Current Issues: Index Arbitrage

Index Arbitrage and the Media

by Craig W. Holden, Assistant Professor, Indiana University

On October 13, 1989, the Dow Jones Industrial Average dropped 190 points in the last 90 minutes of trading. In the wake of that drop, the media exploded with coverage of the allegation that index arbitrage was causing excess volatility. With dramatic speed, index arbitrage became a popular villain. All the major investment banks and securities exchanges were pressured by the investing public to restrict index arbitrage. For example, in announcing that they would suspend the practice, Merrill Lynch Chairman William A. Schreyer and President Daniel P. Tully said, "The causes of excess market volatility are far more complex than any particular computer trading strategy. . . . [However] index arbitrage has been clearly identified in the investing public's mind as a contributing factor to excess market volatility."[1]

So why did the public suddenly link index arbitrage with excess volatility? One explanation is that major newspapers and broadcast and cable networks routinely cite index arbitrage as a major factor in stock market movements. As a typical example, the *Wall Street Journal* ran a news story titled "Stocks Tumble in Late Sell-Off" that reported: "The stock market buckled under the weight of futures-related program selling late in the session and retreated sharply in moderately active trading. . . . The index-arbitrage selling surfaced shortly after 3 p.m. and sent the market into a tailspin; a final burst of sell programs caused stocks to close at their lows."[2]

The key flaw in this reporting is that it focuses on stock market movements *in isolation* from stock index futures and stock index options. Implicitly, it treats index arbitrage as if it affected the common direction of both the stock market and stock index futures rather than simply reducing the fair value difference between them.[3]

Compounding this error is a spurious correlation derived from the fact that stock index futures lead stock indexes.[4] Generally speaking, if prices are dropping in both markets, stock index futures will drop faster than stocks. Index arbitrageurs will thus buy stock index futures and sell stocks. This fosters a spurious correlation between arbitrageurs' sale (purchase) of stocks and stock market declines (rises). By focusing only on stocks, the news media implicitly report this correlation as if it were a causality. Nobody seems to report on the corresponding counterintuitive correlation between arbitrageurs' purchase (sale) of stock index futures and index futures market declines (rises).

A key reason for the media's narrow focus seems to be that the most prominent equity indexes are calculated from the stock market alone, as if stock index futures and options did not exist. Given that these equity derivatives do exist and are heavily traded, indexes should be updated to include them. As a simple example, a combined index might use an average of the S&P 500 index and the fair value of the corresponding stock index futures contract. In trying to explain why this average goes up or down, the "experts" would quickly realize that index arbitrage cannot be a causal factor, as arbitrage affects the difference between markets, not the average. A more complex combined stock index could be constructed with stocks, multiple stock index futures contracts and multiple stock index option contracts, using weights that take into account the long-term average open interest in contracts of different maturities.

Consider the concept of "excess volatility." The term itself recognizes that some basic level of price variability is a natural consequence of the arrival of information. If all investors act as if they were rational, then this basic price variability is the best outcome the market can produce. However, not all investors may act rationally. Black notes that some investors, whom he calls "noise traders," may trade on what they think is good information, when in fact all they have is useless noise.[5] Alternatively, some investors may react emotionally to events (such as the collapse of the American Airlines deal on October 13, 1989) and engage in panic trading. Either noise trading or panic trading creates welfare-reducing excess volatility. Now suppose that, for some reason, such noise/panic trading is concentrated in one particular market—say, stock index futures. Then index arbitrage *would* transmit this excess volatility to stocks. A key point is that index arbitrage is a transmittal mechanism, not the *source* of excess volatility. The behavior of noise/panic traders is the source. Another key point is that noise/panic traders are essentially throwing money away and therefore have a strong incentive to discover and correct their own suboptimal behavior.

Nobody claims to have a clear, decisive explanation of the causes of the crash of 1987. But to my mind, there has always been one compelling piece of evidence about what did *not* cause or even contribute to the market crash. One event from the past immediately dispels the notion that modern institutional arrangements played a significant role in the 1987 crash—the crash of 1929. The fact that the stock market could drop by 22 per cent in two days, long before computers, derivative securities, index arbitrage and modern theories of finance, makes it clear that none of these modern developments is critical.[6]

Roll compellingly drives home this same point by looking contemporaneously across countries.[7] He wanted to

1. Footnotes appear at end of article.

see if countries with certain types of institutional arrangements had bigger drops in their stock markets during the 1987 crash than other countries with different arrangements. For example, he compared countries that had stock index futures and options markets with those that did not. He found that the existence of these derivative markets (and thus of index arbitrage) made no statistically significant contribution to the severity of the stock market crash across countries. Indeed, virtually none of the dozen or so institutional arrangements he analyzed contributed to the size of the crash by country.

If institutional arrangements are not the culprit, then we are left with people. There seems to be an element of irrationality in investor behavior that occasionally surfaces. Such panic behavior surfaced in 1929, 1987 and 1989, and undoubtedly will show up again in the future.

Index arbitrage does not cause excess volatility. At worst, it can transmit excess volatility that is created in other ways. It did not contribute to the drops of the *average* stock indexes in 1987 and 1989. There is no public benefit in conducting a witch hunt against index arbitrage. It is time to clear index arbitrage's good name.

Footnotes

1. *Los Angeles Times*, October 31, 1989.
2. *Wall Street Journal*, September 14, 1989.
3. The fair value of a stock index futures contract is calculated by discounting the futures price back to the present and adding in the present value of the dividends to be paid before the maturity of the futures contract. The difference between this and the current value of the stock index is the fair value difference.
4. This lead-lag relationship is documented in I. Kawaller, P. Koch and T. Koch, "The Temporal Price Relationship between S&P 500 Futures and the S&P 500 Index," *Journal of Finance* 42 (1987), pp. 1309–1329.
5. F. Black, "Noise," *Journal of Finance* 41 (1986), pp. 529–543.
6. The S&P composite dropped by 12.34 per cent and 10.16 per cent on October 28 and 29, 1929, respectively.
7. R. Roll, "The International Crash of 1987," *Financial Analysts Journal*, July/August 1988.