

MA – 374 – Financial Engineering Lab Assignment – 9

Question 1a:

Stock Name	Volatility
RELIANCE_BO	0.160747
TCS_BO	0.243212
HDFCBANK_BO	0.164131
HINDUNILVR_BO	0.157259
INFY_BO	0.24727
KOTAKBANK_BO	0.17253
ICICIBANK_BO	0.244665
LT_BO	0.258421
HDFC_BO	0.15684
SBIN_BO	5
GOOGL	0.335912
AAPL	0.199622
AMZN	0.341236
MSFT	0.267416
NVDA	0.34038
GOOG	0.334109
NFLX	0.620067
TSLA	0.509709
INTC	0.350828
CSCO	0.133358

Stock Name	Volatility
RELIANCE_NS	0.173124
TCS_NS	0.225864
HINDUNILVR_NS	0.173418
INFY_NS	0.240208
KOTAKBANK_NS	0.176667
ICICIBANK_NS	0.243535
LT_NS	0.247836
SBIN_NS	0.273158
ITC_NS	0.222117
ONGC_NS	0.186844
BABA	0.431211
BIDU	0.390618
NVDA	0.327806
JD	0.434321
PYPL	0.342996
SNAP	0.330928
MCD	0.114819
UBER	0.280114
LYFT	0.133966
SQ	0.699429

Question 1b:

Using final price of stock price in the data as S0, the option prices are computed

Stock name - RELIANCE_BO

Historical volatility for last 1 month = 0.16074717546735434

K=1304.025024 , call=1336.221517 , put=0.000000

K=1564.830029 , call=1081.855865 , put=0.000054

K=1825.635034 , call=827.515052 , put=0.024948

K=2086.440039 , call=574.465192 , put=1.340794

K=2347.245044 , call=336.097350 , put=17.338659

K=2608.050049 , call=151.747314 , put=87.354329

K=2868.855054 , call=50.200892 , put=240.173614

K=3129.660059 , call=12.164364 , put=456.502791

K=3390.465063 , call=2.227221 , put=700.931355

K=3651.270068 , call=0.321257 , put=953.391098

K=3912.075073 , call=0.038046 , put=1207.473593

Stock name - TCS_BO

Historical volatility for last 1 month = 0.2432119583139757

K=1898.925049 , call=1945.811144 , put=0.001469

K=2278.710059 , call=1575.527327 , put=0.125736

K=2658.495068 , call=1207.481853 , put=2.488347

K=3038.280078 , call=853.769291 , put=19.183869

K=3418.065088 , call=543.167378 , put=78.990040

K=3797.850098 , call=306.621357 , put=212.852104

K=4177.635107 , call=153.570814 , put=430.209646

K=4557.420117 , call=68.904592 , put=715.951508
K=4937.205127 , call=28.091259 , put=1045.546259
K=5316.990137 , call=10.563854 , put=1398.426939
K=5696.775146 , call=3.716558 , put=1761.987727

Stock name - HDFCBANK_BO

Historical volatility for last 1 month = 0.16413144215377526

K=850.974976 , call=871.985623 , put=0.000000
K=1021.169971 , call=705.992816 , put=0.000059
K=1191.364966 , call=540.021545 , put=0.021654
K=1361.559961 , call=375.020928 , put=1.013902
K=1531.754956 , call=220.127059 , put=12.112899
K=1701.949951 , call=100.591094 , put=58.569800
K=1872.144946 , call=34.152988 , put=158.124560
K=2042.339941 , call=8.625039 , put=298.589476
K=2212.534937 , call=1.669378 , put=457.626681
K=2382.729932 , call=0.257642 , put=622.207810
K=2552.924927 , call=0.032973 , put=787.976008

Stock name - HINDUNILVR_BO

Historical volatility for last 1 month = 0.1572587334591434

K=1316.900024 , call=1349.414402 , put=0.000000
K=1580.280029 , call=1092.537304 , put=0.000031
K=1843.660034 , call=835.678600 , put=0.018457

K=2107.040039 , call=579.936887 , put=1.153873
K=2370.420044 , call=338.177863 , put=16.271979
K=2633.800049 , call=150.752358 , put=85.723603
K=2897.180054 , call=48.492285 , put=240.340659
K=3160.560059 , call=11.232724 , put=459.958228
K=3423.940063 , call=1.935391 , put=707.538025
K=3687.320068 , call=0.259215 , put=962.738978
K=3950.700073 , call=0.028193 , put=1219.385085

Stock name - INFY_BO

Historical volatility for last 1 month = 0.2472701230090616

K=774.974976 , call=794.110009 , put=0.000833
K=929.969971 , call=643.003768 , put=0.062747
K=1084.964966 , call=492.918004 , put=1.145138
K=1239.959961 , call=348.994781 , put=8.390070
K=1394.954956 , call=222.921859 , put=33.485303
K=1549.949951 , call=126.863694 , put=88.595294
K=1704.944946 , call=64.360631 , put=177.260385
K=1859.939941 , call=29.388014 , put=293.455924
K=2014.934937 , call=12.244398 , put=427.480463
K=2169.929932 , call=4.722866 , put=571.127086
K=2324.924927 , call=1.709438 , put=719.281813

Stock name - KOTAKBANK_BO

Historical volatility for last 1 month = 0.1725297752728715

K=957.049988 , call=980.679636 , put=0.000000
K=1148.459985 , call=793.995777 , put=0.000209
K=1339.869983 , call=607.357907 , put=0.046407
K=1531.279980 , call=422.223123 , put=1.595690
K=1722.689978 , call=249.893775 , put=15.950411
K=1914.099976 , call=117.502790 , put=70.243493
K=2105.509973 , call=42.347873 , put=181.772644
K=2296.919971 , call=11.744255 , put=337.853094
K=2488.329968 , call=2.575616 , put=515.368523
K=2679.739966 , call=0.462599 , put=699.939574
K=2871.149963 , call=0.070430 , put=886.231473

Stock name - ICICIBANK_BO

Historical volatility for last 1 month = 0.24466519915427656

K=502.524994 , call=514.932818 , put=0.000438
K=603.029993 , call=416.944654 , put=0.035795
K=703.534991 , call=319.573170 , put=0.687833
K=804.039990 , call=226.067401 , put=5.205585
K=904.544989 , call=144.030995 , put=21.192701
K=1005.049988 , call=81.544379 , put=56.729606
K=1105.554987 , call=41.031737 , put=114.240486
K=1206.059985 , call=18.527650 , put=189.759921
K=1306.564984 , call=7.613301 , put=276.869093
K=1407.069983 , call=2.889531 , put=370.168845
K=1507.574982 , call=1.027135 , put=466.329970

Stock name - LT_BO

Historical volatility for last 1 month = 0.2584214868784518

K=1763.599976 , call=1807.147772 , put=0.004358

K=2116.319971 , call=1463.370083 , put=0.237977

K=2469.039966 , call=1122.662577 , put=3.541777

K=2821.759961 , call=797.928024 , put=22.818533

K=3174.479956 , call=515.236591 , put=84.138407

K=3527.199951 , call=299.509872 , put=212.422995

K=3879.919946 , call=157.059279 , put=413.983709

K=4232.639941 , call=74.994740 , put=675.930478

K=4585.359937 , call=33.018395 , put=977.965440

K=4938.079932 , call=13.579255 , put=1302.537607

K=5290.799927 , call=5.279900 , put=1638.249560

Stock name - HDFC_BO

Historical volatility for last 1 month = nan

K=1389.300049 , call=nan , put=nan

K=1667.160059 , call=nan , put=nan

K=1945.020068 , call=nan , put=nan

K=2222.880078 , call=nan , put=nan

K=2500.740088 , call=nan , put=nan

K=2778.600098 , call=nan , put=nan

K=3056.460107 , call=nan , put=nan

K=3334.320117 , call=nan , put=nan

K=3612.180127 , call=nan , put=nan

K=3890.040137 , call=nan , put=nan

K=4167.900146 , call=nan , put=nan

Stock name - SBIN_BO

Historical volatility for last 1 month = 0.28628147975865514

K=323.225006 , call=331.209858 , put=0.004398

K=387.870007 , call=268.282083 , put=0.125533

K=452.515009 , call=206.343934 , put=1.236295

K=517.160010 , call=148.186460 , put=6.127732

K=581.805011 , call=98.196230 , put=19.186412

K=646.450012 , call=59.845080 , put=43.884172

K=711.095013 , call=33.684587 , put=80.772590

K=775.740015 , call=17.660773 , put=127.797686

K=840.385016 , call=8.712981 , put=181.898804

K=905.030017 , call=4.085780 , put=240.320515

K=969.675018 , call=1.837917 , put=301.121562

Stock name - GOOGL

Historical volatility for last 1 month = 0.33591172925855145

K=61.605000 , call=63.133176 , put=0.007144

K=73.925999 , call=51.201915 , put=0.092676

K=86.246999 , call=39.642537 , put=0.550092

K=98.567999 , call=29.043277 , put=1.967625
K=110.888999 , call=20.062030 , put=5.003171
K=123.209999 , call=13.088461 , put=10.046395
K=135.530999 , call=8.107051 , put=17.081779
K=147.851999 , call=4.800415 , put=25.791936
K=160.172999 , call=2.736799 , put=35.745113
K=172.493999 , call=1.512417 , put=46.537525
K=184.814999 , call=0.814999 , put=57.856900

Stock name - AAPL

Historical volatility for last 1 month = 0.19962158066130956

K=84.510002 , call=86.596562 , put=0.000001
K=101.412003 , call=70.112188 , put=0.000315
K=118.314003 , call=53.647769 , put=0.020585
K=135.216003 , call=37.476044 , put=0.333548
K=152.118004 , call=22.804178 , put=2.146371
K=169.020004 , call=11.625831 , put=7.452712
K=185.922005 , call=4.896047 , put=17.207617
K=202.824005 , call=1.717949 , put=30.514208
K=219.726006 , call=0.512790 , put=45.793737
K=236.628006 , call=0.133430 , put=61.899065
K=253.530006 , call=0.030990 , put=78.281314

Stock name - AMZN

Historical volatility for last 1 month = 0.34123603490394183

K=64.860001 , call=66.470424 , put=0.009024
K=77.832001 , call=53.919345 , put=0.109665
K=90.804001 , call=41.781966 , put=0.624007
K=103.776001 , call=30.677683 , put=2.171444
K=116.748001 , call=21.278305 , put=5.423786
K=129.720001 , call=13.970013 , put=10.767214
K=142.692001 , call=8.727308 , put=18.176230
K=155.664001 , call=5.222686 , put=27.323329
K=168.636002 , call=3.014641 , put=37.767003
K=181.608002 , call=1.689297 , put=49.093379
K=194.580002 , call=0.924244 , put=60.980048

Stock name - MSFT

Historical volatility for last 1 month = 0.2674159562556964

K=166.705002 , call=170.821716 , put=0.000753
K=200.046002 , call=138.335795 , put=0.032640
K=233.387003 , call=106.204755 , put=0.419408
K=266.728003 , call=75.729743 , put=2.462204
K=300.069003 , call=49.320072 , put=8.570342
K=333.410004 , call=29.135651 , put=20.903728
K=366.751004 , call=15.658311 , put=39.944197
K=400.092004 , call=7.725857 , put=64.529551
K=433.433005 , call=3.540830 , put=92.862332
K=466.774005 , call=1.525457 , put=123.364767
K=500.115005 , call=0.624618 , put=154.981737

Stock name - NVDA

Historical volatility for last 1 month = 0.34038032240670485

K=205.434998 , call=210.534977 , put=0.027771

K=246.521997 , call=170.775638 , put=0.340990

K=287.608997 , call=132.315332 , put=1.953242

K=328.695996 , call=97.116092 , put=6.826560

K=369.782996 , call=67.316365 , put=17.099391

K=410.869995 , call=44.151346 , put=34.006930

K=451.956995 , call=27.544792 , put=57.472934

K=493.043994 , call=16.456051 , put=86.456751

K=534.130994 , call=9.480196 , put=119.553454

K=575.217993 , call=5.300704 , put=155.446519

K=616.304993 , call=2.893166 , put=193.111539

Stock name - GOOG

Historical volatility for last 1 month = 0.3341093273457128

K=62.230000 , call=63.773236 , put=0.006773

K=74.675999 , call=51.717650 , put=0.089894

K=87.121999 , call=40.030543 , put=0.541493

K=99.567999 , call=29.305861 , put=1.955519

K=112.013999 , call=20.214964 , put=5.003328

K=124.459999 , call=13.159533 , put=10.086605

K=136.905999 , call=8.127017 , put=17.192796

K=149.351999 , call=4.794589 , put=25.999075

K=161.797999 , call=2.721734 , put=36.064927

K=174.243999 , call=1.496826 , put=46.978726

K=186.689999 , call=0.802340 , put=58.422947

Stock name - NFLX

Historical volatility for last 1 month = 0.620067371014985

K=201.175003 , call=208.712710 , put=2.570678

K=241.410004 , call=174.018175 , put=7.117739

K=281.645004 , call=142.883197 , put=15.224355

K=321.880005 , call=115.836264 , put=27.419017

K=362.115005 , call=92.965059 , put=43.789407

K=402.350006 , call=74.033863 , put=64.099806

K=442.585007 , call=58.620679 , put=87.928217

K=482.820007 , call=46.228022 , put=114.777155

K=523.055008 , call=36.356592 , put=144.147319

K=563.290009 , call=28.546898 , put=175.579221

K=603.525009 , call=22.398150 , put=208.672068

Stock name - TSLA

Historical volatility for last 1 month = 0.5097085868825962

K=104.639999 , call=107.674045 , put=0.450475

K=125.567999 , call=88.535053 , put=1.722768

K=146.495999 , call=70.987693 , put=4.586694

K=167.423999 , call=55.608210 , put=9.618497
K=188.351999 , call=42.685205 , put=17.106778
K=209.279999 , call=32.213883 , put=27.046742
K=230.207999 , call=23.979187 , put=39.223331
K=251.135999 , call=17.656678 , put=53.312108
K=272.063998 , call=12.892927 , put=68.959642
K=292.991998 , call=9.355677 , put=85.833678
K=313.919998 , call=6.758306 , put=103.647593

Stock name - INTC

Historical volatility for last 1 month = 0.3508277735653776

K=17.735001 , call=18.176244 , put=0.003365
K=21.282001 , call=14.750068 , put=0.036613
K=24.829001 , call=11.447971 , put=0.193940
K=28.376001 , call=8.438665 , put=0.644059
K=31.923001 , call=5.895672 , put=1.560490
K=35.470001 , call=3.913477 , put=3.037720
K=39.017001 , call=2.481028 , put=5.064695
K=42.564001 , call=1.511873 , put=7.554964
K=46.111002 , call=0.891307 , put=10.393823
K=49.658002 , call=0.511416 , put=13.473356
K=53.205002 , call=0.287114 , put=16.708478

Stock name - CSCO

Historical volatility for last 1 month = 0.1333575866714754

K=25.674999 , call=26.308917 , put=0.000000
K=30.809999 , call=21.300701 , put=0.000000
K=35.944999 , call=16.292508 , put=0.000023
K=41.079999 , call=11.289925 , put=0.005656
K=46.214999 , call=6.448810 , put=0.172758
K=51.349998 , call=2.607706 , put=1.339870
K=56.484998 , call=0.662435 , put=4.402815
K=61.619998 , call=0.103356 , put=8.851953
K=66.754998 , call=0.010350 , put=13.767163
K=71.889998 , call=0.000711 , put=18.765740
K=77.024998 , call=0.000036 , put=23.773281

Stock Name: RELIANCE_NS :-

Historical volatility for last 1 month = 0.17312422372606626

K=1305.550049 , call=1337.784194 , put=0.000000
K=1566.660059 , call=1083.121321 , put=0.000307
K=1827.770068 , call=828.523889 , put=0.066056
K=2088.880078 , call=576.020526 , put=2.225874
K=2349.990088 , call=341.121869 , put=21.990397
K=2611.100098 , call=160.712916 , put=96.244625
K=2872.210107 , call=58.152051 , put=248.346940
K=3133.320117 , call=16.227259 , put=461.085329
K=3394.430127 , call=3.588122 , put=703.109373
K=3655.540137 , call=0.650891 , put=954.835323
K=3916.650146 , call=0.100231 , put=1208.947843

Stock Name: TCS_NS :-

Historical volatility for last 1 month = 0.22586373316303845

K=1896.000000 , call=1942.812704 , put=0.000298

K=2275.200000 , call=1573.022535 , put=0.047647

K=2654.400000 , call=1204.537425 , put=1.400055

K=3033.600000 , call=847.122955 , put=13.823104

K=3412.800000 , call=529.613189 , put=66.150857

K=3792.000000 , call=288.091664 , put=194.466850

K=4171.200000 , call=135.827241 , put=412.039946

K=4550.400000 , call=56.046006 , put=702.096230

K=4929.600000 , call=20.574088 , put=1036.461830

K=5308.800000 , call=6.841665 , put=1392.566926

K=5688.000000 , call=2.096607 , put=1757.659387

Stock Name: HINDUNILVR_NS :-

Historical volatility for last 1 month = 0.1734184787529056

K=1316.900024 , call=1349.414402 , put=0.000000

K=1580.280029 , call=1092.537594 , put=0.000322

K=1843.660034 , call=835.728182 , put=0.068039

K=2107.040039 , call=581.053029 , put=2.270016

K=2370.420044 , call=344.203538 , put=22.297653

K=2633.800049 , call=162.321161 , put=97.292406

K=2897.180054 , call=58.849313 , put=250.697688

K=3160.560059 , call=16.471854 , put=465.197358

K=3423.940063 , call=3.656936 , put=709.259569

K=3687.320068 , call=0.666623 , put=963.146386

K=3950.700073 , call=0.103228 , put=1219.460120

Stock Name: INFY_NS :-

Historical volatility for last 1 month = 0.2402082131586479

K=770.525024 , call=789.549818 , put=0.000463

K=924.630029 , call=639.292927 , put=0.043710

K=1078.735034 , call=489.869943 , put=0.920866

K=1232.840039 , call=346.032588 , put=7.383650

K=1386.945044 , call=219.489231 , put=31.140431

K=1541.050049 , call=123.146258 , put=85.097596

K=1695.155054 , call=61.076037 , put=173.327514

K=1849.260059 , call=27.037914 , put=289.589531

K=2003.365063 , call=10.840083 , put=423.691838

K=2157.470068 , call=3.997574 , put=567.149468

K=2311.575073 , call=1.375964 , put=714.827997

Stock Name: KOTAKBANK_NS :-

Historical volatility for last 1 month = 0.17666657492923488

K=956.049988 , call=979.654946 , put=0.000000

K=1147.259985 , call=793.166288 , put=0.000348

K=1338.469983 , call=606.738786 , put=0.061851

K=1529.679980 , call=422.042973 , put=1.855044
K=1720.889978 , call=250.827514 , put=17.128592
K=1912.099976 , call=119.534823 , put=72.324906
K=2103.309973 , call=44.265060 , put=183.544150
K=2294.519971 , call=12.801734 , put=338.569829
K=2485.729968 , call=2.967968 , put=515.225069
K=2676.939966 , call=0.570130 , put=699.316237
K=2868.149963 , call=0.093733 , put=885.328845

Stock Name: ICICIBANK_NS :-

Historical volatility for last 1 month = 0.24353548754585577

K=502.024994 , call=514.420434 , put=0.000399
K=602.429993 , call=416.527834 , put=0.033789
K=702.834991 , call=319.232355 , put=0.664301
K=803.239990 , call=225.742281 , put=5.100218
K=903.644989 , call=143.663129 , put=20.947056
K=1004.049988 , call=81.151702 , put=56.361620
K=1104.454987 , call=40.687007 , put=113.822915
K=1204.859985 , call=18.281566 , put=189.343464
K=1305.264984 , call=7.466286 , put=276.454175
K=1405.669983 , call=2.813538 , put=369.727417
K=1506.074982 , call=0.992146 , put=465.832016

Stock Name: LT_NS :-

Historical volatility for last 1 month = 0.24783643928062146

K=1765.500000 , call=1809.092335 , put=0.001985
K=2118.600000 , call=1464.855336 , put=0.146916
K=2471.700000 , call=1122.978370 , put=2.651879
K=2824.800000 , call=795.240033 , put=19.295472
K=3177.900000 , call=508.245753 , put=76.683123
K=3531.000000 , call=289.562339 , put=202.381639
K=3884.100000 , call=147.159339 , put=404.360569
K=4237.200000 , call=67.355886 , put=668.939045
K=4590.300000 , call=28.146749 , put=974.111838
K=4943.400000 , call=10.894177 , put=1301.241196
K=5296.500000 , call=3.958379 , put=1638.687329

Stock Name: SBIN_NS :-

Historical volatility for last 1 month = 0.2731581257234285

K=322.750000 , call=330.720811 , put=0.002085
K=387.300000 , call=267.841315 , put=0.078844
K=451.850000 , call=205.735306 , put=0.929090
K=516.400000 , call=147.012684 , put=5.162722
K=580.950000 , call=96.259113 , put=17.365407
K=645.500000 , call=57.427367 , put=41.489915
K=710.050000 , call=31.322883 , put=78.341687
K=774.600000 , call=15.760098 , put=125.735156
K=839.150000 , call=7.397204 , put=180.328517
K=903.700000 , call=3.275685 , put=239.163252
K=968.250000 , call=1.382878 , put=300.226700

Stock Name: ITC_NS :-

Historical volatility for last 1 month = 0.22211743763782593

K=232.050003 , call=237.779363 , put=0.000025

K=278.460004 , call=192.519811 , put=0.004607

K=324.870004 , call=147.400268 , put=0.149197

K=371.280005 , call=103.552160 , put=1.565223

K=417.690005 , call=64.492497 , put=7.769693

K=464.100006 , call=34.782442 , put=23.323772

K=510.510007 , call=16.164891 , put=49.970355

K=556.920007 , call=6.536461 , put=85.606058

K=603.330008 , call=2.338954 , put=126.672685

K=649.740009 , call=0.754719 , put=170.352583

K=696.150009 , call=0.223570 , put=215.085568

Stock Name: ONGC_NS :-

Historical volatility for last 1 month = 0.18684430006517466

K=104.000000 , call=106.567769 , put=0.000000

K=124.800000 , call=86.281440 , put=0.000117

K=145.600000 , call=66.007632 , put=0.012755

K=166.400000 , call=45.991879 , put=0.283449

K=187.200000 , call=27.618967 , put=2.196982

K=208.000000 , call=13.580620 , put=8.445082

K=228.800000 , call=5.346621 , put=20.497529

K=249.600000 , call=1.697282 , put=37.134636

K=270.400000 , call=0.444796 , put=56.168596

K=291.200000 , call=0.099036 , put=76.109282

K=312.000000 , call=0.019268 , put=96.315960

Stock Name: BABA :-

Historical volatility for last 1 month = 0.4312108347475048

K=38.777500 , call=39.785797 , put=0.050877

K=46.533000 , call=32.455706 , put=0.284802

K=54.288500 , call=25.583912 , put=0.977024

K=62.044000 , call=19.476375 , put=2.433503

K=69.799500 , call=14.349488 , put=4.870632

K=77.555000 , call=10.269897 , put=8.355057

K=85.310500 , call=7.170909 , put=12.820085

K=93.066000 , call=4.905953 , put=18.119146

K=100.821500 , call=3.301561 , put=24.078769

K=108.577000 , call=2.193083 , put=30.534307

K=116.332500 , call=1.442128 , put=37.347369

Stock Name: BIDU :-

Historical volatility for last 1 month = 0.39061785341378163

K=61.500000 , call=63.052891 , put=0.034451

K=73.800000 , call=51.279027 , put=0.256898

K=86.100000 , call=40.089840 , put=1.064024

K=98.400000 , call=30.034678 , put=3.005173
K=110.700000 , call=21.577428 , put=6.544236
K=123.000000 , call=14.916487 , put=11.879606
K=135.300000 , call=9.971055 , put=18.930486
K=147.600000 , call=6.478959 , put=27.434702
K=159.900000 , call=4.112837 , put=37.064892
K=172.200000 , call=2.562184 , put=47.510551
K=184.500000 , call=1.572572 , put=58.517251

Stock Name: NVDA :-

Historical volatility for last 1 month = 0.3278058355283591

K=239.000000 , call=244.921621 , put=0.020690
K=286.800000 , call=198.579397 , put=0.298279
K=334.600000 , call=153.556480 , put=1.895177
K=382.400000 , call=112.126838 , put=7.085348
K=430.200000 , call=76.960183 , put=18.538507
K=478.000000 , call=49.711448 , put=37.909586
K=525.800000 , call=30.376763 , put=65.194715
K=573.600000 , call=17.685520 , put=99.123286
K=621.400000 , call=9.884781 , put=137.942360
K=669.200000 , call=5.341888 , put=180.019281
K=717.000000 , call=2.809129 , put=224.106336

Stock Name: JD :-

Historical volatility for last 1 month = 0.4343214561655574

K=14.230000 , call=14.601107 , put=0.019768
K=17.075999 , call=11.914196 , put=0.108589
K=19.921999 , call=9.397779 , put=0.367903
K=22.767999 , call=7.162849 , put=0.908705
K=25.613999 , call=5.286884 , put=1.808473
K=28.459999 , call=3.792991 , put=3.090311
K=31.305999 , call=2.656375 , put=4.729427
K=34.151999 , call=1.823712 , put=6.672496
K=36.997999 , call=1.232131 , put=8.856647
K=39.843999 , call=0.821967 , put=11.222215
K=42.689999 , call=0.542994 , put=13.718974

Stock Name: PYPL :-

Historical volatility for last 1 month = 0.3429959340395246

K=28.000000 , call=28.695453 , put=0.004131
K=33.600000 , call=23.278746 , put=0.049159
K=39.200000 , call=18.043803 , put=0.275952
K=44.800000 , call=13.257932 , put=0.951816
K=50.400000 , call=9.208187 , put=2.363806
K=56.000000 , call=6.057952 , put=4.675307
K=61.600000 , call=3.794975 , put=7.874065
K=67.200000 , call=2.278795 , put=11.819622
K=72.800000 , call=1.320621 , put=16.323182
K=78.400000 , call=0.743346 , put=21.207643
K=84.000000 , call=0.408687 , put=26.334720

Stock Name: SNAP :-

Historical volatility for last 1 month = 0.33092837061147107

K=6.205000 , call=6.358804 , put=0.000603

K=7.446000 , call=5.156175 , put=0.008333

K=8.687000 , call=3.989028 , put=0.051546

K=9.928000 , call=2.916512 , put=0.189389

K=11.169000 , call=2.006764 , put=0.490000

K=12.410000 , call=1.301287 , put=0.994883

K=13.651000 , call=0.799397 , put=1.703353

K=14.892000 , call=0.468507 , put=2.582823

K=16.133000 , call=0.263905 , put=3.588580

K=17.374000 , call=0.143876 , put=4.678910

K=18.615000 , call=0.076390 , put=5.821784

Stock Name: MCD :-

Historical volatility for last 1 month = 0.11481938034898109

K=141.330002 , call=144.819452 , put=0.000000

K=169.596002 , call=117.251342 , put=0.000000

K=197.862003 , call=89.683236 , put=0.000005

K=226.128003 , call=62.121456 , put=0.006335

K=254.394003 , call=35.039837 , put=0.492826

K=282.660004 , call=12.954230 , put=5.975330

K=310.926004 , call=2.538445 , put=23.127655

K=339.192004 , call=0.248536 , put=48.405856
K=367.458005 , call=0.012893 , put=75.738324
K=395.724005 , call=0.000391 , put=103.293932
K=423.990005 , call=0.000008 , put=130.861659

Stock Name: UBER :-

Historical volatility for last 1 month = nan

K=31.180000 , call=nan , put=nan
K=37.416000 , call=nan , put=nan
K=43.652000 , call=nan , put=nan
K=49.888000 , call=nan , put=nan
K=56.124001 , call=nan , put=nan
K=62.360001 , call=nan , put=nan
K=68.596001 , call=nan , put=nan
K=74.832001 , call=nan , put=nan
K=81.068001 , call=nan , put=nan
K=87.304001 , call=nan , put=nan
K=93.540001 , call=nan , put=nan

Stock Name: LYFT :-

Historical volatility for last 1 month = nan

K=7.450000 , call=nan , put=nan
K=8.940000 , call=nan , put=nan
K=10.430000 , call=nan , put=nan

K=11.920000 , call=nan , put=nan
K=13.410000 , call=nan , put=nan
K=14.900000 , call=nan , put=nan
K=16.390000 , call=nan , put=nan
K=17.880000 , call=nan , put=nan
K=19.370000 , call=nan , put=nan
K=20.859999 , call=nan , put=nan
K=22.349999 , call=nan , put=nan

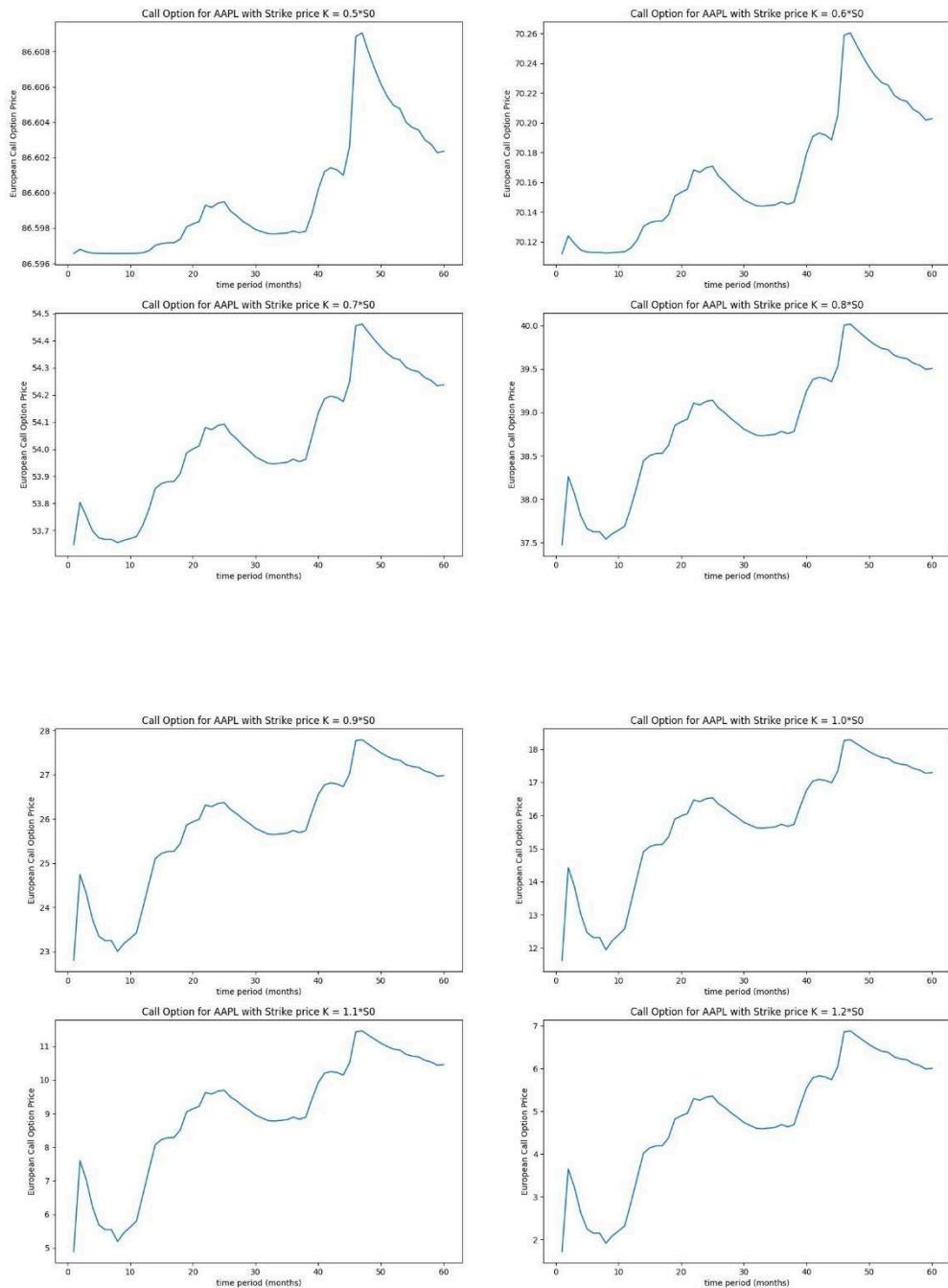
Stock Name: SQ :-

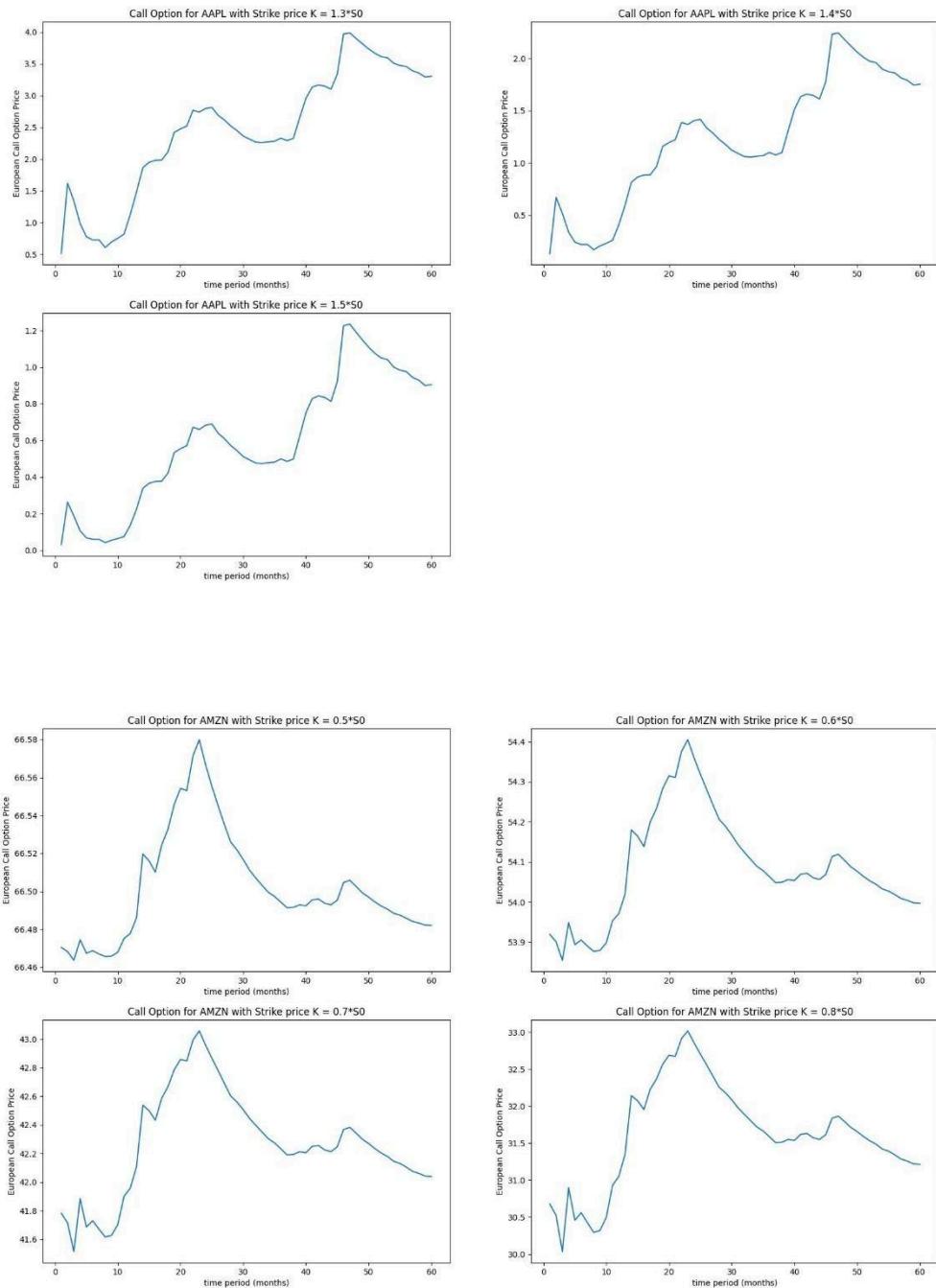
Historical volatility for last 1 month = 0.6994286590340004

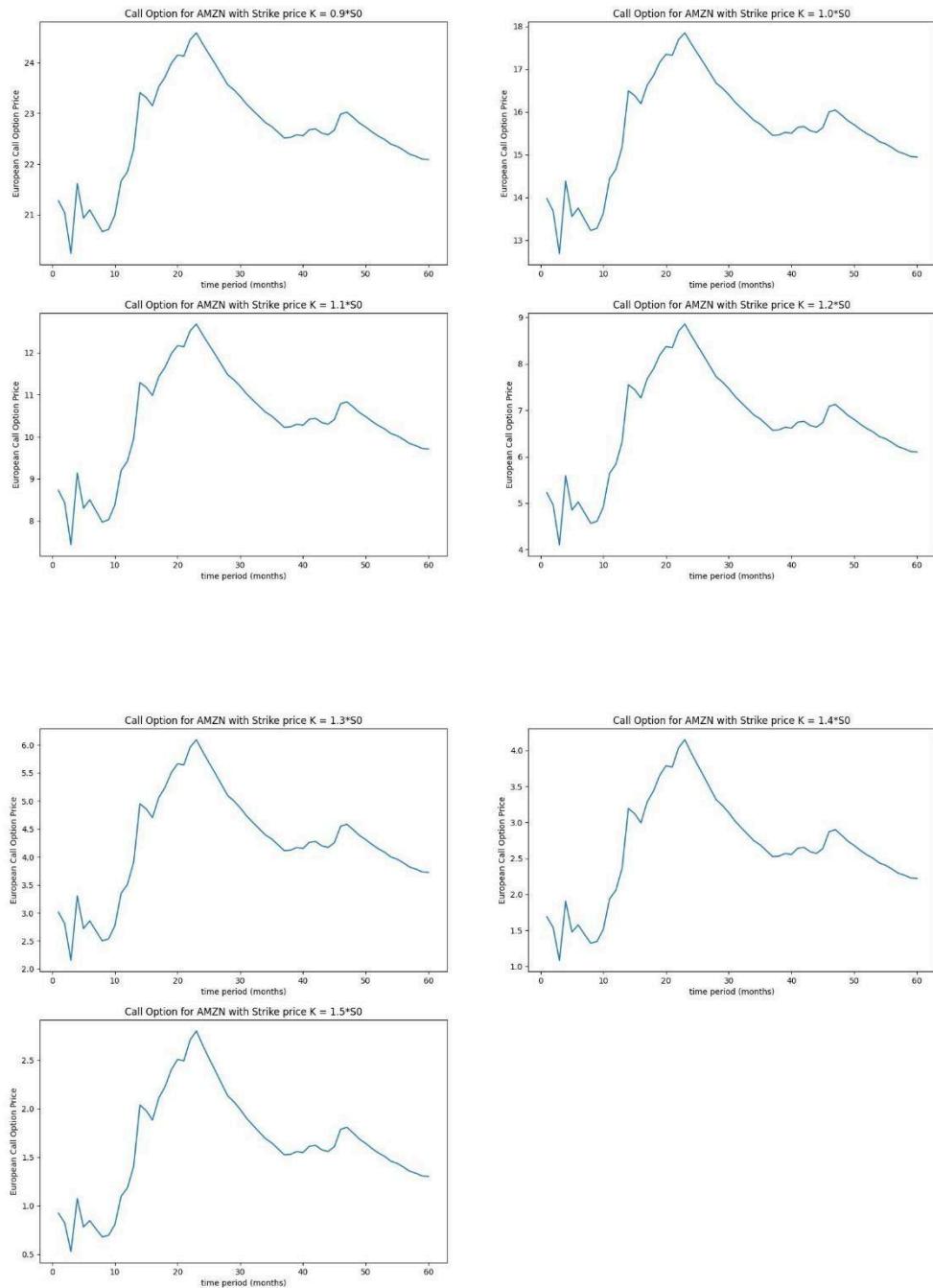
K=29.555000 , call=30.937077 , put=0.652361
K=35.466000 , call=26.073965 , put=1.554306
K=41.377000 , call=21.751880 , put=2.997278
K=47.288000 , call=18.004698 , put=5.015153
K=53.199001 , call=14.817815 , put=7.593327
K=59.110001 , call=12.146391 , put=10.686960
K=65.021001 , call=9.930797 , put=14.236423
K=70.932001 , call=8.107320 , put=18.178003
K=76.843001 , call=6.614631 , put=22.450371
K=82.754001 , call=5.397147 , put=26.997943
K=88.665001 , call=4.406382 , put=31.772236

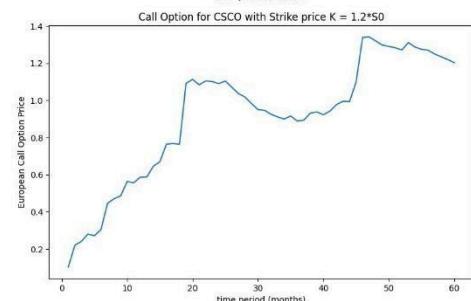
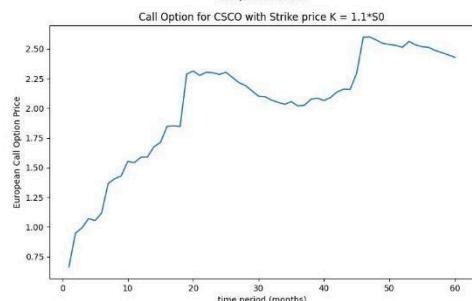
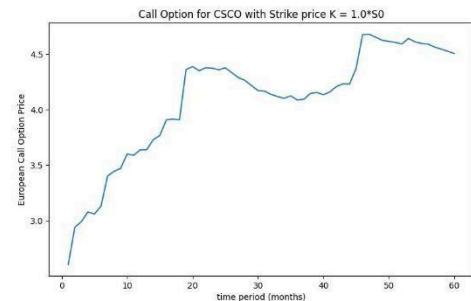
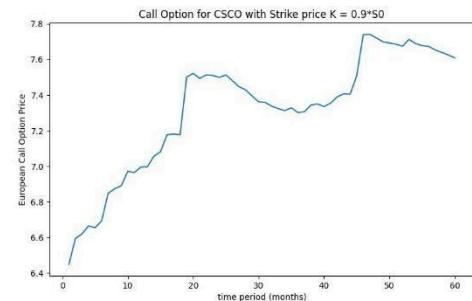
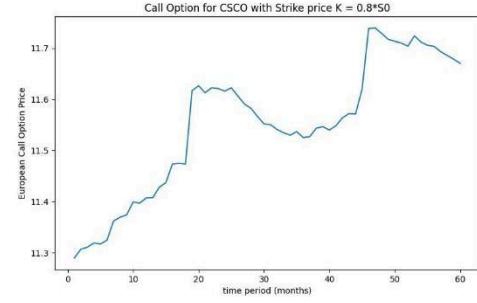
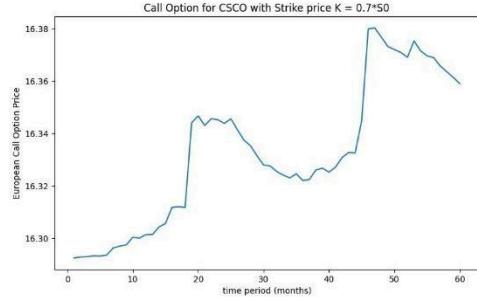
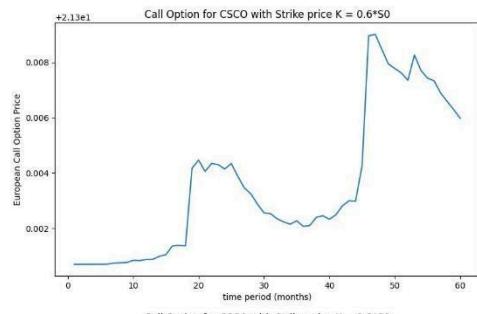
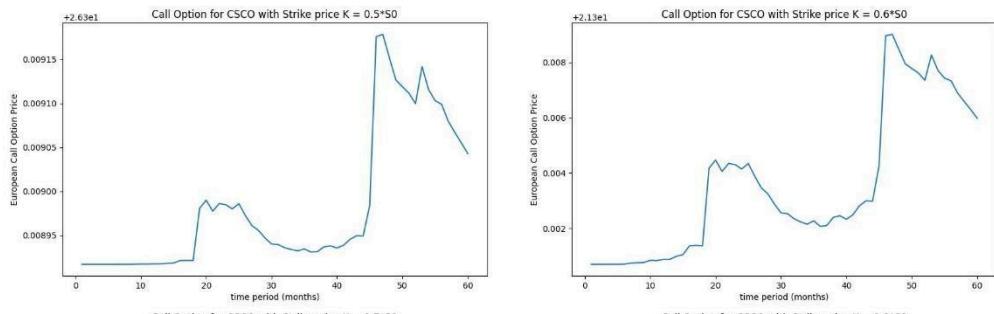
Question 1c:

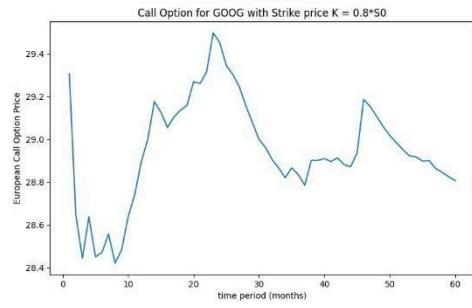
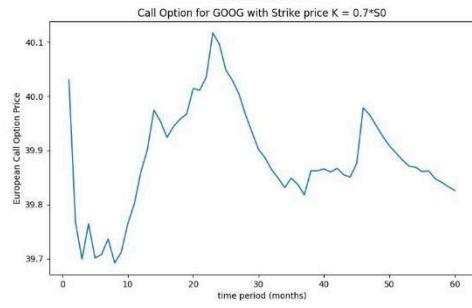
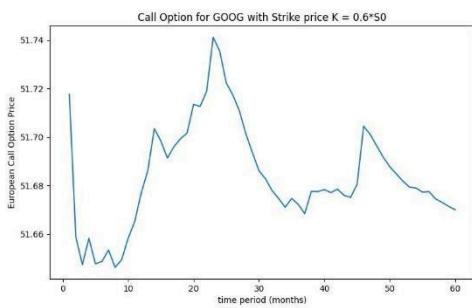
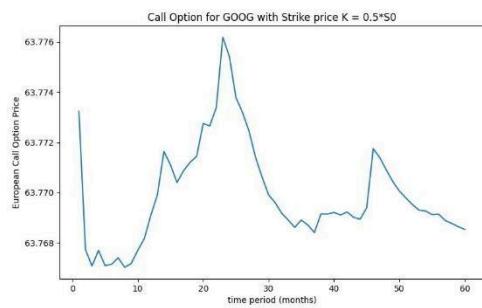
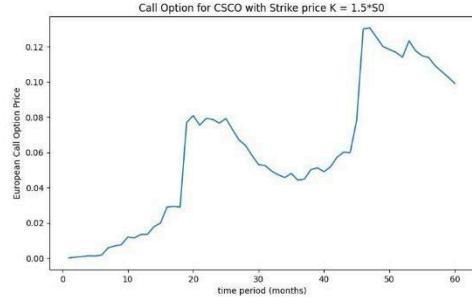
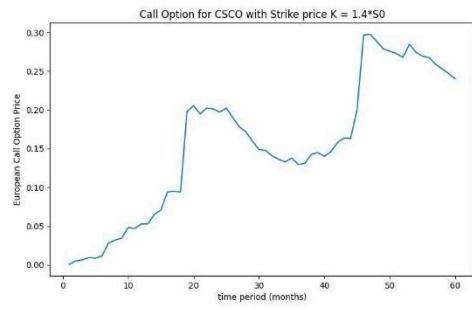
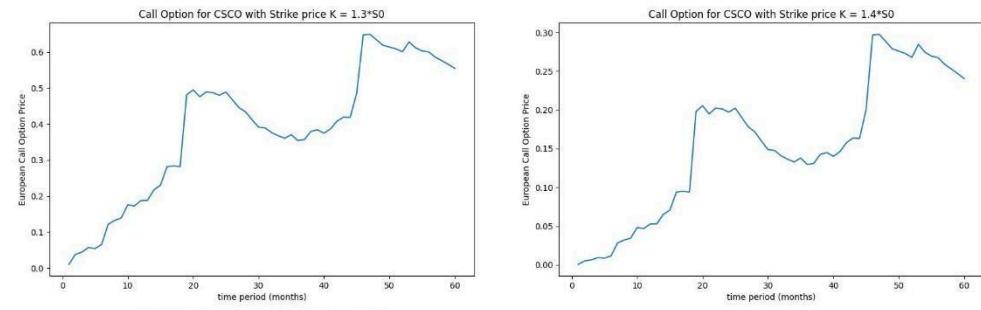
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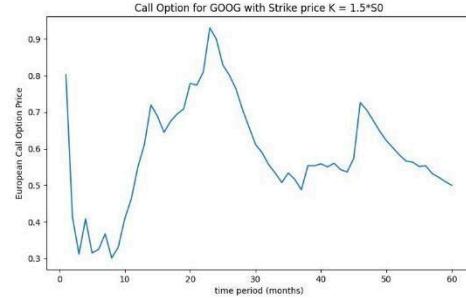
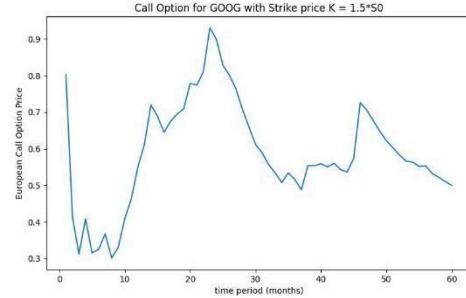
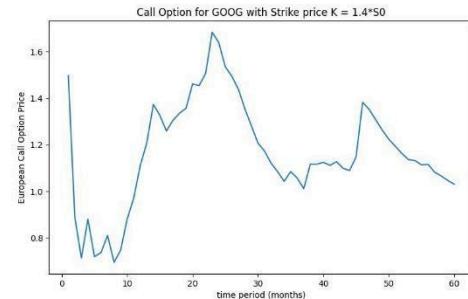
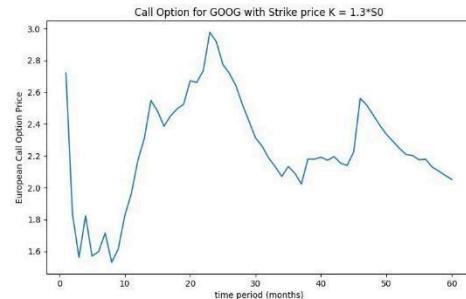
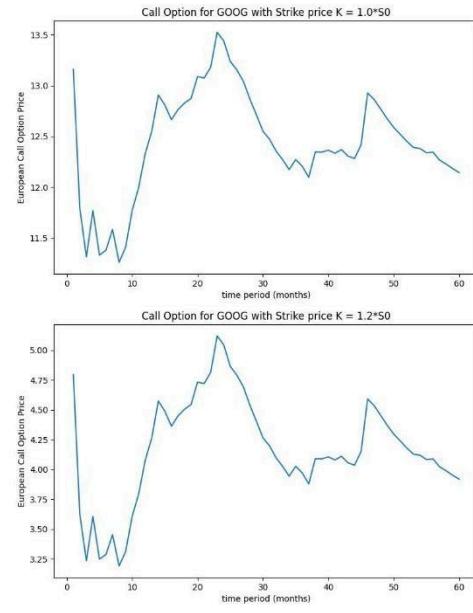
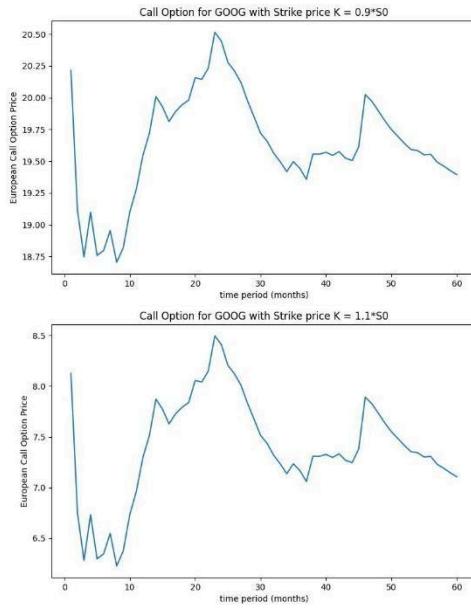


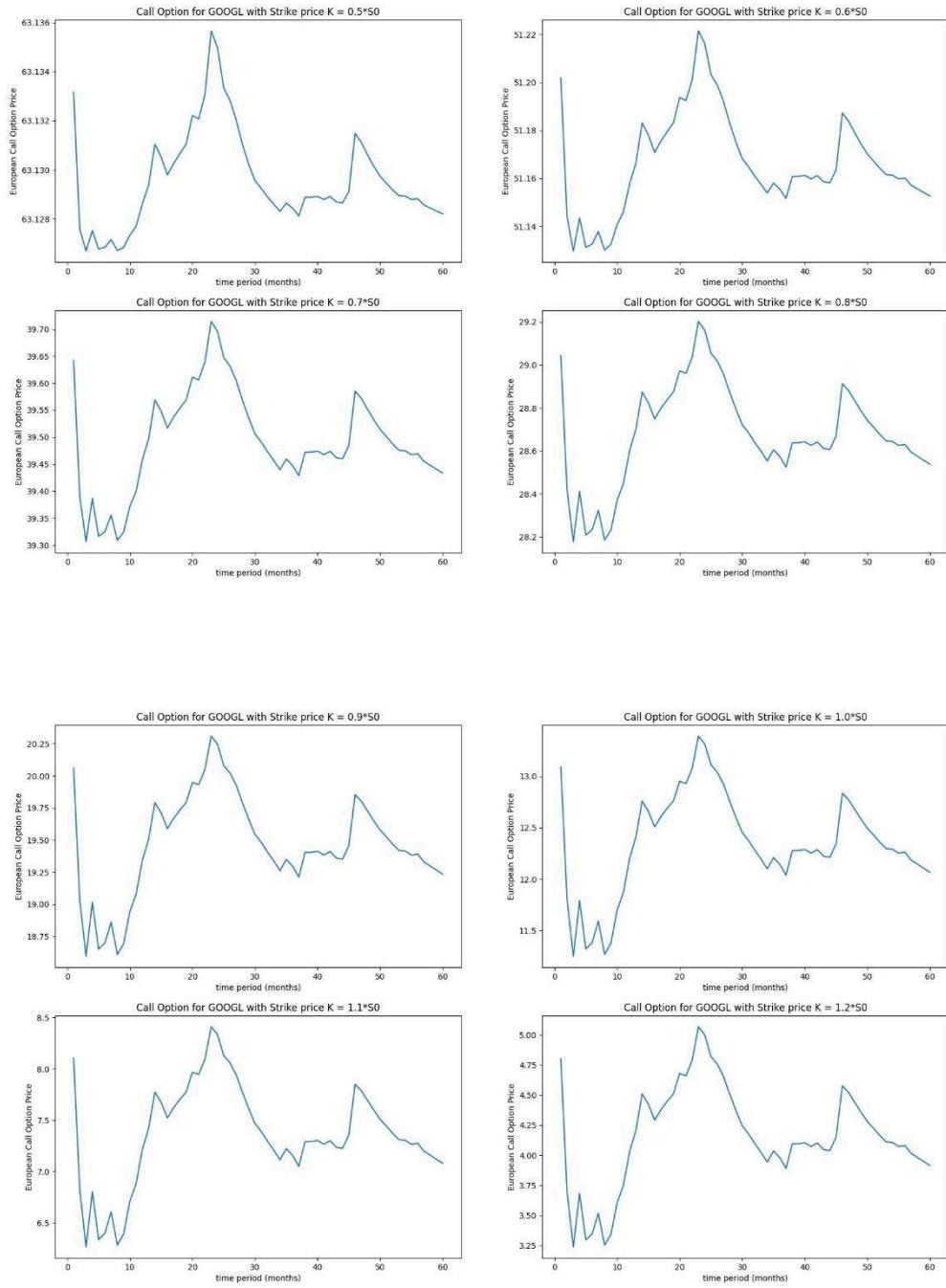


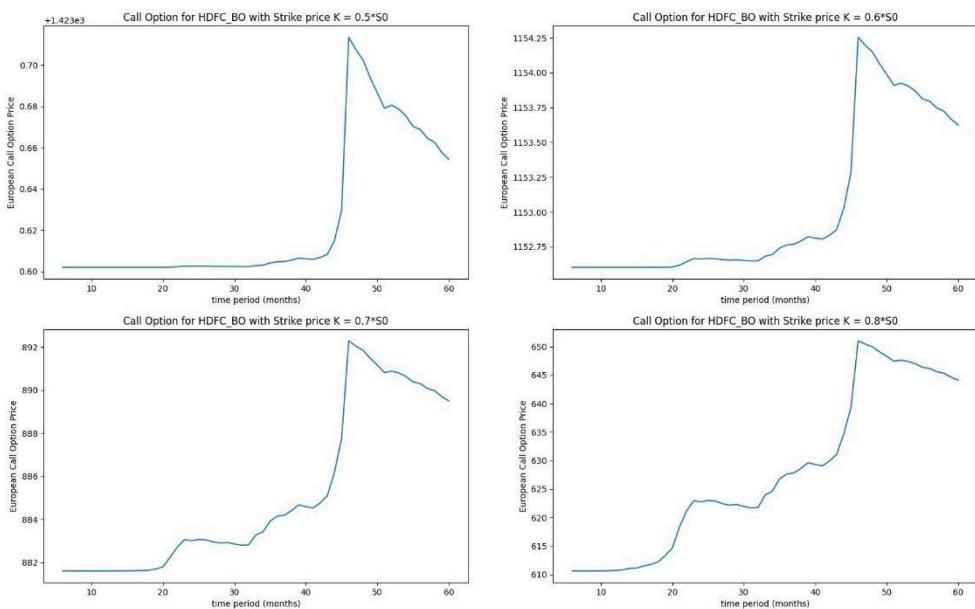
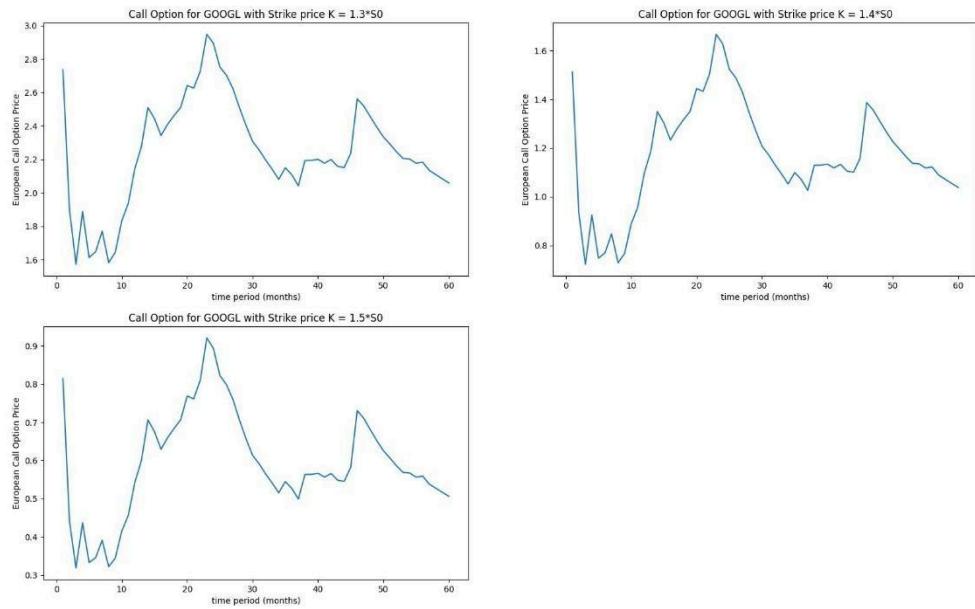


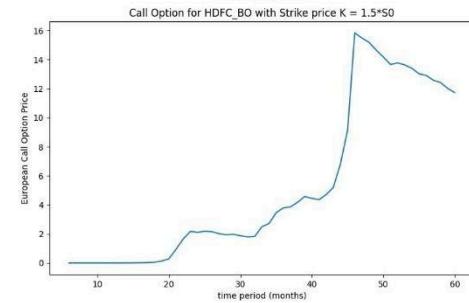
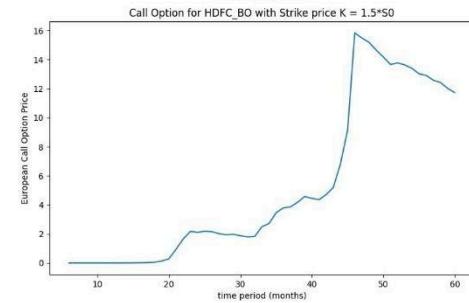
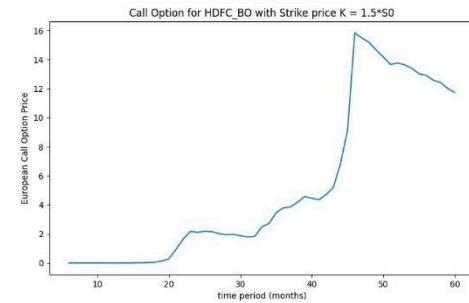
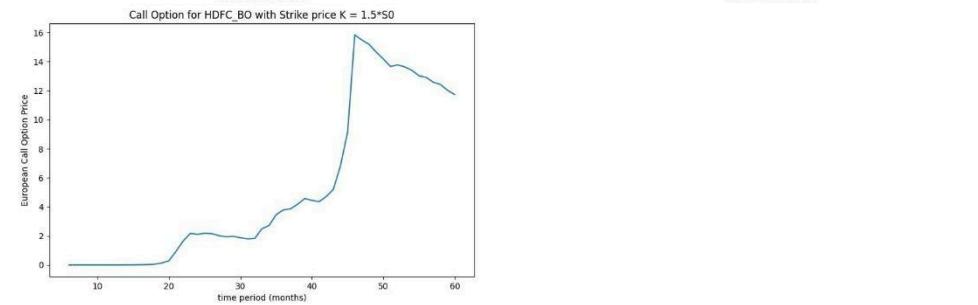
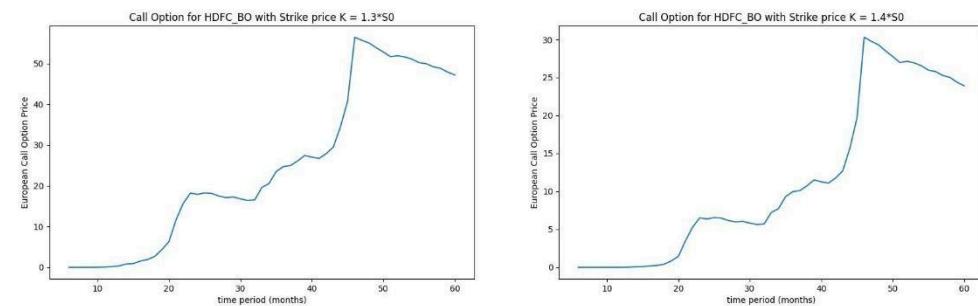
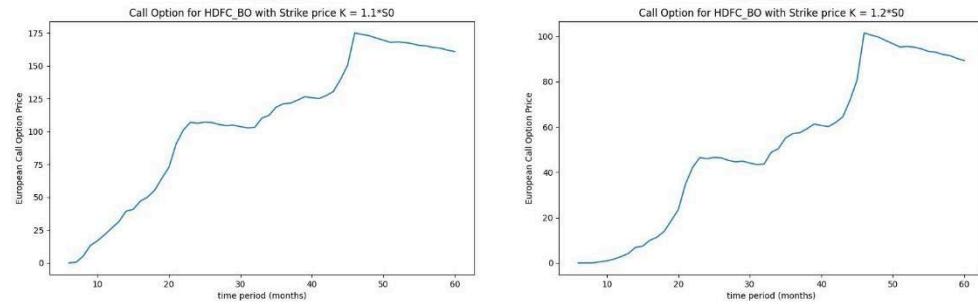
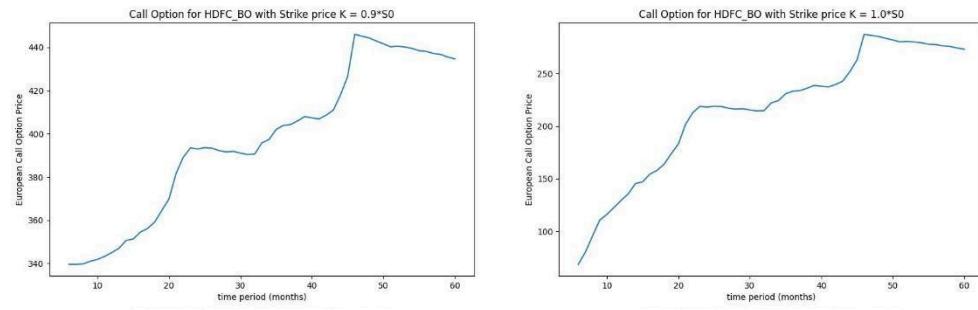


