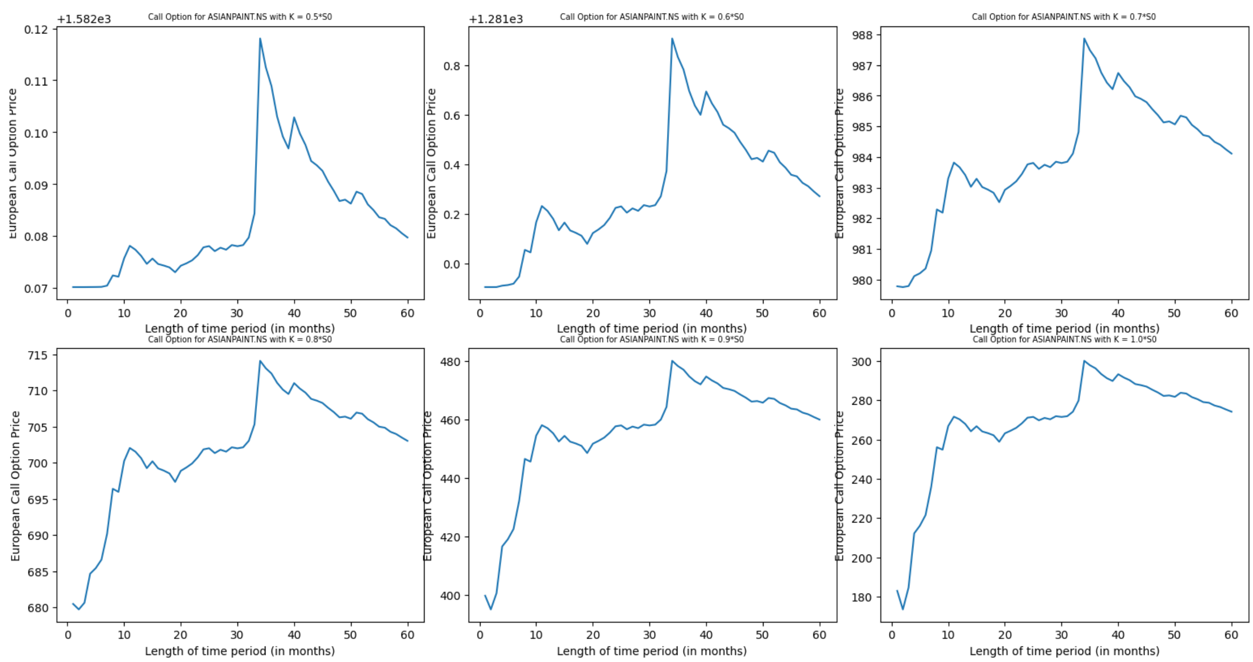
c) Volatility Graph

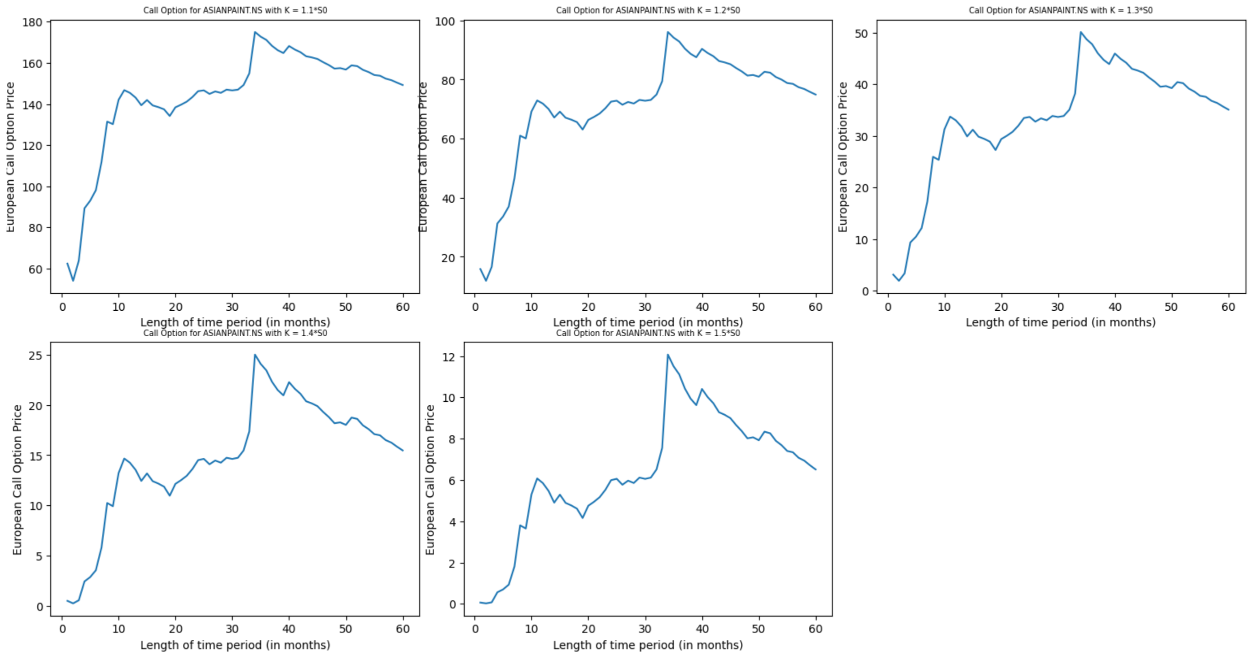


NSE:

