Financial Engineering Laboratory (MA 374)

Lab 09

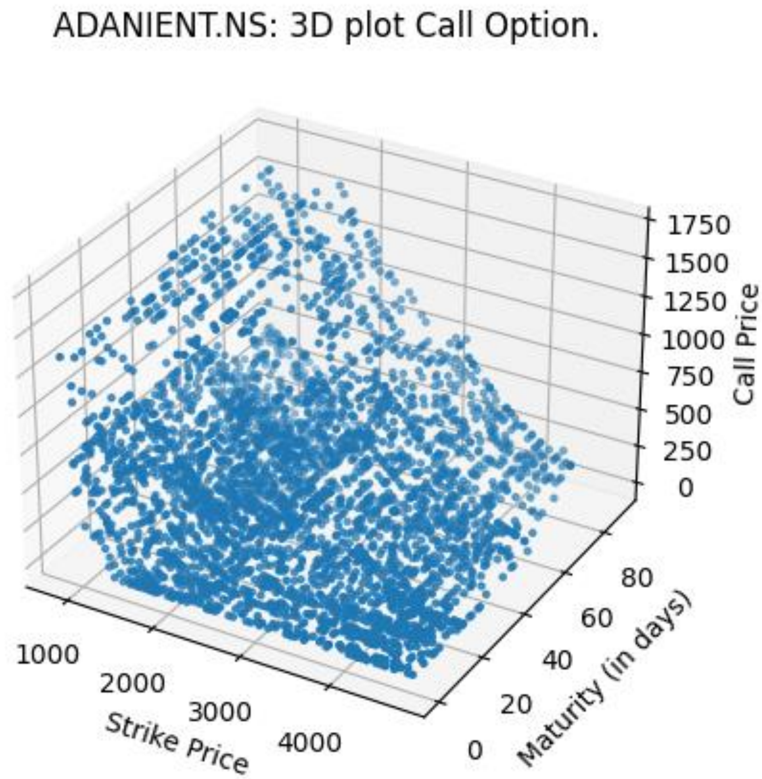
Naveen Kumar A G 210123075

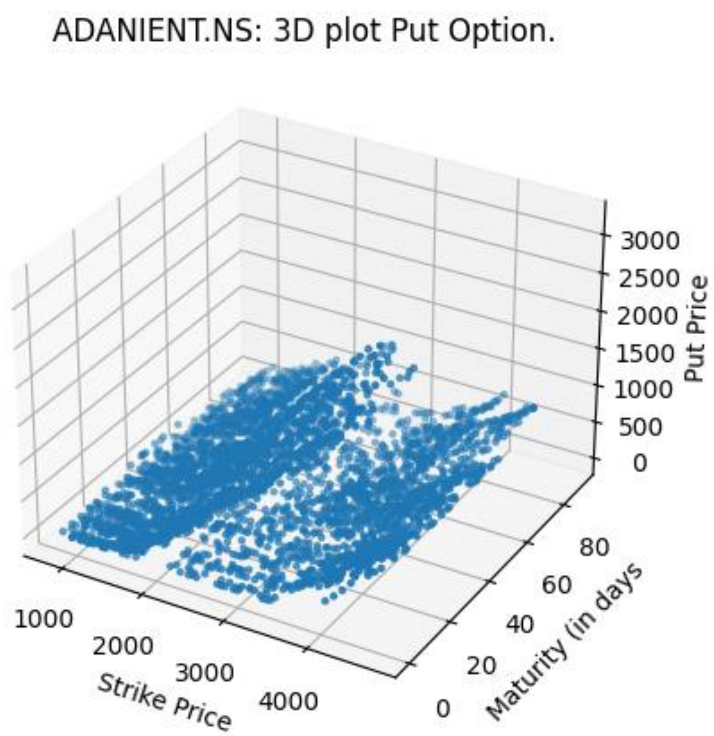
The following stocks have been chosen representing various sectors of the Indian economy:

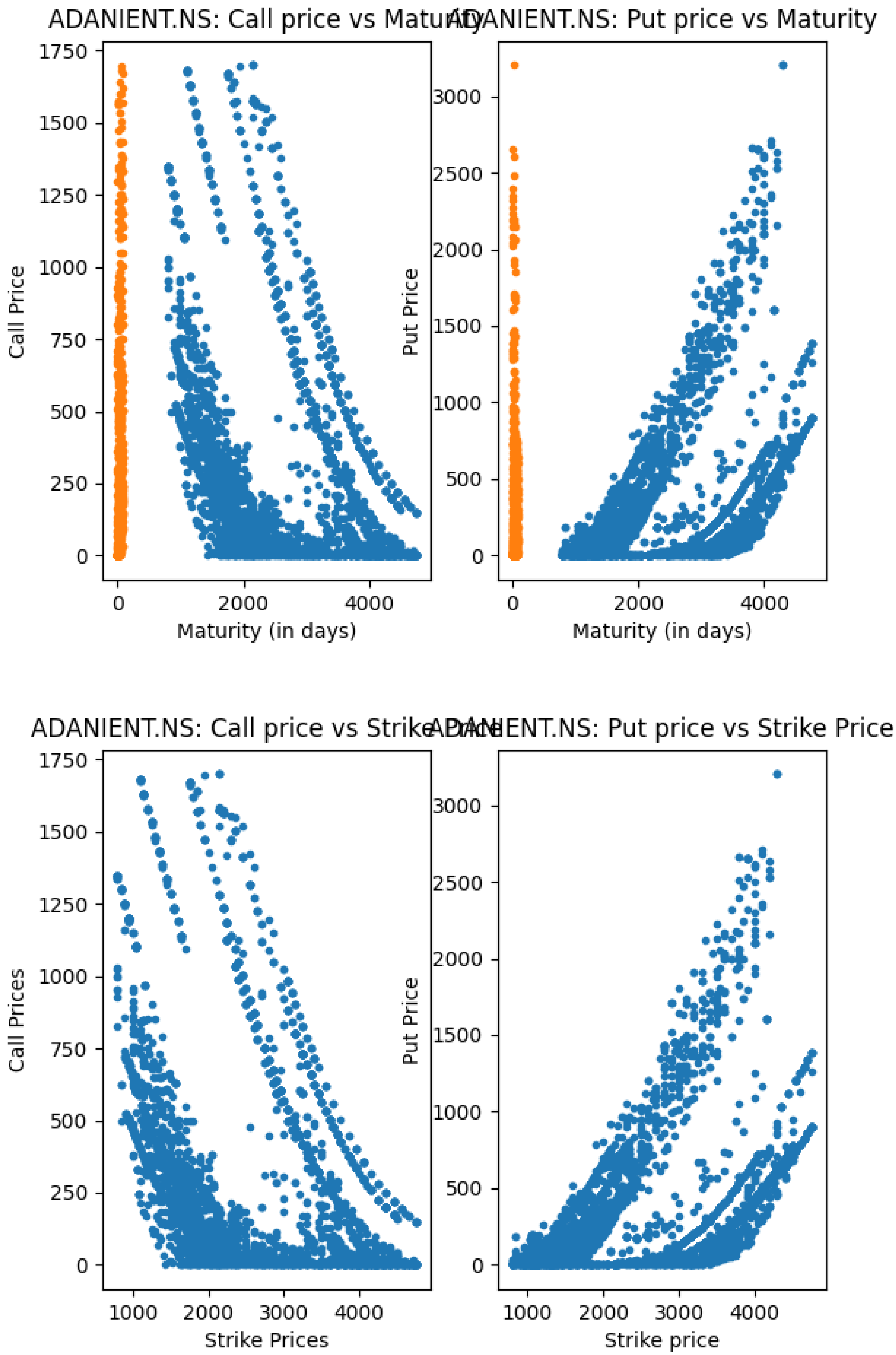
1) Adani Enterprises: Ports and transportation
2) Bharti Airtel: Telecommunication
3) Axis Bank: Banking
4) Bajaj Auto: Automotive
5) Bharat Petroleum Corp Lt: Energy
6) Cipla: Pharmaceutical
7) HCL: IT

Source: https://www.nseindia.com/report-detail/fo_eq_security

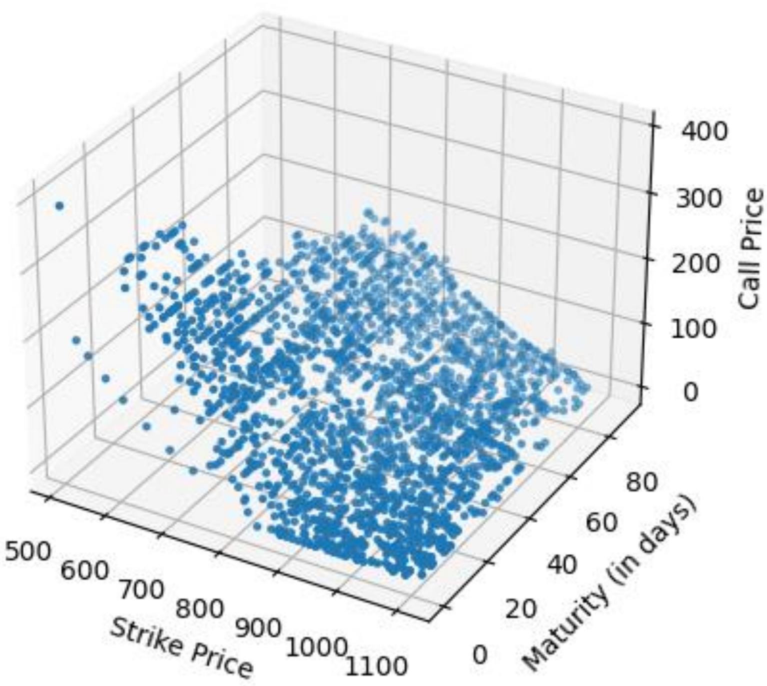
Q2a


ADANIENT.NS: 3D plot Call Option.
1750
1500
1250
1000
750
500
250
0
Call Price
1000
2000
3000
4000
Strike Price
0
20
40
60
80
Maturity (in days)

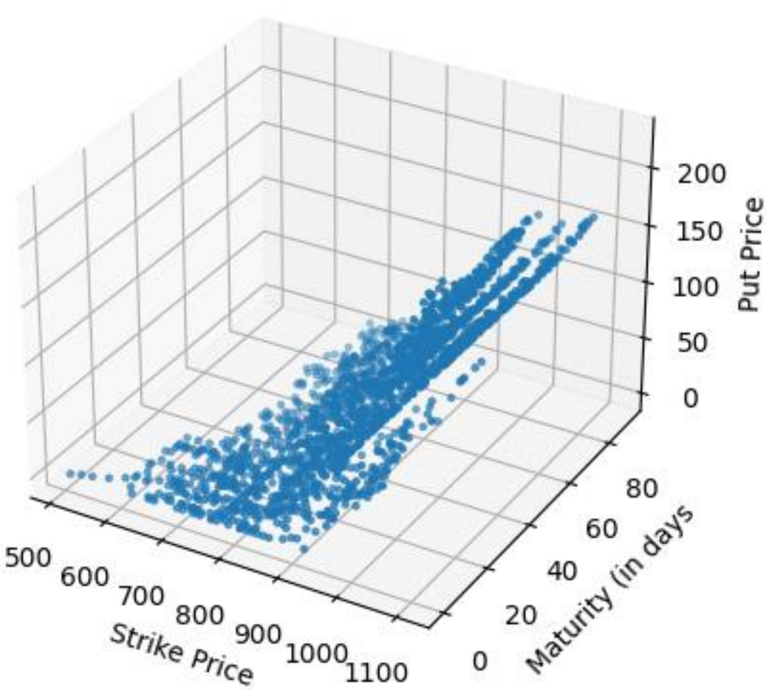

ADANIENT.NS: 3D plot Put Option.
3000
2500
2000
1500
1000
500
0
Put Price
1000
2000
3000
4000
Strike Price
0
20
40
60
80
Maturity (in days

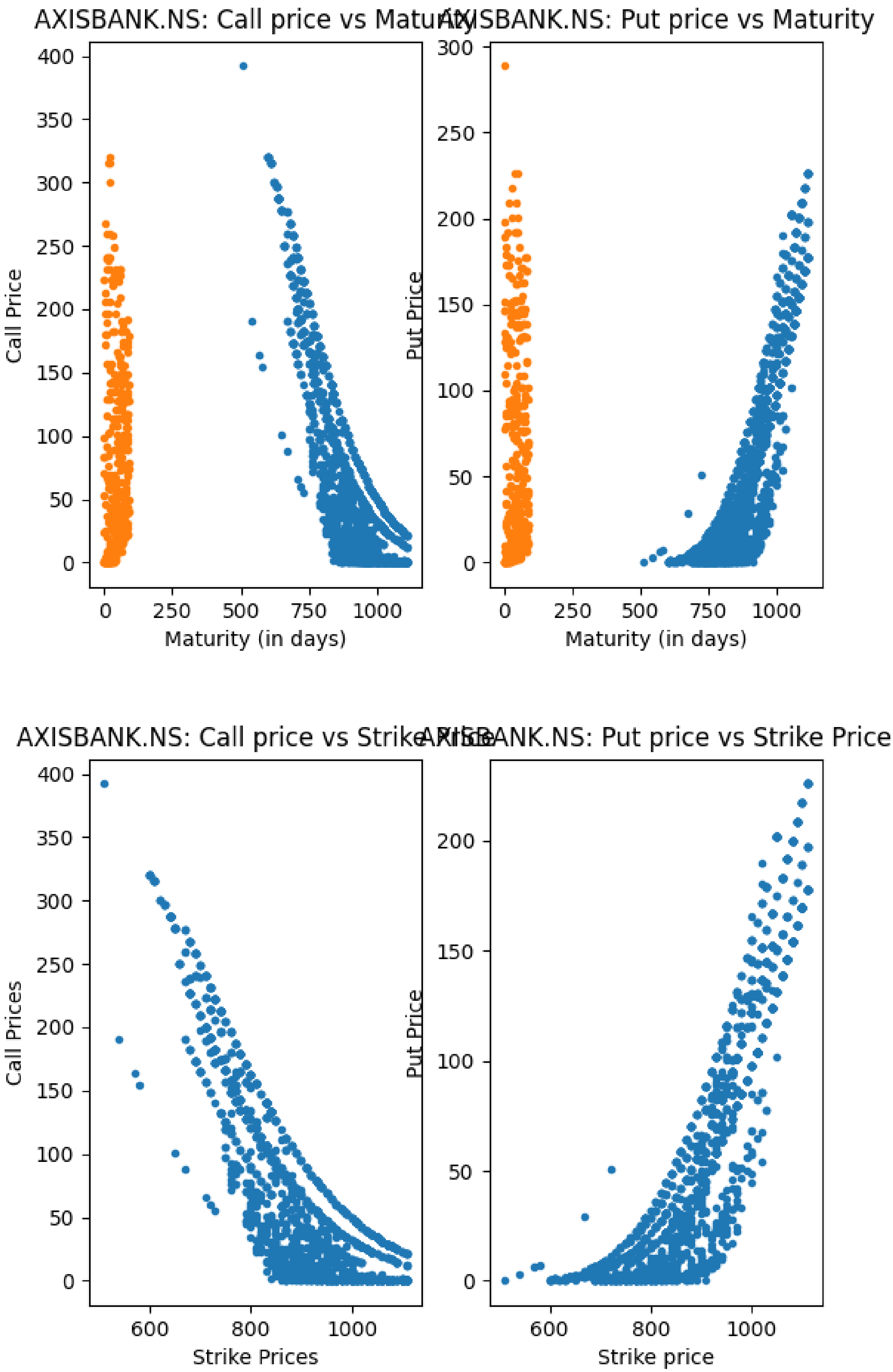

ADANIENT.NS: Call price vs Maturity
ADANIENT.NS: Put price vs Maturity
Call Price
1750
1500
1250
1000
750
500
250
0
Maturity (in days)
0
2000
4000
Put Price
3000
2500
2000
1500
1000
500
0
Maturity (in days)
ADANIENT.NS: Call price vs Strike Price
ADANIENT.NS: Put price vs Strike Price
Call Prices
Strike Prices
1000
2000
3000
4000
Put Price
Strike price

AXISBANK.NS: 3D plot Call Option.

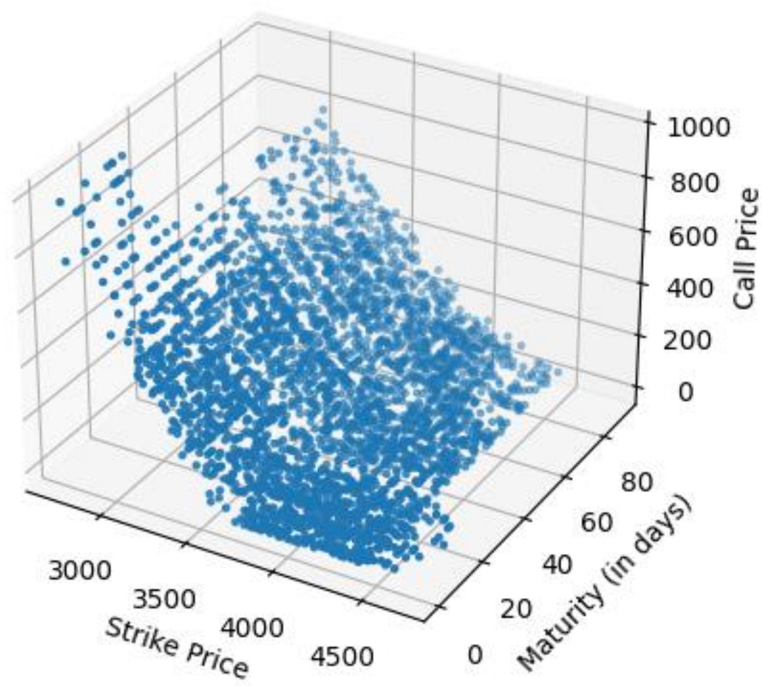


AXISBANK.NS: 3D plot Put Option.

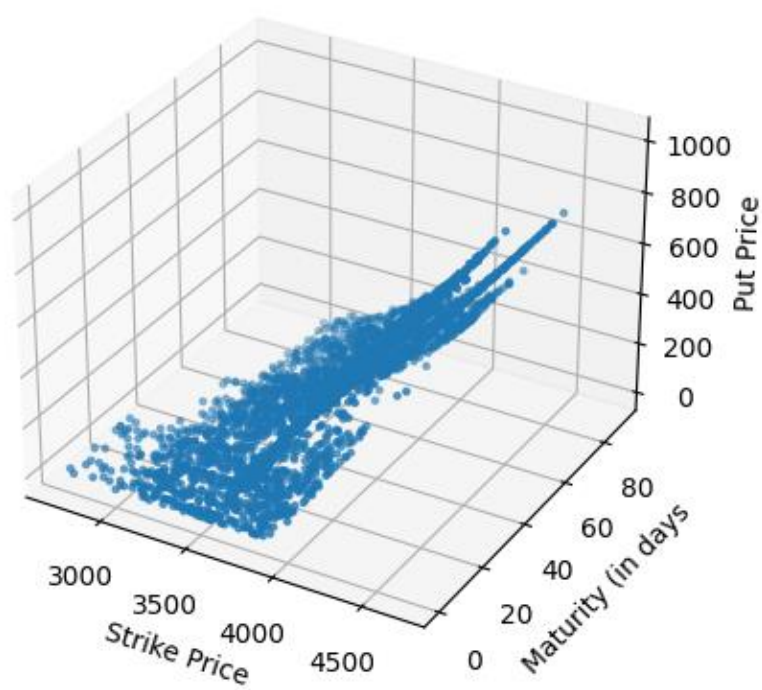


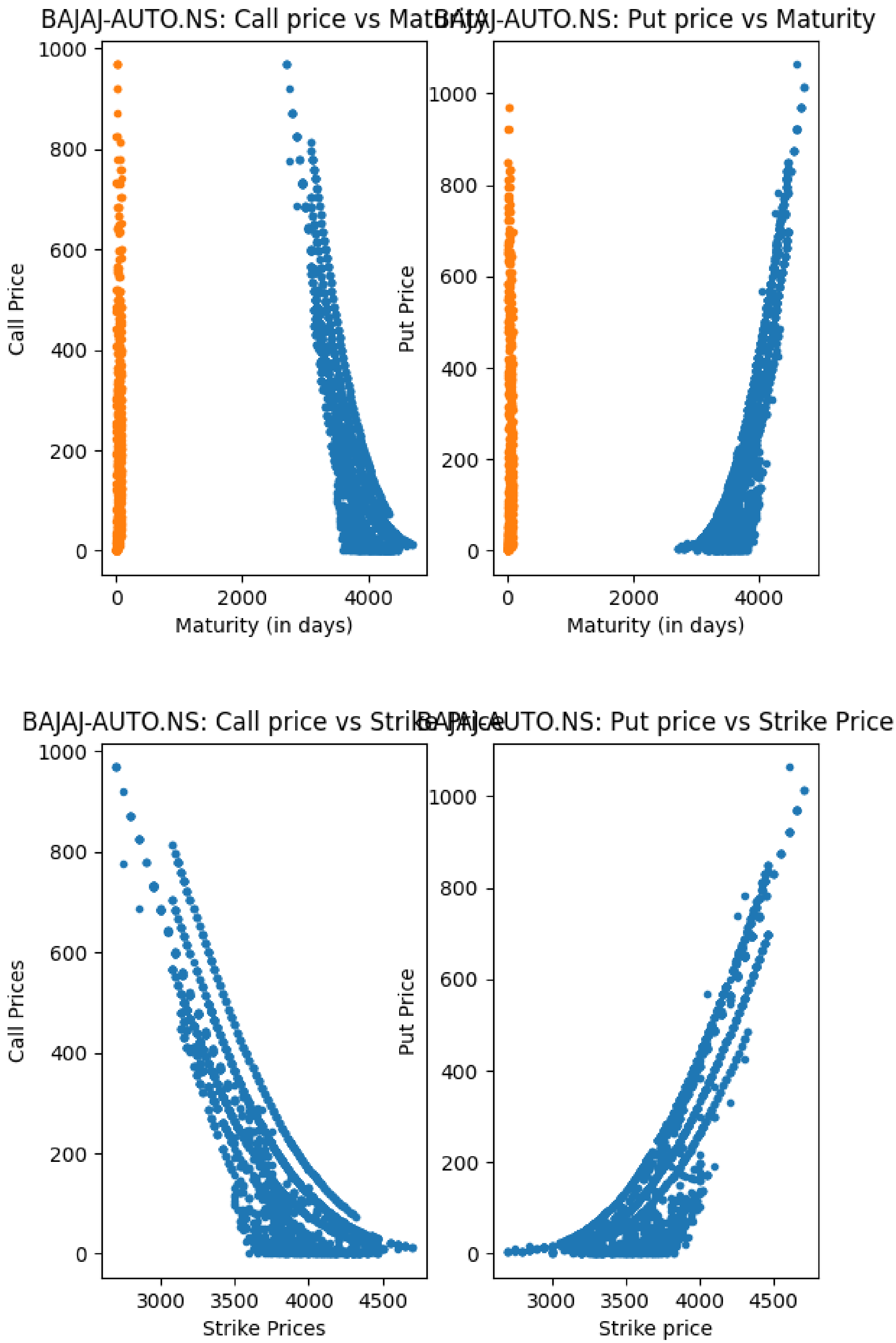

AXISBANK.NS: Call price vs Maturity
Call Price
Maturity (in days)
AXISBANK.NS: Put price vs Maturity
Put Price
Maturity (in days)
AXISBANK.NS: Call price vs Strike Price
Call Prices
Strike Prices
AXISBANK.NS: Put price vs Strike Price
Put Price
Strike price

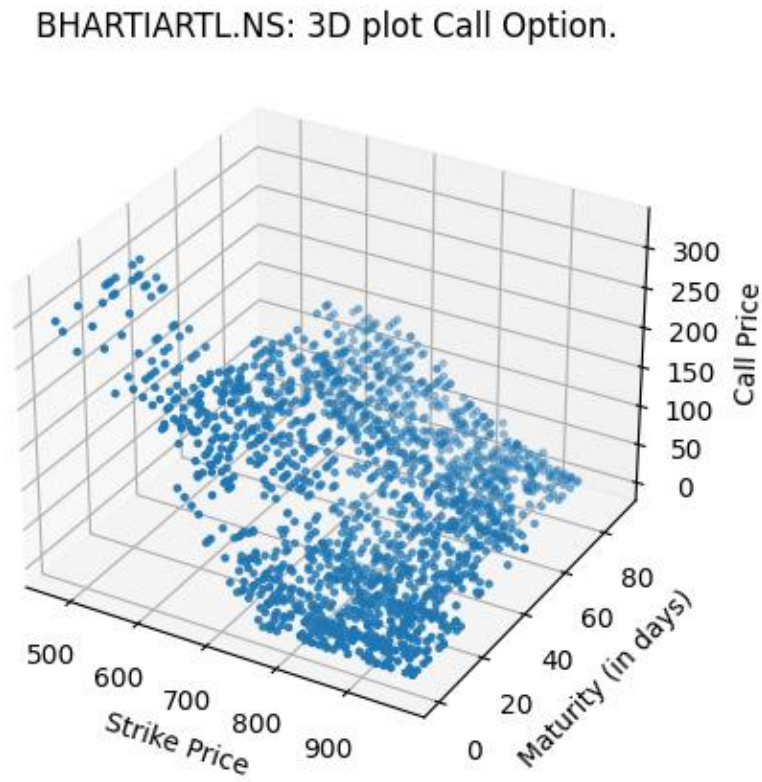
BAJAJ-AUTO.NS: 3D plot Call Option.