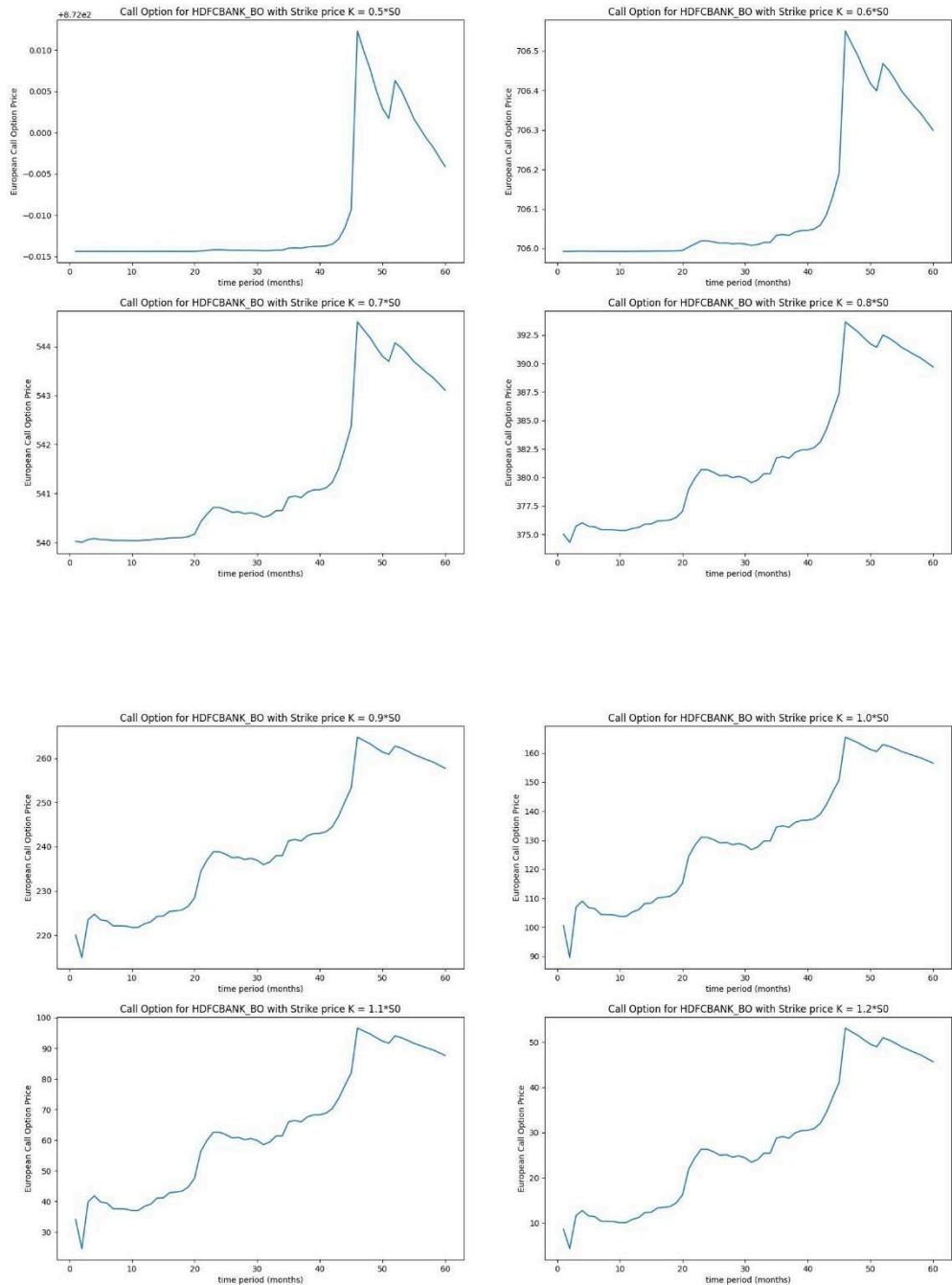


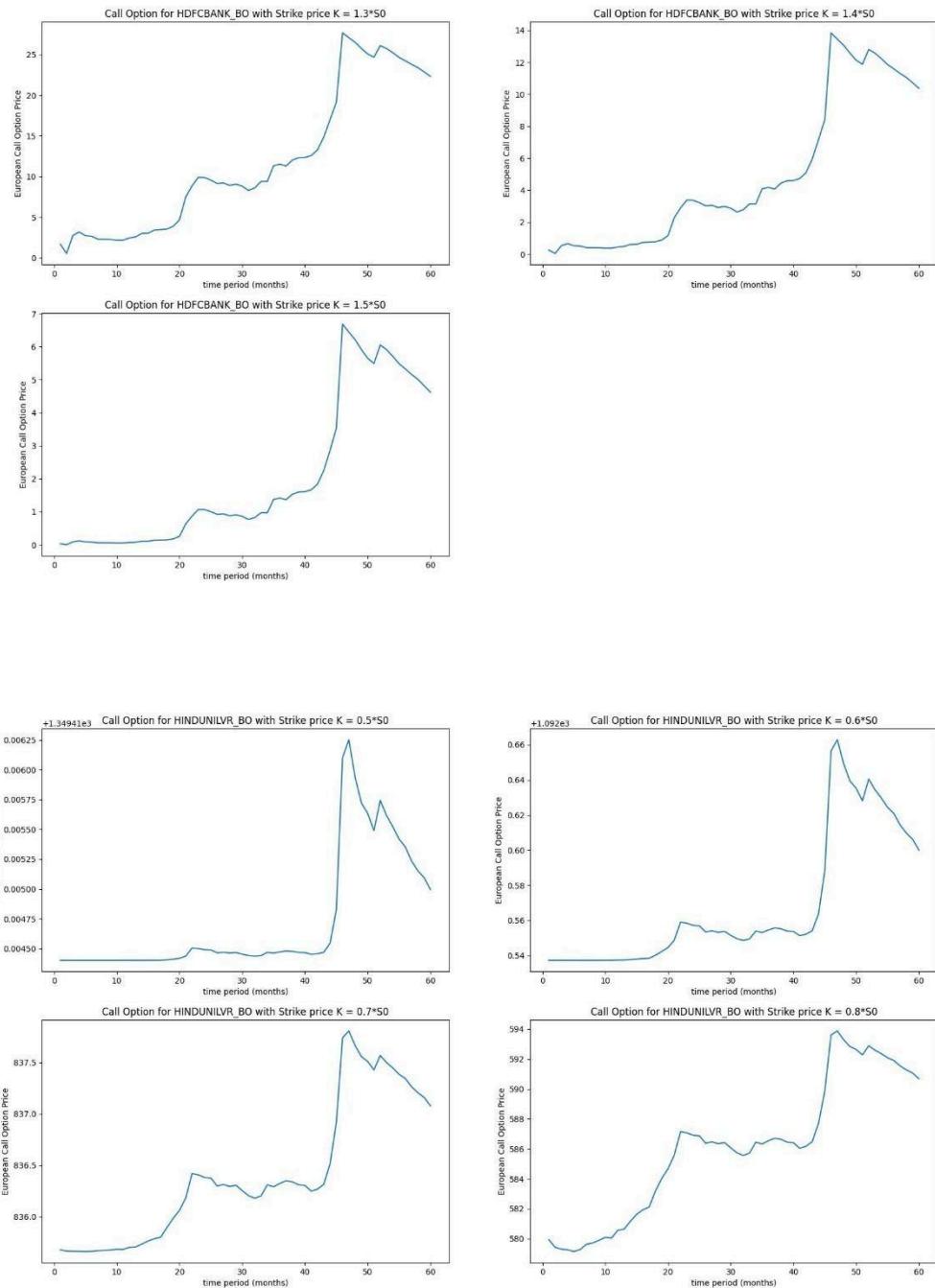


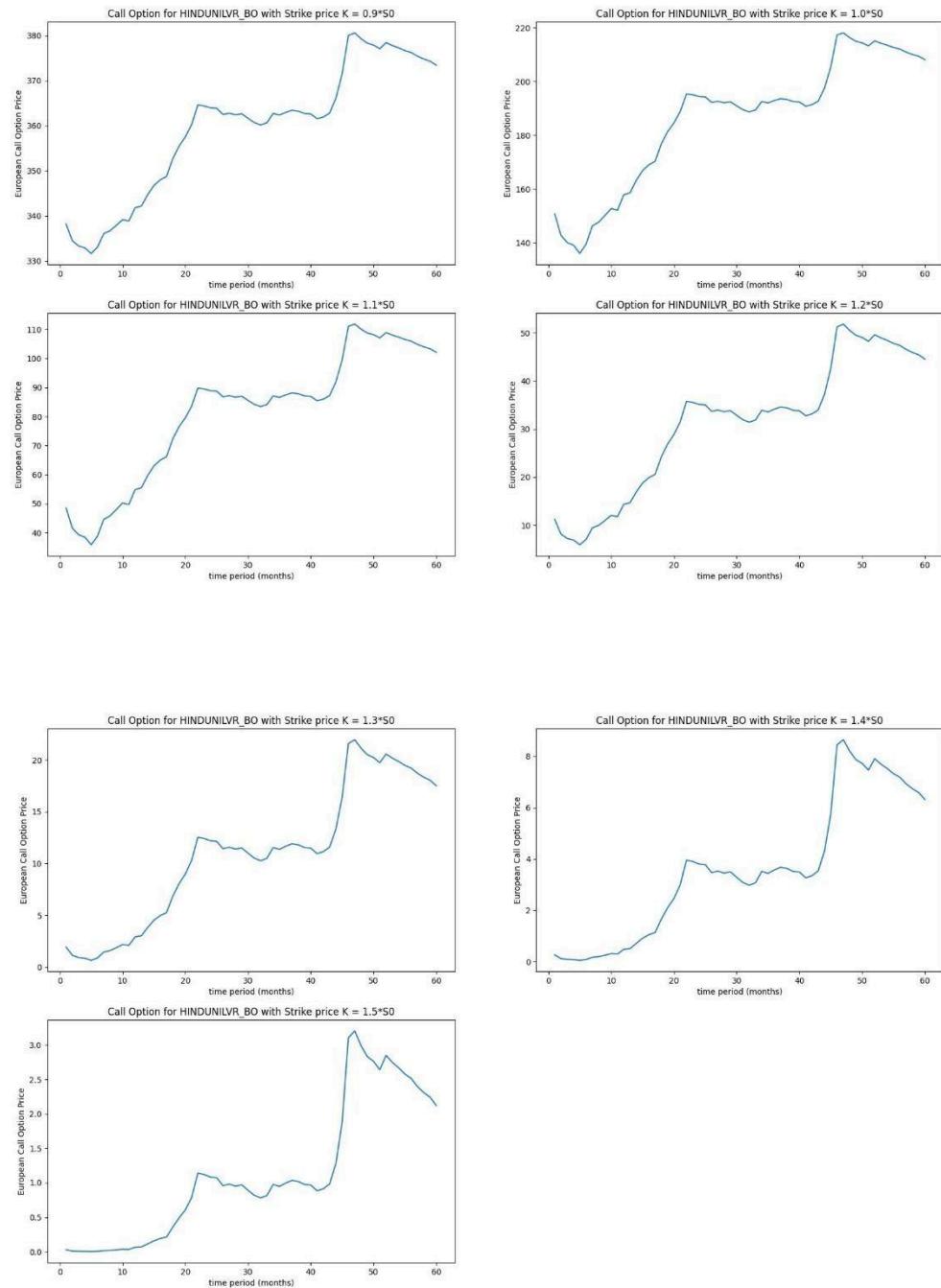


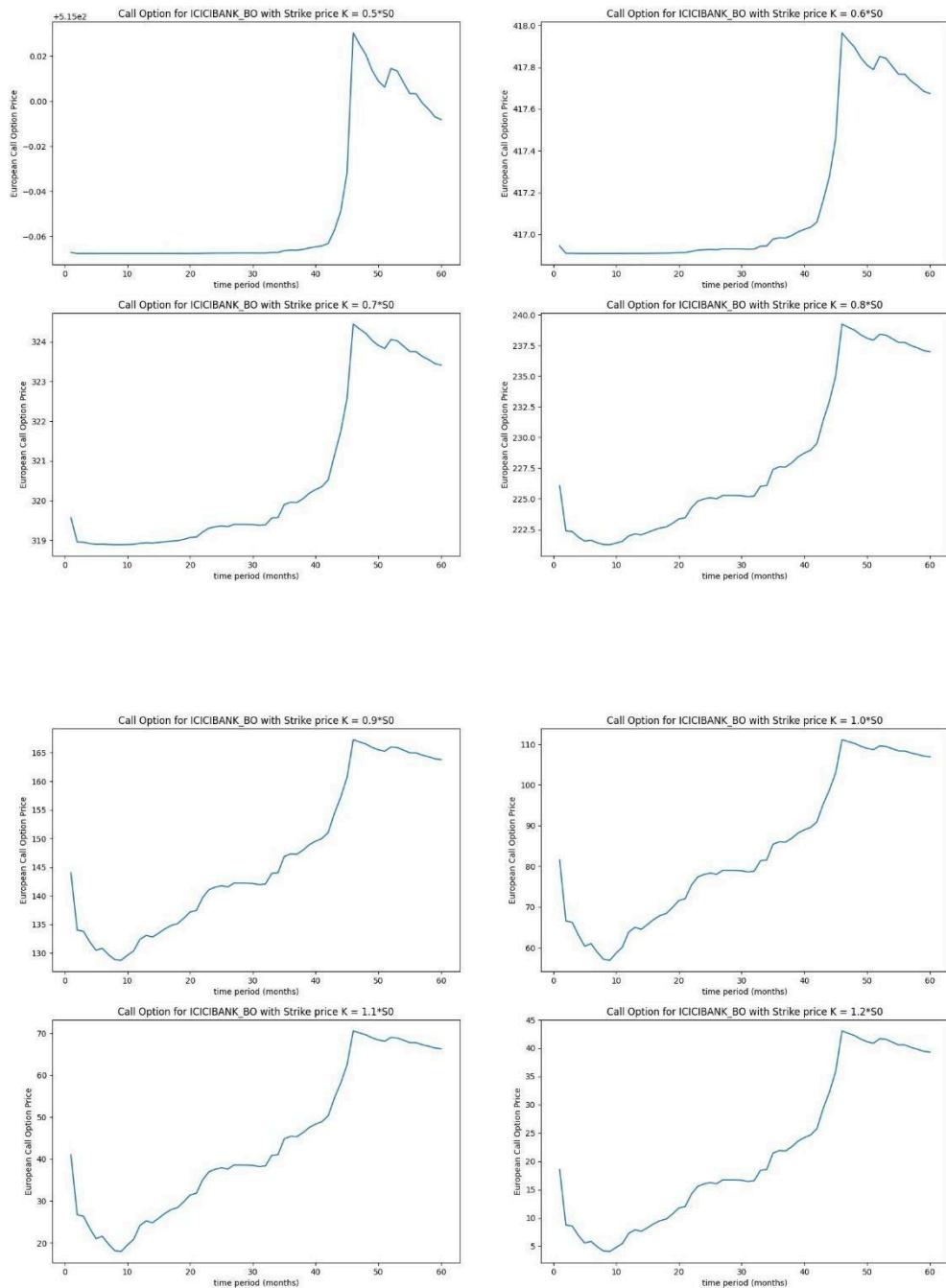


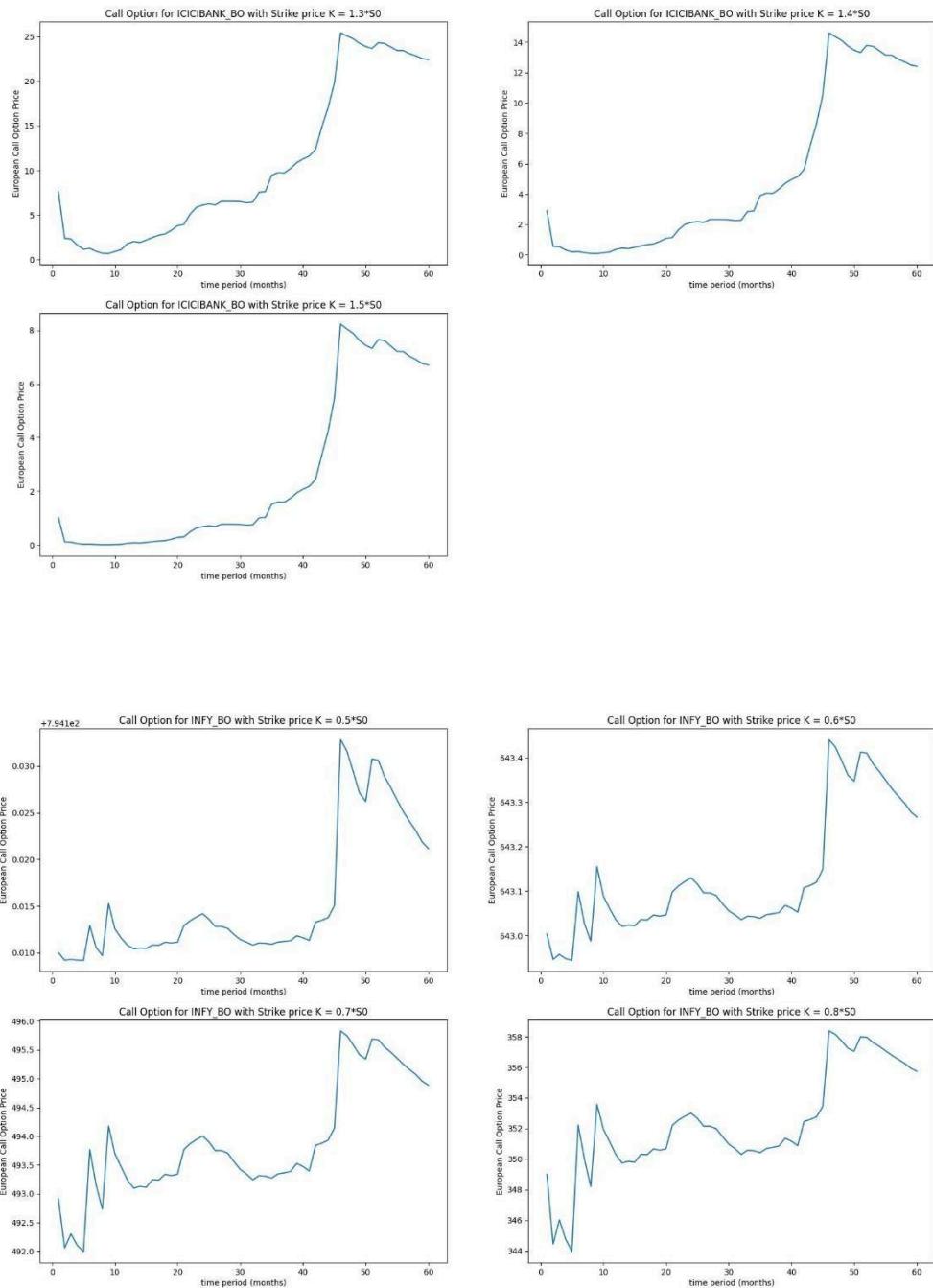


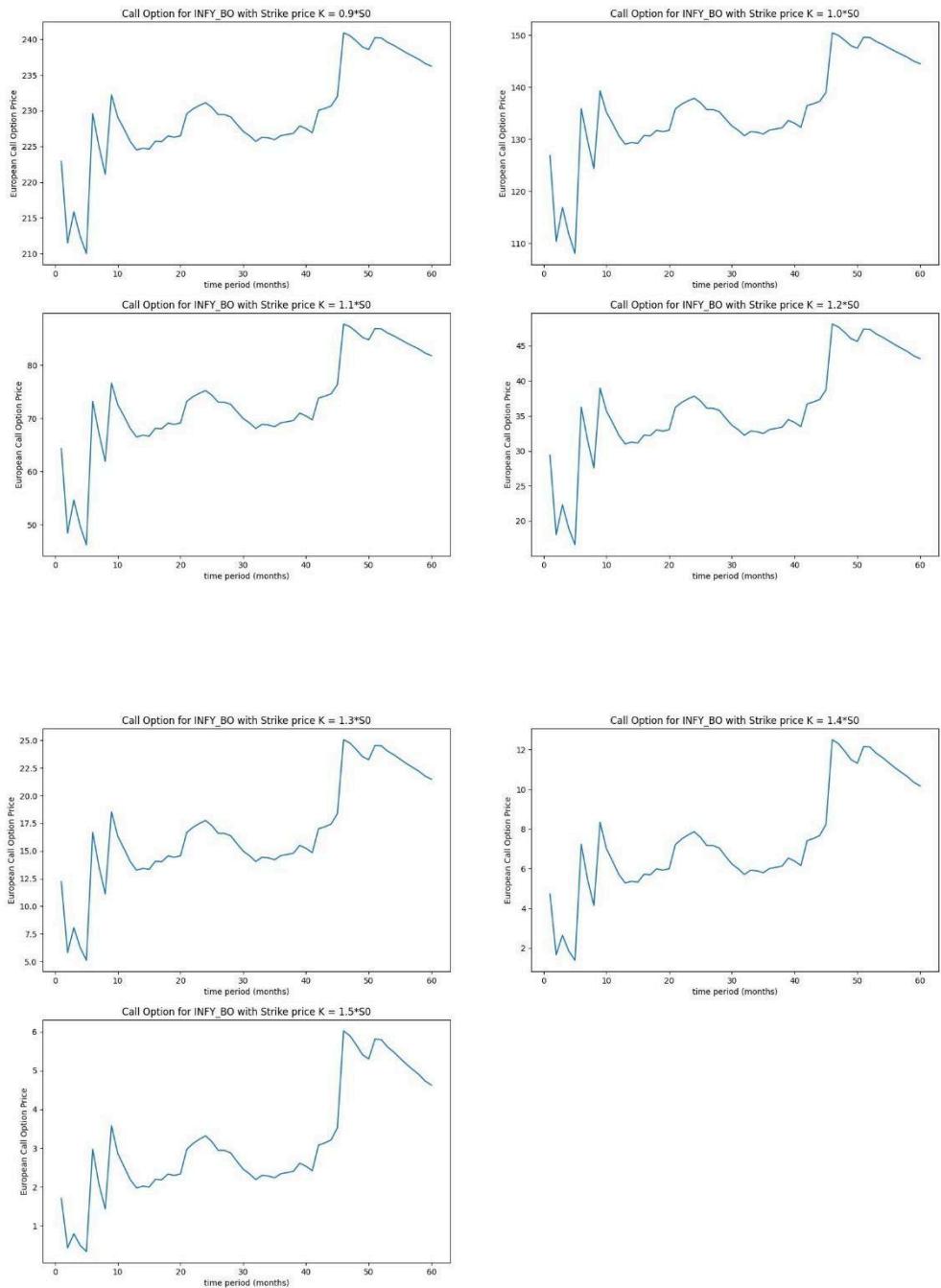


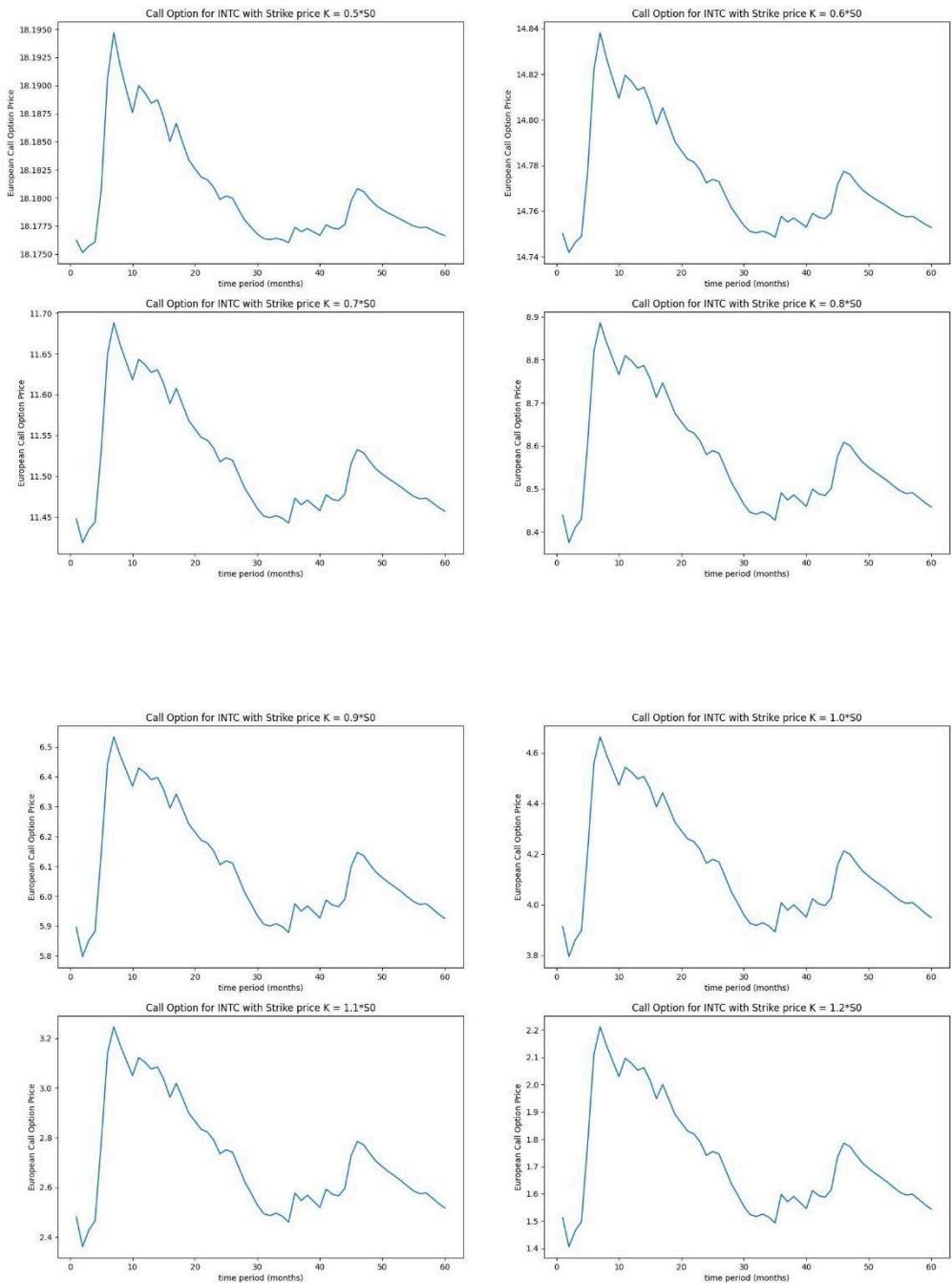


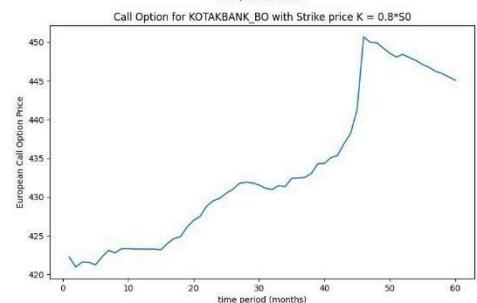
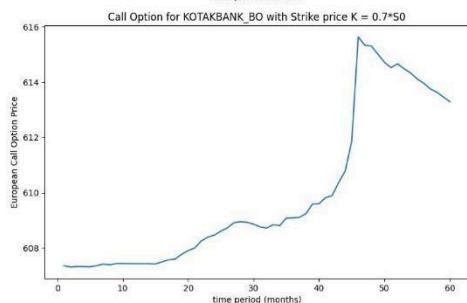
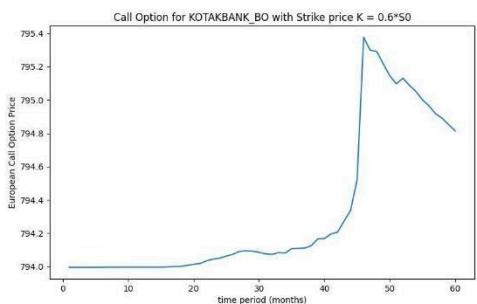
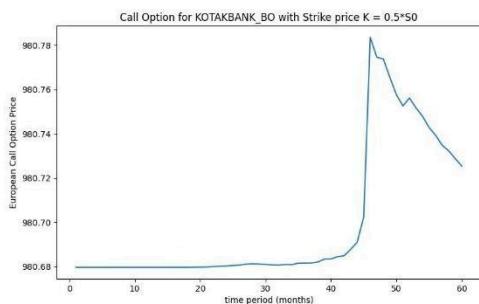
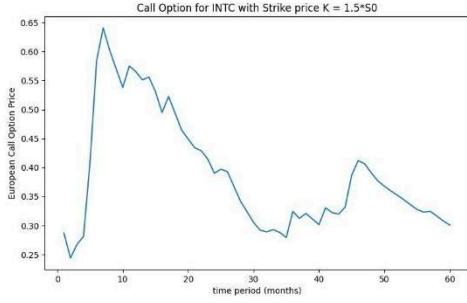
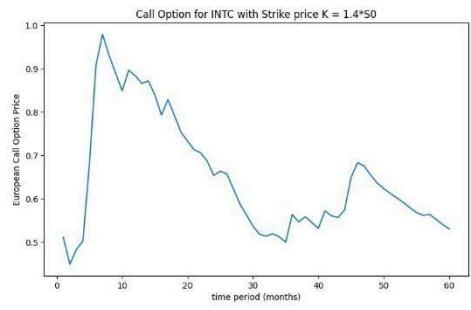
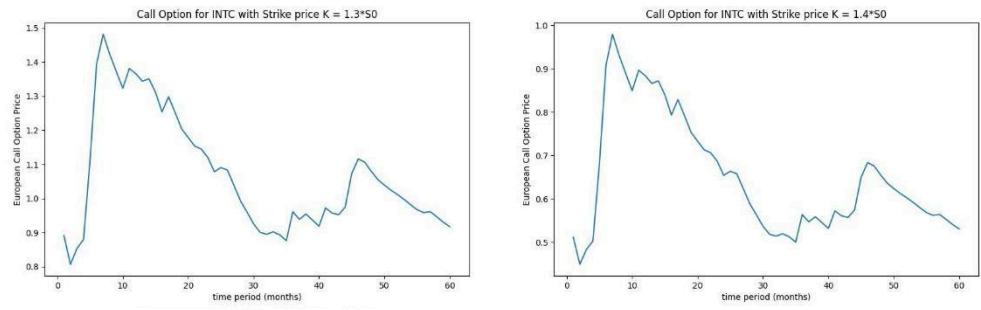


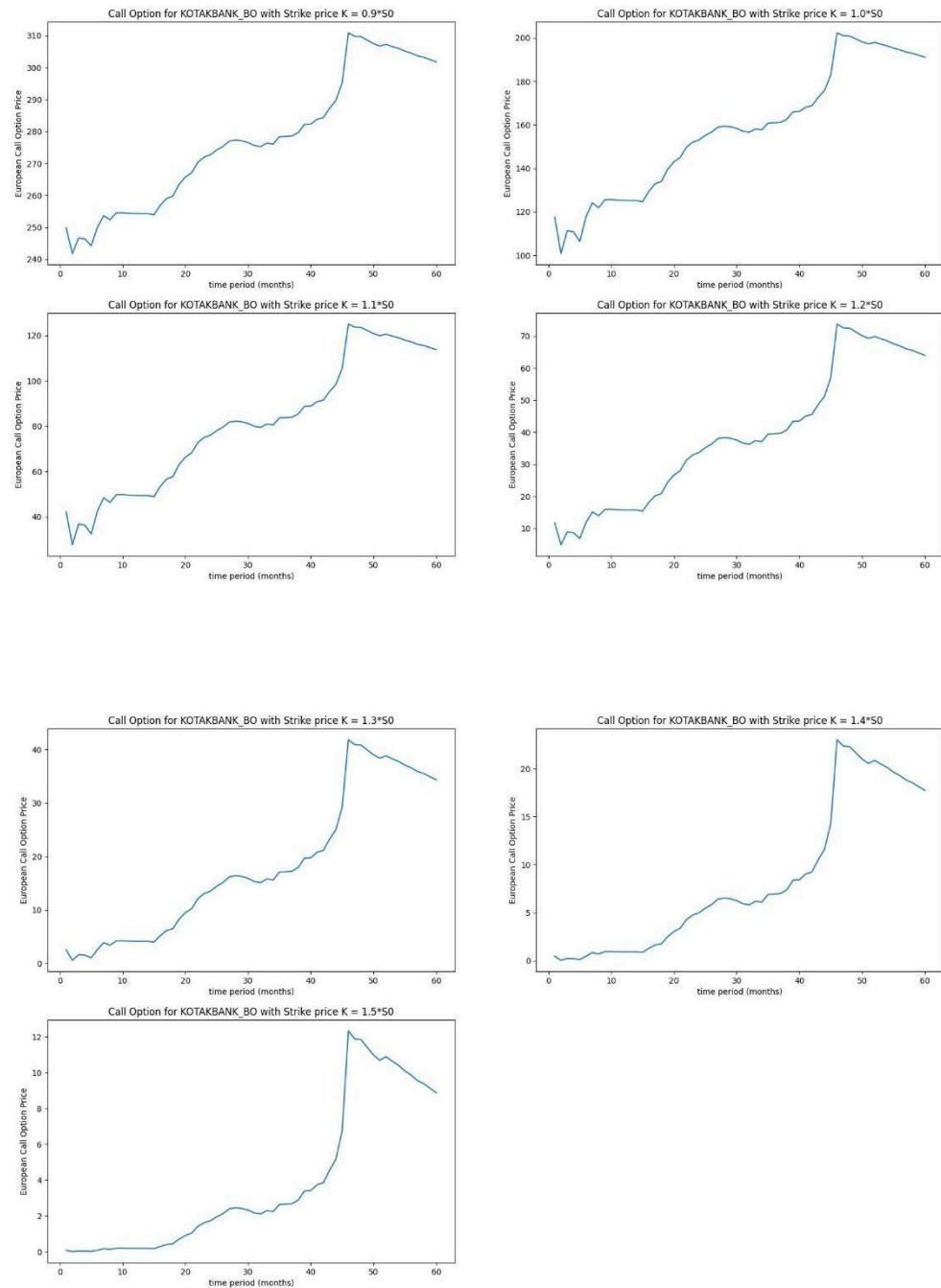


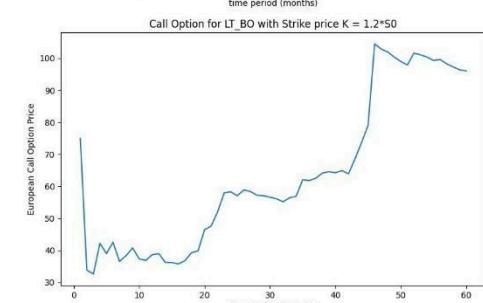
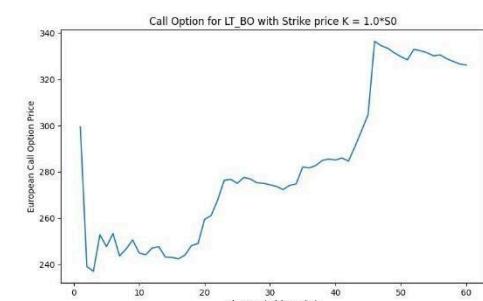
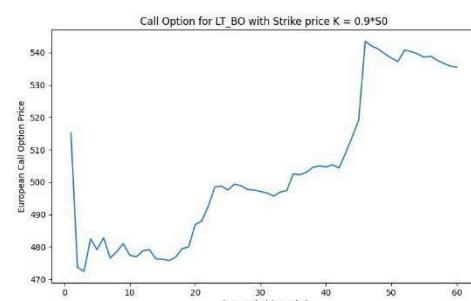
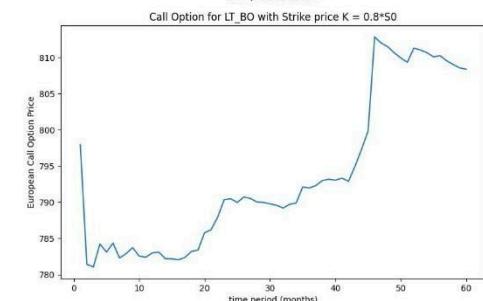
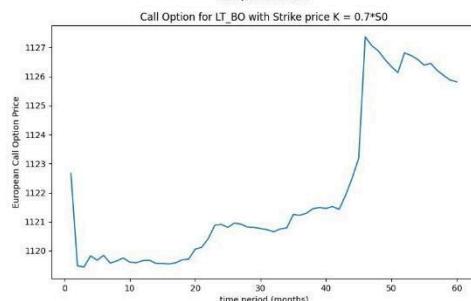
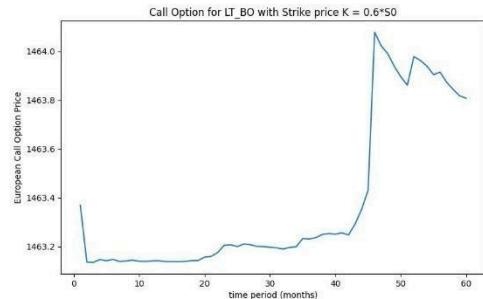
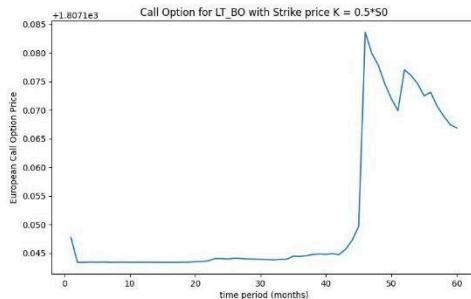


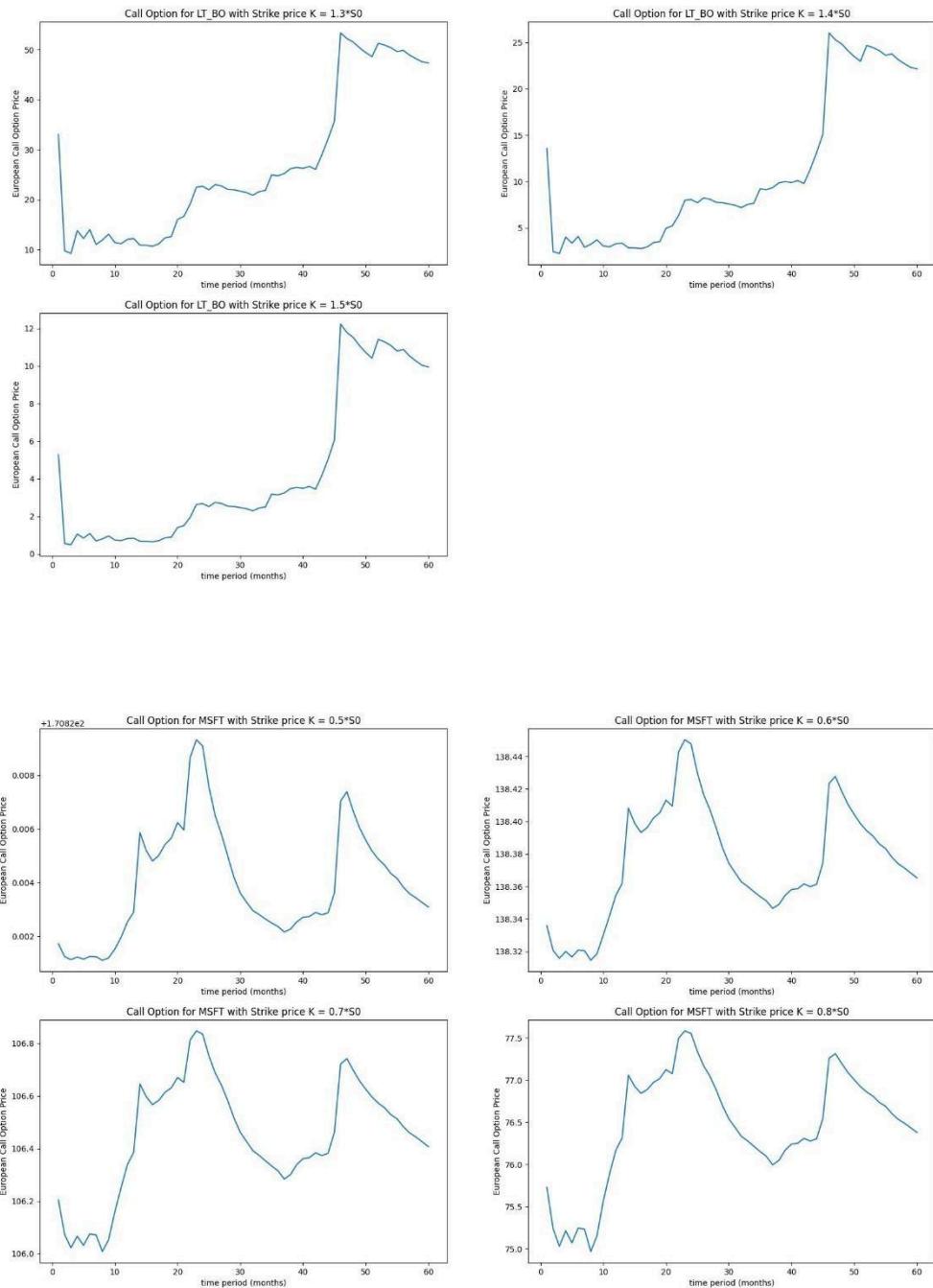


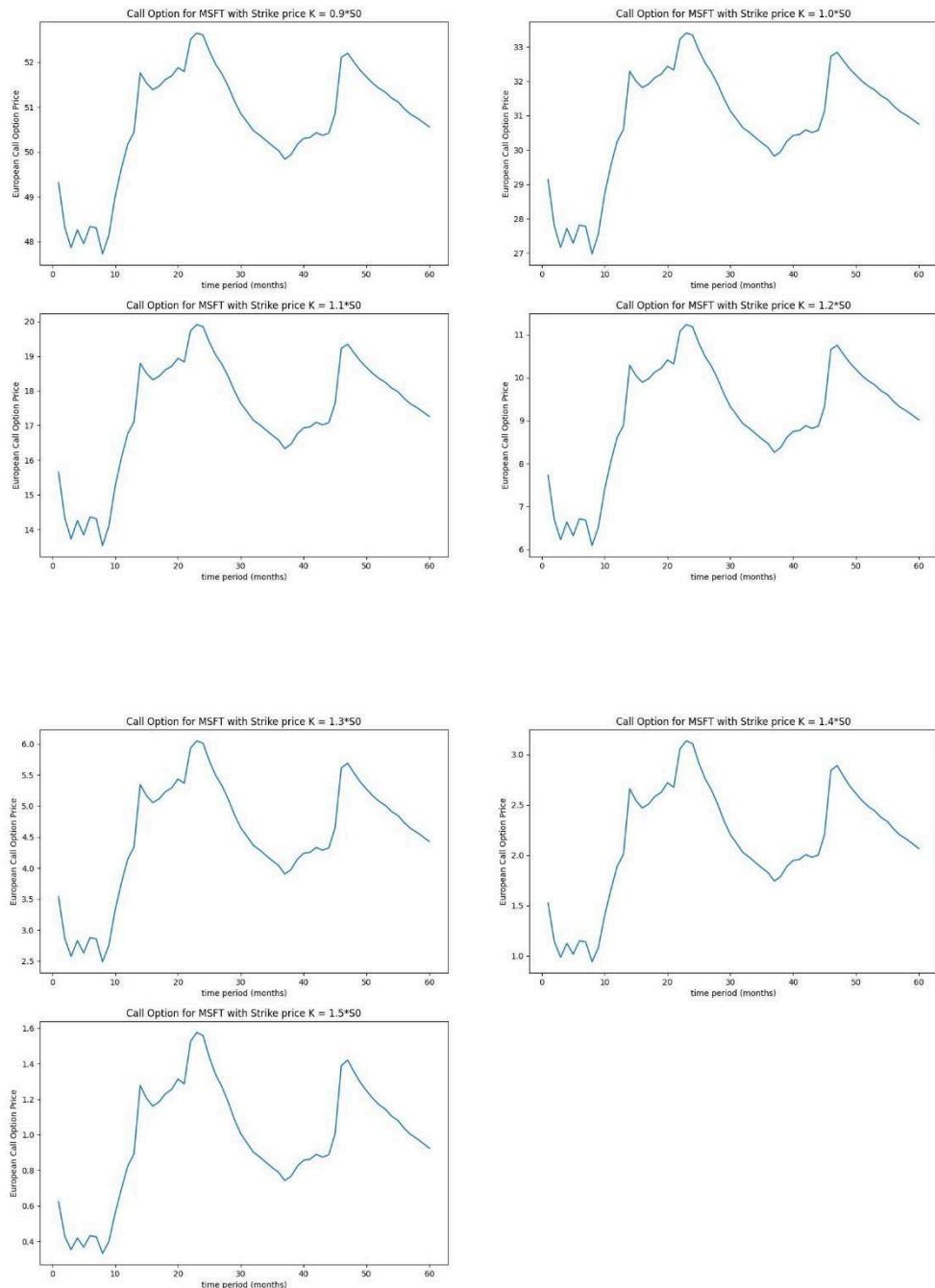


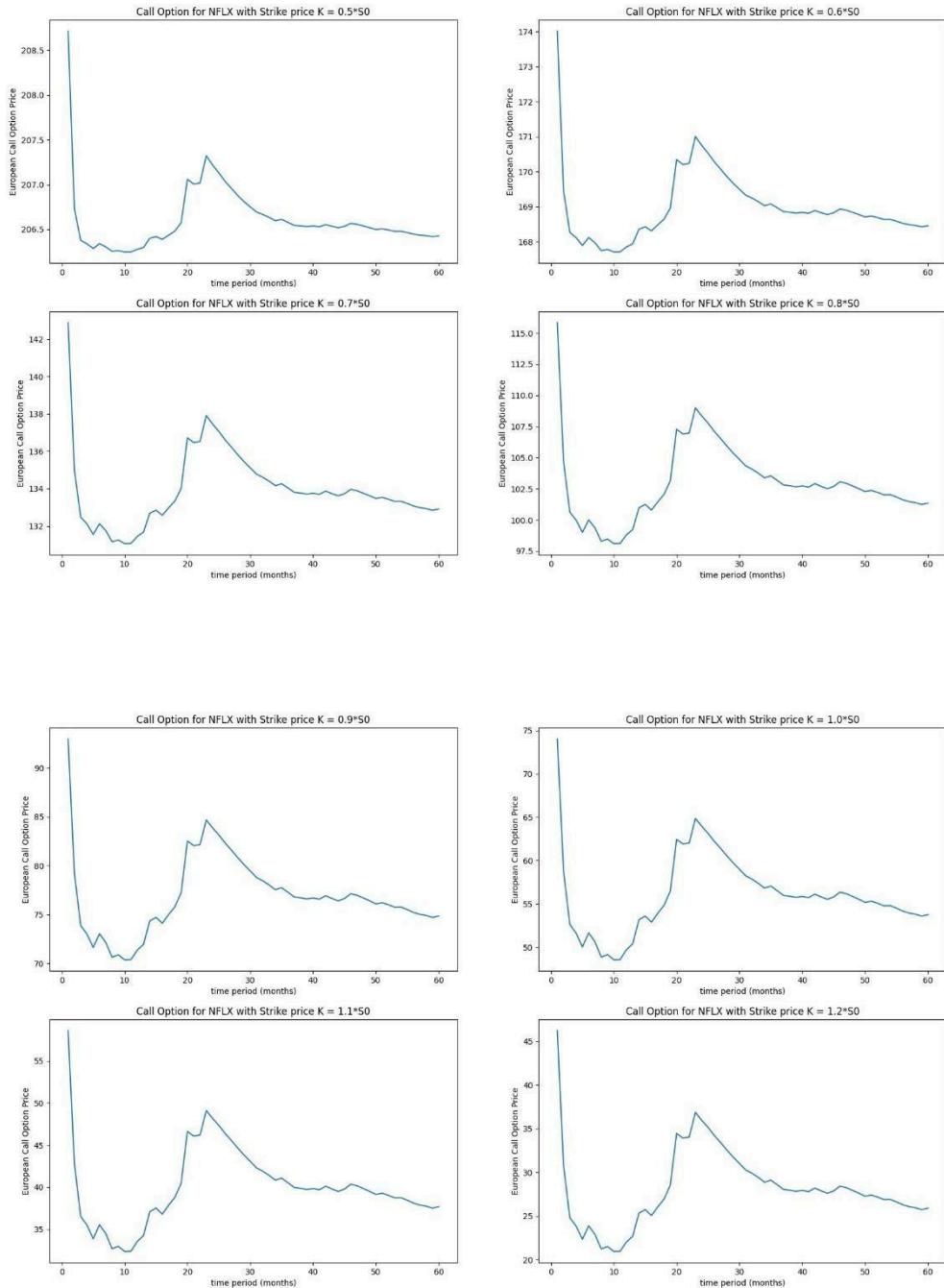


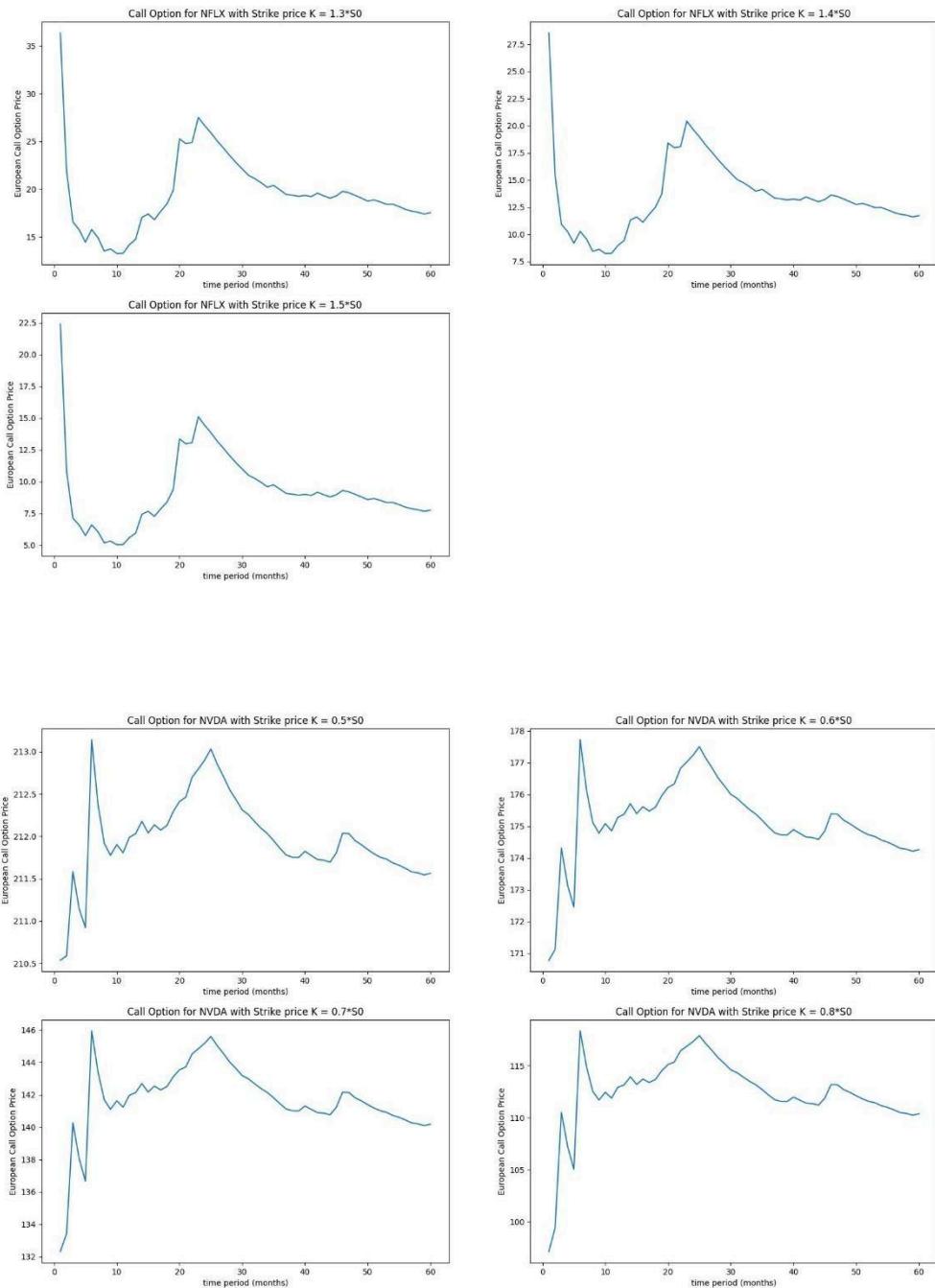


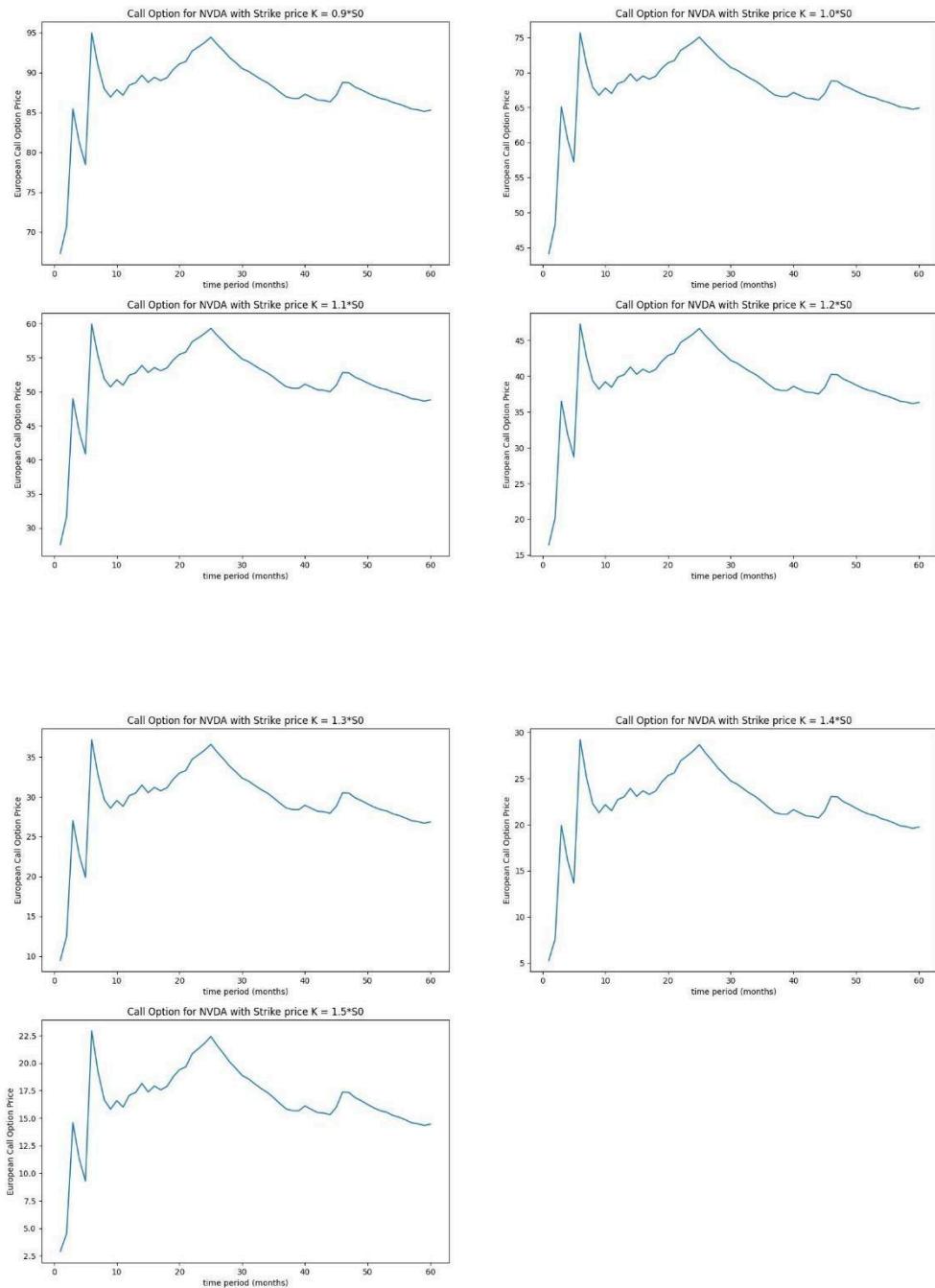


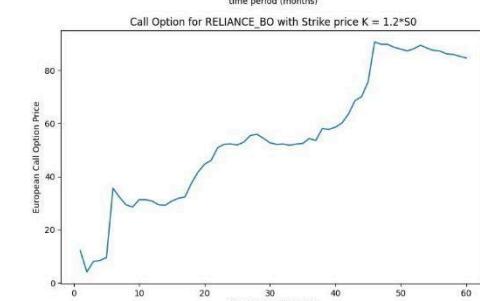
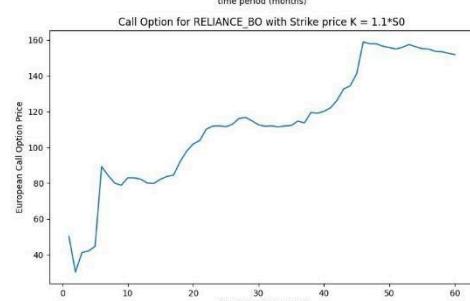
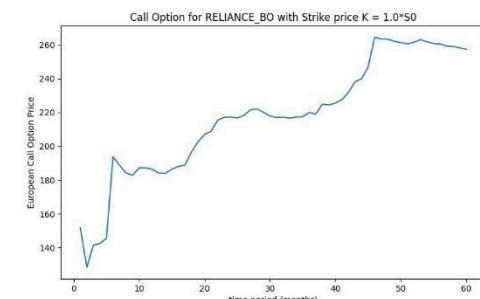
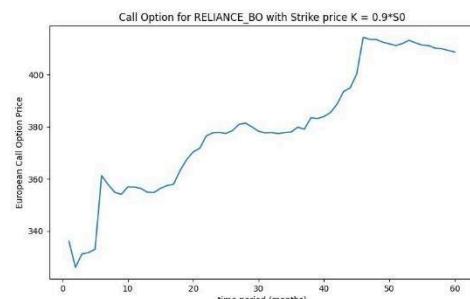
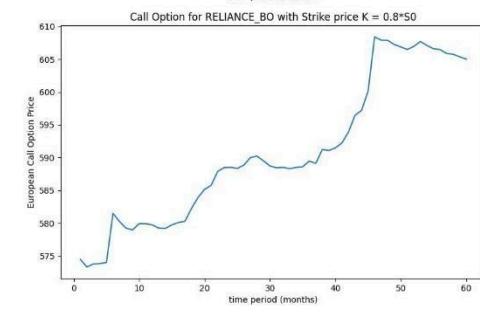
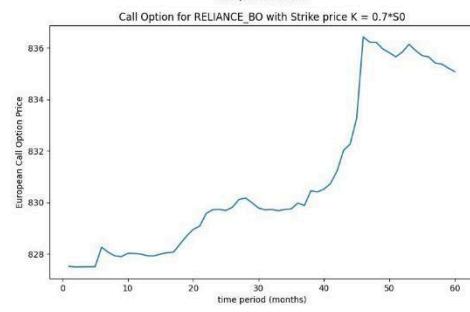
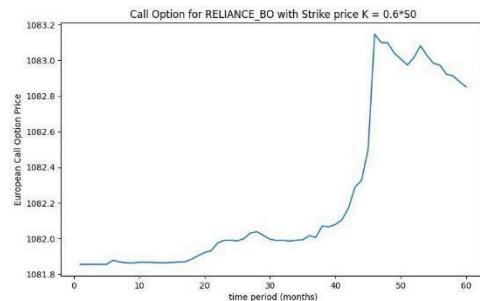
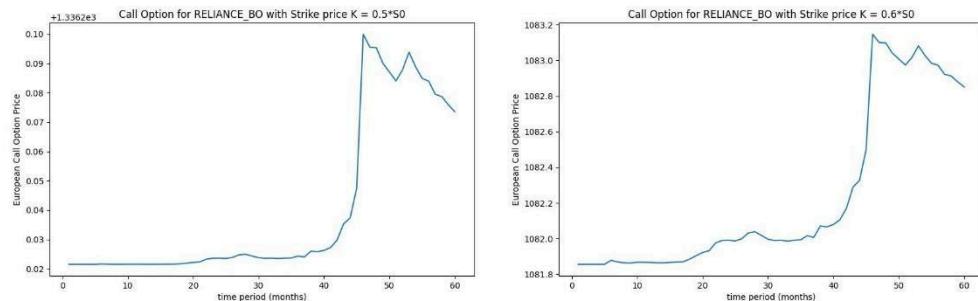


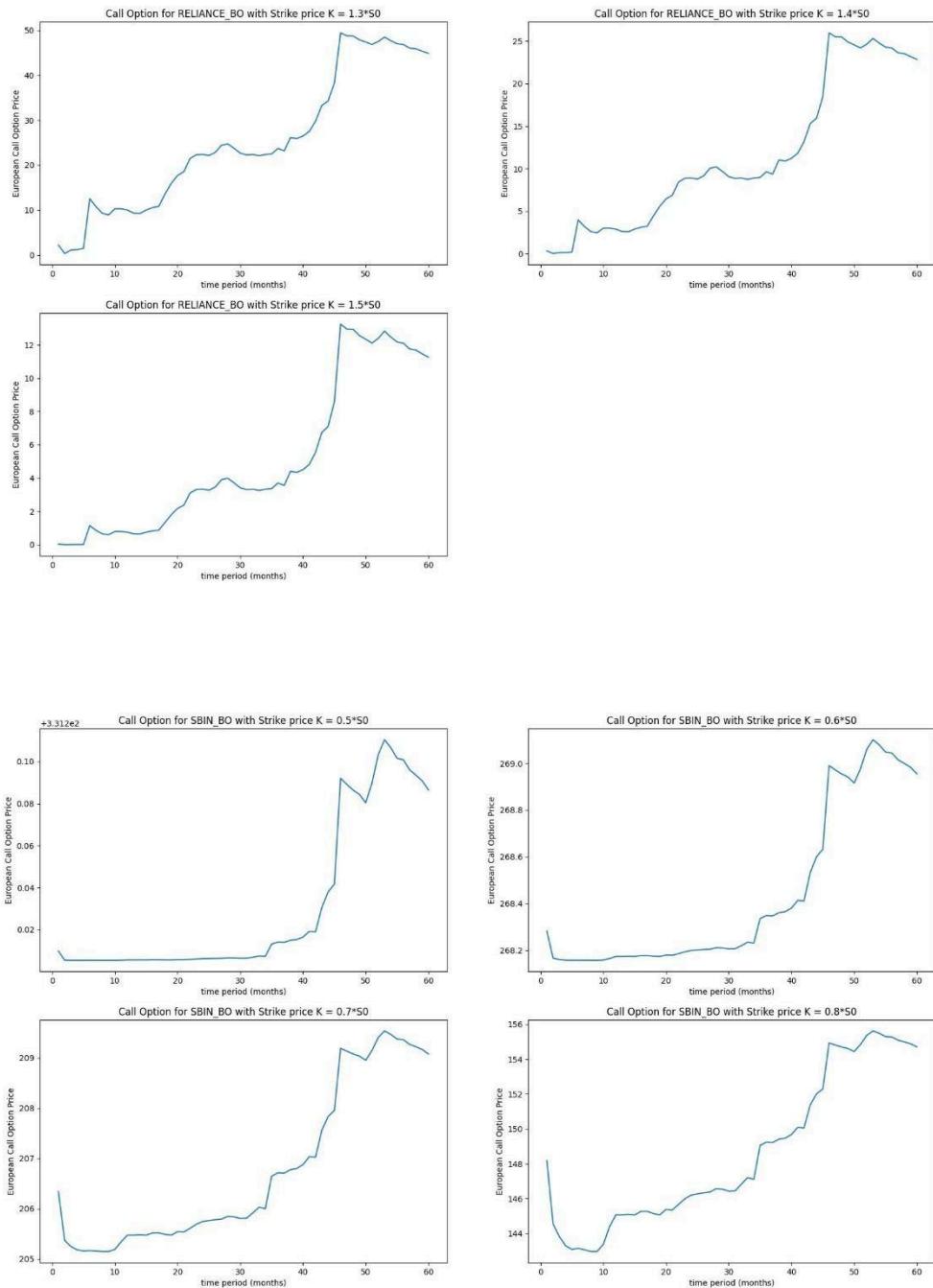


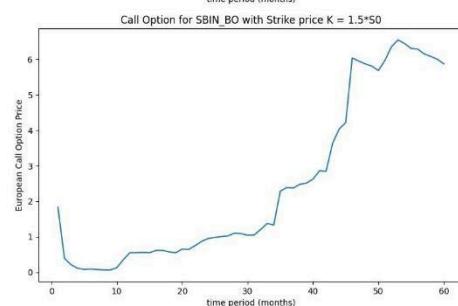
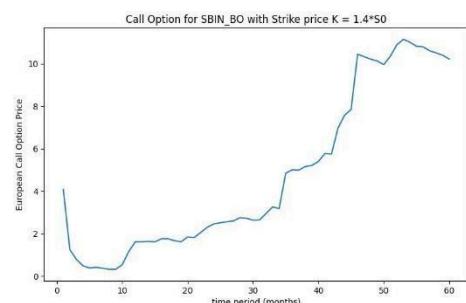
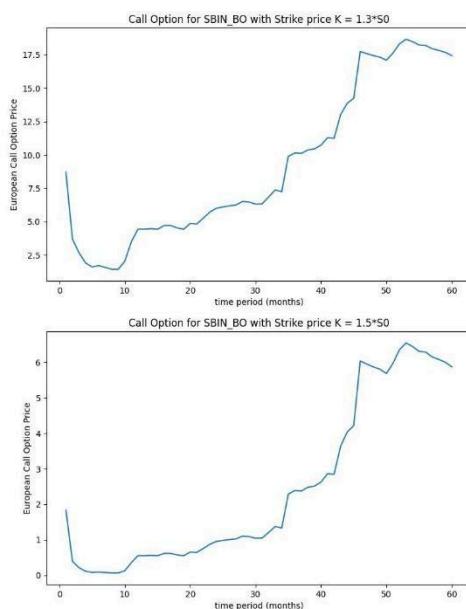
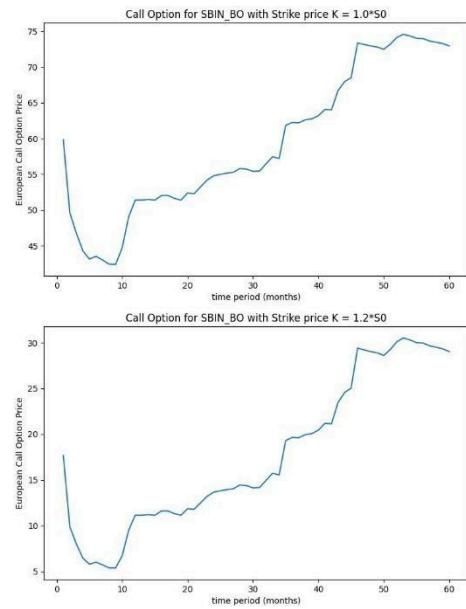
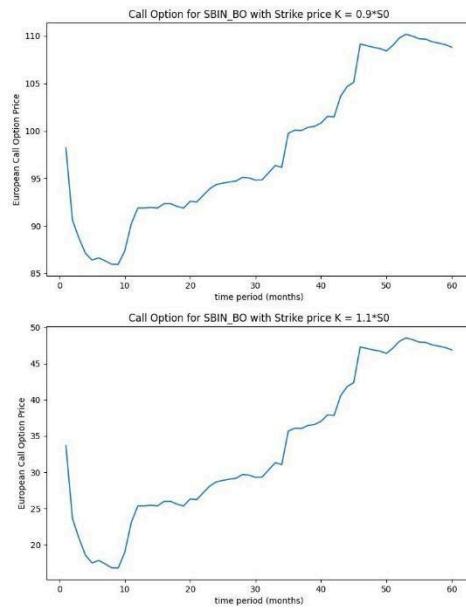


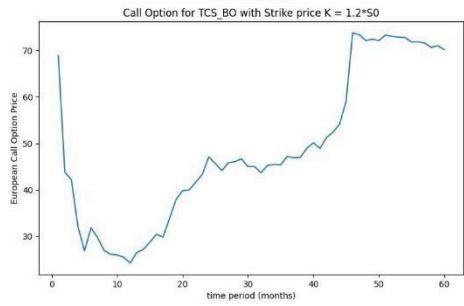
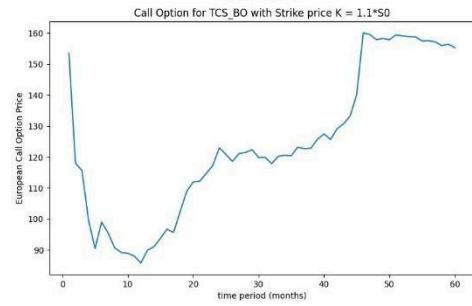
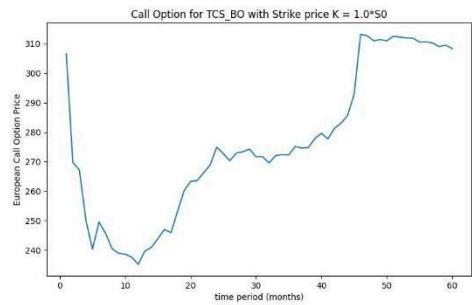
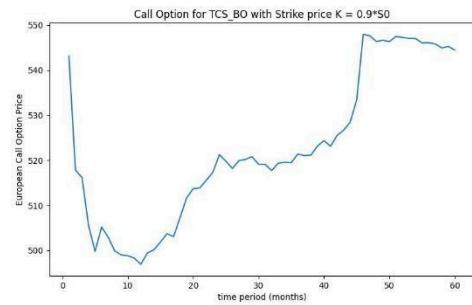
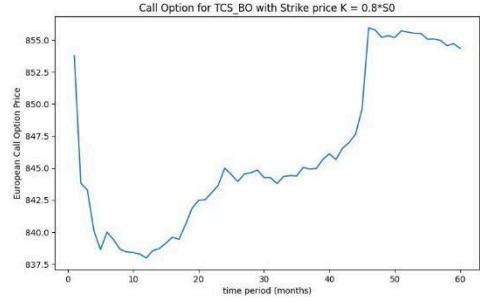
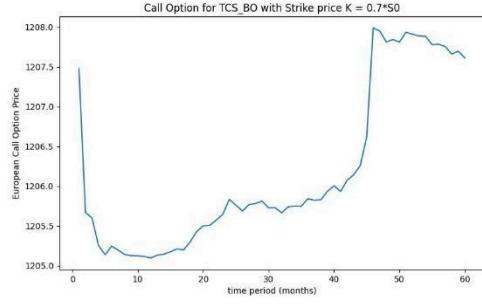
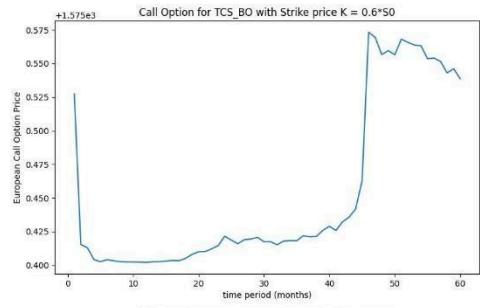
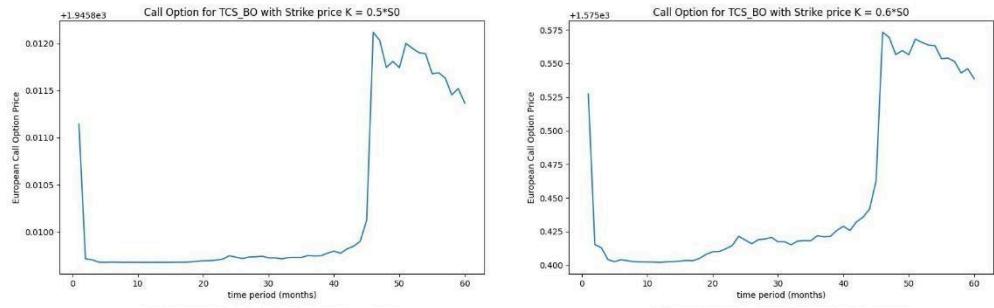


