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An Analytical Study on Stock Index Using Option Greeks on Derivatives Market in India

Dr. M. Sumathy[1] Abirami T[2*]

[1]Professor and Head, Department of Commerce, Bharathiar University, Coimbatore, India.

[2]M.Com (Finance and Accounting), Department of Commerce, Bharathiar University, Coimbatore, India.

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*Corresponding Author: abithangavel10@gmail.com

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Abstract

This study explores the significance of Option Greeks in understanding the pricing dynamics and risk factors associated with options trading. Option Greeks namely Delta, Gamma, Vega, Theta, and Rho serve as crucial indicators of how an option's value responds to changes in underlying market variables such as asset price, volatility, and time decay. These metrics play an essential role in both hedging strategies and speculative activities by offering insights into potential price movements and risk exposures. Options contracts, which grant the right to buy or sell an asset at a specific strike price before a set expiration date, are priced based on models considering these sensitivities. By integrating Option Greeks with pricing models, investors can make more informed and strategic decisions in the derivative markets. This paper aims to highlight the role of Option Greeks in analyzing options and managing investment risks effectively.

Keywords: *Greeks, Stock Index Options, Nifty 50 Options, Options Pricing, Delta, Gamma, Vega, Theta, Rho, Implied Volatility, Time Decay, Trend Analysis.*

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1. INTRODUCTION

Option Greeks are key financial metrics that measure how sensitive an option's price is to various factors related to the underlying asset. These measures are widely used in analyzing individual options and entire option portfolios, helping traders understand the risks and make informed investment decisions. Options contracts serve multiple purposes, such as hedging against potential losses in a portfolio or speculating on future price movements of an asset. A call option grants the holder the right to buy the underlying asset, whereas a put option allows the holder to sell it. Both types of options have a predetermined price known as the strike price and must be exercised by a specific date, referred to as the expiration date. The cost of entering an option position is called the premium, which fluctuates based on pricing models that incorporate various market factors. To assess these price movements

and associated risks, traders often rely on Option Greeks in combination with option pricing models. The primary Greeks include Delta, Gamma, Vega, Theta, and Rho, each representing the impact of different variables such as changes in the underlying asset's price, market volatility, and time decay. There are also additional Greeks beyond these core ones. Together, they provide valuable insights into how an option behaves under different market conditions.

2. STATEMENT OF THE PROBLEM

The Indian derivative market has witnessed significant growth, with options trading playing a crucial role in investment strategies. However, traders and investors often lack a structured approach to interpreting Option Greek - key risk measures that influence option pricing and decision-making. Option Greeks such as Delta, Gamma, Theta, Vega, and Rho provide insights into price sensitivity, time decay, volatility impact, and the behavior of various companies. This study aims to bridge the gap by analyzing the behavior of Option Greeks in Stock Index Options, comparing their impact across various companies, and offering practical recommendations to enhance trading strategies and risk management.

3. OBJECTIVES OF THE STUDY

- To analyze the role of Option Greeks in helping traders and investors make informed decisions.
- To compare the Behavior of Option Greeks across my selected companies.

4. RESEARCH METHODOLOGY

4.1 Sources of Data

The data used are secondary and collected from the NSE website, Money Control, and historical data.

4.2 Sampling Method

A sample of 5 companies listed in the Stock Index is taken for my analysis.

4.3 Selected Companies for analysis:

- ABCAPITAL
- HDFC BANK
- TCS
- UNION BANK
- PEL

4.4 Period of the Study

The period of the study covers 3 months from 01.12.2024 to 28.02.2025.

4.5 Tools Used for Analysis

- Trend analysis
- Descriptive Analysis

5. ANALYSIS AND INTERPRETATION

- **Objective 1:**

To analyze the role of Option Greeks in helping traders and investors make informed decisions.