BAJAJ-AUTO.NS: 3D plot Put Option.




BAJAJ-AUTO.NS: Call price vs Maturity
BAJAJ-AUTO.NS: Put price vs Maturity
Call Price
Put Price
Maturity (in days)
BAJAJ-AUTO.NS: Call price vs Strike Price
BAJAJ-AUTO.NS: Put price vs Strike Price
Call Prices
Strike Prices
Strike price


BHARTIARTL.NS: 3D plot Call Option.
Call Price
Maturity (in days)
Strike Price
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250
200
150
100
50
0
80
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40
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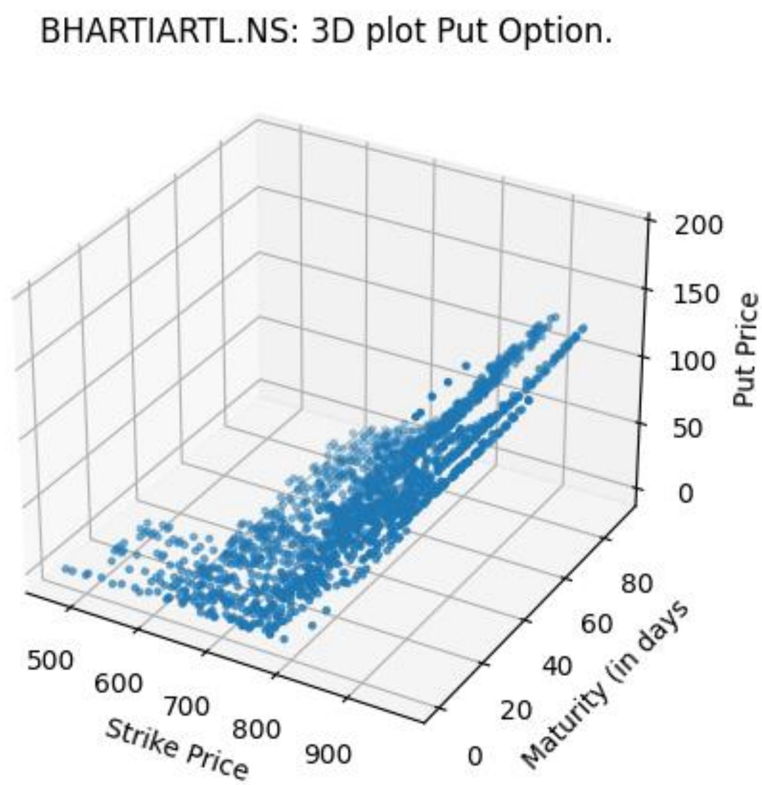
0
500
600
700
800
900


BHARTIARTL.NS: 3D plot Put Option.
Put Price
Maturity (in days
Strike Price
200
150
100
50
0
80
60
40
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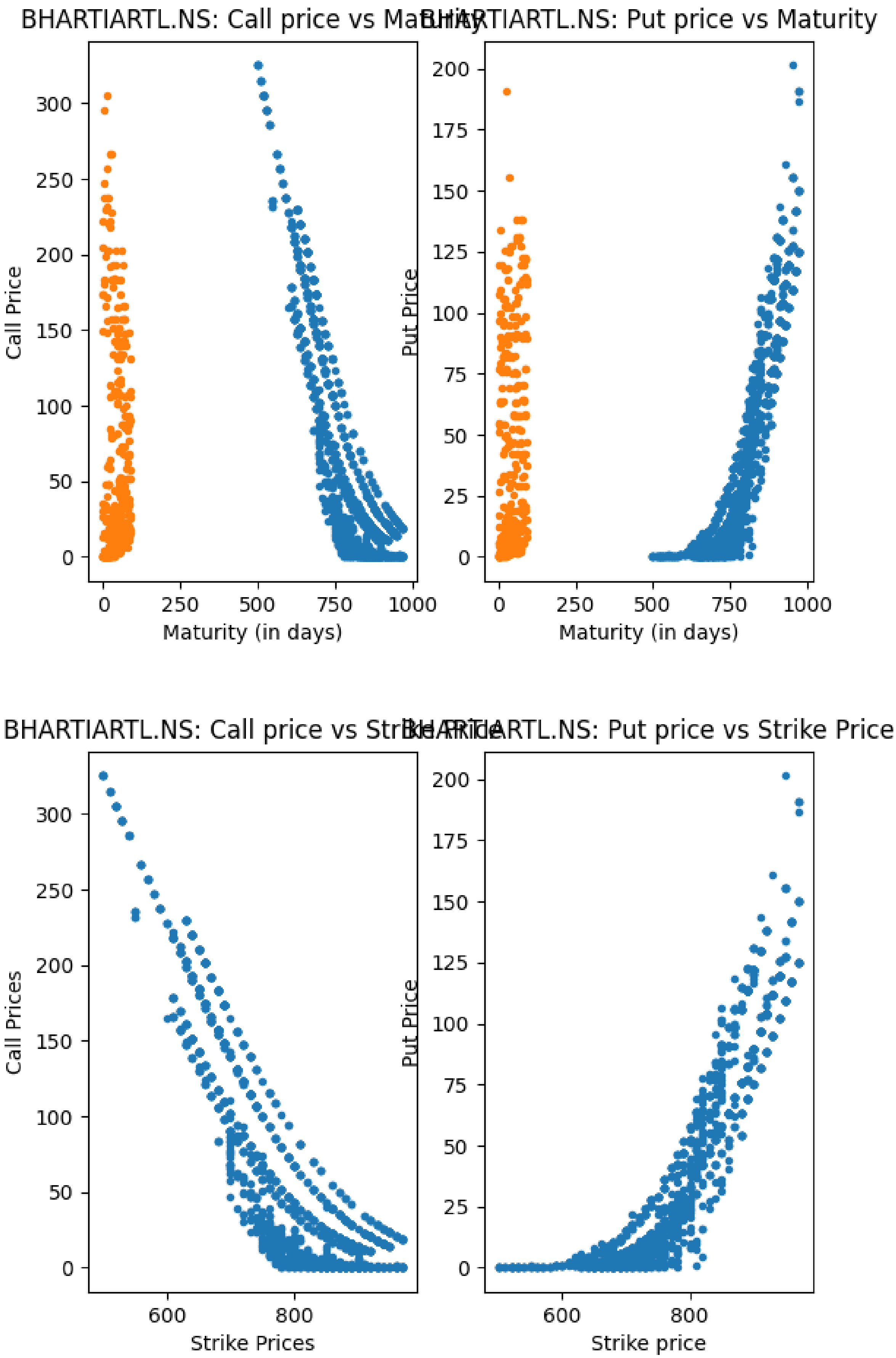
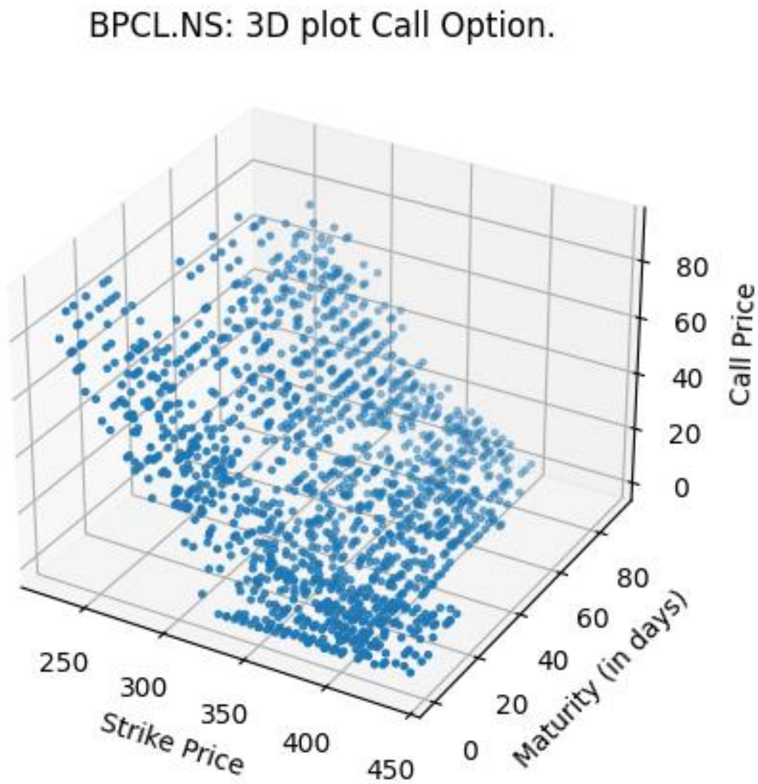
0
500
600
700
800
900


BHARTIARTL.NS: Call price vs Maturity
BHARTIARTL.NS: Put price vs Maturity
Call Price
Put Price
Maturity (in days)
Maturity (in days)
BHARTIARTL.NS: Call price vs Strike Price
BHARTIARTL.NS: Put price vs Strike Price
Call Prices
Put Price
Strike Prices
Strike price


BPCL.NS: 3D plot Call Option.
Call Price
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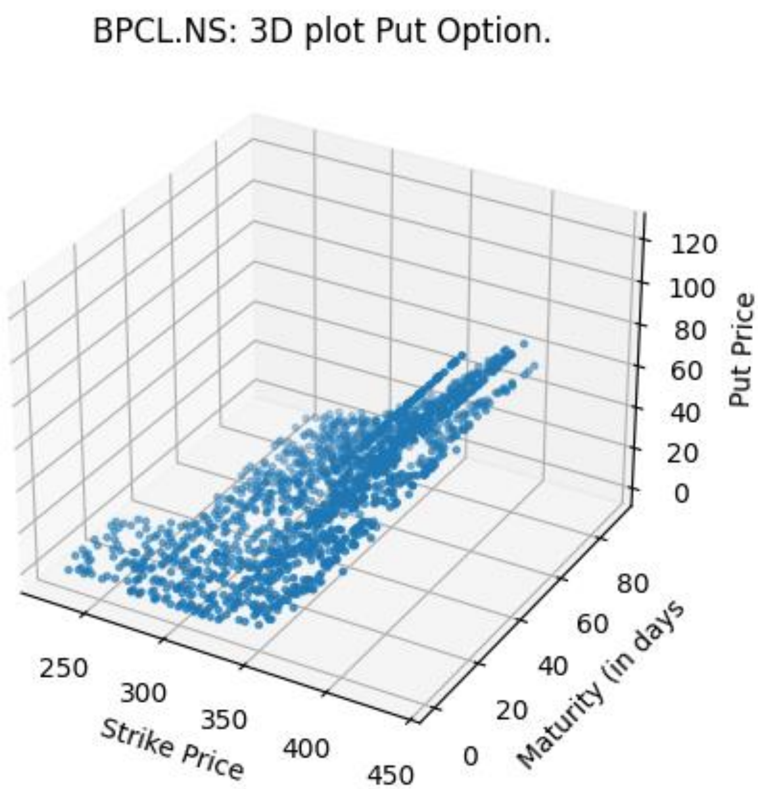
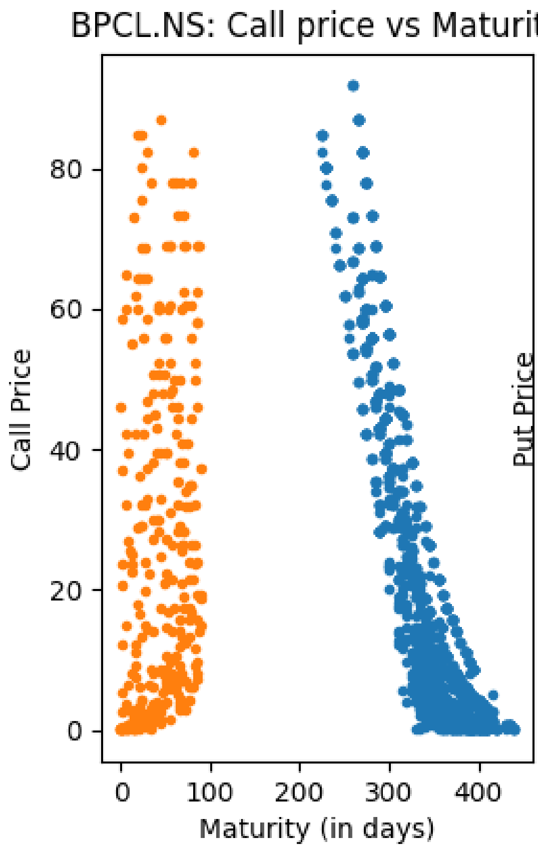
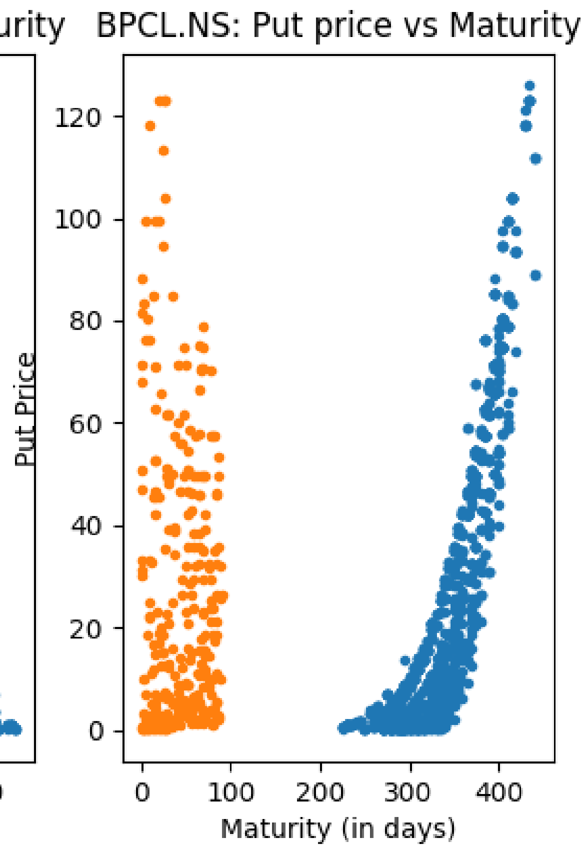
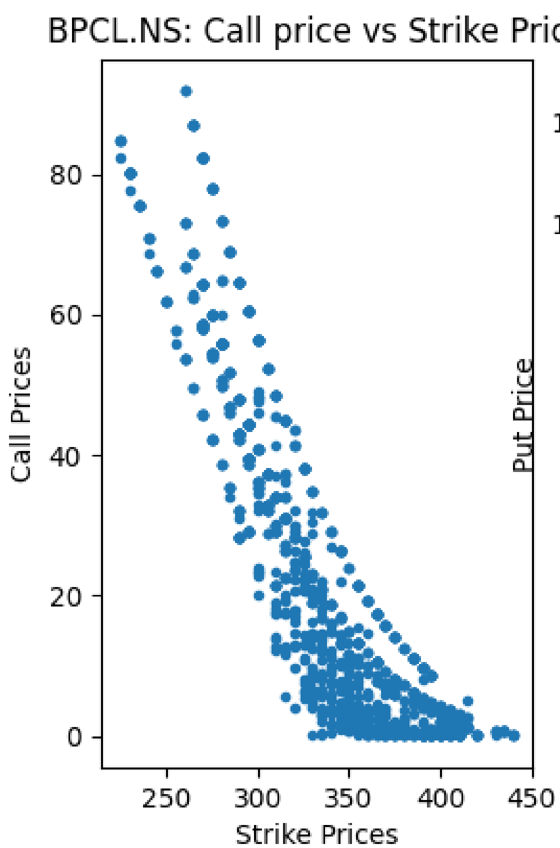
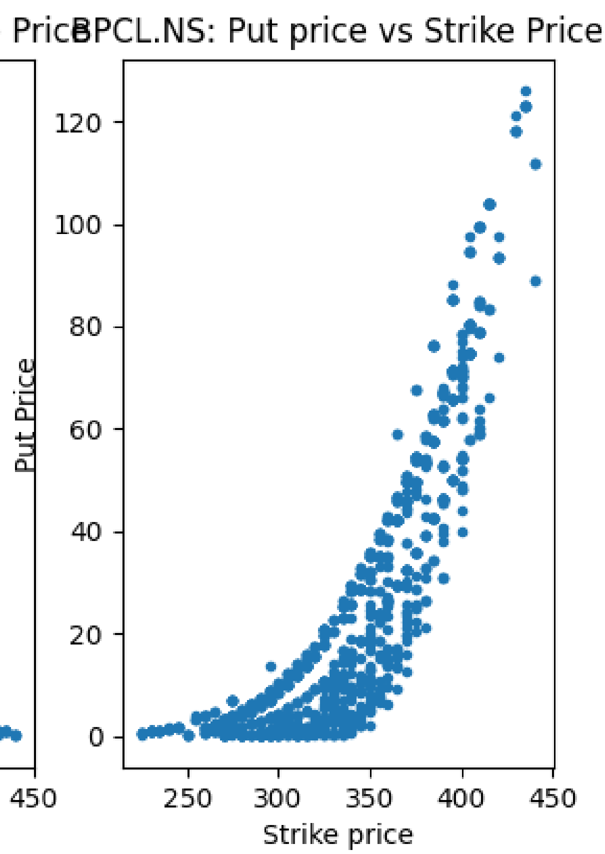
20
40
60
80
Strike Price
250
300
350
400
450
Maturity (in days)
0
20
40
60
80


BPCL.NS: 3D plot Put Option.
Put Price
0
20
40
60
80
100
120
Strike Price
250
300
350
400
450
Maturity (in days
0
20
40
60
80


BPCL.NS: Call price vs Maturity
Call Price
Maturity (in days)
0
20
40
60
80
0
100
200
300
400


BPCL.NS: Put price vs Maturity
Put Price
Maturity (in days)
0
20
40
60
80
100
120
0
100
200
300
400


BPCL.NS: Call price vs Strike Price
Call Prices
Strike Prices
0
20
40
60
80
250
300
350
400
450


