Guest Speaker

Program Trading and the Market

By Hans R. Stoll
Vanderbilt University and
Robert E. Whaley
Duke University

Five years ago, stock index futures and options were untested concepts. Today, each of these instruments trades underlying equity values substantially in excess of trading on the New York Stock Exchange. Critics of this development complain that speculative activity in Chicago, rather than careful analysis of individual stocks, is determining stock prices and that massive trading of index stocks, stimulated by futures price changes, is generating excessive volume and price volatility in the stock market, particularly on the expiration day of futures contracts.

Index futures and options have imposed some dislocations on already established markets. But these short-run dislocations are offset by important benefits, one of the most important being the ability to trade "the market" cheaply and quickly.

The thought that the entire stock market can be traded like a bushel of wheat is a bit scary to some people. Traditional stock market trading is a "bottom up" approach concerned with building a portfolio from the component stocks; index futures trading is a "top down" approach, paying little attention to the individual parts. This conflict of approaches lies behind some of the controversy and some of the current dislocations.

It is most evident in the arbitrage program trading that occurs when index futures prices and index cash prices are out of line. When the basis (the percentage difference between the futures and cash price) exceeds the cost of carrying the underlying commodity (which in the case of index futures is the difference between the interest rate and the dividend yield), an arbitrage opportunity exists that necessitates the sale of futures and purchase of the underlying commodity—in this case, the component stocks of the index (in the appropriate proportions) via a program trade.

In maintaining the links between futures and cash prices, arbitrage must transmit a futures price change generated by relatively few trades in the futures market to each of the individual stocks in the index. The specialist and other traders on the stock exchange think in terms of individual stocks, not portfolios, and stock market procedures adjust prices of stocks according to trading pressures in individual stocks.

The magnitude of arbitrage activity and the frequency of deviations from the theoretical price relation between futures and cash have caught everyone by surprise. Since the theoretical relation between index futures and the underlying cash index is accepted by everyone, one might expect stock prices simply to adjust to the "correct" relation in anticipation of arbitrage programs. This has not been the case. Instead, substantial arbitrage has been necessary to move stock prices, and the theoretical relation has often appeared to be violated.

Stock index futures expiration days often provide a good illustration of this conflict. Because index futures contracts call for cash settlement, any stock positions established in arbitrage programs must be unwound piecemeal in the stock market via transactions in each of the index stocks. This has sometimes caused substantial order imbalances in the index stocks later in the expiration day. This is a real dislocation to existing markets but it is one that should be dealt with by improving procedures for trading individual stocks, not by restricting index futures in a way that reduces their usefulness. The SEC proposal to disclose order imbalances a half-hour before the close on expiration days is an important step in that direction.

The prospect remains, of course, that attempts to improve trading in individual stocks will not resolve the conflict. Trading of 500 individual stocks is inherently more expensive than trading a single futures contract, and that cost difference may be reflected in an expiration day price impact. If there were a way to trade portfolios of stocks in the stock market as one does in the futures market, the dislocations in the stock market might be completely eliminated. In principle, this is possible through the creation of certificates that would be claims on underlying stocks, where transfers of the underlying shares would be made by book-entry transfers. Such certificates would also allow settlement of futures contracts by delivery rather than by cash settlement. As a practical matter, such an approach appears a long way off.

In the meantime, the dynamic tension between the portfolio approach to trading represented by index futures and the individual stock approach represented by the stock market, while causing some short-run dislocations, has the prospect of improving the trading efficiency of markets and the flexibility available to money managers.