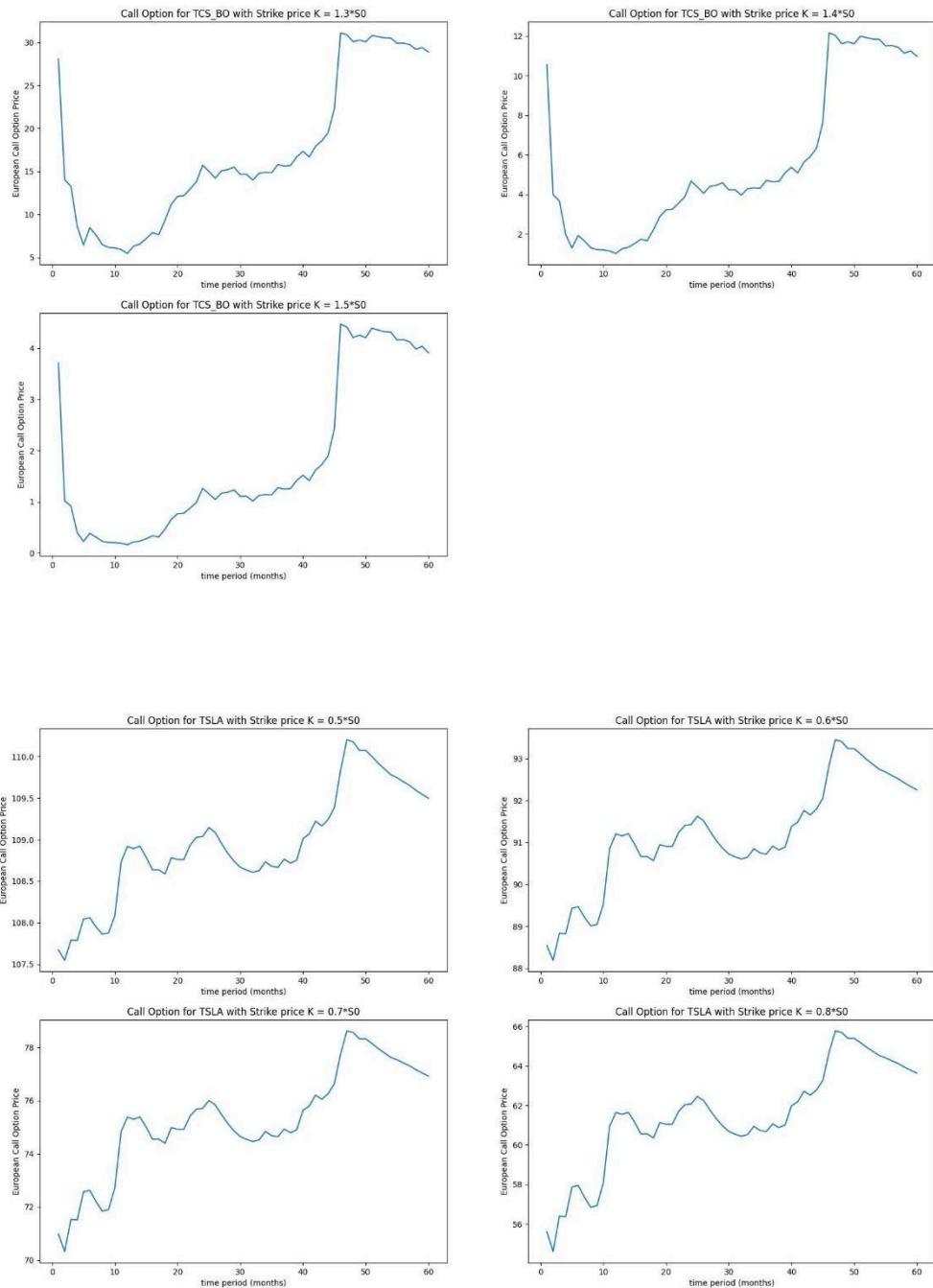


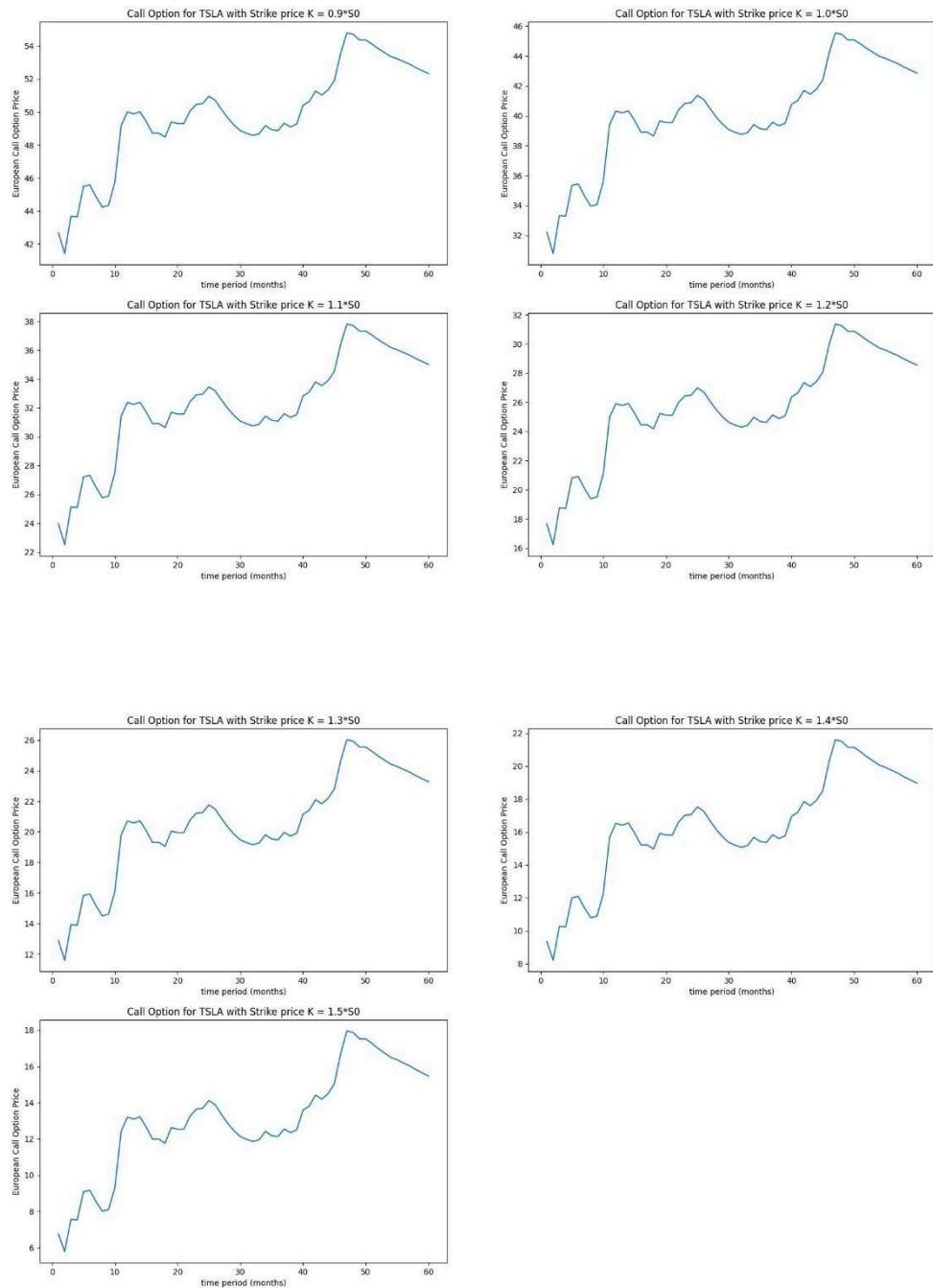






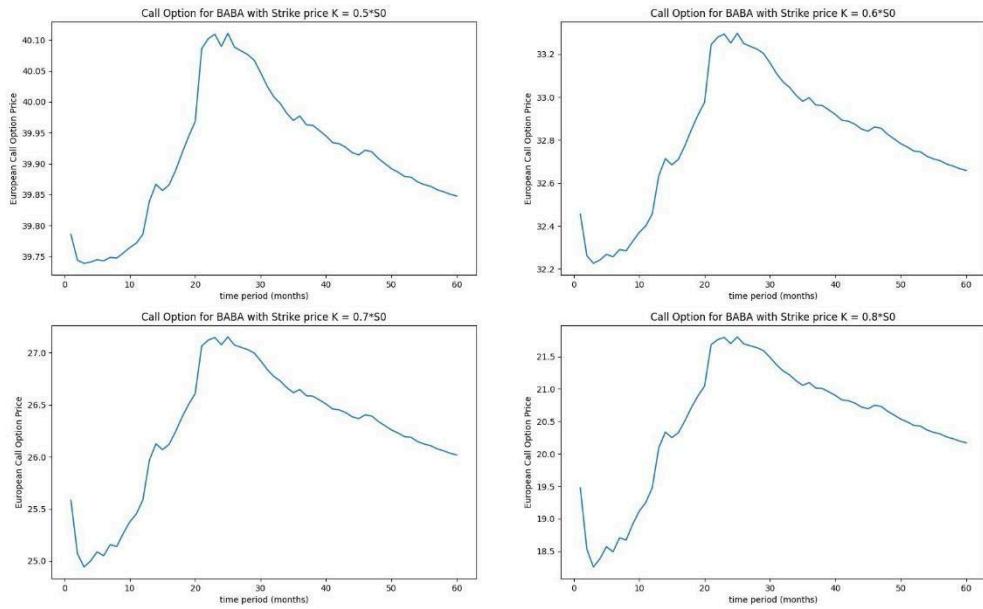




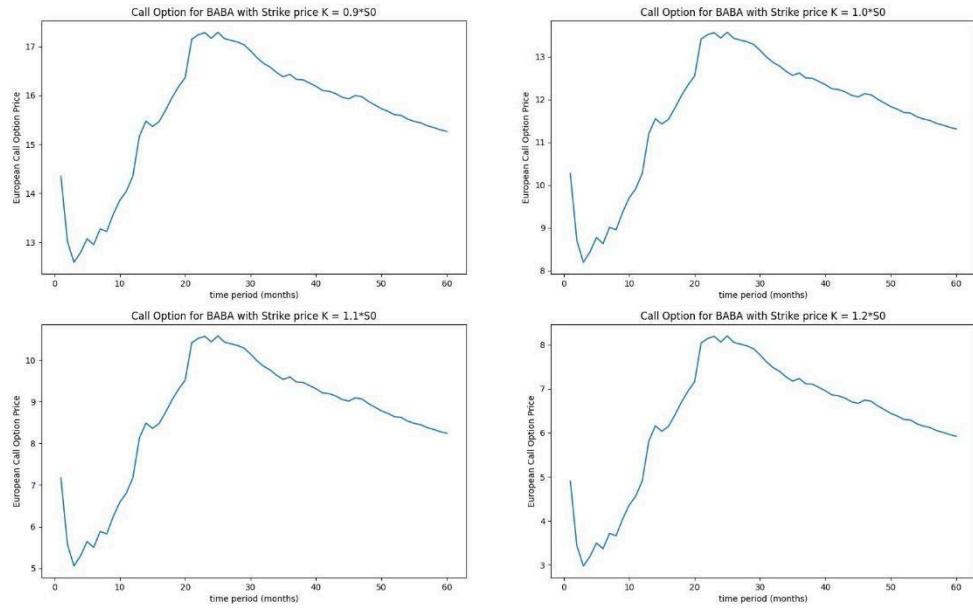


Plots for call option and volatility – stocks in nsedata1

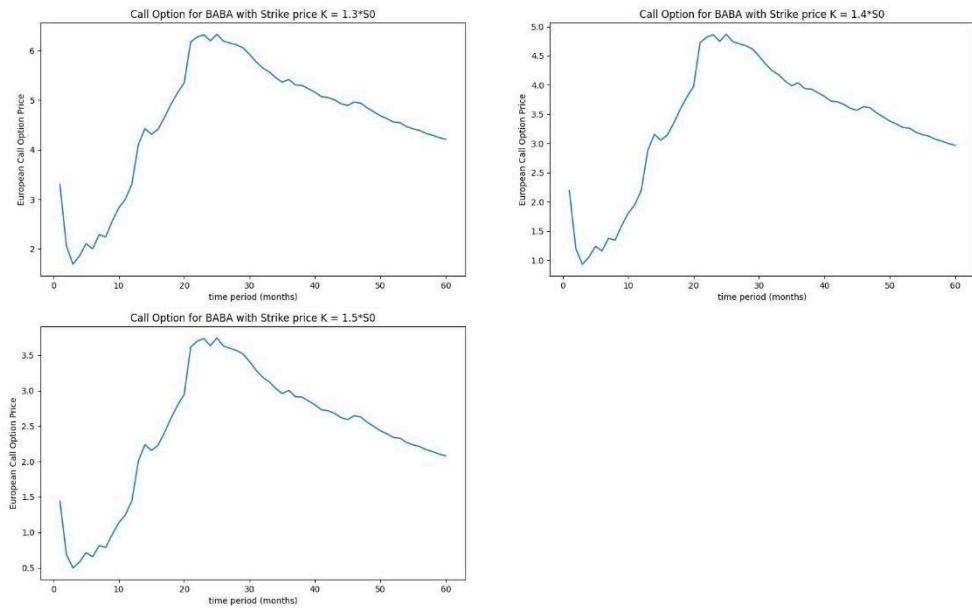
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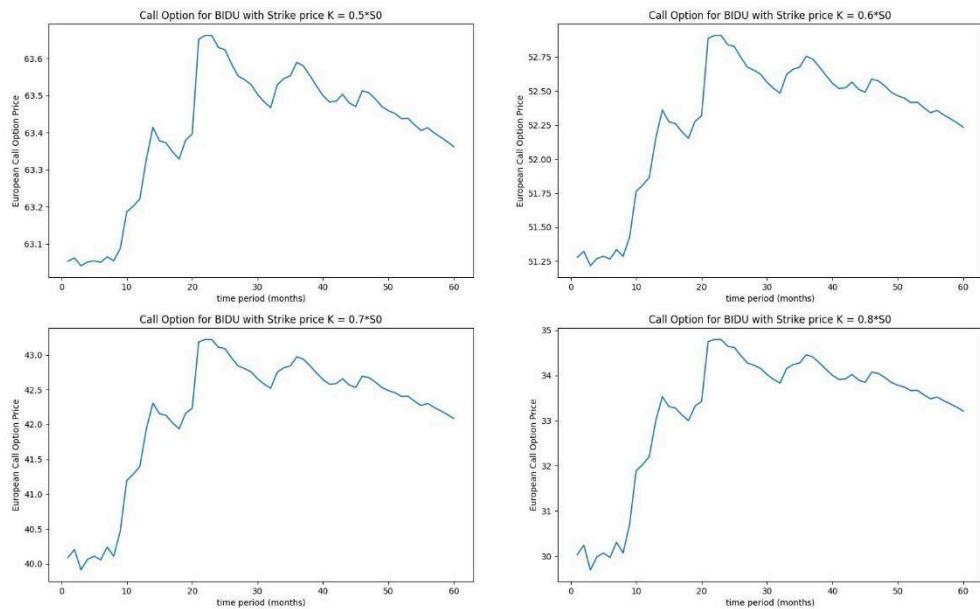
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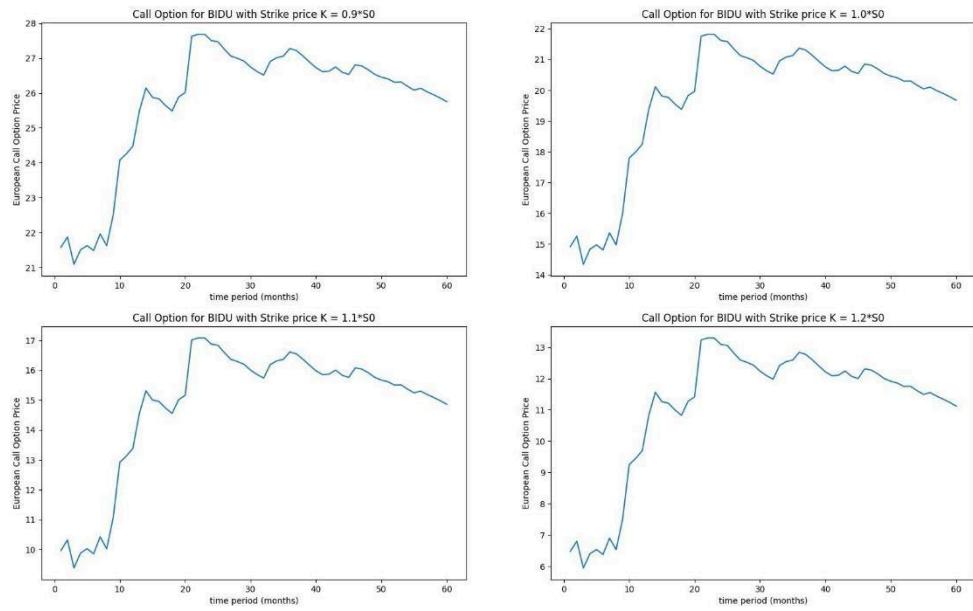
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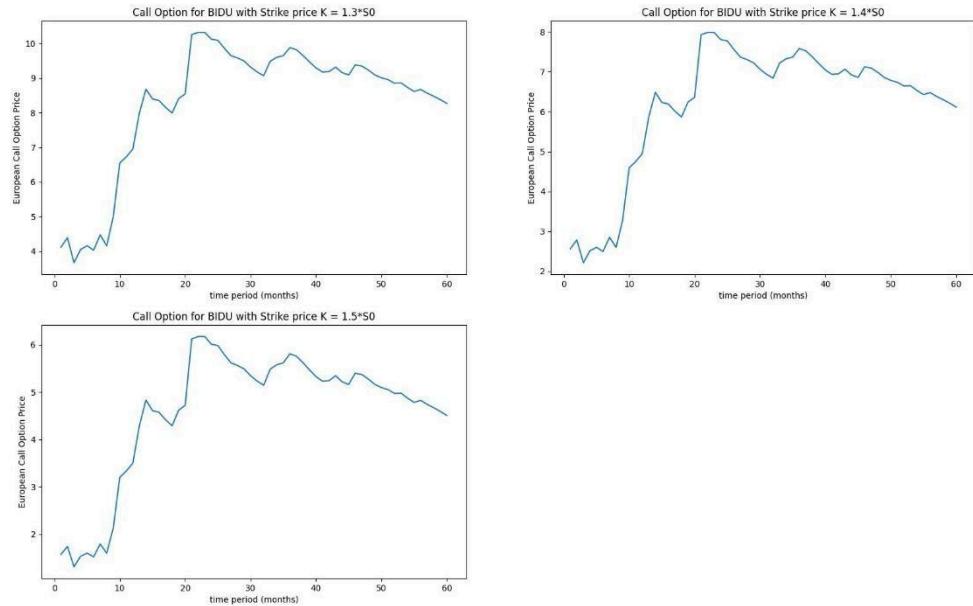
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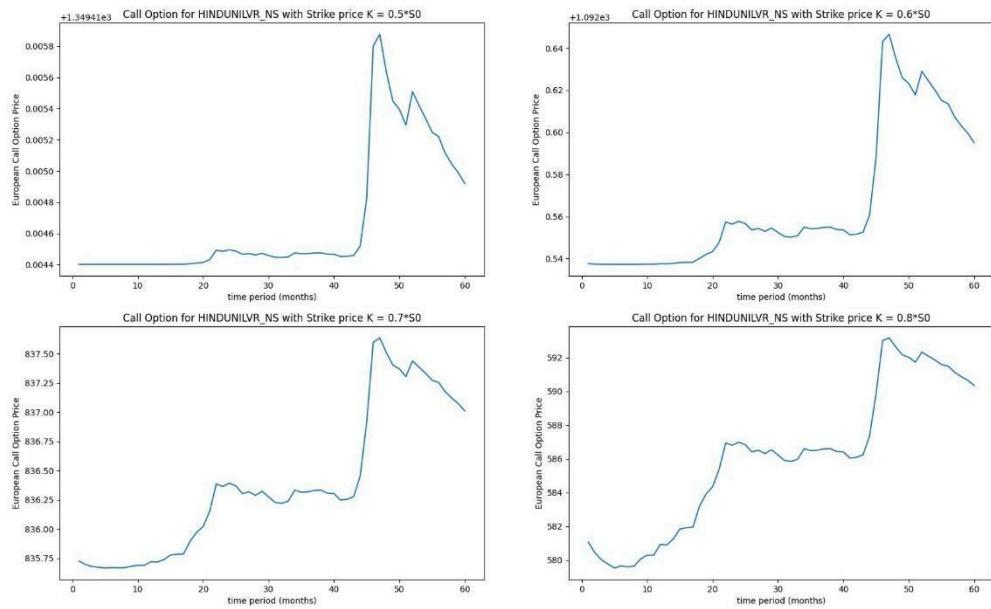
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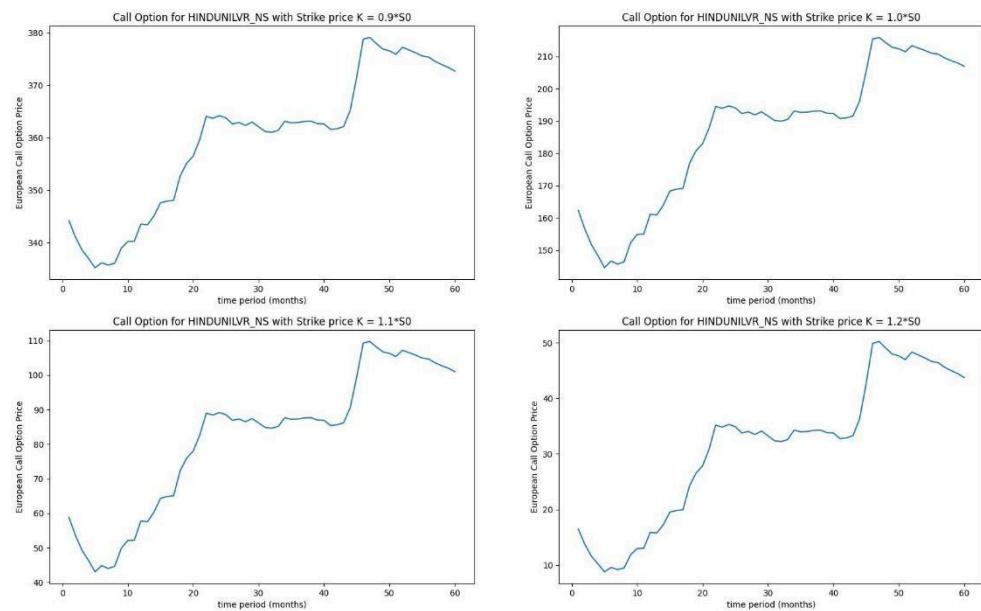
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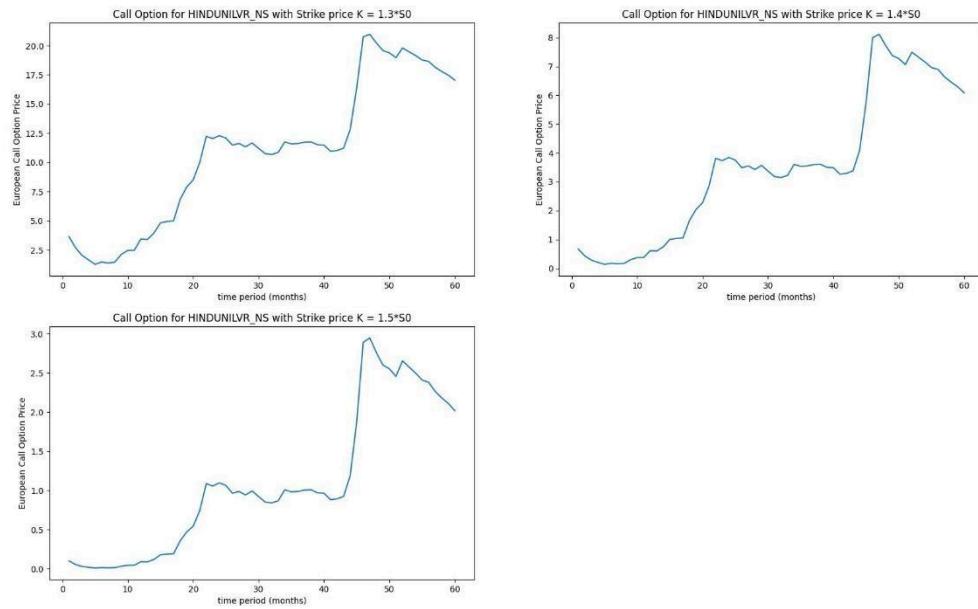
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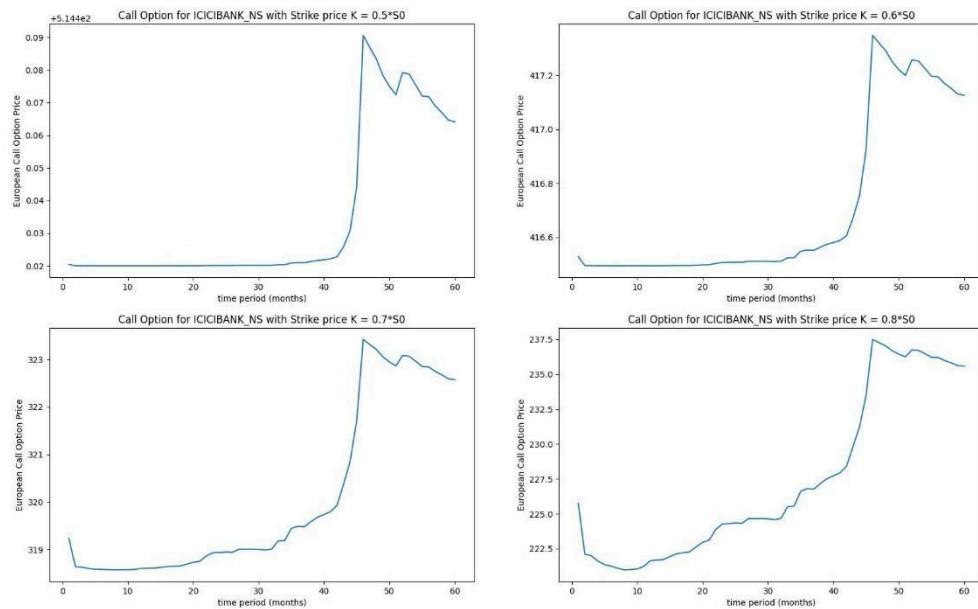
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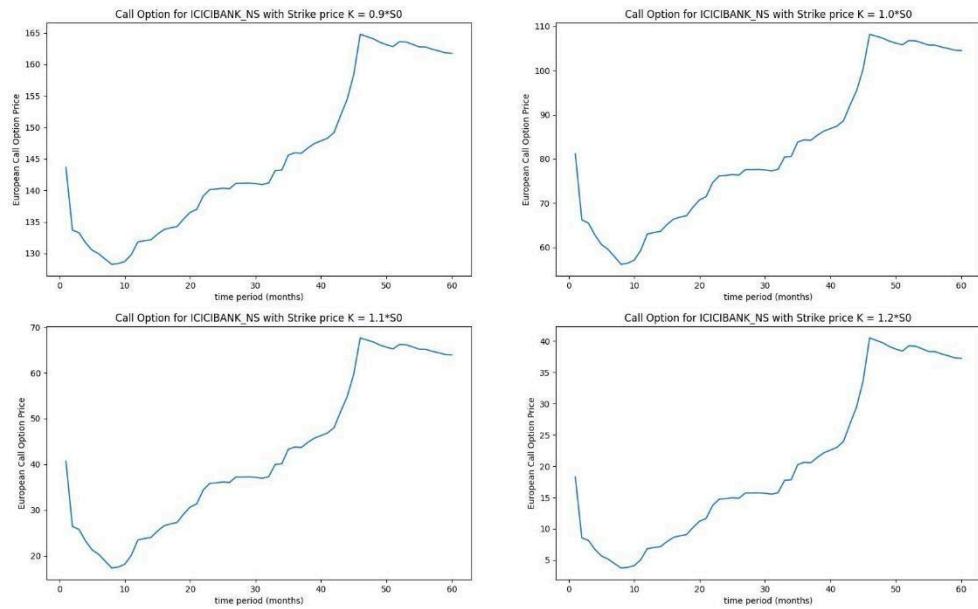
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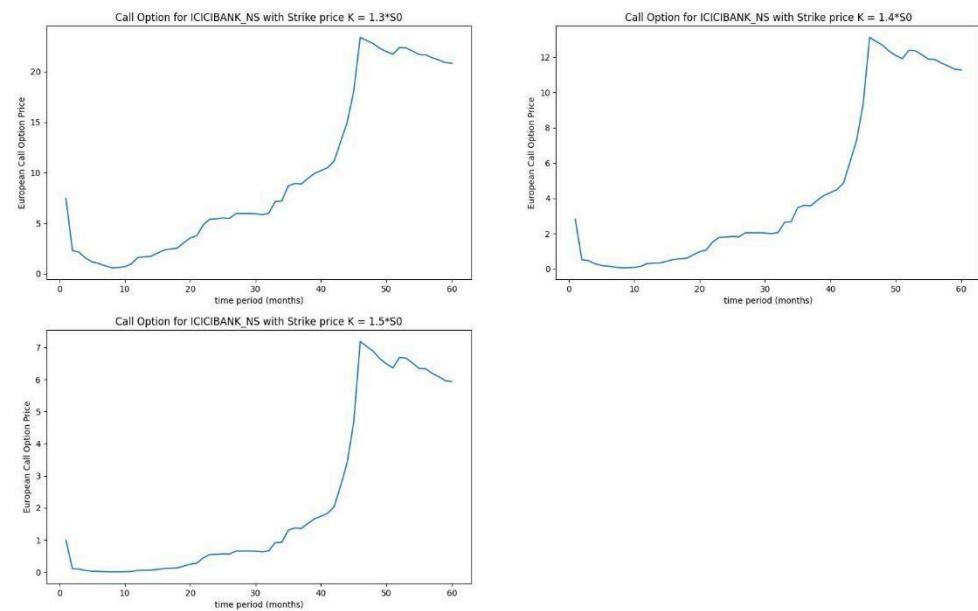
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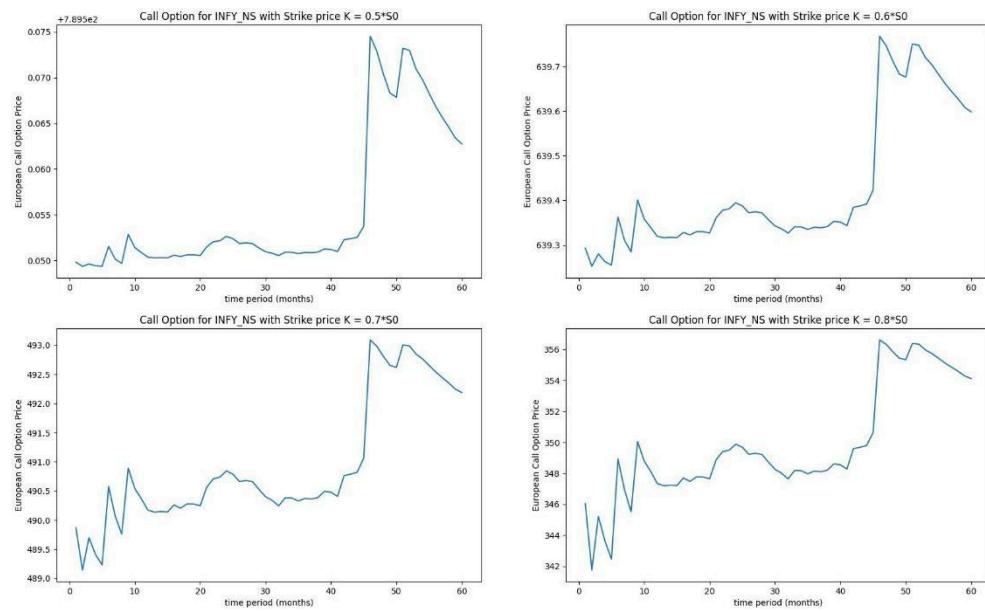
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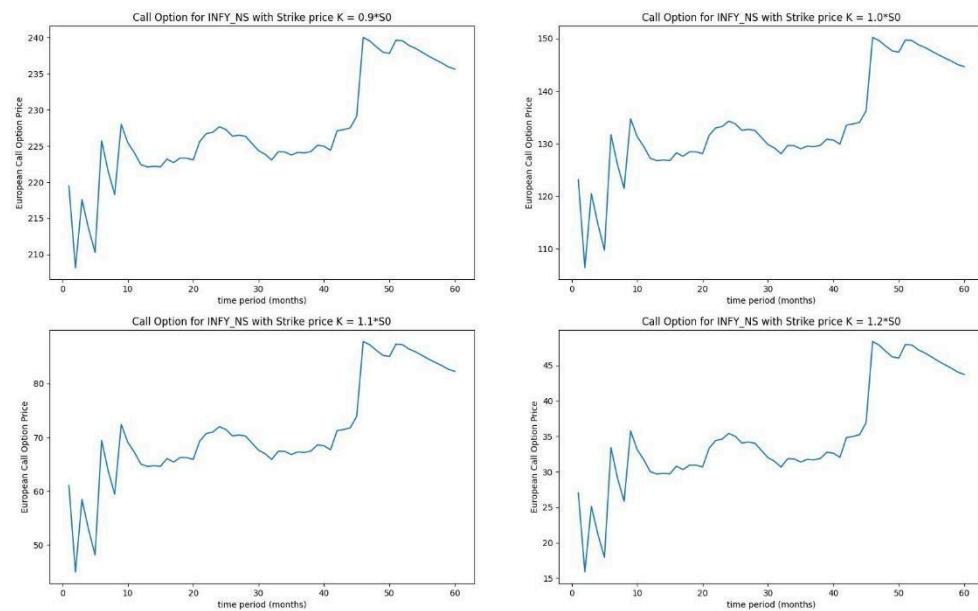
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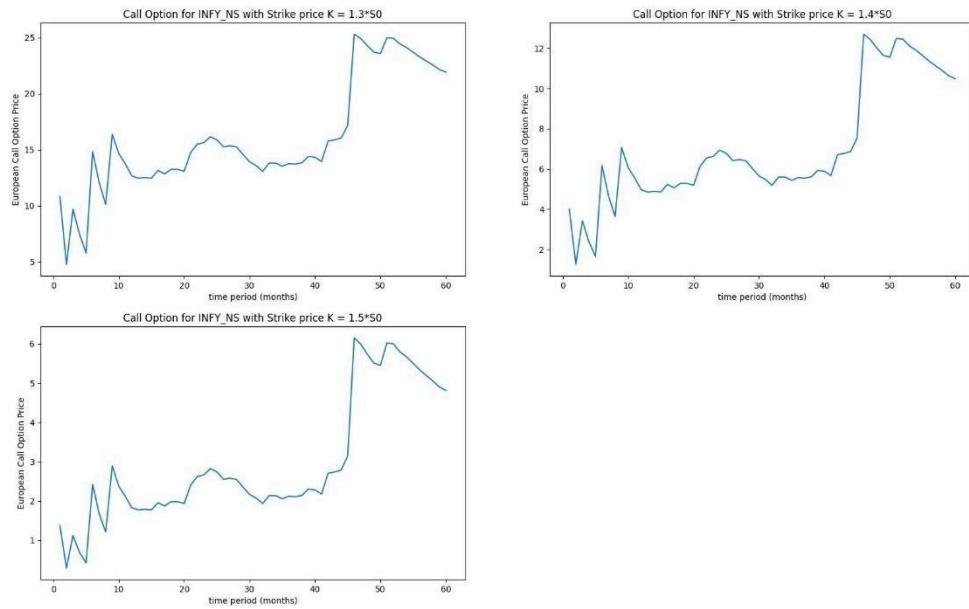
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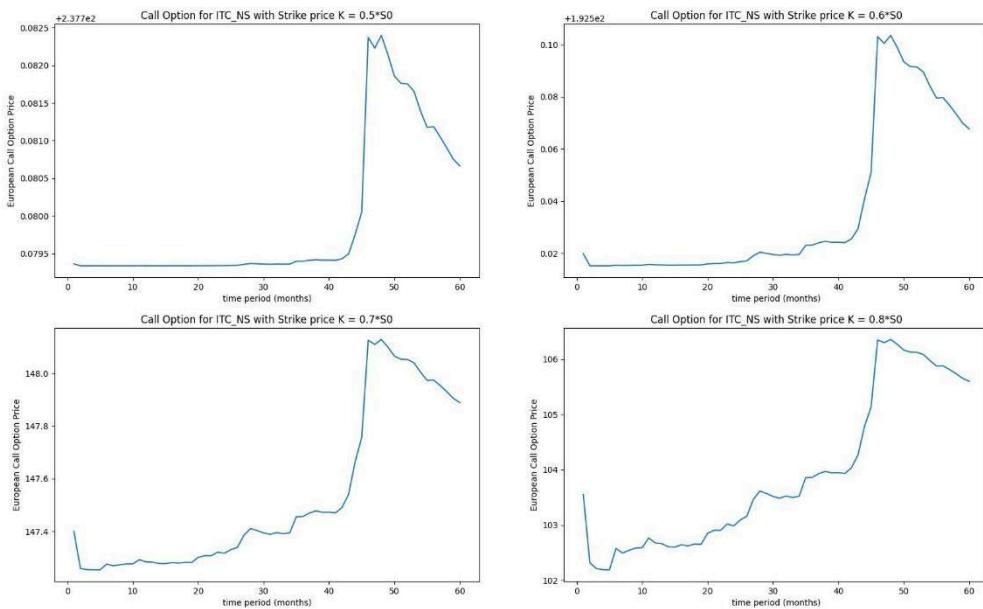
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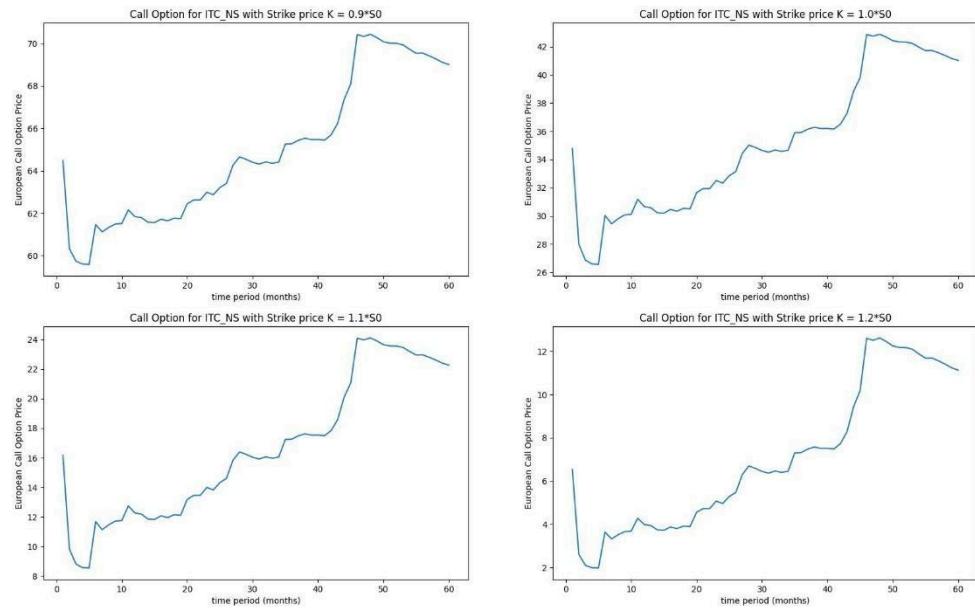
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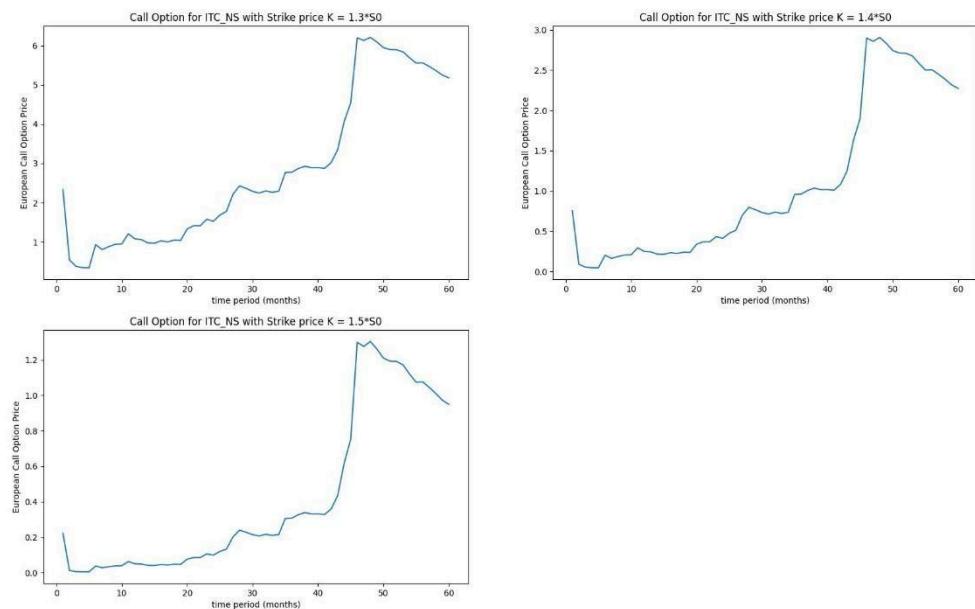
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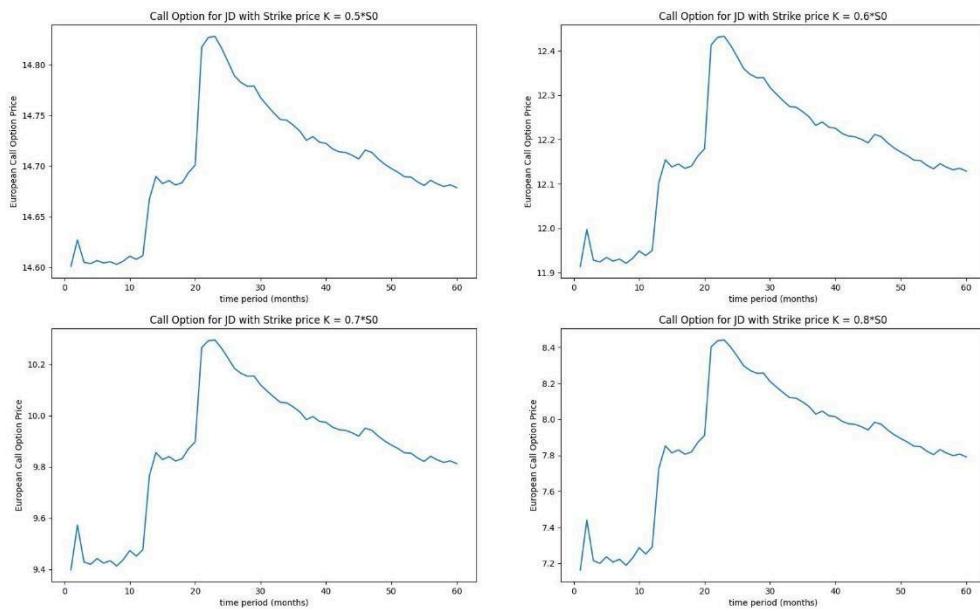
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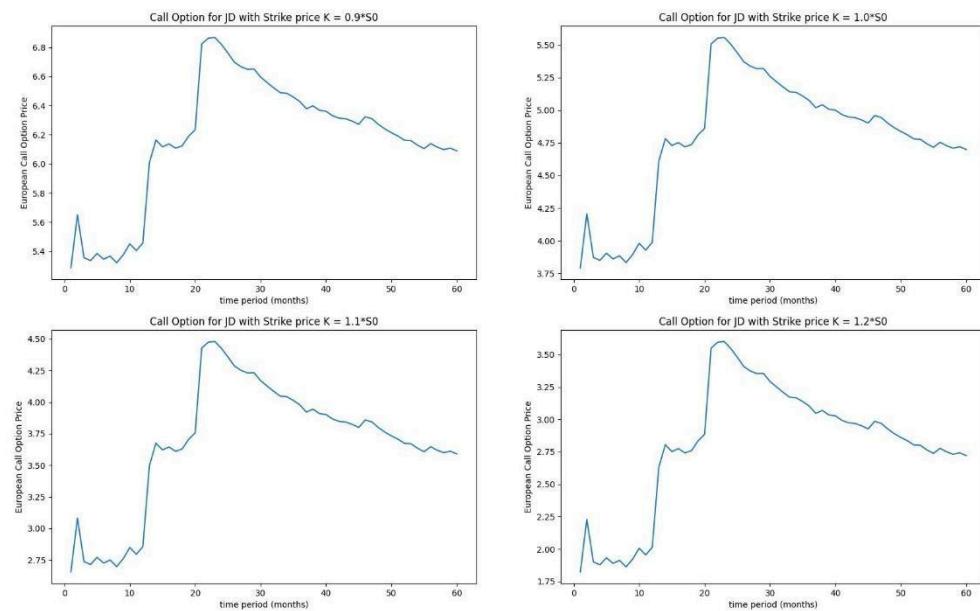
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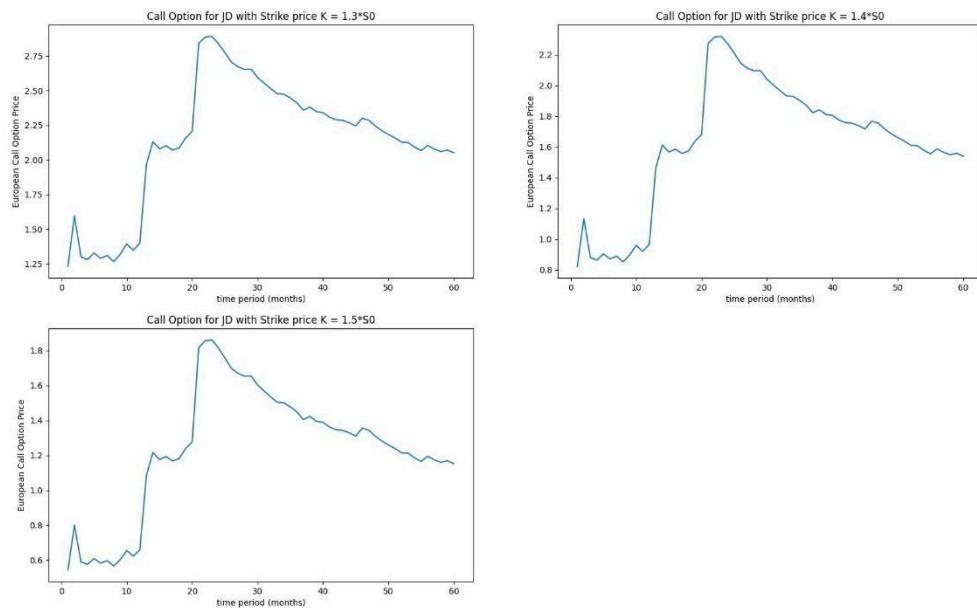
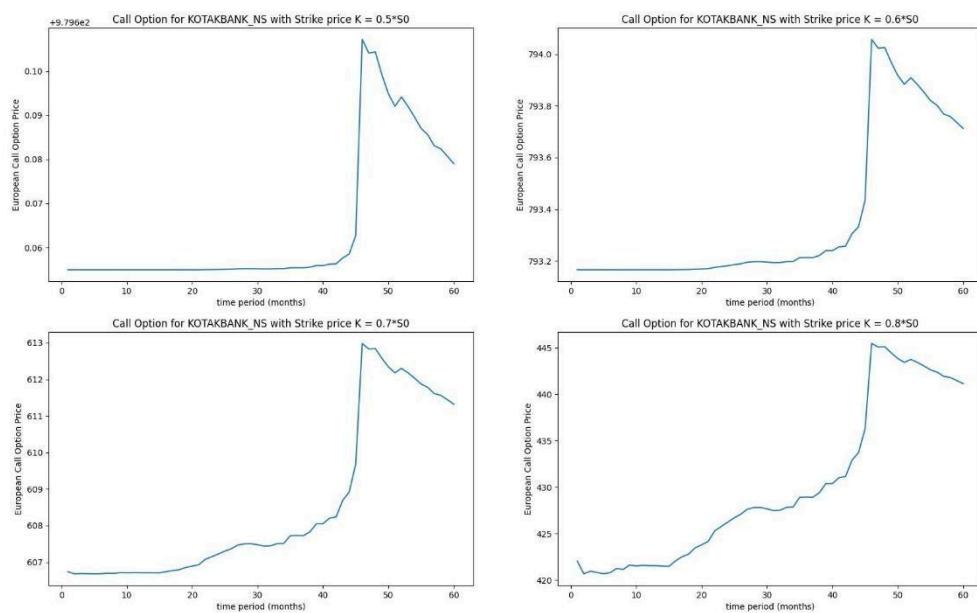


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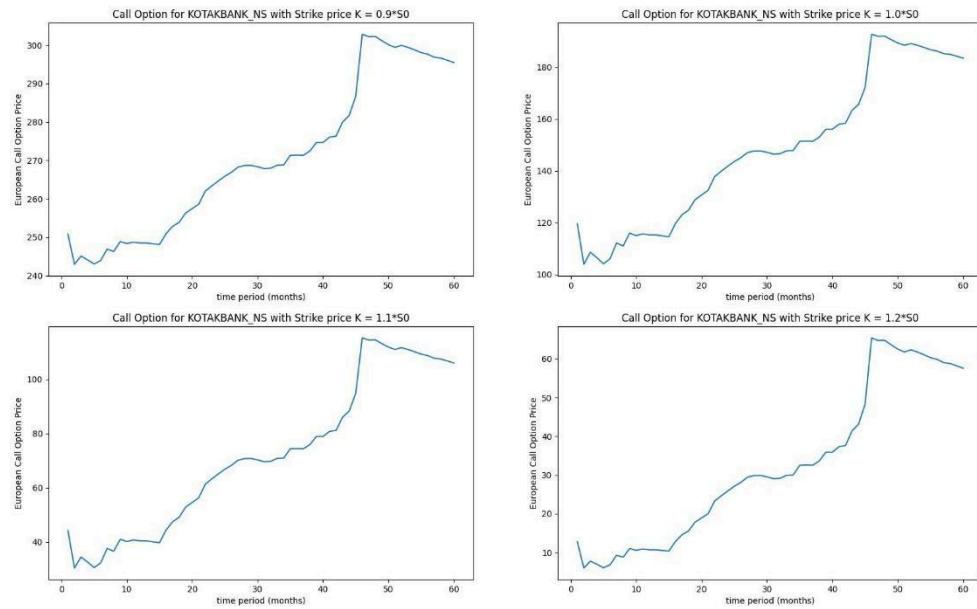


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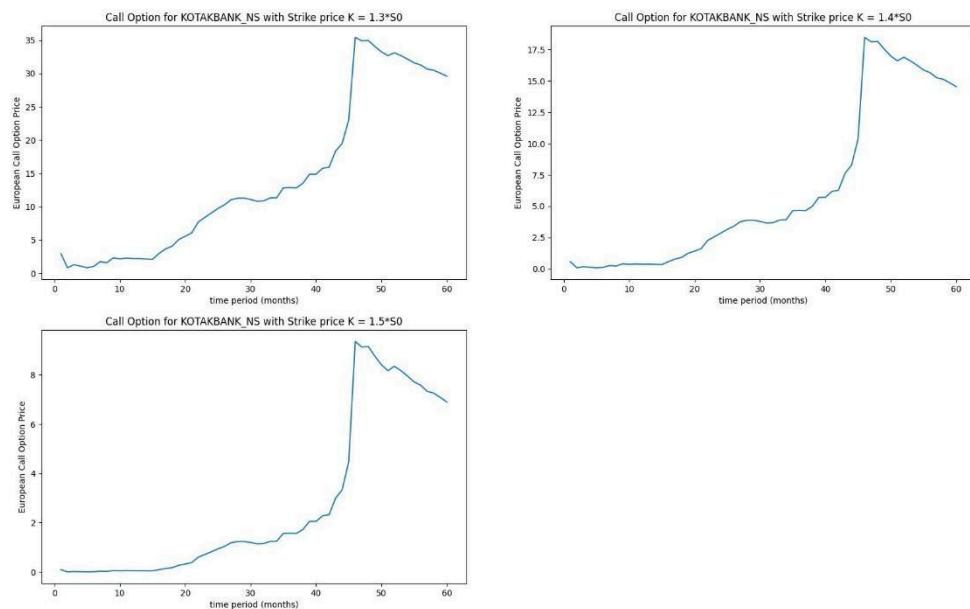