BPCL.NS: Put price vs Strike Price
Put Price
Strike price
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20
40
60
80
100
120
250
300
350
400
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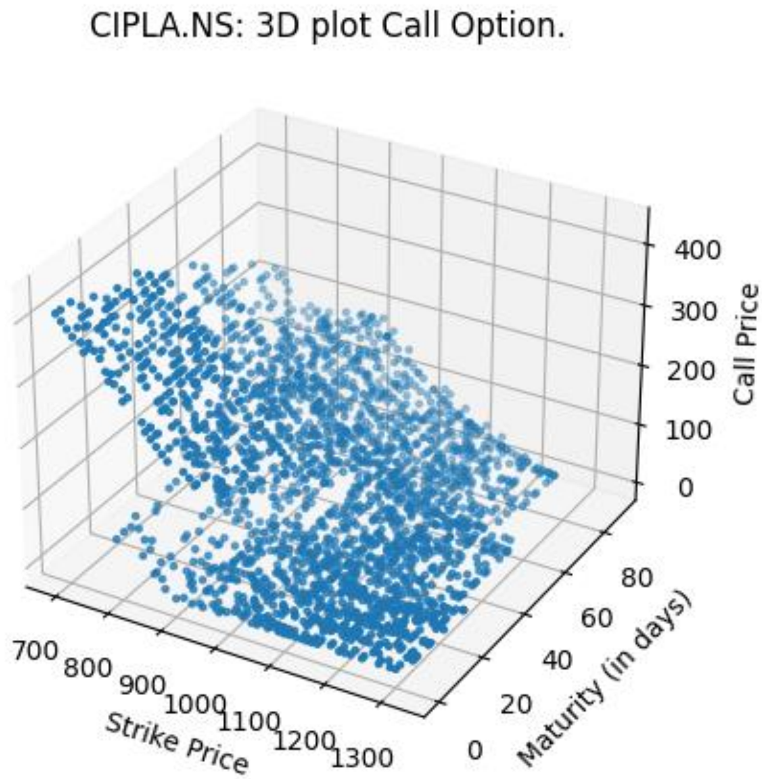
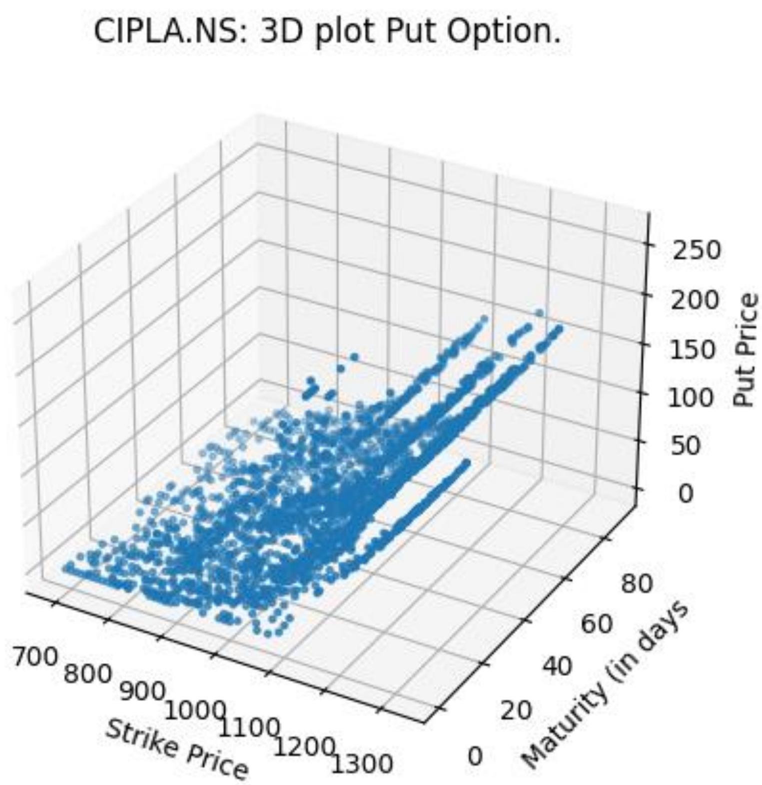
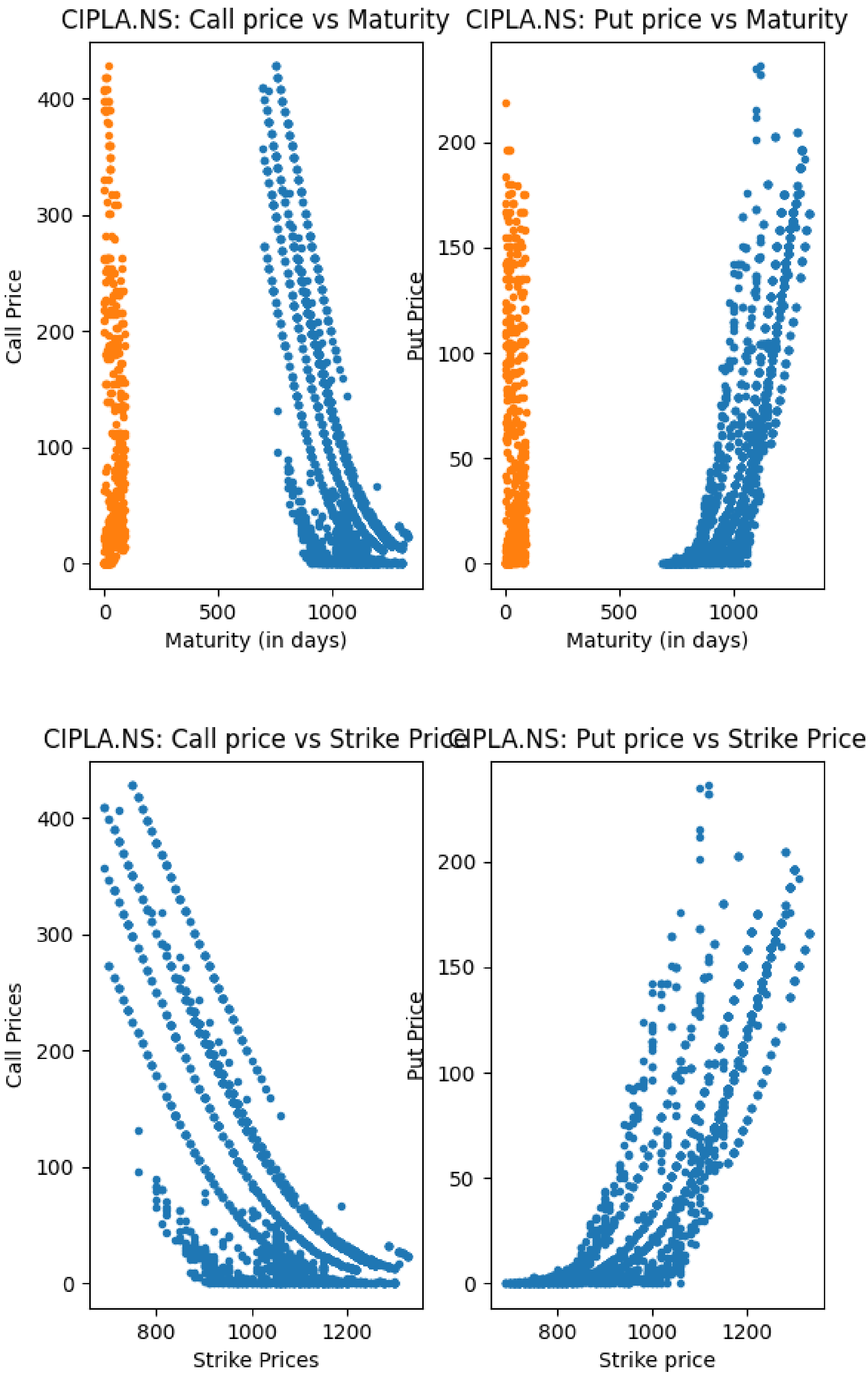
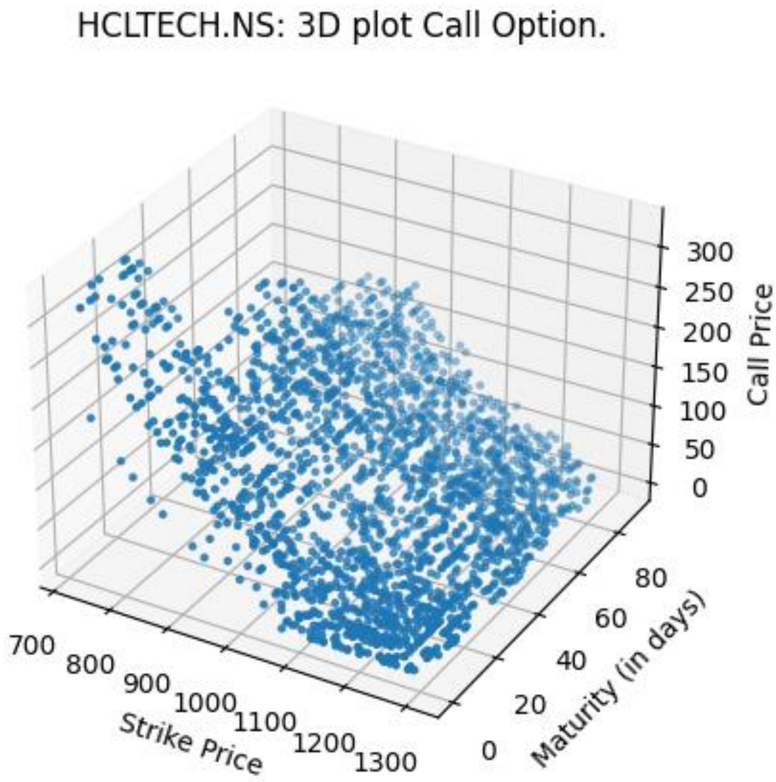
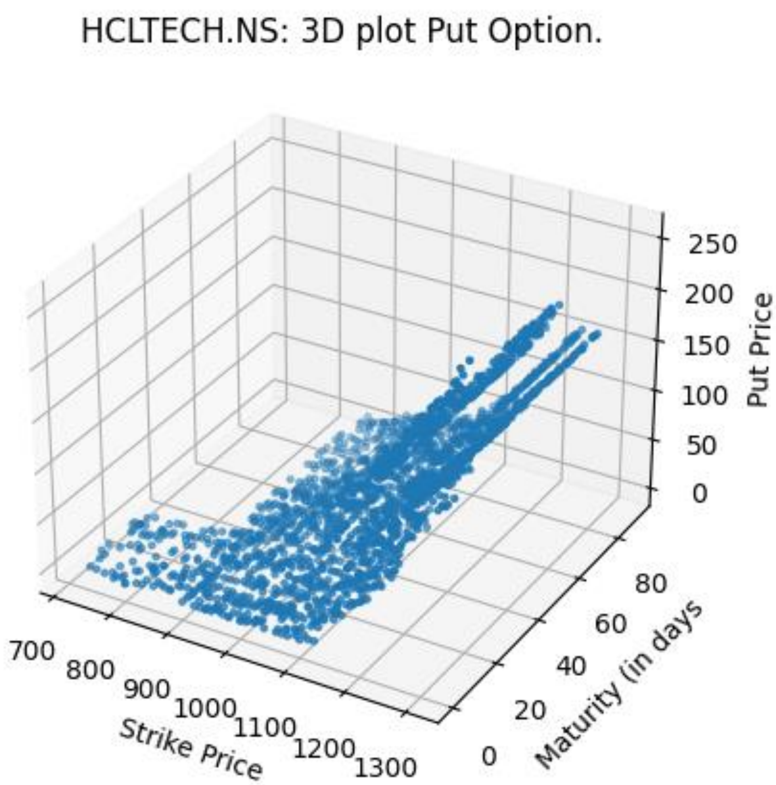

CIPLA.NS: 3D plot Call Option.
Strike Price
700
800
900
1000
1100
1200
1300
Maturity (in days)
0
20
40
60
80
Call Price
0
100
200
300
400

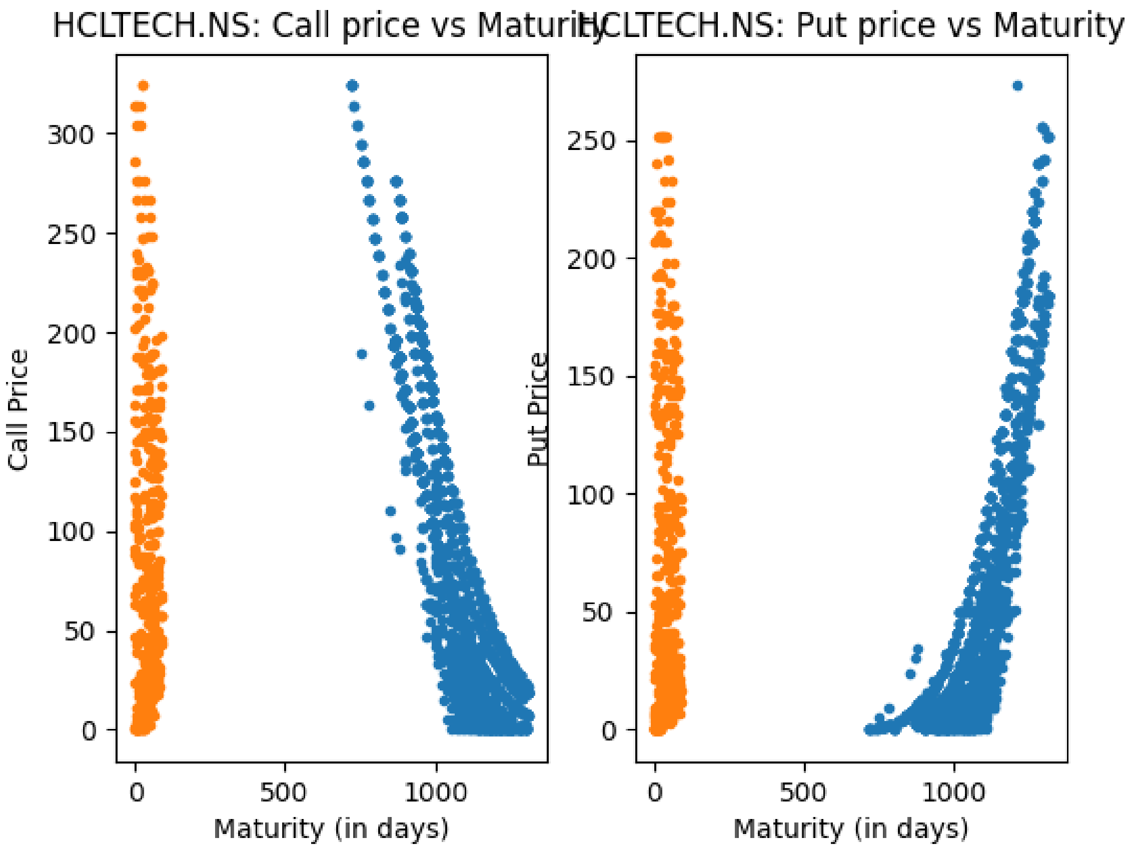

CIPLA.NS: 3D plot Put Option.
Strike Price
700
800
900
1000
1100
1200
1300
Maturity (in days
0
20
40
60
80
Put Price
0
50
100
150
200
250

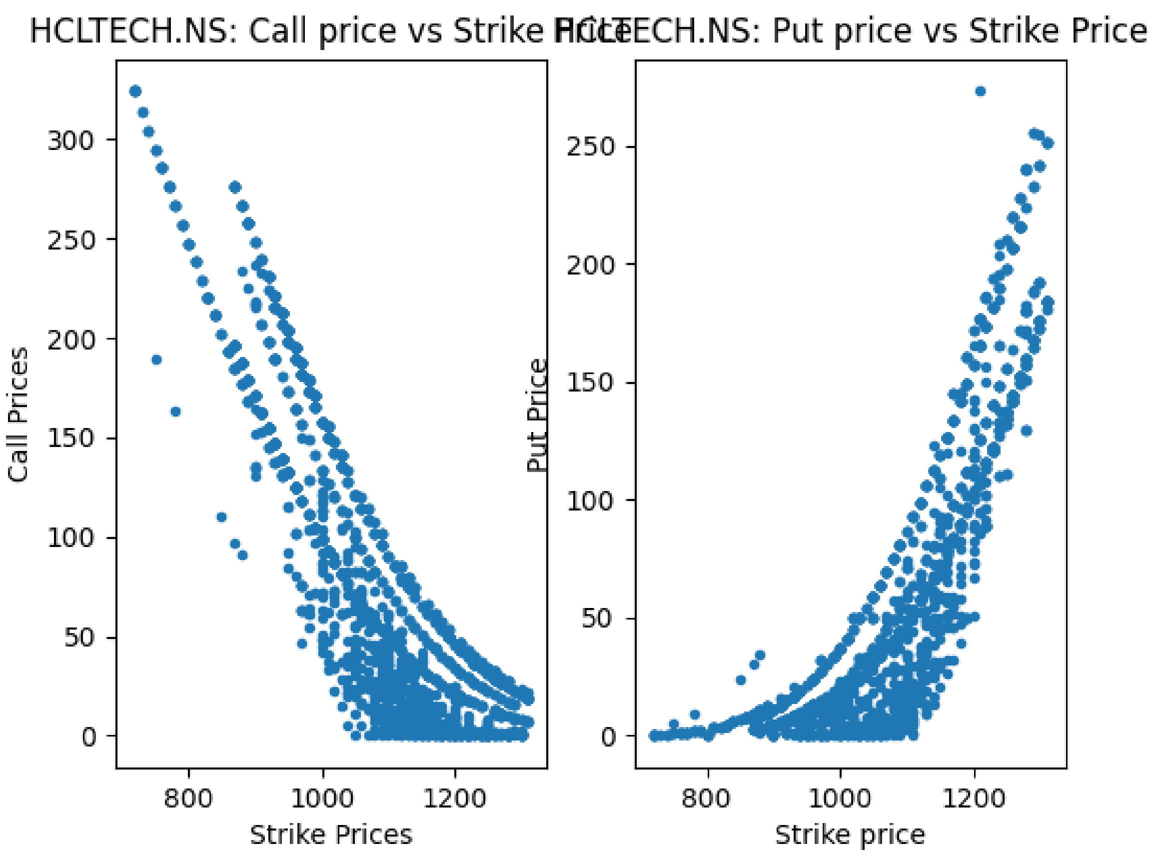


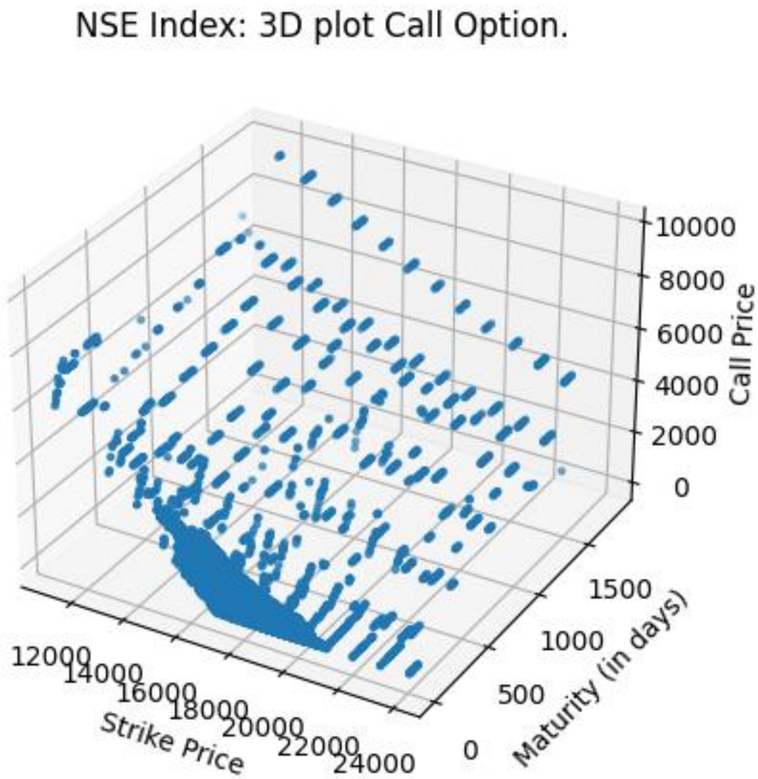
CIPLA.NS: Call price vs Maturity
Call Price
Maturity (in days)
CIPLA.NS: Put price vs Maturity
Put Price
Maturity (in days)
CIPLA.NS: Call price vs Strike Price
Call Prices
Strike Prices
CIPLA.NS: Put price vs Strike Price
Put Price
Strike price

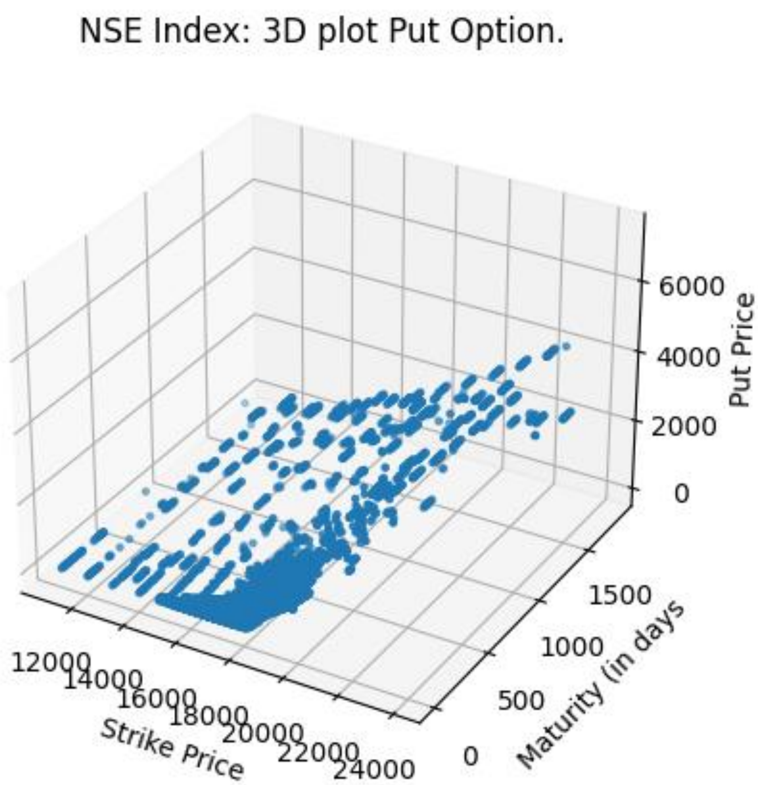

HCLTECH.NS: 3D plot Call Option.
Call Price
Strike Price
Maturity (in days)

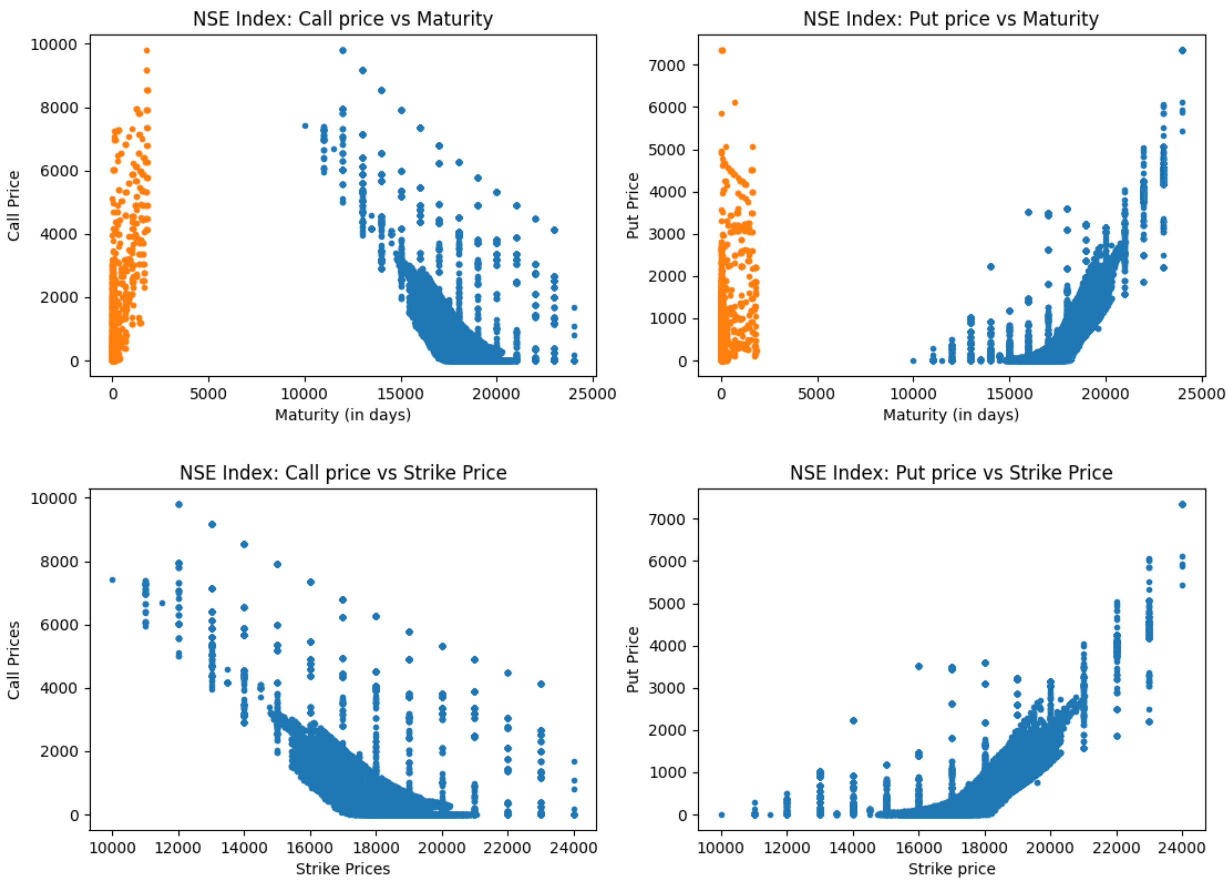

HCLTECH.NS: 3D plot Put Option.
Put Price
Strike Price
Maturity (in days


HCLTECH.NS: Call price vs Maturity
HCLTECH.NS: Put price vs Maturity
Call Price
Put Price
Maturity (in days)
Maturity (in days)

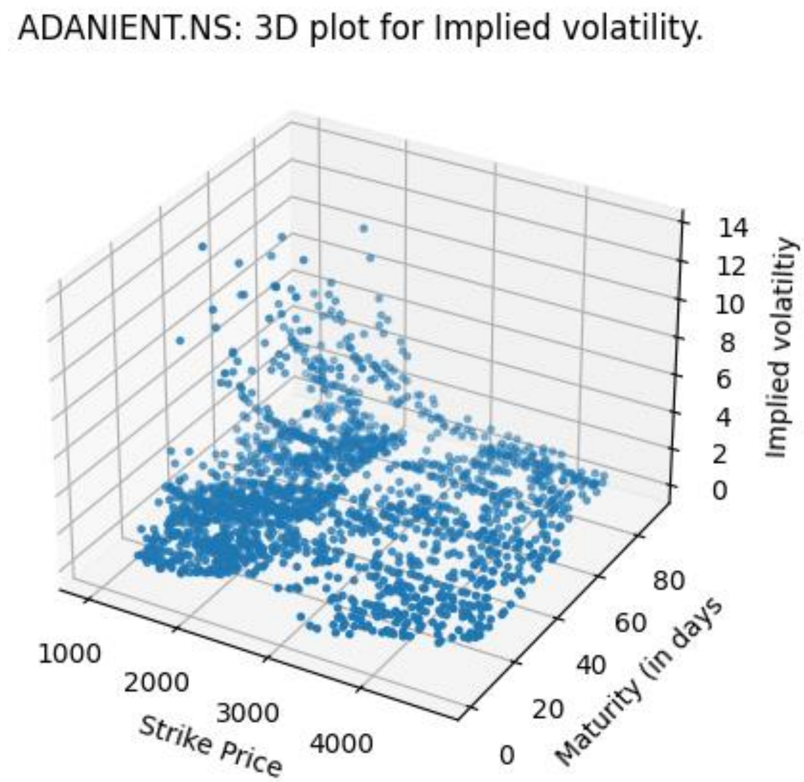

HCLTECH.NS: Call price vs Strike Price
HCLTECH.NS: Put price vs Strike Price
Call Prices
Put Price
Strike Prices
Strike price

