**Question 2: (Plots at End of Report)**

We observe that with respect to strike price the options (put or call) show their respective behaviours. But for various maturity the options show random behaviour for both price and volatility. Usually the volatility is high for very short and very long time period (low for medium). There is some correlation between historical and Implied Volatility (Avg), but not much.

Taking t = 0, as Dec-30-2016

NIFTY

| Maturity (working days) | Implied Volatility (Avg) | Historical Volatility |
|---|---|---|
| 63 | 0.202647 | 0.149626 |
| 126 | 0.150987 | 0.130494 |
| 189 | 0.160971 | 0.134660 |
| 252 | 0.147656 | 0.150682 |

AMBUJACEM

| Maturity (working days) | Implied Volatility (Avg) | Historical Volatility |
|---|---|---|
| 21 | 0.624427 | 0.232486 |
| 42 | 0.560060 | 0.328754 |
| 63 | 0.345049 | 0.293577 |

BAJAJ-AUTO

| Maturity (working days) | Implied Volatility (Avg) | Historical Volatility |
|---|---|---|
| 21 | 0.215581 | 0.214274 |
| 42 | 0.297569 | 0.240816 |
| 63 | 0.261188 | 0.225267 |

BANKBARODA

| Maturity (working days) | Implied Volatility (Avg) | Historical Volatility |
|---|---|---|
| 21 | 0.385542 | 0.248893 |
| 42 | 0.402769 | 0.462451 |
| 63 | 0.418663 | 0.407327 |

# Question 2 Plots



AMBUJACEM Both Volatility vs Maturity

BANKBARODA Both Volatility vs Maturity

AMBUJACEM Call Option Price vs Maturity

BANKBARODA Call Option Price vs Maturity

AMBUJACEM Call Option Price vs (Maturity, Strike)

BANKBARODA Call Option Price vs (Maturity, Strike)

AMBUJACEM Call Option Price vs Strike

BANKBARODA Call Option Price vs Strike

AMBUJACEM Call Volatility vs Maturity

BANKBARODA Call Volatility vs Maturity

AMBUJACEM Call Volatility vs (Maturity, Strike)



BANKBARODA Call Volatility vs (Maturity, Strike)

AMBUJACEM Call Volatility vs Strike

BANKBARODA Call Volatility vs Strike

AMBUJACEM Put Option Price vs Maturity

BANKBARODA Put Option Price vs Maturity

AMBUJACEM Put Option Price vs (Maturity, Strike)

BANKBARODA Put Option Price vs (Maturity, Strike)

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AMBUJACEM Put Option Price vs Strike

BANKBARODA Put Option Price vs Strike

AMBUJACEM Put Volatility vs Maturity

BANKBARODA Put Volatility vs Maturity

AMBUJACEM Put Volatility vs (Maturity, Strike)

BANKBARODA Put Volatility vs (Maturity, Strike)

AMBUJACEM Put Volatility vs Strike

Maturity (in days) = 21
Maturity (in days) = 42
Maturity (in days) = 63

BANKBARODA Put Volatility vs Strike

BAJAJ–AUTO Both Volatility vs Maturity

NIFTY Both Volatility vs Maturity

BAJAJ−AUTO Call Option Price vs Maturity

NIFTY Call Option Price vs Maturity

BAJAJ–AUTO Call Option Price vs (Maturity, Strike)



NIFTY Call Option Price vs (Maturity, Strike)

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BAJAJ–AUTO Call Option Price vs Strike

NIFTY Call Option Price vs Strike

BAJAJ–AUTO Call Volatility vs Maturity

NIFTY Call Volatility vs Maturity



BAJAJ–AUTO Call Volatility vs (Maturity, Strike)

NIFTY Call Volatility vs (Maturity, Strike)

BAJAJ–AUTO Call Volatility vs Strike

NIFTY Call Volatility vs Strike

BAJAJ–AUTO Put Option Price vs Maturity

NIFTY Put Option Price vs Maturity

BAJAJ–AUTO Put Option Price vs (Maturity, Strike)

NIFTY Put Option Price vs (Maturity, Strike)



BAJAJ−AUTO Put Option Price vs Strike

NIFTY Put Option Price vs Strike

Maturity (in days) = 63
Maturity (in days) = 126
Maturity (in days) = 189
Maturity (in days) = 252

BAJAJ–AUTO Put Volatility vs Maturity

NIFTY Put Volatility vs Maturity



BAJAJ-AUTO Put Volatility vs (Maturity, Strike)

NIFTY Put Volatility vs (Maturity, Strike)



BAJAJ−AUTO Put Volatility vs Strike

NIFTY Put Volatility vs Strike