Δγθνρ
γθνρΔ
θνρΔγ
νρΔγθ
ρΔγθν

Role of Greeks in Derivatives – II (Gamma)

The Greeks are various functions that show the sensitivity of Fair Value of an option to changes in market conditions. These functions are very helpful in assessing and comparing various option positions. They show what effect different variables will have on the fair value price of an option. There are ways of estimating the risks associated with options, such as the risk of the stock price moving up or down, implied volatility moving up or down, or how much money is made or lost as time passes. They are numbers generated by mathematical formulas. Collectively, they are known as the "Greeks", because most use Greek letters as names. Each Greek estimates the risk for one variable:

- ✓ **delta** measures the change in the option price due to a change in the stock price,
- ✓ **gamma** measures the change in the option delta due to a change in the stock price,
- ✓ **theta** measures the change in the option price due to time passing,
- ✓ **Vega** measures the change in the option price due to volatility changing, and
- ✓ **Rho** measures the change in the option price due to a change in interest rates.

To make the concept of Greeks easier for you, we have created individual series for each of them. In this series, we now learn about Gamma.

Gamma

Gamma is an estimate of how much the delta of an option changes when the price of the stock moves ₹1.00. As a tool, gamma can tell you how "stable" your delta is. A big gamma means that your delta can start changing dramatically for even a small move in the stock price.

Long calls and long puts both always have positive gamma. Short calls and short puts both always have negative gamma. Stock has zero gamma because its delta is always 1.00 – it never changes. Positive gamma means that the delta of long calls will become more positive and move toward +1.00 when the stock prices rises, and less positive and move toward 0.00 when the stock price falls. It means that the delta of long puts will become more negative and move toward –1.00 when the stock price falls, and less negative and move toward 0.00 when the stock price rises. The reverse is true for short gamma.

For example, the IFCI Mar 50 call has a delta of +.45, and the IFCI Mar 50 put has a delta of -.55, with the price of IFCI at ₹ 48.00. The gamma for both the IFCI Mar 50 call and put is .07. If IFCI moves up ₹ 1.00 to ₹ 49.00, the delta of the IFCI Mar 50 call becomes +.52 (+.45 + (₹ 1 * .07), and the delta of the IFCI Mar 50 put becomes -.48 (-.55 + (₹ 1 * .07). If IFCI drops ₹ 1.00 to ₹ 47.00, the delta of the IFCI Mar 50 call becomes +.38 (+.45 + (-₹ 1 * .07), and the delta of the IFCI Mar 50 put becomes -.62 (-.55 + (-₹ 1 * .07).

Gamma measures how much the delta of a position changes when the stock price moves (₹1.00. At-the-money options have the highest Gammas. Gamma decreases as you go in-the-money or out-of-the-money. Gamma is sometimes used as a risk management tool to manage a large portfolio, because it tends to reflect the speed of an option. Options with high gamma are the most responsive to price movements, so they provide the most help in covering directional exposure.