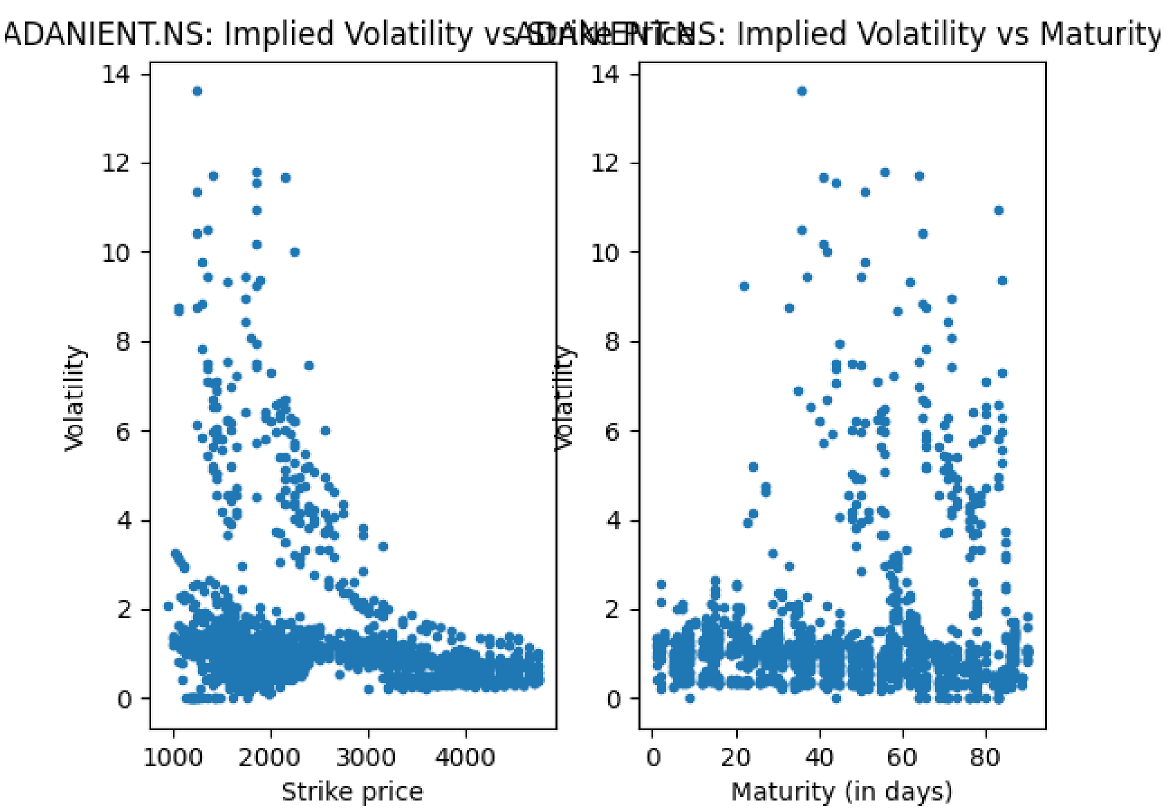

NSE Index: 3D plot Call Option.
Call Price
10000
8000
6000
4000
2000
0
Strike Price
12000
14000
16000
18000
20000
22000
24000
Maturity (in days)
0
500
1000
1500

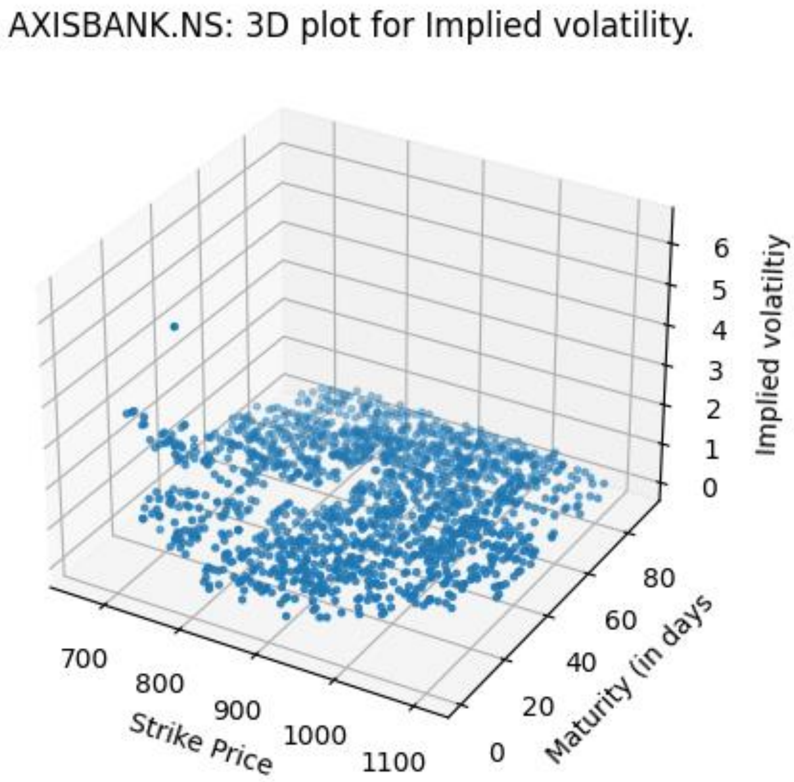

NSE Index: 3D plot Put Option.
Put Price
6000
4000
2000
0
Strike Price
12000
14000
16000
18000
20000
22000
24000
Maturity (in days
0
500
1000
1500

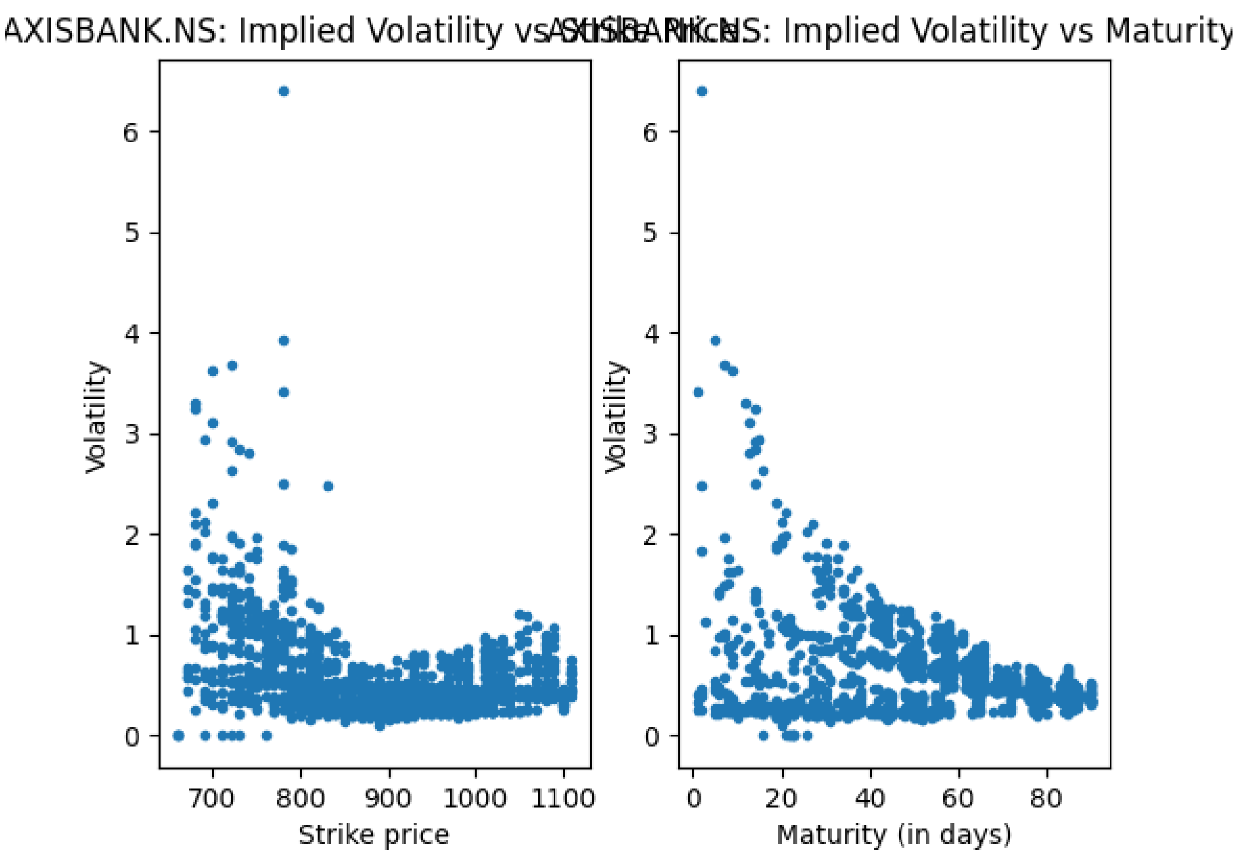

NSE Index: Call price vs Maturity
Call Price
Maturity (in days)
NSE Index: Put price vs Maturity
Put Price
Maturity (in days)
NSE Index: Call price vs Strike Price
Call Prices
Strike Prices
NSE Index: Put price vs Strike Price
Put Price
Strike price

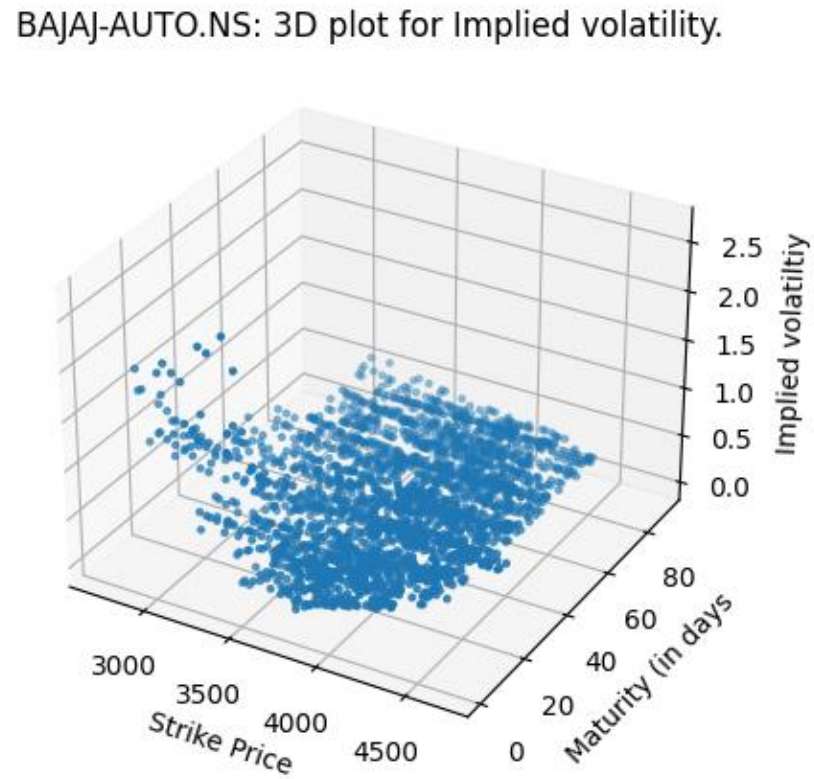
Q2b

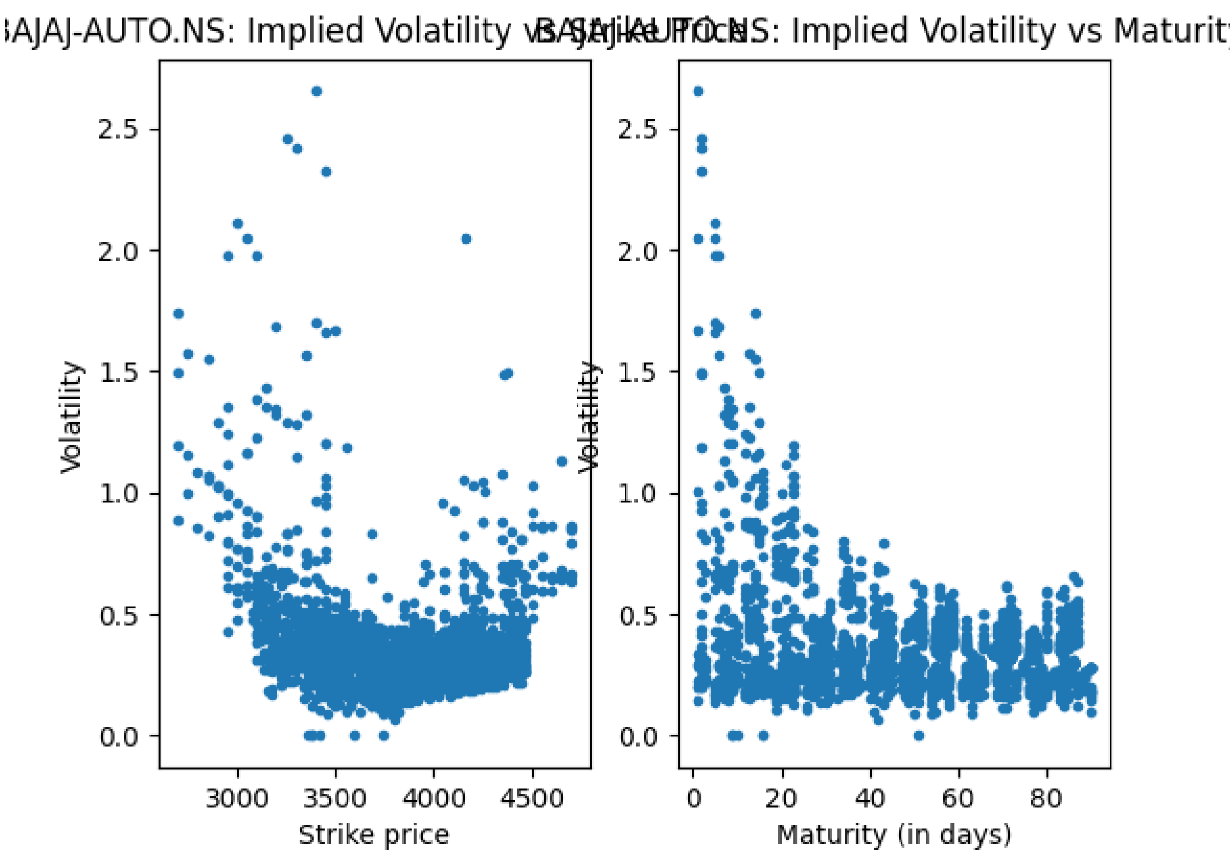

ADANIENT.NS: 3D plot for Implied volatility.
Implied volatiltiy
Maturity (in days)
Strike Price
0
2
4
6
8
10
12
14
0
20
40
60
80
1000
2000
3000
4000

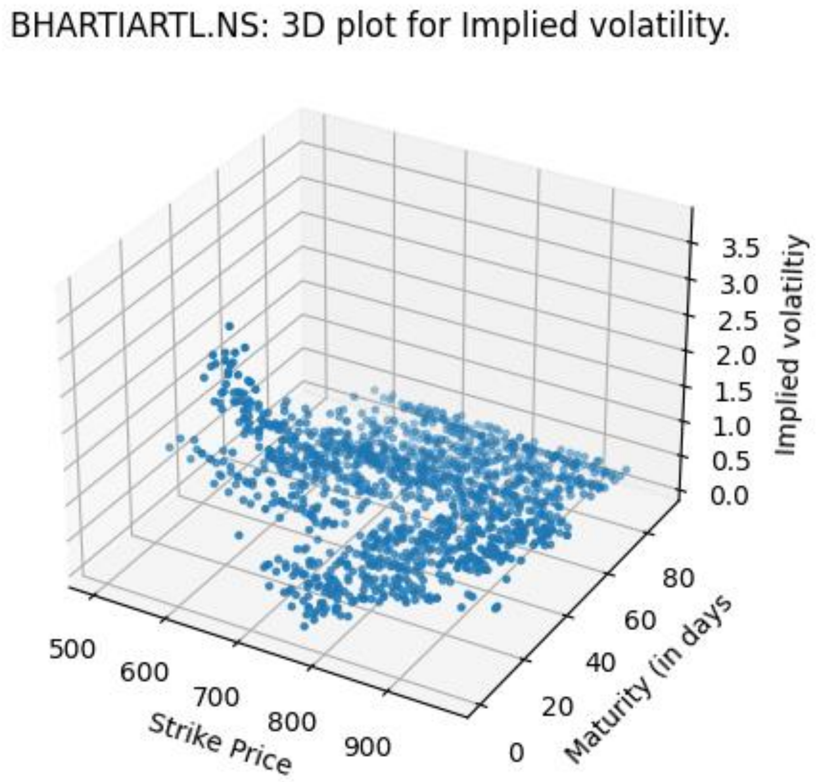

ADANIENT.NS: Implied Volatility vs
Implied Volatility vs Maturity
Volatility
Strike price
Volatility
Maturity (in days)
0
2
4
6
8
10
12
14
1000
2000
3000
4000
0
20
40
60
80

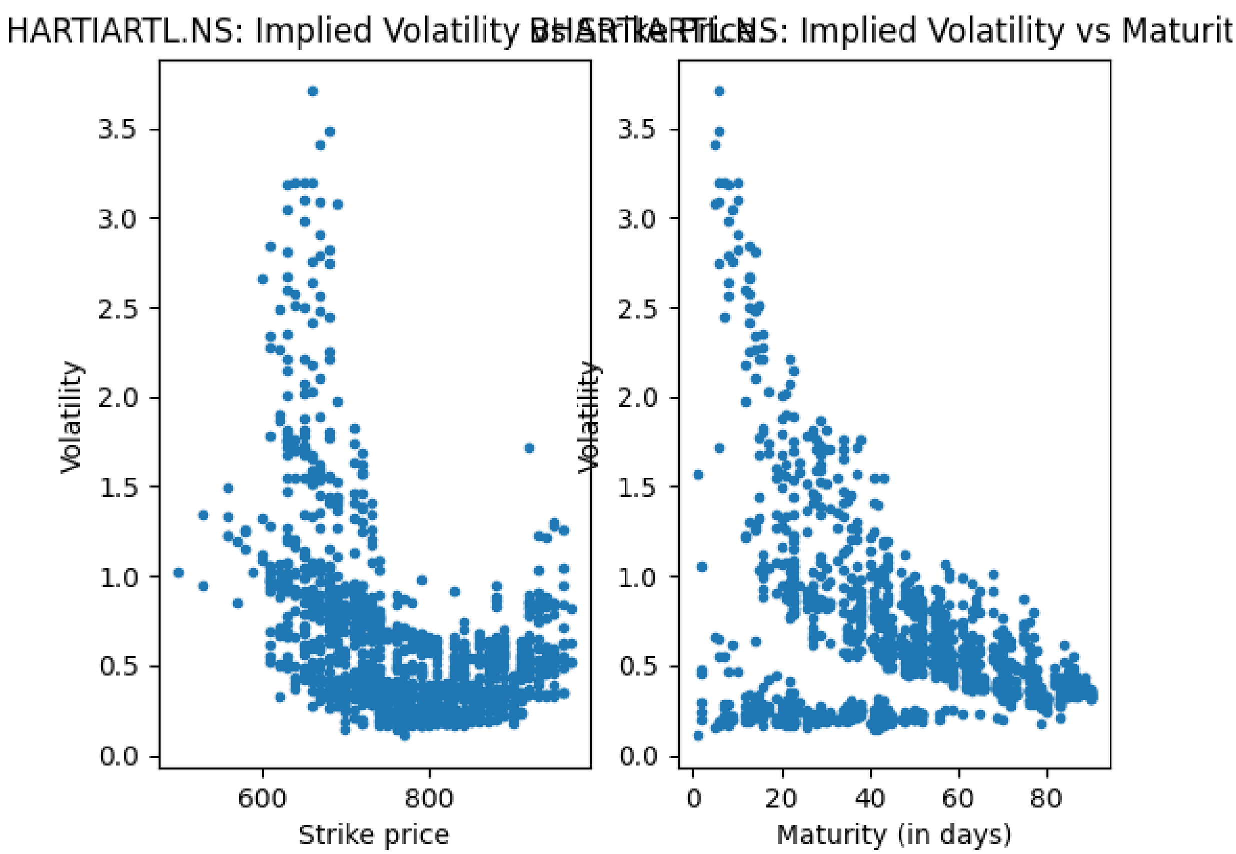

AXISBANK.NS: 3D plot for Implied volatility.
Strike Price
Maturity (in days
Implied volatiltiy

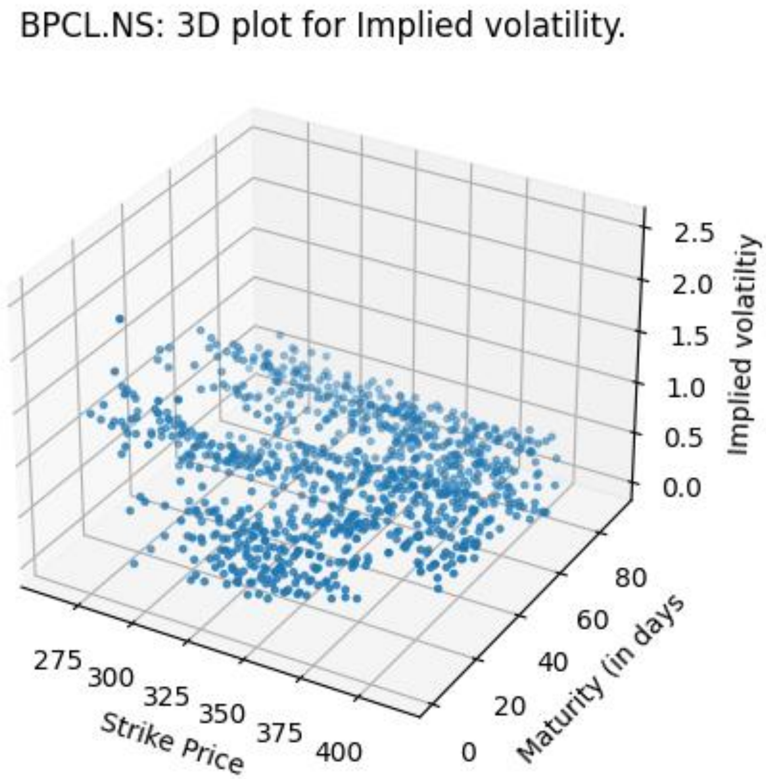

AXISBANK.NS: Implied Volatility vs
AXISBANK.NS: Implied Volatility vs Maturity
Volatility
Strike price
Volatility
Maturity (in days)

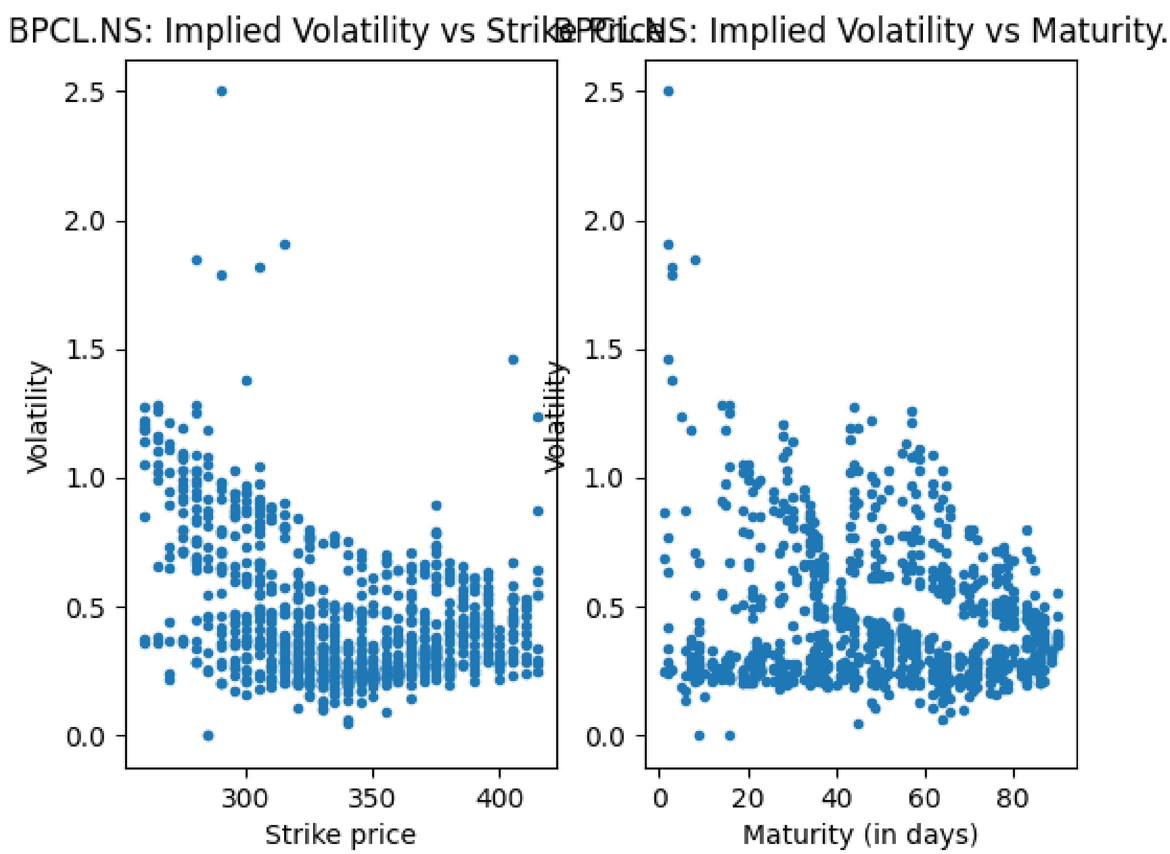

BAJAJ-AUTO.NS: 3D plot for Implied volatility.
Implied volatiltiy
Maturity (in days
Strike Price