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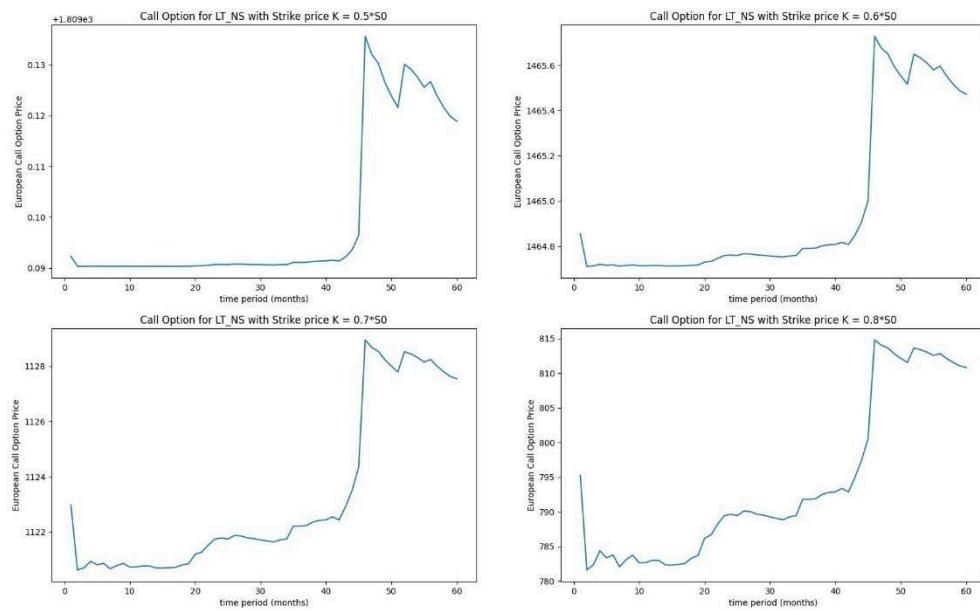
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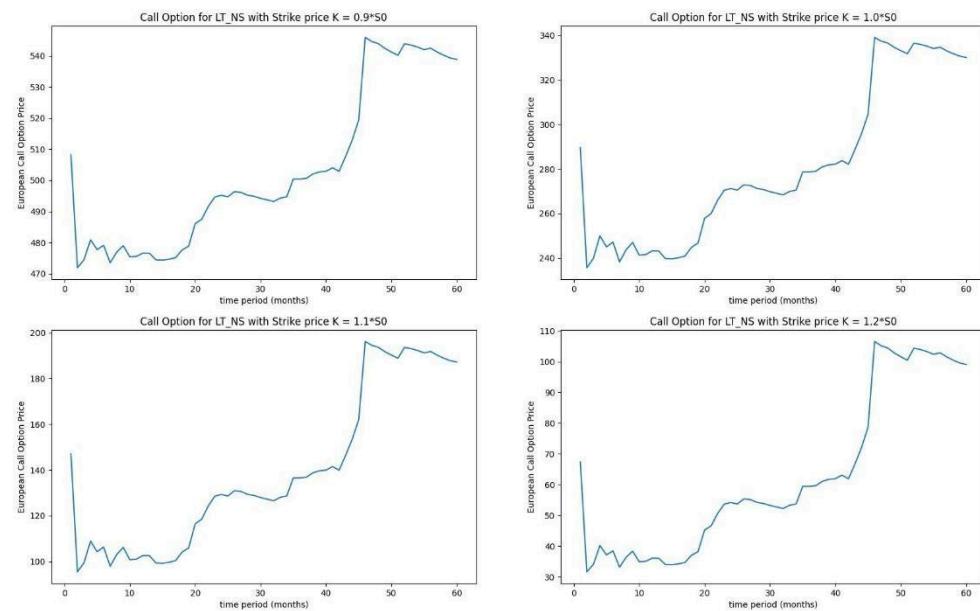
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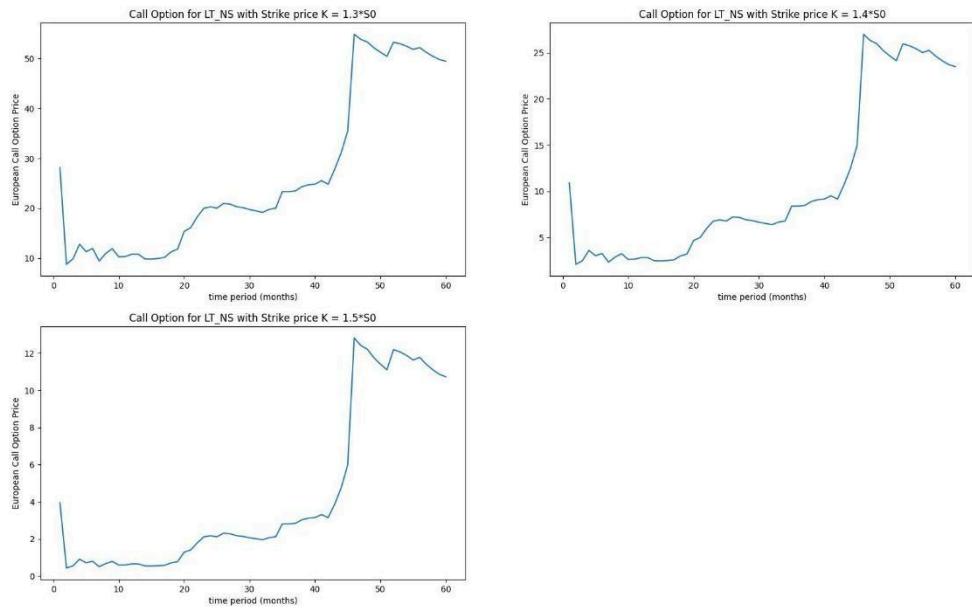
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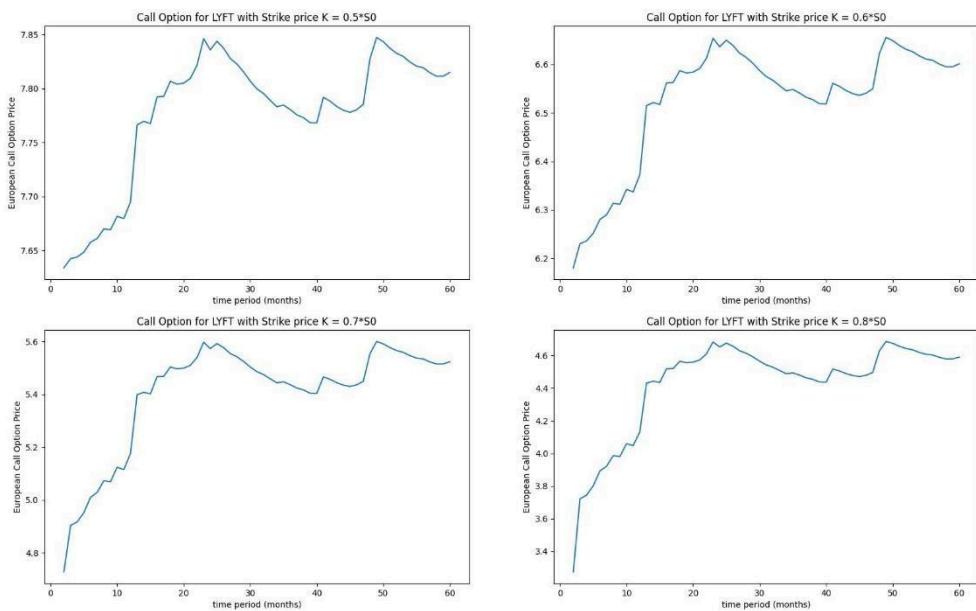
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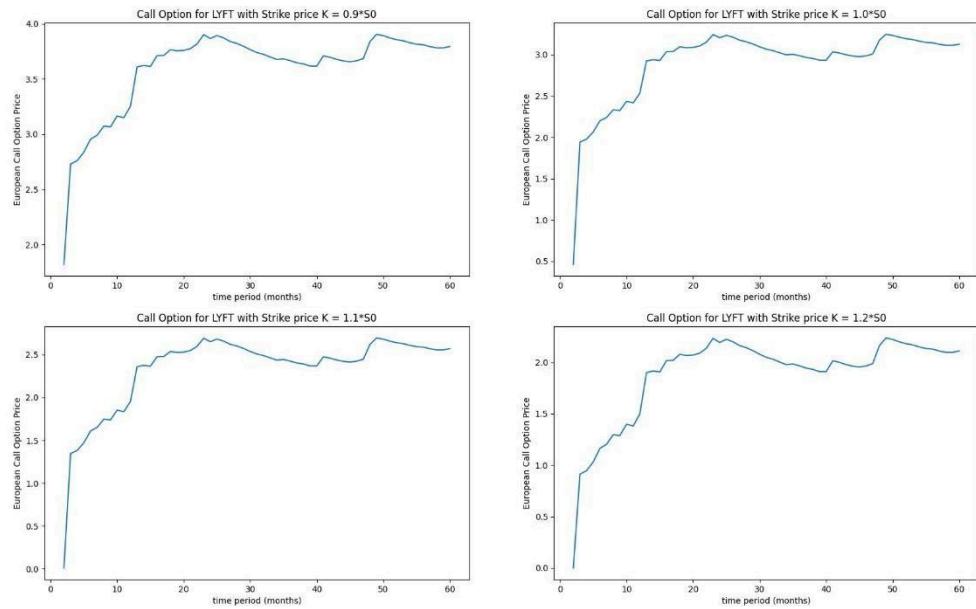
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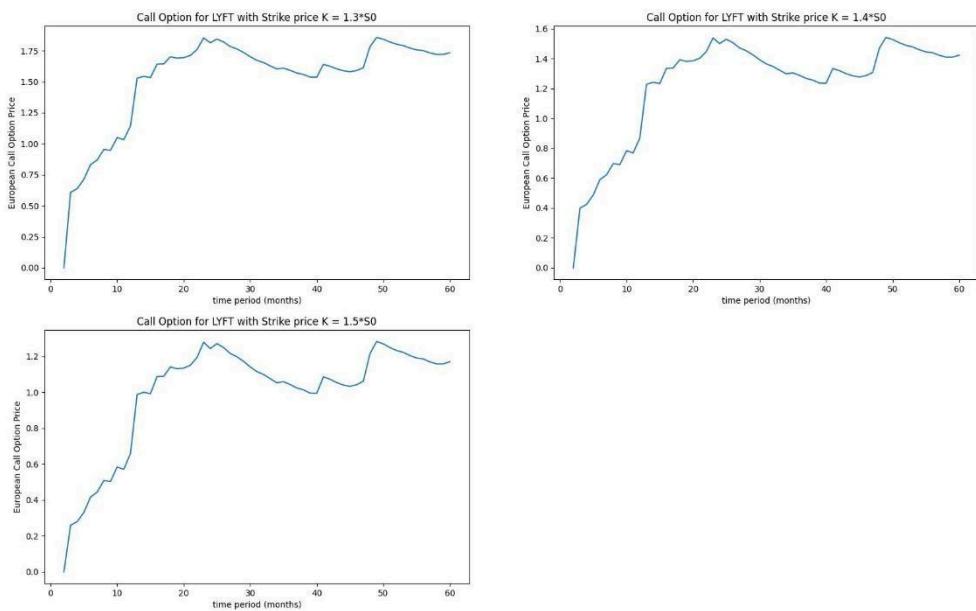
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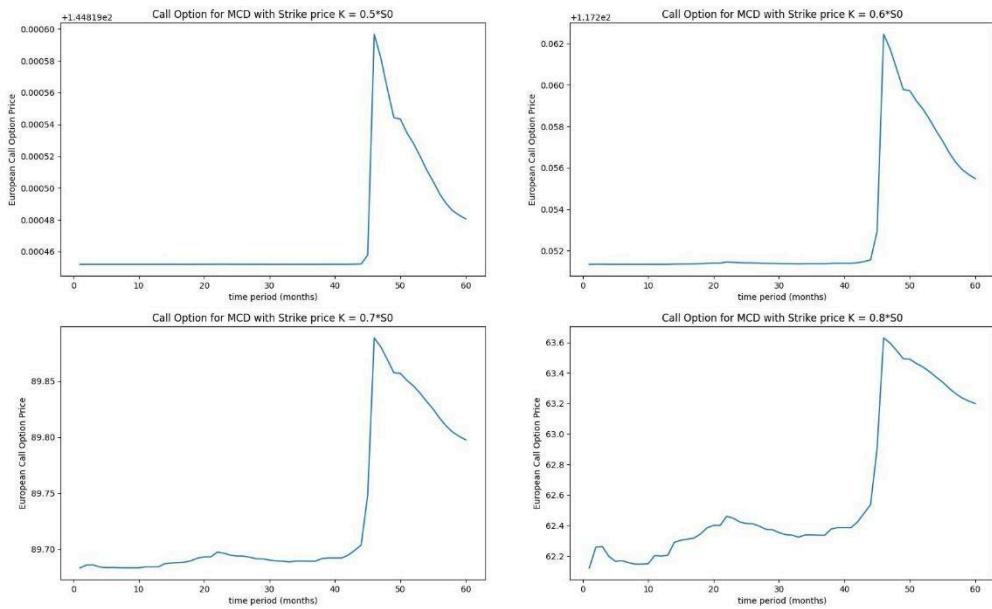
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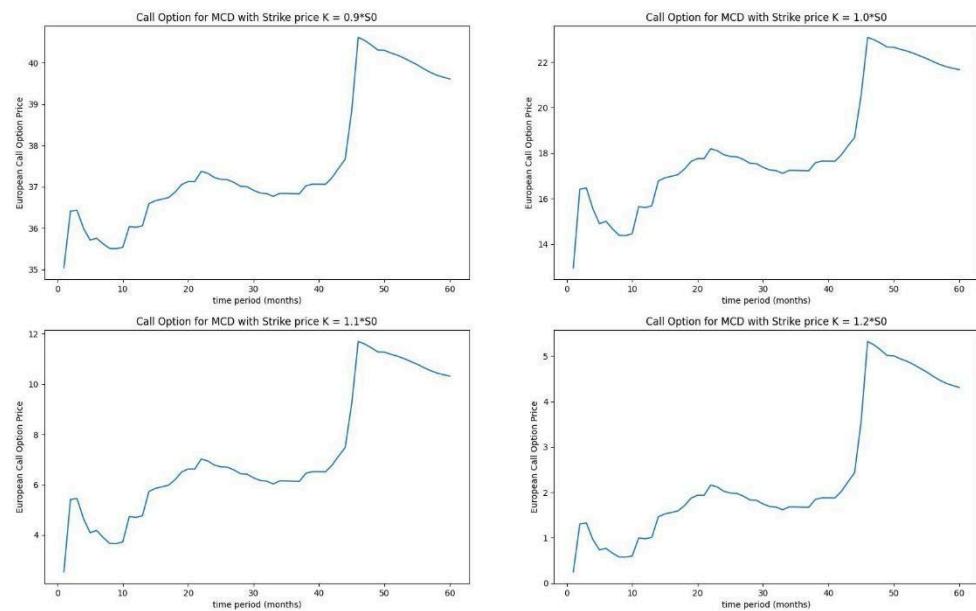
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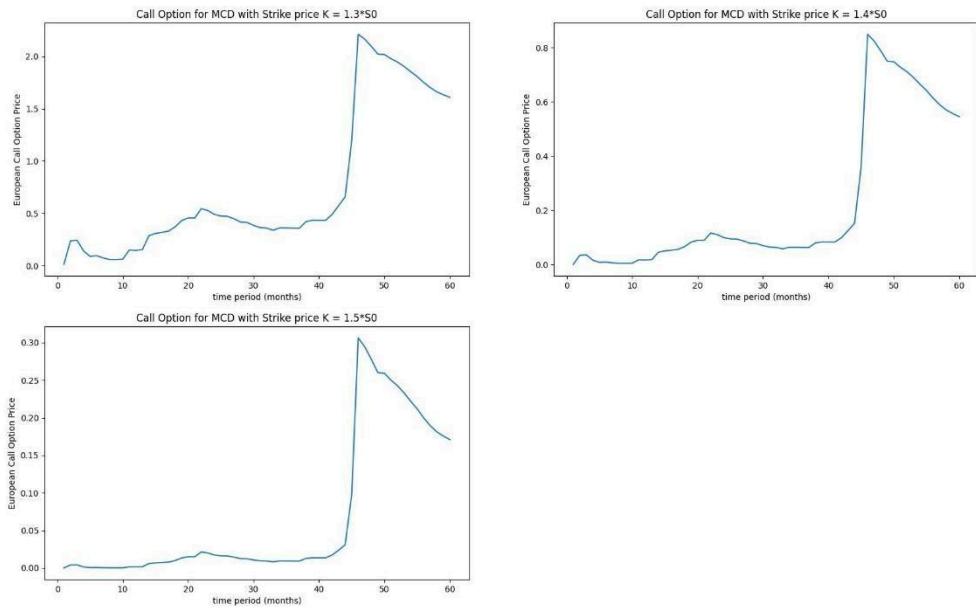
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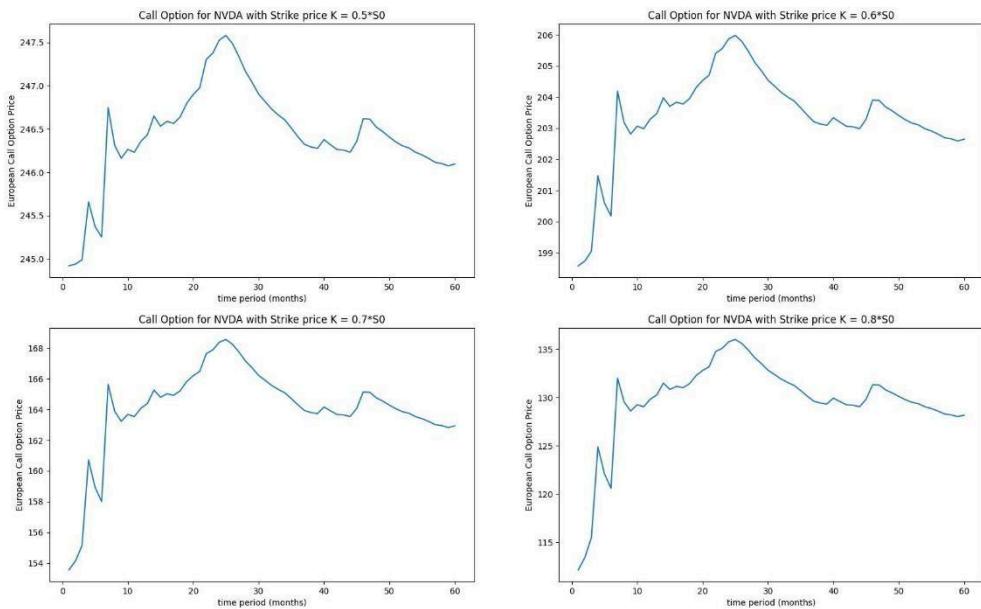
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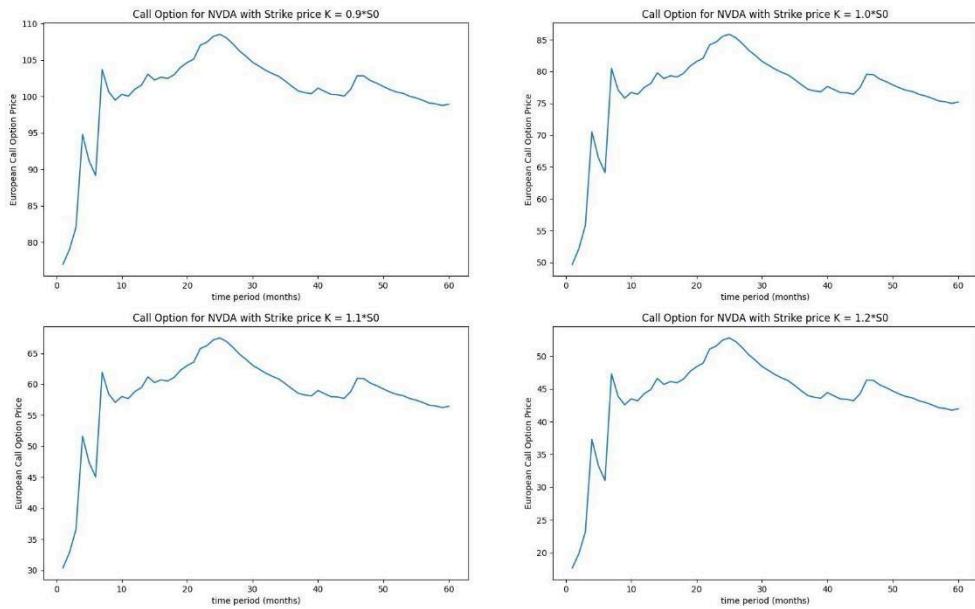
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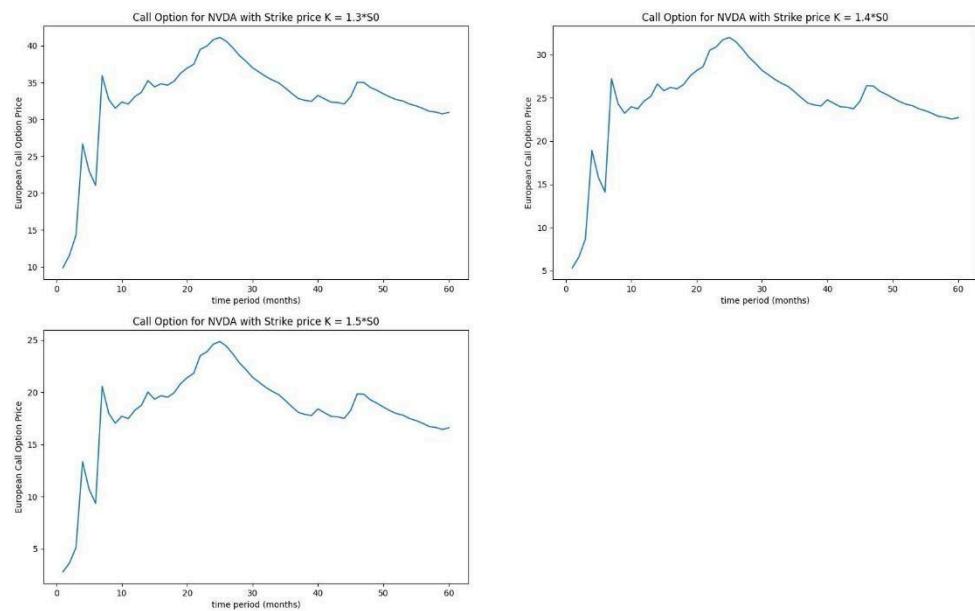
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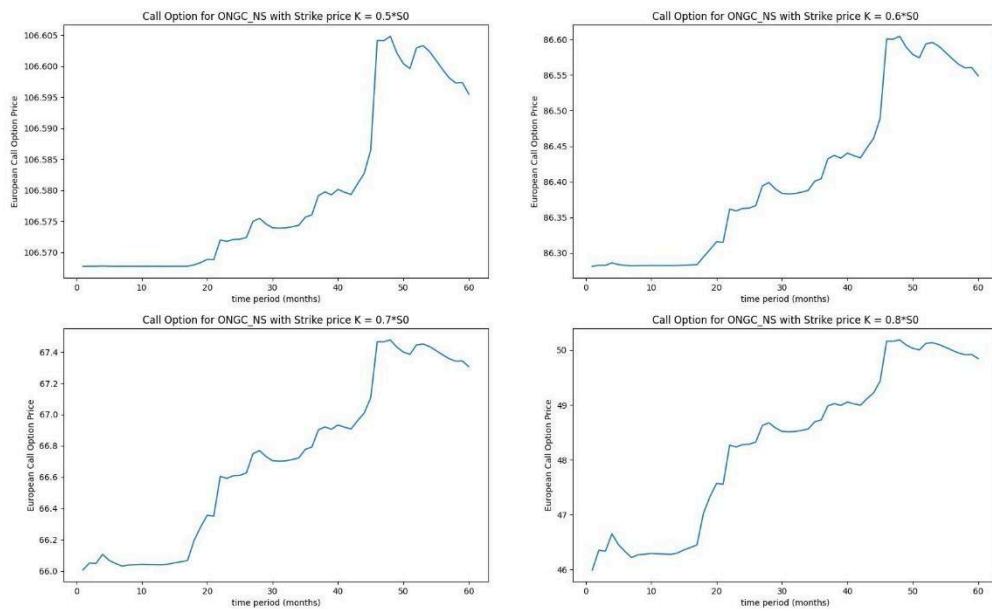
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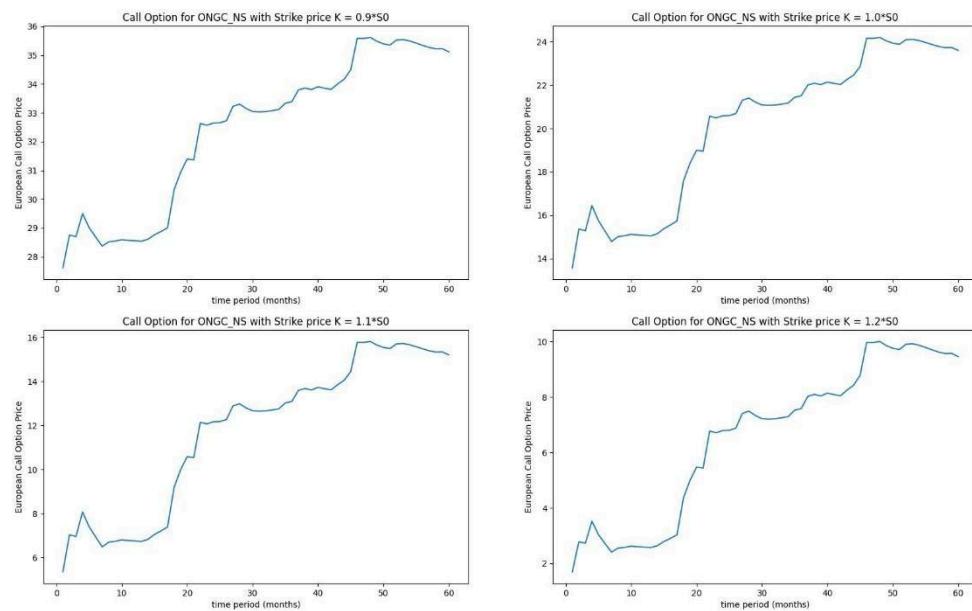
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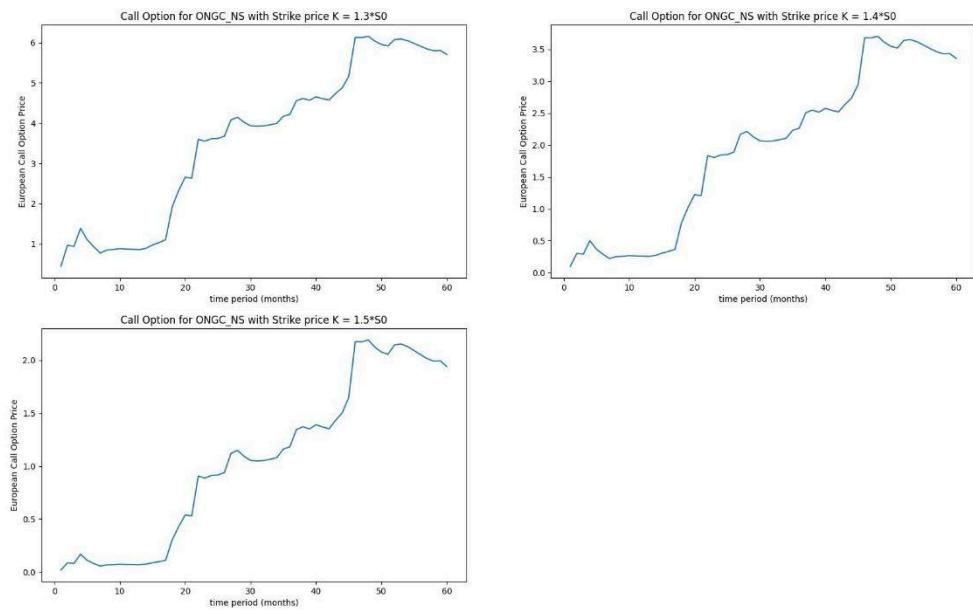
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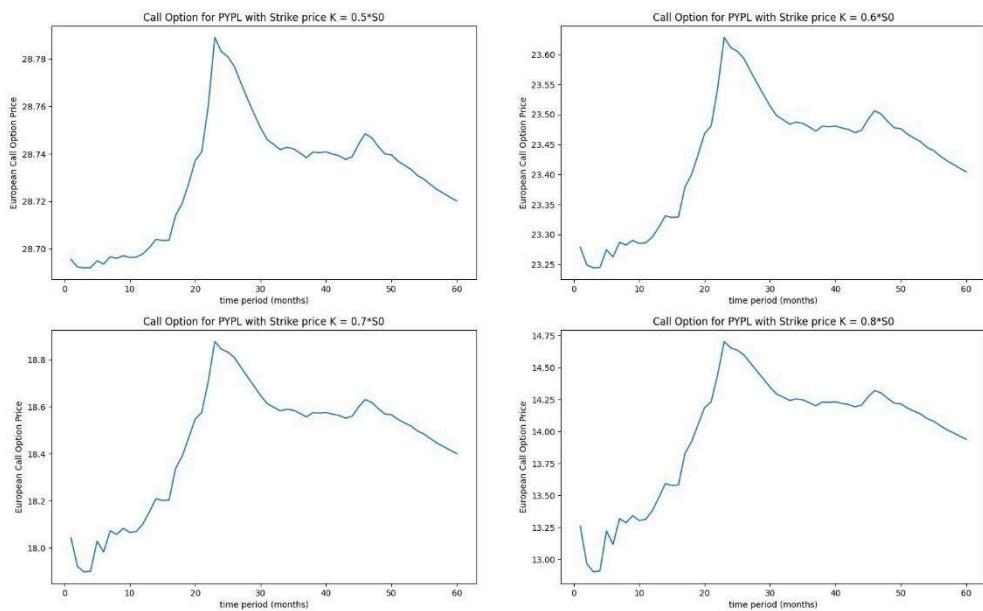
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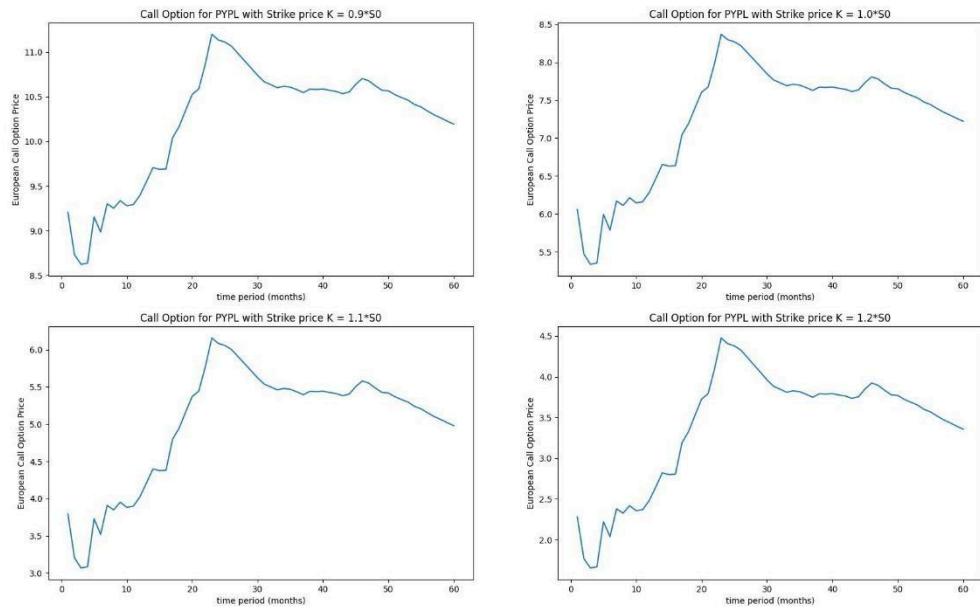
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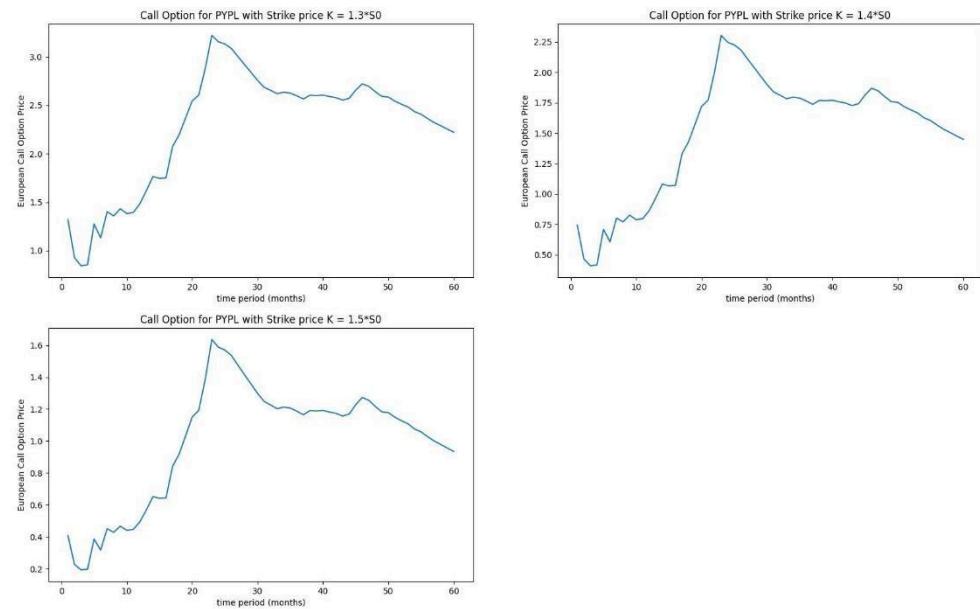
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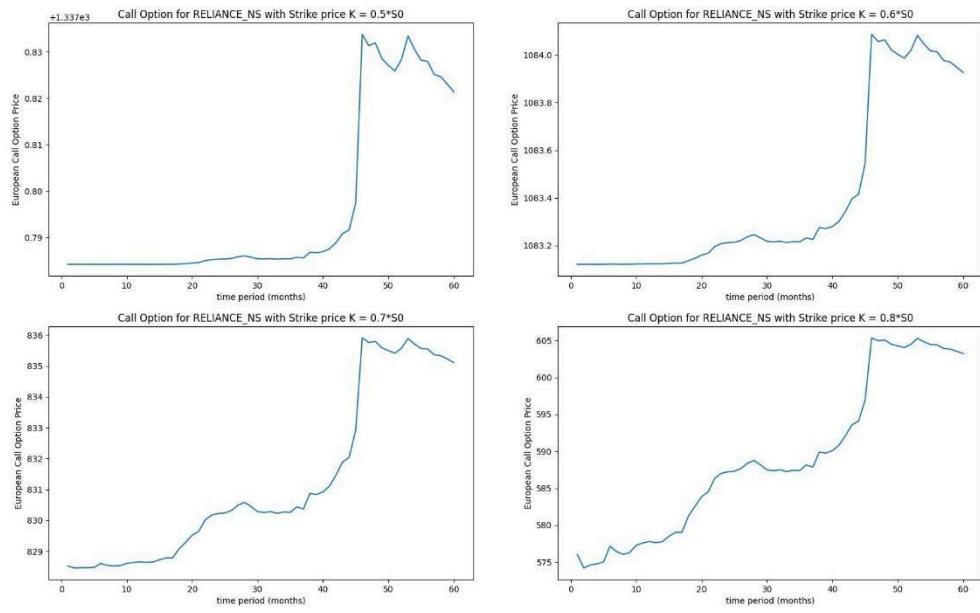
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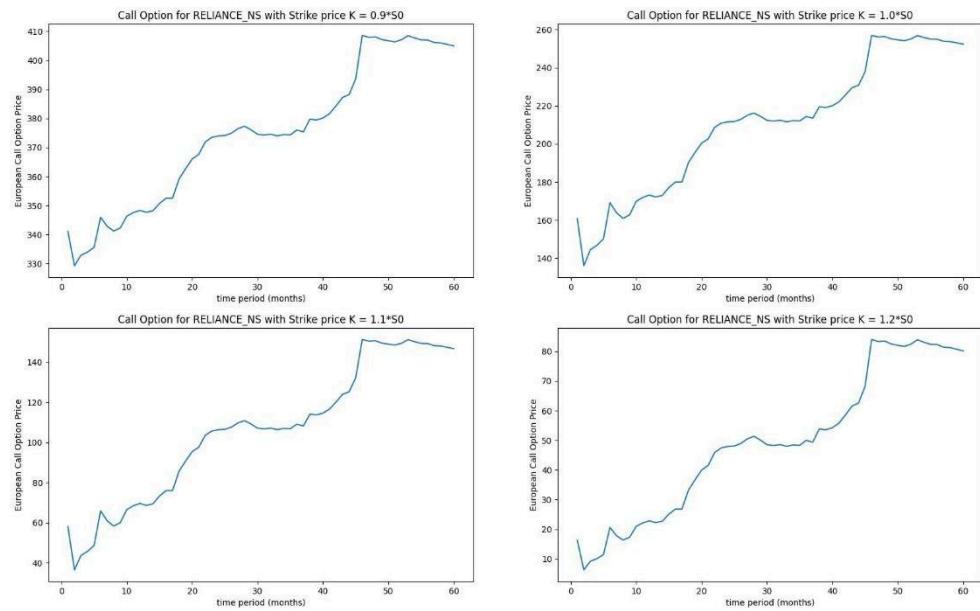
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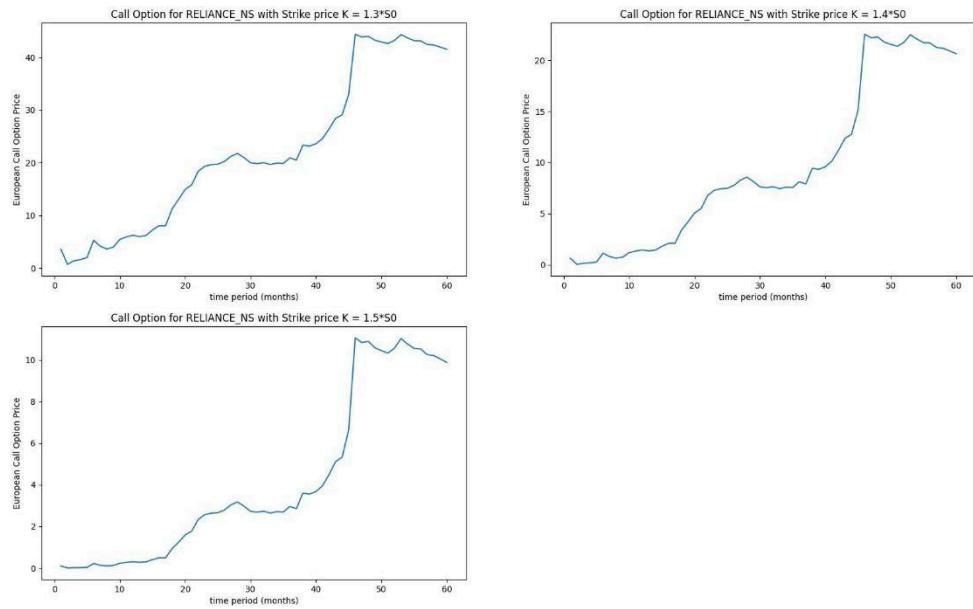
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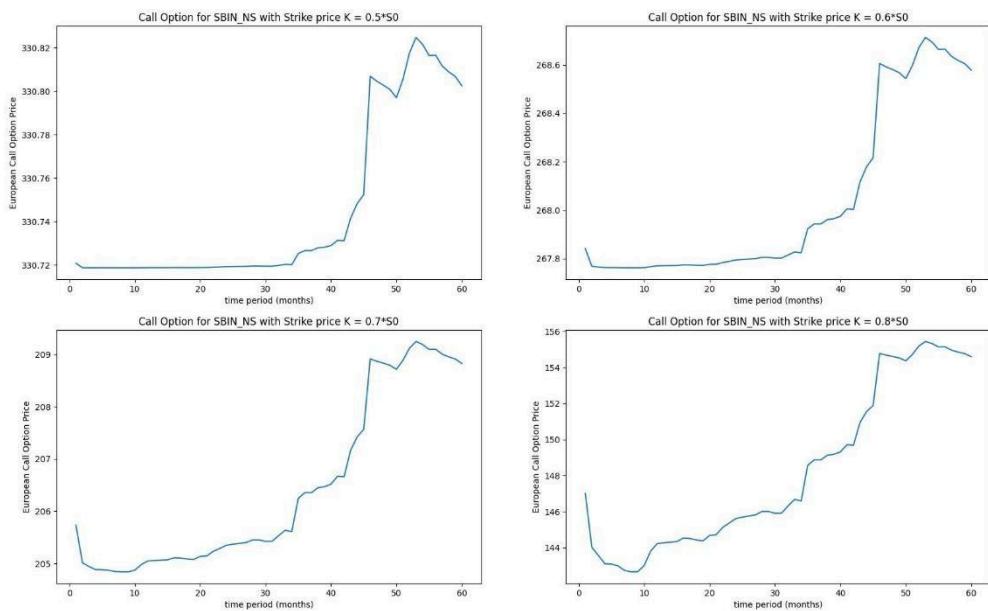
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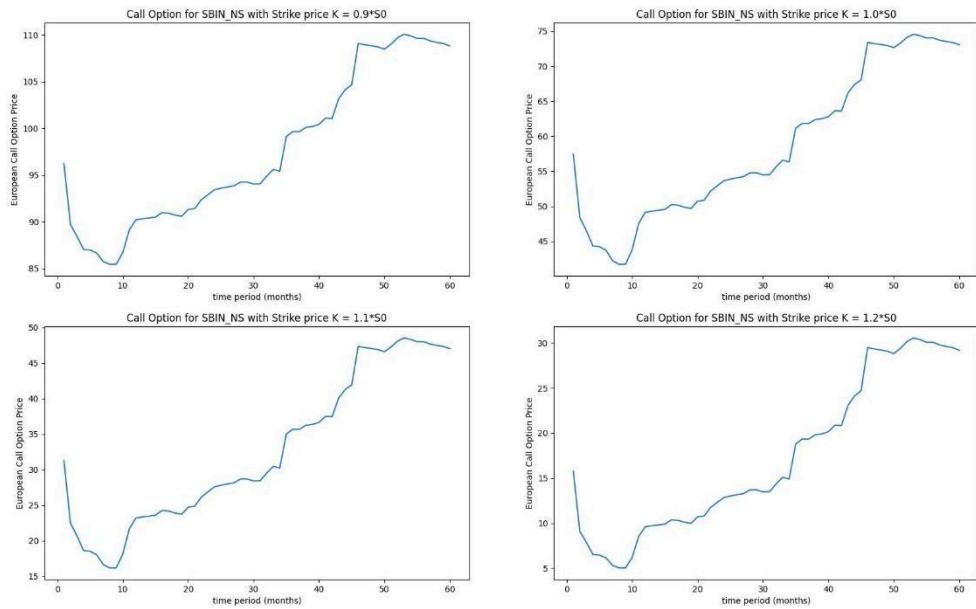
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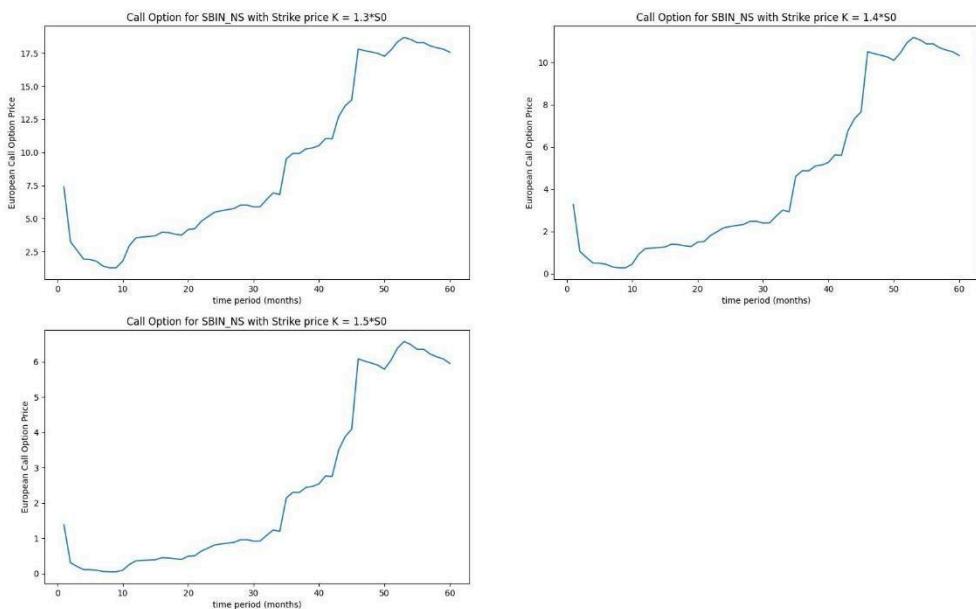
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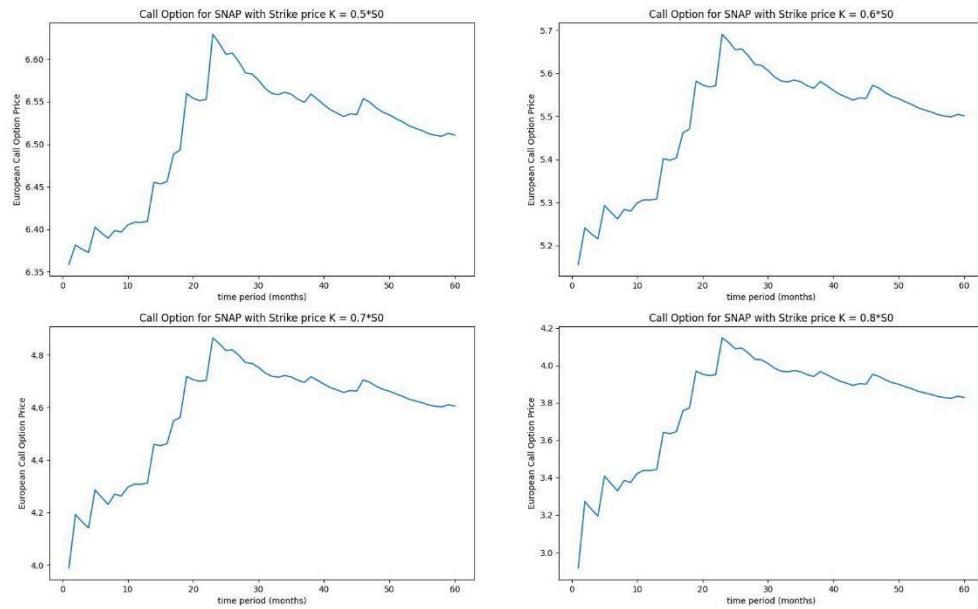
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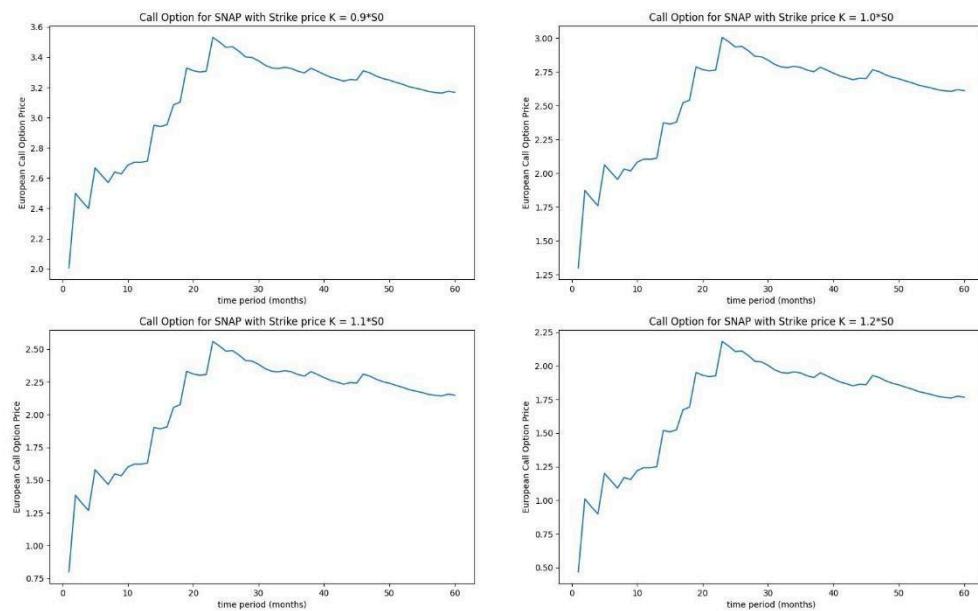
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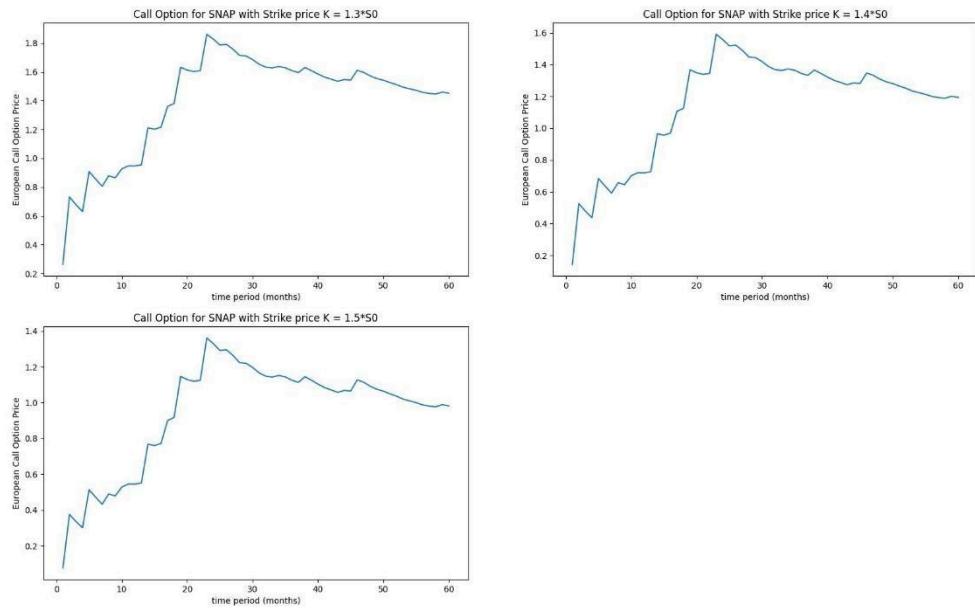
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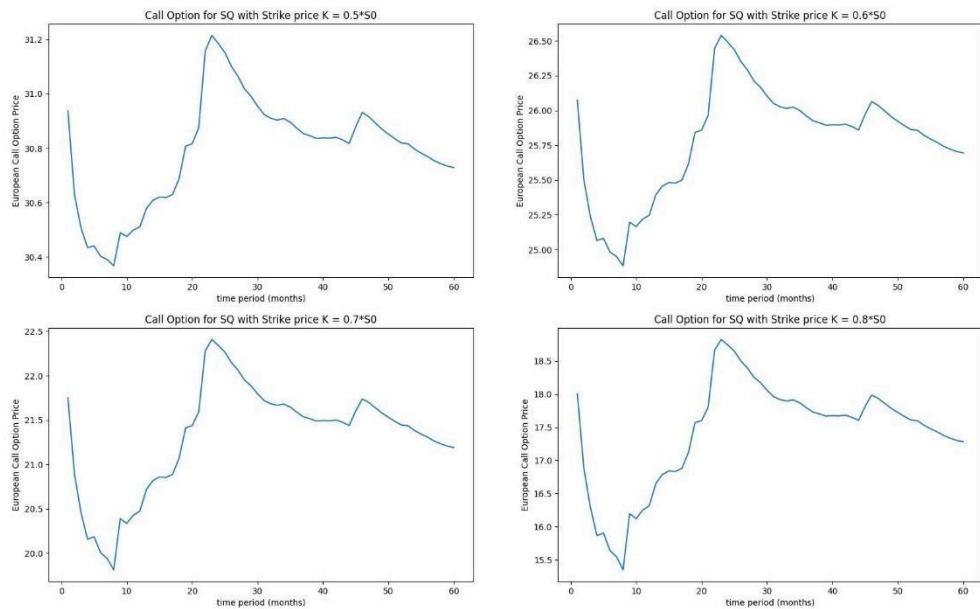
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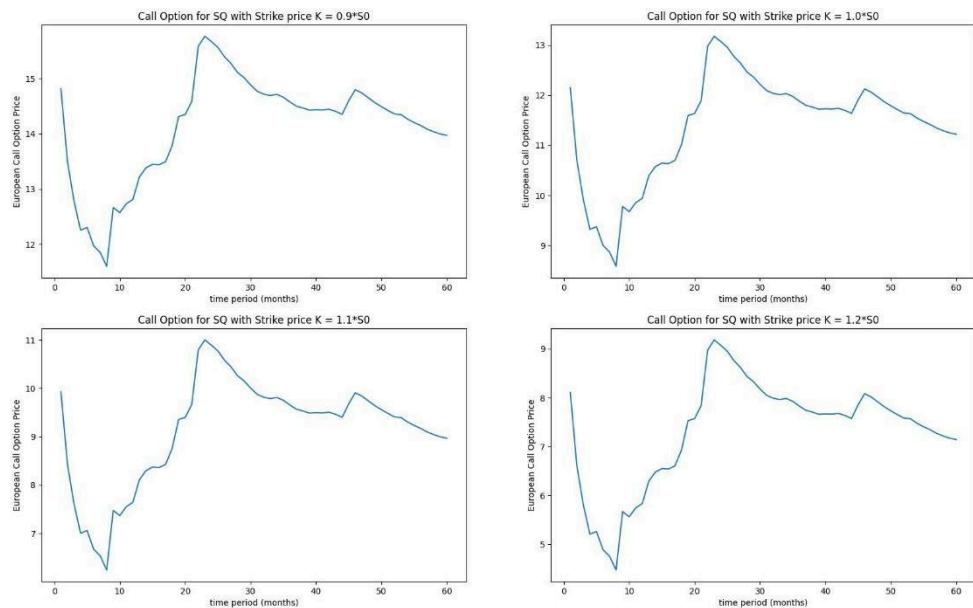
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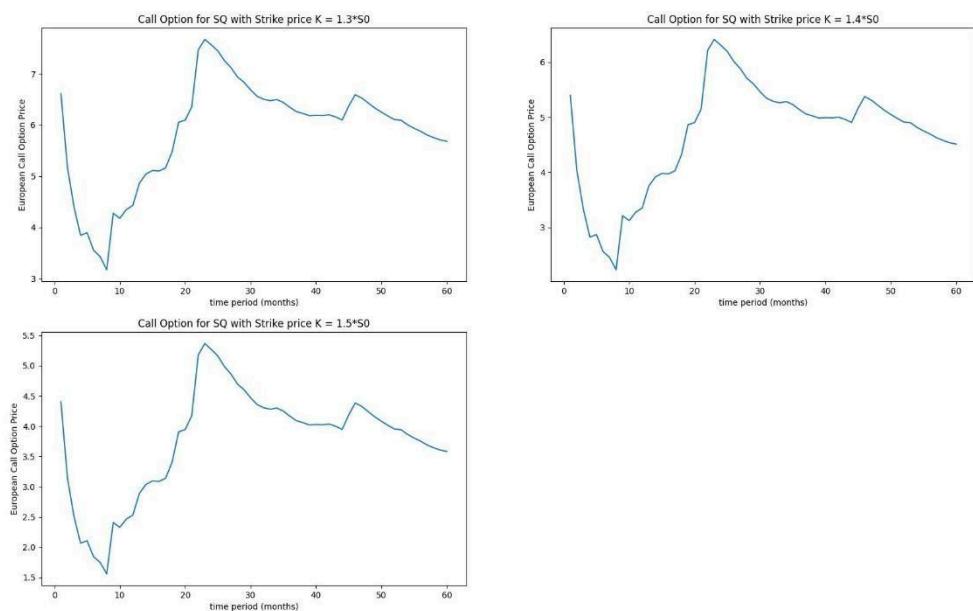
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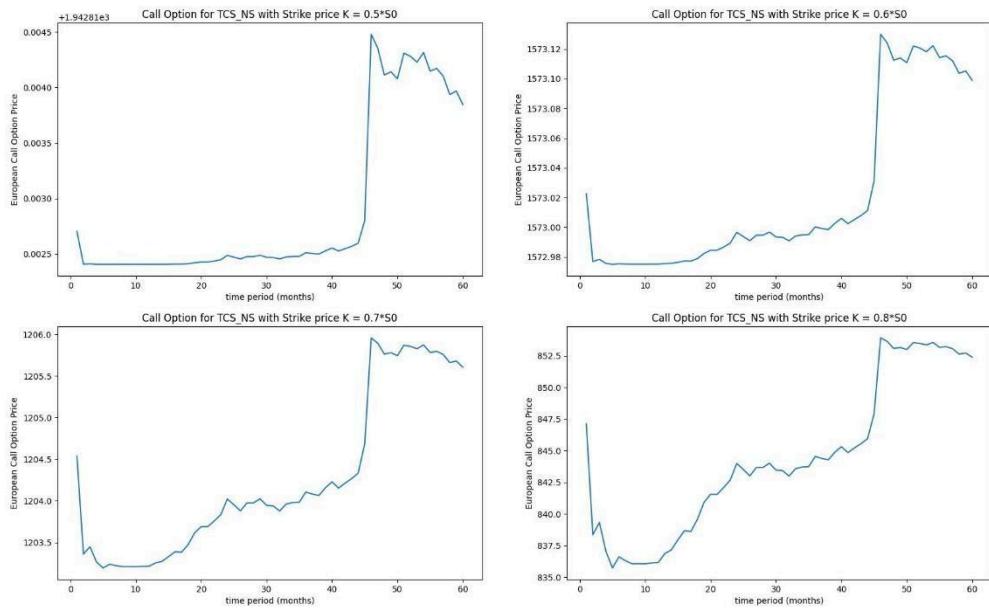
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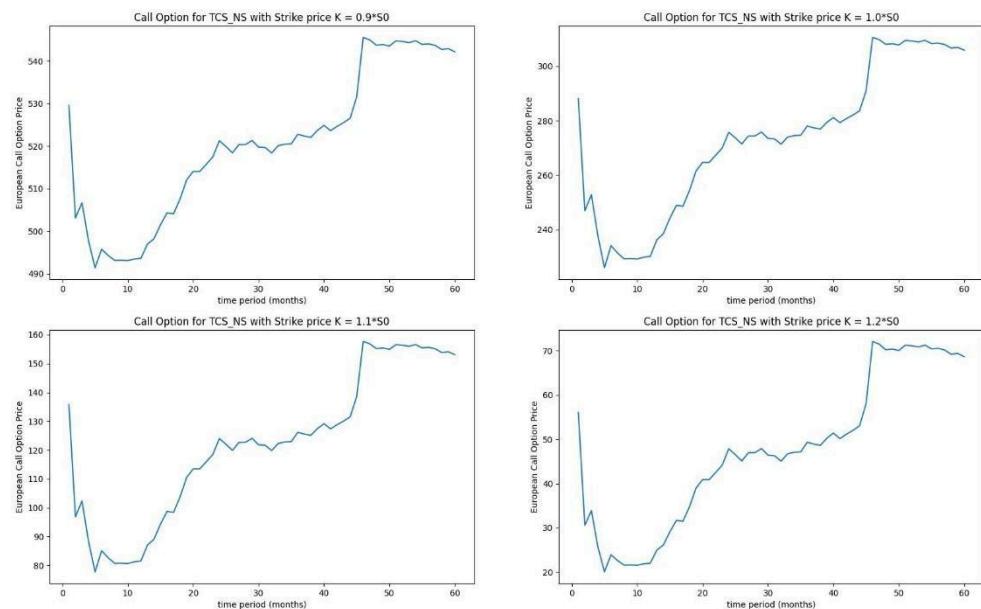
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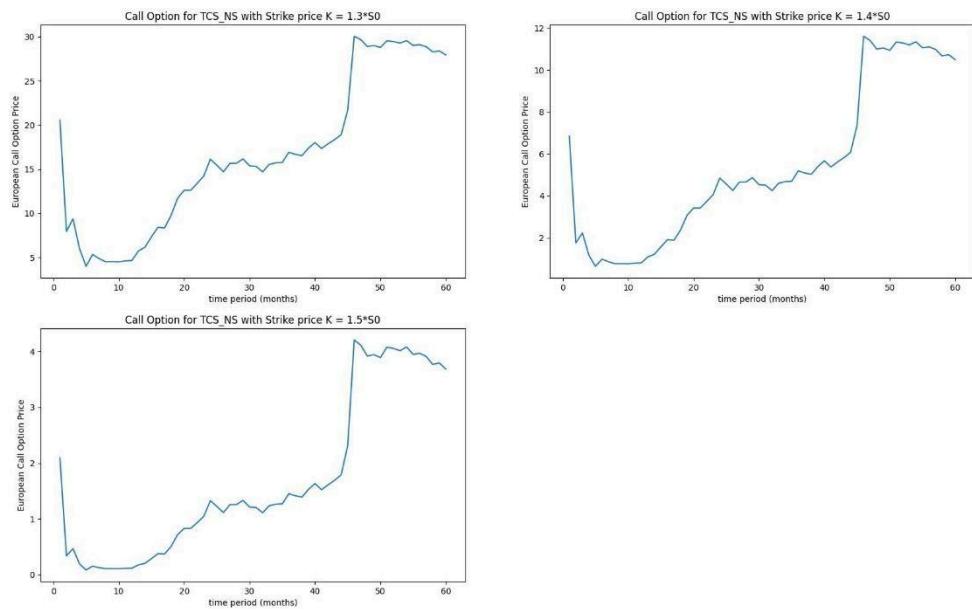
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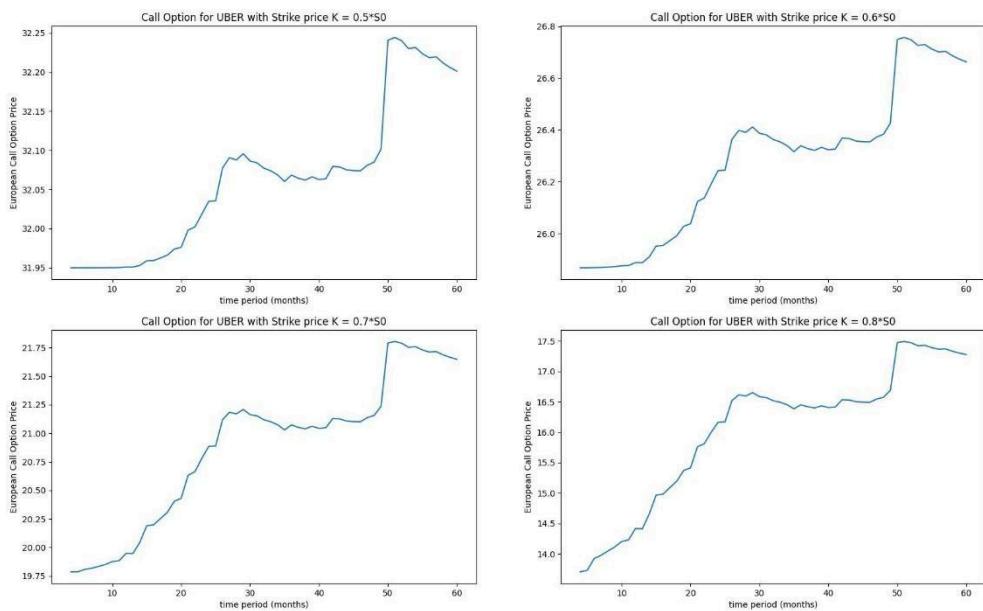
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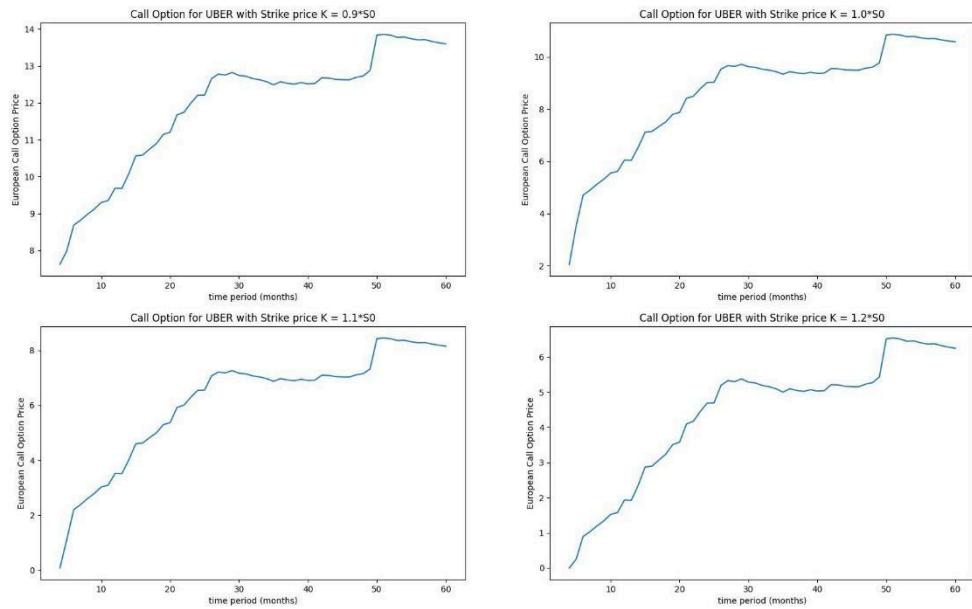
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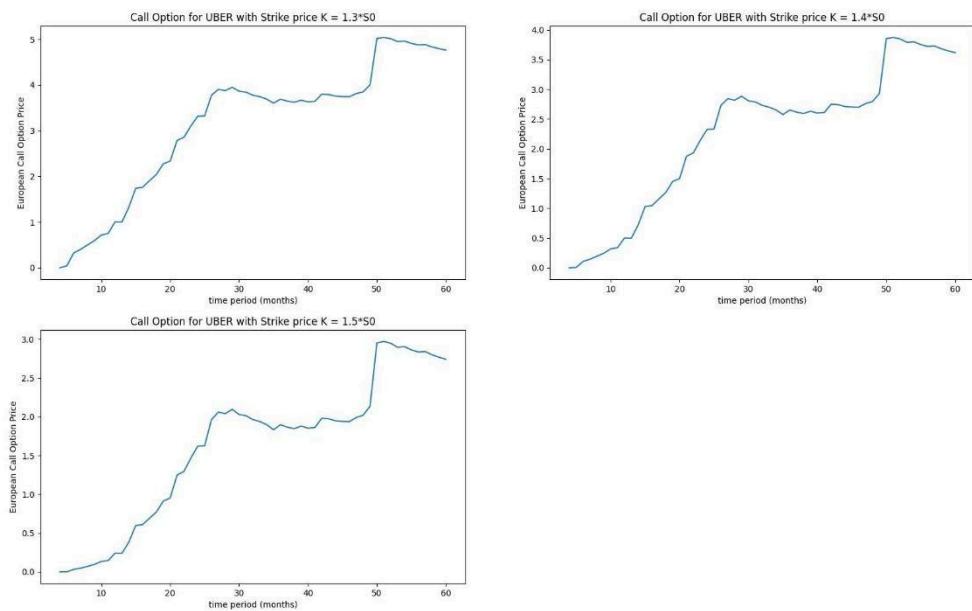
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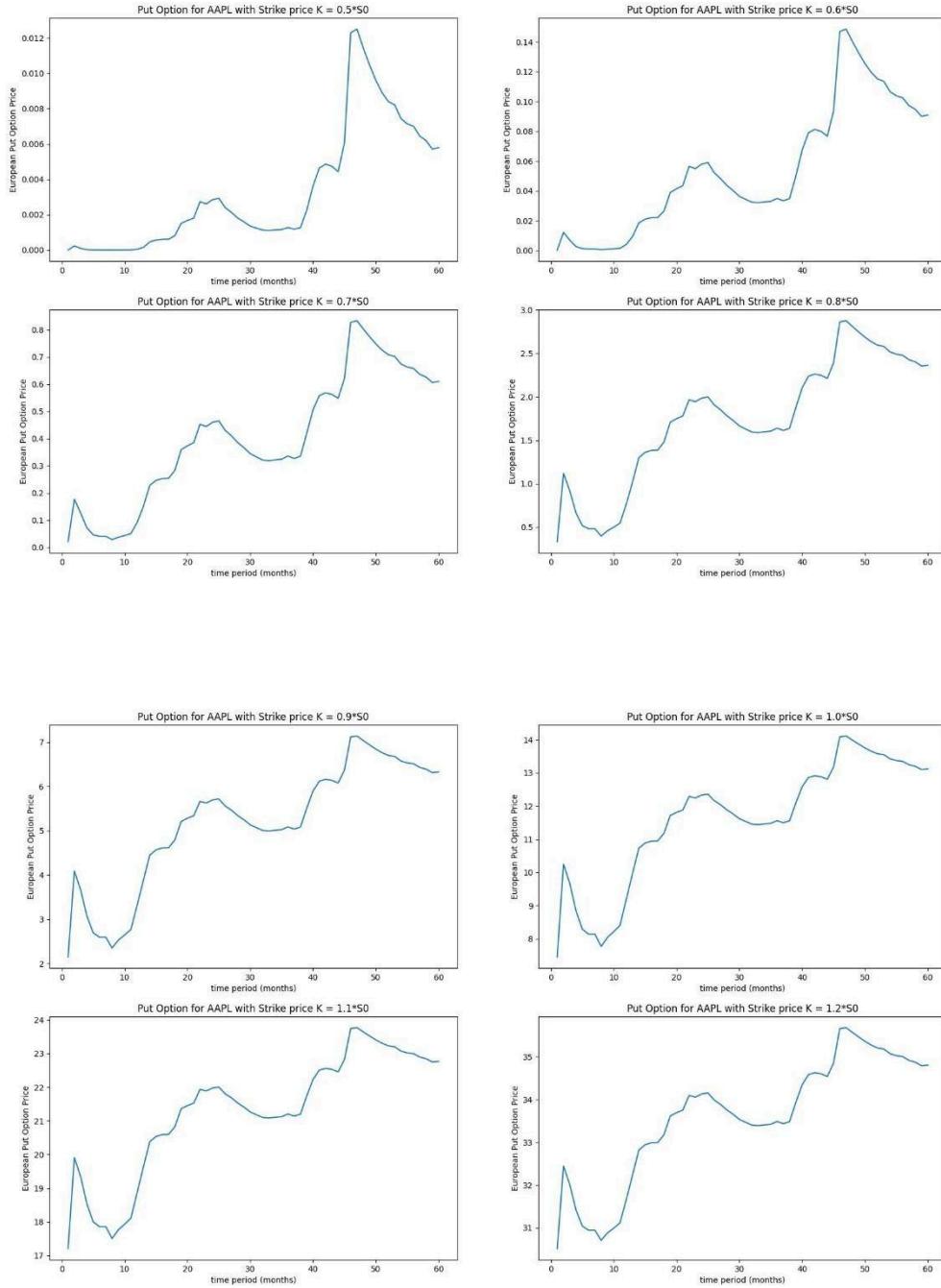
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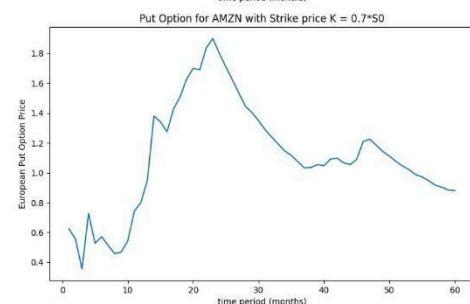
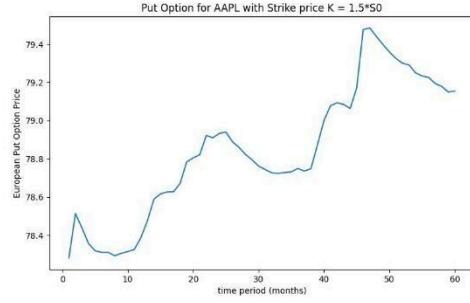
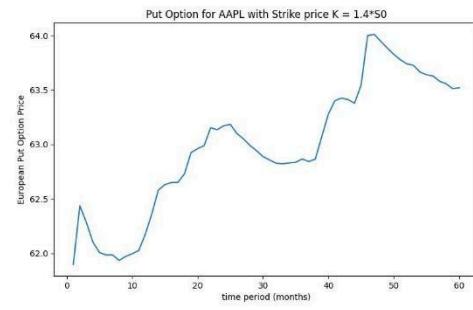
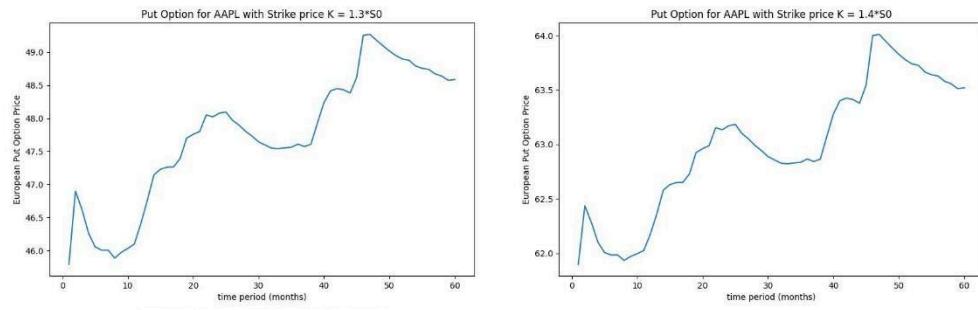


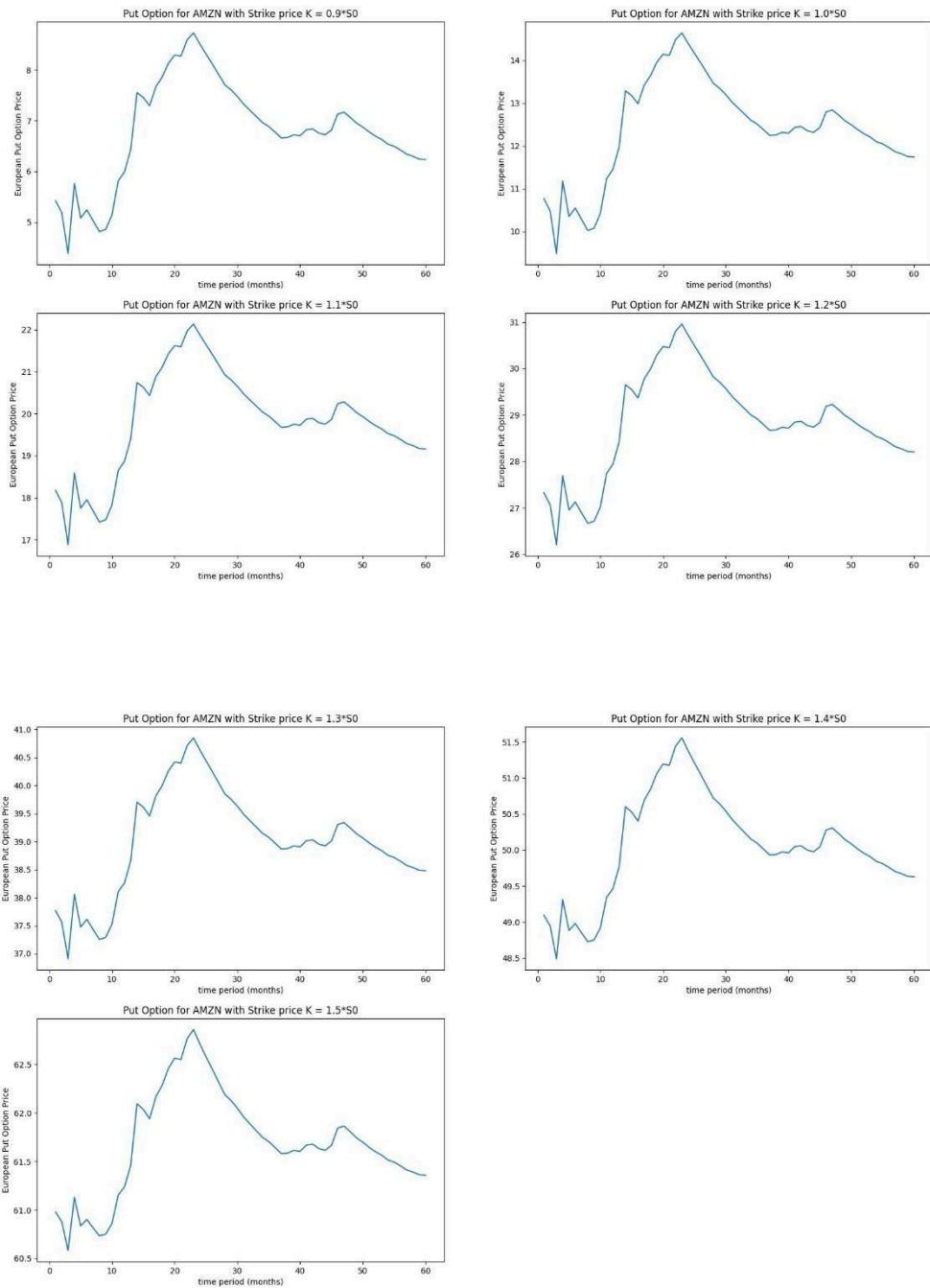
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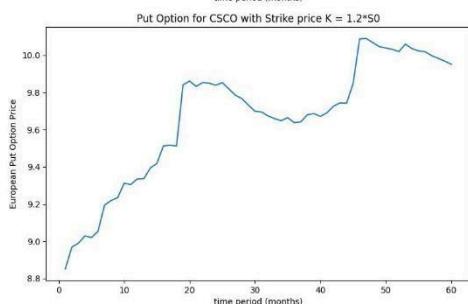
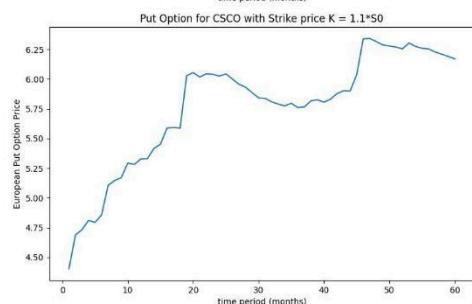
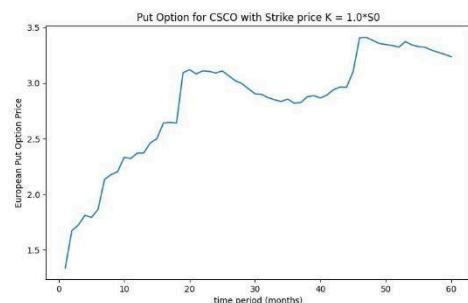
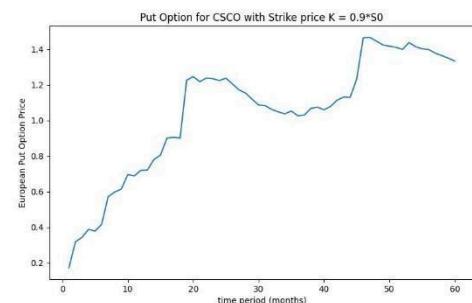
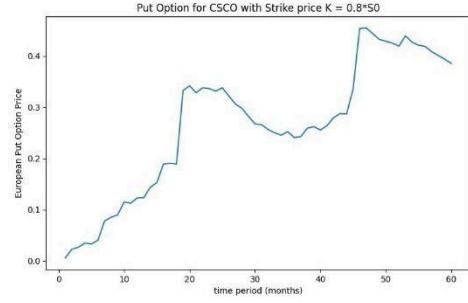
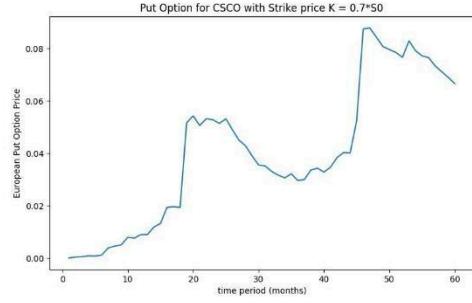
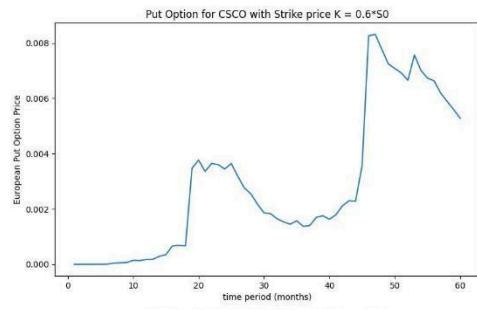
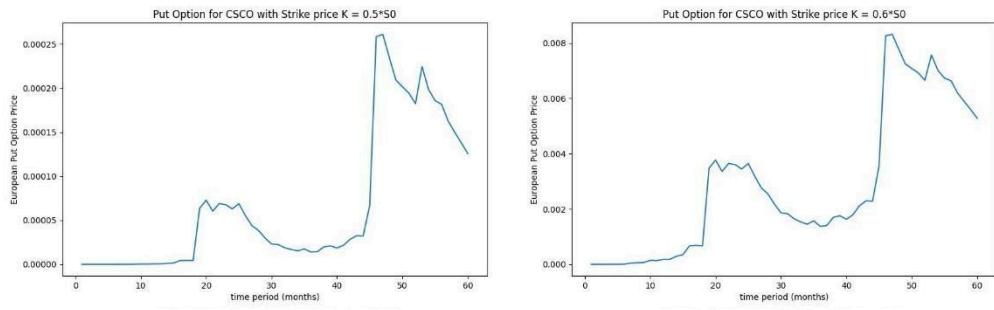


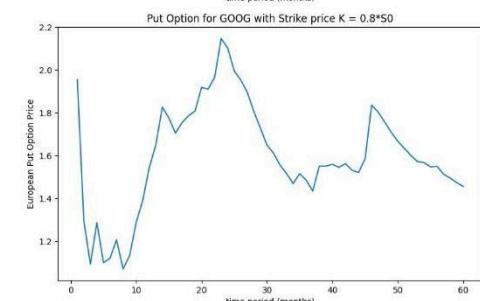
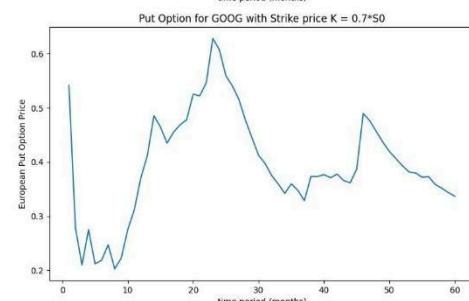
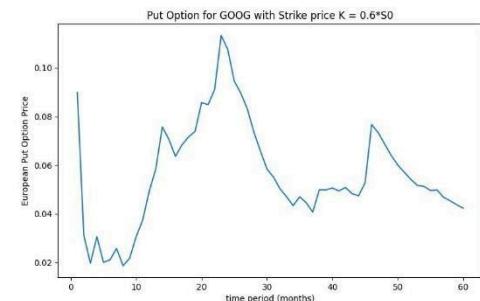
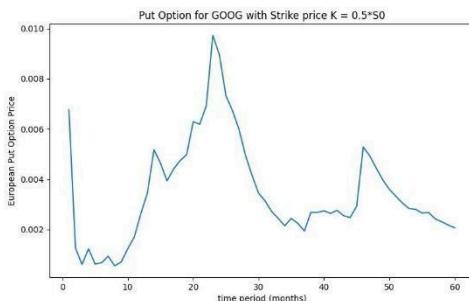
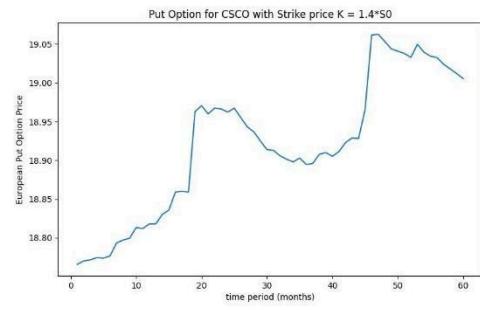
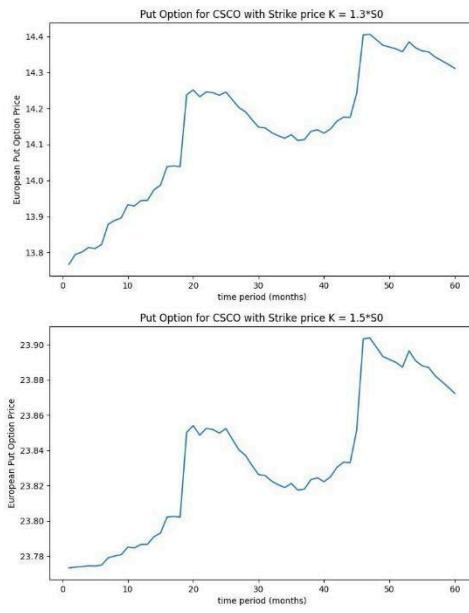
Plots for put option and volatility – stocks in bsedata1

