



LEADING RESEARCH

At Risk

Research by Mark Mitchell

Arbitrageurs are used to trying to explain the complexities of what they do—engaging in trading strategies that take advantage of pricing differences between a security, currency, or commodity traded on several markets. That said, they tend to conjure up diverse perceptions. To the investing public, they often loom like secretive denizens of Wall Street, with a gluttonous appetite for risk and an uncanny ability to snag big profits in return. In the eyes of professional investors, on the other hand, “arbs” generate returns by providing liquidity and eliminating market inefficiencies. For several years, HBS associate professor Mark Mitchell has been exploring the kinds of risks arbitrageurs confront each day—risks that can substantially limit the profits to be made from the next “sure thing.”

Mitchell first became interested in arbitrage when he worked as a senior financial economist at the Securities and Exchange Commission during the stock market crash of October 1987. While investigating its causes and consequences, he analyzed proprietary portfolio data from numerous arbitrageurs. Besides showing that arbs had incurred severe losses in the crash, the data indicated to Mitchell that one kind of arbitrage, risk arbitrage, might be much more chancy in a bear market than in a bull market.

Risk or merger arbitrage involves assessing the likely outcome of announced mergers and acquisitions. After a corporate merger at a premium is announced (meaning that the price offered per target share is higher than the price of the stock before the deal), the stock price of the takeover target usually rises. However, because the transaction may still fall through, be delayed, or be renegotiated, the target price does not immediately climb to the full announced deal price. Arbitrageurs must consider the likelihood of all these factors, then find a combination of trades that will be profitable if their assessments are correct. This usually involves some combination of purchasing the stock of the target firm and short selling the stock of the acquiring firm (in a stock merger), all the while paying financing and transaction costs. Since most acquisitions are either completed or abandoned within a matter of months, arbs must also constantly keep abreast of new merger announcements in order to find opportunities to reinvest.

New and Improved Models

In 1995, Mitchell initiated the development of a database of virtually all merger activity since 1963 in which U.S. companies were targets. Two years later, he began a long-term collaboration with Todd Pulvino, now an assistant professor of finance at Northwestern University's Kellogg School of Management. Their goal was to create two different models of potential risk arbitrage portfolios, each based on somewhat different assumptions. One of the models built in realistic transaction costs—a major improvement on prior studies. In addition, unlike most previous researchers, Mitchell and Pulvino did not assume that returns on arbitrage investments were independent of overall market trends. What they found was that market-related risk is small when the stock market as a whole is rising, but considerable when it is falling.

By making an erroneous assumption that risk arbitrage is market neutral, earlier research had falsely characterized its risks and excess returns (that is, returns beyond those for an investment in a similarly risky asset). Mitchell and Pulvino discovered that the overall excess returns for risk arbitrage transactions were only about 4 percent per year—a far cry from the conclusions of other studies that had put that number at anywhere from 12 to several hundreds percent.

In another paper written with Pulvino and HBS assistant professor Erik Stafford, Mitchell examines another kind of arbitrage strategy. An arbitrage opportunity occurs when the market value of an entire company is less than the market value of its publicly traded subsidiaries. Thus, a company determining that some of its assets are undervalued often offers a portion of them to the public as a “spin-off” in hopes of improving value for its investors.

A Case in Point

Consider, for example, the case of Palm, Inc., creator of the PalmPilot. When the maker of these personal digital assistants went public on March 2, 2000, parent company 3Com owned 532 million shares, or 95 percent of the venture, a stash of stock worth \$50.6 billion at the day's closing price of \$95.06. At the same time, 3Com had 351 million of its own shares outstanding, making its multibillion-dollar stake in Palm worth \$144.08 per 3Com share. Yet 3Com closed the day at only \$81.81. The stock market's verdict was loud and clear. The way investors saw things that day, the rest of 3Com was worth negative \$62.27 per share.

Arbs refer to this as a “negative stub value,” a not uncommon phenomenon in corporate spin-offs. Mitchell and his colleagues assembled a database of 82 such situations between 1985 and 2000. Their research shows that trying to take advantage of what appears to be such a clear-cut arbitrage opportunity can be much riskier in practice than in theory; a large price discrepancy may be quite rational.

At the time of the Palm public offering, the authors explain, 3Com had announced its intention to distribute its Palm shares to 3Com stockholders. However, the final date of the distribution had not been determined. Between the March 2 public offering date and the actual distribution on July 27, arbs faced several important questions: Would the distribution actually occur, or might the Internal Revenue Service make the spin-off prohibitively expensive for 3Com's shareholders by declaring it a taxable event? Since only 5 percent of Palm's shares were publicly traded, could arbitrageurs manage to borrow enough stock to sell short? And in light of a frenzied demand at the time for Internet stocks among “amateur” investors, would the price differential get worse before it got better?

The researchers found that time delays and the possibility of a widening price gap were the biggest risks in most spin-off arbitrage transactions. If the price gap widens before it

narrows, arbs have to come up with a bigger down payment—a margin call. If they can't, their broker will liquidate their stakes at a loss, even if waiting a little longer might prove profitable. Taking all arbitrage opportunities in their database into account, Mitchell and his colleagues discovered that arbs who posted sufficient capital to avoid margin calls earned little more than the return on a virtually risk-free investment.

In both cases, the research demonstrates that arbs are taking very real risks stemming from bear markets and market “frictions” such as margin calls. While its conclusions on risk arbitrage show escalating risk in a bear market, the findings on spin-off arbitrage suggest that it is more profitable in a market heading south. Since the risks implicit in each strategy offset each other, overall portfolio risk can be reduced by employing both approaches at the same time, provided the size and frequency of the investments using each strategy can be matched. “That might not be easy,” Mitchell concludes, “but the idea that it is even possible marks a big step forward in making the implicit risks of arbitrage more manageable.”

by Emily S. Plishner

Outside Reading

Mitchell and Pulvino, “Characteristics of Risk and Return in Risk Arbitrage,” *The Journal of Finance* 56, no. 6 (2001): 2135–75.

Mitchell, Pulvino, and Stafford, “Limited Arbitrage in Equity Markets,” *The Journal of Finance*, forthcoming February 2002.