

15. According To Put-call Parity, An Increase In The Underlying Stock Price Will _____ The Value Of

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Introduction

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is a fundamental concept in options trading and financial derivatives. Understanding how changes in the underlying stock price influence the value of options is essential for traders, investors, and financial analysts. The put-call parity principle provides a theoretical framework that links the prices of call and put options with the current stock price, strike price, interest rates, and time to expiration. When the underlying asset's price increases, it affects the valuation of both call and put options differently, creating opportunities for arbitrage and informing trading strategies.

This article explores the put-call parity relationship in detail, examines how an increase in the underlying stock price impacts the value of calls and puts, and discusses related concepts such as arbitrage opportunities, implied volatility, and risk management. By the end of this comprehensive guide, readers will have a clear understanding of the mechanics behind the put-call parity and its implications for options trading.

Understanding Put-Call Parity

What Is Put-Call Parity?

Put-call parity is a fundamental principle in options pricing that establishes a specific relationship between the prices of a call option and a put option with the same strike price and expiration date. It is based on the no-arbitrage principle, which states that there should be no riskless profit opportunities in efficient markets.

The basic put-call parity formula for European options (which can only be exercised at expiration) is expressed as:

$$C + PV(K) = P + S$$

Where:

- C = Price of the European call option
- P = Price of the European put option
- S = Current price of the underlying stock
- $PV(K)$ = Present value of the strike price, discounted at the risk-free rate

This relationship shows that the combined value of holding a call option and the discounted strike price should equal the combined value of holding a put option and the underlying stock. When the market prices deviate from this relationship, arbitrageurs can exploit the difference to generate riskless profits, which helps restore equilibrium.

Implications of Put-Call Parity

The put-call parity provides traders with a benchmark to identify mispricings and arbitrage opportunities. It also helps in constructing synthetic positions, such as creating a synthetic long or short position in the underlying asset using options. Understanding how the parity works is crucial for effective options trading and risk management.

How Does an Increase in the Underlying Stock Price Affect Option Values?

Impact on Call Options

When the underlying stock price increases, the value of a call option typically increases. This is because a call option gives the holder the right, but not the obligation, to buy the stock at a predetermined strike price. As the stock price rises above the strike price, the intrinsic value of the call increases, making it more valuable.

For example:

- If the strike price of a call is \$50 and the stock price rises from \$55 to \$60, the intrinsic value increases from \$5 to \$10.
- This increase in intrinsic value directly boosts the total premium of the call option, assuming other factors like volatility and time to expiration remain constant.

In essence, the greater the stock's upward movement relative to the strike price, the more valuable the call option becomes. This relationship is fundamental to profit-making strategies like buying calls when anticipating bullish movements.

Impact on Put Options

Conversely, an increase in the underlying stock price generally decreases the value of a put option. A put option grants the right to sell the stock at a specified strike price. When the stock price rises above the strike price, the put's intrinsic value diminishes because it becomes less likely that exercising the put will be profitable.

For example:

- If the strike price is \$50 and the stock rises from \$45 to \$55, the intrinsic value of the put drops from \$5 to \$0.
- Once the stock price exceeds the strike price, the put becomes out-of-the-money, and its value is primarily driven by time value and volatility rather than intrinsic value.

Theoretical Impact Based on Put-Call Parity

Relationship Between Stock Price and Option Prices

According to put-call parity, changes in the underlying stock price influence the prices of both call and put options in predictable ways. When the stock price increases:

1. Call options become more valuable due to higher intrinsic value.
2. Put options become less valuable as their likelihood of profitable exercise decreases.

This relationship holds true assuming no arbitrage opportunities and constant risk-free rates, dividends, and volatility.

Arbitrage and Price Adjustments

Market participants constantly monitor deviations from put-call parity. If the observed prices of options and the underlying stock do not conform to the parity relationship, arbitrageurs step in to exploit the discrepancy. For instance:

- If the call price is too high relative to the put, traders can sell the call and buy the put, simultaneously taking positions in the underlying to lock in riskless profit.
- Similarly, if the call is undervalued, traders can buy the call and sell the put, combined with positions in the underlying asset, to restore equilibrium.

