Measuring Investment Returns of Portfolios Containing Futures and Options

John C. Stannard, CFA, FSIP
Journal of Performance Measurement
vol. 10, no. 2 (Winter 2005/2006):64–70

The author discusses the main problems associated with measuring derivatives returns and develops a framework for performance measurement. The approach quantifies the notional market value of futures and options. This value is then used as the basis for performance measurement using conventional techniques. For options, the notional market value can be calculated on a full basis (involving detailed knowledge of option positions and hedge ratios) or on a partial basis (in which only the market prices of the options are included). The author advocates the use of the full exposure method whenever possible.

Measuring rates of return for derivatives offers many challenges. Futures and options are considered separately because they have very different impacts on return distributions. Futures have a price, which is the basis for determining gains/losses on the futures position, but the investor is not required to pay this price on opening the contract. Rather than a market value, futures have a net realized value, which represents the profit or loss arising from changes in price each day. For futures, one cannot measure return as the change in market value. Instead, the author uses the notional market value of the futures position as the basis for return calculations. The notional market value is the equivalent amount of a physical security that would cause the same change in net realized value for a given change in the price of the underlying security. The notional market value of a futures contract is calculated as the futures price multiplied by a constant value, called the "contract multiplier" (or "tick size"). The author measures the notional stock return (the return arising from futures plus physical assets where appropriate) as the change in notional market value over a period of time. For accurate results, the author must include the notional income arising from the underlying cash, even if the cash position does not exist.

John C. Stannard, CFA, FSIP, is at Russell Investment Group. The summary was prepared by Joseph D.V. Vu, CFA, DePaul University.

Unlike futures, options do not move in a symmetrical manner in response to movements in the underlying security index. The factor determining the relationship between changes in the stock price and the call option is the hedge ratio (or delta). In order to calculate the notional market value of options, the author presents two approaches: (1) full exposure, where the full impact of the option position is recognized as a component of notional market value, and (2) partial exposure, where only the option value is included in the notional market value of the option position. The full exposure approach incorporates the full impact of the option position adjusted for the hedge ratio. The author identifies the notional stock position, which shows an equivalent price change to the stock/option combination for a given small change in the stock price. This approach is similar to the approach used for futures. The full exposure method is the preferred approach and is necessary if detailed and precise valuation and performance information is needed at the asset level.

Under the partial method, only the stock position is adjusted to show the direct options impact. Therefore, the hedge ratio is ignored, there are no cash adjustments, and the return calculations are far simpler. The author values the option position at the premium and adds it to the stock position. The author advocates the use of the full exposure method whenever possible.

Keywords: Performance Measurement and Evaluation: performance measurement