

Trading time decay in options

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FULL TEXT

OTHERS Mastering Derivatives. If implied volatility decreases, time value declines significantly

You expect an underlying to move up, but the implied volatility is currently high and could decline subsequently. Should you buy a call option on the underlying? This week, we discuss how decrease in implied volatility can affect your long call position even if the underlying moves up as expected.

Time value

An option price consists of intrinsic value and time value. The intrinsic value of an option moves one-to-one with the underlying. Suppose, you hold a 500 strike call on an underlying that trades at 500; if the underlying were to move to 575, the intrinsic value of the 500 call will be 75 points. The option price will, however, not increase by 75 points! This is because the call will lose time value.

Time value of an option consists of two components — time to expiry and implied volatility. The time to expiry will drag down the option price and the implied volatility acts as a lever on time value. If implied volatility decreases, time value declines. The decline can be attributed to the option's vega, which captures the sensitivity of the option value to one percentage point change in implied volatility. If the vega of an option is 11.5 and the implied volatility declines one per cent, the option price will decline approximately 11.5 points.

Buying an option with high implied volatility is, therefore, risky if the volatility were to subsequently decline. But what if you expect the underlying to move up? Consider the 18000, 18100 and 18200 next-week Nifty calls with the spot index at 17963. Suppose the index were to move to 18130. Given the time decay, it is not surprising that all calls will generate greater profits if the index were to reach the target sooner than later. But the calls will generate lower gains if the implied volatility declines. Suppose the index reaches 18130 two days after you set up the long position. The gains on the 18000 call will likely be five per cent lower when implied volatility declines one per cent, all else remaining the same. The same call will likely generate nine per cent lower gains if implied volatility declines two per cent. This decline in gains will be greater for 18100 calls (six per cent and 12 per cent) and even more for 18200 calls (nine per cent and 18 per cent).

Applying the above observation for a trading decision, a long call position could generate gains despite a subsequent decline in implied volatility. However, the gains will be significantly lower because decline in implied volatility lowers the time value of an option. To offset the loss in time value, the strike ought to carry intrinsic value when the underlying reaches your price target. This means buying an at-the-money (ATM) option that becomes a tradable in-the-money (ITM) strike is better than buying a far out-of-the-money (OTM) option that moves closer to ATM when the underlying hits the price target.

Optional reading

The 18200 call will be out-of-the-money when the index moves to 18130. The increase in option price because of increase in the underlying (through the option delta) is marginally offset by the decrease in time value because of decrease in volatility. That is why ATM options are preferable for such trades. True, ATM options have the highest vega. This means that the option will lose more when implied volatility declines. But the positive side is that the delta will increase the most when the underlying moves up because ATM options also have the highest gamma.

The author offers training programmes for individuals to manage their personal investments

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