Practical Implications for Traders and Investors

Strategic Trading Based on Underlying Movement

Understanding how the underlying stock price impacts option values enables traders to develop effective strategies, including:

1. Buying calls when expecting a bullish movement.
2. Selling puts if anticipating stability or slight upward movement.
3. Constructing spreads that capitalize on expected changes in the underlying price.

Risk Management and Hedging

Investors can use put-call parity to hedge their positions. For example:

- Long stock + long put = protective put strategy to guard against downside risk.
- Long call + short stock = synthetic long position to simulate owning the stock.

Impact of Market Factors

While the core relationship assumes constant volatility, interest rates, and dividends, real-world factors can influence the sensitivity of option prices to underlying movements. Traders need to consider:

- Market volatility
- Interest rate changes
- Expected dividends
- Time remaining until expiration

Conclusion

In summary, according to put-call parity, an increase in the underlying stock price will **increase the value of call options** and **decrease the value of put options**. This fundamental principle provides a robust framework for understanding options pricing, identifying arbitrage opportunities, and developing trading strategies. By comprehending the mechanics behind the put-call parity, traders and investors can make more informed decisions, manage risk more effectively, and optimize their options portfolios.

As markets evolve and new financial products emerge, the core tenets of put-call parity continue to serve as a cornerstone of options theory, ensuring market efficiency and fairness. Whether you are a seasoned trader or a novice investor, grasping how underlying stock movements influence option values is vital for successful trading and investment success.

Frequently Asked Questions

According to put-call parity, an increase in the underlying stock price will _____ the value of a call option.

increase

How does a rise in the underlying stock price affect the value of a put option according to put-call parity?

It generally decreases the value of the put option.

In the context of put-call parity, what happens to the call option value when the underlying asset's price increases?

The call option's value increases.

Does an increase in the underlying stock price have any effect on the put option's value as per put-call parity?

Yes, it tends to decrease the put option's value.

According to put-call parity, what is the relationship between the underlying stock price and the value of a call option?

As the underlying stock price increases, the value of the call option increases.

If the underlying stock price rises, what is the expected impact on the call option's price based on put-call parity?

The call option's price is expected to rise.

In put-call parity, an increase in stock price affects the relationship between calls and puts how?

It increases the value of calls and decreases the value of puts.

What is the effect of an increased underlying stock price on the put-call parity relationship?

It causes the value of call options to go up and the value of put options to go down, maintaining the parity.

Why does an increase in the underlying stock price lead to a higher value of call options in put-call parity?

Because a higher stock price increases the likelihood that the call will be profitable at expiration.

Additional Resources

According To Put-call Parity, An Increase In The Underlying Stock Price Will _____ The Value Of

Understanding the relationship between call and put options is fundamental to options trading and financial derivatives. The principle of put-call parity offers a crucial framework for traders and investors to analyze how changes in the underlying stock price influence the value of options. Specifically, an increase in the underlying stock price has direct implications on the value of calls and puts, impacting trading strategies, risk management, and arbitrage opportunities. In this comprehensive review, we explore the concept of put-call parity, its core components, how changes in the underlying influence options, and the practical applications for traders and investors.

What Is Put-Call Parity?

Put-call parity is a fundamental principle in options pricing that establishes a theoretical relationship between the prices of European call and put options with the same strike price and expiration date. It provides a logical framework to determine whether options are correctly priced or if arbitrage opportunities exist.

Basic Formula of Put-Call Parity

For European options, the put-call parity relationship is expressed as:

$$C - P = S - K e^{-rT}$$

Where:

- C = Price of the European call option
- P = Price of the European put option
- S = Current price of the underlying stock
- K = Strike price of the options
- r = Risk-free interest rate
- T = Time to expiration (in years)
- e^{-rT} = Present value factor for the strike price

This formula indicates that the difference between the call and put prices equals the current stock price minus the present value of the strike price, emphasizing the interconnectedness of these options.

Implications of Put-Call Parity

- Ensures no arbitrage opportunities exist under ideal conditions.

- Offers a way to derive the price of one option if the other is known.
- Serves as a benchmark for identifying mispricings in options markets.

Impact of Underlying Stock Price Increase on Option Values

The core question derived from the put-call parity concept is: "According to put-call parity, an increase in the underlying stock price will _____ the value of..." The answer depends on whether we are considering call options, put options, or the relationship between them.

