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BOOK REVIEWS

Mark Kritzman, Senior Editor

UNDERSTANDING ARBITRAGE: AN INTUITIVE APPROACH TO FINANCIAL ANALYSIS

By Randall S. Billingsley
(Reviewed by Tim Adler)

Understanding Arbitrage offers a comprehensive yet accessible review of this core financial principle, and it links arbitrage to a wide range of the most important precepts of finance, including the foundations of capital structure and the pricing of options, futures, and forward contracts.

In Chapter 1, we are introduced to the framework of arbitrage and the central idea of no free lunch. This latter principle is illustrated with the fable about the efficient markets professor and the student walking down the street. The student notices a 100 bill on the street and leans down to retrieve it. The efficient markets professor admonishes the student to ignore it, noting that if the 100 dollar bill were real it would not still be on the street.

The booming hedge fund industry suggests that a large group of investors believes that the proverbial 100 bill might in fact be real, although recent experience in the convertible arbitrage arena serves as a sobering challenge to this view. For example, the CSFB/Tremont hedge fund database[1] reports that in the second quarter of 2005 investors lost $2.9 billion in convertible arbitrage strategies. These results represent the fourth consecutive quarter of losses by convertible arbitrage strategies. Since January 1994, the cumulative return of convertible arbitrage and risk arbitrage hedge fund strategies is lower than an equivalent investment in the passive MSCI World Index.[2]

Of course, this book makes the clear distinction between pure arbitrage—riskless profit in the absence of initial investment—and the strategies employed by hedge funds, which clearly are not without risk. In practice, pure arbitrage opportunities are rarely available. Investors for the most part engage in risk arbitrage by which they identify opportunities where prices *should* converge to an expected value and generate a positive return. This book provides two engaging case studies to illustrate how, in practice, arbitrageurs such as George Soros and Long Term Capital Management drew upon large amounts of capital and incurred high levels of risk as they sought to profit from perceived mispricings.

True to its title, the focus of the book is the understanding of arbitrage, and in particular how it relates to many aspects

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of finance. In Chapter 2, we gain insight about arbitrage and the "law of one price" by way of a hypothetical commodities example. Chapter 3 extends these insights to spot and forward pricing and the cost of carry model. This model is then applied to equities and fixed income securities. In Chapter 4, we are shown how the law of one price governs the theory of purchasing power parity and expected future exchange rates. Chapters 5 and 6 present a solid review of option pricing theory, including put–call parity, binominal option pricing, and the Black–Scholes model. Finally, in Chapter 7, we are shown how arbitrage serves as the foundation of the famous Modigliani–Miller capital structure propositions.

This book is a succinct, yet hardly superficial, review of this pervasive financial principle. Novices, as well as seasoned professionals, will appreciate the clarity of style and the easy-to-follow practical examples, which makes *Understanding Arbitrage* a valuable resource for both industry and the academy.

Notes

[1] See http://www.hedgeindex.com

[2] Cumulative returns between January 1994 and September 2005 of convertible arbitrage, risk arbitrage, and MSCI World Index: 168, 142, and 212%, respectively. As reported by CSFB/Tremont. Hedge fund databases typically suffer from biases that reduce the quality of the reported statistics. Survivorship bias refers to the poorly performing funds that drop out of the index. In addition, hedge fund managers report performance records voluntarily and thus are more likely to only submit records of funds that have performed well.

THE LEGACY OF FISCHER BLACK

By Bruce Lehmann
Reviewed by Craig W. French

This book is an elucidation of the applied science of financial economics, as told through 12 chapters contributed by many of the preeminent researchers in the field. While none of the material draws directly from Fischer Black's own work, the spirit of the research is what drove Lehmann to select these particular examples. Most of the 12 chapters in this volume derive from talks given at the 1996 Berkeley Conference on Finance in honor of Fischer Black. In addition to these historic presentations, Lehmann added his own comprehensive summary of the work of Fischer Black, from the Sharpe–Treynor CAPM applied to Black's relatively overlooked wheat economy model, to Black's zero-beta CAPM, to Black's empirical investigations and collaborations, to the Black–Scholes–Merton options pricing model, to his work on international asset pricing and asset allocation, as well as Black's rigorous treatment of business cycles and macroeconomics. Also fortuitously added is a contribution on "Crisis and Risk Management" by one of Black's most famous collaborators, Myron Scholes, who provides an excellent review of this critical subject from the unique perspective of a Nobel Laureate with first-hand experience in managing the Long-Term Capital Management liquidity crisis. Also added is a beautiful review of the contributions of Black, Merton, and Scholes to economics by the 2003 Financial Engineer of the Year as voted by the IAFE, Darrell Duffie.

Stewart Myers, who in 1976 published Black's "Dividend Puzzle" paper, as well as Black's astounding reinterpretation of Jack Treynor's 1962–1963 MIT presentations of CAPM, in his wonderful text "Modern Developments in Financial Management," reviews Black's many contributions to corporate finance, including real options and accounting issues.

Bob Litterman provides a treatment of risk budgeting as currently practiced at Goldman Sachs, many of the approaches having been pioneered when Black was a partner there. This chapter reminded me of my days as a young analyst in

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Goldman's Asset Management division, when the following story circulated amongst the troops: At one presentation on risk management to some brokers, someone in the audience asked Black, who was the presenter, "If you're so smart, why aren't you rich?" To which Black calmly reflected for a moment and then replied, "If you're so rich, why aren't you smart?"

Although there is no substantial difference between the models in Black–Litterman (1991) and Black's earlier collaboration with Jack Treynor in their 1973 paper, "How to Use Security Analysis to Improve Portfolio Selection," Lehmann's compilation treats the earlier paper for the first time in Steve Ross' excellent chapter on noisy rational expectations. This chapter provides a theoretical explanation for the existence of intermediation in capital markets, such as mutual funds, which accommodates an unstable equilibrium.

Mark Rubinstein and Jens Jackwerth's chapter on imputing risk-neutral probabilities from options prices, asset prices, and the risk-free rate takes a general equilibrium approach much similar to the approach favored by Black. Scott Richard adds a negatively correlated factor to the one-factor model of Black–Karasinski in order to better price term structure derivatives. Douglas Breeden examines the empirical negative convexity (why don't they simply refer to it as "concavity?") in the mortgage market. Huang and Stoll examine the returns of liquidity providers on the NYSE and find that liquidity providers such as specialists and dealers profit at the expense of public limit orders.

Brennan, Chordia, and Subrahmanyam analyze 13 years of data, use individual securities in order to avoid the problems associated with forming artificial portfolios, and, using APT-style factors, find that after adjusting for risk, mean asset returns are significantly related to certain firm characteristics: size, analyst following, membership in the S&P 500 index, 12 month lagged returns, and the bid–ask spread (negative!). Lehmann provides a discussion of the Brennan *et al.* paper in Chapter 8, discussing the problematic nature of their task, suggesting potential methodological improvements to their procedure and discussing the portfolio formation issue as well as the data-mining aspect of the specification searches.

While a title like "The Legacy of Fischer Black" might whet potential readers' appetites for a volume reprinting Black's own work, Lehmann has done a masterful job of both describing Black's own work and assembling a current group of research that is similar in spirit to the type of work in which Black was interested and engaged. This volume, paired perhaps with Perry Mehrling's "Fischer Black and the Revolutionary Idea of Finance," will provide the reader with a relatively comprehensive overview of the incredible work in economics performed by Fischer Black and his successors.

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