5.1 Trend Analysis

Analyzing monthly trends in Option Greeks such as Delta, Gamma, Theta, Vega, and Rho for selected companies like ABCAPITAL, HDFC BANK, TCS, UNION BANK, and PEL provides traders with valuable insights into market behavior and evolving price dynamics. These Greeks serve as essential indicators of how option prices react to changes in the underlying asset, time to expiry, volatility, and interest rates. For instance, Delta reflects the directional movement of the underlying asset, Gamma indicates the rate of change in Delta, Theta measures time decay, Vega captures sensitivity to volatility, and Rho shows the impact of interest rate changes. Observing consistent patterns—whether rising or falling—in these Greeks over time helps traders assess risk exposure, forecast potential price movements, and adjust their strategies accordingly. Monthly trend analysis allows for the identification of recurring behaviors or anomalies in the market, which can be used to refine decision-making processes. It supports traders in optimizing entry and exit points based on changing market conditions and enhances the ability to respond proactively to shifts in momentum or volatility. This approach not only improves trading accuracy but also strengthens risk management by enabling a deeper understanding of market signals. Ultimately, monitoring these trends empowers traders to make more informed, data-driven decisions and improve profitability in index options trading.

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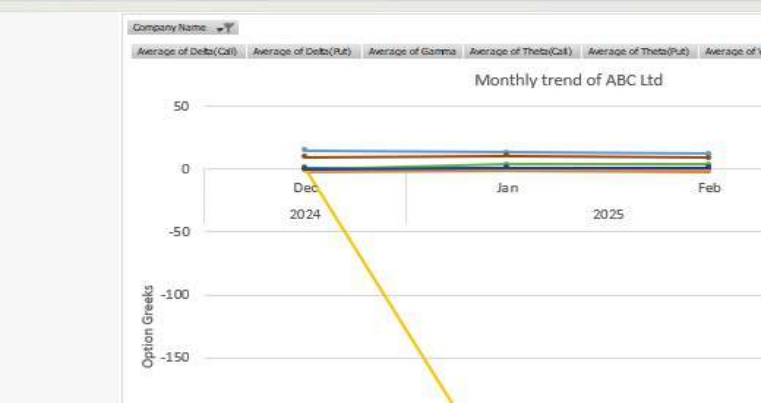
5.1.1 Monthly Trend Charts

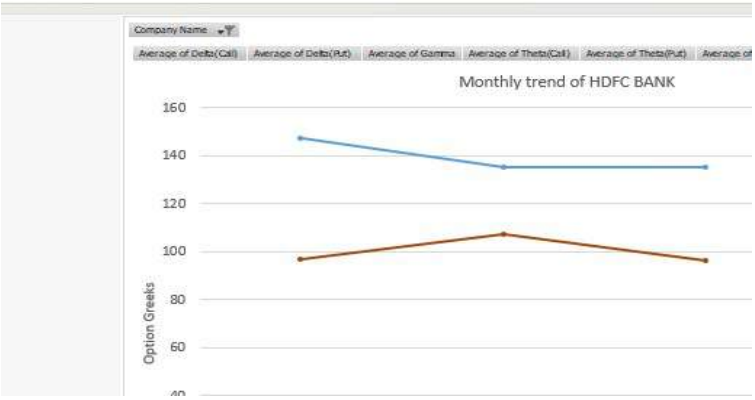
❖ **Trend Analysis of ABC LTD**



Source: (Computed and Compiled from the Excel)

The Option Greeks exhibit noticeable trends over the period from December 2024 to February 2025. Delta (Call) shows a slight decline, suggesting that the sensitivity of call options to price changes in the underlying stock is decreasing. Delta(Put) remains close to -1, indicating deep in-the-money puts that closely mirror inverse stock movements. Gamma remains extremely low, signifying minimal fluctuations in Delta, which suggests that the options are either deep in-the-money or out-of-the-money. Theta (Call & Put) exhibits a steep negative trend, highlighting rapid time decay, with call options losing value faster than puts. Vega decreases over time, reflecting the reduced sensitivity of option prices to volatility changes as expiry nears. Meanwhile, Rho (Call & Put) remains low, indicating that interest rate fluctuations have little impact on ABCAPITAL's options. These patterns suggest that as expiration approaches, traders in ABCAPITAL options must account for the reduced responsiveness of Delta, the accelerated time decay, and the diminishing influence of volatility when making trading decisions.

