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# Program Trading and Expiration-Day Effects

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# Program Trading and Expiration-Day Effects

*The arbitrage between index futures and the underlying cash index and the cash settlement feature of index futures contracts, which requires arbitrageurs to unwind positions in the stock market, are thought to be at the heart of the abnormal stock price movements during the "triple-witching" hour—the last hour of trading on days on which index futures, index options and options on index futures expire simultaneously. During 1984 and 1985, volume was substantially higher than normal in the last hour of trading on those quarterly Fridays. Open interest in the expiring futures contracts on the expiration day amounted to about 40 per cent of the average month-end open interest. The incremental stock market volume, however, was approximately one-third the volume that would be implied if the entire expiration-day open interest were traded in the stock market.*

*Analysis of stock market price changes in the last hour of expiration days and the first half-hour of the following day indicates that the volatility of price changes was significantly higher on expiration days, with the stock market tending to fall. Stocks not in the S&P 500, however, exhibited no price effects. Price effects seemed also to be associated only with the S&P 500 futures contract expirations; index option expirations themselves did not lead to abnormal market movements. When the magnitude of price effects was measured by the degree of reversal in prices on the morning after the expiration day, the average magnitude of the price effect in the 10 most recent quarterly futures contract expirations examined was about 0.4 per cent of the closing index value at expiration.*

*The average expiration-day price effect of 0.4 per cent is not large, considering that a price impact of approximately 0.25 per cent of the value of the transaction can be expected on the basis of the bid-ask spread. Once this market impact cost is drawn out, the average expiration day price impact falls to about 0.15 per cent of the value of the transaction, an amount representing the additional cost of liquidity. Furthermore, price impacts in excess of those found on expiration days are frequently encountered in large block transactions, where the cost of providing liquidity also increases. On expiration days, however, transactions in many stocks occur simultaneously, so the market as a whole is affected.*

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*This article is based on a larger study,* Expiration Day Effects of Index Options and Futures, *Monograph Series in Finance and Economics, Monograph No. 1986-3 (New York: New York University, March 1987). The study was carried out at the request of the major option exchanges.*

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