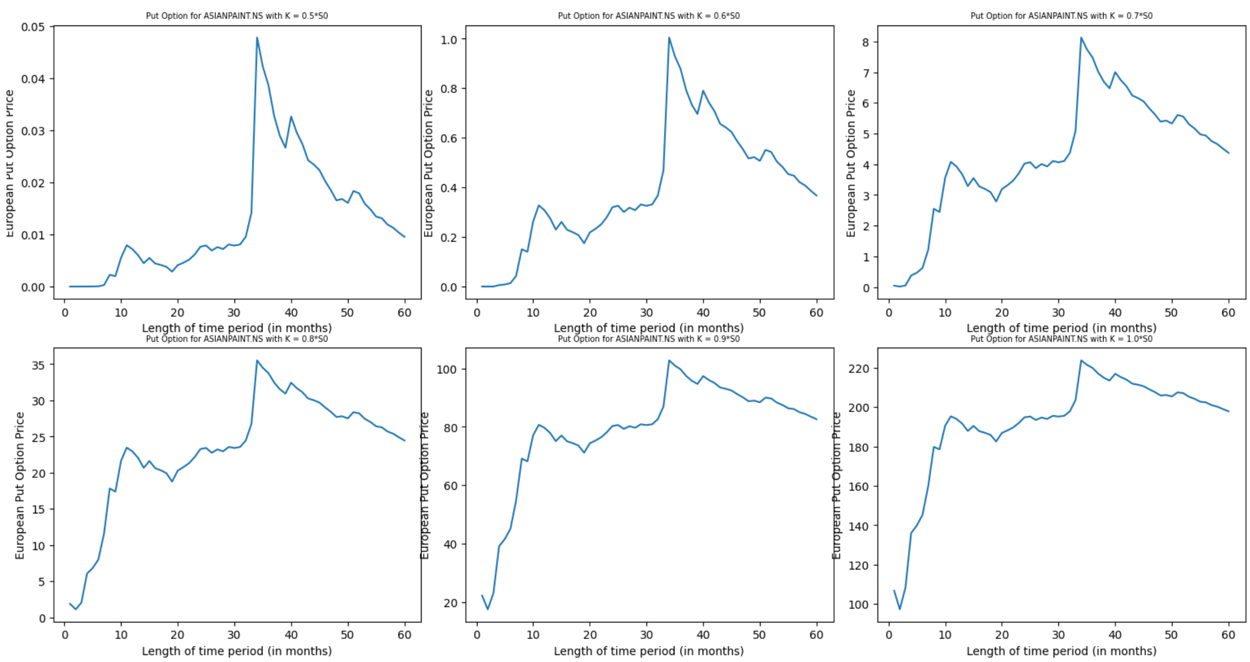
1) Asian Paints

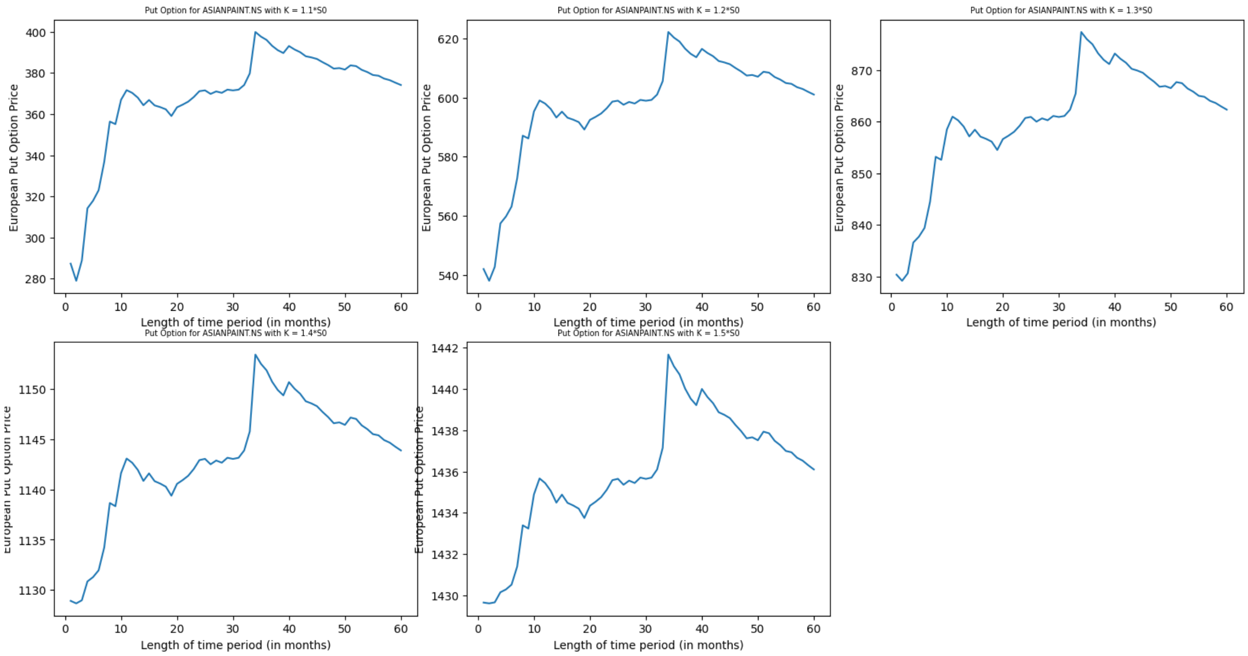
   a) Call Option



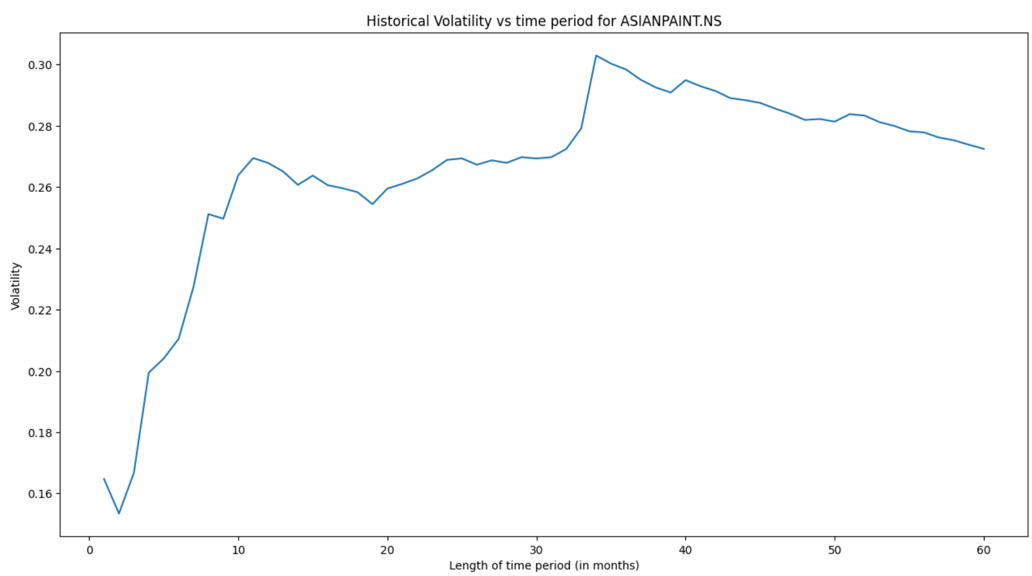

Call Option for ASIANPAINT.NS with K = 1.1*S0
Call Option for ASIANPAINT.NS with K = 1.2*S0
Call Option for ASIANPAINT.NS with K = 1.3*S0
Call Option for ASIANPAINT.NS with K = 1.4*S0
Call Option for ASIANPAINT.NS with K = 1.5*S0
European Call Option Price
Length of time period (in months)

b) Put Option


Put Option for ASIANPAINT.NS with K = 0.5*S0
Put Option for ASIANPAINT.NS with K = 0.6*S0
Put Option for ASIANPAINT.NS with K = 0.7*S0
Put Option for ASIANPAINT.NS with K = 0.8*S0
Put Option for ASIANPAINT.NS with K = 0.9*S0
Put Option for ASIANPAINT.NS with K = 1.0*S0
European Put Option Price
Length of time period (in months)