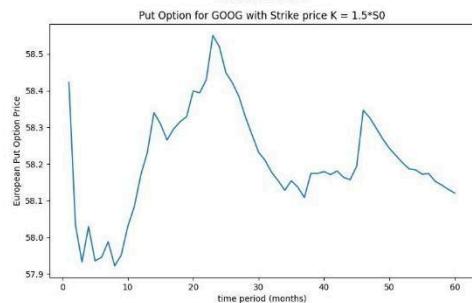
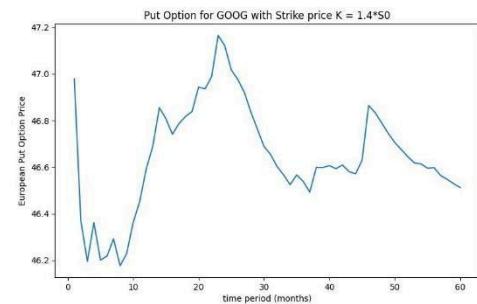
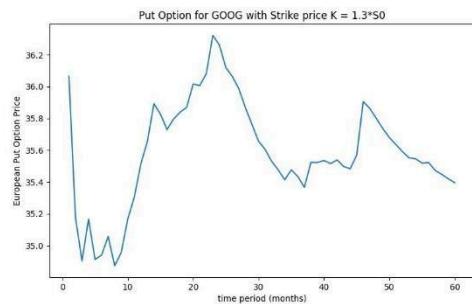
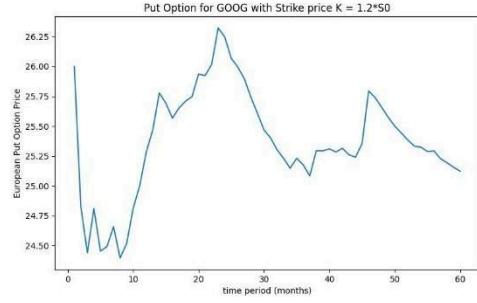
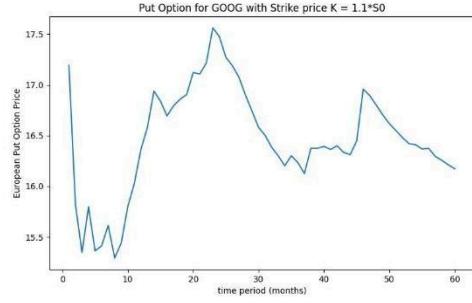
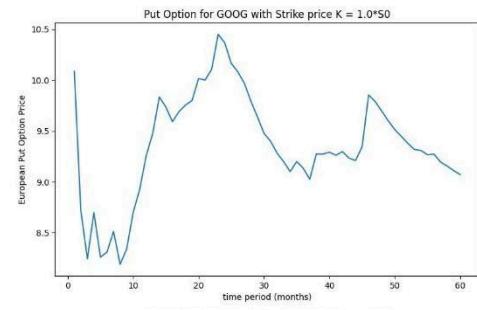
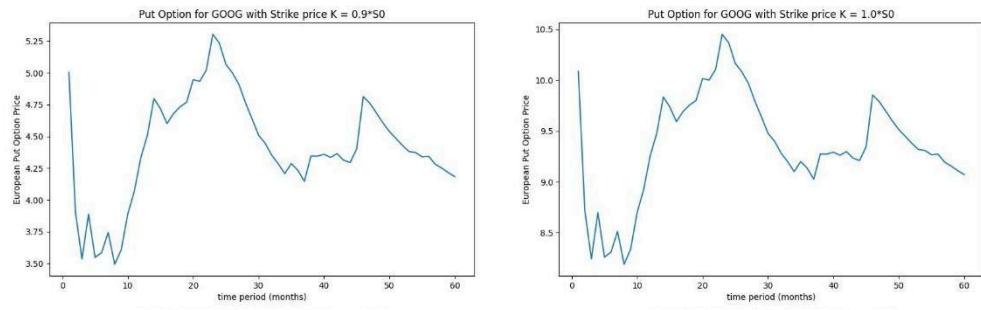


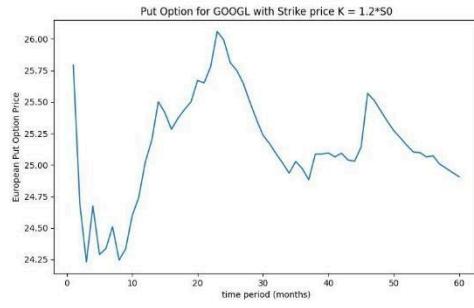
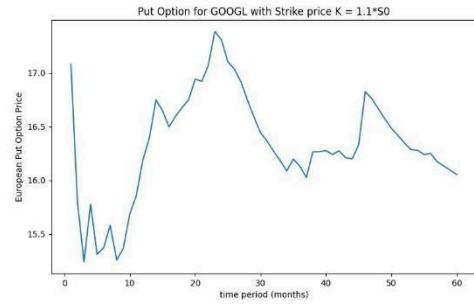
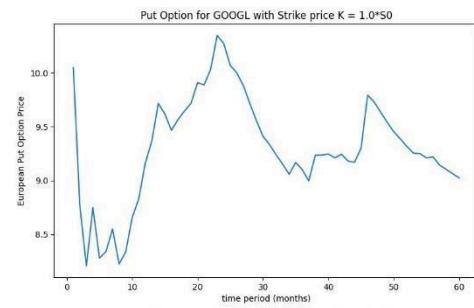
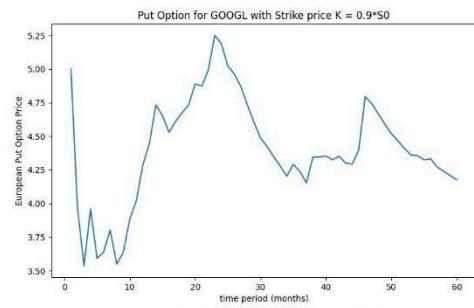
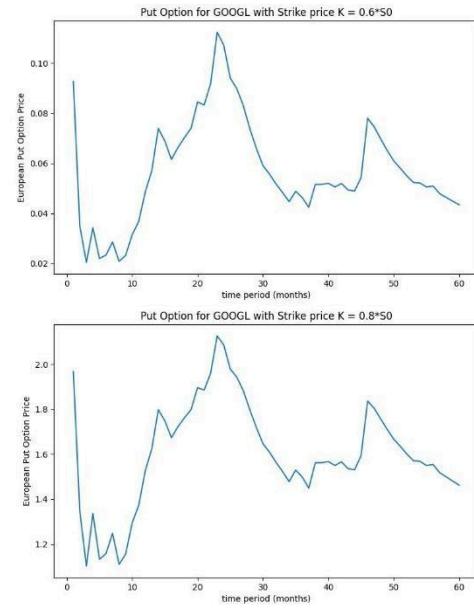
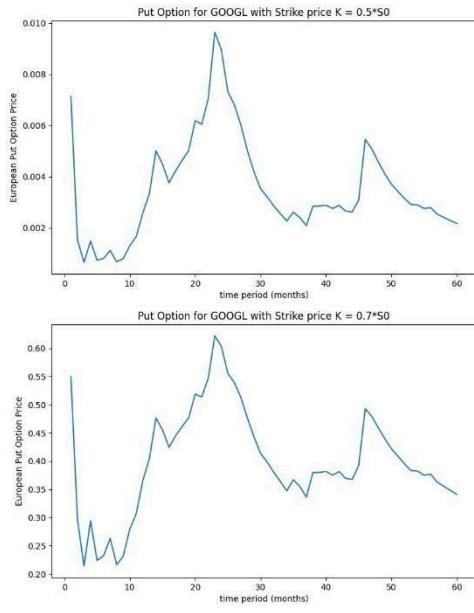


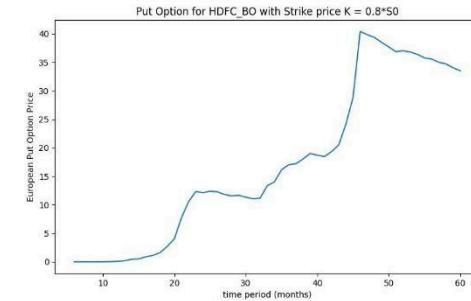
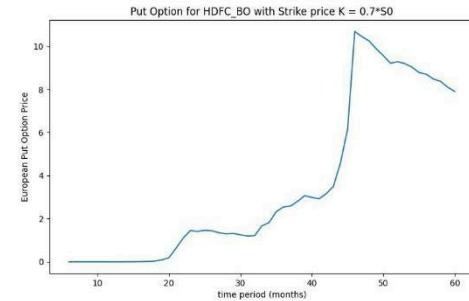
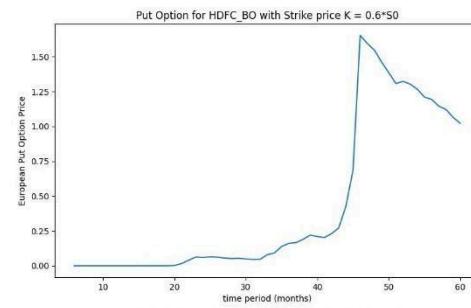
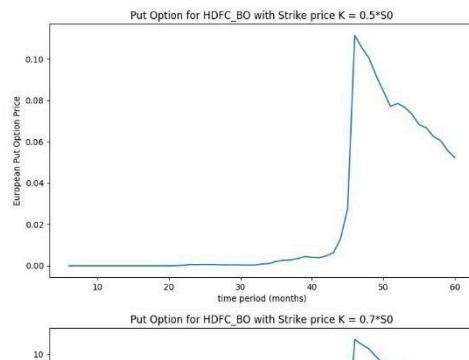
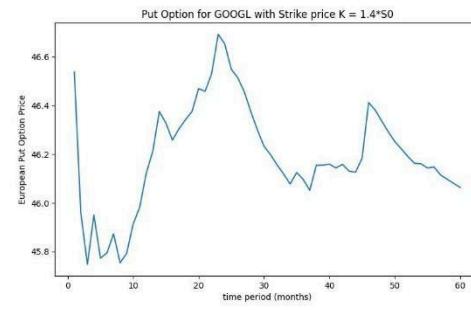
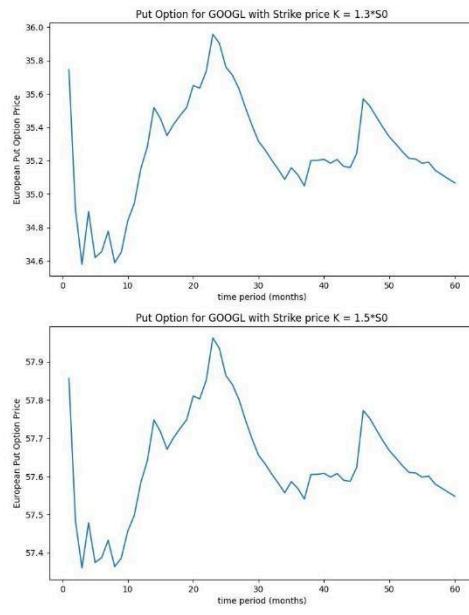


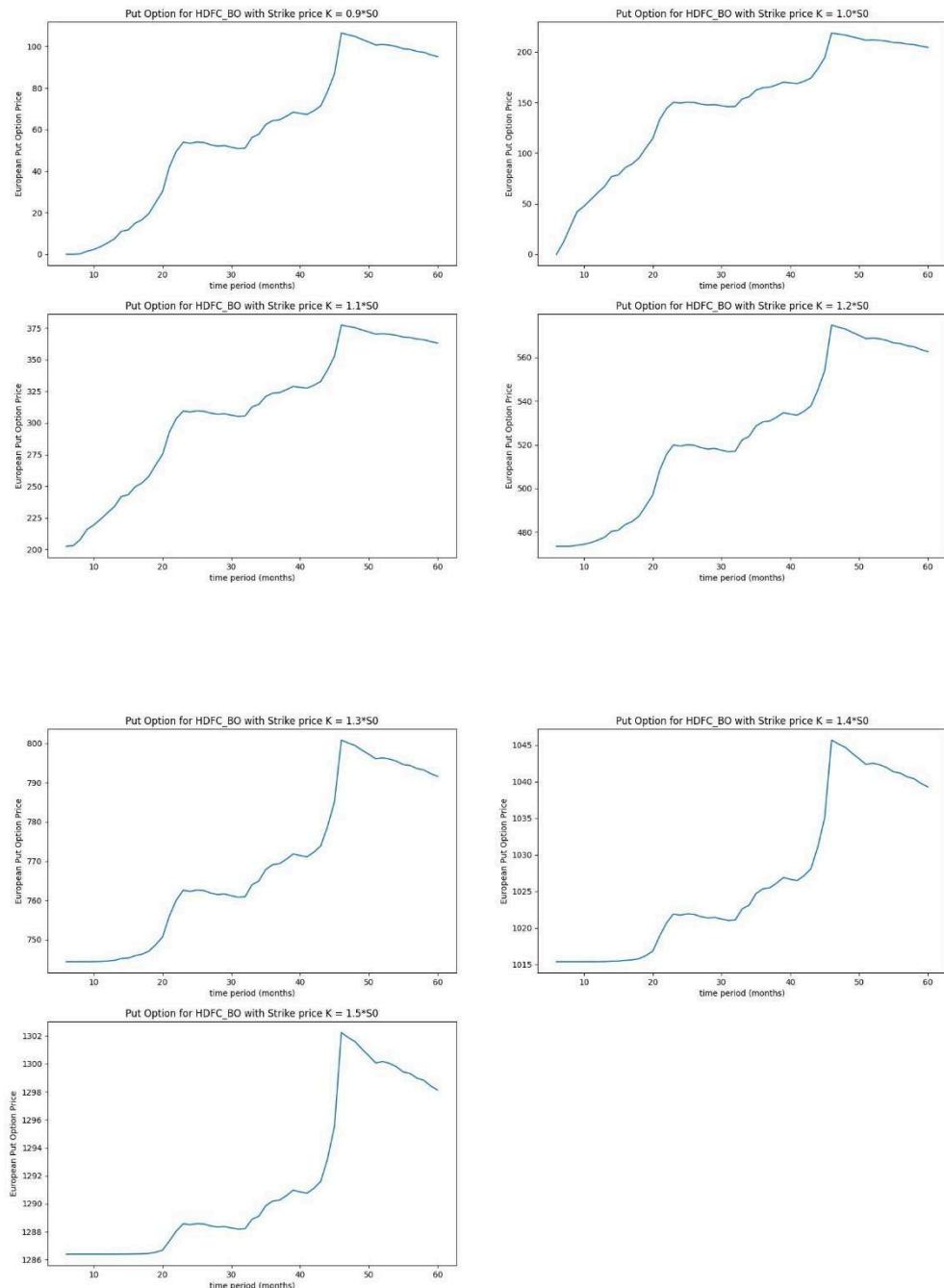


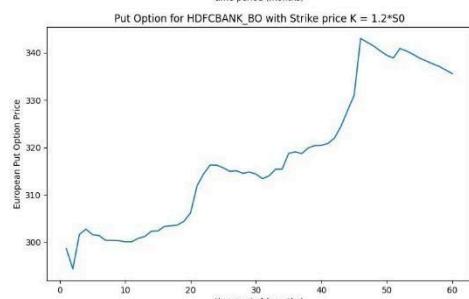
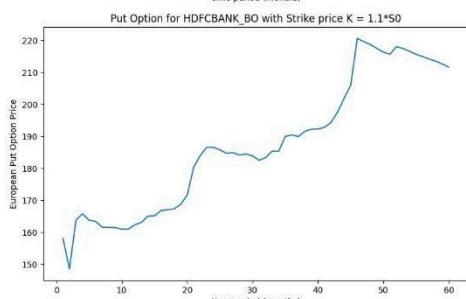
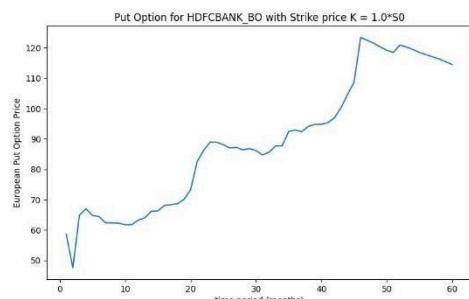
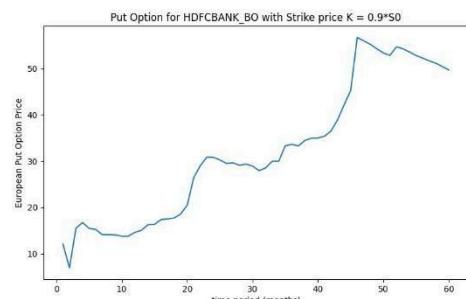
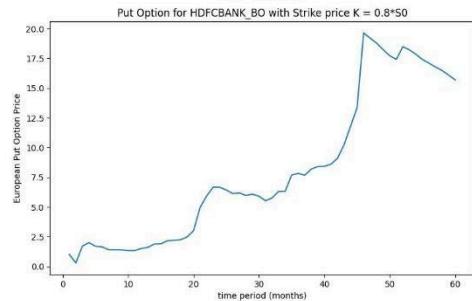
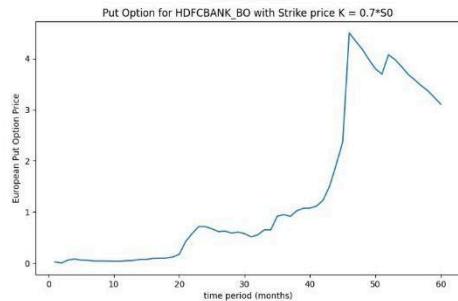
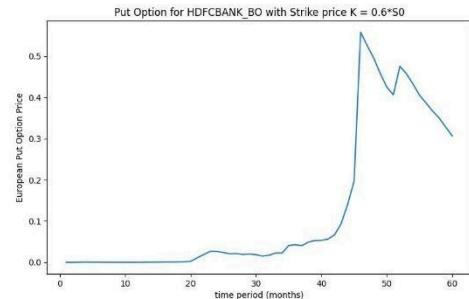
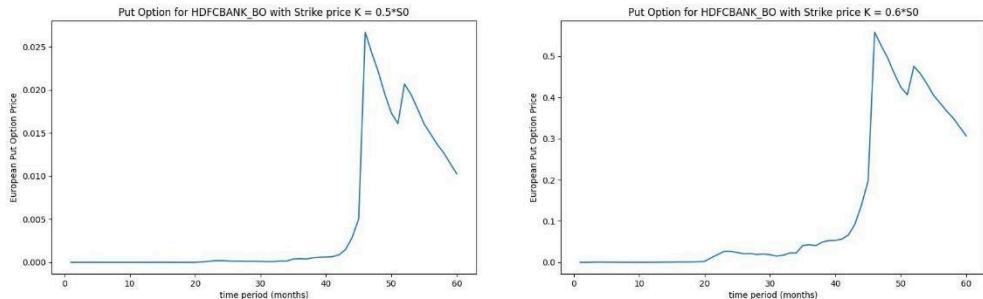


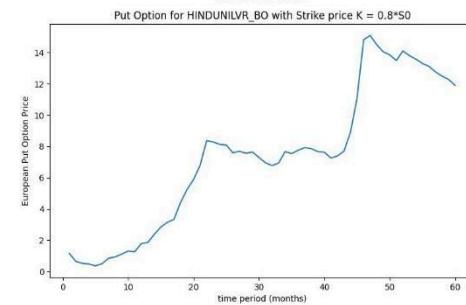
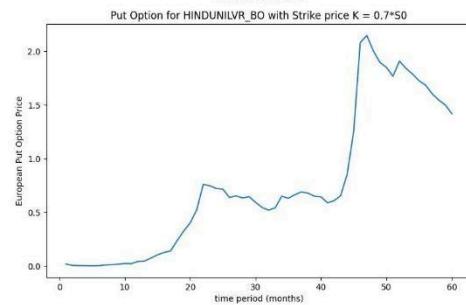
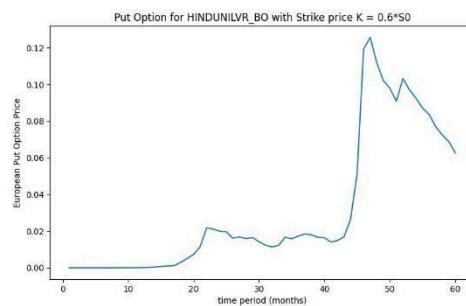
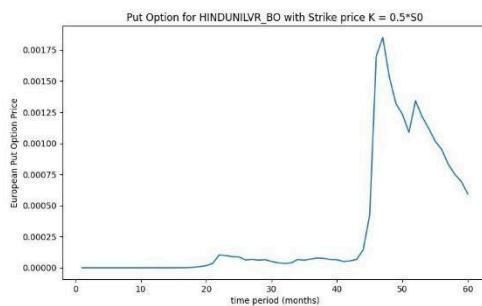
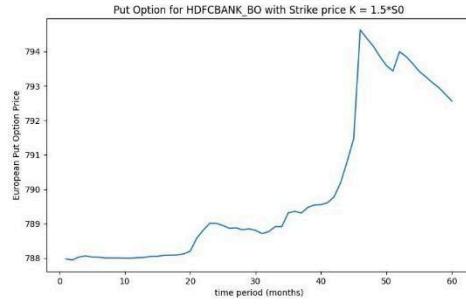
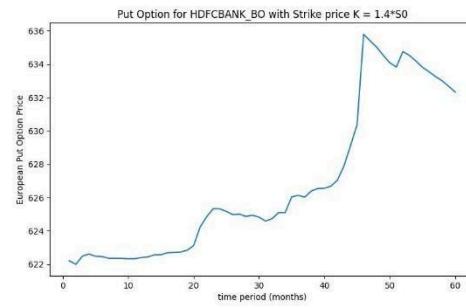
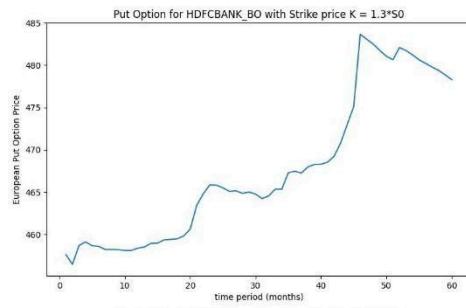


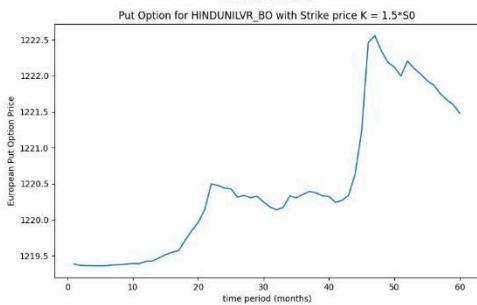
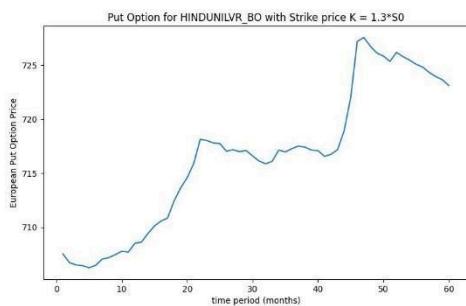
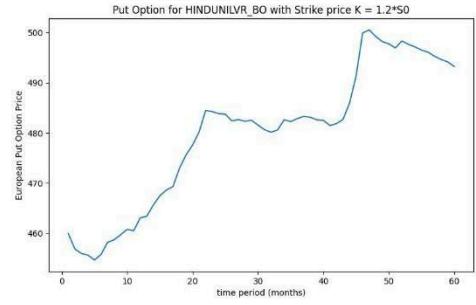
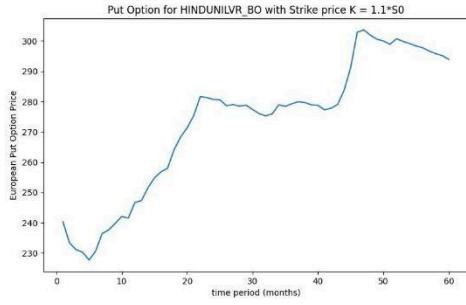
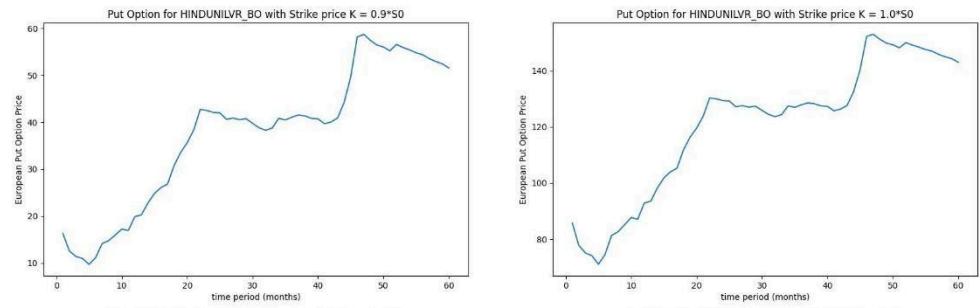


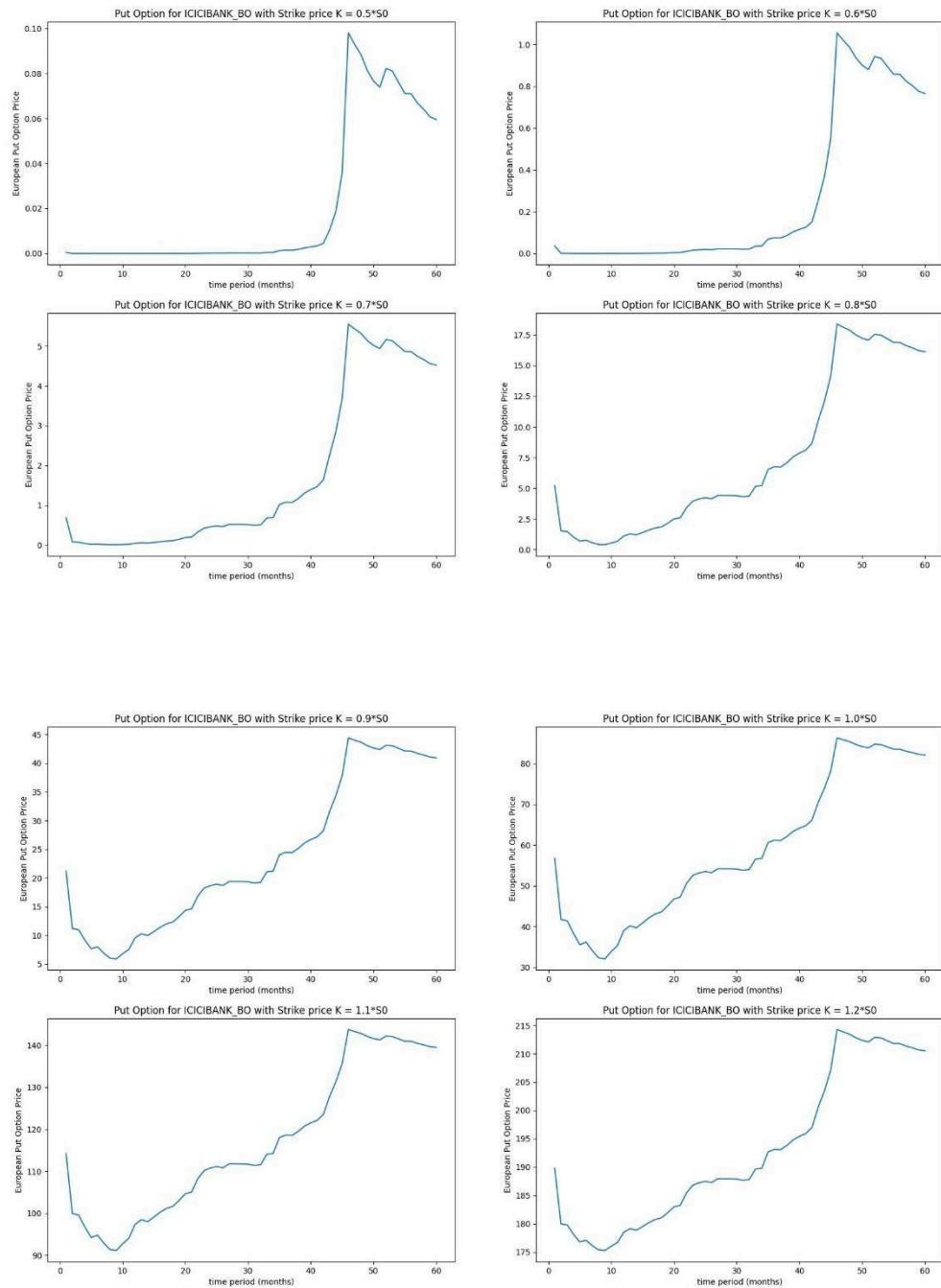


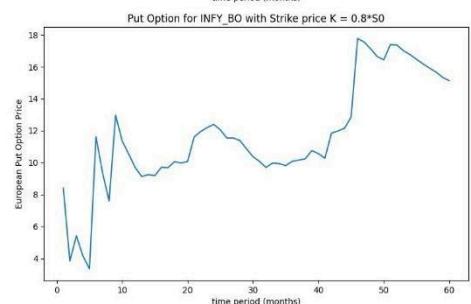
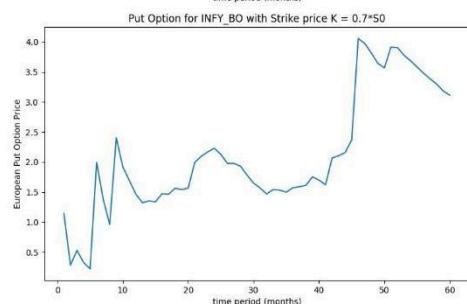
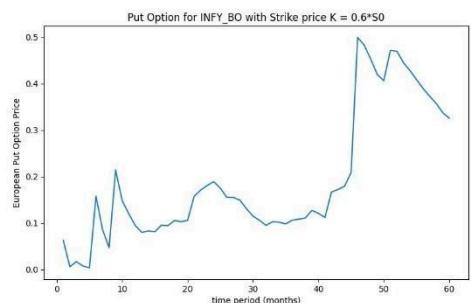
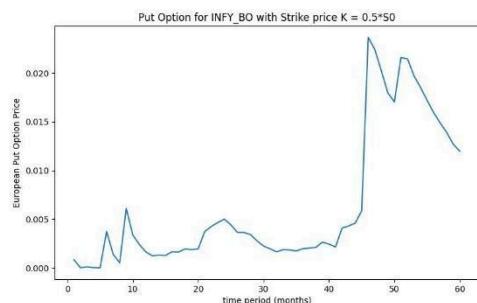
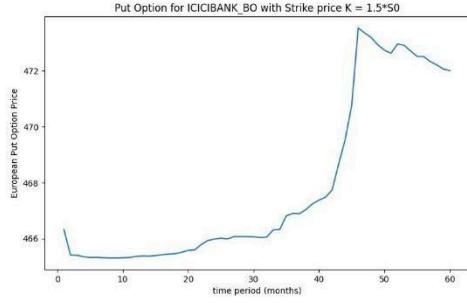
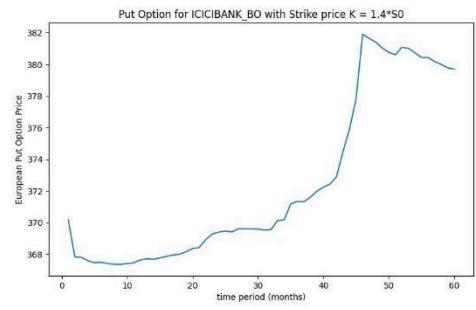
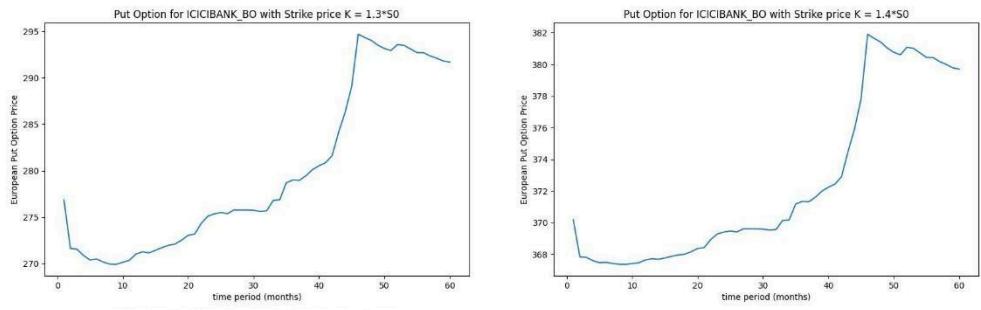


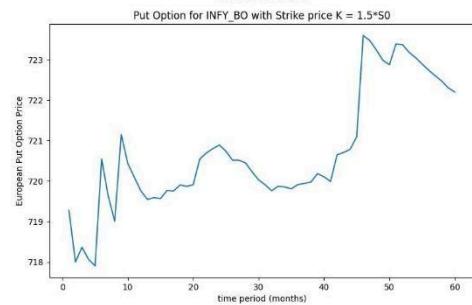
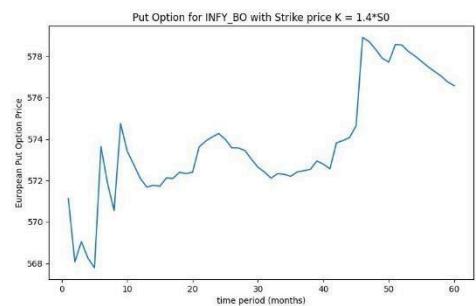
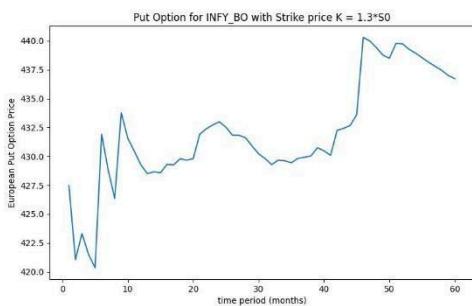
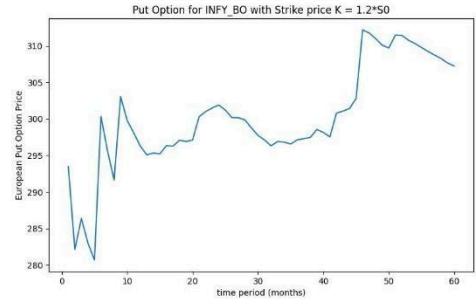
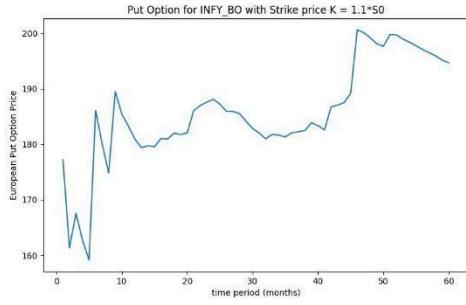
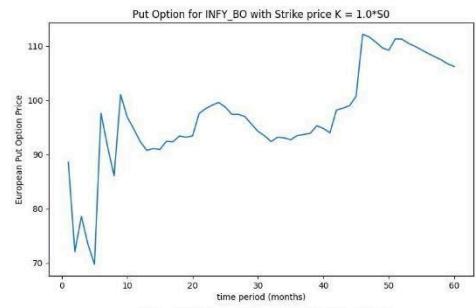
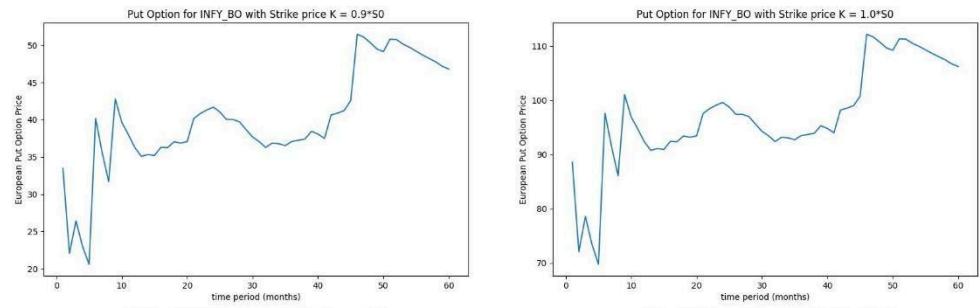


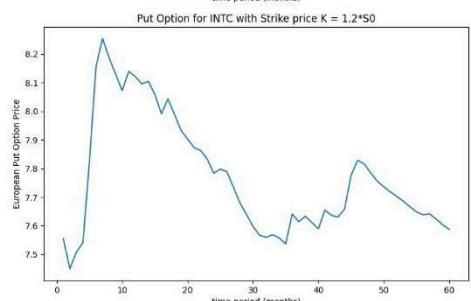
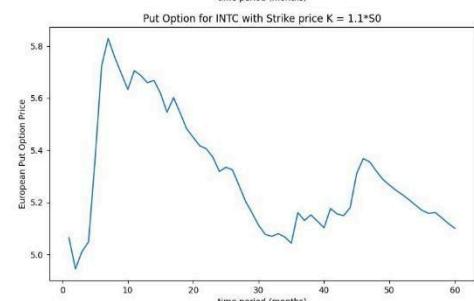
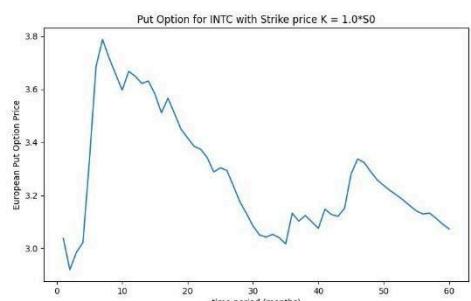
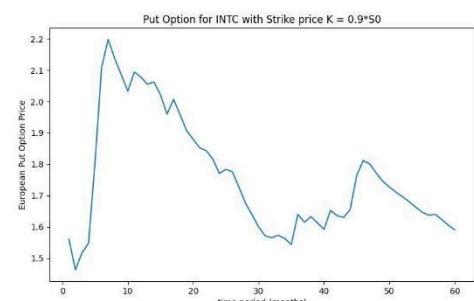
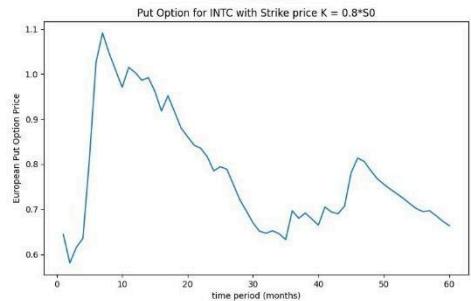
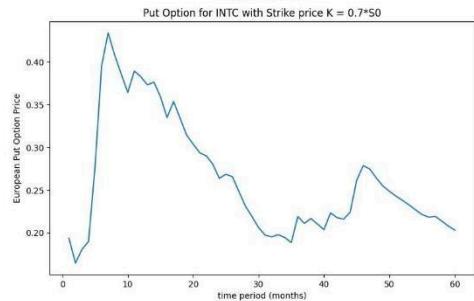
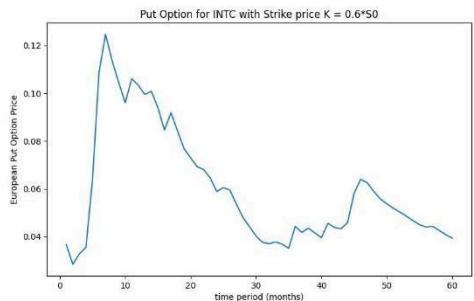
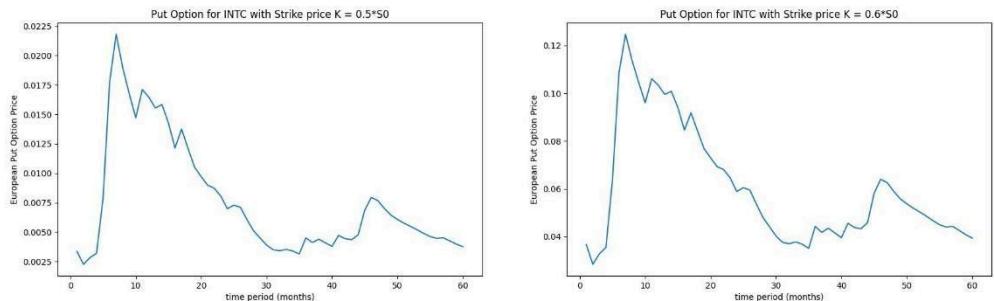


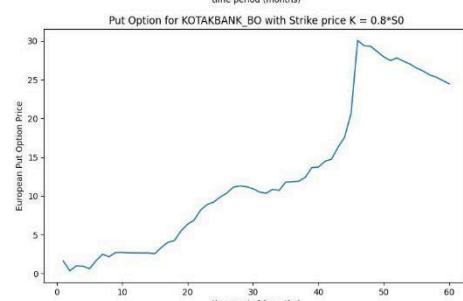
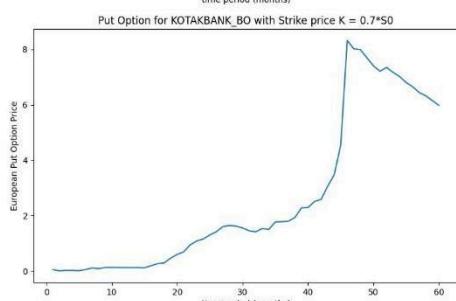
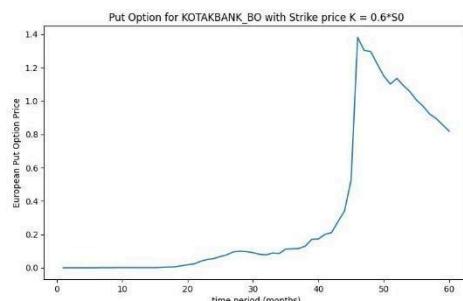
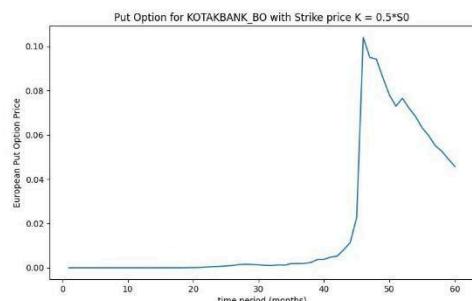
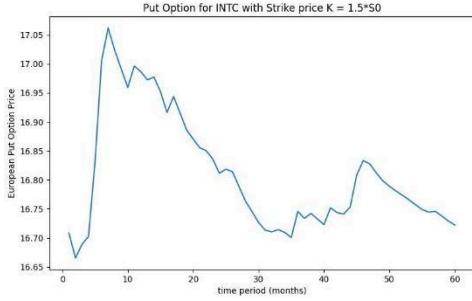
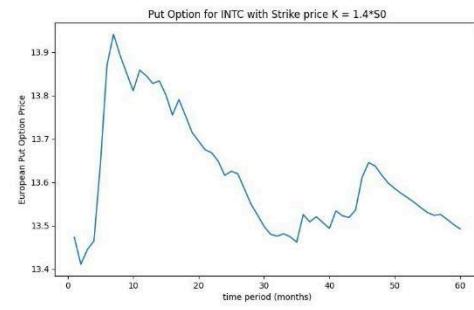
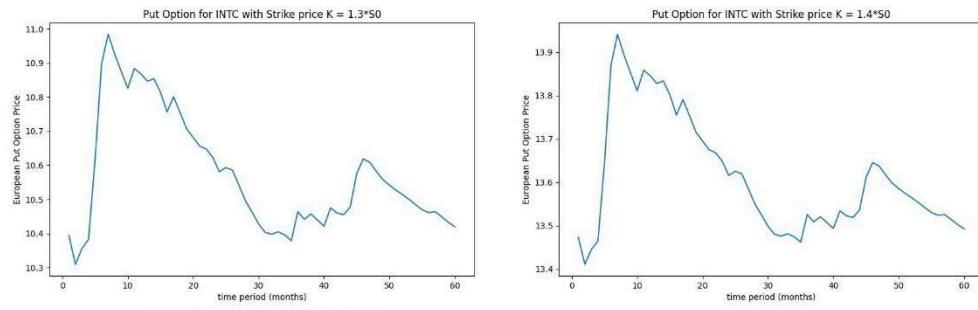


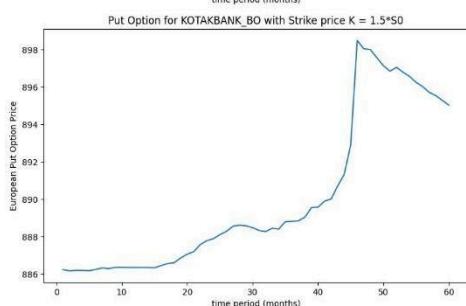
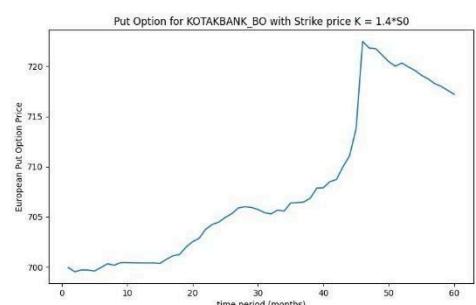
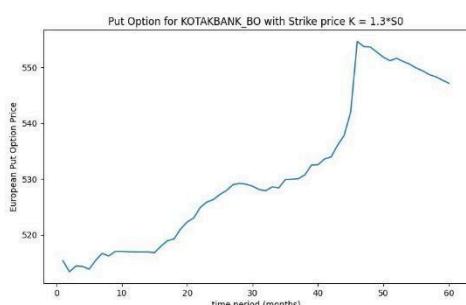
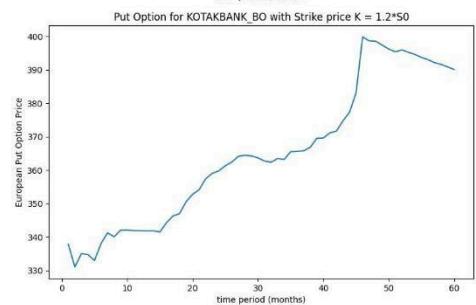
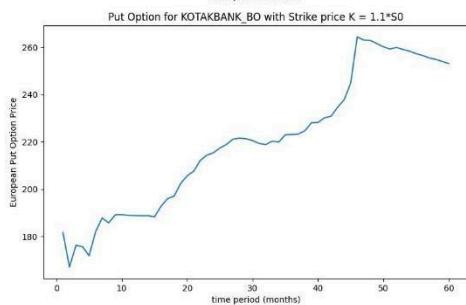
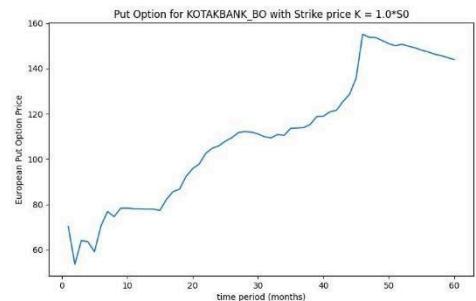
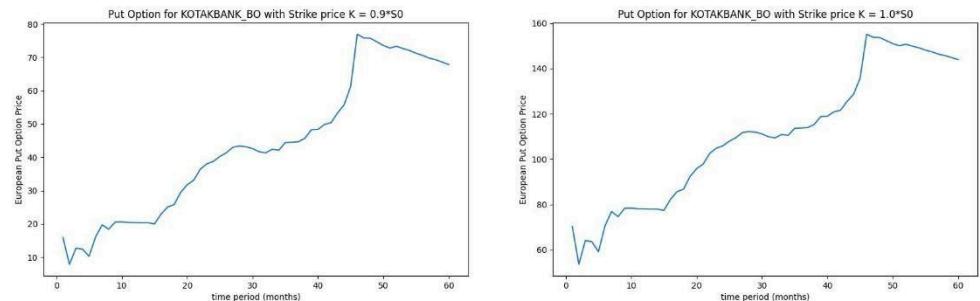


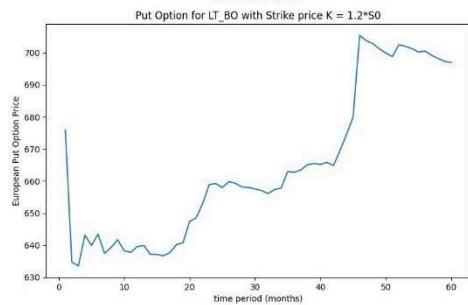
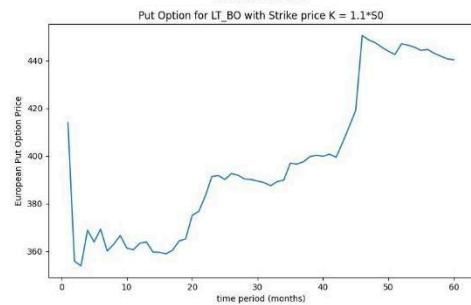
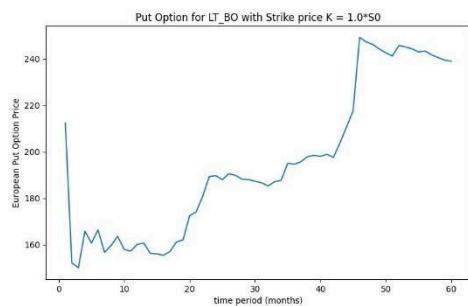
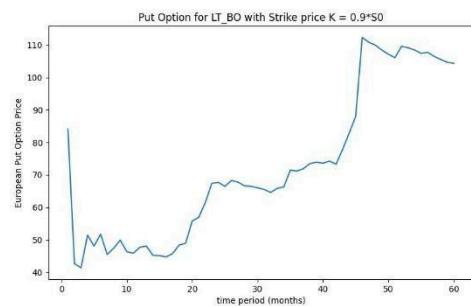
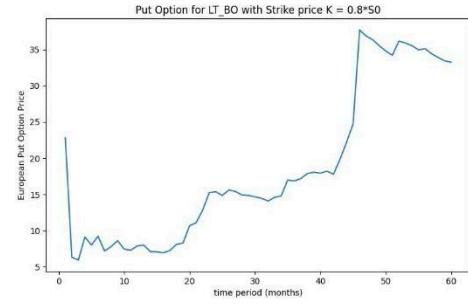
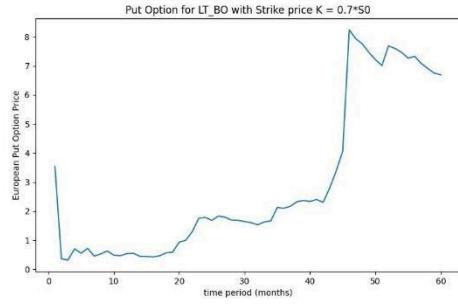
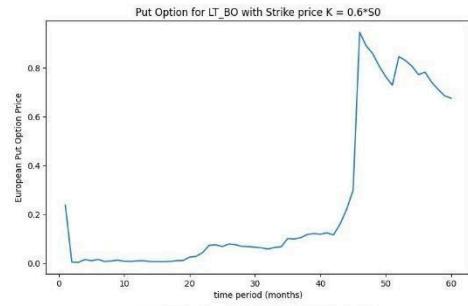
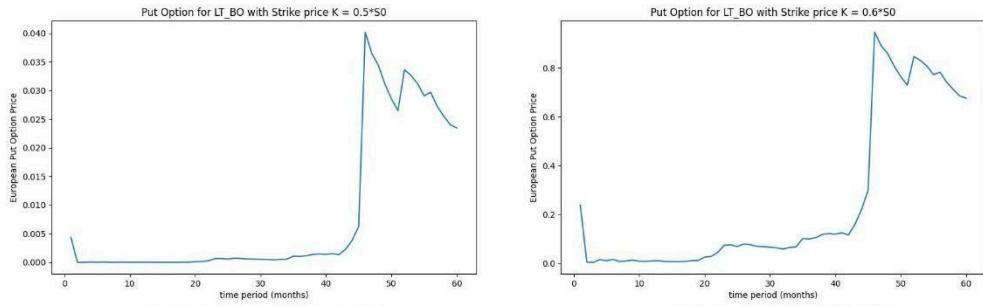


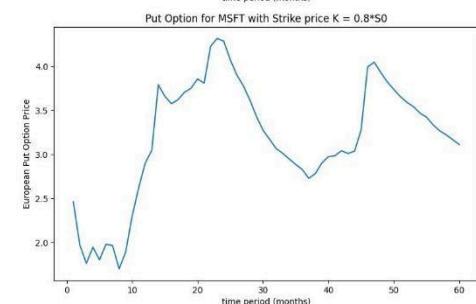
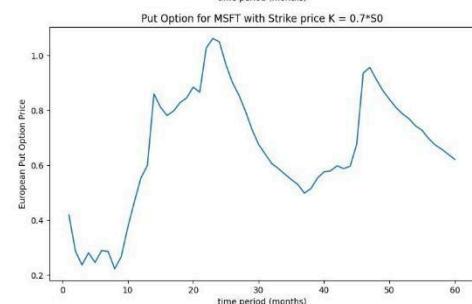
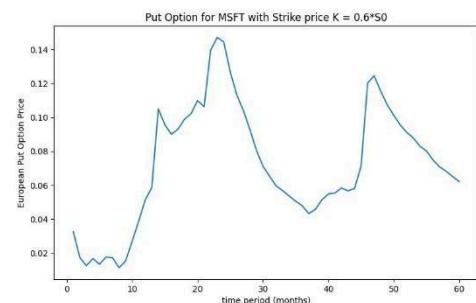
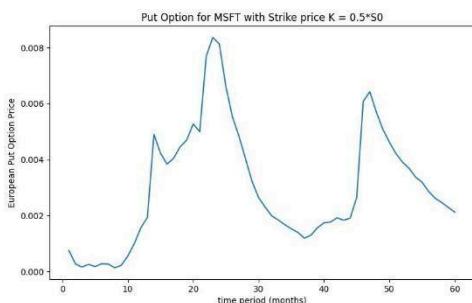
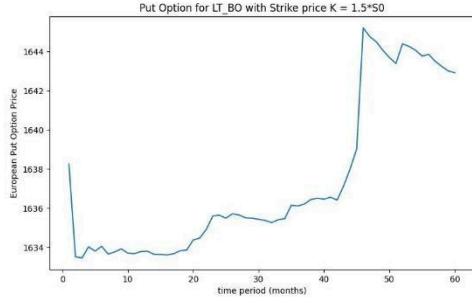
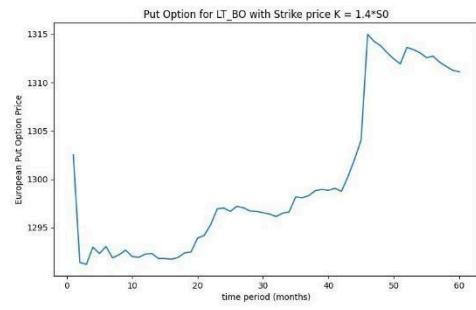
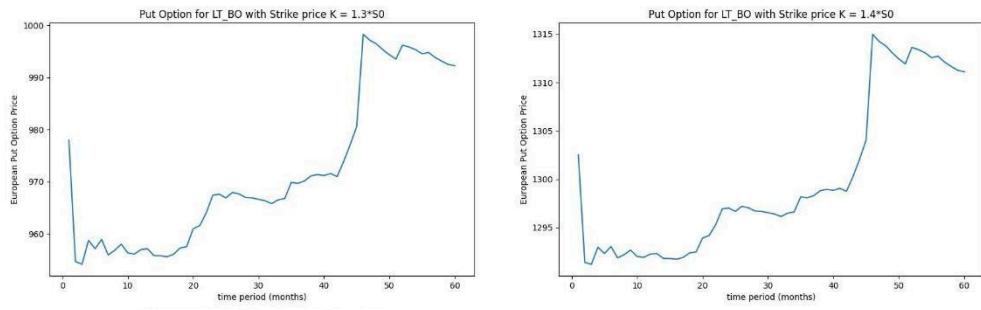


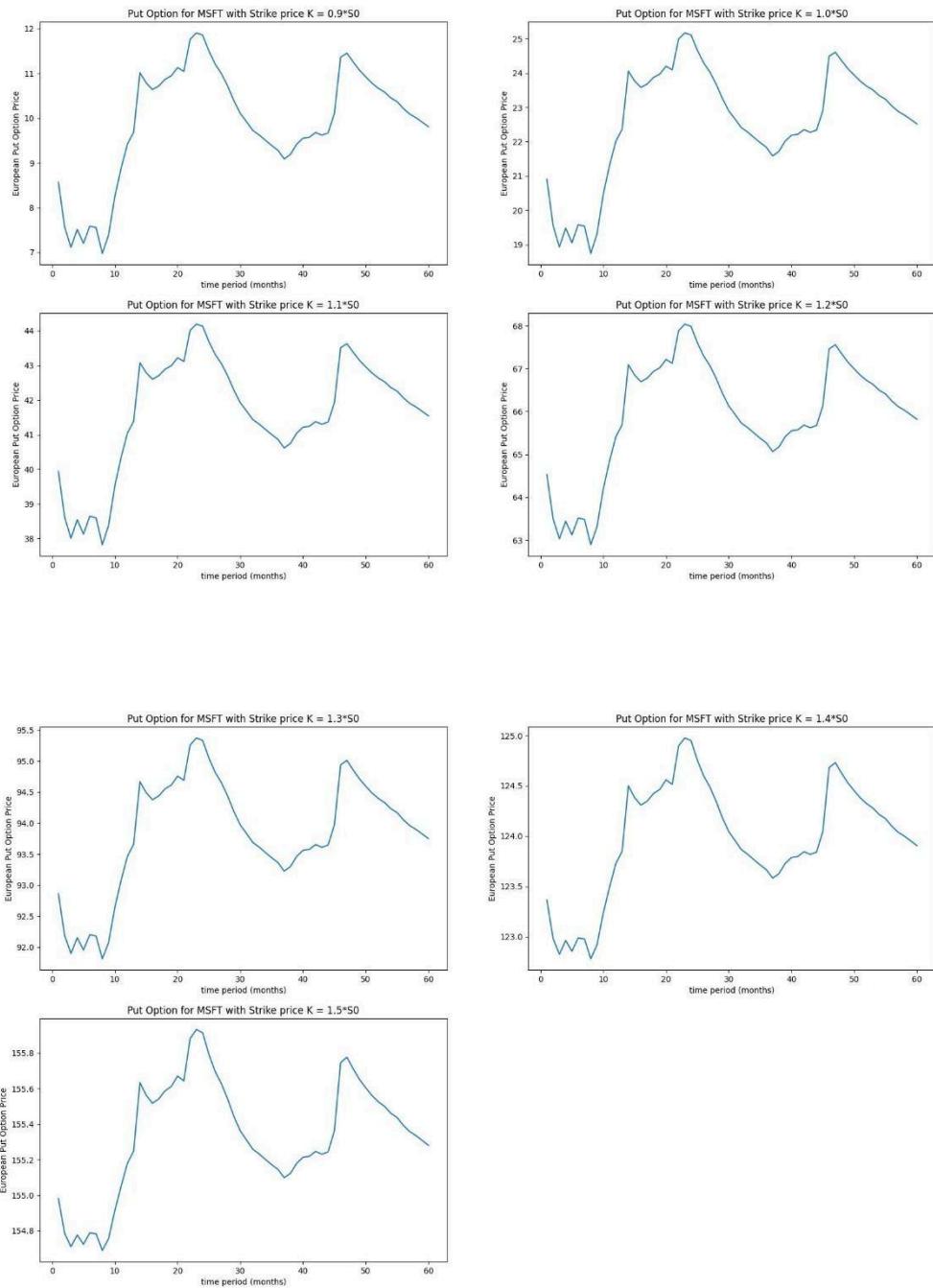


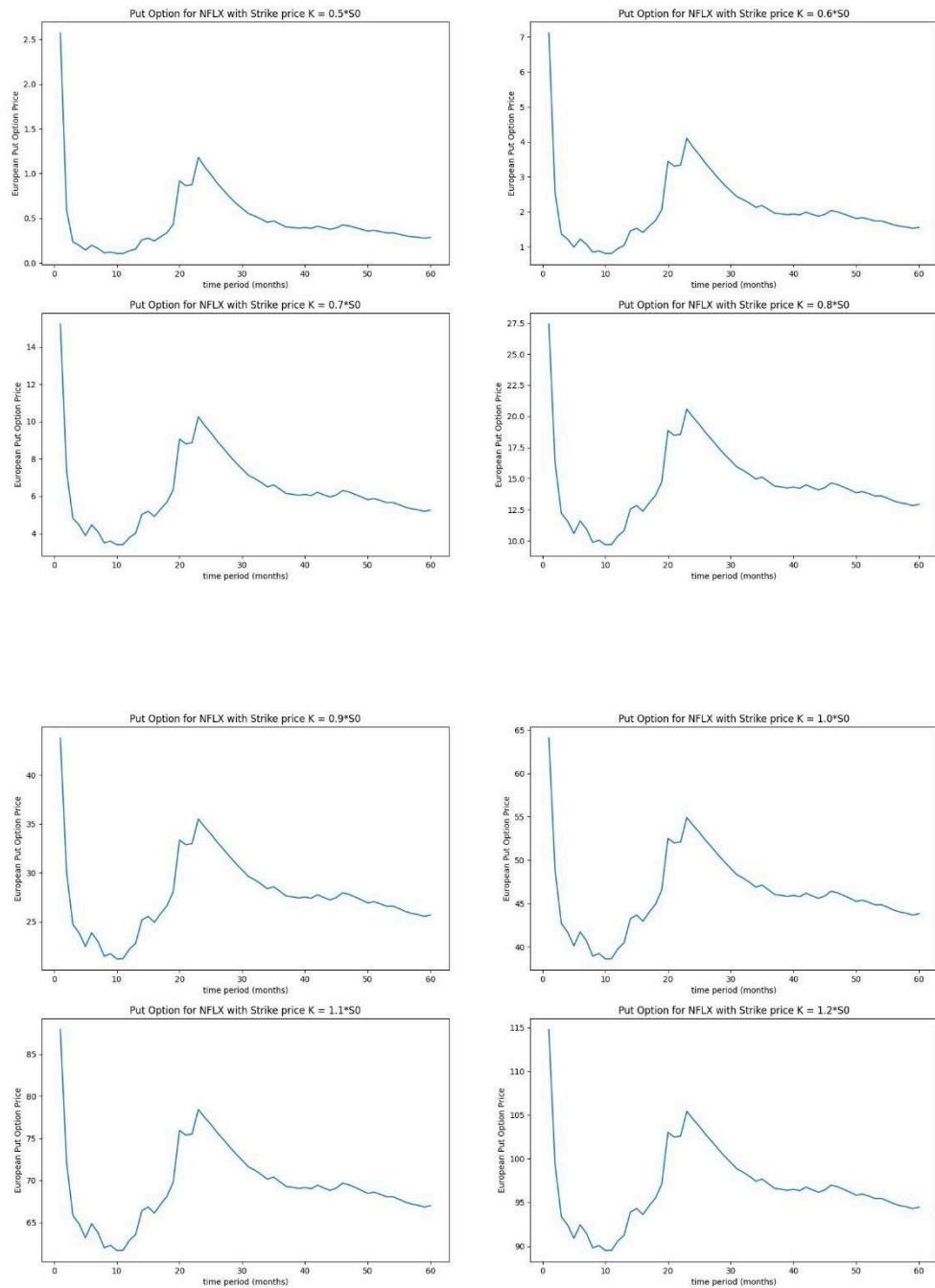


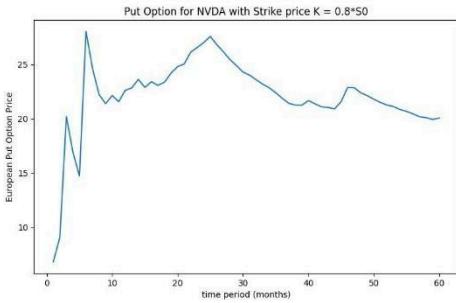
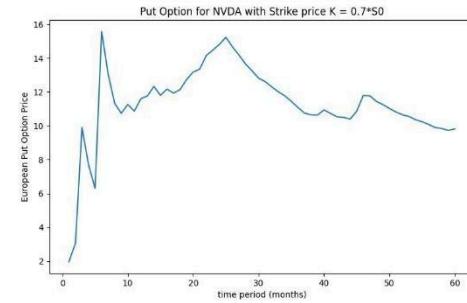
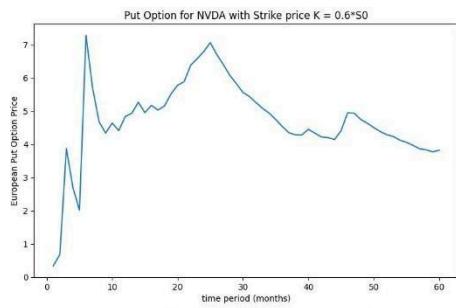
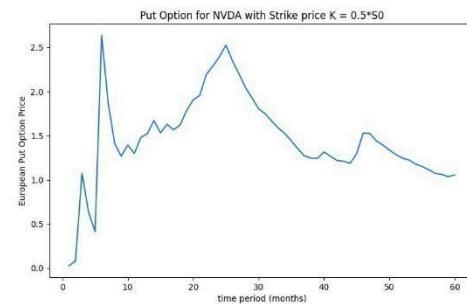
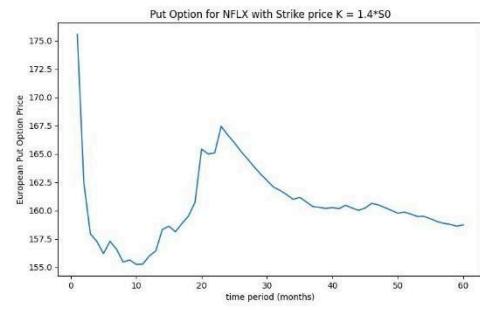
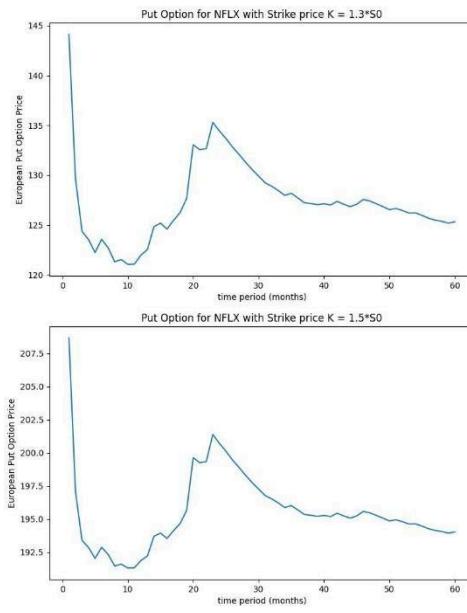


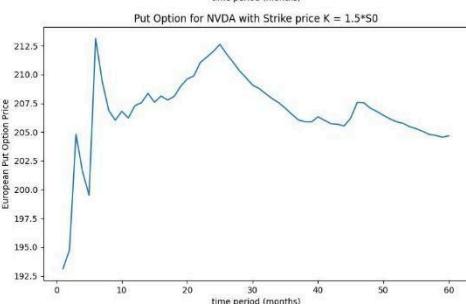
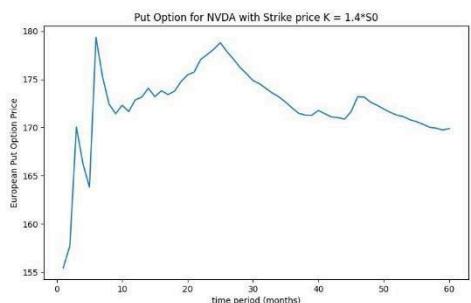
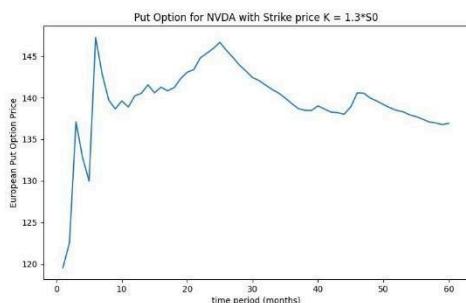
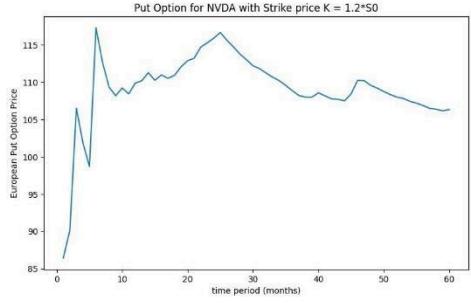
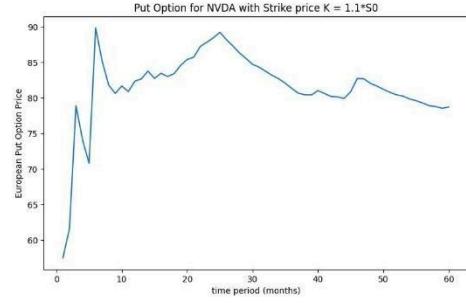
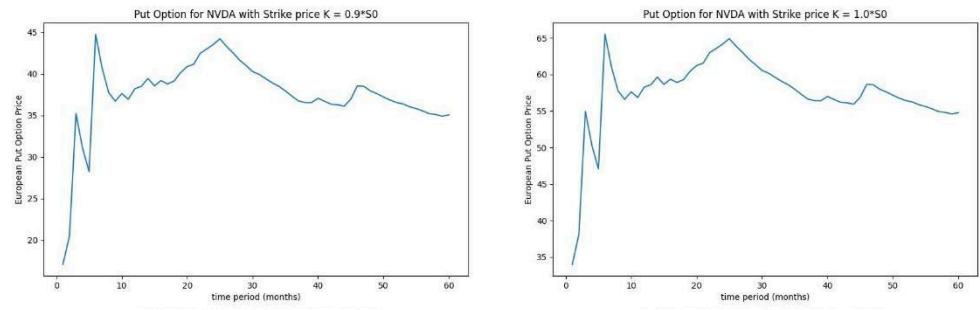