❖ **Trend Analysis of HDFC BANK**



Source: (Computed and Compiled from the Excel)

The Options Greeks show similar trends but with some variations in magnitude. Delta (Call) experiences a gradual decrease, indicating that call options become less reactive to changes in the underlying stock price, while Delta (Put) stays close to -1, suggesting that deep-in-the-money put options move almost exactly opposite to the stock. Gamma remains low throughout the observed period, implying stable Delta values with minimal shifts. Theta (Call & Put) follows a strong negative trend, emphasizing that both call and put options are losing value due to time decay, with calls experiencing slightly higher decay than puts. Vega declines steadily, suggesting that as expiry nears, volatility has a weaker effect on option pricing. Rho (Call & Put) remains low, reinforcing the

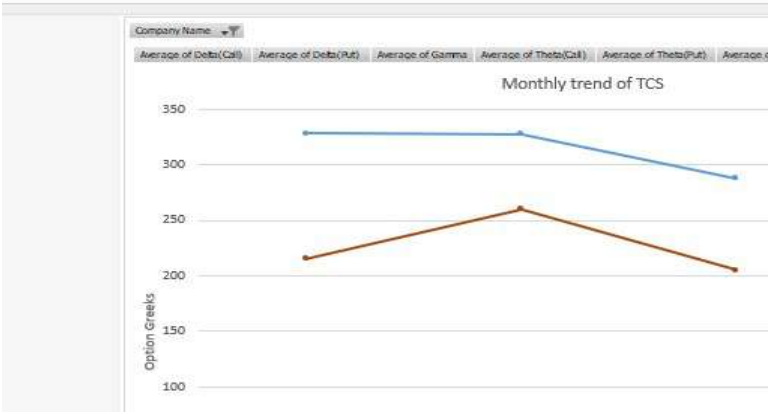
minimal impact of interest rate changes on HDFCBANK's option prices. Overall, the behavior of these Greeks indicates that traders should focus on managing time decay and volatility exposure, as well as adjusting their strategies based on the declining sensitivity of option prices to market movements.

❖ Trend Analysis of PEL

Source: (Computed and Compiled from the Excel)

Delta(Call) shows a gradual decline, indicating that call options are becoming less sensitive to changes in the underlying stock price, while Delta(Put) remains close to -1, suggesting that deep-in-the-money put options closely mirror inverse stock movements. Gamma remains consistently low, implying that Delta is stable with minimal fluctuations. Theta(Call & Put) follows a strong negative trajectory, highlighting the impact of time decay on option values, with call options experiencing slightly higher decay than puts. Vega steadily declines, indicating that as expiration approaches, volatility has a diminishing effect on option pricing. Rho(Call & Put) remains low throughout the period, reinforcing that interest rate fluctuations have minimal influence on PEL's option prices. Overall, these trends suggest that traders should focus on mitigating the effects of time decay and adjusting their positions in response to the decreasing influence of volatility on option valuations.

❖ Trend Analysis of TCS

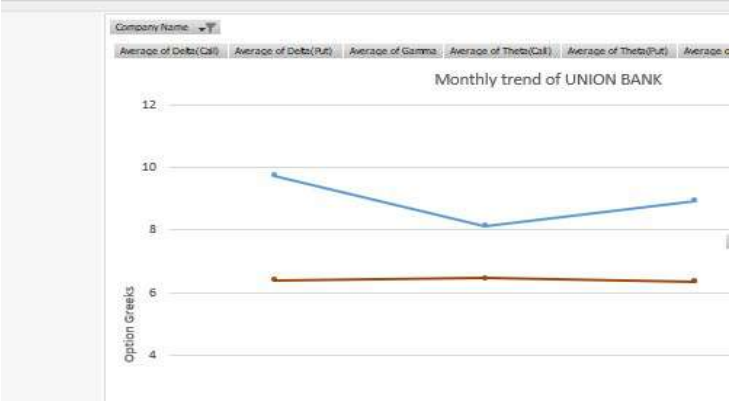


Source: (Computed and Compiled from the Excel)

The analysis of TCS Options Greeks over the period from December 2024 to February 2025 reveals key insights into their behavior. Delta for Call options remains consistently at 1, indicating that the Call option prices move almost one-to-one with the underlying stock price, while Delta for Put options is 0, suggesting they are out-of-the-money with minimal price movement. Gamma values are

extremely low, meaning Delta is stable with little sensitivity to changes in the underlying price. Theta shows that time decay has a minor negative impact on Call options, whereas Put options experience significant value erosion over time. Vega is close to zero, indicating that fluctuations in implied volatility have a negligible effect on both Call and Put options, suggesting they are either deep in-the-money or out-of-the-money. Lastly, Rho shows minimal impact on Call options, while Put options have a relatively high Rho value, meaning interest rate changes significantly influence their pricing. Overall, the analysis suggests that TCS Call options are deep-in-the-money with stable behavior, whereas Put options are out-of-the-money and highly sensitive to time decay and interest rate fluctuations.