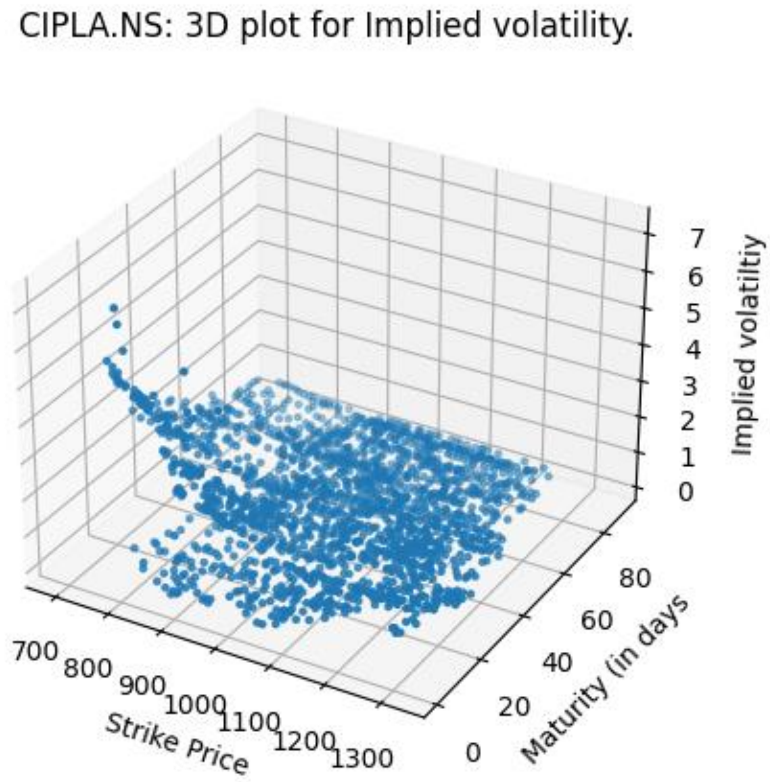

Volatility
Strike price
Volatility
Maturity (in days)

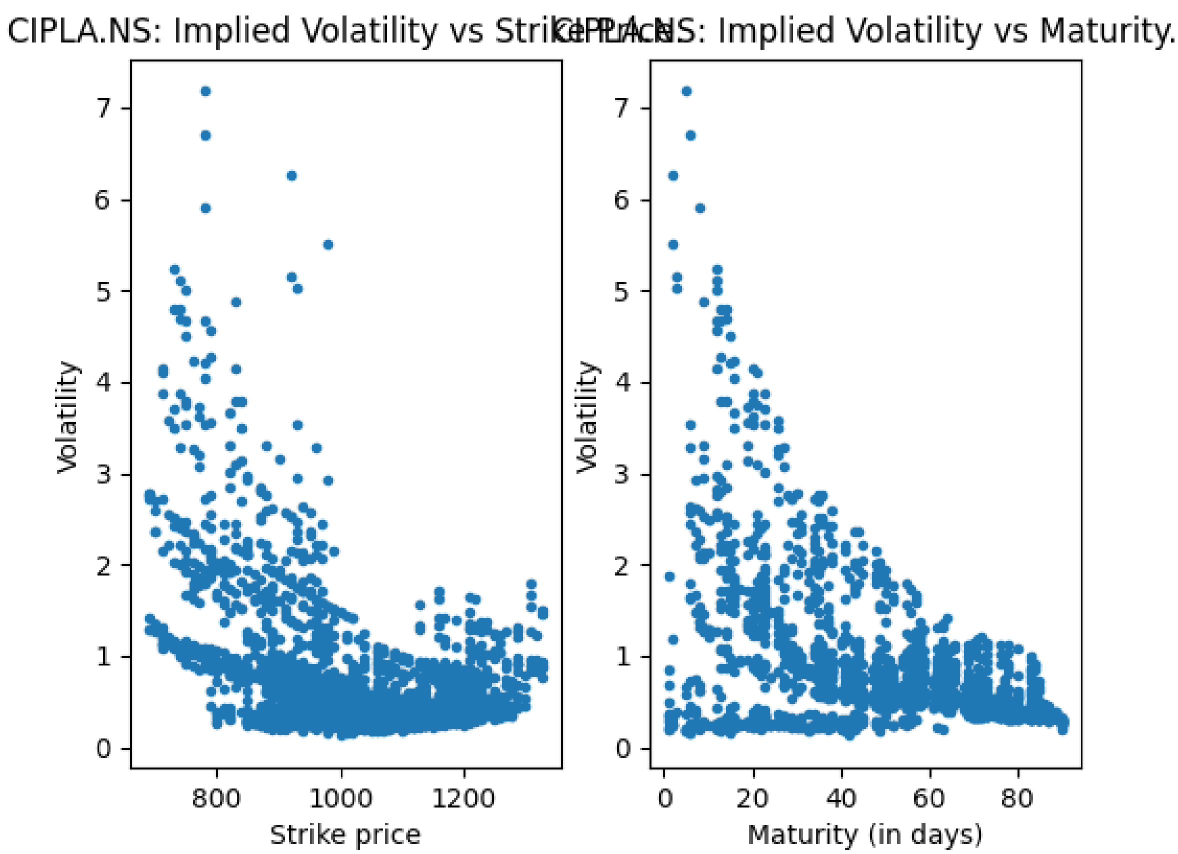

BHARTIARTL.NS: 3D plot for Implied volatility.
Implied volatiltiy
Strike Price
Maturity (in days

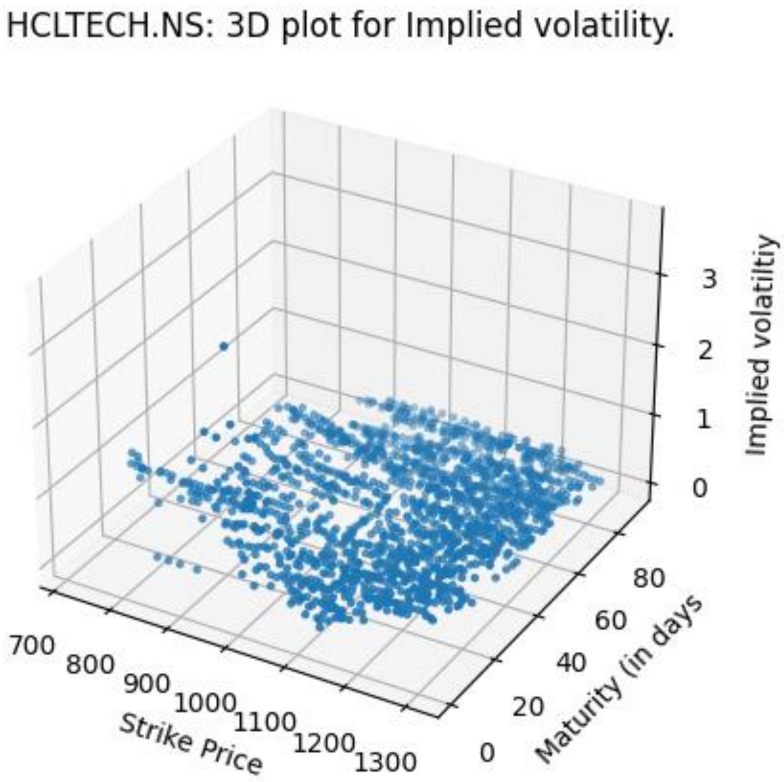

HARTIARTL.NS: Implied Volatility vs Strike Price
BHARTIARTL.NS: Implied Volatility vs Maturit
Volatility
Strike price
Volatility
Maturity (in days)

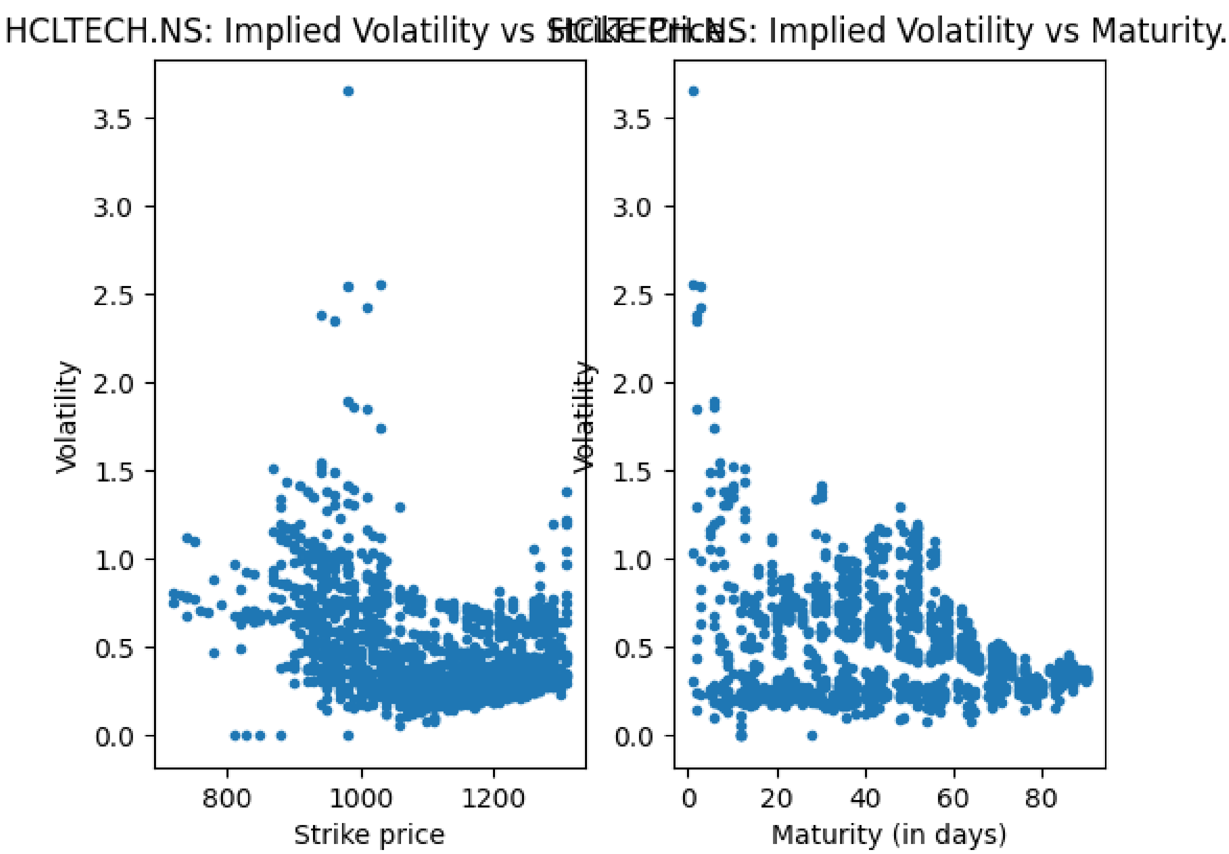

BPCL.NS: 3D plot for Implied volatility.
Implied volatiltiy
2.5
2.0
1.5
1.0
0.5
0.0
Maturity (in days
80
60
40
20
0
Strike Price
275
300
325
350
375
400

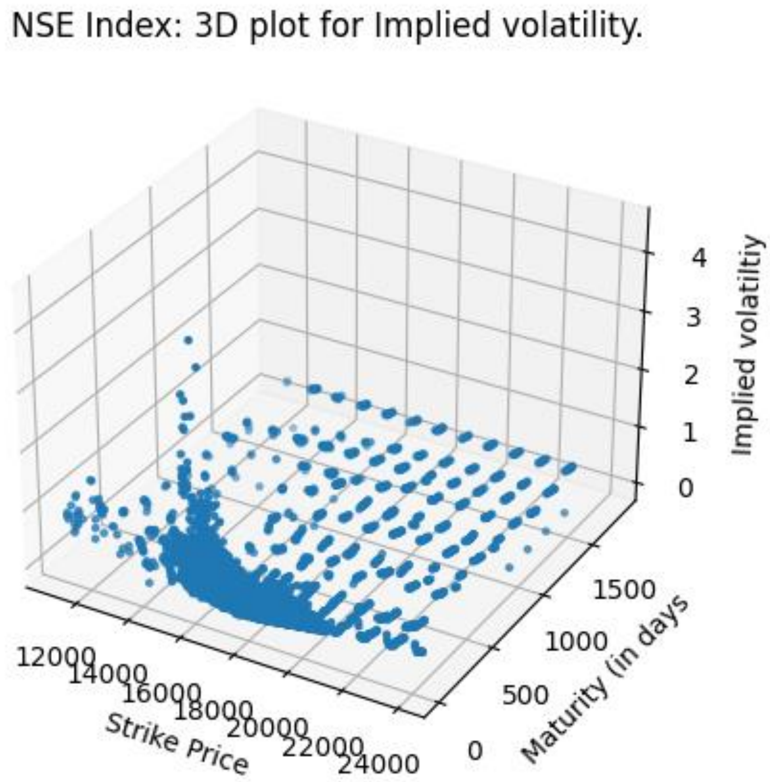

BPCL.NS: Implied Volatility vs Strike Price.
BPCL.NS: Implied Volatility vs Maturity.
Volatility
Volatility
2.5
2.0
1.5
1.0
0.5
0.0
300
350
400
Strike price
0
20
40
60
80
Maturity (in days)

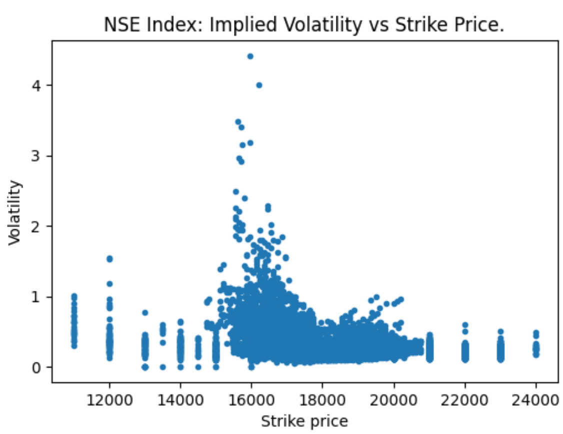

CIPLA.NS: 3D plot for Implied volatility.
Strike Price
700
800
900
1000
1100
1200
1300
Maturity (in days
0
20
40
60
80
Implied volatiltiy
0
1
2
3
4
5
6
7

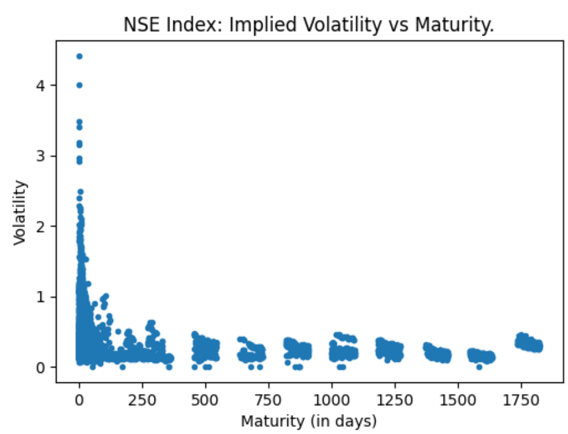

CIPLA.NS: Implied Volatility vs StrikCIPLA.NS: Implied Volatility vs Maturity.
Volatility
0
1
2
3
4
5
6
7
800
1000
1200
Strike price
Volatility
0
1
2
3
4
5
6
7
0
20
40
60
80
Maturity (in days)


HCLTECH.NS: 3D plot for Implied volatility.
Implied volatiltiy
0
1
2
3
Strike Price
700
800
900
1000
1100
1200
1300
Maturity (in days
0
20
40
60
80

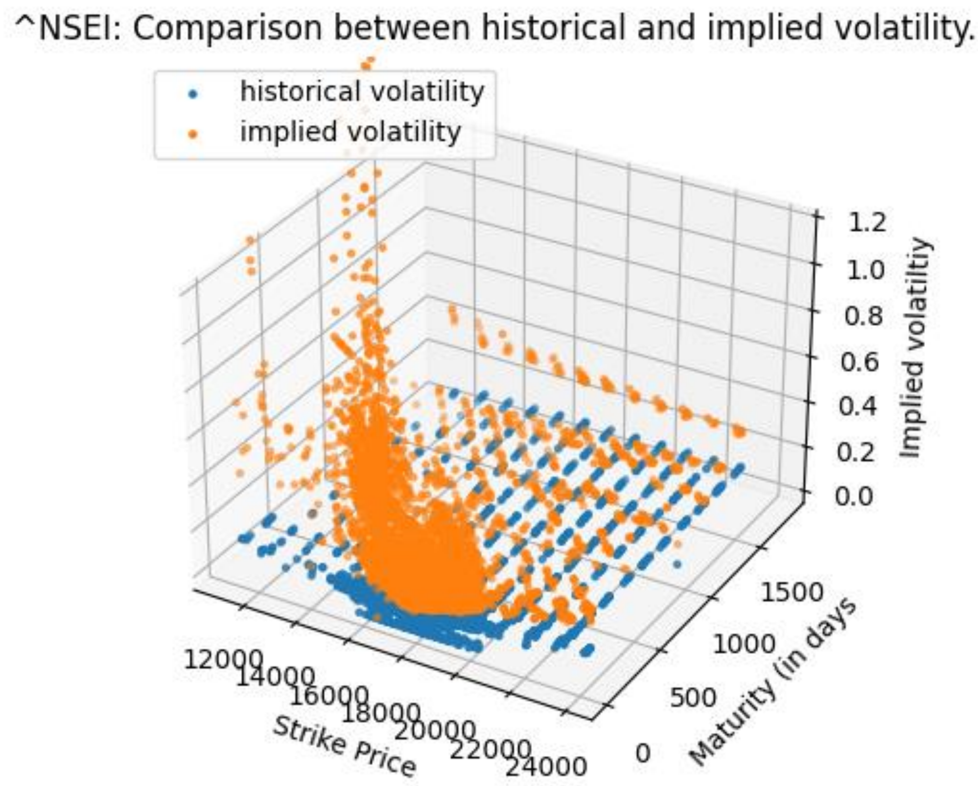

HCLTECH.NS: Implied Volatility vs Maturity.
Volatility
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Strike price
800
1000
1200
Maturity (in days)
0
20
40
60
80

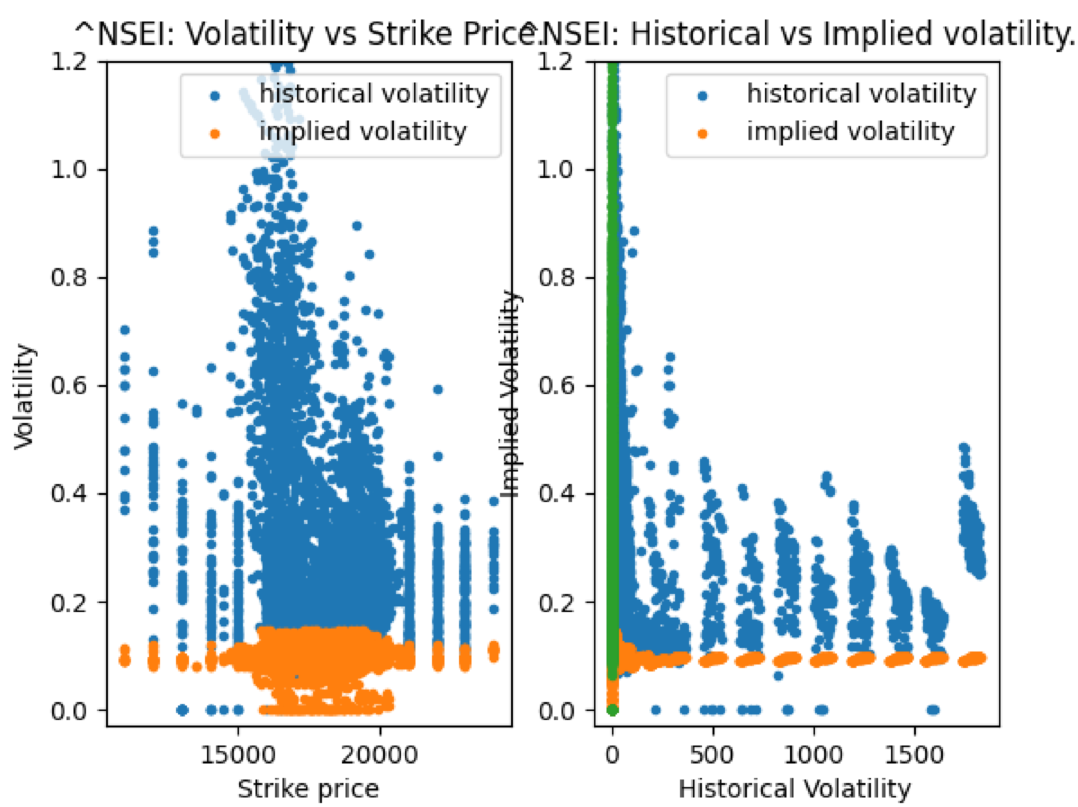

NSE Index: 3D plot for Implied volatility.
Implied volatility
Strike Price
Maturity (in days)
12000
14000
16000
18000
20000
22000
24000
0
500
1000
1500
0
1
2
3
4

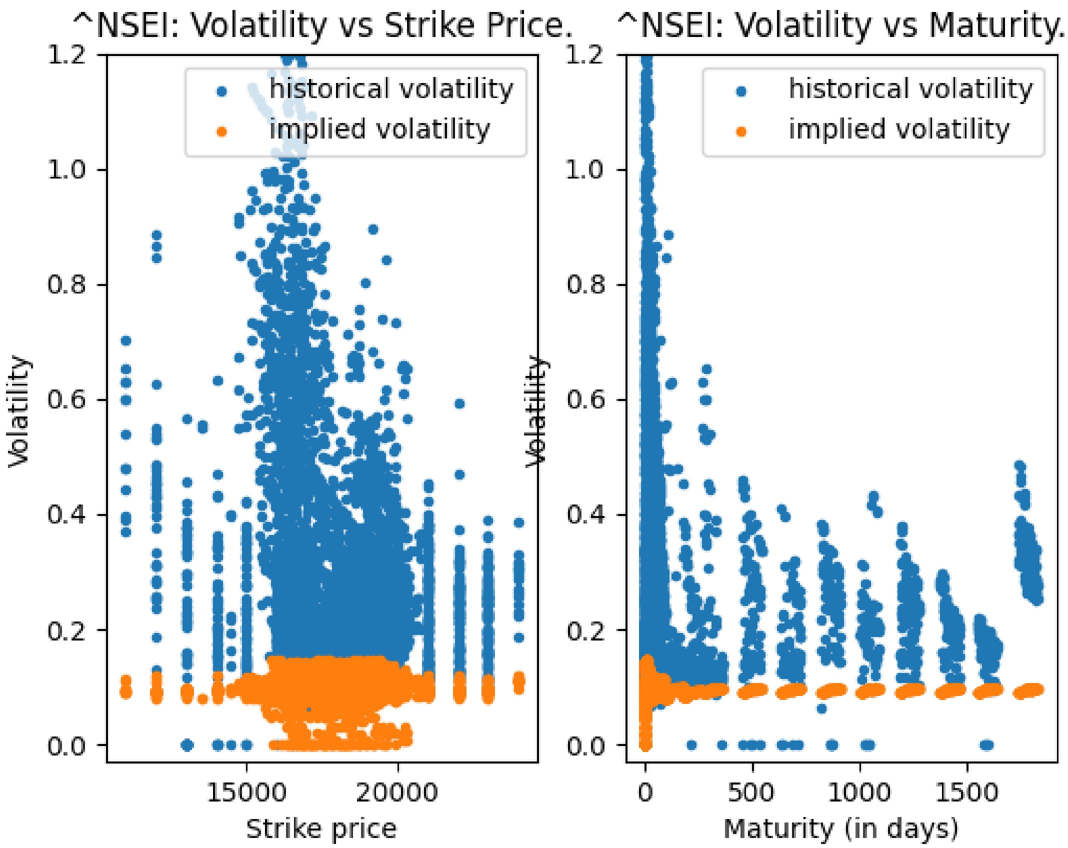

NSE Index: Implied Volatility vs Strike Price.
Volatility
Strike price
12000
14000
16000
18000
20000
22000
24000
0
1
2
3
4