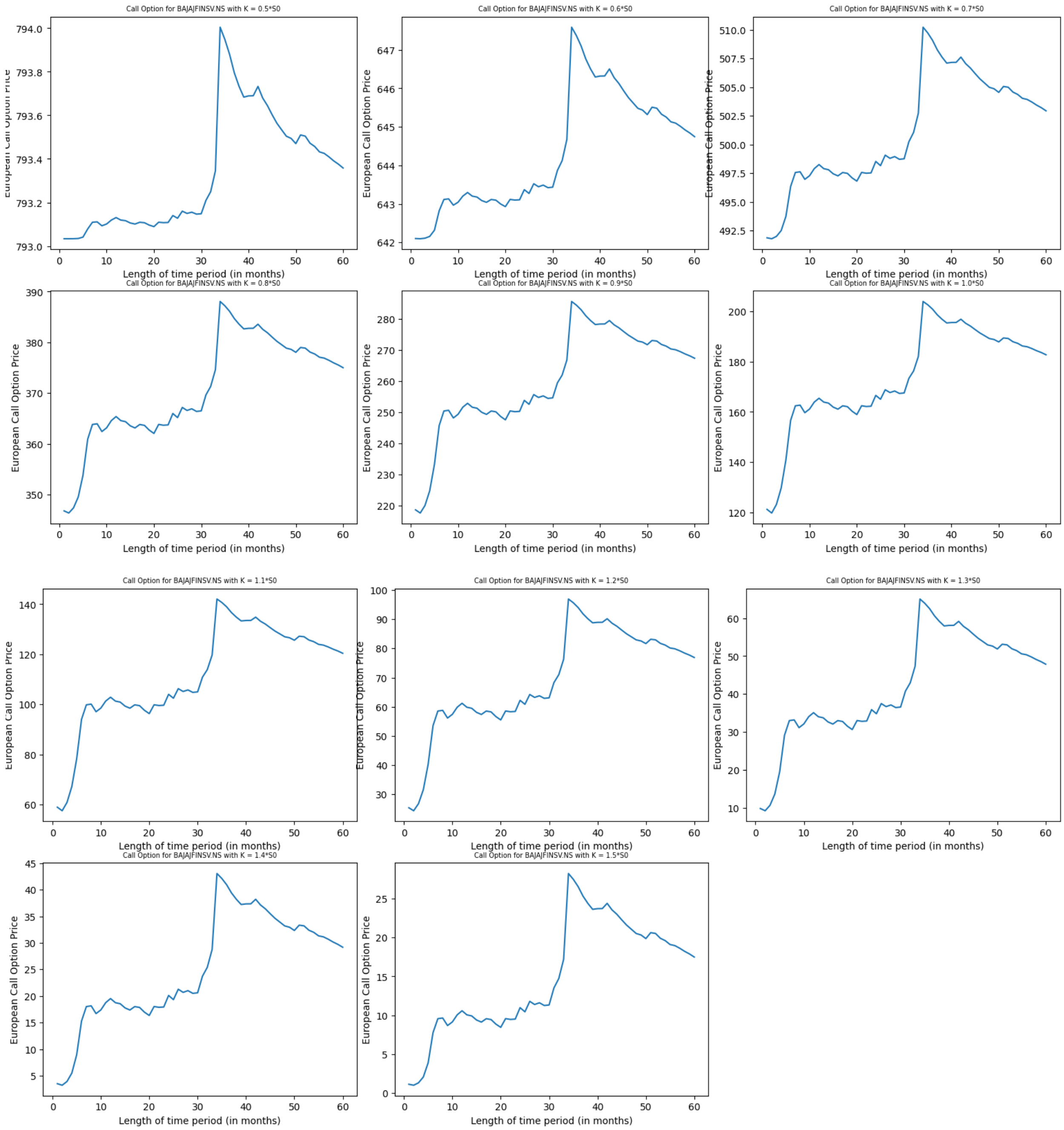


c) Volatility Graph

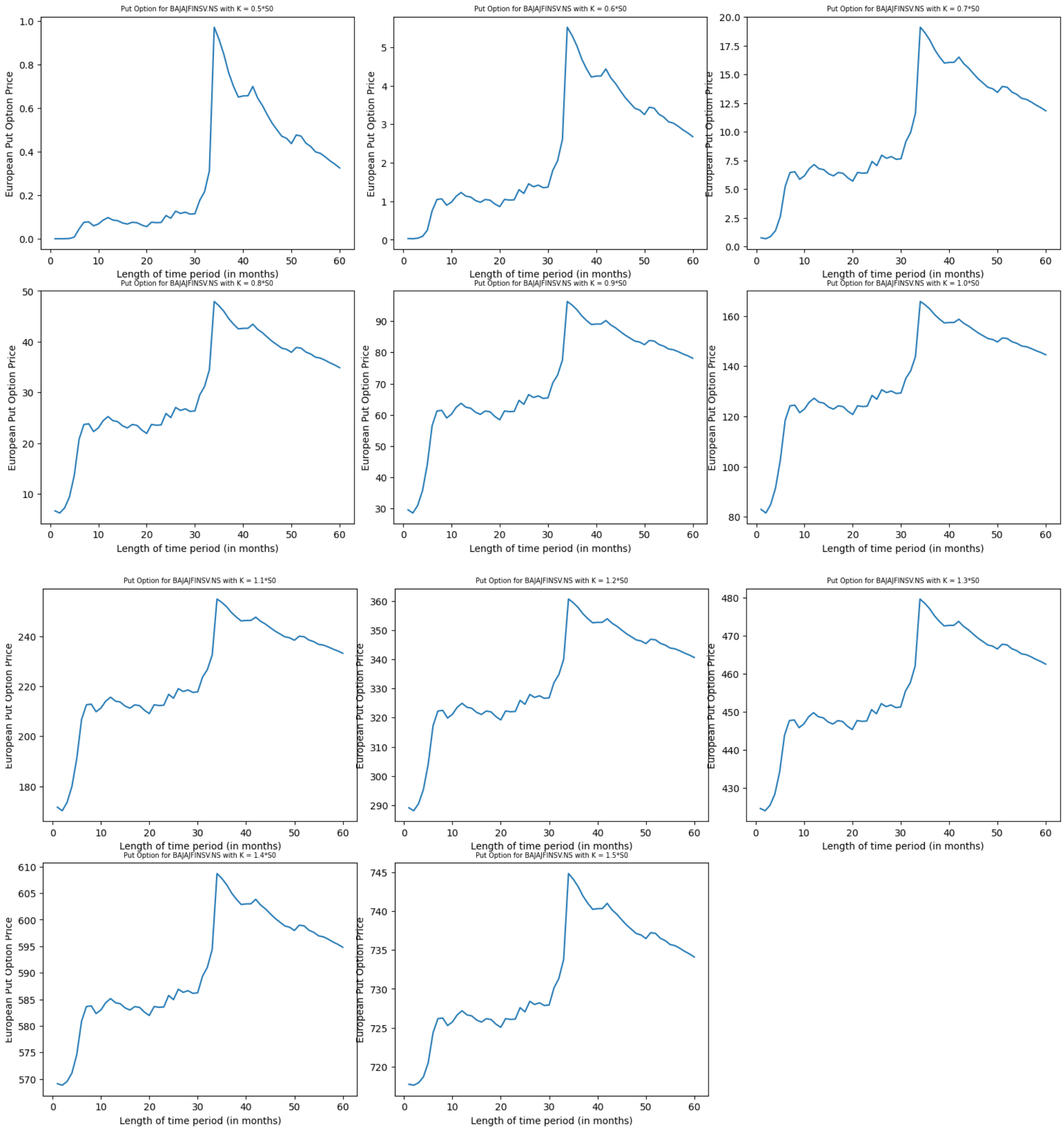


2) Bajaj Finance

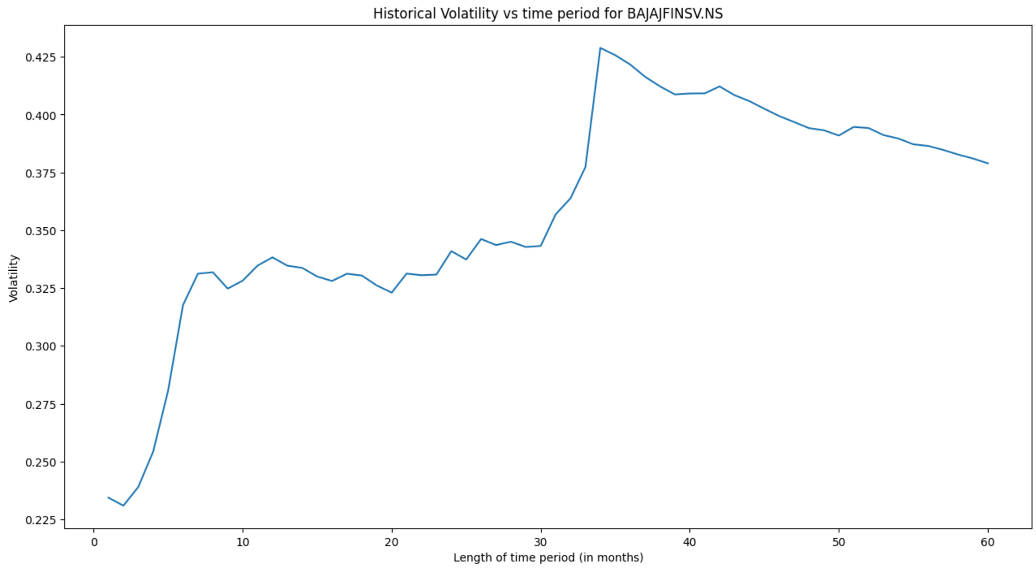
a) Call Option


Call Option for BAJAJFINSV.NS with K = 0.5*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 0.6*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 0.7*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 0.8*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 0.9*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.0*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.1*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.2*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.3*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.4*S0
European Call Option Price
Length of time period (in months)
Call Option for BAJAJFINSV.NS with K = 1.5*S0
European Call Option Price
Length of time period (in months)

b) Put Option



c) Volatility Graph


Historical Volatility vs time period for BAJAJFINSV.NS
Volatility
0.425
0.400
0.375
0.350
0.325
0.300
0.275
0.250
0.225
0
10
20
30
40
50
60
Length of time period (in months)