❖ **Trend Analysis of UNION BANK**



Source: (Computed and Compiled from the Excel)

The analysis of Option Greeks for Union Bank across different months provides key insights into the option price behavior and sensitivity to market factors. The Delta for Call options remains stable at 1, indicating deep-in-the-money options with high sensitivity to underlying price movements, while the Delta for Put options is close to zero, suggesting they are out-of-the-money. Gamma values are extremely small, implying minimal changes in Delta concerning price fluctuations. Theta shows negative values, with Call options losing a very small amount of value daily and Put options exhibiting larger values, reflecting time decay's impact on option pricing. Vega remains low, indicating that implied volatility changes have little impact on option prices. The Rho for Call options is close to zero, while for Put options, it is significantly higher, suggesting a greater sensitivity to interest rate changes. The chart shows that Delta remains relatively stable, while Theta and Rho exhibit some fluctuations, highlighting the changing effects of time decay and interest rate sensitivity over the months.

➢ **Objective 2:**

To compare the Behavior of Option Greeks across selected companies.

5.2 Descriptive Analysis

❖ **Introduction**

Descriptive analysis summarizes and interprets data to identify patterns and trends. In the context of Option Greeks, it helps traders and researchers analyze how different factors such as price movements, volatility, and time decay affect options pricing.

❖ **Explanation**

Descriptive analysis in Option Greeks involves statistical measures like Mean, Standard Deviation, and Range to study the behavior of Option Greeks across different stocks, strike prices, and periods.

The five Options Greeks analyzed are:

- Delta (Δ): Measures how much the option price changes with the underlying stock price.
- Gamma (Γ): Measures how much Delta changes when the stock price moves.
- Theta (Θ): Measures the rate of time decay in the option price.

- Vega (ν): Measures the sensitivity of the option price to changes in volatility.
- Rho (ρ): Measures the sensitivity of the option price to interest rate changes.

❖ **Mean (Average Value)**

The Mean helps to understand the average behavior of each Greek over the selected period.

Formula In Excel: =AVERAGE (range)

- If the Delta (Call) Mean is close to 1, most options are deep in-the-money.
- If the Theta Mean is highly negative, options quickly lose value.
- A higher Vega Mean means options are more sensitive to volatility.

Table-1 : Calculation of Mean for Call & Put

Company Name	Option Type	Delta	Gamma	Theta	Vega	Rho
ABCAPITAL	Call	0.754	0.0017	-176.68	2.45	0.82
ABCAPITAL	Put	-0.999		13.56		9.76
HDFC BANK	Call	0.999	0.0016	-1.111	0.002	0.0002
HDFC BANK	Put	-0.0005		138.98		100.02
TCS	Call	1	6.05517×10^{-19}	-2.32323×10^{-16}	2.86596×10^{-18}	1.52532×10^{-19}
TCS	Put	0		314.38		226.93
UNIONBANK	Call	1	8.86692×10^{-13}	-1.94984×10^{-9}	2.52149×10^{-12}	1.54774×10^{-13}
UNION BANK	Put	-9.51239×10^{-13}		8.93		6.41
PEL	Call	1	1.04286×10^{-7}	-7.41888×10^{-5}	1.07699×10^{-7}	8.54772×10^{-9}
PEL	Put	-2.38202×10^{-8}		77.24		74.74

Source: (Computed and Compiled from the Excel)

Delta: The ABCAPITAL call option has a delta of 0.754, indicating a moderate positive correlation with the stock price, while the put option has a delta of -0.999, meaning it moves almost inversely to the stock price. The HDFC BANK call delta is 0.999, meaning it nearly matches the stock price movements. The put delta is -0.0005, suggesting a very low sensitivity to stock price changes. The TCS call delta is exactly 1, showing a perfect correlation with stock price changes, whereas the put delta is 0, indicating no sensitivity. The UNION BANK call delta is 1, behaving similarly to TCS, whereas the put delta is -9.51239×10^{-13}, which is nearly zero, meaning minimal price sensitivity. The PEL call delta is 1, confirming strong responsiveness to stock price increases, while the put delta is -2.38202×10^{-8}, suggesting negligible sensitivity.