NSE Index: Implied Volatility vs Maturity.
Volatility
Maturity (in days)
0
250
500
750
1000
1250
1500
1750
0
1
2
3
4

Q2c


^NSEI: Comparison between historical and implied volatility.
historical volatility
implied volatility
Implied volatilitiy
1.2
1.0
0.8
0.6
0.4
0.2
0.0
12000
14000
16000
18000
20000
22000
24000
Strike Price
0
500
1000
1500
Maturity (in days


^NSEI: Volatility vs Strike Price
historical volatility
implied volatility
Volatility
1.2
1.0
0.8
0.6
0.4
0.2
0.0
15000
20000
Strike price
^NSEI: Historical vs Implied volatility.
historical volatility
implied volatility
Implied Volatility
0
500
1000
1500
Historical Volatility


^NSEI: Volatility vs Strike Price.
^NSEI: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)
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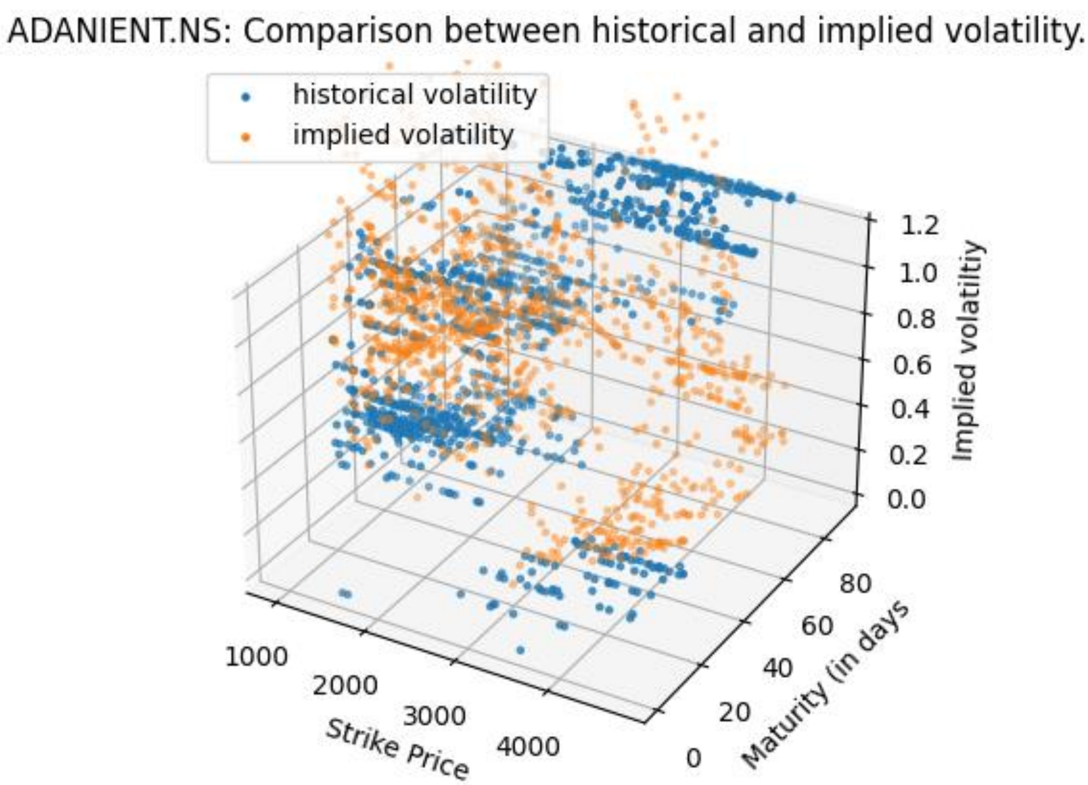
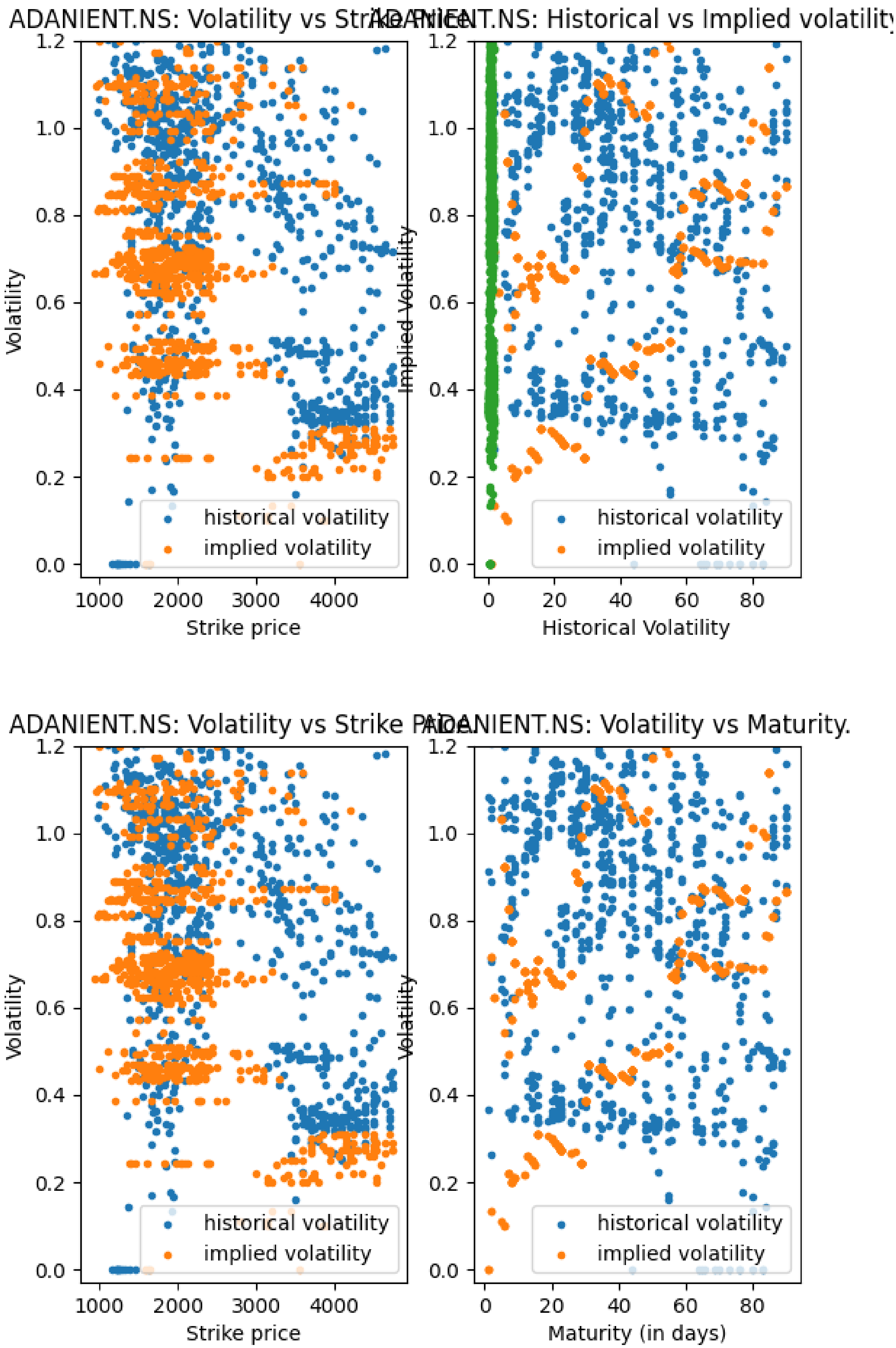
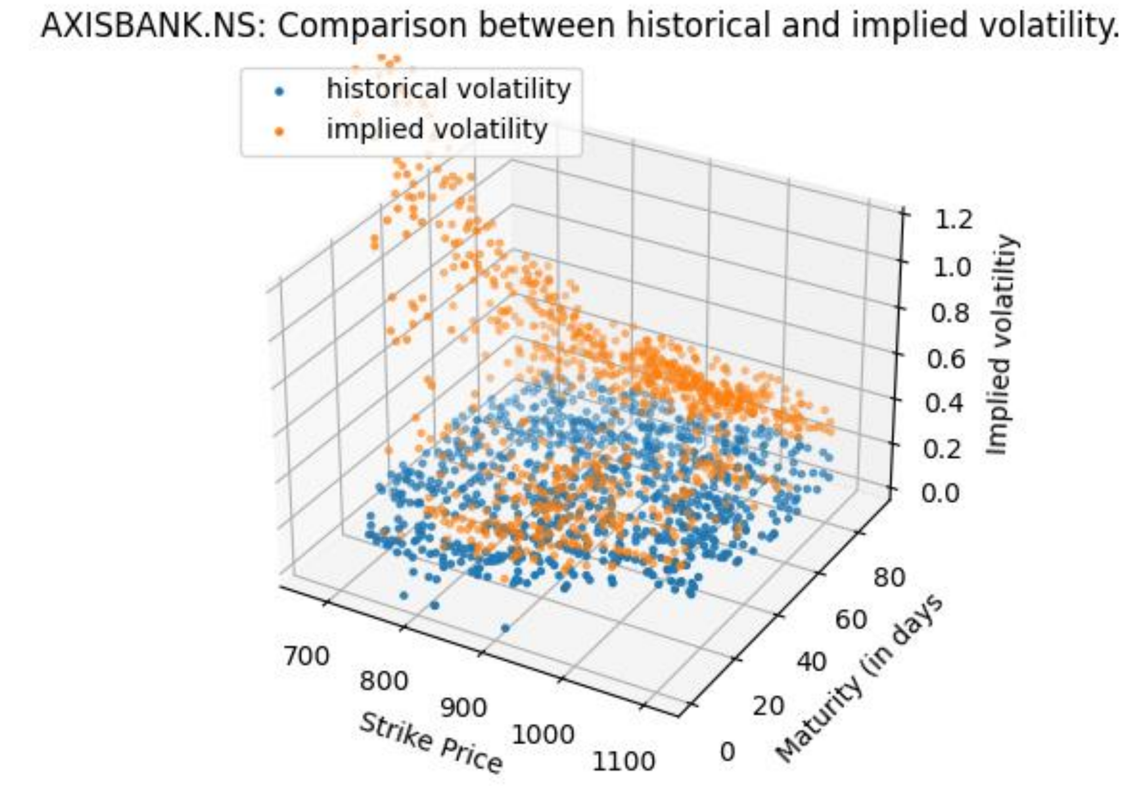
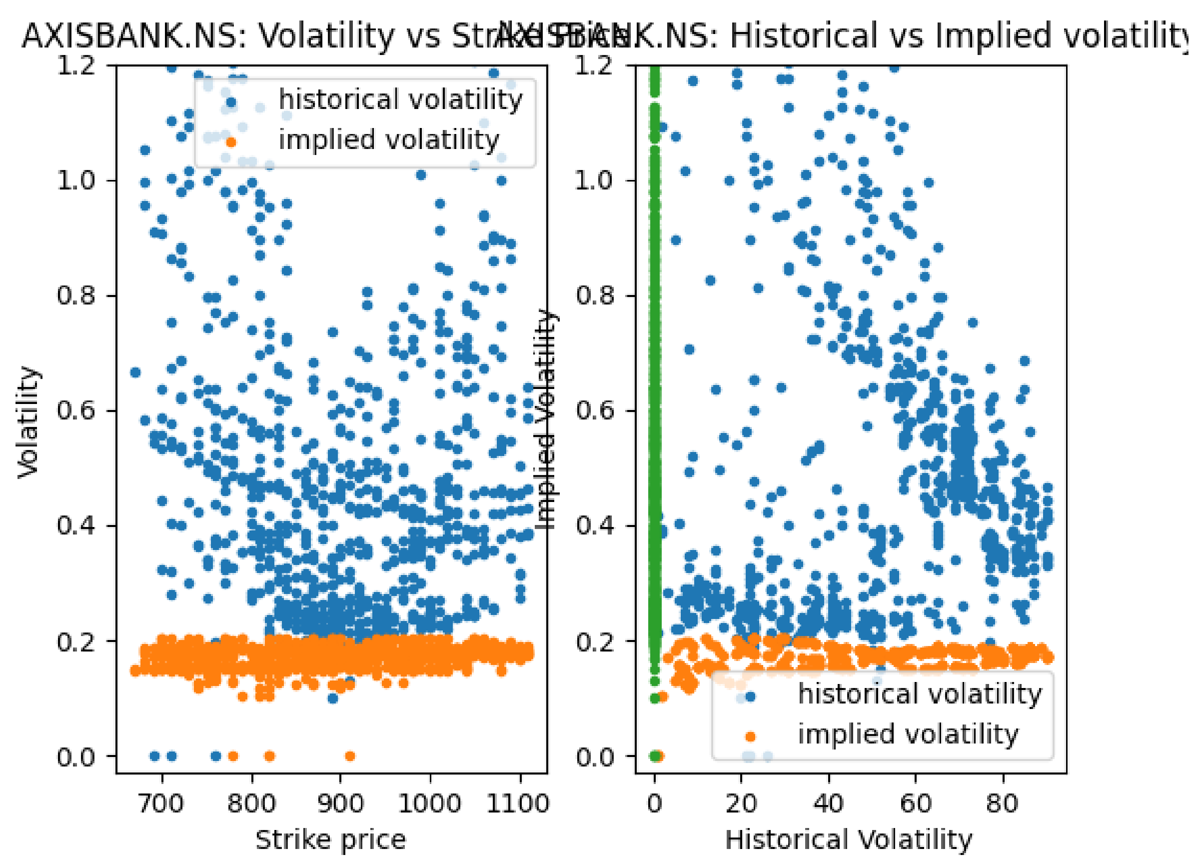
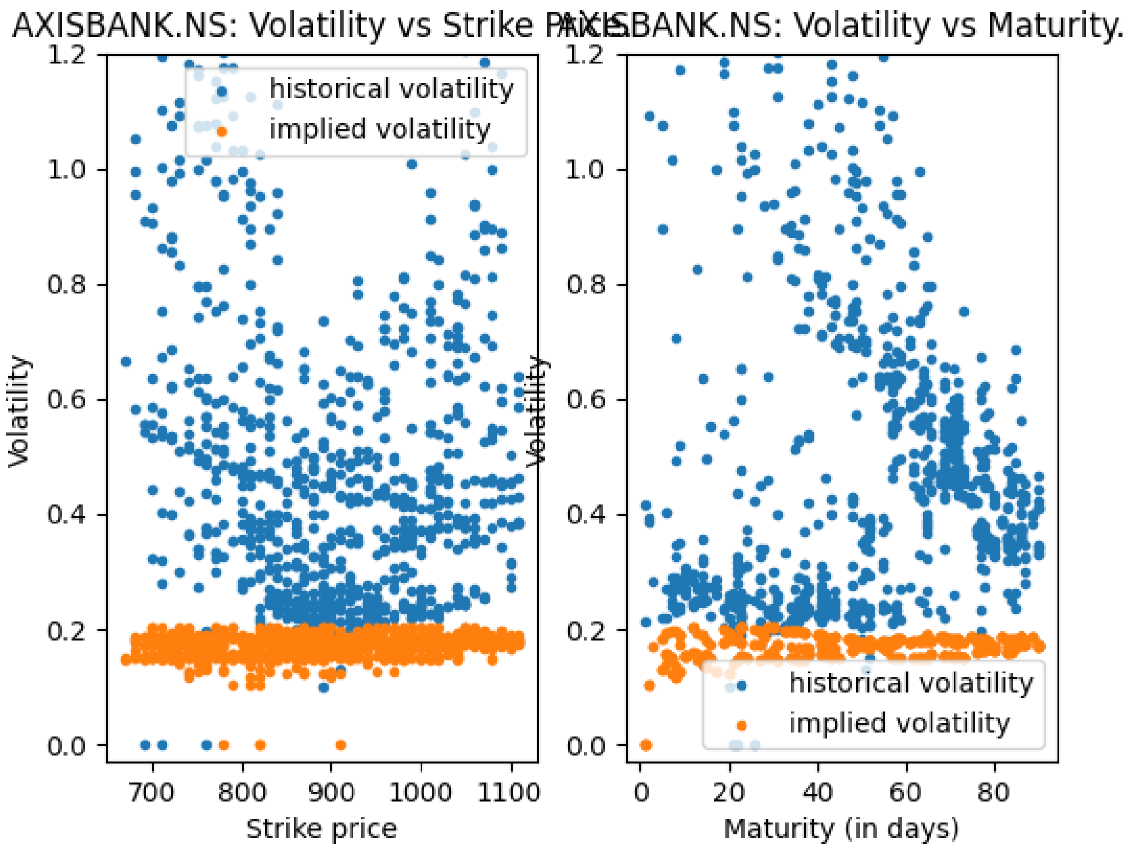
1.0
0.8
0.6
0.4
0.2
0.0
15000
20000
0
500
1000
1500

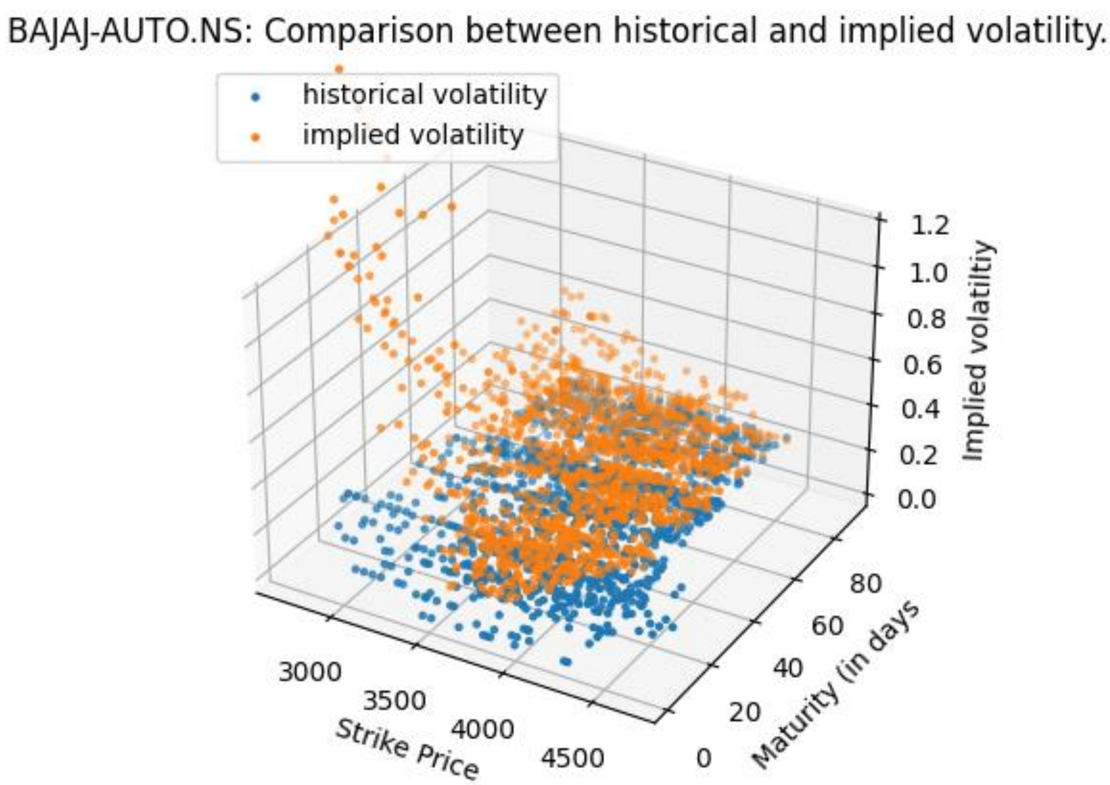

ADANIENT.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Implied volatilitiy
Strike Price
Maturity (in days
1000
2000
3000
4000
0
20
40
60
80
0.0
0.2
0.4
0.6
0.8
1.0
1.2

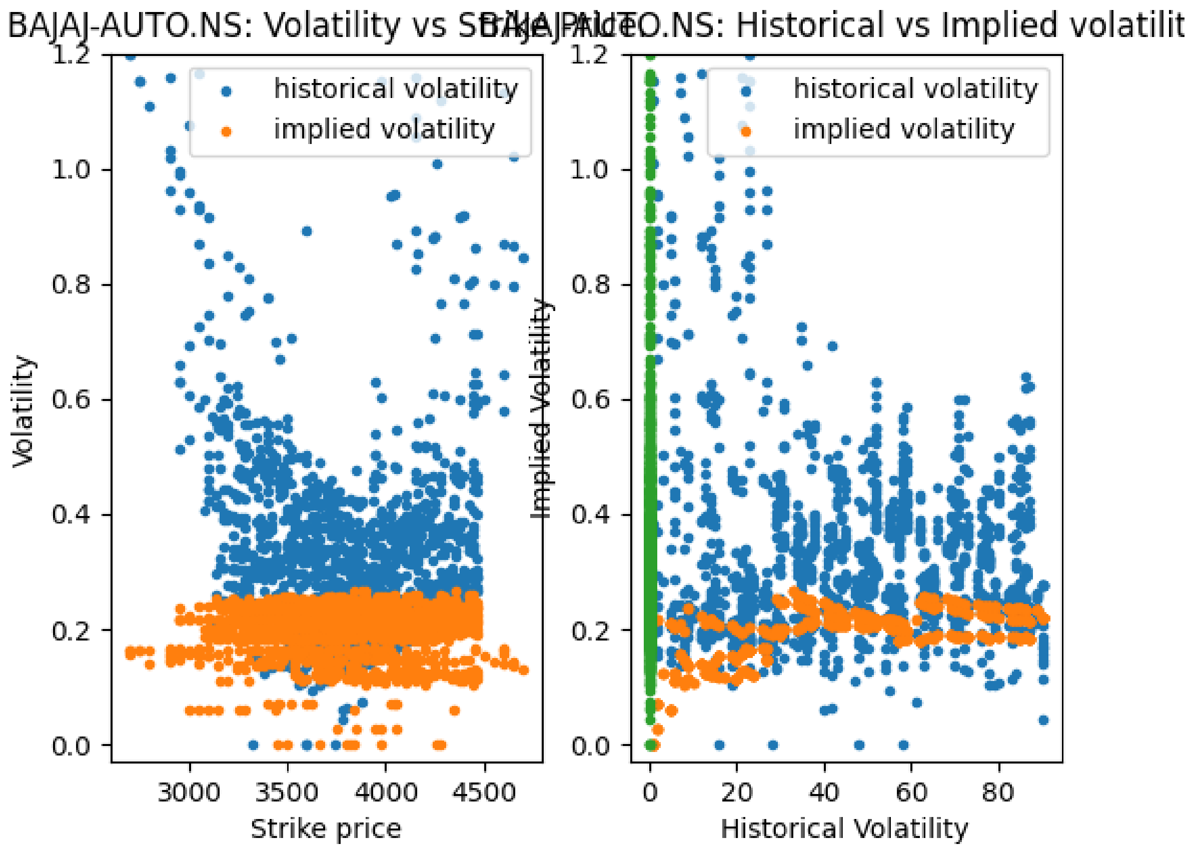

ADANIENT.NS: Volatility vs Strike Price.
ADANIENT.NS: Historical vs Implied volatilit
Volatility
Strike price
Implied Volatility
Historical Volatility
historical volatility
implied volatility
ADANIENT.NS: Volatility vs Strike Price.
ADANIENT.NS: Volatility vs Maturity.
Volatility
Strike price
Volatility
Maturity (in days)
historical volatility
implied volatility