Effect on Call Options

An increase in the stock price generally raises the value of call options. This is because a call option gives the holder the right, but not the obligation, to buy the stock at a fixed strike price. When the stock price exceeds the strike price, the call becomes more valuable, potentially leading to an in-the-money position.

Features:

- Intrinsic value increases as the stock price rises above the strike.
- Time value may also increase if there's more room for the stock to appreciate.
- Profit potential expands, making calls more attractive.

Pros:

- Increased upside potential.
- Useful for bullish strategies.

Cons:

- Higher premiums may be required.
- Potential for rapid decrease if the stock price falls.

Effect on Put Options

Conversely, an increase in the underlying stock price will decrease the value of put options. A put gives the right to sell stock at a fixed strike price; if the stock price rises, the right becomes less valuable because the put is less likely to be exercised profitably.

Features:

- Intrinsic value decreases as the stock price moves away from the strike price in the upward direction.

- Time value diminishes as the likelihood of profitable exercise declines.

Pros:

- Less expensive to purchase when stock prices rise.
- Useful for hedging downside risk.

Cons:

- Loss of value if used as a speculative tool in rising markets.
- May expire worthless if the stock continues upward.

Practical Implications of the Relationship

Understanding how the underlying stock's movement affects options is crucial for implementing effective trading strategies, arbitrage, and risk management.

Arbitrage Opportunities

- When the market prices deviate from put-call parity, traders can exploit differences to lock in riskless profits.
- For example, if a stock's call options are overpriced relative to puts, traders can establish arbitrage positions by shorting calls and buying puts, hedged by the underlying stock.

Risk Management

- Investors can hedge their positions by choosing options that will appreciate or depreciate as the underlying moves.
- For instance, if expecting a stock price increase, purchasing calls can benefit from the rise, while selling puts might expose the investor to downside risk.

Strategic Trading

- Bullish outlooks are often expressed through purchasing calls or writing puts.
- Bearish expectations might involve buying puts or writing calls.
- The interplay of these options, guided by the put-call parity principle, helps in designing hedging and

speculative strategies.

Limitations and Assumptions of Put-Call Parity

While put-call parity offers valuable insights, it relies on several assumptions that may not always hold true in real markets.

Key Assumptions:

- European-style options (can't be exercised early).
- No dividends paid during the life of the options.
- No transaction costs or taxes.
- Perfect markets with no arbitrage opportunities.
- Continuously compounded risk-free interest rates.

Limitations:

- Early exercise options like American calls and puts violate the parity.
- Dividends or income distributions affect the relationship.
- Market frictions and liquidity issues can cause deviations.
- Time decay (theta) and volatility impact options differently than the static formula suggests.

Conclusion: An Increase in the Underlying Stock Price Will _____ The Value Of..

According To Put-Call Parity, An Increase In The Underlying Stock Price Will Increase The Value Of Call Options And Decrease The Value Of Put Options. This fundamental relationship underscores the inverse correlation between the stock price and put options, and the direct correlation with call options. For traders, investors, and risk managers, recognizing how underlying price movements influence options prices is essential for crafting effective strategies, identifying arbitrage opportunities, and managing risk.

By understanding the mechanics behind put-call parity, market participants can better navigate the complexities of options markets, assess mispricings, and optimize their investment decisions. While the theoretical framework provides a clear picture, real-world factors such as dividends, early exercise features, and market imperfections must be considered to apply these principles effectively.

In summary, an increase in the underlying stock price predominantly raises the value of call

options—which benefit from upward movements—and reduces the value of put options, which lose their attractiveness as the stock price moves higher. This dynamic forms the basis for many trading strategies and arbitrage opportunities, highlighting the vital importance of put-call parity in modern options trading.

Final Thoughts:

Understanding the influence of underlying stock price movements through the lens of put-call parity empowers traders with a strategic advantage. Whether hedging risks, speculating on market direction, or exploiting mispricings, the relationship between stock prices and options prices remains central to effective derivatives trading. Continual awareness of the assumptions and market conditions ensures that traders can adapt and make informed decisions in the ever-evolving financial landscape.

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