Gamma: The Gamma for ABCAPITAL is 0.0017, which indicates a moderate rate of change in Delta. This means that as the underlying price moves, the option's Delta adjusts at a reasonable rate, making it more responsive to price fluctuations. However, compared to other companies, this Gamma value suggests that while there is some reactivity, it is not highly volatile. The Gamma for HDFC BANK is 0.0016, which is nearly identical to ABCAPITAL. This suggests that Delta is also adjusting at a moderate pace, ensuring a stable yet responsive relationship between the option price and the underlying asset. Since Gamma remains low, it implies that the option does not experience significant fluctuations in Delta, keeping price sensitivity relatively steady. The Gamma for TCS is extremely low at 6.05517×10^{-19}, meaning there is almost no change in Delta as the underlying price fluctuates. This suggests that the option price remains relatively stable and does not react sharply to underlying market movements. Such a low Gamma indicates that the Delta of TCS options is nearly constant, making them less sensitive to rapid price swings. The Gamma for UNION BANK stands at 8.86629×10^{-12}, which, although higher than TCS, is still

considered very low. This suggests that changes in Delta remain minimal, meaning the option price does not significantly adjust in response to underlying price movements. Traders holding UNION BANK options would see only small shifts in Delta, leading to relatively predictable price behavior. PEL has the highest Gamma at 1.04286×10^{-7}, though it is still relatively low compared to industry benchmarks. This implies that while Delta adjusts slightly faster than in UNION BANK and TCS, the option remains fairly stable and does not exhibit excessive fluctuations. This level of Gamma suggests a modest sensitivity of Delta to underlying price changes, offering a balance between responsiveness and stability.

Theta: The ABCAPITAL call theta is -176.68, meaning it loses value significantly as time passes, while the put theta is 13.56, implying it retains value better over time. The HDFC BANK call theta is -1.111, showing slight time decay, whereas the put theta is 138.98, meaning it holds value well. The TCS call theta is -2.32323×10^{-16} (nearly zero), while the put theta is 314.38, suggesting strong value retention for puts. The UNION BANK call theta is -1.94984×10^{-9} (very low), while the put theta is 8.93, indicating slight value retention. The PEL call theta is -7.41888×10^{-5}, suggesting minor value loss, while the put theta is 77.24, meaning it holds value over time.

Vega: The Vega for ABCAPITAL is 2.45, indicating that its option prices are highly sensitive to changes in market volatility. A small increase in volatility would result in a noticeable change in the option's price, making it an attractive choice for traders expecting market turbulence. The Vega for HDFC BANK is 0.002, which is extremely low. This suggests that volatility has a negligible impact on the option's price. Even if market volatility increases significantly, the price of HDFC BANK's options is unlikely to experience drastic fluctuations. The Vega for TCS is 2.86596×10^{-18}, an almost negligible value. This indicates that changes in market volatility have little to no effect on pricing its options, making them relatively stable in uncertain market conditions. A Vega of 2.52149×10^{-12}, UNION BANK options also show minimal sensitivity to volatility. Traders holding these options would experience little impact from shifts in market uncertainty, leading to stable pricing. The Vega for PEL is1.07699×10^{-7}, which is slightly higher than that of UNION BANK and TCS but still relatively insignificant. While there is some reaction to volatility changes, the effect remains minimal, making it less prone to major price fluctuations caused by market uncertainty.

Rho: The ABC Ltd call rho is 0.82, meaning a rise in interest rates slightly benefits it, while the put rho is 9.76, indicating a moderate negative effect. The HDFC BANK call rho is 0.0002, showing minimal influence from interest rates, while the put rho is 100.02, meaning it is highly sensitive. The TCS call rho is 1.52533×10^{-19} (nearly zero), whereas the put rho is 226.93, indicating strong interest rate sensitivity. The UNION BANK call rho is 1.54774×10^{-13} (insignificant), while the put rho is 6.41, meaning it has a slight response. The PEL call rho is 8.54772×10^{-9} (very low), whereas the put rho is 74.74, suggesting moderate interest rate sensitivity.

