Alfidi Capital

Put-Call Parity Analysis of Market Ignorance

03 November 2009

This is the option analysis methodology of Alfidi Capital. It is useful for determining whether Mr. Market (more accurately, his minders in the guise of arbitrageurs and option hedgers) thinks a stock is devoid of arbitrage opportunities. Lack of arbitrage potential implies the market thinks the stock is fairly priced, which means the discerning analyst (like our firm's founder) has an opportunity to identify the stock's intrinsic value. This method is most useful as a means of confirming the market's ignorance. This method is not at all useful for analyzing your mother-in-law.

The concept of **put-call parity (i.e., the Law of One Price)** reminds us that the value of long or short option strategies for a given stock at the same strike and expiration tend to provide equivalent payoffs. We start with a given stock's at-the-money call and put with equivalent strike prices and expiration dates. We will use the yield of a T-bill that matures when the option expires (i.e., matching duration) as the risk-free rate (RFR). We find the stock's price by plugging in the appropriate RFR for the option duration under consideration.

$C + X/(1+RFR) = S + P$

C = call premium (last close)
$X/(1+RFR)$ = PV of strike price X
S = stock price (last close)
P = put premium (last close)

For a dividend paying stock, add its dividend to the equation:
$C + X/(1+RFR) + d/(1+RFR) = S + P$

Solving for S gives us the version of the equation we need:
$S = C + X/(1+RFR) + d/(1+RFR) - P$

This gives a "quick and dirty" estimate of what the options market thinks the underlying stock price should be. The estimate will not be precisely equal to the stock's last closing price primarily because put-call parity was originally formulated with European options in mind. Those things can't be exercised before their expiration date.

If put-call parity holds, the market is successfully arbitraging away excess profits that could be obtained from an option play on a stock. Investors and hedgers simply accept the stock's current price as its intrinsic value. If the put-call estimate is far from the market price of a stock (say, more than 1%), then someone in the market expects a major change in the value of this stock. That means the stock may present either an arbitrage opportunity or an imminent entry point for a long or short position (depending on which way the parity breaks). Mr. Market isn't always perfectly efficient, and sometimes he misprices a stock. A breakdown in put-call parity is something a value-oriented investor should notice.