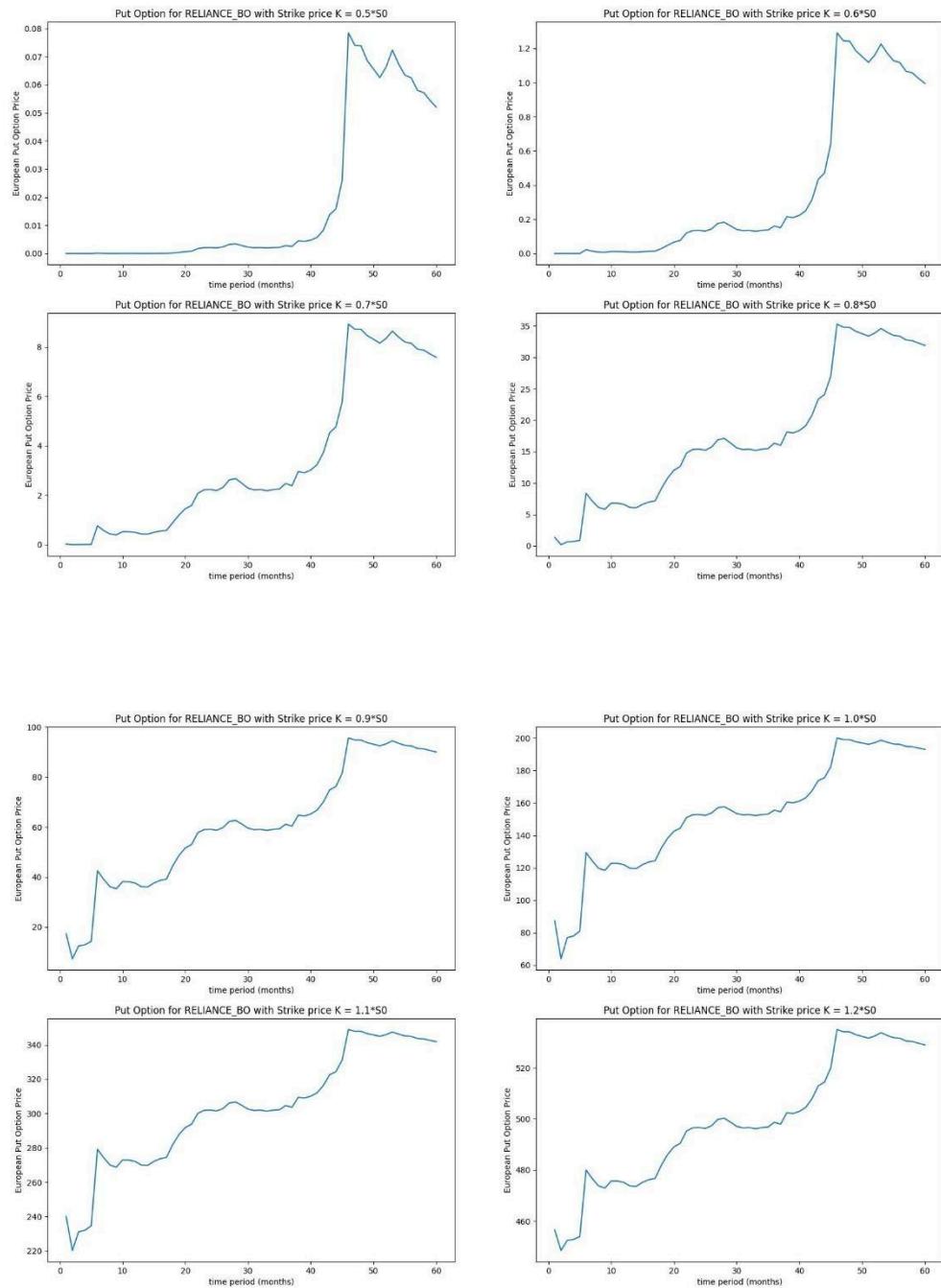


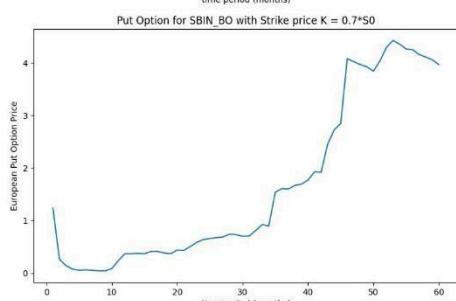
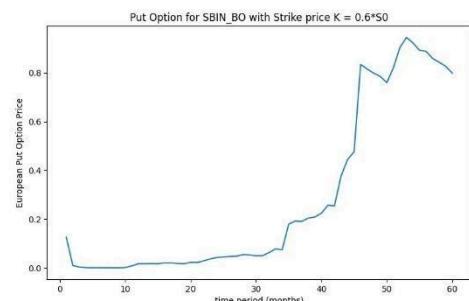
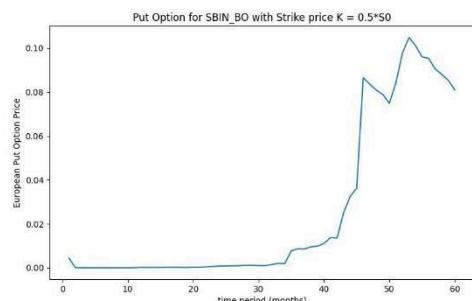
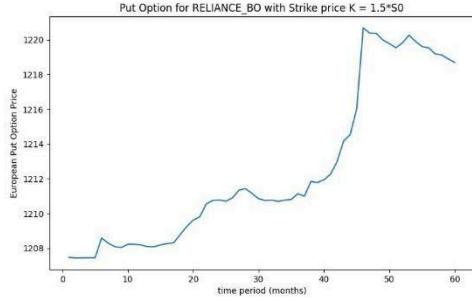
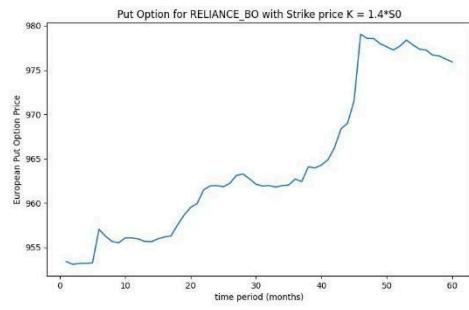
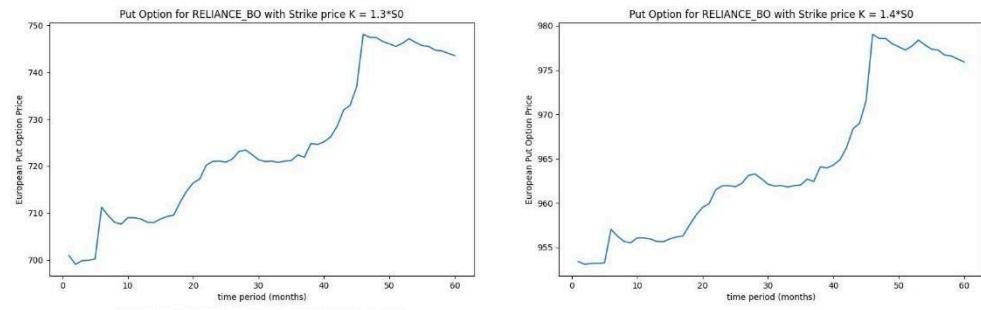


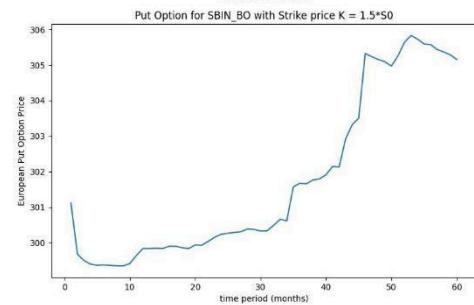
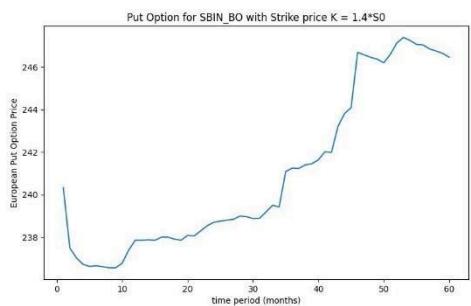
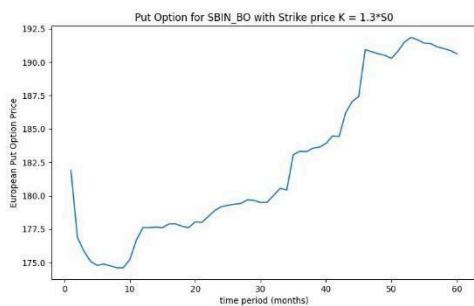
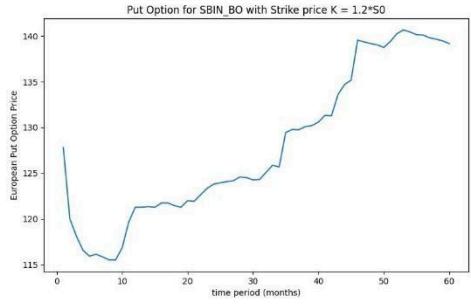
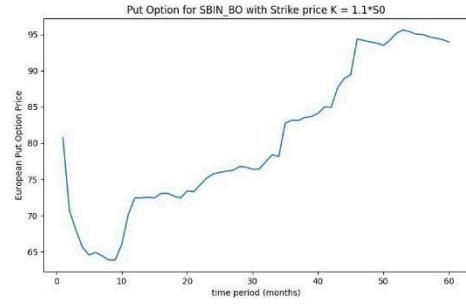
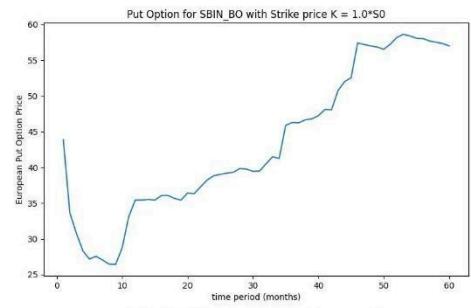
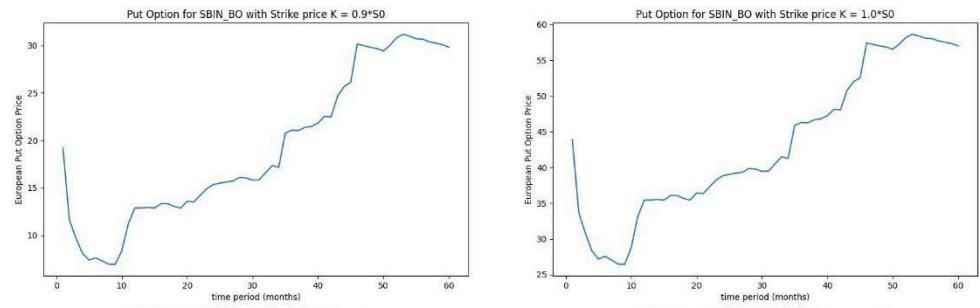


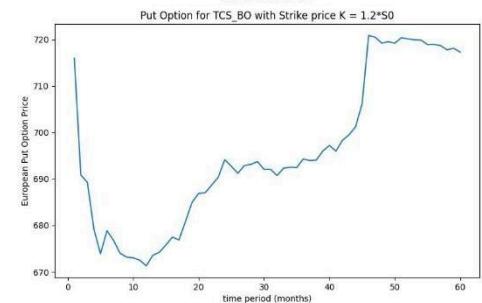
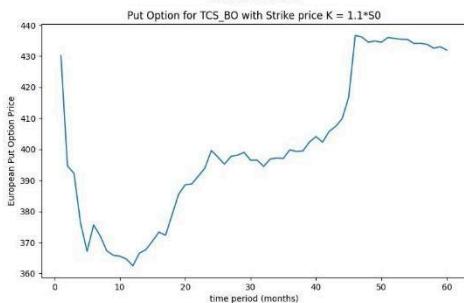
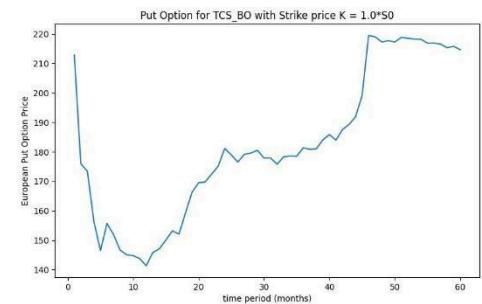
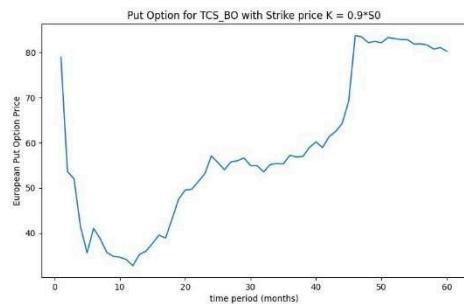
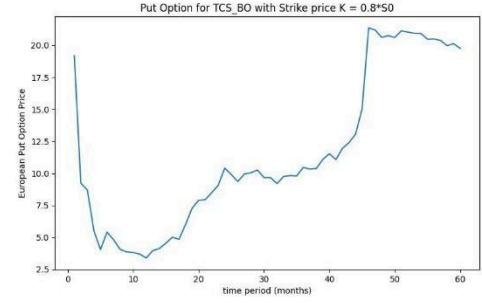
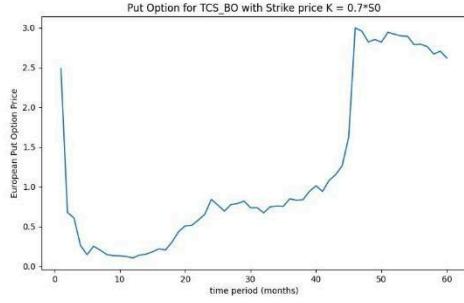
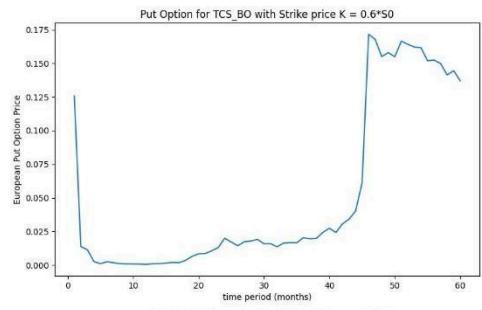
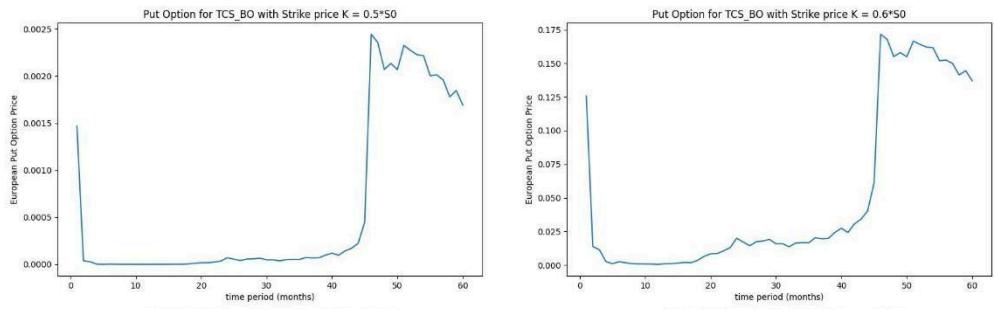


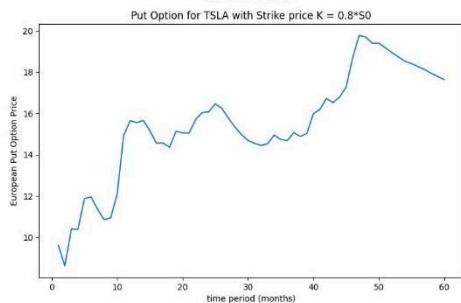
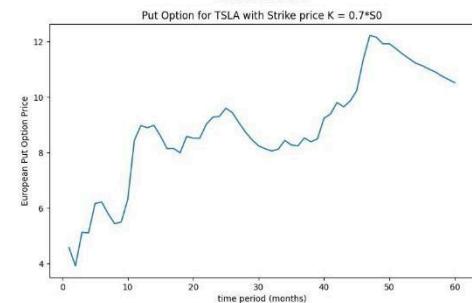
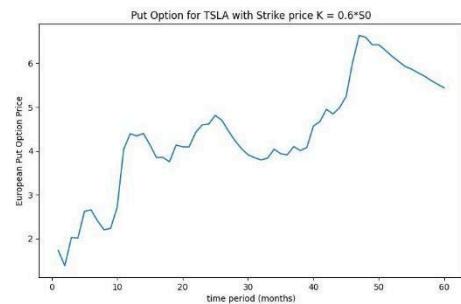
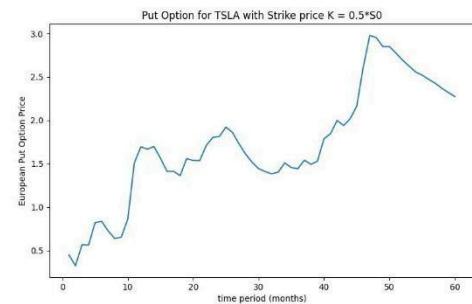
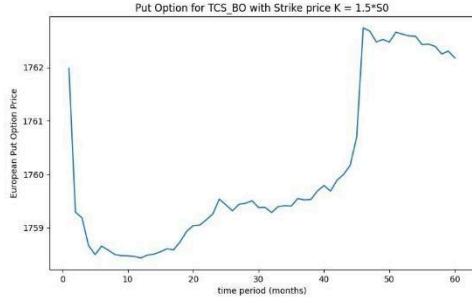
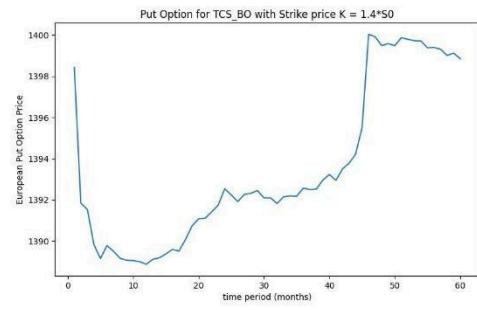
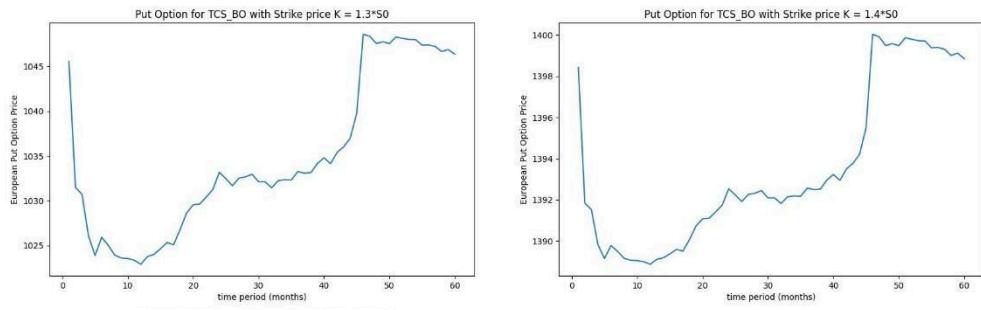


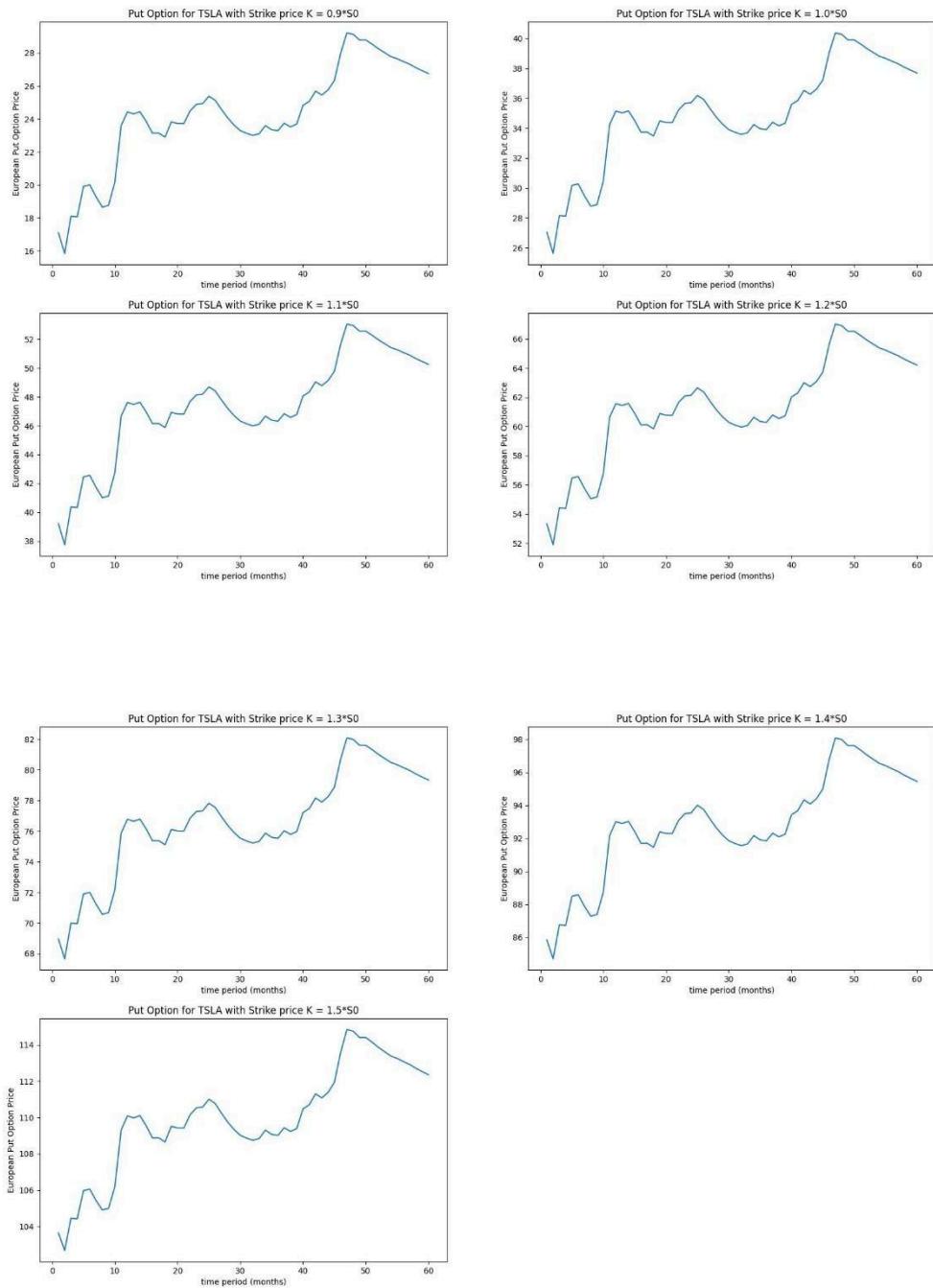






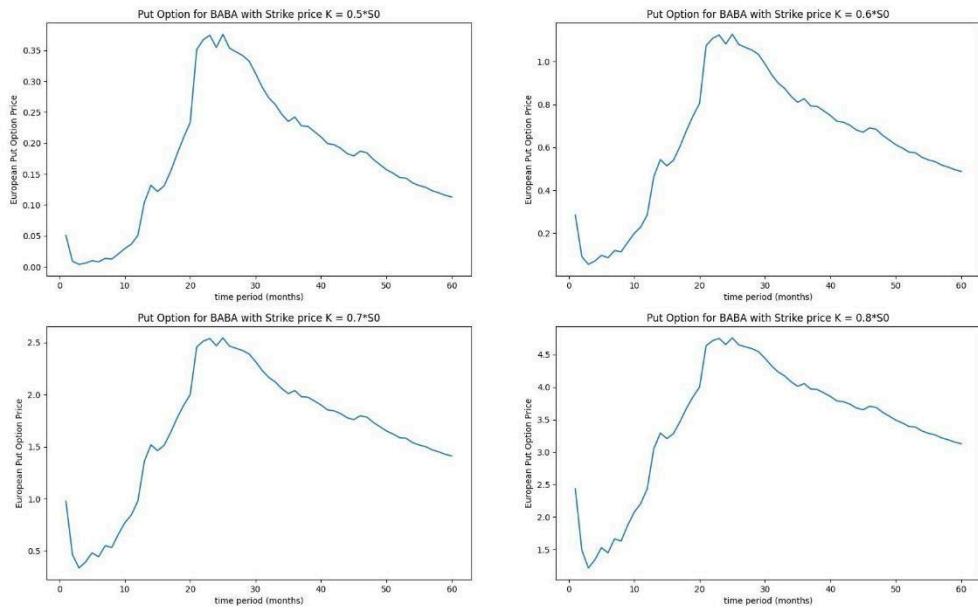




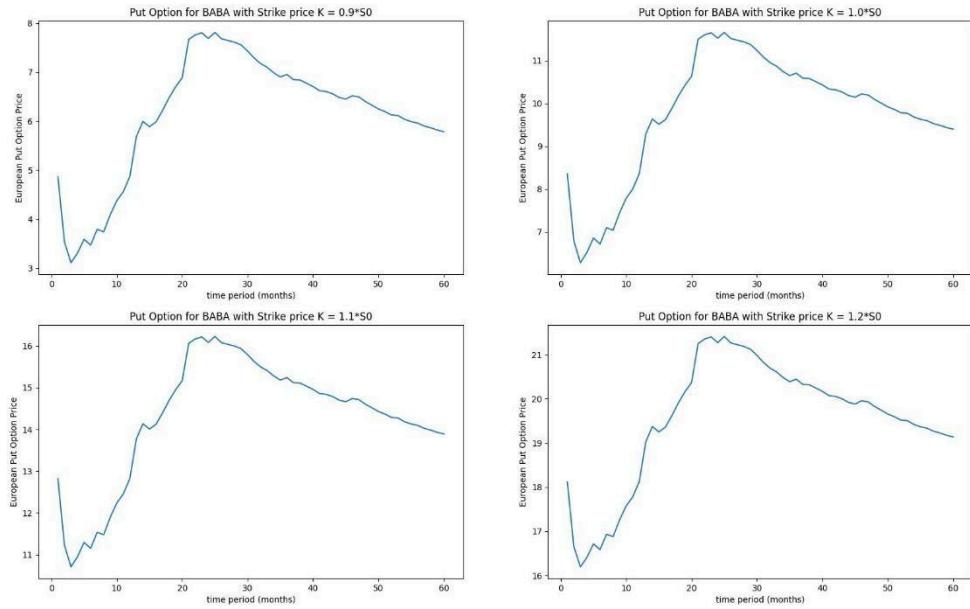


Plots for call option and volatility – stocks in nsedata1

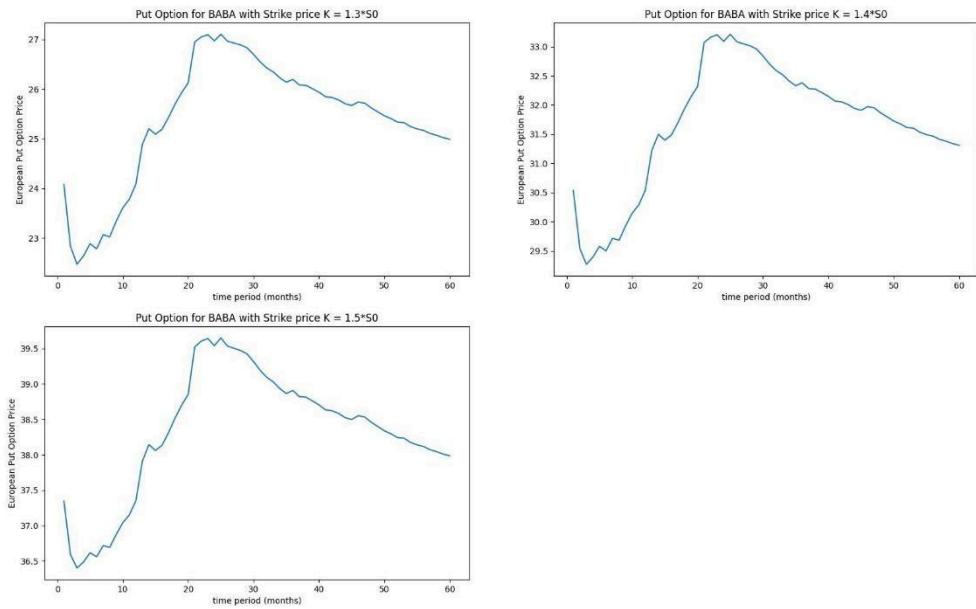
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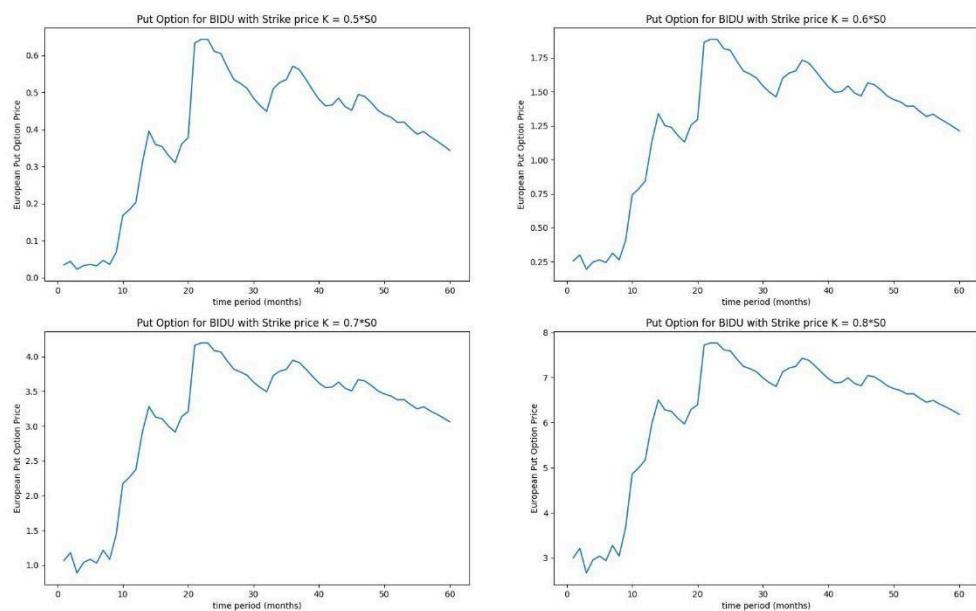
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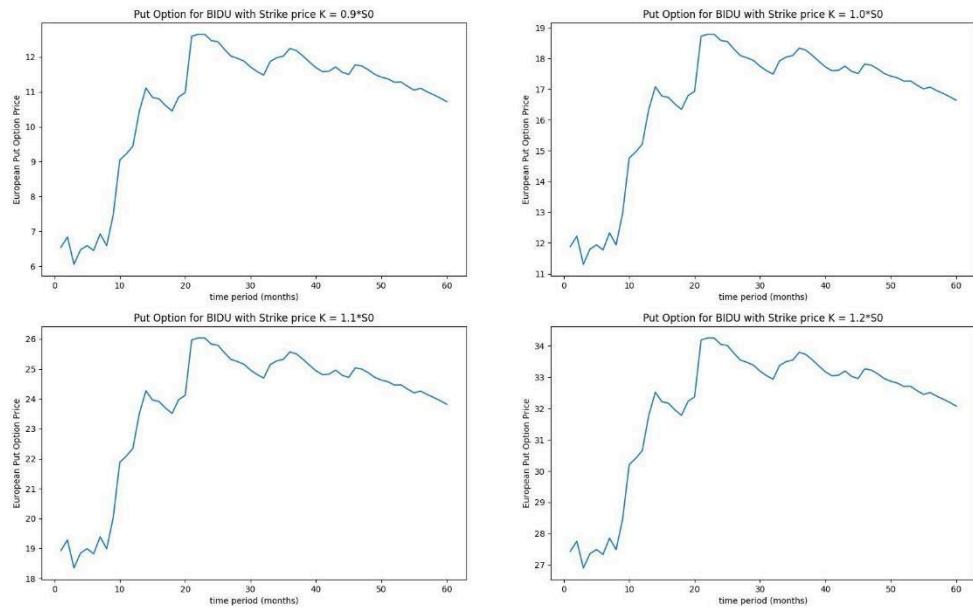
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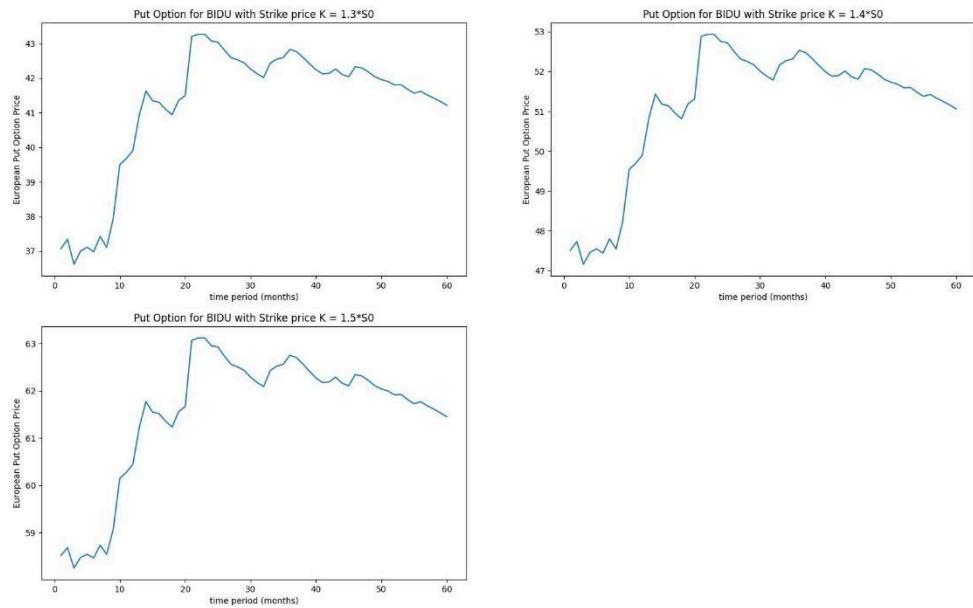
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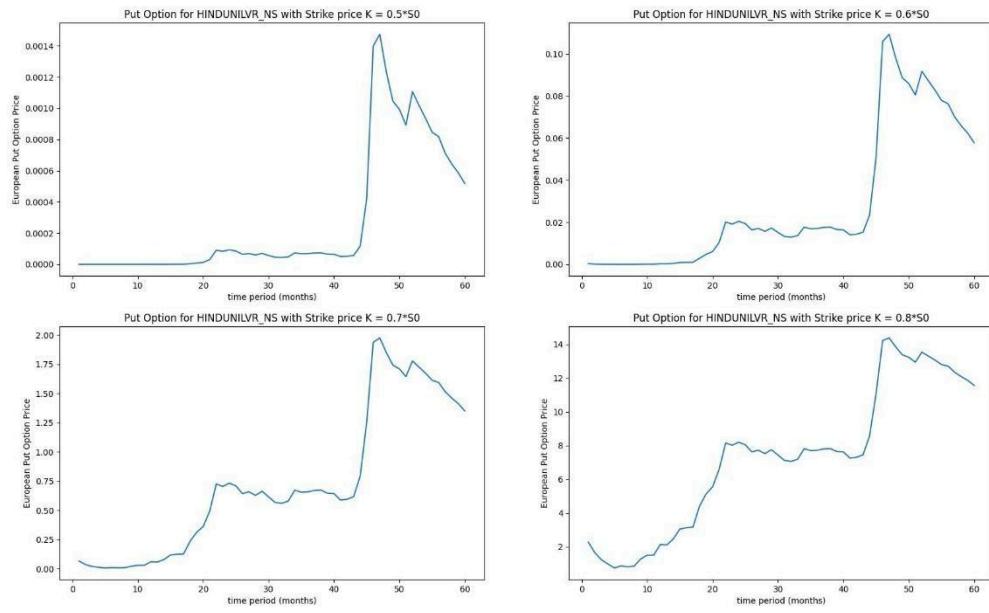
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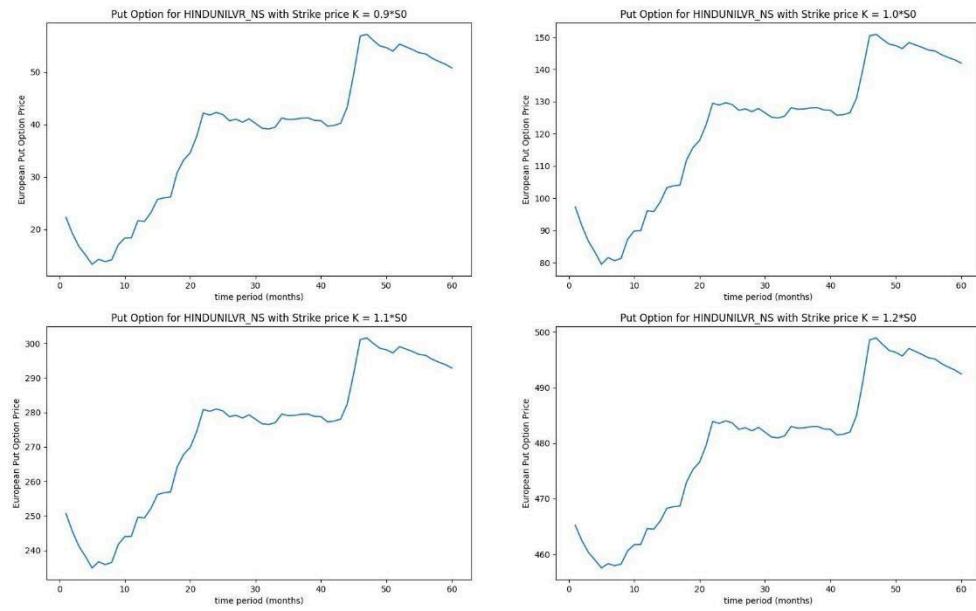
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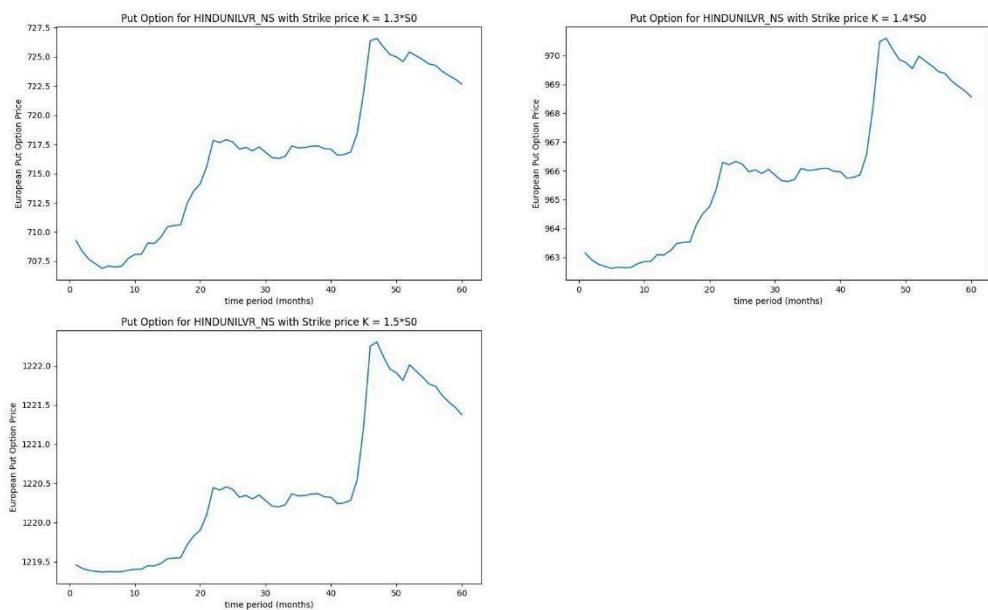
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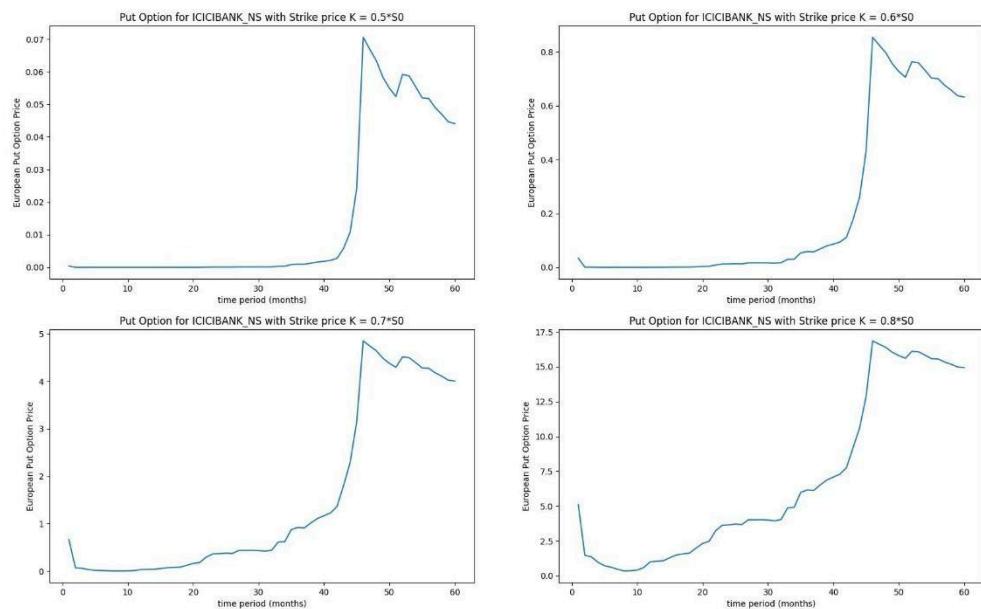
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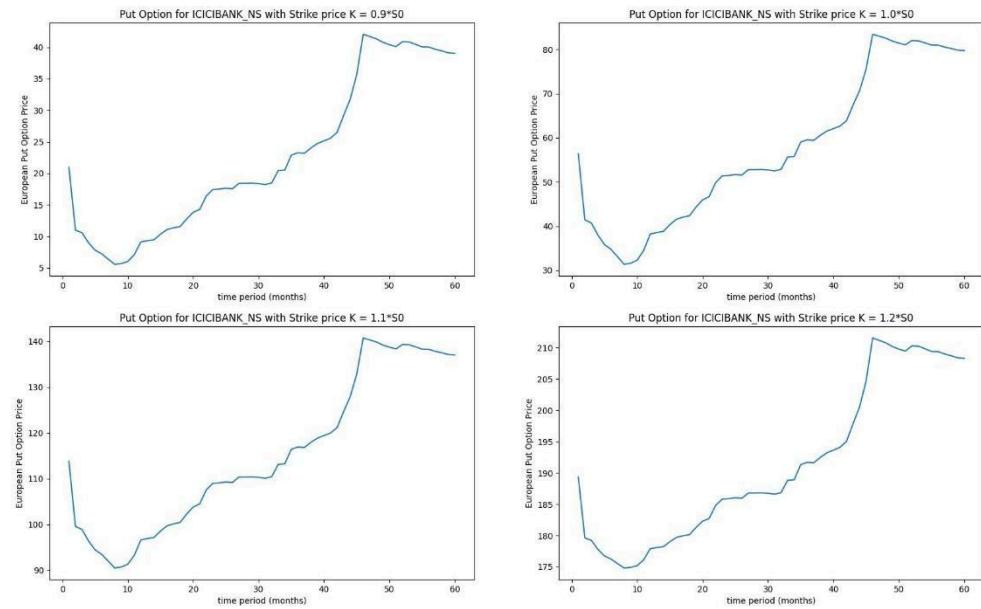
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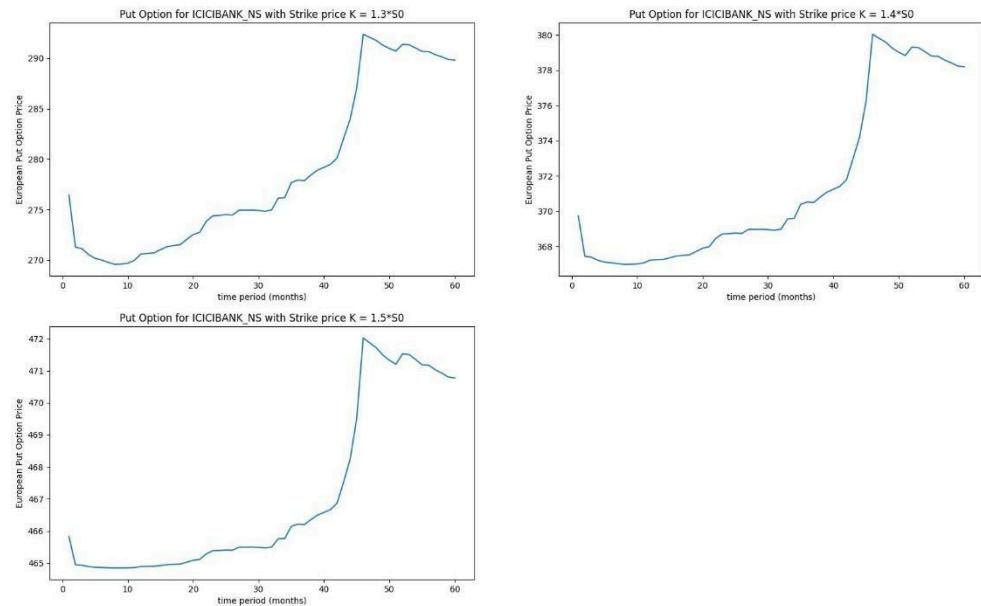
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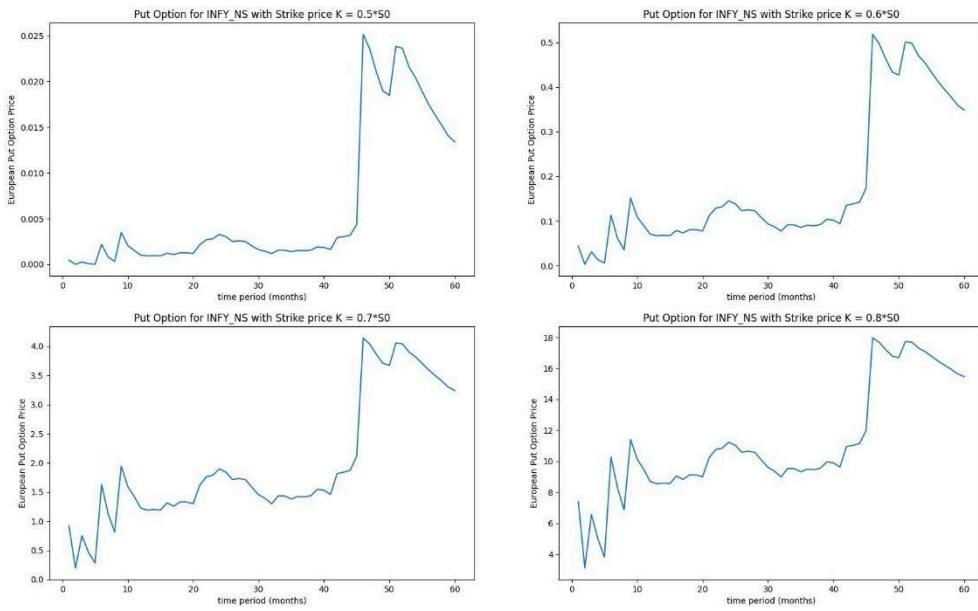
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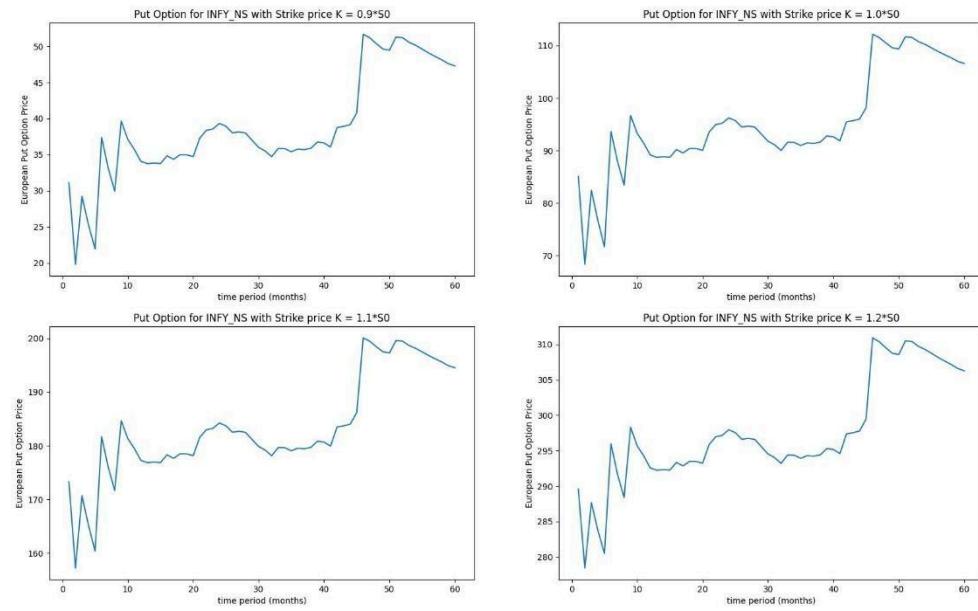
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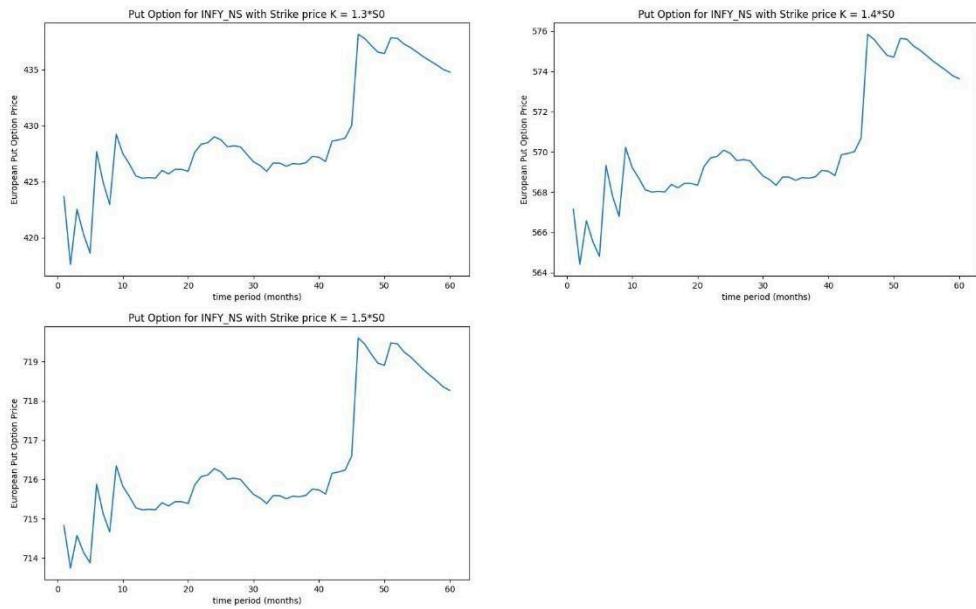
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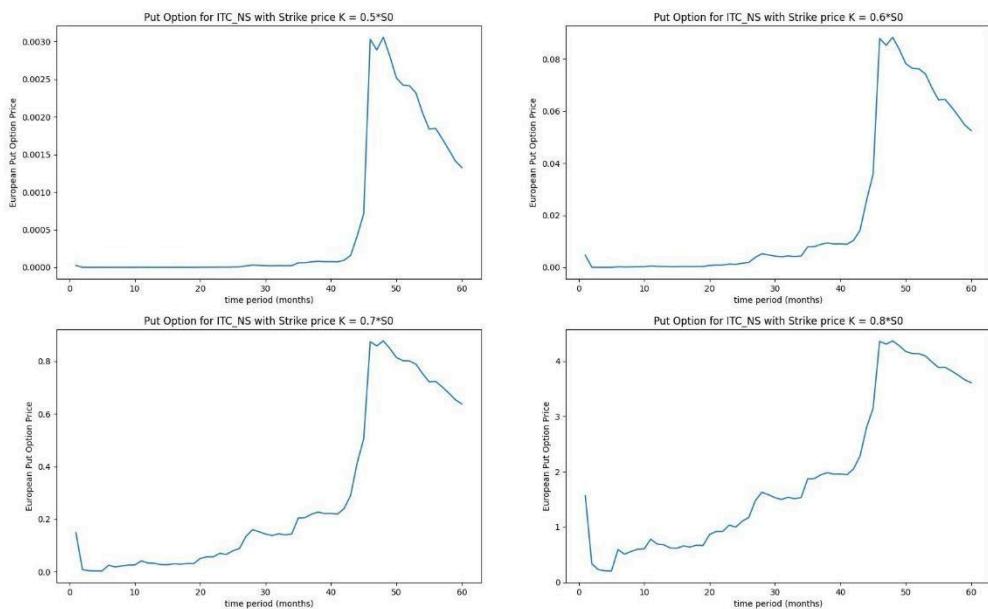
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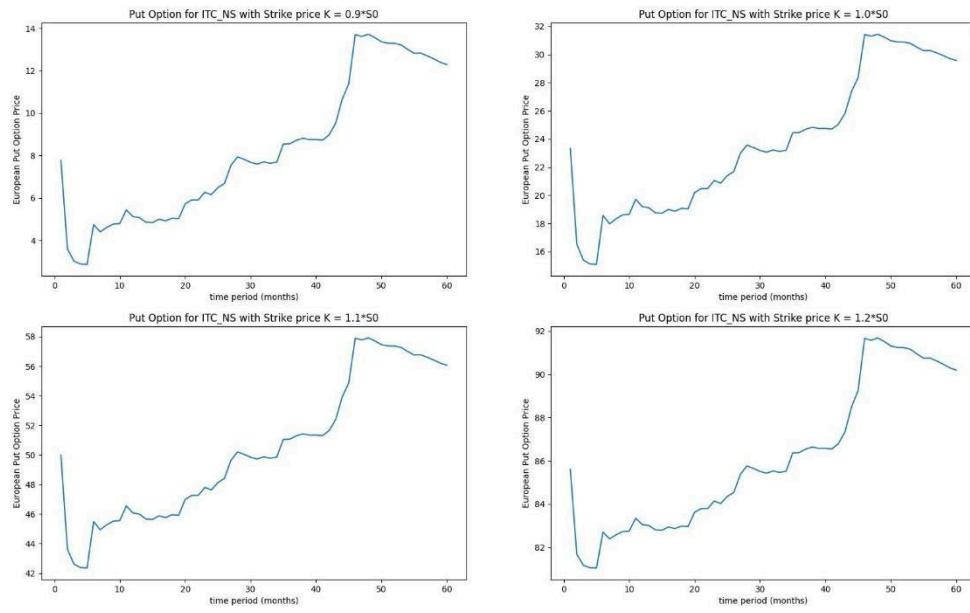
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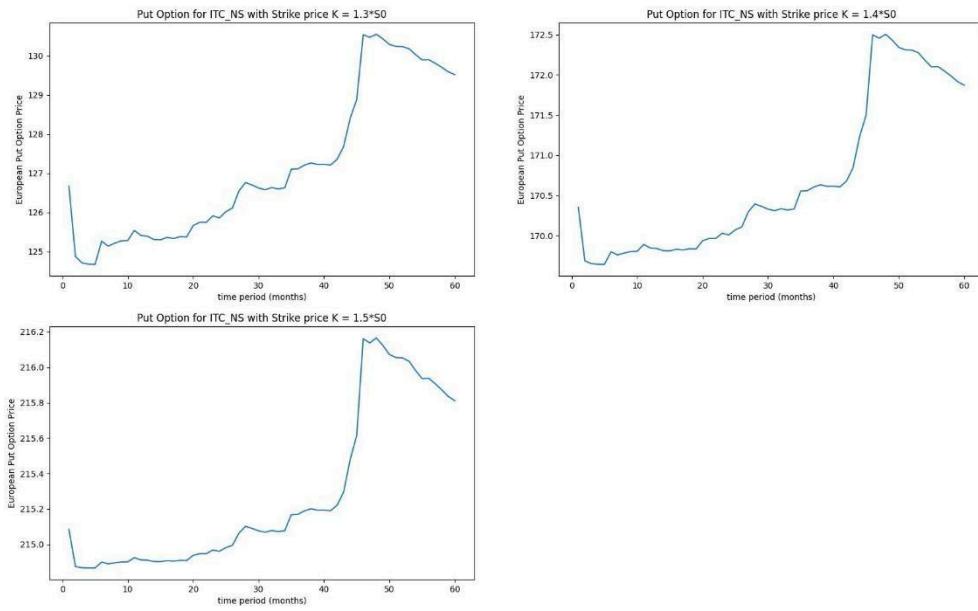
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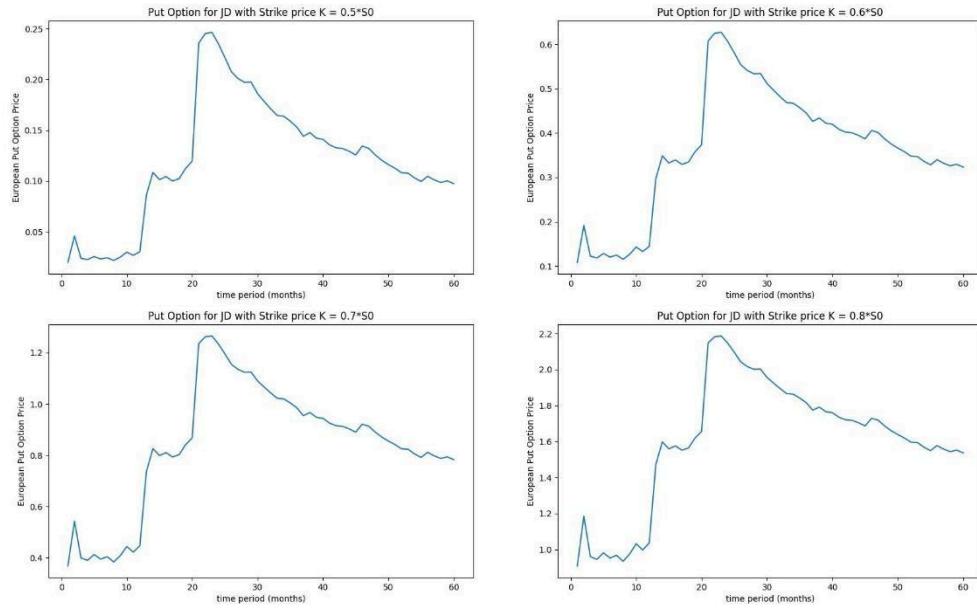
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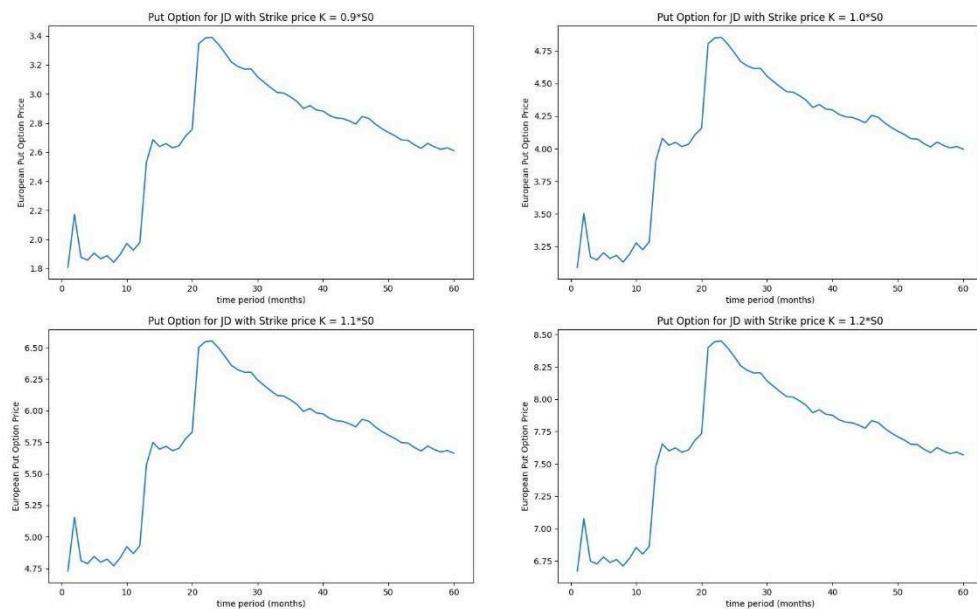
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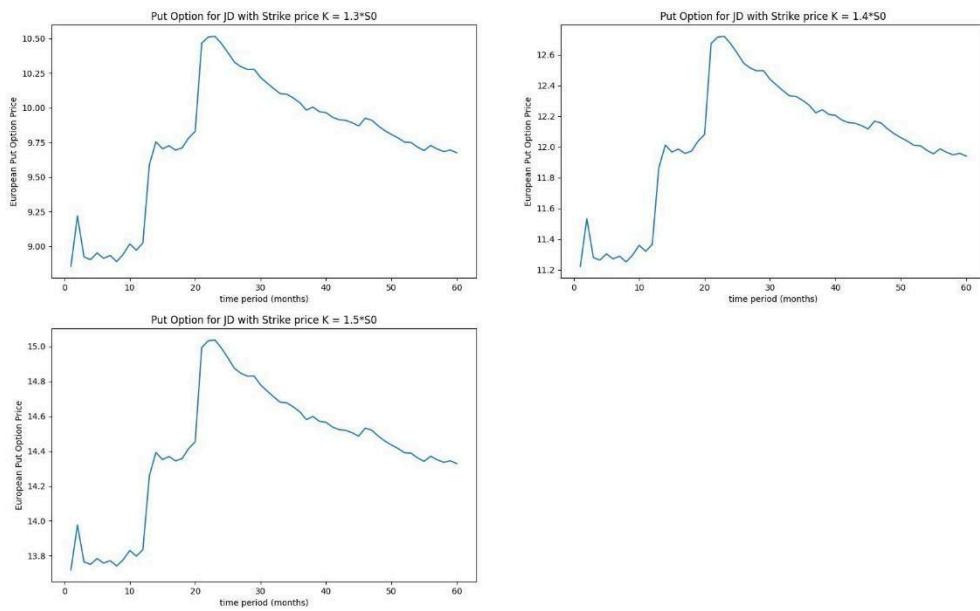
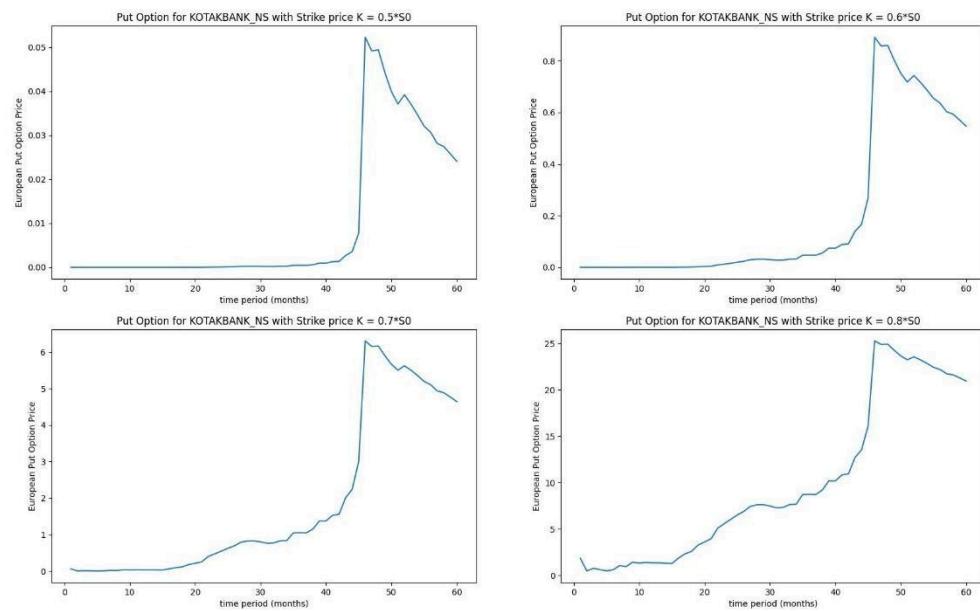


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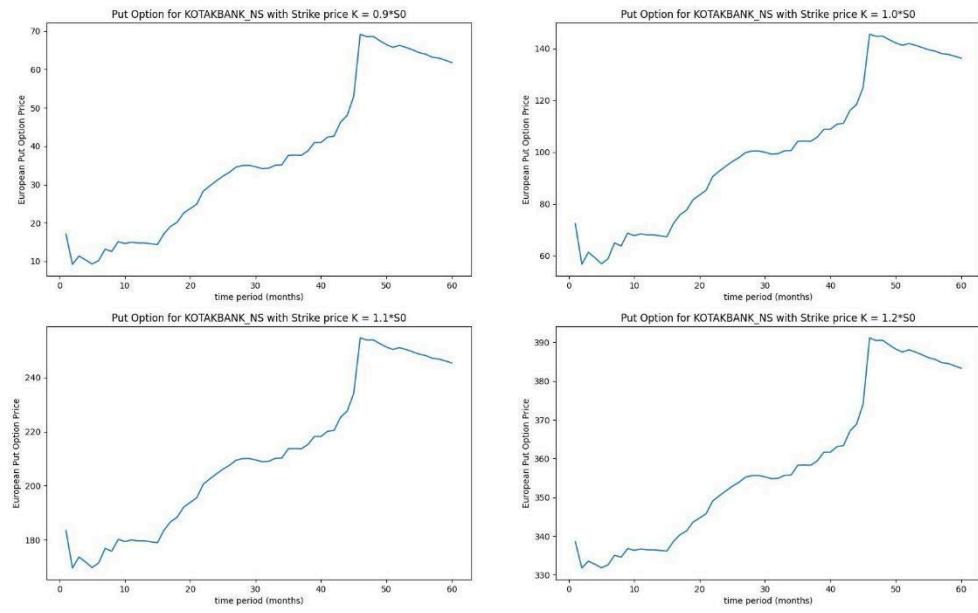


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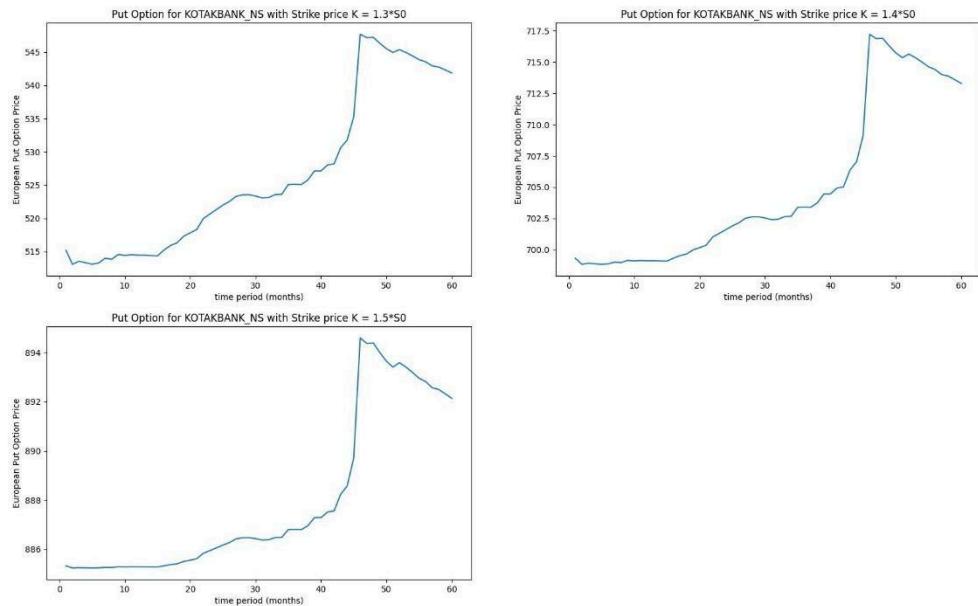