5.3 Standard Deviation (Volatility of Greeks)

Measures how much the Greek values fluctuate from the mean.

Formula In Excel: =STDEV.P(range)

- A high Standard Deviation in Delta means the option's price sensitivity is unstable.
- A low Standard Deviation in Theta means time decay remains consistent.
- High Vega Standard Deviation means option pricing is highly unpredictable due to volatility changes.

Table-2 : Calculation of Standard Deviation for Call & Put

Company Name	Option Type	Delta	Gamma	Theta	Vega	Rho
ABCAPITAL	Call	0.173		125.11		0.58
ABCAPITAL	Put	0.0001	0.001	1.024	3.46	0.73
HDFC BANK	Call	9.38253×10^{-6}		0.761		0.0001
HDFC BANK	Put	0.0003	0.001	5.673	0.003	5.079

TCS	Call	0	1.3158×10^{-18}	3.1707×10^{-16}	6.139×10^{-18}	2.07538×10^{-19}
TCS	Put	0		18.702		23.851
UNIONBANK	Call	1.40288×10^{-13}	1.93055×10^{-12}	2.28799×10^{-9}	4.248×10^{-12}	1.78655×10^{-13}
UNION BANK	Put	1.23845×10^{-12}		0.653		0.040
PEL	Call	4.78817×10^{-10}	2.33101×10^{-7}	7.33566×10^{-5}	4.605×10^{-9}	8.17635×10^{-9}
PEL	Put	3.24759×10^{-8}		8.603		28.30

Source: (Computed and Compiled from the Excel)

Delta: The call delta for ABCAPITAL is 0.173, indicating that for every ₹1 change in the underlying price, the call option moves by 17.3%, while the put delta is 0.0001, showing almost no sensitivity to price changes. The call delta for HDFC BANK is 9.38253×10^{-4}, which is very low, indicating minimal responsiveness to underlying price changes, while the put delta is 0.0003, which also shows weak sensitivity. The call delta for TCS is 0, meaning no price sensitivity. The put delta is also 0, confirming no impact from price movements. The call delta for UNION BANK is 1.40288×10^{-3}, showing very low sensitivity to price changes. The put delta is 1.12458×10^{-3} also indicating minimal impact. The call delta for PEL is 4.78817×10^{-3} which is slightly higher than other companies but still low. The put delta is 3.24759×10^{-3}, reflecting weak price sensitivity.

Gamma: The Gamma value for ABCAPITAL is 0.001, suggesting a moderate rate of change in delta for both call and put options. The Gamma for HDFC BANK is 0.001, meaning the change in delta remains minimal for both calls and put options. The Gamma for TCS is 1.3158×10^{-18}, which is an extremely low value, implying negligible changes in delta. The Gamma for UNION BANK is1.93055×10^{-12}, which is very small, suggesting little change in delta. The Gamma for PEL is 2.33101×10^{-7}, meaning that the delta changes slightly with price movements.

Theta: The call theta for ABCAPITAL is 125.11, meaning it loses value significantly as time passes, while the put theta is 1.024, indicating it retains value better over time. The call theta for HDFC BANK is 0.761, showing slight time decay, whereas the put theta is 5.673, indicating strong value retention over time. The call theta for TCS is 3.1707×10^{-16}, nearly zero, indicating minimal time decay. The theta is 18.702, showing slight value retention. The call theta for UNION BANK is 2.28799×10^{-9}, almost zero, meaning minimal time decay. The put theta is 0.653, implying slight value retention. The call theta for PEL is 7.33566×10^{-5}, suggesting minor value loss over time. The put theta is 8.603, meaning it holds value better over time.

Vega: The Vega for ABCAPITAL is 3.46, showing high sensitivity to volatility changes, meaning even a small rise in market volatility will significantly affect its price. The Vega for HDFC BANK is 0.003, which is extremely low, implying that volatility changes have little effect on option prices. The Vega for TCS is 6.139×10^{-18}, an almost negligible value, meaning volatility has no meaningful impact. The Vega for UNION BANK is4.248×10^{-12}, which is extremely low, meaning that volatility has almost no effect. The Vega for PEL is 4.605×10^{9}, showing minimal volatility sensitivity.

