Book Review

Active Portfolio Management: A Quantitative Approach to Providing Superior Returns and Controlling Risk, 2nd edition, Richard C. Grinold and Ronald N. Kahn.

New York: McGraw-Hill, 2000. 596 pp., $70.00 (hardcover). ISBN 0-07-024882-6.

This unusual book is *not* intended chiefly as a textbook for investment courses. The book's principal target audience is quantitatively inclined investment management professionals with some masters-level knowledge of finance. However, it could make an excellent textbook for a second-year MBA course in quantitative portfolio management; the authors mention this as a possible use of the book. Be warned: anyone teaching a course based on this book would need to make a substantial commitment to mastering and expositing a large body of unfamiliar, analytical material. The payoff would be a class full of students who could not complain that the course was not practically relevant.

Alternatively, the book could play a valuable supporting role in an investments course as optional outside reading. Many M.B.A. students query the usefulness of modern portfolio theory in business applications. In this book the authors nearly describe how to build a fully functional investment management business, and it is all done on a foundation of modern portfolio theory.

The book covers a comprehensive range of quantitative portfolio management techniques, including design and estimation of security selection models, portfolio optimization methods, measuring and controlling portfolio risk, measuring transaction costs, developing efficient trading strategies, and portfolio performance and performance attribution measurement. The focus is on domestic stock and bond portfolios managed against a prespecified benchmark. There is only one chapter on asset allocation (which also includes the only material on international investing), nothing on strategic asset allocation or asset-liability modeling, and very little on derivatives. The most impressive contribution of the book is in the step-by-step linkages that the authors construct from the start of the investment management process (return forecasting and/or security valuation) to the final buy and sell orders, and beyond that to expost performance measurement.

The book consists of 22 chapters divided into four parts. After Chapter 1, Introduction, comes Part One, Foundations, consisting of chapters 2 (Consensus Expected Returns: The Capital Asset Pricing Model), 3 (Risk), 4 (Exceptional Return, Benchmarks, and Value Added), 5 (Residual Risk and Return: The Information Ratio), and 6 (The Fundamental Law of Active Management). Part Two, Expected Returns and Valuation, consists of chapters 7

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(Expected Returns and the Arbitrage Pricing Theory), 8 (Valuation in Theory), and 9 (Valuation in Practice). Part Three, Information Processing, consists of chapters 10 (Forecasting Basics), 11 (Advanced Forecasting), 12 (Information Analysis), and 13 (The Information Horizon). Part Four, Implementation, consists of chapters 14 (Portfolio Construction), 15 (Long/Short Investing), 16 (Transactions Costs, Turnover, and Trading), 17 (Performance Analysis), 18 (Asset Allocation), 19 (Benchmark Timing), 20 (The Historical Record for Active Management), 21 (Open Questions), and 22 (Summary). Eighteen of the 22 chapters include technical appendixes, and there are three general appendixes at the end of the book, giving a review of notation, a glossary of terms, and a review of statistics and portfolio return basics. Purchasers should be careful to get the second edition, not the first edition, which is still in circulation but is not a good substitute.

The authors use a unified analytical framework throughout the book. Let r_B denote the return on a pre-specified benchmark portfolio and r_P the return on the investment manager's chosen portfolio. The difference between the portfolio return and benchmark return is the active return of the portfolio. The authors assume that the risk-return preferences of the investment manager can be represented by a utility function which is linear in the mean and variance of active return. Letting U_{r_P} denote the manager's utility for the chosen portfolio, this gives: $U_{r_P} = E[r_P - r_B] - \lambda \text{var}[r_P - r_B]$, where λ is a risk aversion parameter. Purists will object to this formulation on several grounds. The use of a mean-variance utility function limits the possible return distributions and/or underlying preferences. The use of a static utility function ignores dynamic patterns in risk or return. Most notably, the use of active returns rather than total returns means that the analysis is from the viewpoint of the investment manager, not the underlying investor. Roll (1992) shows that, in general, mean-variance optimization using active returns gives portfolios that are not consistent with a total return mean-variance objective. Many Masters-level course teachers will want to mix the discussion of practical applications of mean-variance techniques with broader questions about the link between investment decisions and capital market equilibrium. This broader viewpoint is clouded when the analysis is done using active returns rather than total returns.

A critical part of any implementation of mean-variance techniques is a Bayesian shrinkage correction of return forecasts. Markowitz's mean-variance model of portfolio choice was one of the first major contributions to modern finance. Yet as a practical tool the mean-variance technique languished for decades. The error maximization problem [as it was aptly named by Michaud (1989)] caused the mean-variance technique to perform very badly in early applications. A mean-variance optimizer cannot distinguish between true expected returns and estimation error in expected returns, and similarly for true variances and covariances versus the estimation error in them. In attempting to maximize expected return for a given level of risk, an optimizer

will tend to maximize the positive estimation error in the chosen portfolio's calculated expected return. Similarly (although the effect is not as pronounced) the calculated variance of the "optimized" portfolio will be biased downward, since the optimizer will tend to overweight stocks with underestimated variances and/or pairs of stocks with underestimated covariances. The result will often be an "optimized" portfolio with extremely aggressive positions, promising an unrealistically high expected return for its purported level of risk. Jorion (1985) showed that the use of a Bayesian framework can eliminate the error maximization problem. The authors of this book use a variant of Bayesian shrinkage due to Grinold (1994). Their treatment is clear and thorough; this part of the book is an important contribution since this material does not appear in most existing investment textbooks.

Some academics may find the book too narrowly focused on practical problems. For example, the authors spend eight pages (including almost three pages of detailed linear algebra) analyzing the problem of "dispersion." They define dispersion as the differences in return among client portfolios run by the same manager using the same benchmark. Dispersion arises naturally because different clients add and subtract capital on different dates, and the manager's buy and sell choices change through time. Which particular securities are bought and sold, and therefore the portfolio's subsequent performance, depends upon when capital was added or subtracted from each account. Not only are there lucky and unlucky investment managers who have the same true skill level, but also lucky and unlucky clients of the same manager! Dispersion is an important practical problem for portfolio managers, but not a deep problem from the viewpoint of social scientific research on capital markets and their role in the economy. On the other hand, inspiration for new ideas can come from unexpected places. Perhaps the next big idea about contract theory for investment management, or about the link between information signals and equilibrium security prices, will come from thinking deeply about dispersion!

In summary, if you are teaching a masters-level course in investments and are questioned about the practical applicability of modern portfolio theory, cite this book. It shows that modern portfolio theory can be applied in a detailed, integrated way to a wide range of investment management problems. If you are adventurous, the book would be an interesting textbook for a second-year masters-level course. Students in such a course would need an investments course as a prerequisite, and a tolerance for lots of mean-variance algebra. Despite its high level of technical rigour, the book concentrates on practical problems of investment management rather than capital market theory.

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