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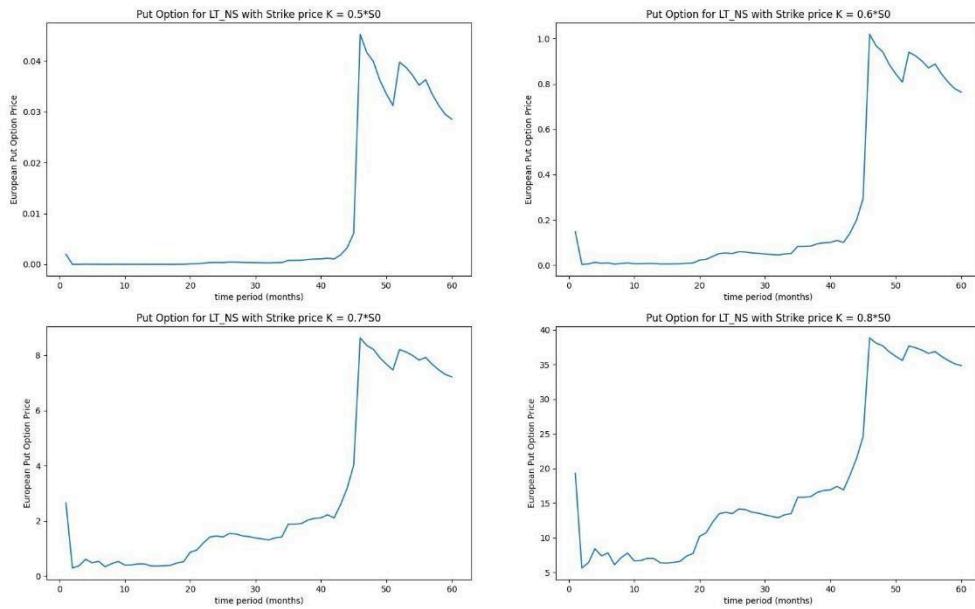
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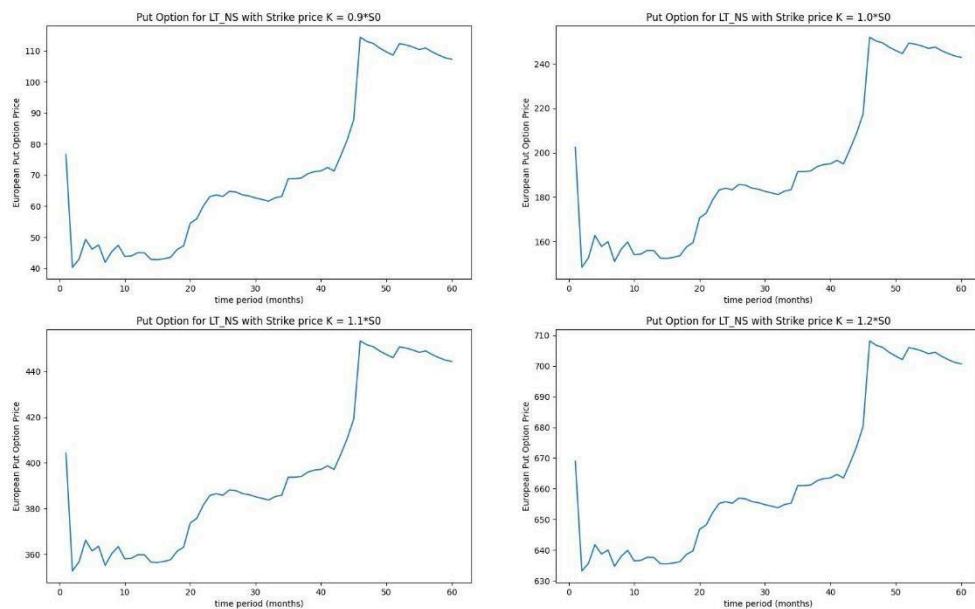
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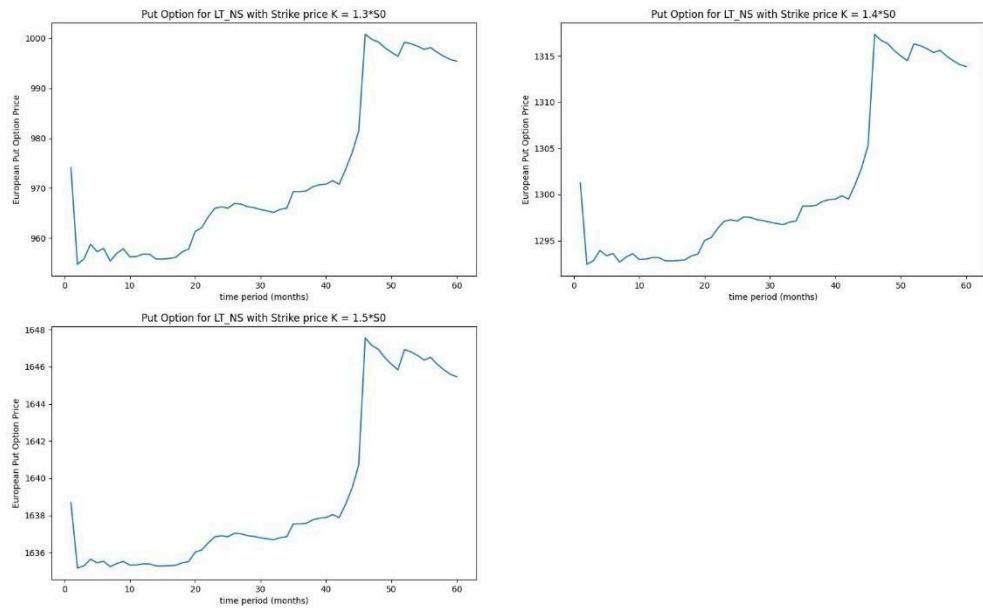
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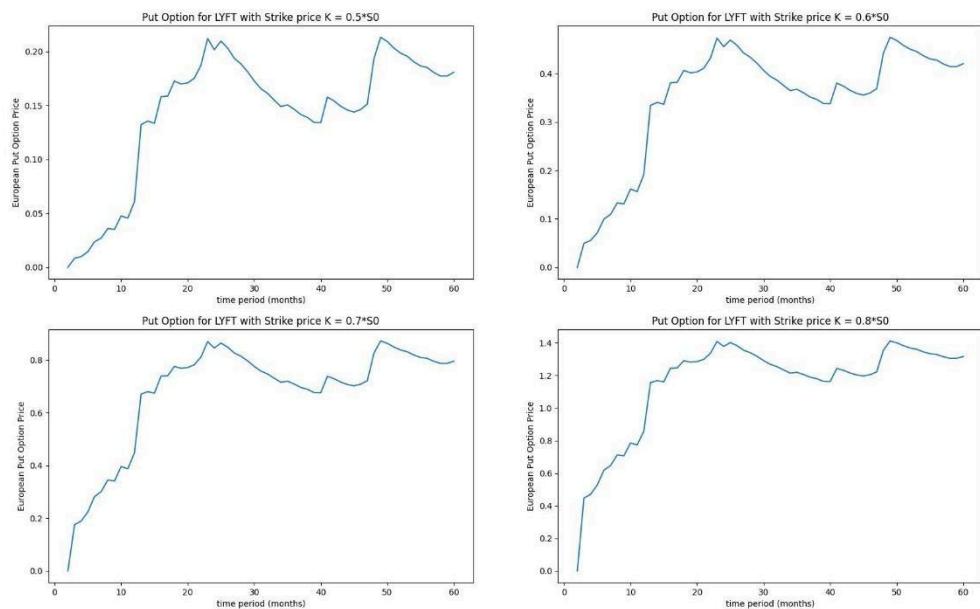
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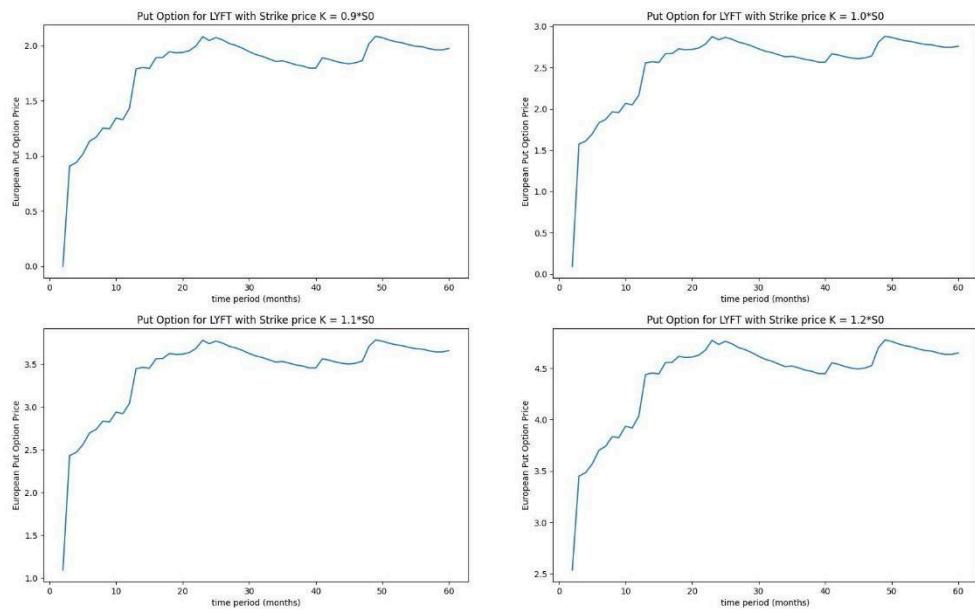
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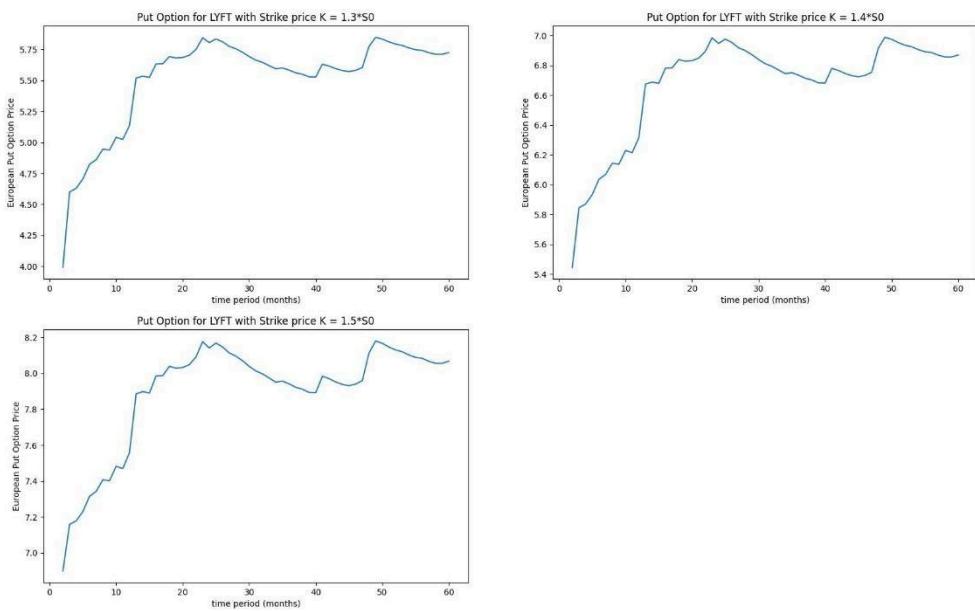
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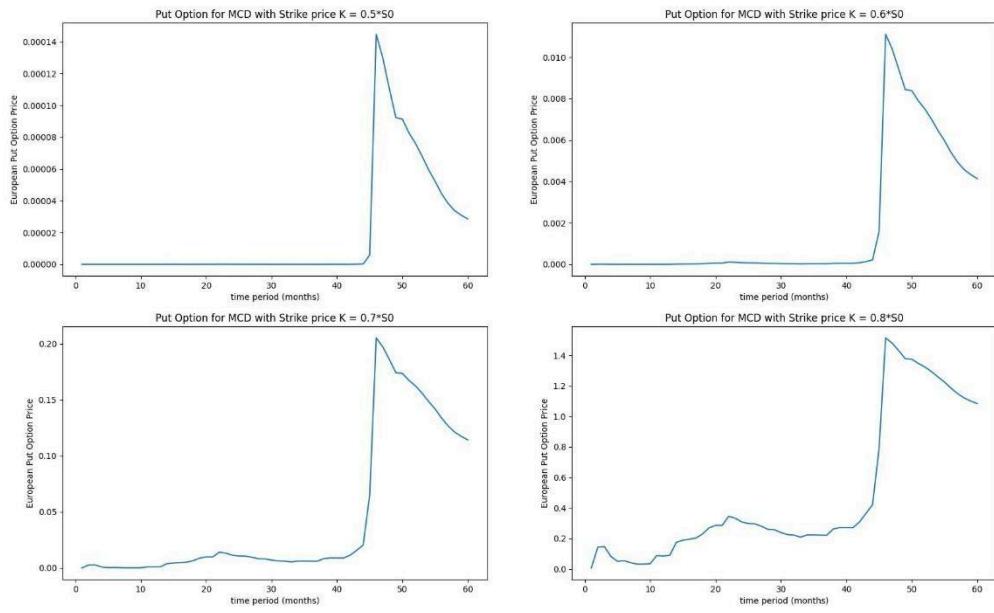
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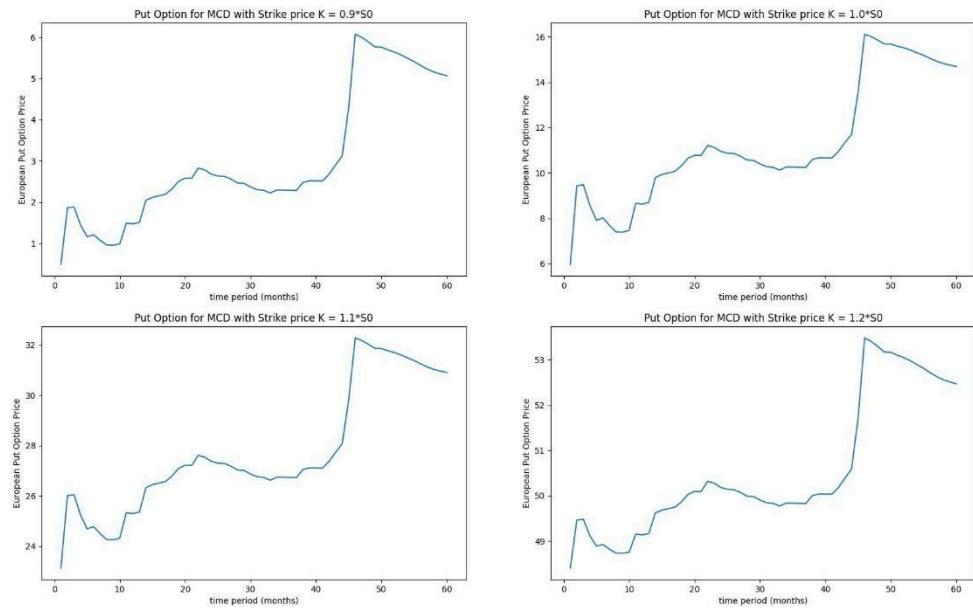
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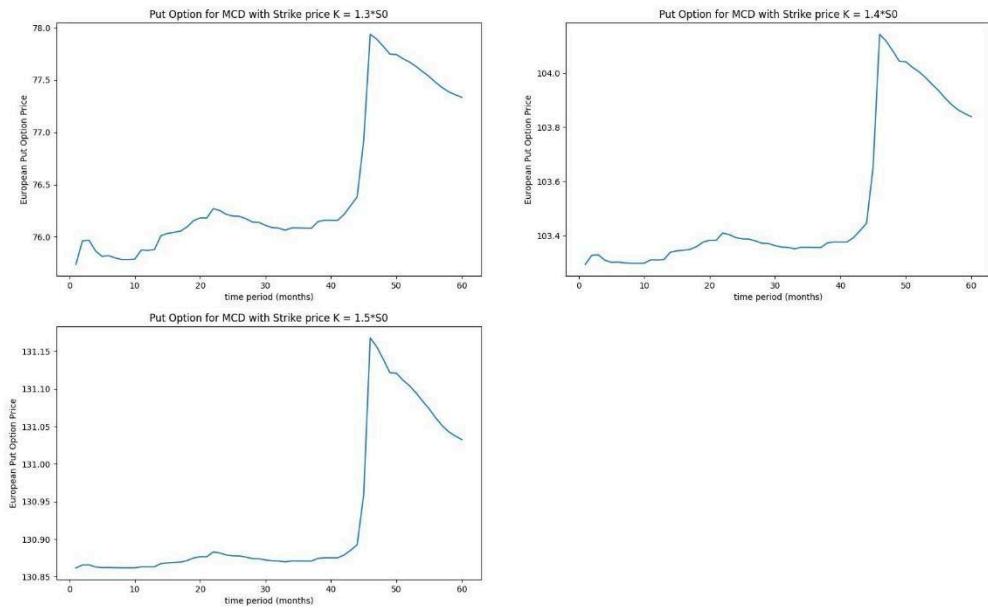
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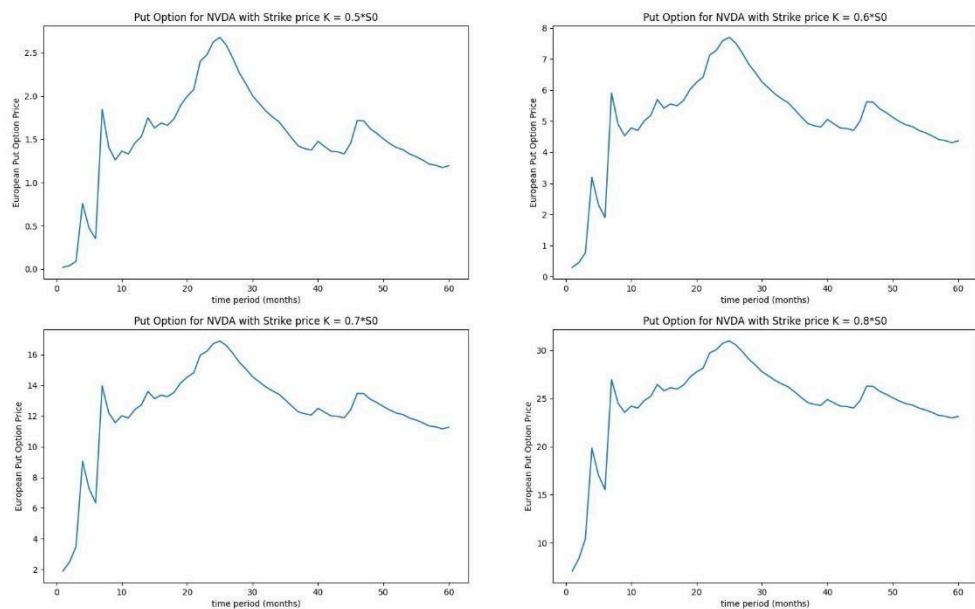
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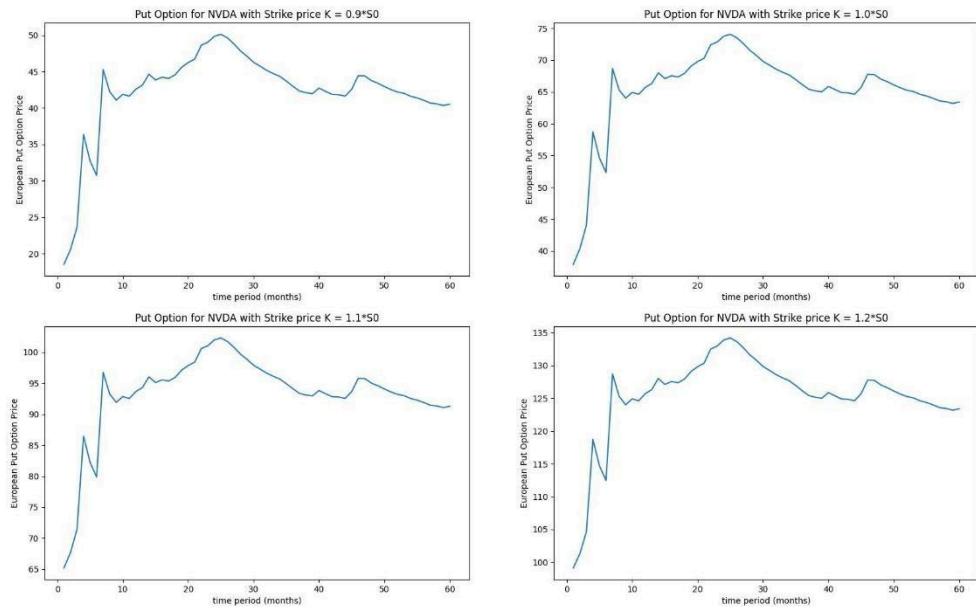
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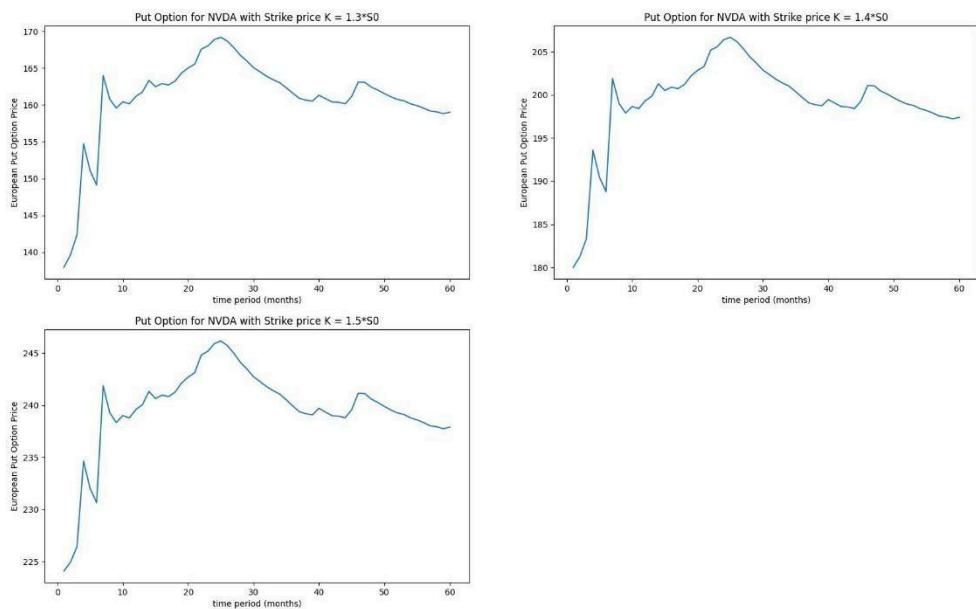
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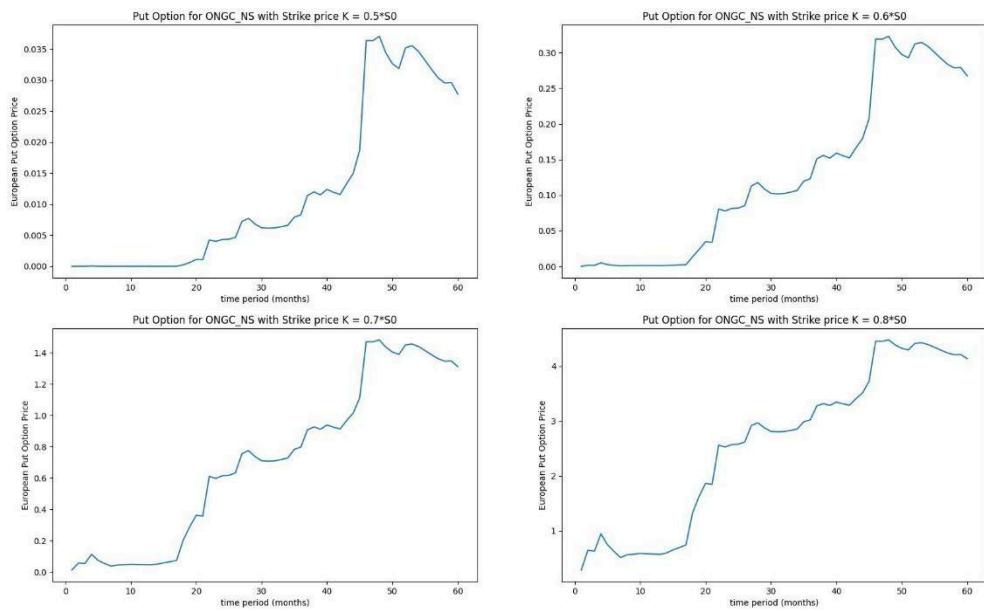
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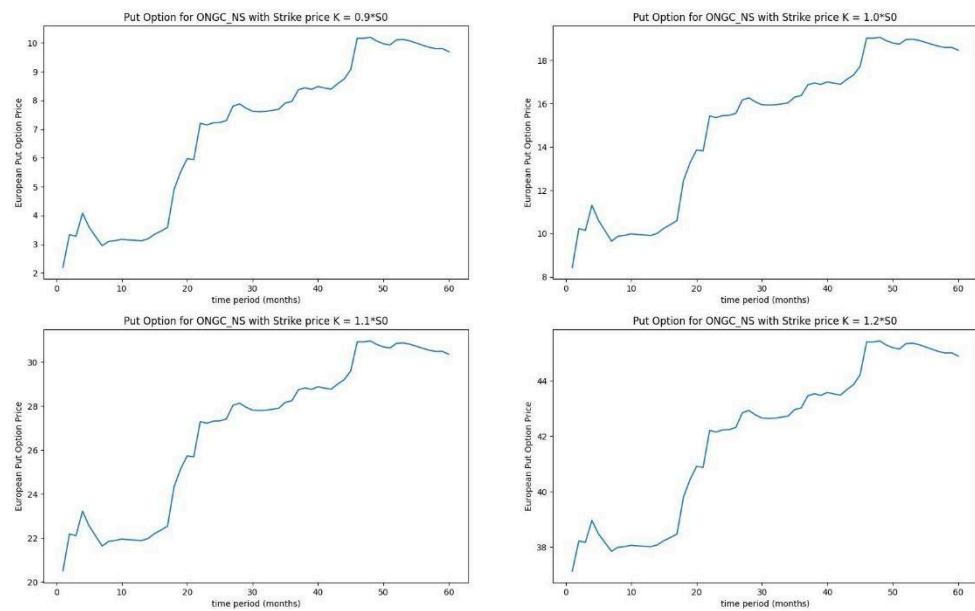
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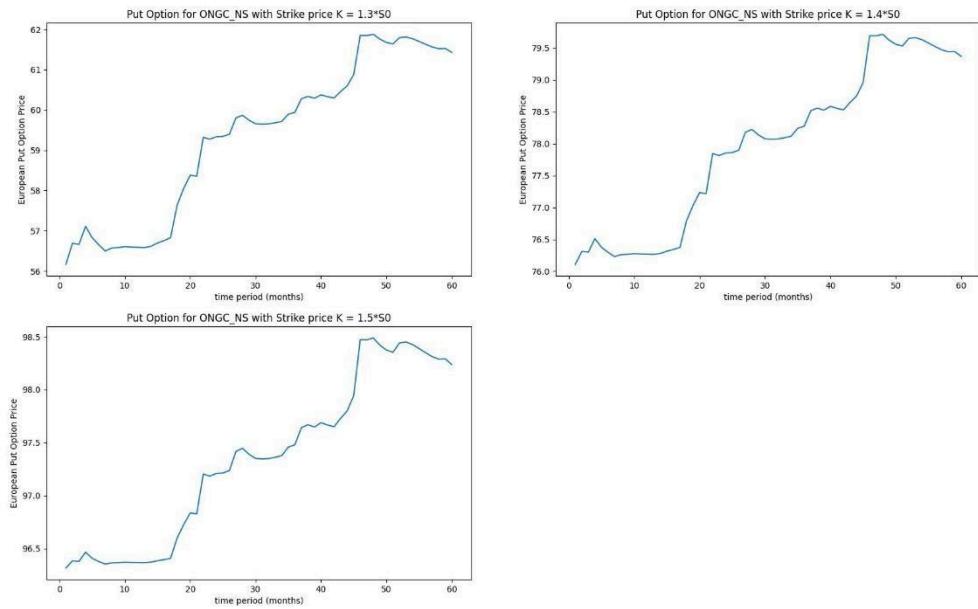
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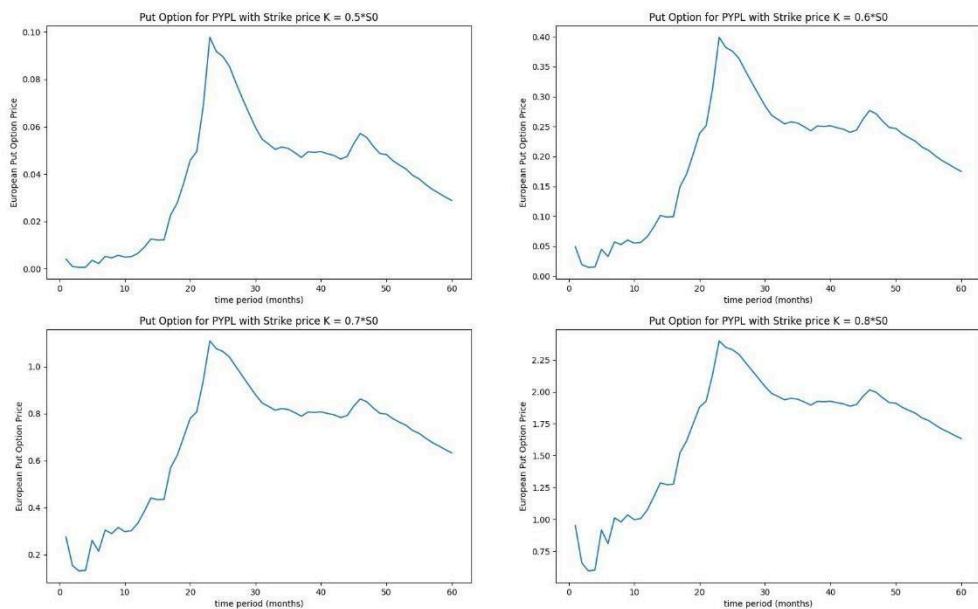
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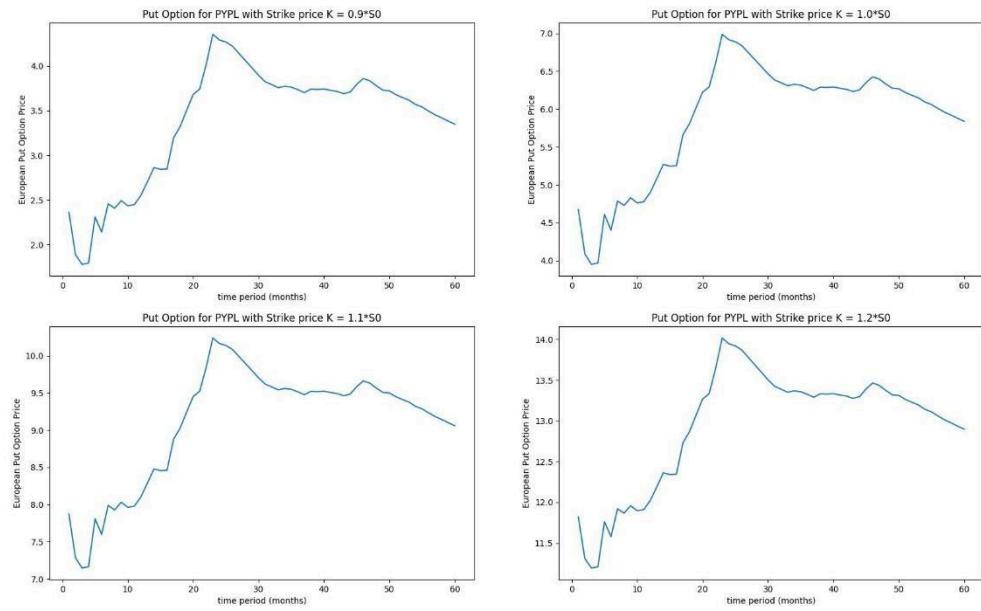
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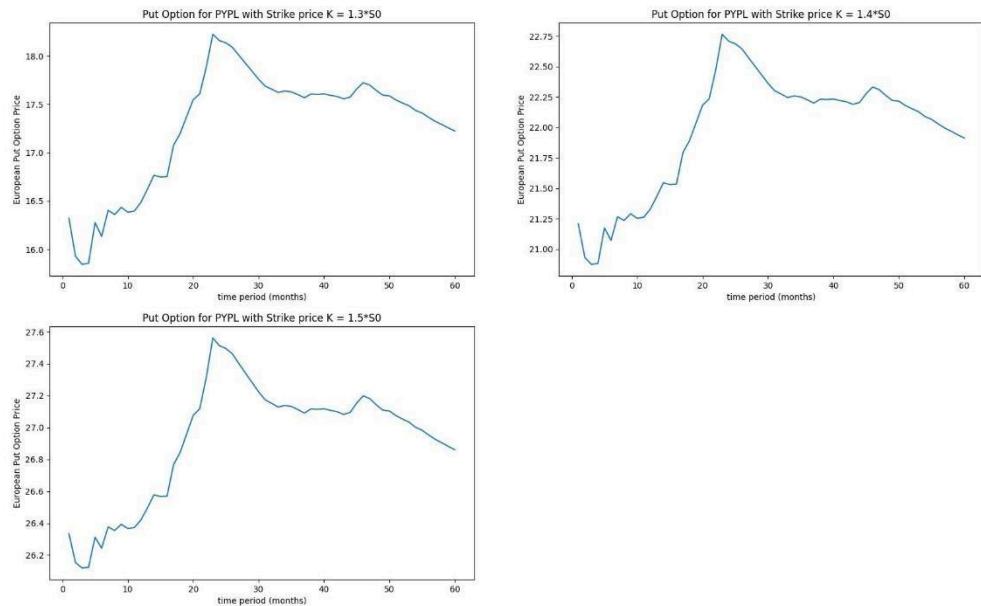
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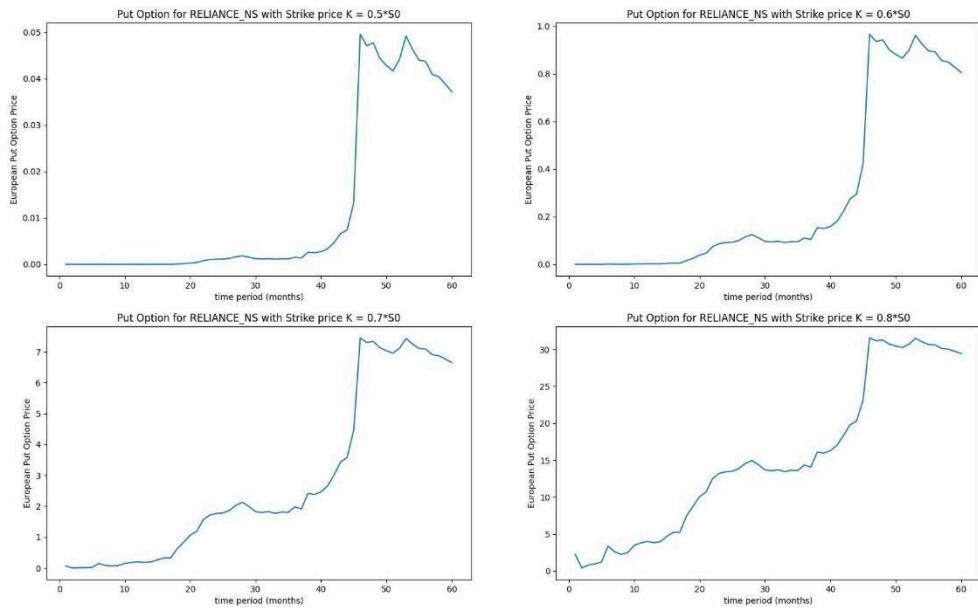
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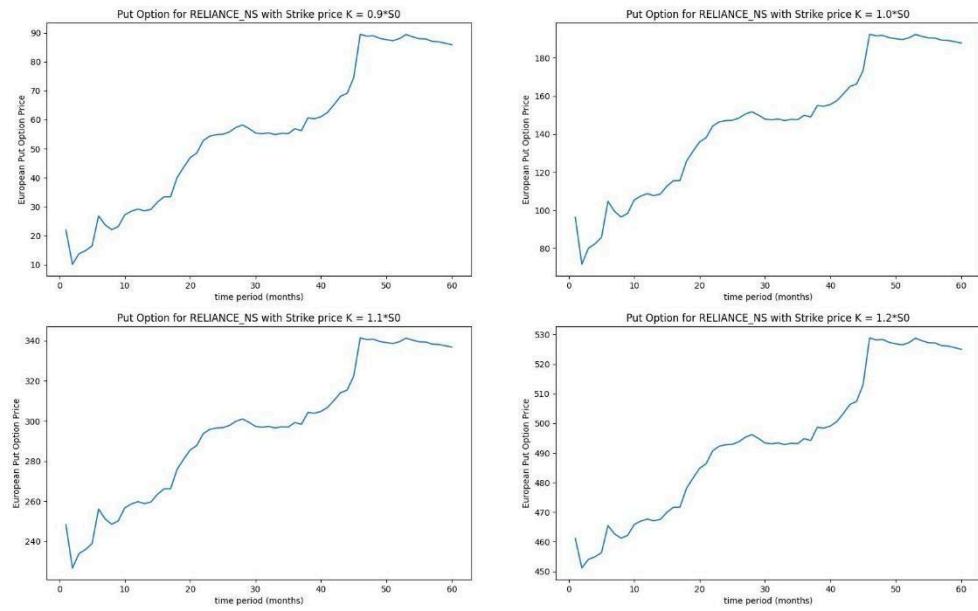
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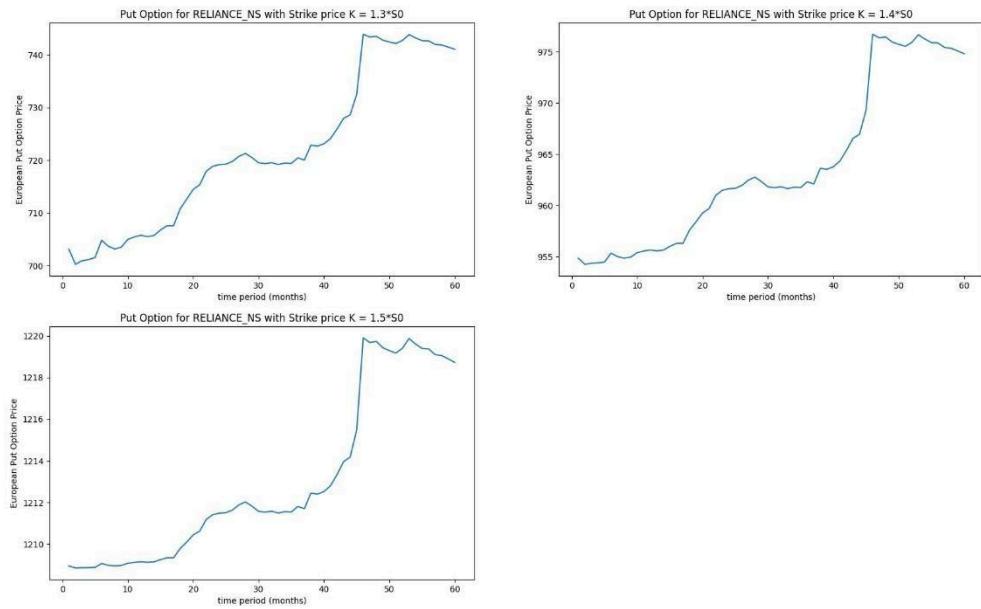
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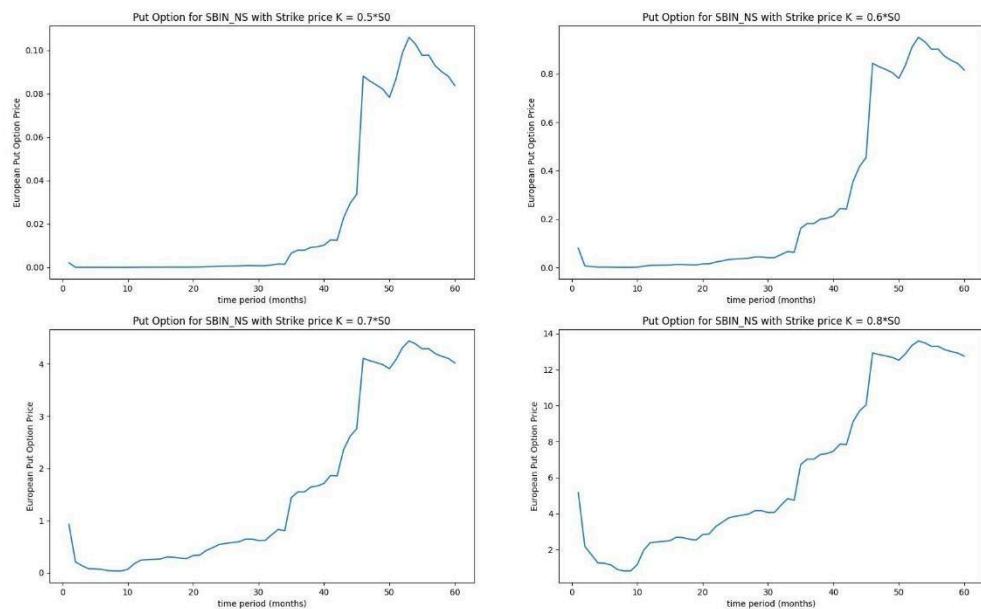
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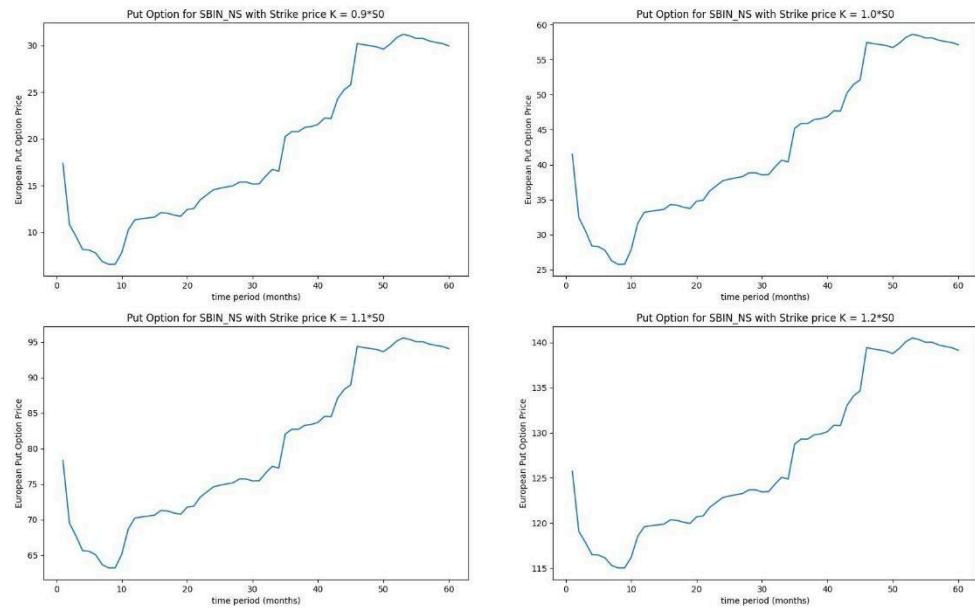
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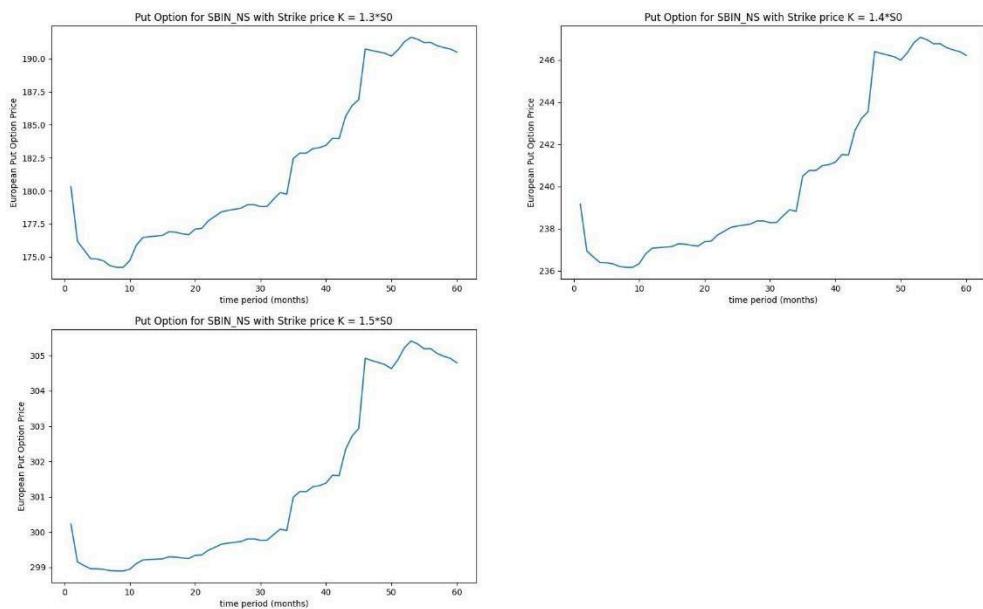
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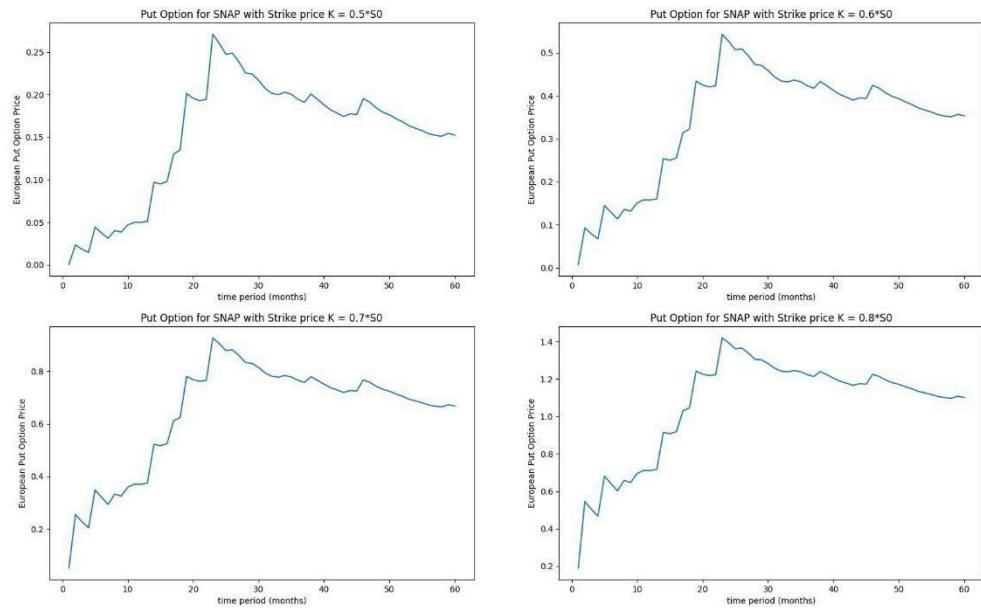
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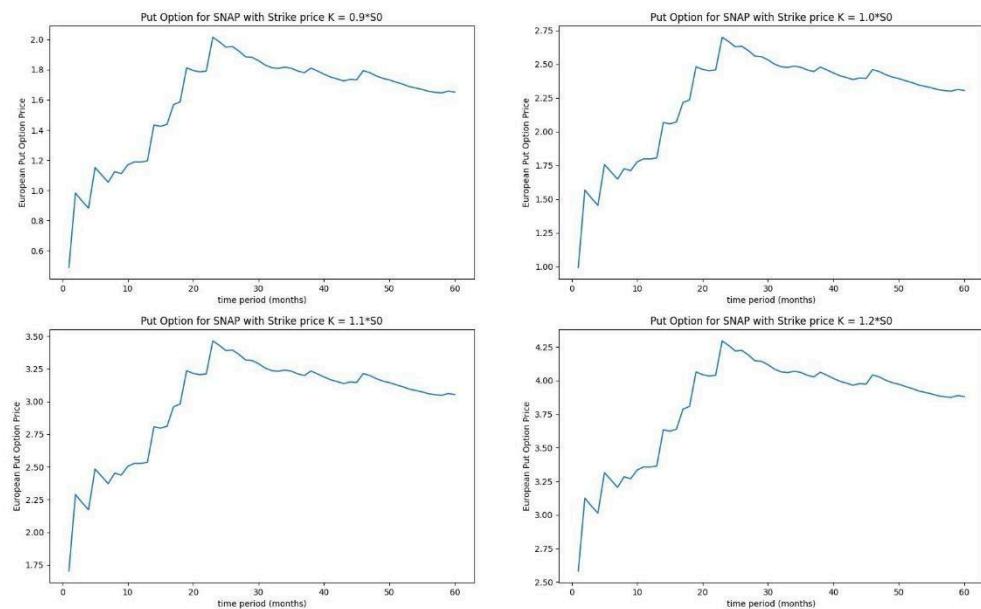
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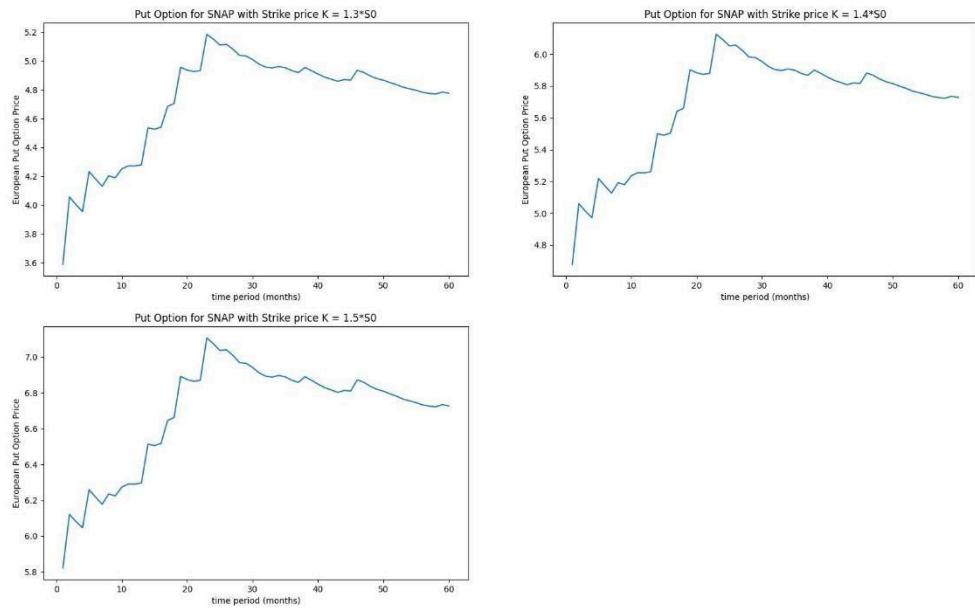
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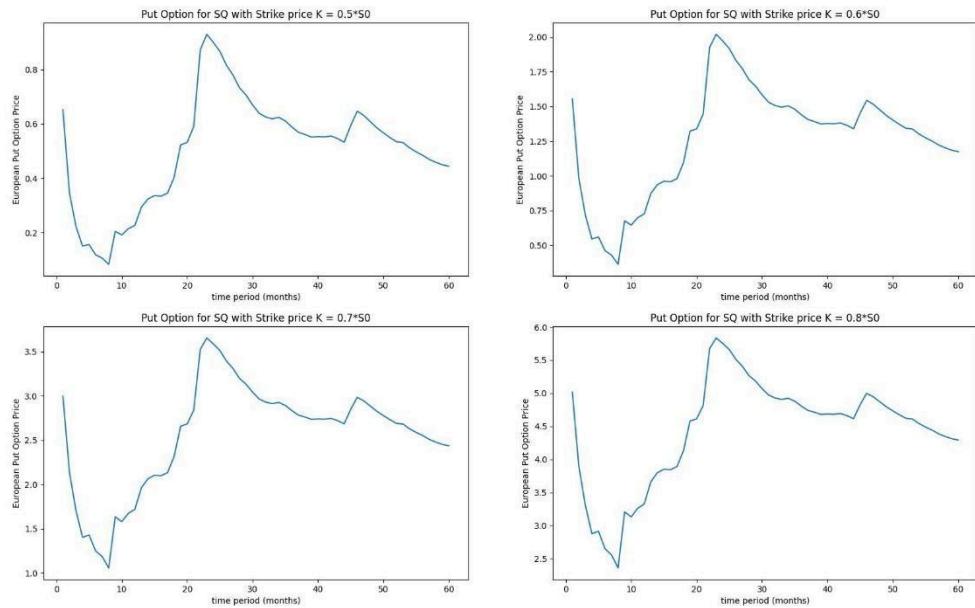
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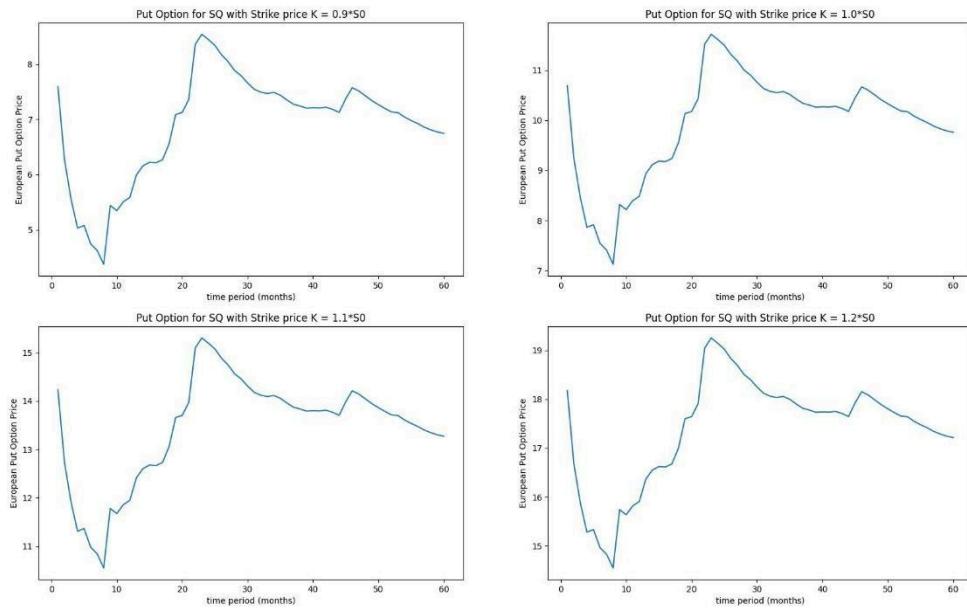
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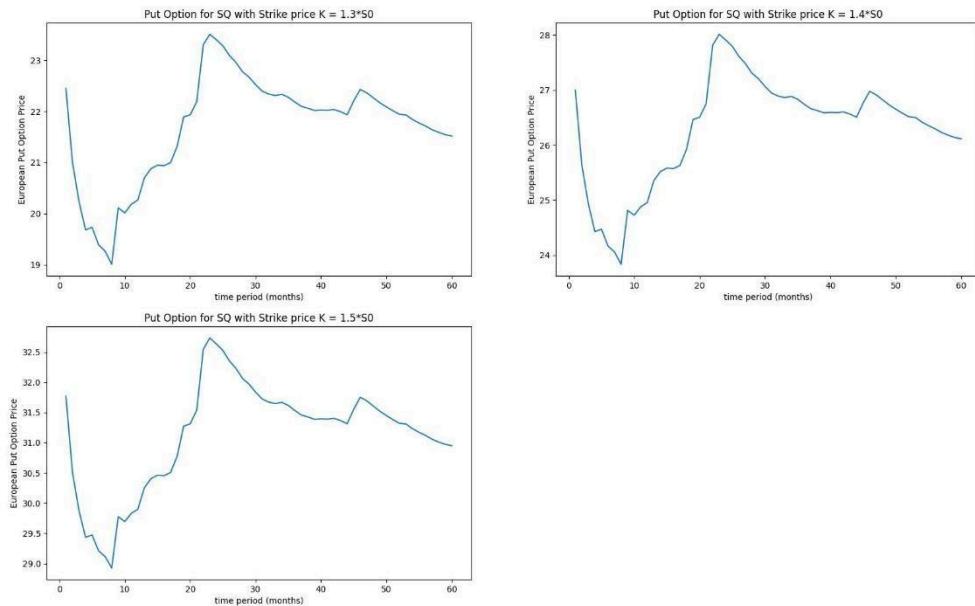
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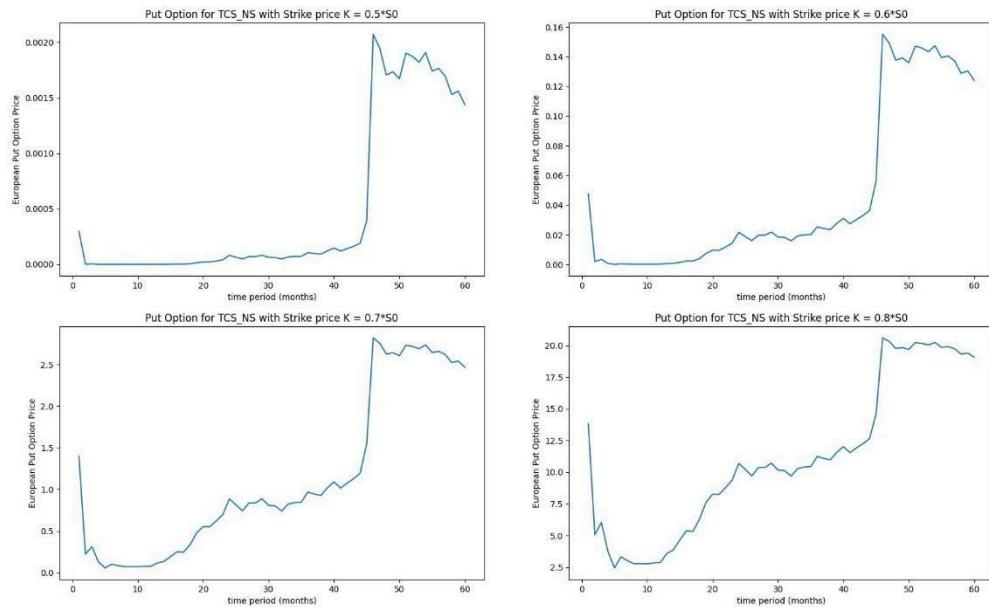
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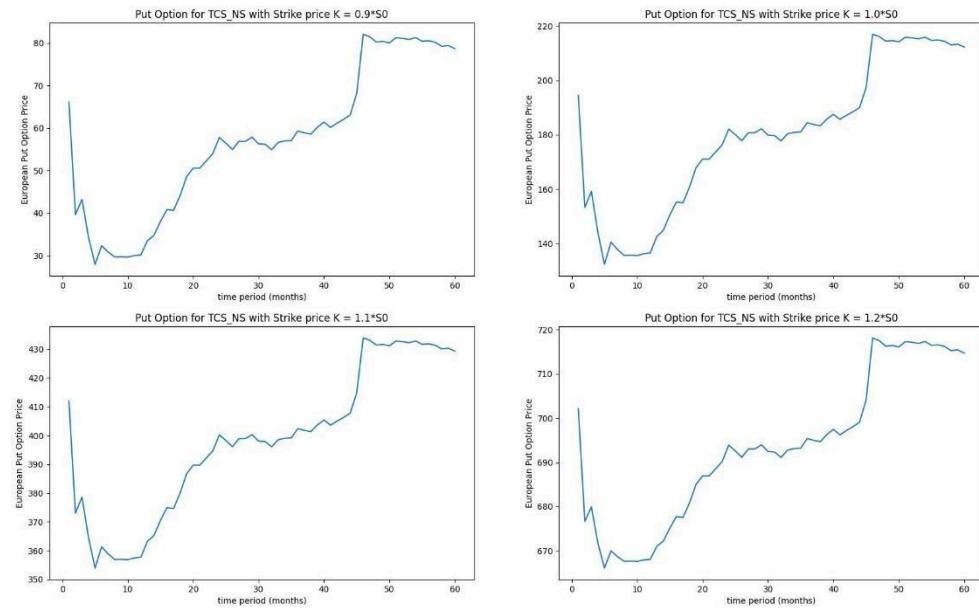
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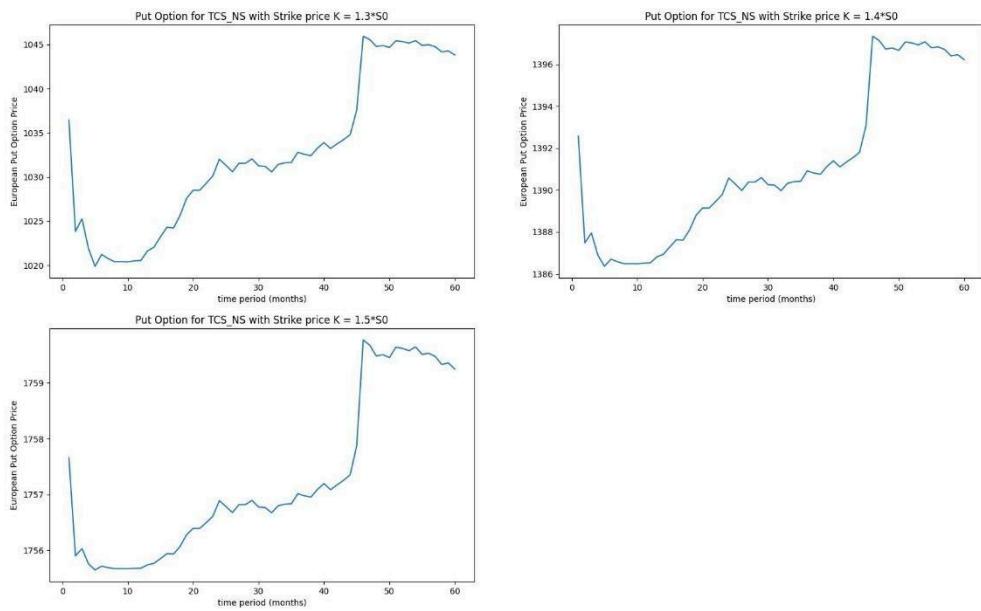
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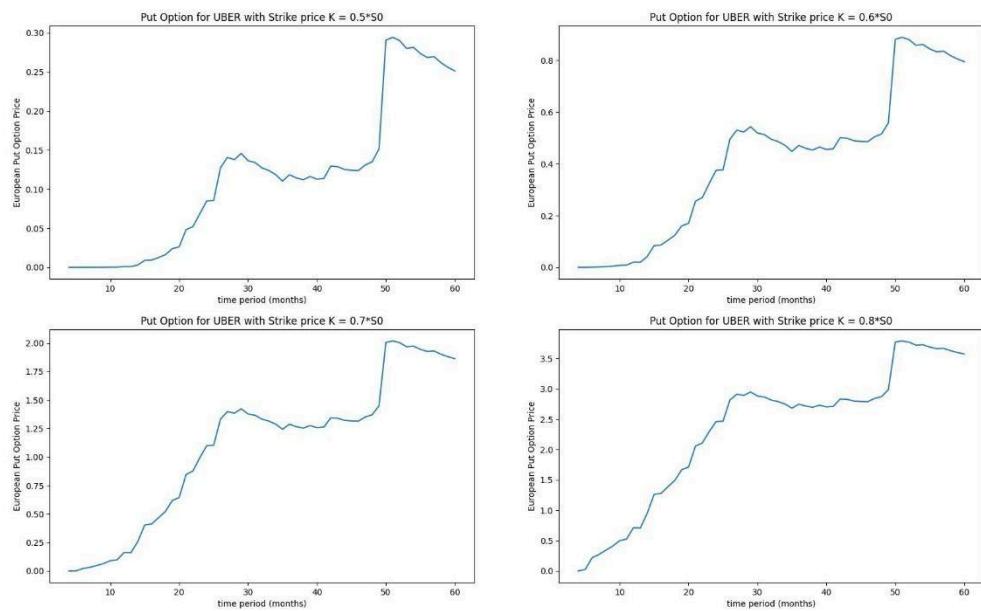
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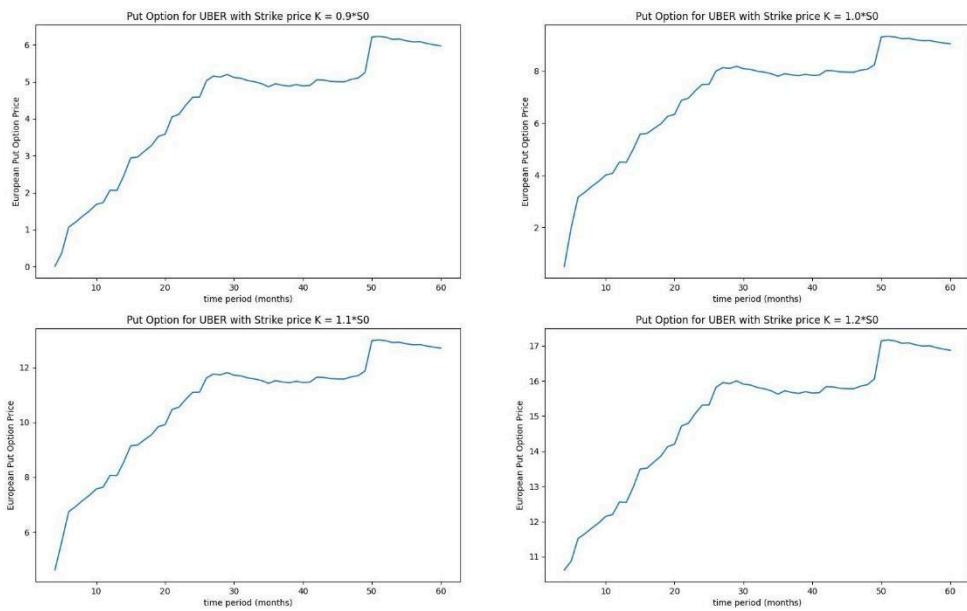
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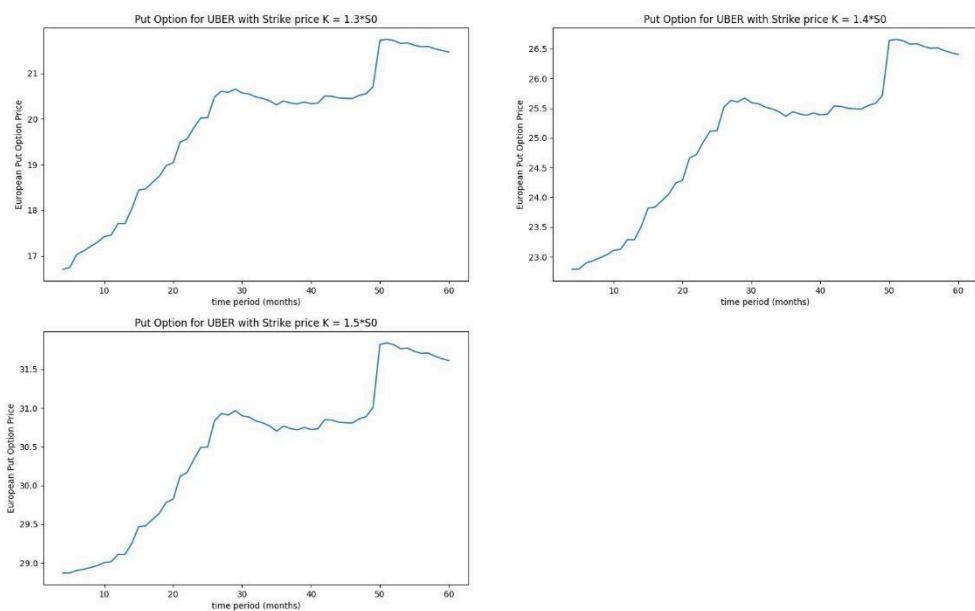
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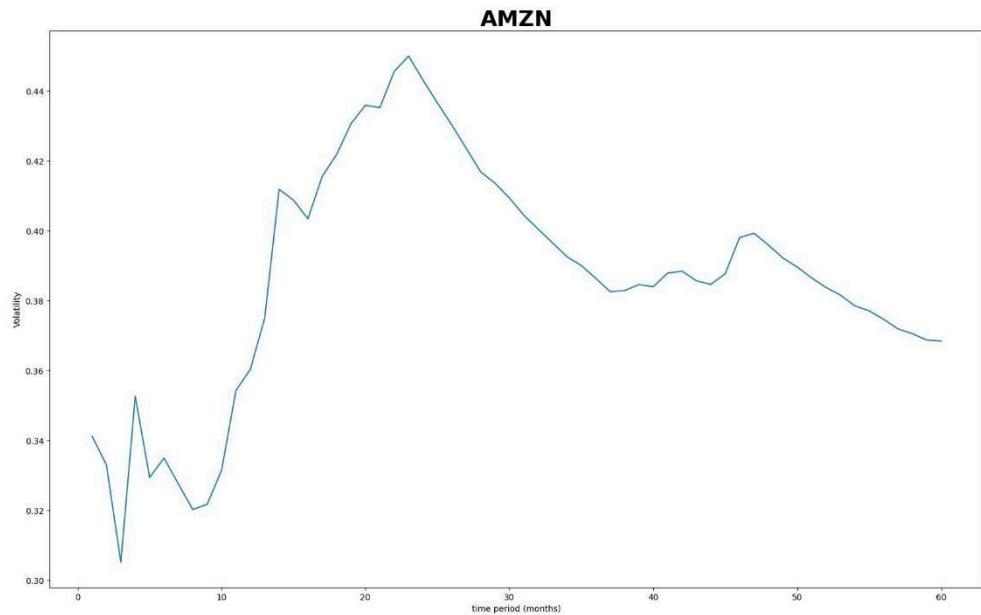
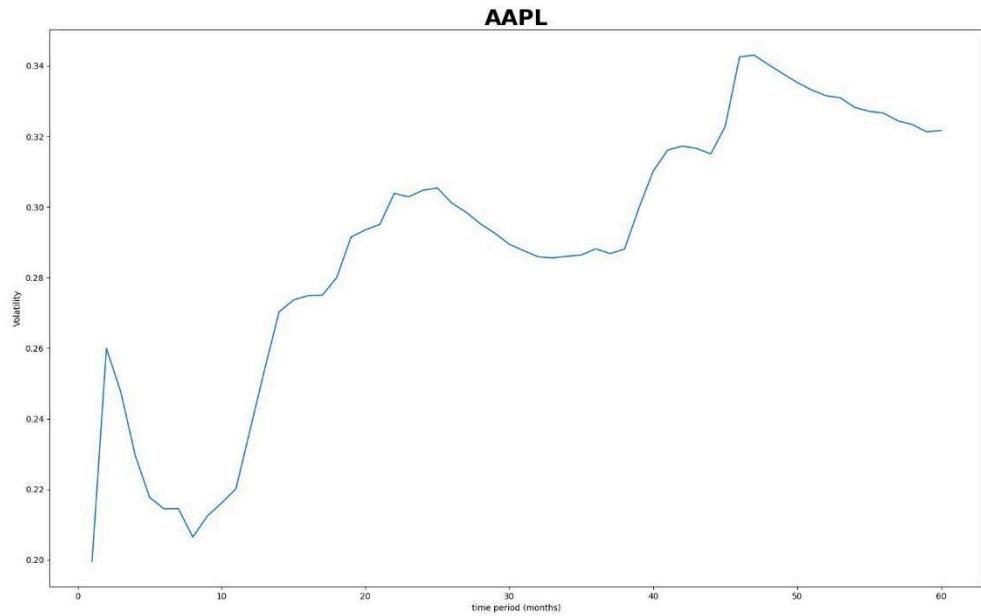
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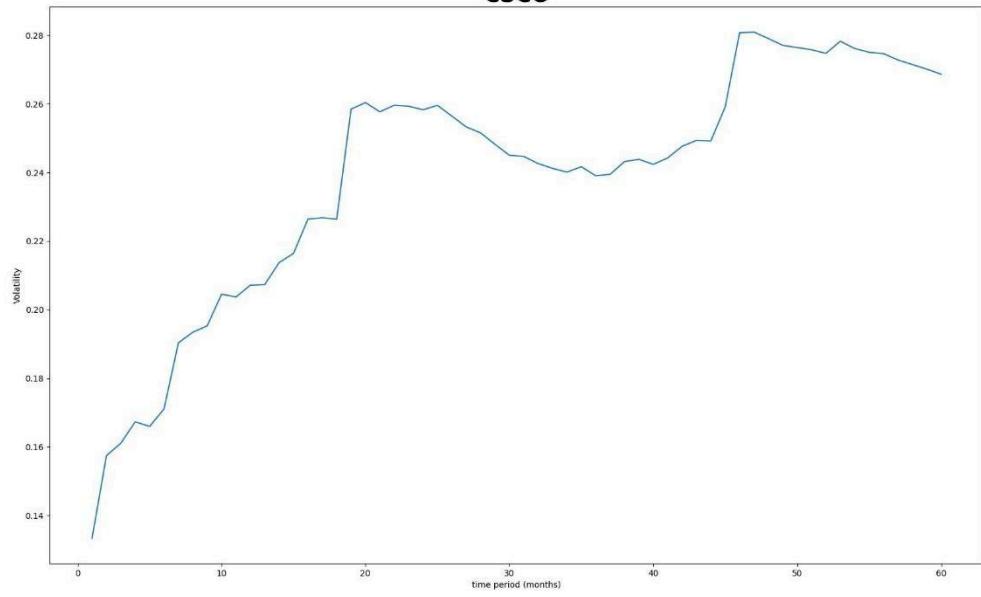
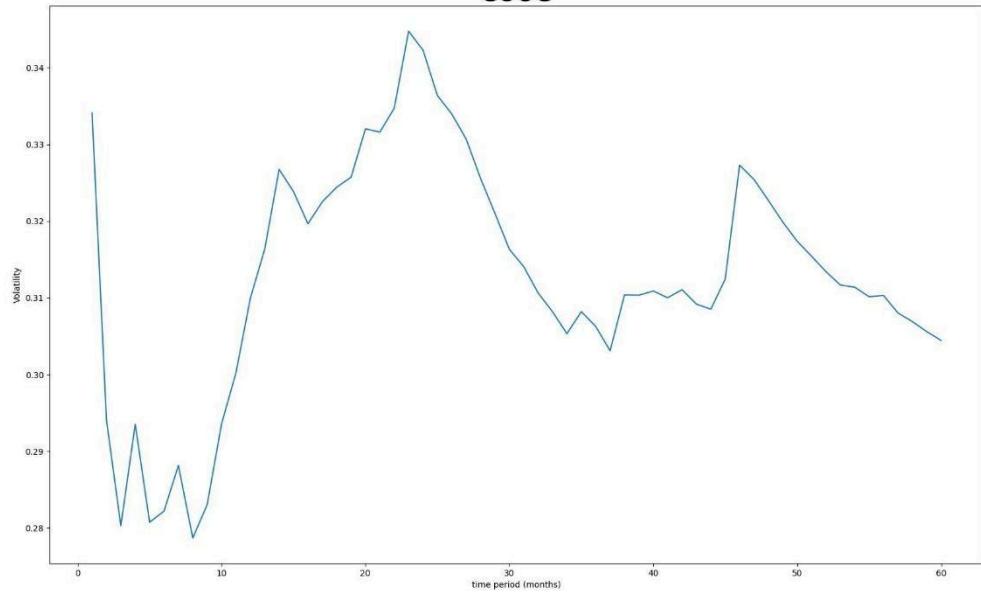