Rho: The call Rho for ABCAPITAL is 0.58, implying that an increase in interest rates slightly raises the call option's price, while the put Rho is 0.73, meaning a rise in rates slightly increases the put option's price. The call Rho for HDFC BANKis 0.0001, meaning a rise in interest rates has a moderate impact on increasing the option price, while the put Rho is 5.079 is strong. The call Rho for TCS is2.07358×10^{-28},which is practically insignificant, while the he put Rho is 23.851, indicating a strong relationship between interest rate changes and put option pricing. The call Rho for UNION BANK is negligible, while the put rho is 0.040, showing a weak relationship with interest rate changes. The call Rho for PEL is 8.17653×10^{-9}, reflecting the negligible impact from interest rates, while the put Rho is 28.30, showing a significant effect of interest rate changes on pricing.

5.4 Range (Max-Min)

Measures the highest and lowest values of each Greek.

Formula in Excel: =MAX (range) – MIN (range)

- A wide range in Gamma means Delta is unstable, indicating high risk.
- A high range in Rho suggests interest rate sensitivity fluctuates a lot.

Table-3 : Calculation of Range for Call & Put

Company Name	Option Type	Delta	Gamma	Theta	Vega	Rho
ABCAPITAL	Call	0.369	0.003	273.167	7.52	1.27
ABCAPITAL	Put	0.0003		2.490		1.80
HDFC BANK	Call	2.26894×10^{-5}	0.004	1.836	0.008	0.0003
HDFC BANK	Put	0.0007		12.08		11.01
TCS	Call	0	3.54692×10^{-18}	6.80559×10^{-16}	1.65896×10^{-17}	4.45903×10^{-19}
TCS	Put	0		39.89		-1.10
UNIONBANK	Call	3.0842×10^{13}	5.20315×10^{-12}	5.14604×10^{-9}	1.19165×10^{-11}	4.03701×10^{-13}
UNION BANK	Put	2.68985×10^{12}		1.600		0.09
PEL	Call	1.07989×10^{9}	6.25516×10^{-7}	0.0001	4.86723×10^{-7}	1.9267×10^{-8}
PEL	Put	6.97683×10^{8}		18.56		63.59

Source: (Computed and Compiled from the Excel)

Delta: The call option Delta for ABCAPITAL is 0.369, meaning a 1-point increase in the underlying price leads to a 0.369 increase in the option price, while the put option has a very low Delta (0.0003), indicating minimal price movement in response to the underlying asset change. The call option Delta for HDFC BANK is close to zero (2.26894×10^{-5}), suggesting the option is deep out-of-the-money and has little sensitivity to price changes, while the put Delta (0.0007) is also low, meaning small changes in the stock price do not significantly impact the Put. TCS has a Delta of 0 for both Call and Put, meaning these options are deep out-of-the-money. The call option for UNION BANK is highly sensitive to price changes, meaning that for every 1-point increase in the stock price, the option price increases significantly, while the Put option is less sensitive, indicating it might be out-of-the-money or has a lower probability of expiring in-the-money. The call option for PEL has a strong reaction to underlying price changes, suggesting it is either deep in-the-money or at-the-money, while the Put option is not very reactive, meaning it is either out-of-the-money or losing its effectiveness as expiration nears.

Gamma: A low Gamma value for ABCAPITAL indicates that Delta changes gradually with small movements in the underlying price. This means the option price reacts smoothly and predictably to market changes. The HDFC BANK is small, Gamma suggests a slow rate of Delta change. The option remains stable, and price movements in the underlying asset do not cause sudden shifts in option sensitivity. TCS is an extremely small Gamma value that is nearly zero, meaning Delta hardly changes at all. Such a low value could indicate that the option is deep in-the-money or deep out-of-the-money, where Delta is already close to 0 or 1 and does not fluctuate much. A UNION BANK shows a very small Gamma, suggesting minimal change in Delta. This means the option behaves stably, with little sensitivity to price movements of the underlying asset. While the PEL value is larger than TCS and UNION BANK, it is still quite low, indicating that Delta remains relatively stable. The option's price sensitivity to the underlying asset changes at a controlled rate.