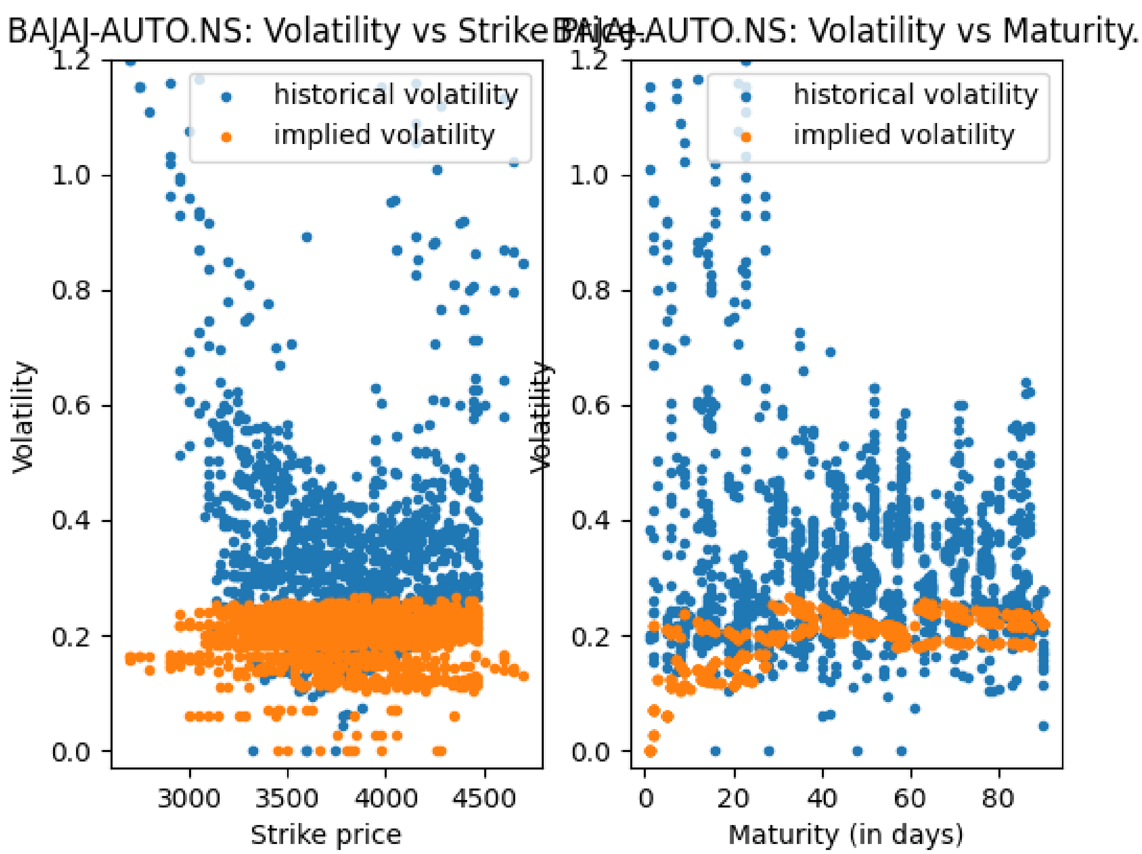

AXISBANK.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Implied volatiltiy
Strike Price
Maturity (in days

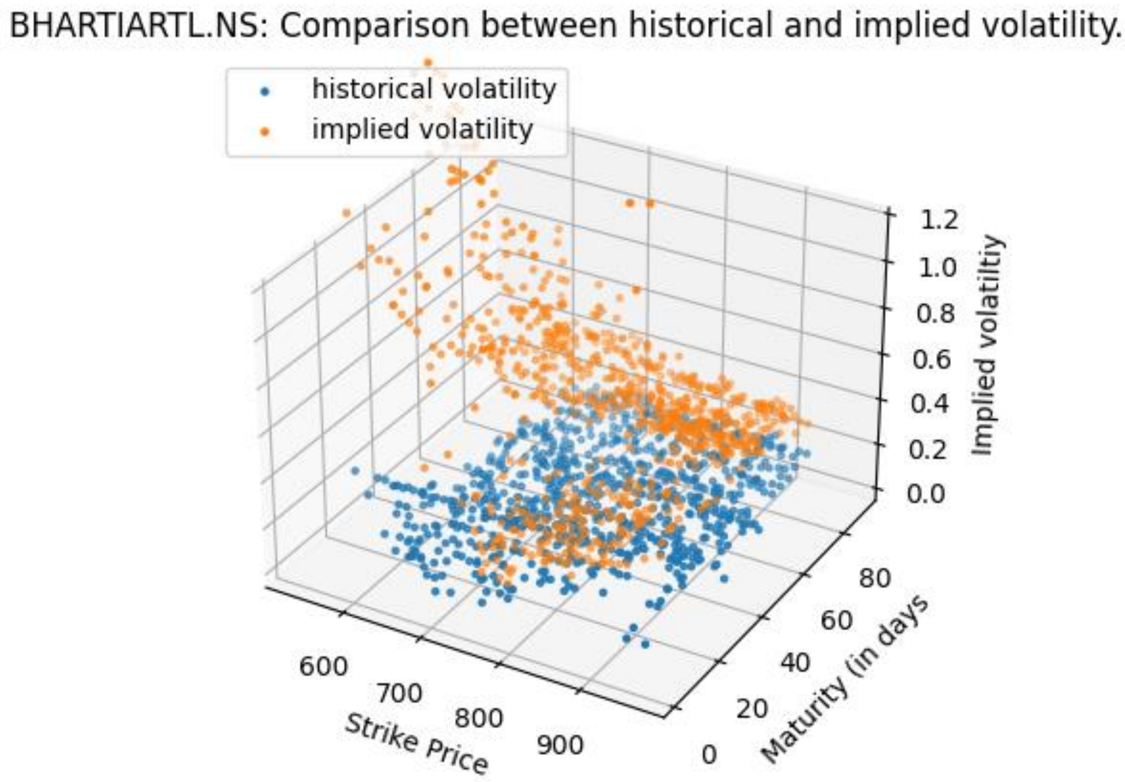

AXISBANK.NS: Volatility vs Strike Price
AXISBANK.NS: Historical vs Implied volatility
historical volatility
implied volatility
Volatility
Strike price
Implied Volatility
Historical Volatility

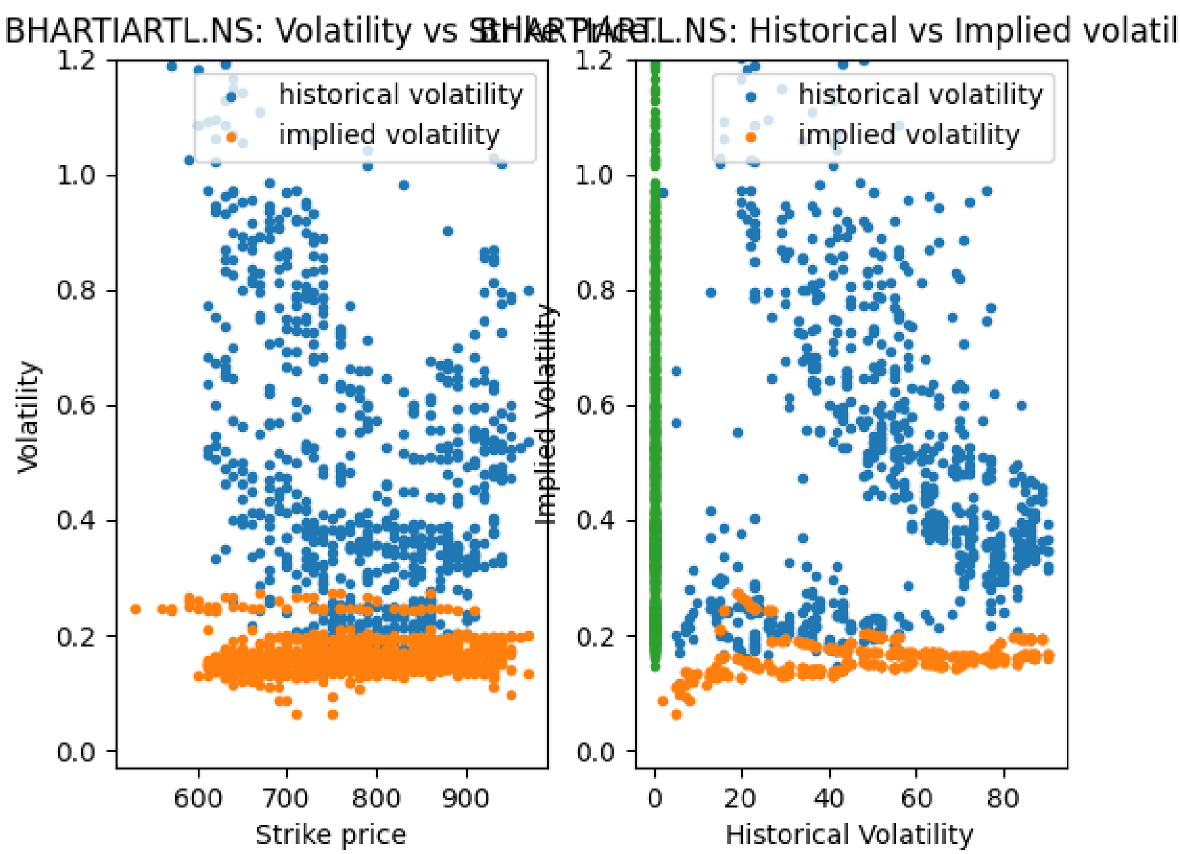

AXISBANK.NS: Volatility vs Strike Price.
AXISBANK.NS: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
700
800
900
1000
1100
0
20
40
60
80

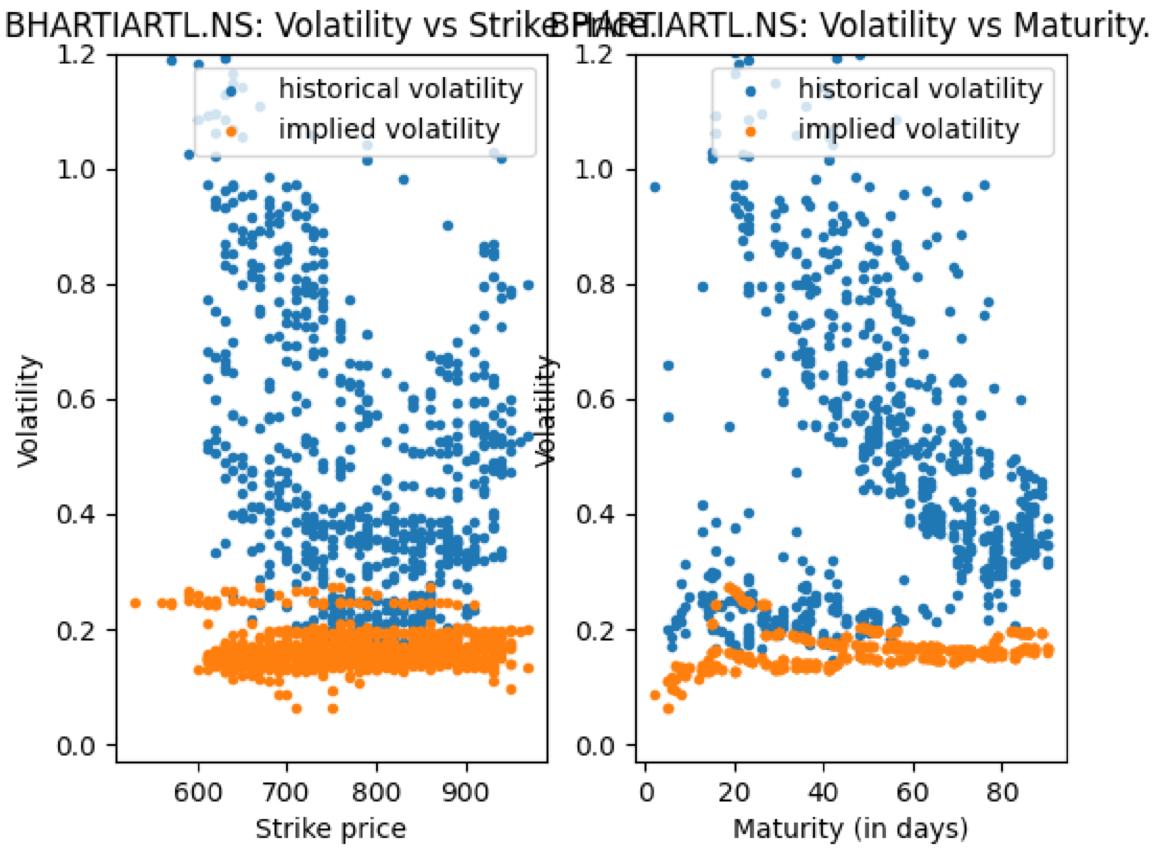

BAJAJ-AUTO.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Implied volatilitiy
Maturity (in days
Strike Price
3000
3500
4000
4500
0
20
40
60
80
0.0
0.2
0.4
0.6
0.8
1.0
1.2

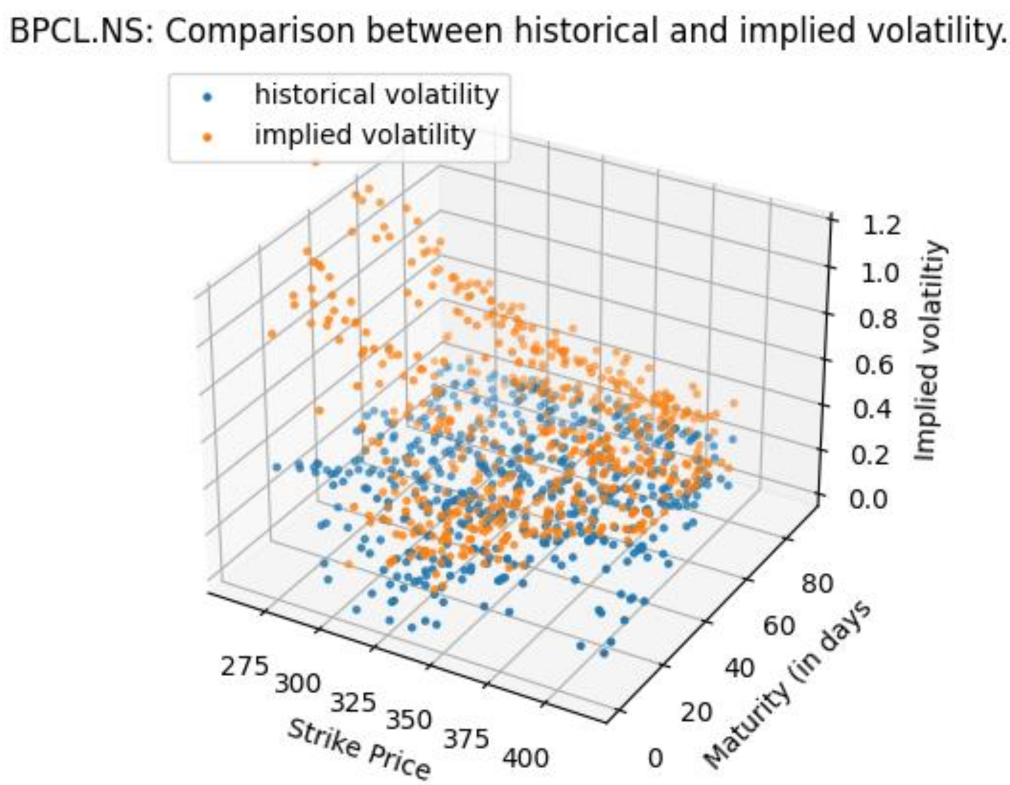

BAJAJ-AUTO.NS: Historical vs Implied volatilit
historical volatility
implied volatility
Volatility
Strike price
Implied Volatility
Historical Volatility
0.0
0.2
0.4
0.6
0.8
1.0
1.2
3000
3500
4000
4500
0
20
40
60
80

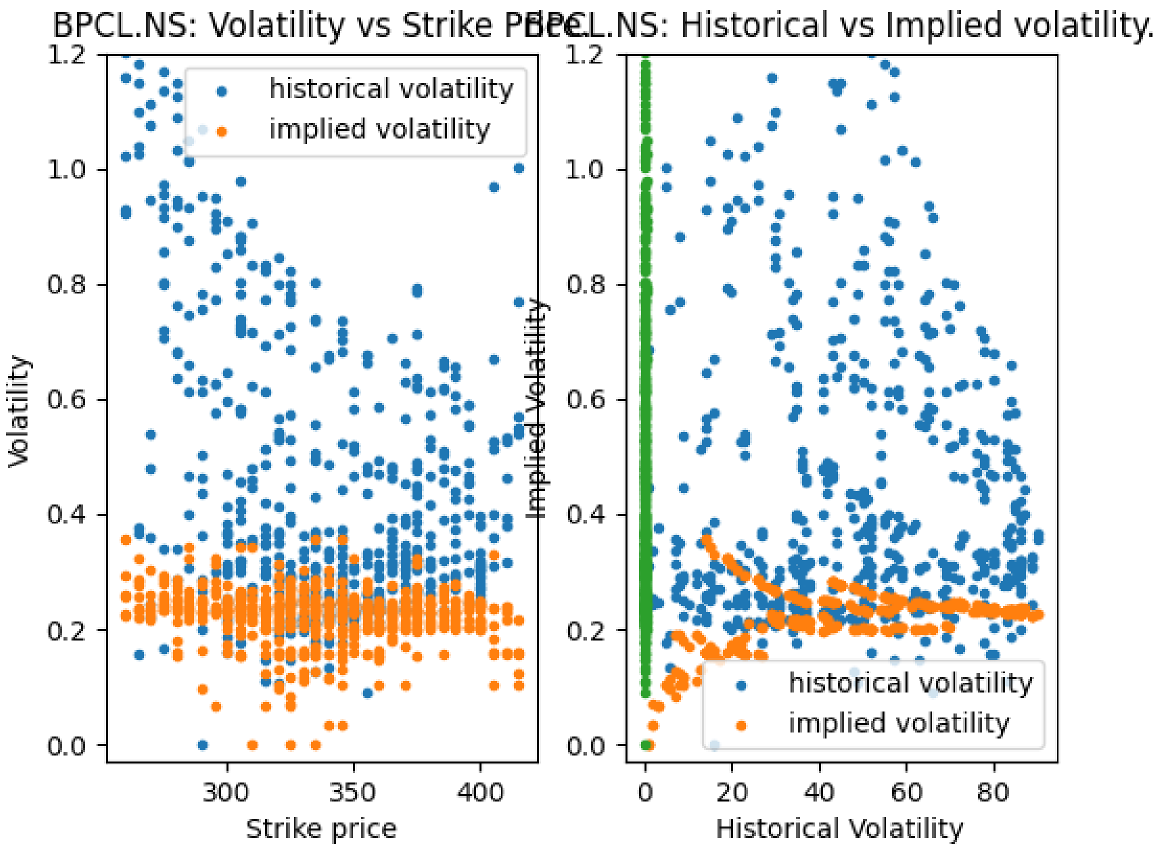

BAJAJ-AUTO.NS: Volatility vs Strike
BAJAJ-AUTO.NS: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
3000
3500
4000
4500
0
20
40
60
80

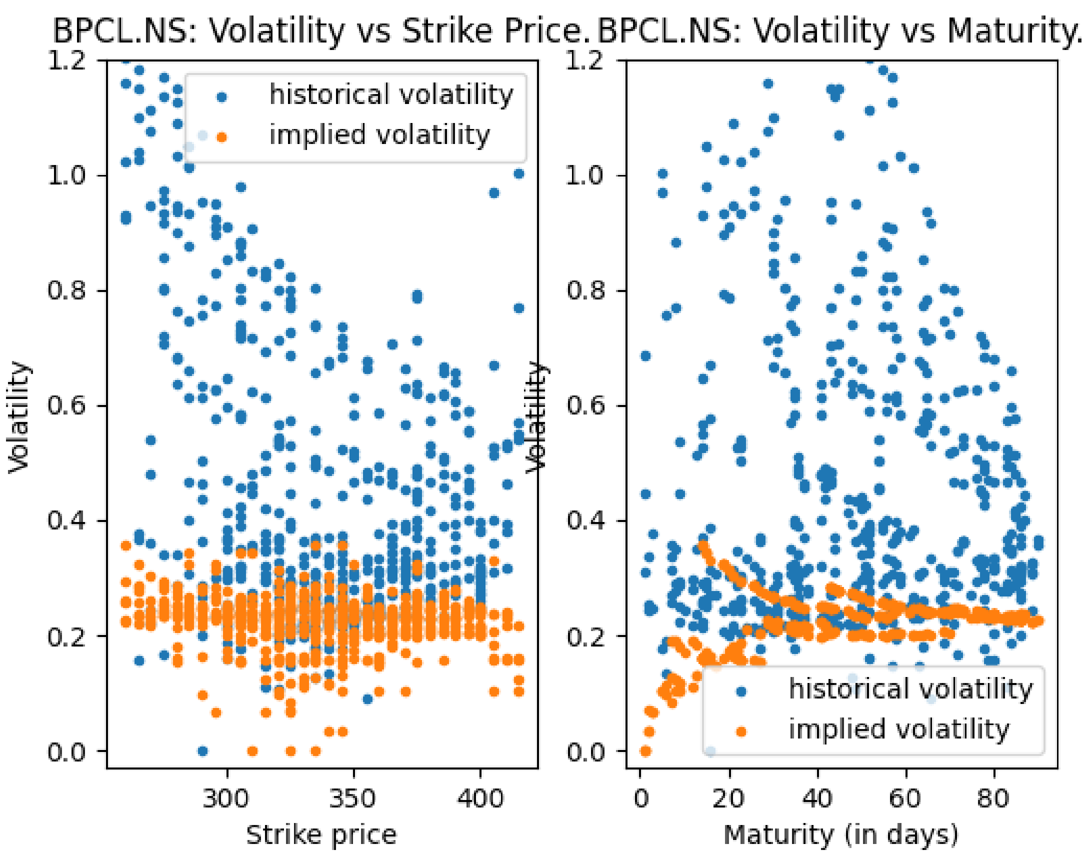

BHARTIARTL.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Strike Price
600
700
800
900
Maturity (in days
0
20
40
60
80
Implied volatiltiy
0.0
0.2
0.4
0.6
0.8
1.0
1.2

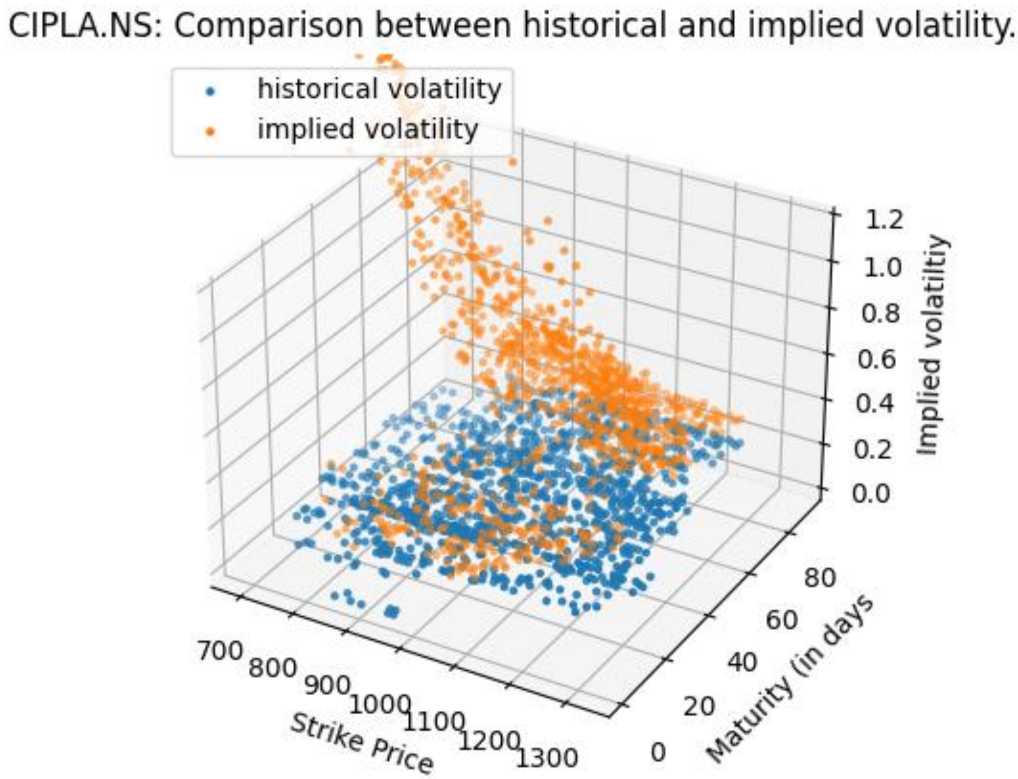

BHARTIARTL.NS: Volatility vs Strike Price
BHARTIARTL.NS: Historical vs Implied volatili
historical volatility
implied volatility
Volatility
Strike price
600
700
800
900
0.0
0.2
0.4
0.6
0.8
1.0
1.2
historical volatility
implied volatility
Implied Volatility
Historical Volatility
0
20
40
60
80
0.0
0.2
0.4
0.6
0.8
1.0
1.2