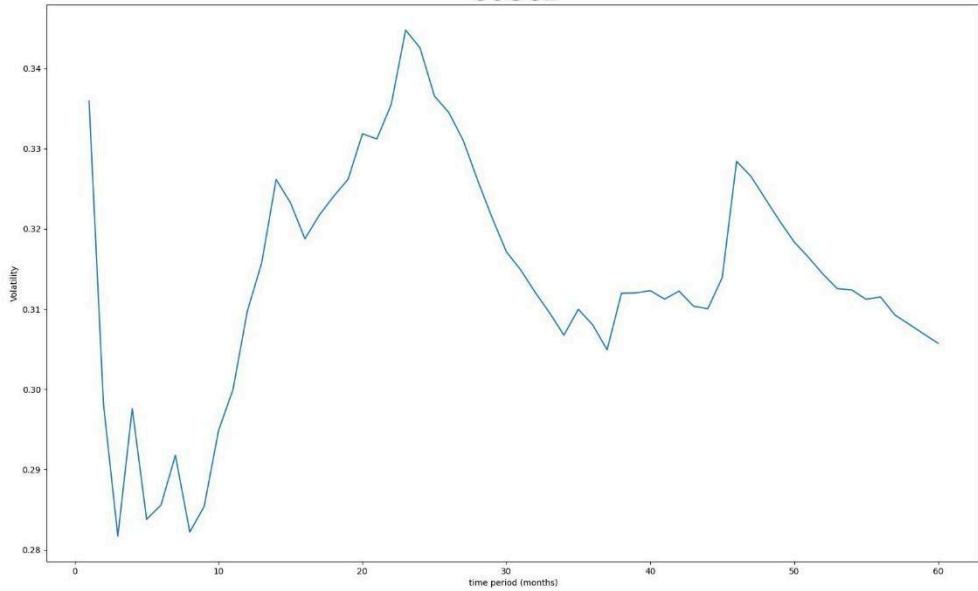
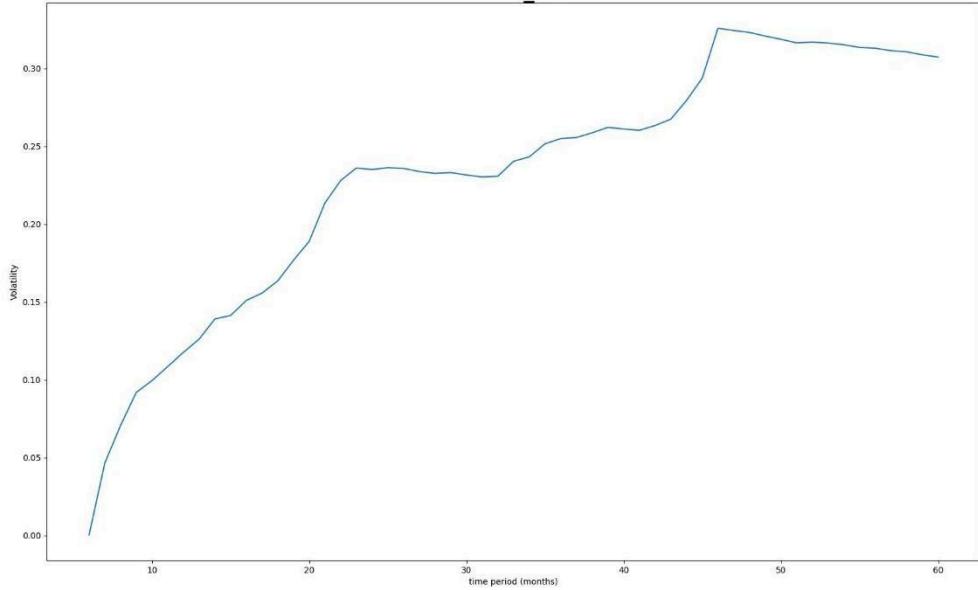
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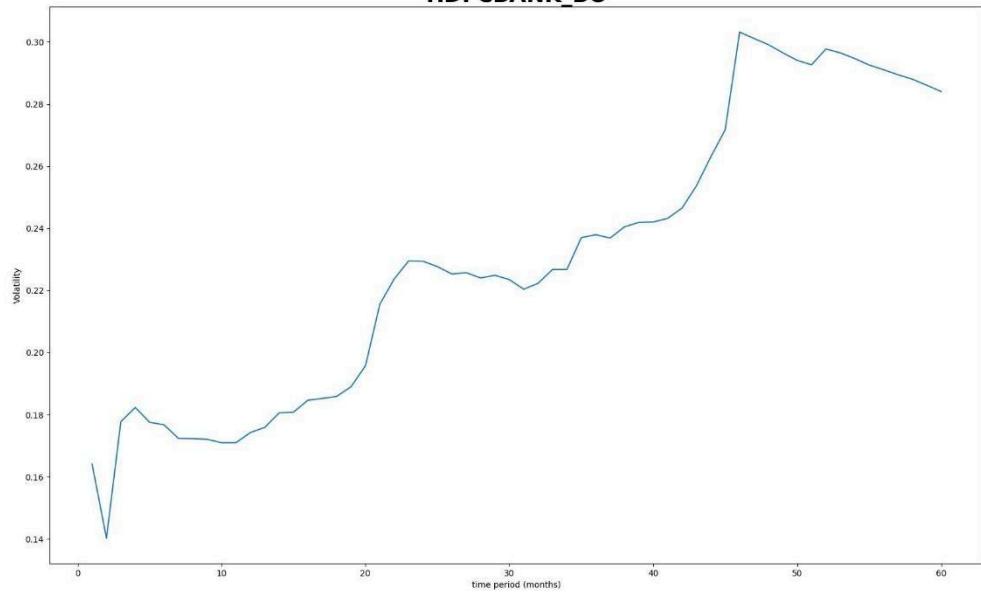
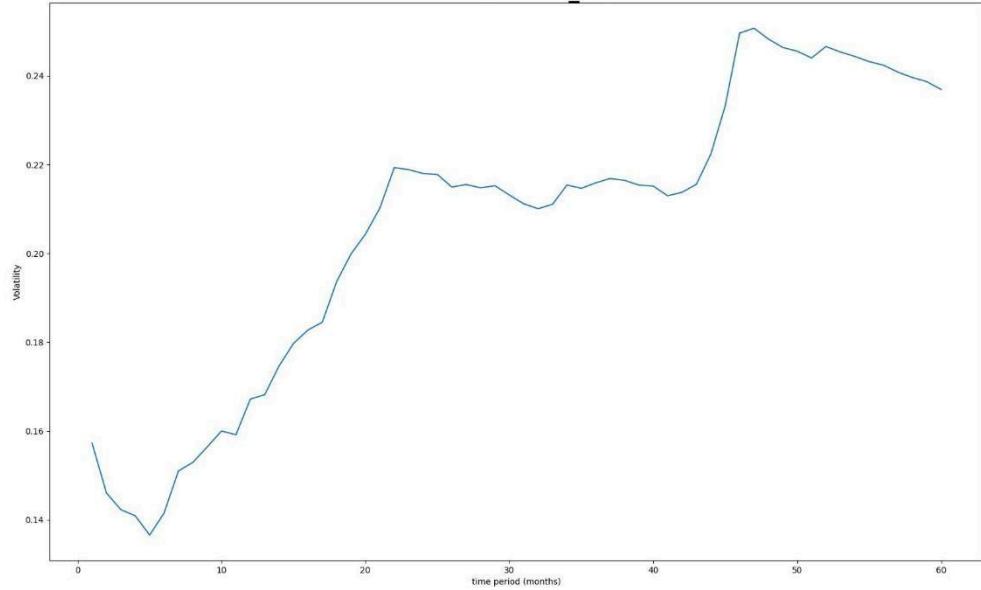


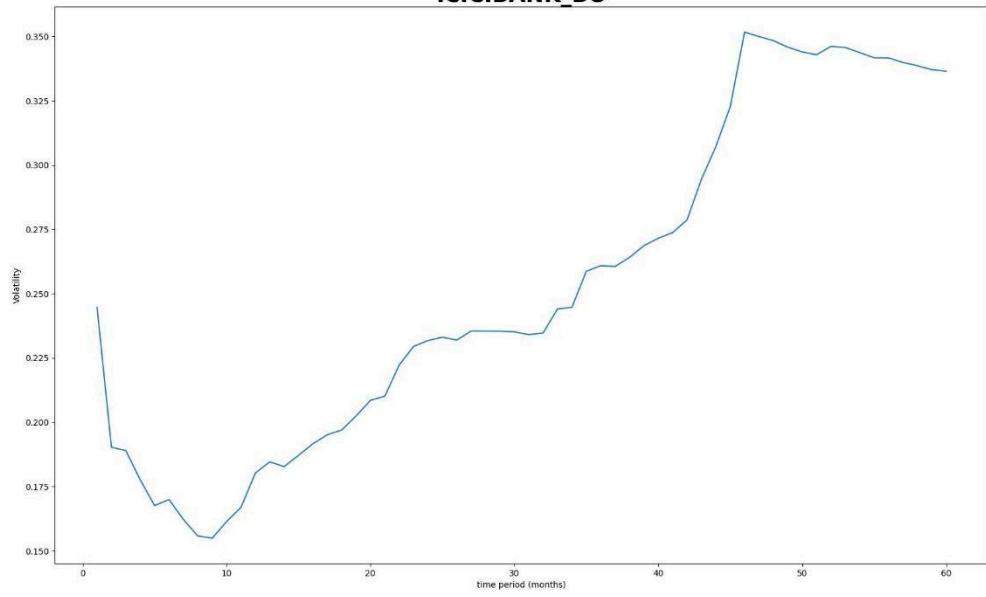
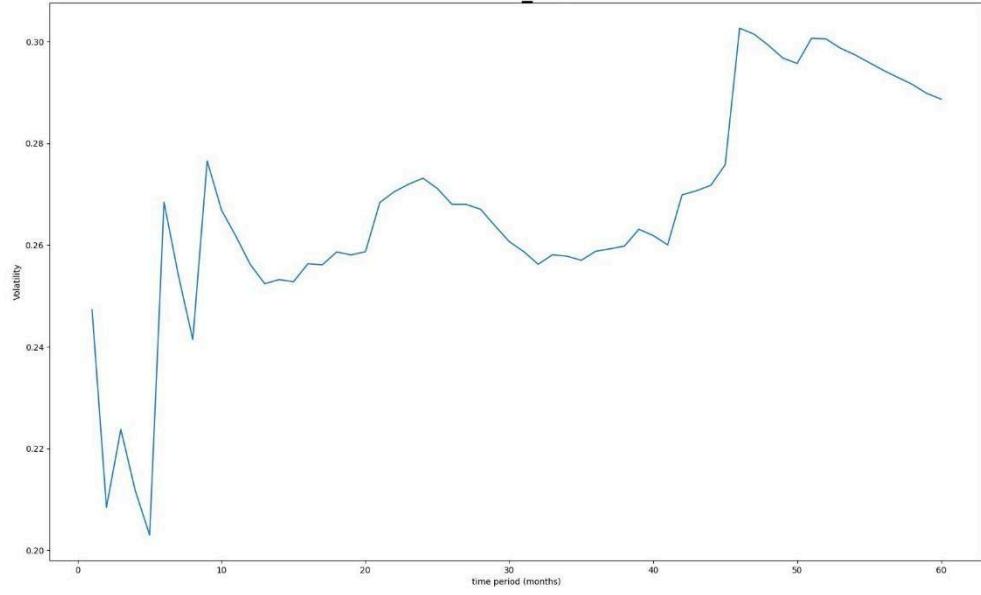
Historical Volatility for bsedata1 stocks

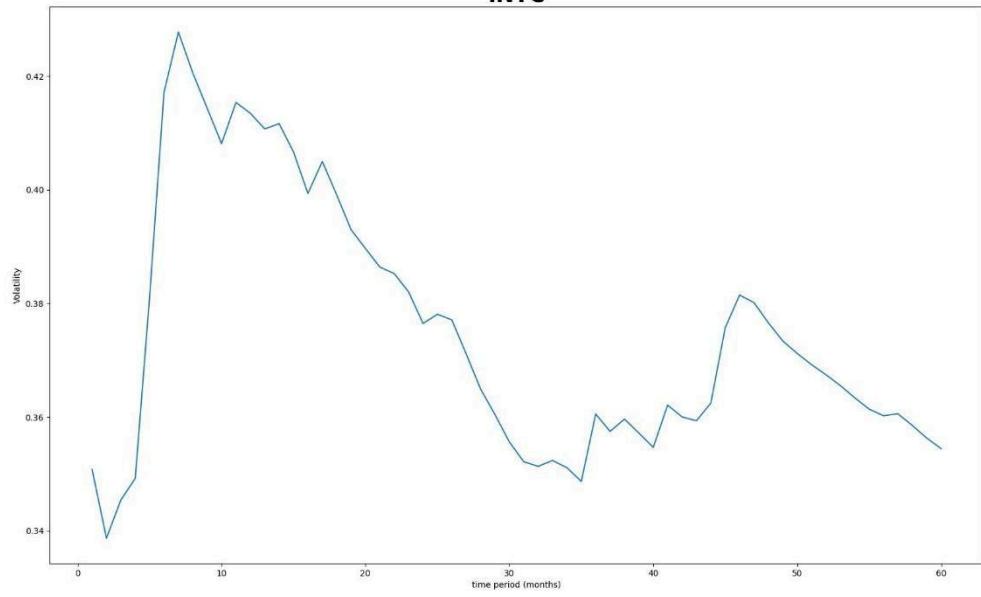
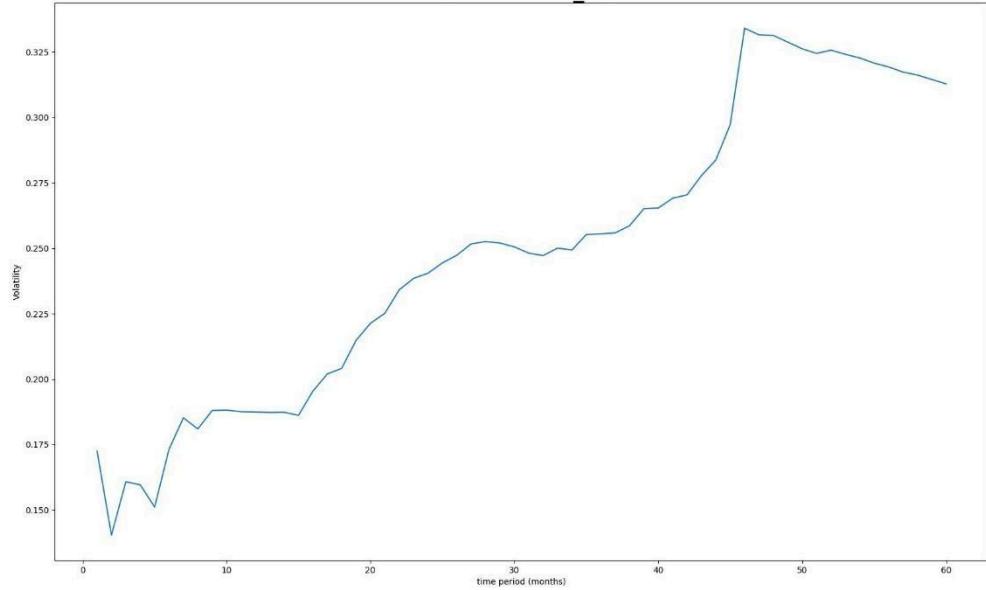


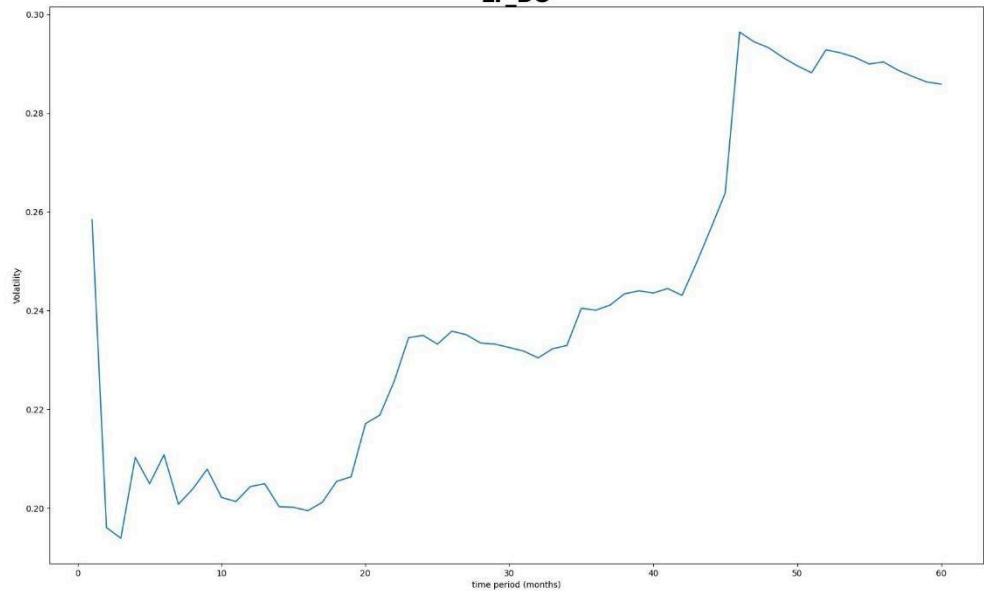
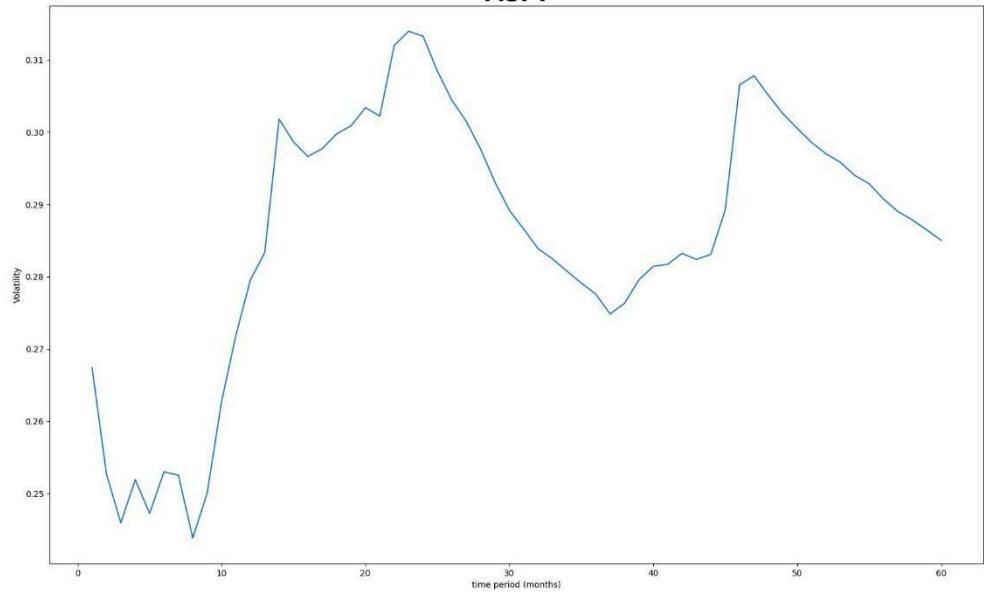
CSCO**GOOG**

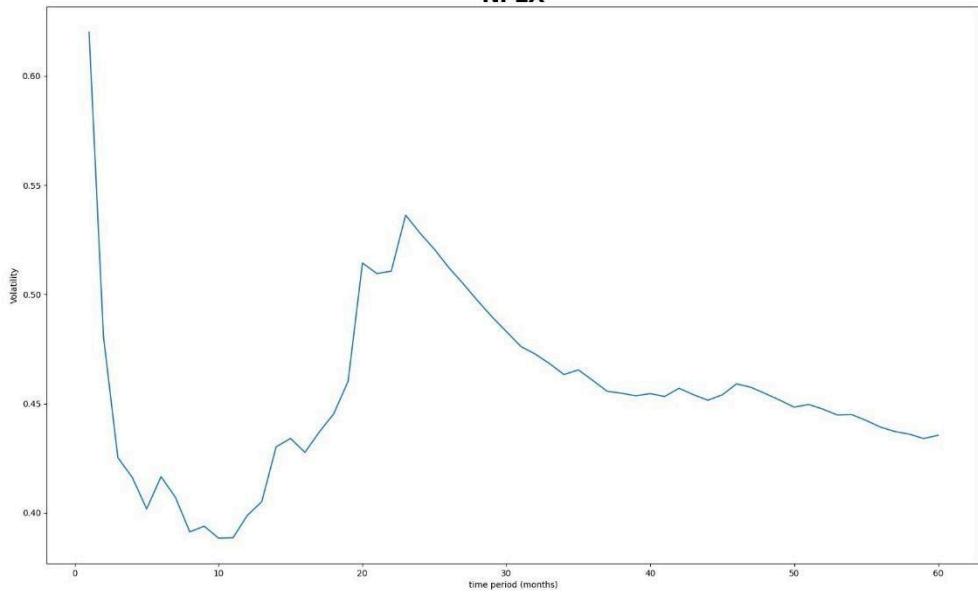
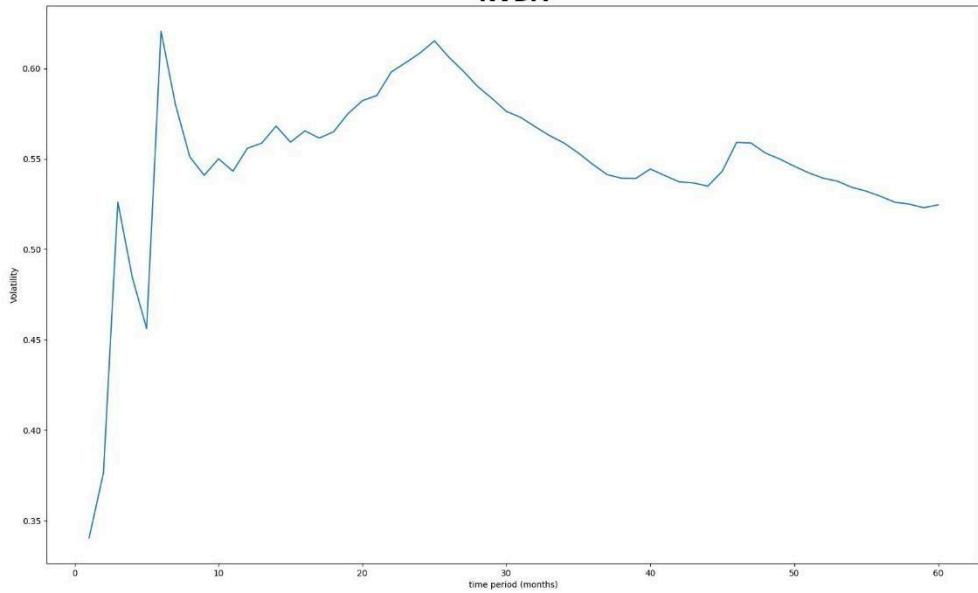
GOOGL**HDFC_BO**

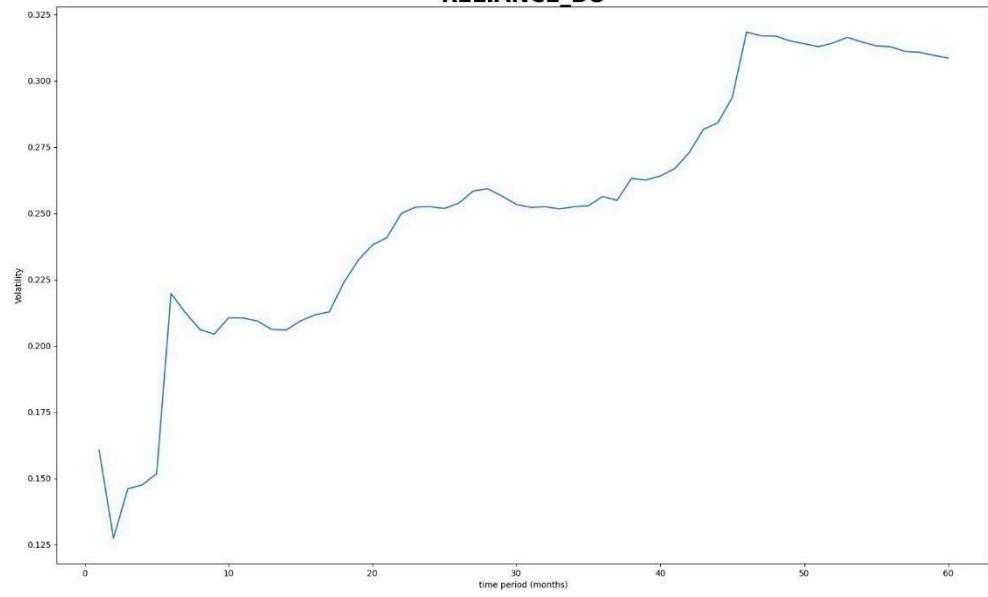
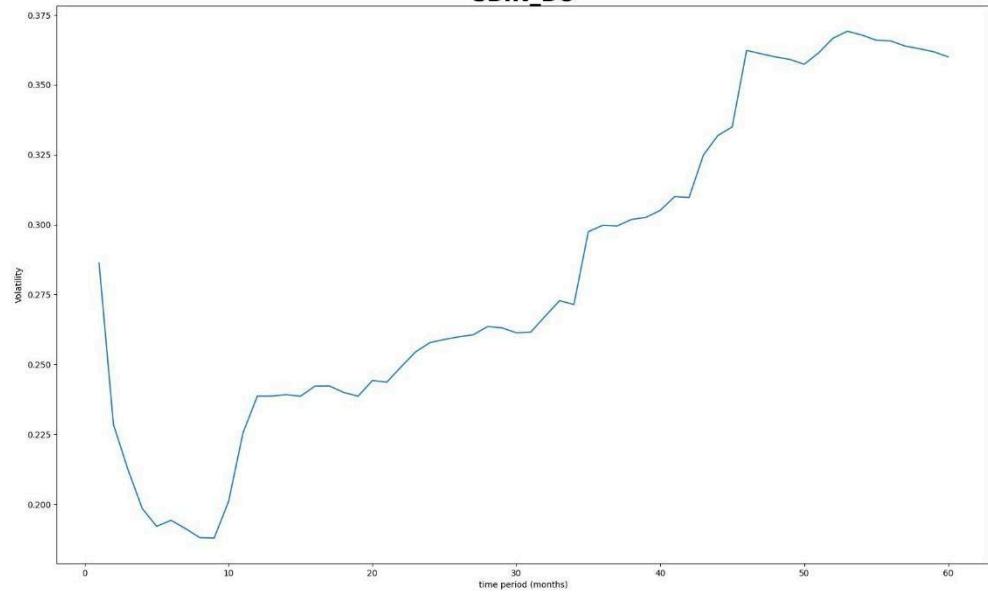
HDFCBANK_BO**HINDUNILVR_BO**

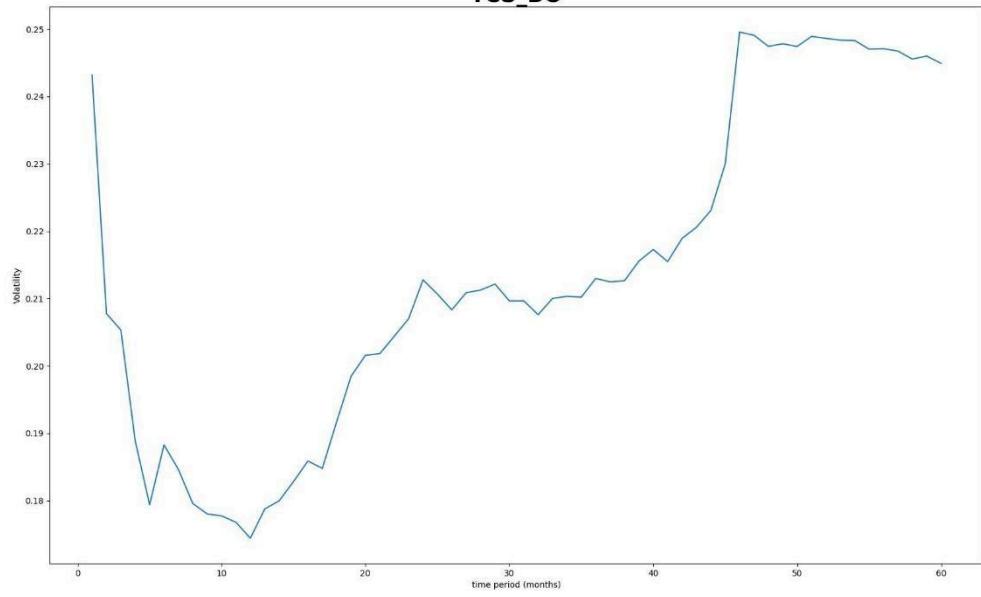
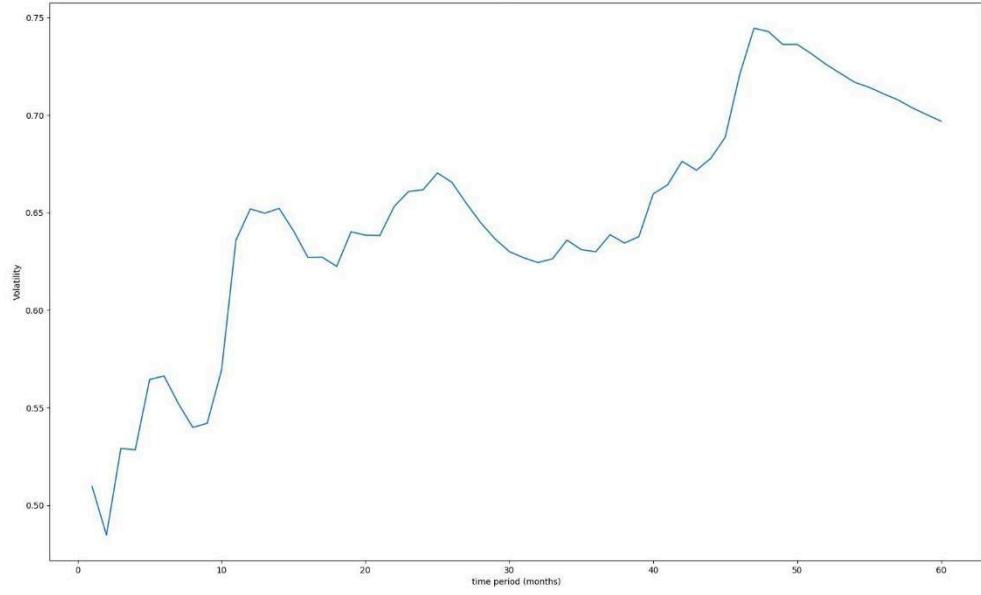
ICICIBANK_BO**INFY_BO**

INTC**KOTAKBANK_BO**

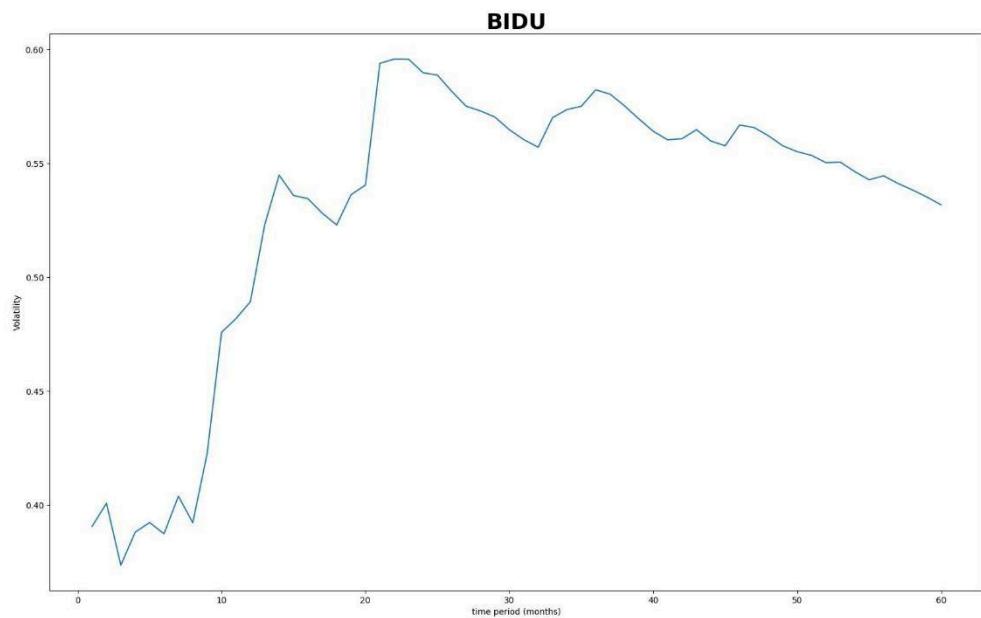
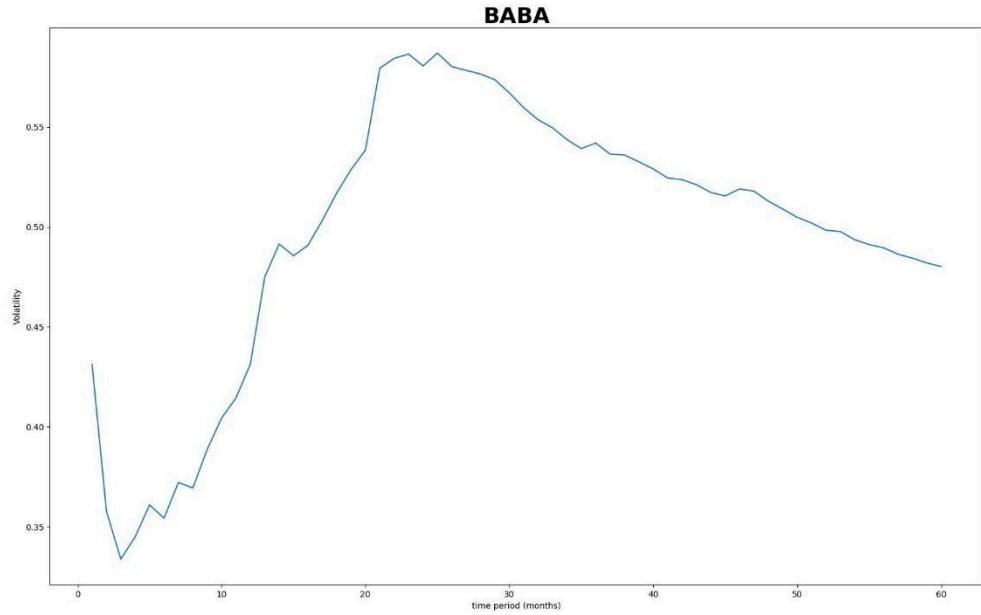
LT_BO**MSFT**

NFLX**NVDA**

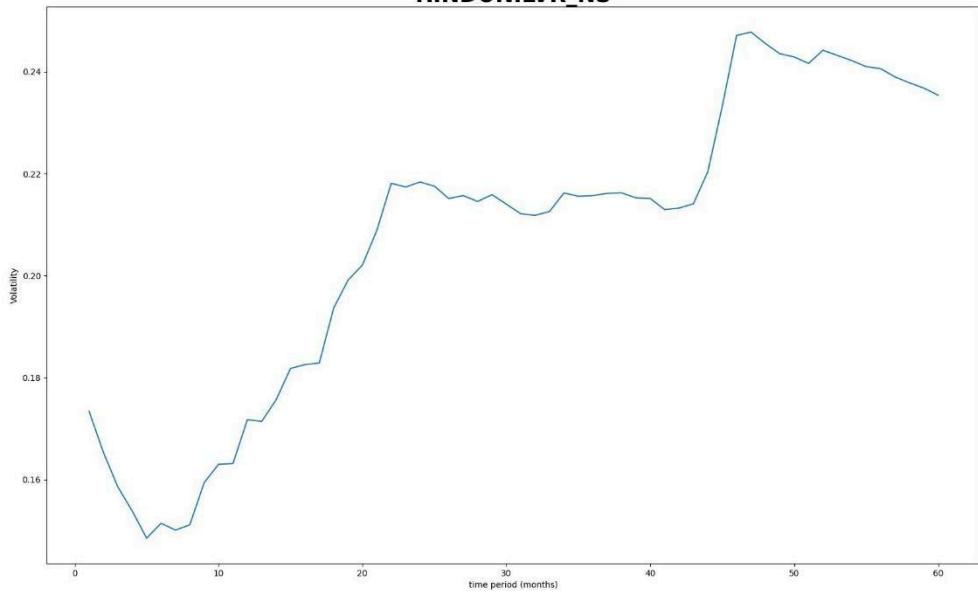
RELIANCE_BO**SBIN_BO**

TCS_BO**TSLA**

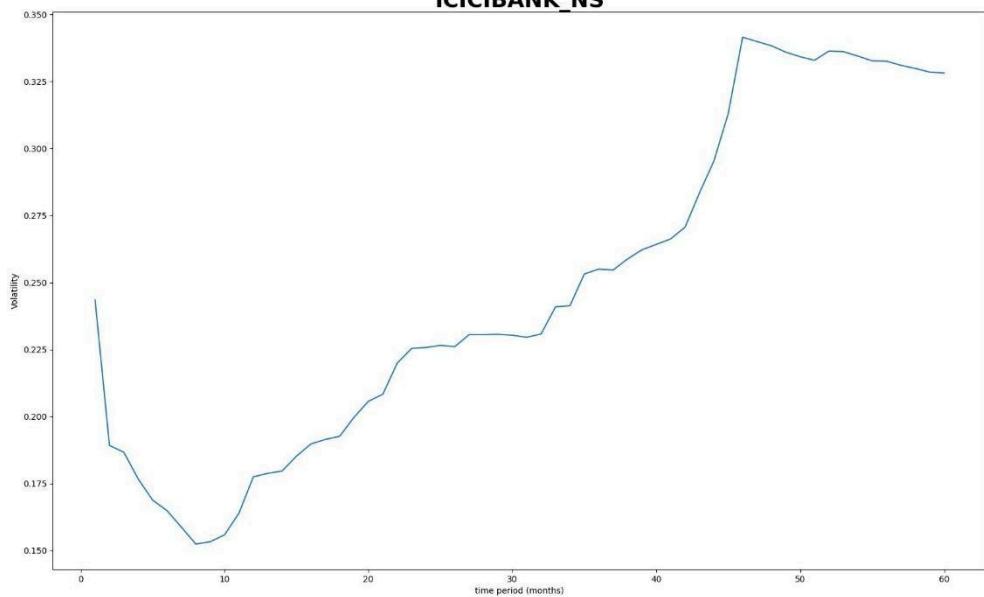
Historical volatility for nsedata1

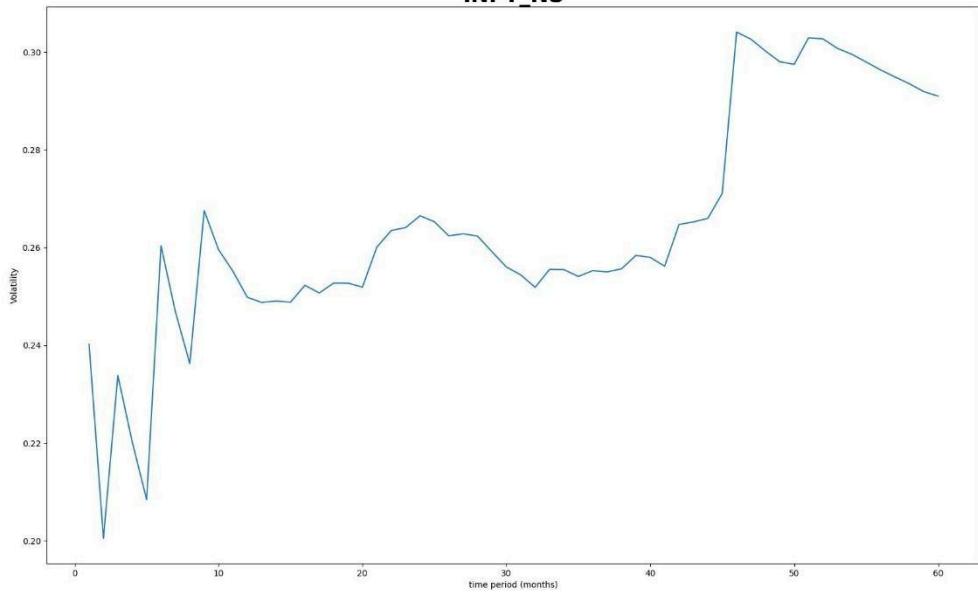
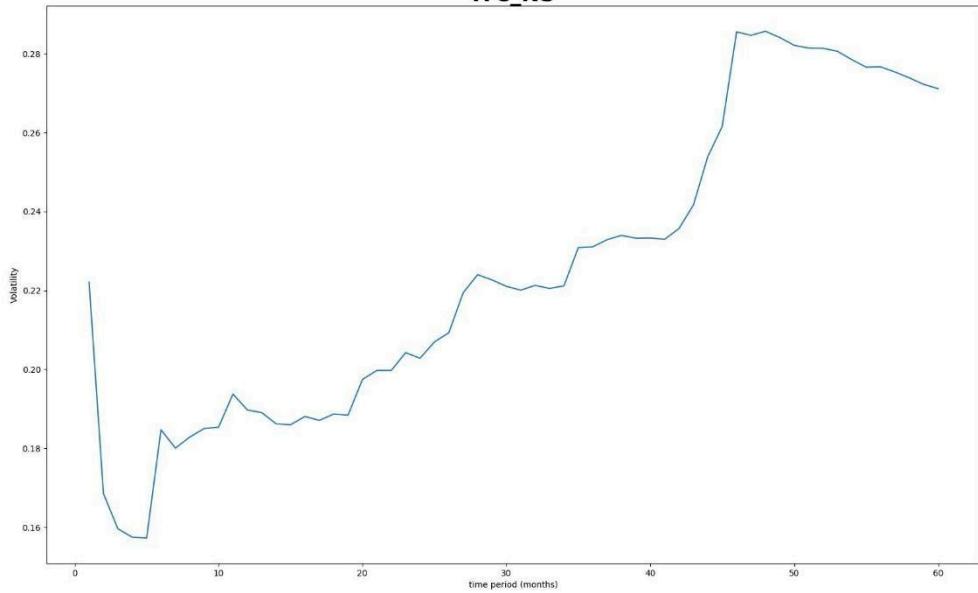


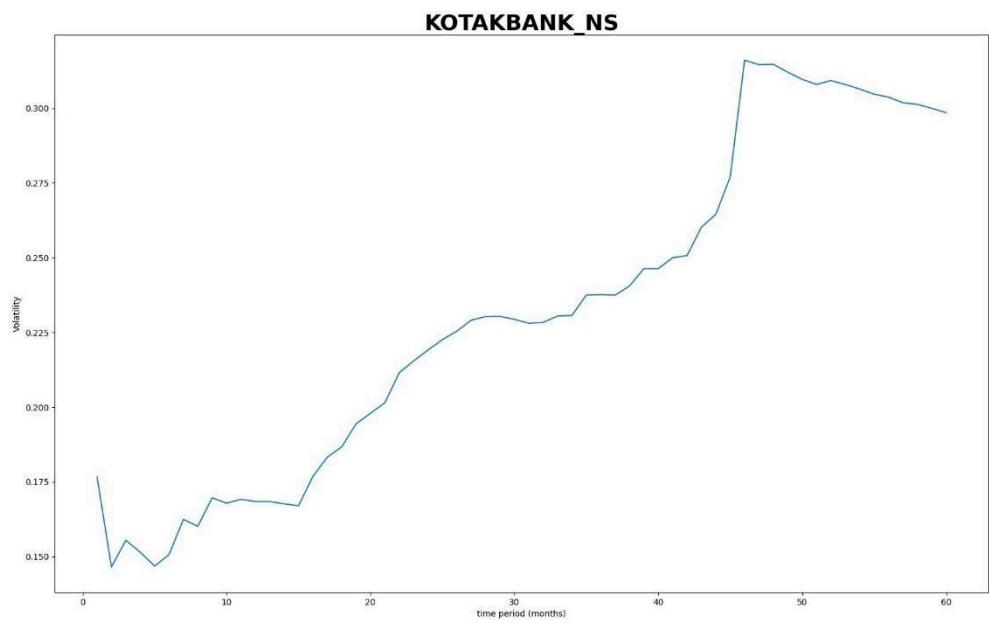
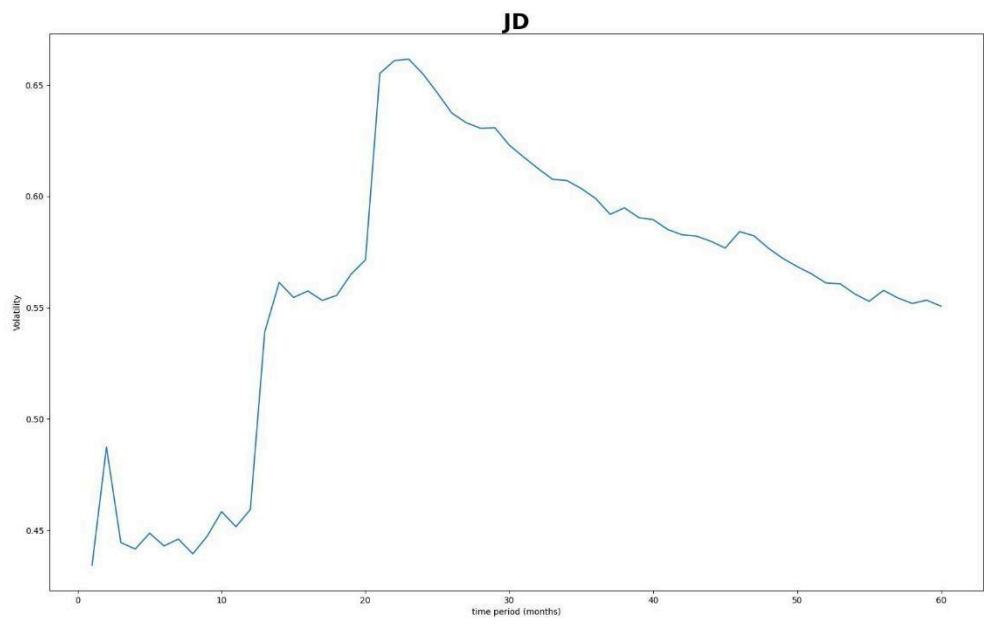
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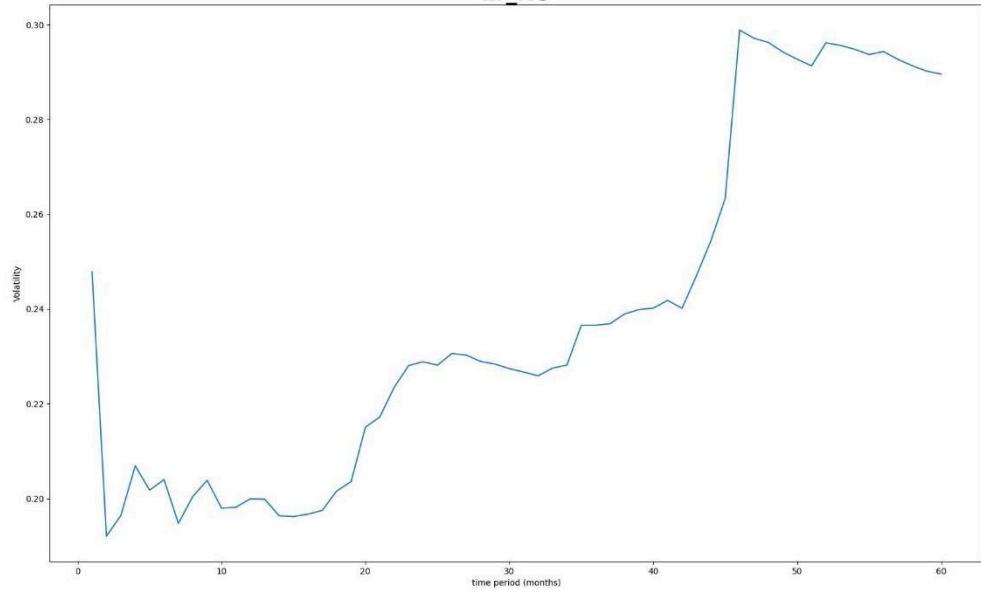
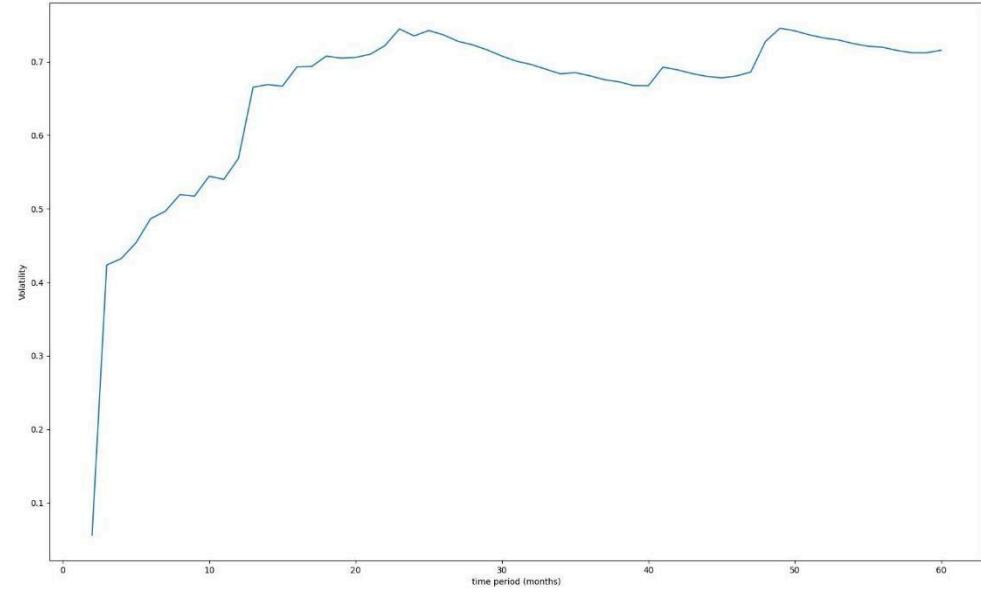


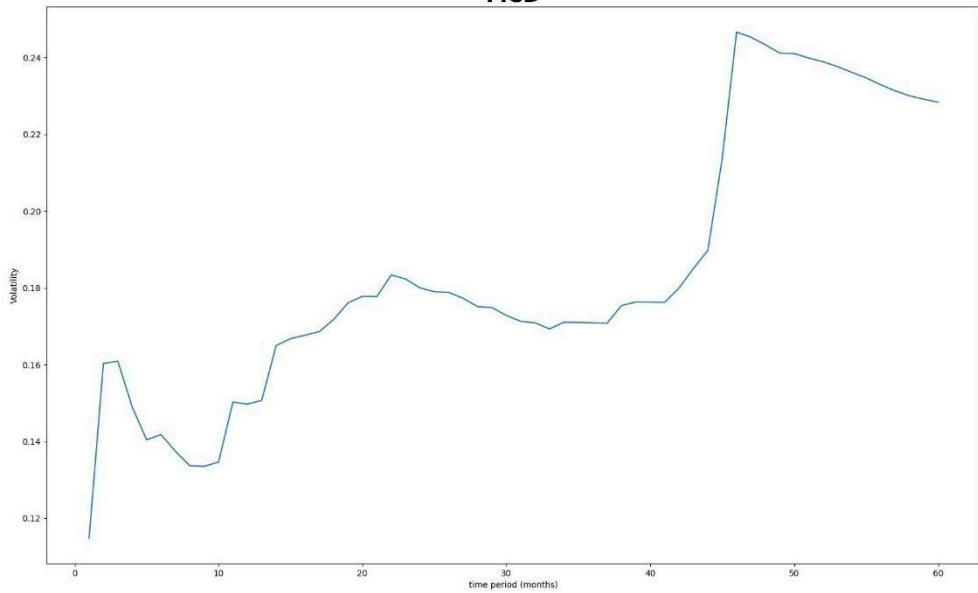
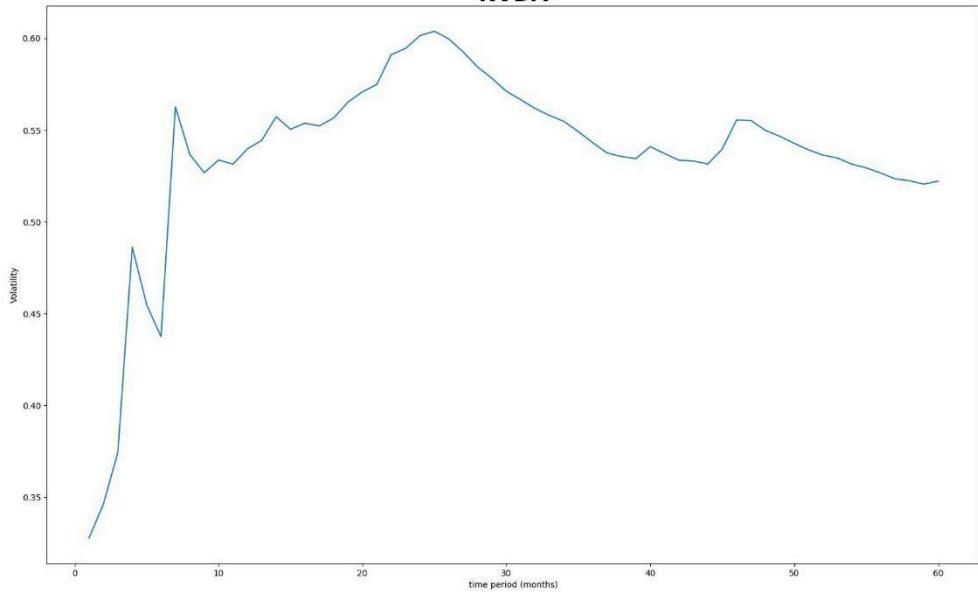
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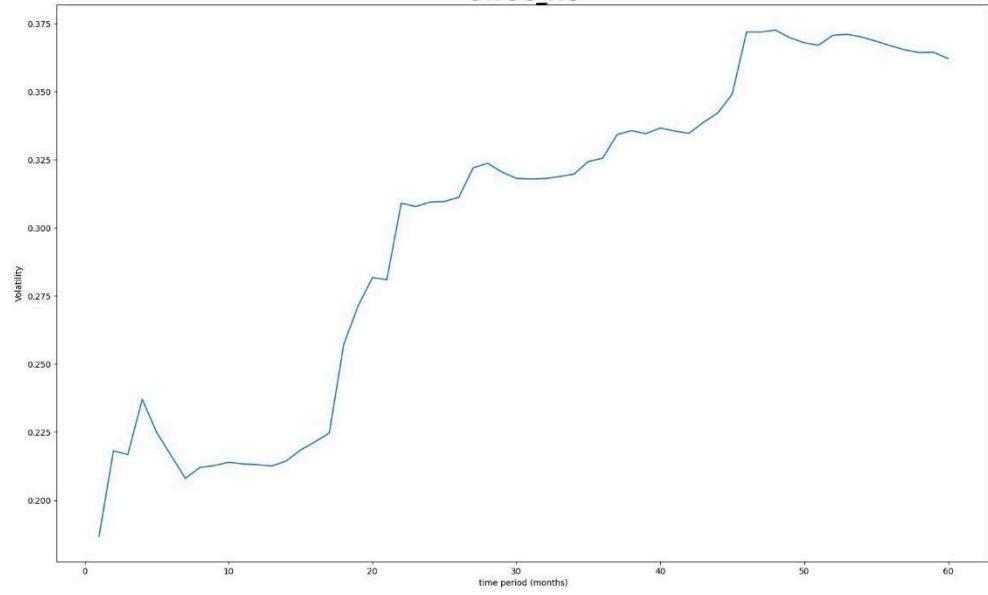
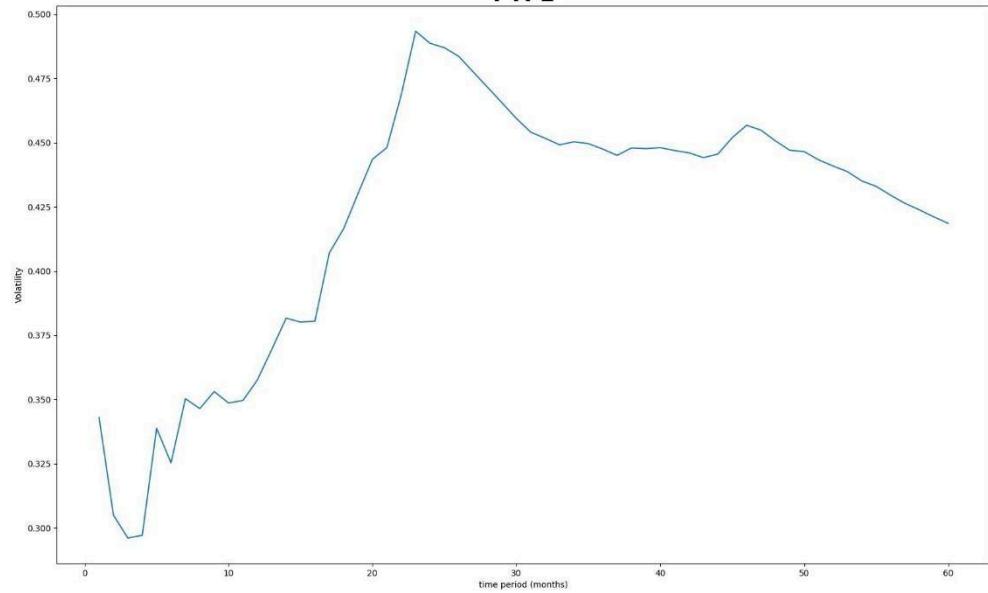


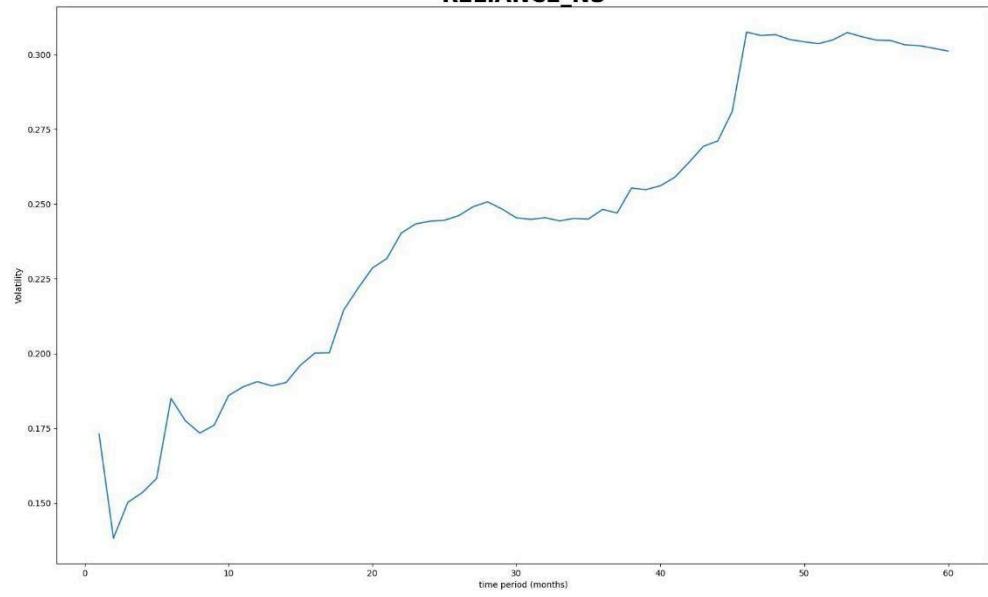
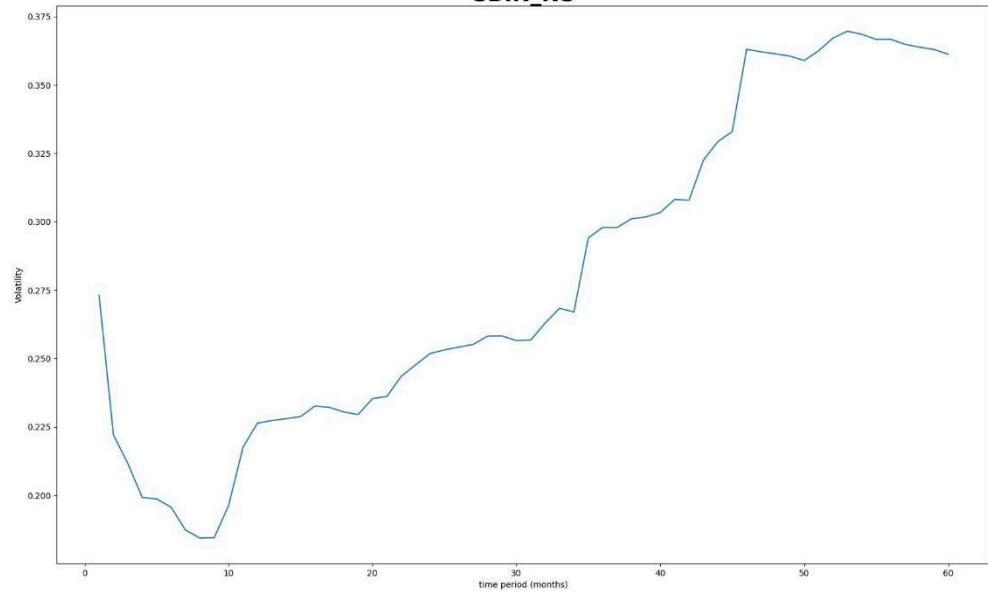
INFY_NS**ITC_NS**

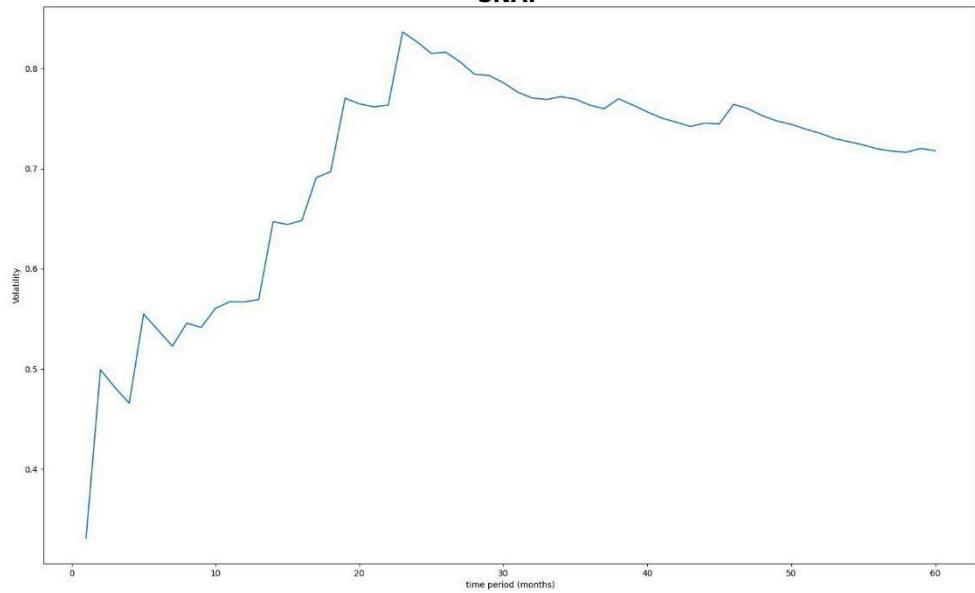


LT_NS**LYFT**

MCD**NVDA**

ONGC_NS**PYPL**

RELIANCE_NS**SBIN_NS**

SNAP**SQ**