Theta: The call option for ABCAPITAL has an extremely high Theta (273.167), meaning its price decays rapidly as expiration approaches, while the put option Theta (2.490) is much lower,

suggesting slower time decay for puts. The HDFC BANK Put option (12.08) experiences higher time decay than the Call option (1.83), indicating that puts are losing value faster as expiration nears. The TCS Call option Theta (6.80559×10^{-16})is nearly zero, meaning negligible time decay, likely due to deep ITM or OTM positioning, while the Put option (39.89) shows significant time decay, making it more sensitive to time erosion. The UNION BANK call option Theta (5.14604×10^{-9}) is almost zero, meaning time decay is insignificant, while the Put option Theta (1.600) indicates slow but steady decay over time. The PEL call option Theta (0.0001) is nearly zero, showing minimal impact from time decay. However, the Put option Theta (18.56) suggests a higher rate of value loss as expiration nears.

Vega: Vega (7.52) for ABCAPITAL is the highest among all companies, indicating that the option price is highly sensitive to changes in implied volatility. A 1% increase in volatility would increase the option price by 7.52 units. Vega (0.008) for HDFC BANK is extremely low, meaning the option price is barely affected by changes in volatility. This suggests the option is either deep in the money or out of the money, where Vega tends to be minimal. The TCS value is extremely close to zero, meaning that changes in volatility have no practical impact on the option price. Such a low Vega suggests the option is either very deep in-the-money (ITM) or out-of-the-money (OTM), where Vega tends to diminish significantly. Similar to TCS, the UNION BANK is extremely small. Vega suggests that volatility has almost no effect on the option price. This can occur when an option is deep ITM or OTM, where price movements are primarily driven by intrinsic value rather than volatility. Vega (4.86723×10^{7}) for PEL is extremely small, indicating that the option price is almost independent of volatility changes. This could mean the option is very deep ITM or OTM.

Rho: A call ABCAPITAL shows a slight increase in interest rates will increase the call option price by a small amount, while the put option price is also positively affected, meaning rising interest rates have a minor impact on put prices. HDFC BANK Almost negligible impact of interest rates on call option pricing, while A high Rho suggests that put prices are significantly impacted by interest rate changes, making them sensitive to economic shifts. TCS shows practically zero, meaning interest rate changes do not affect the call option price, while A negative value suggests that an increase in interest rates decreases the put price, which aligns with general option pricing behavior. A UNION BANK shows an insignificant impact, meaning interest rates have almost no effect on call prices. At the same time, a small positive value suggests a slight increase in put options when interest rates rise, though the impact is minimal. PEL shows almost zero, meaning interest rate changes have no meaningful impact on the call option. Extremely high Rho, meaning put prices are highly sensitive to interest rate fluctuations.

6. FINDINGS

- Mostly deep in the money, highly responsive to stock price changes, but less affected by volatility or interest rates. Time decay peaked in January before stabilizing in February.
- Either deep in the money (moving strongly against the stock) or deep out of the money (facing rapid time decay). Sensitivity to price changes was stable, with minimal impact from volatility and interest.
- Call options generally exhibit strong price correlation with moderate to high time decay, while put options show varying sensitivity to price movements, with some gaining value as expiration nears.
- Interest rate sensitivity is more pronounced in put options, while gamma and vega remain low across most companies, indicating stable delta and minimal volatility impact.

7. SUGGESTIONS

- Comparing Option Greeks across different companies can help investors select stocks with stable option pricing.
- Studying Option Greeks over time helps investors predict market trends and optimize their investment strategies.
- Companies should monitor the behaviour of Option Greeks to understand how their stock options are priced in the market.

8. CONCLUSION

The study highlights the crucial role of Option Greeks in navigating the Nifty 50 options market, enabling traders and investors to make

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informed decisions, manage risk effectively, and optimize their trading strategies. By providing valuable insights into the behavior of Nifty 50 options and the role of Option Greeks, this research highlights the critical need for traders and investors to understand and effectively utilize these metrics to achieve success in the market. The analysis reveals that a comprehensive understanding of Delta, Gamma, Theta, Vega, and Rho is essential for traders and investors to navigate the complexities of the Nifty 50 options market, where market conditions, volatility, and time decay can significantly impact option pricing and risk assessment. Ultimately, this research highlights that Option Greeks are indispensable tools for traders and investors seeking to make informed decisions, manage risk, and optimize their trading strategies in the Stock Index Options Market.

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