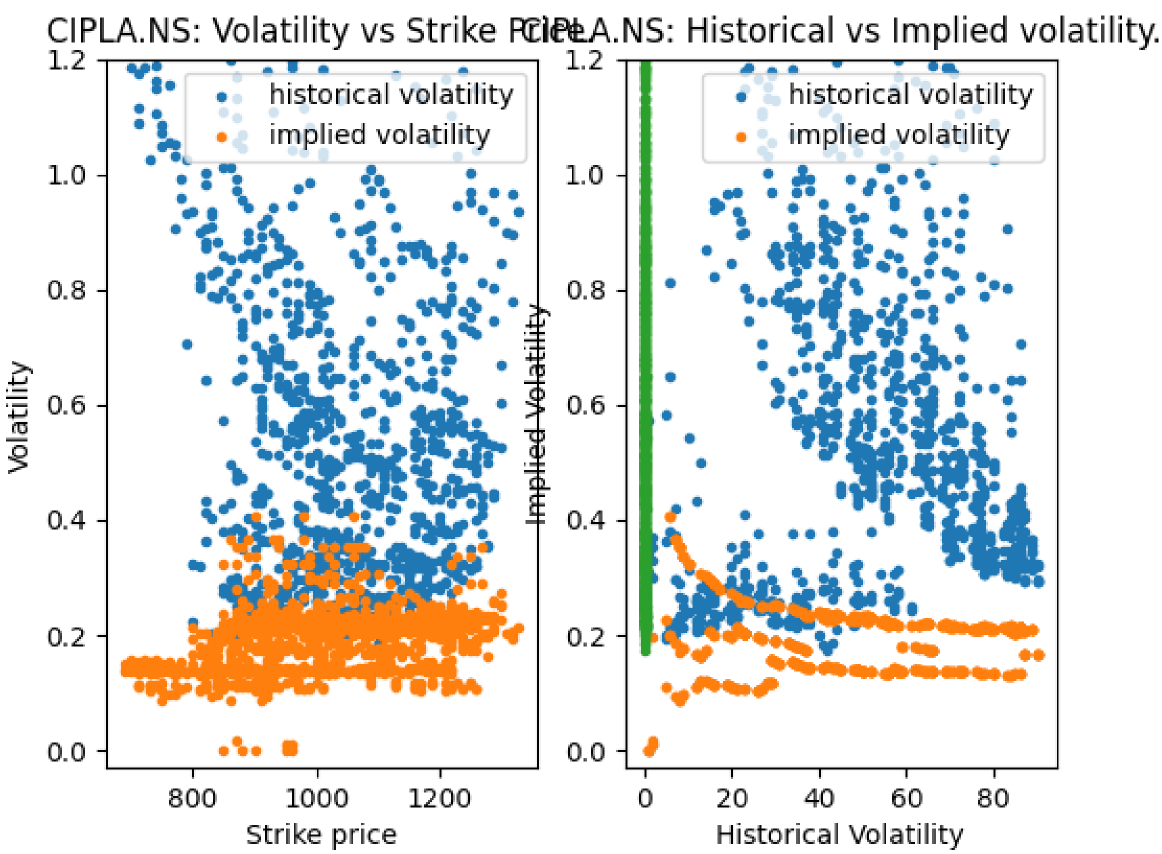

BHARTIARTL.NS: Volatility vs Strike Price.
BHARTIARTL.NS: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
600
700
800
900
0
20
40
60
80

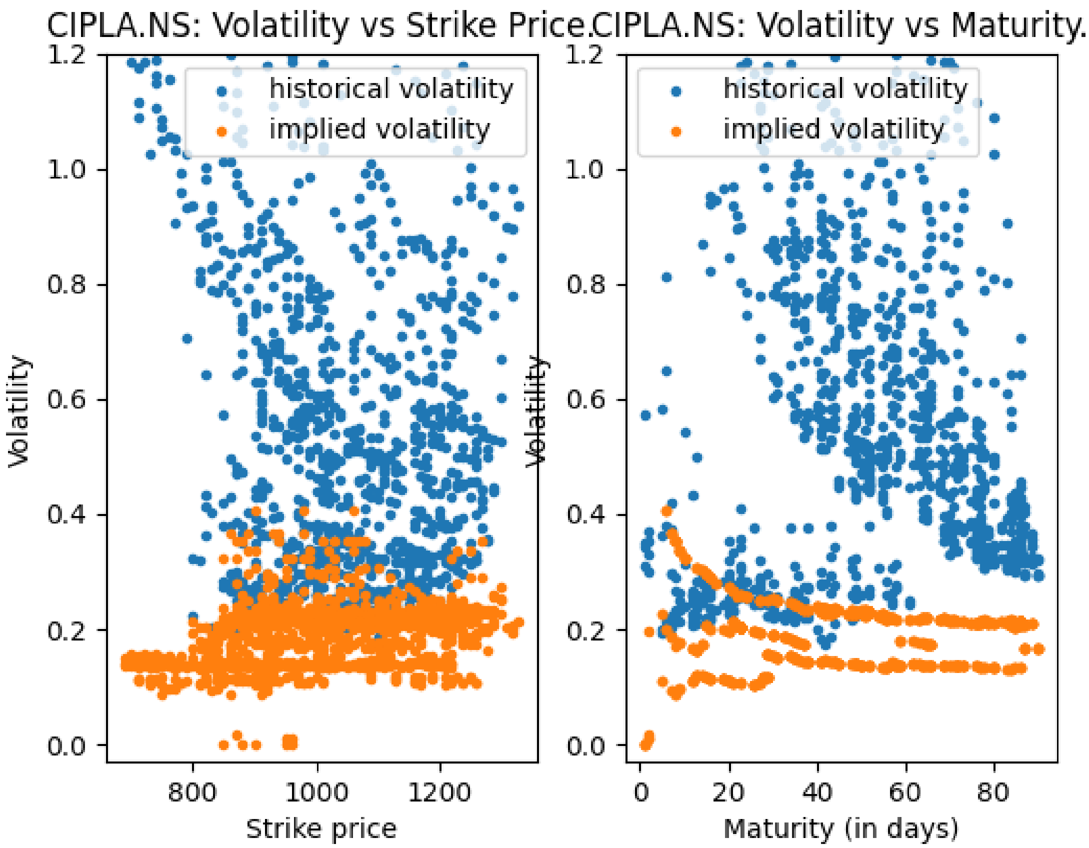

BPCL.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Implied volatilitiy
Strike Price
Maturity (in days
275
300
325
350
375
400
0
20
40
60
80
0.0
0.2
0.4
0.6
0.8
1.0
1.2

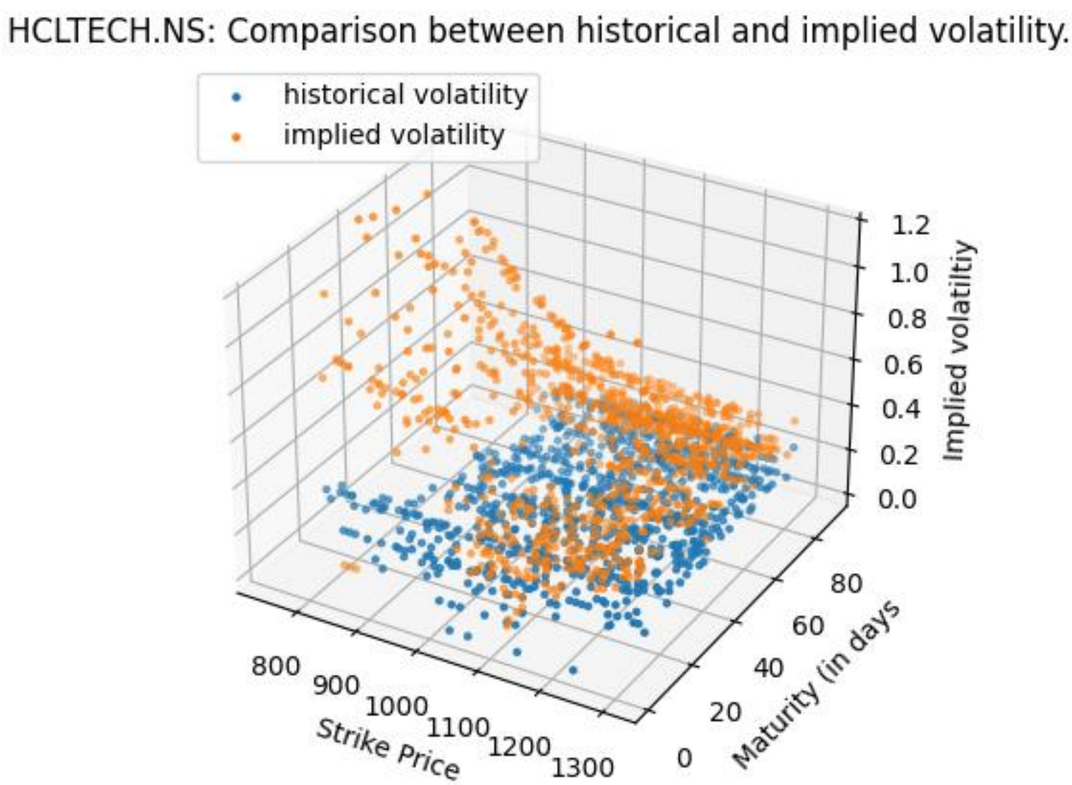

BPCL.NS: Volatility vs Strike Price.
BPCL.NS: Historical vs Implied volatility.
historical volatility
implied volatility
Volatility
Strike price
Implied Volatility
Historical Volatility

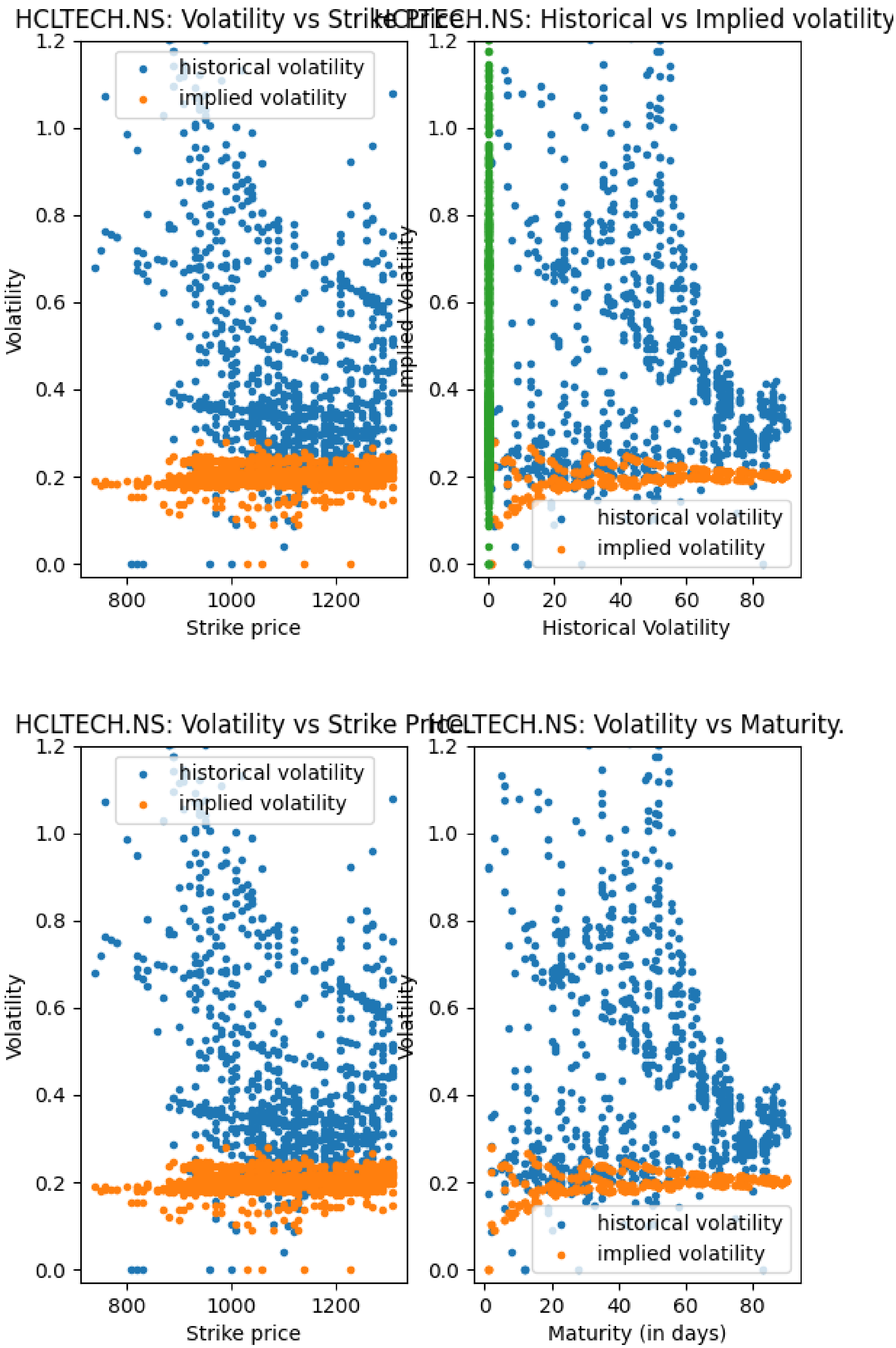

BPCL.NS: Volatility vs Strike Price.
BPCL.NS: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)


CIPLA.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Implied volatiltiy
700
800
900
1000
1100
1200
1300
Strike Price
0
20
40
60
80
Maturity (in days


CIPLA.NS: Volatility vs Strike Price
historical volatility
implied volatility
Volatility
1.2
1.0
0.8
0.6
0.4
0.2
0.0
800
1000
1200
Strike price
CIPLA.NS: Historical vs Implied volatility.
historical volatility
implied volatility
Implied Volatility
0
20
40
60
80
Historical Volatility


CIPLA.NS: Volatility vs Strike Price.
CIPLA.NS: Volatility vs Maturity.
historical volatility
implied volatility
Volatility
Strike price
Maturity (in days)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
800
1000
1200
0
20
40
60
80


HCLTECH.NS: Comparison between historical and implied volatility.
historical volatility
implied volatility
Strike Price
Maturity (in days
Implied volatilitiy
800
900
1000
1100
1200
1300
0
20
40
60
80
0.0
0.2
0.4
0.6
0.8
1.0
1.2



HCLTECH.NS: Volatility vs Strike Price
HCLTECH.NS: Historical vs Implied volatility
Volatility
Strike price
historical volatility
implied volatility
Implied Volatility
Historical Volatility
HCLTECH.NS: Volatility vs Strike Price
HCLTECH.NS: Volatility vs Maturity.
Volatility
Strike price
Maturity (in days)
historical volatility
implied volatility

***************** For ^NSEI *****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	2934.9	18191	7	0.0852192	0.730068
2	1.1	18191	7	0.0852192	0.199349
3	122.6	18191	7	0.0852192	0.117769
4	1.05	18191	7	0.0852192	0.261815
5	475.55	18191	7	0.0852192	0.14509
6	613.55	18191	7	0.0852192	0.140538
7	568.95	18191	7	0.0852192	0.150372
8	2743.2	18191	7	0.0852192	0.719412
9	2367.2	18191	7	0.0852192	0.701084
10	2321.1	18191	7	0.0852192	0.699139
11	2695.6	18191	7	0.0852192	0.716863
12	520	18191	7	0.0852192	0.142585
13	1.05	18191	7	0.0852192	0.351335
14	2506.85	18191	7	0.0852192	0.707515
15	1	18191	7	0.0852192	0.338042
16	1543.05	18191	7	0.0852192	0.674112
17	2	18191	14	0.110508	0.197546
18	1327.3	18191	14	0.110508	0.440969
19	4.9	18191	14	0.110508	0.136632
20	1938	18191	14	0.110508	0.426916

***************** For AXISBANK.NS *****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	9.55	934.55	27	0.196361	0.242358
2	68.95	934.55	27	0.196361	0.326978
3	93.7	934.55	27	0.196361	0.339541
4	1.3	934.55	27	0.196361	0.264188
5	12	934.55	56	0.177543	0.180018
6	14	934.55	56	0.177543	0.237313
7	26.85	934.55	56	0.177543	0.378794
8	1.2	933.75	26	0.201659	0.250386
9	197	933.75	26	0.201659	0.422949
10	60.75	933.75	55	0.179811	0.307947
11	33.9	933.75	55	0.179811	0.370322
12	22.85	933.75	55	0.179811	0.392076
13	79.15	933.75	55	0.179811	0.234927
14	133.25	933.75	89	0.187148	0.399638
15	140.4	933.75	89	0.187148	0.401211
16	126.3	933.75	89	0.187148	0.398124
17	36.5	933.75	89	0.187148	0.38447
18	128.65	941.6	23	0.203011	0.601089
19	5.9	941.6	23	0.203011	0.220787
20	5.9	941.6	23	0.203011	0.220787

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*****************  For HCLTECH.NS  *****************
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SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	10	1044.45	27	0.179303	0.221363
2	193.6	1044.45	27	0.179303	0.546753
3	8.6	1044.45	27	0.179303	0.590446
4	84.8	1044.45	56	0.186215	0.686246
5	101.5	1044.45	56	0.186215	0.719934
6	57.35	1044.45	56	0.186215	0.632862
7	221.5	1044.45	56	0.186215	1.00375
8	148.15	1044.45	56	0.186215	0.821308
9	126.85	1044.45	56	0.186215	0.77348
10	155.6	1044.45	56	0.186215	0.838421
11	294.95	1039.3	26	0.180728	0.720785
12	29.45	1039.3	26	0.180728	0.203484
13	220.05	1039.3	26	0.180728	0.667791
14	229.15	1039.3	26	0.180728	0.673649
15	103.35	1039.3	26	0.180728	0.628549
16	1.05	1039.3	26	0.180728	0.283416
17	8.45	1039.3	26	0.180728	0.223231
18	47.45	1039.3	26	0.180728	0.172709
19	9.65	1039.3	55	0.187903	0.190014
20	248.45	1039.3	55	0.187903	1.11511

```
*****************  For CIPLA.NS  *****************
```

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	4.05	1087.55	27	0.19409	0.289829
2	4.9	1087.55	27	0.19409	0.287709
3	226.95	1087.55	27	0.19409	1.38547
4	25.45	1087.55	27	0.19409	0.778307
5	378.85	1087.55	27	0.19409	2.00729
6	8.95	1087.55	27	0.19409	0.286327
7	2.1	1087.55	27	0.19409	0.319875
8	32.05	1087.55	56	0.224799	0.406573
9	117.7	1087.55	56	0.224799	0.451881
10	124.7	1087.55	56	0.224799	0.456663
11	18.75	1087.55	56	0.224799	0.400917
12	171.2	1087.55	56	0.224799	0.496046
13	131.95	1087.55	56	0.224799	0.46205
14	272.85	1075.95	26	0.196931	1.68
15	209.3	1075.95	26	0.196931	1.42374
16	2.65	1075.95	26	0.196931	0.377095
17	339.85	1075.95	26	0.196931	1.97559
18	183.9	1075.95	26	0.196931	1.32901
19	15.6	1075.95	26	0.196931	0.271611
20	17.05	1075.95	55	0.226877	0.423262

***************** For BPCL.NS *****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	23.75	327.2	27	0.153725	0.178393
2	10.35	327.2	27	0.153725	0.241923
3	1.55	327.2	27	0.153725	0.370662
4	4.75	327.2	56	0.198366	0.233103
5	9.95	330.5	26	0.155642	0.258986
6	28.9	330.5	26	0.155642	0.319173
7	7.65	330.5	55	0.199072	0.391773
8	40.75	330.5	89	0.225036	0.308334
9	64.3	330.5	89	0.225036	0.243245
10	37.35	330.5	89	0.225036	0.311437
11	16.75	330.5	89	0.225036	0.325782
12	18.7	330.5	89	0.225036	0.324588
13	18	333.85	23	0.157435	0.263427
14	1.65	333.85	23	0.157435	0.527789
15	4.25	333.85	23	0.157435	0.245608
16	1.2	333.85	23	0.157435	0.538148
17	5.9	333.85	23	0.157435	0.24318
18	5.9	333.85	23	0.157435	0.24318
19	2.25	333.85	23	0.157435	0.258619
20	2.25	333.85	23	0.157435	0.258619

***************** For BAJAJ-AUTO.NS *****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	113.1	3568.8	27	0.166648	0.629291
2	644.3	3568.8	27	0.166648	0.868013
3	5.95	3568.8	27	0.166648	0.206651
4	779.15	3568.8	27	0.166648	0.963764
5	27.6	3568.8	27	0.166648	0.59957
6	733.35	3568.8	27	0.166648	0.929602
7	138.75	3568.8	56	0.215129	0.423748
8	62.15	3568.8	56	0.215129	0.408748
9	56.35	3616.05	26	0.165876	0.243461
10	74.15	3616.05	26	0.165876	0.181007
11	14.85	3616.05	26	0.165876	0.258653
12	45.25	3616.05	26	0.165876	0.24718
13	17.15	3616.05	26	0.165876	0.580103
14	27.8	3616.05	26	0.165876	0.462471
15	132.35	3616.05	26	0.165876	0.211389
16	86.05	3616.05	26	0.165876	0.184357
17	66.05	3616.05	55	0.21593	0.259632
18	273.9	3616.05	55	0.21593	0.406574
19	156.8	3616.05	55	0.21593	0.395645
20	52.45	3616.05	55	0.21593	0.261467

**************** For BHARTIARTL.NS ****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	208.55	820.75	27	0.243178	0.754278
2	106.2	820.75	27	0.243178	0.647488
3	1.7	820.75	27	0.243178	0.202246
4	1.35	820.75	27	0.243178	0.232598
5	45.8	820.75	56	0.197129	0.521638
6	25.8	820.75	56	0.197129	0.494528
7	165.1	820.75	56	0.197129	0.748129
8	5	820.75	56	0.197129	0.202695
9	94.5	820.75	56	0.197129	0.597006
10	30	806.1	26	0.243047	0.224901
11	208.55	806.1	26	0.243047	1.09614
12	5.1	806.1	26	0.243047	0.214985
13	7.2	806.1	26	0.243047	0.214272
14	69.95	806.1	55	0.195263	0.623309
15	81.65	806.1	55	0.195263	0.647876
16	182.95	806.1	55	0.195263	0.918571
17	131.45	806.1	55	0.195263	0.767748
18	131.05	806.1	89	0.192117	0.44531
19	122.9	806.1	89	0.192117	0.434553
20	28.4	806.1	89	0.192117	0.348497

**************** For ADANIENT.NS ****************

SI No.	Call Price	Spot Price (S0)	Maturity (in days)	Historical Volatility	Implied Volatility
1	35.55	3810.6	27	0.269518	0.360642
2	751.45	3810.6	56	1.33217	0.846075
3	180.65	3810.6	56	1.33217	0.71232
4	31	3810.6	56	1.33217	0.33891
5	388.85	3810.6	56	1.33217	0.29795
6	281.5	3810.6	56	1.33217	0.730713
7	248.65	3810.6	56	1.33217	0.724477
8	238.9	3858.35	26	0.267577	0.339566
9	6	3858.35	26	0.267577	0.37956
10	103.75	3858.35	26	0.267577	0.335397
11	219.8	3858.35	55	1.34661	0.292835
12	248.65	3858.35	55	1.34661	0.698926
13	401.55	3858.35	55	1.34661	0.719319
14	824.1	3858.35	55	1.34661	0.801574
15	16	3858.35	55	1.34661	0.327308
16	190.05	3858.35	55	1.34661	0.328018
17	388.85	3858.35	55	1.34661	0.159836
18	66.05	3858.35	55	1.34661	0.334805
19	354.8	3858.35	89	1.28683	0.464445
20	400.35	3858.35	89	1.28683	0.462013

Observations:

1. Historical volatility represents past volatility, while implied volatility predicts future volatility.

2. Certain stocks like NIFTY50 and RELIANCE tend to have higher implied volatility, whereas others like BAJAJ-AUTO and TATAMOTORS exhibit higher historical volatility. Variations between these two types of volatilities stem from various real market factors.

3. The graphical representation of historical versus implied volatility effectively illustrates this relationship. Additionally, other plots demonstrate how different types of volatility correlate with changes in strike price and maturity.