Core-Satellite Portfolio Management

A MODERN APPROACH TO PROFESSIONALLY MANAGED FUNDS

J. CLAY SINGLETON

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This book is printed on recycled, acid-free paper containing a minimum of 50% recycled de-inked paper.

To my wife and best friend, Kathy,
and to our family,
Robert, Kerri, Caitlyn, and Chelsea

ABOUT THE CONTRIBUTORS

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Jeffrey Antonacci serves as manager of Ibbotson's fund-of-funds team, where he is responsible for managing a team of consultants that develops and manages asset allocation and fund-of-funds programs for institutional and retail clients. A frequent speaker at financial services client conferences, Mr. Antonacci lectures on asset allocation, manager selection, investment style diversification, market forecasting, and alternative asset classes.

Prior to joining Ibbotson Associates, Mr. Antonacci was an institutional investments product manager for Northern Trust Global Investments, where he was responsible for developing competitive intelligence and monitoring, analyzing, and evaluating investment managers. Prior to joining Northern Trust Global Investments, he held supervisory positions in Northern Trust's Daily Valuation Division, where he was responsible for the valuation and financial statement analysis of institutional employee benefit plans.

Mr. Antonacci received an M.B.A. from the Kellogg Graduate School of Management at Northwestern University and a B.S. in Finance from Indiana University. He is also a CFA charterholder, a member of the CFA Institute, and a member of the Investment Analysts Society of Chicago.

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Peng Chen is Managing Director at Ibbotson Associates. He is responsible for Ibbotson Associates' overall research activities. Ibbotson Associates is an independent asset allocation consulting firm that provides data, software, consulting, research, training, and presentation materials to the investment profession.

Dr. Chen conducts research projects on asset allocation, portfolio risk measurement, nontraditional assets, and global financial markets. He has also contributed to the development of various Ibbotson products and services, including software, consulting services, educational services, and presentation materials. His writings have appeared in the *Financial Analyst Journal, Journal of Portfolio Management, Journal of Investing, Journal of Financial Planning, Bank Securities Journal, Journal of the Association of American Individual Investors,* *Consumer Interest Annual*, and the *Journal of Financial Counseling and Planning*. He received the Articles of Excellence Award from the Certified Financial Planner Board in 1996 and the 2003 Graham and Dodd Scroll Award from the *Financial Analysis Journal*.

Dr. Chen received his bachelor's degree in Industrial Management Engineering from the Harbin Institute of Technology and his master's and doctorate in Consumer Economics from the Ohio State University. He is a CFA charterholder.

Bradley S. Daniels, CFA
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Brad Daniels was a portfolio manager at Schlarbaum Capital Management, LP, when he coauthored a chapter for this book. He has worked in the investment industry since 1983. Prior to joining Schlarbaum Capital Management, LP, he was a member for eighteen years of the equity team at Miller Anderson & Sherrerd, which merged with Morgan Stanley Investment Management in 1996. He worked directly with Gary Schlarbaum for fifteen years on the small-cap core and small-cap value strategies and then oversaw the strategies upon Mr. Schlarbaum's departure from Morgan Stanley.

Prior to joining Miller Anderson & Sherrerd, Mr. Daniels was an associate at Kidder, Peabody & Co., Inc., from 1983 to 1985. He received his B.S. from the University of Pennsylvania in 1983 and his M.B.A. from the Wharton School at the University of Pennsylvania in 1989, and is a CFA charterholder.

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Samuel W. Halpern is associated with Independent Fiduciary Services, Inc., a pension investment consulting firm based in Washington, D.C. His expertise includes advising public and private investment funds and fiduciaries on controls over investment risk and expense, alternative investments, governance, prudent investment practices, and related matters. He has been integrally involved in every operational review/best practices study IFS has performed, collectively concerning over $550 billion in assets, and all "independent fiduciary transactions," where the firm acts as an independent decisionmaker, replacing the regular plan fiduciaries when they suffer a conflict of interest. He also is centrally involved in the firm's ongoing, broad-based investment consulting to ERISA-covered defined benefit, defined contribution, and welfare plans, including advising clients on investment policy, asset allocation, manager selection and monitoring, custody, brokerage, and related matters.

Previously a partner in a Washington, DC labor law firm, Mr. Halpern specialized in the field of fiduciary responsibility regarding ERISA-covered investments. Before entering private practice, he litigated fiduciary responsibility cases under ERISA at the U.S. Department of Labor, where he helped develop standards governing pension fund investments. He graduated Phi Beta Kappa from Brown University, attended the London School of Economics, and received his law degree with honors from the George Washington National Law Center in Washington, DC.

Andrew Irving, J.D.
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Andrew Irving is Mr. Halpern's colleague at Independent Fiduciary Services, Inc. Mr. Irving joined IFS in 2003 after 25 years of private law practice in the New York City office of the international law firm Bryan Cave LLP and its predecessor in New York, Robinson Silverman Pearce Aronsohn & Berman.

Mr. Irving's work for IFS focuses on operational reviews and fiduciary transactions, as well as oversight of IFS's internal legal affairs and ongoing consulting services. His law practice before joining IFS focused on the representation of public, Taft-Hartley and corporate pension and welfare plans, labor unions, corporate plan sponsors, and financial institutions serving the benefit plan community. He has devoted much of his time to advising clients on issues of fiduciary responsibility in investment decision making, and has also litigated cases in state and federal courts that raised those issues. He also worked with plan fiduciaries and the investment community designing sophisticated investment products and strategies to comply with statutory requirements such as synthetic guaranteed investment contracts, direct real estate investments, and hedge "fund of fund" vehicles. Having worked with leading investment and actuarial firms, as well as with some of the largest public and private sector pension plans, he has in-depth knowledge of the complex environment in which institutional investment decision makers carry out their fiduciary responsibilities.

Mr. Irving received his B.A. cum laude from Yale University and his law Juris Doctor from Columbia Law School, where he was a member of the Law Review. He has published articles in various professional journals published by the American Bar Association, the International Foundation of Employee Benefit Plans, and the Research Institute of America, and has edited official reports of the Committee on Labor and Employment Law of the Association of the Bar of the City of New York.

Ranga Nathan, CFA
Principal, InvestMatrix Inc.

Ranga Nathan is a principal at InvestMatrix Inc., a consulting firm specializing in risk management and the structuring of investment products, including exchange-traded funds and hedge funds.

Mr. Nathan started his career at Citibank (Asia) and Chase (Europe). He then spent over ten years at Waldner & Co., which pioneered foreign exchange and interest rate risk management research, and he eventually became the firm's president. At Waldner, he (a) developed models to identify directional changes in the foreign exchange, interest rate, equity, and energy markets; (b) was the project leader of all risk management consulting assignments for multinational firms and institutional investors in North America, Europe, and Asia; (c) developed structured investment products for an international base of institutional and individual investors; and (d) supervised research, trading, back office, middle office, and compliance functions relating to overlay management and alternative investments.

After leaving Waldner, Mr. Nathan assumed the position of Senior Vice President, Global Risk Management, at a division of Sakura Bank (currently part of the Mitsui Banking Corporation), where he developed risk management products and managed hedge funds-of-funds. After that, at Nuveen, he was involved in developing equity and fixed-income exchange-traded funds. After buying the equity ETF business from Nuveen, he assisted in the launch of the first ETFs based on enhanced indexes.

Mr. Nathan has written articles on risk management, index products, and alternative investments in *Euromoney, Derivatives Quarterly, Global Pensions*, the *Journal of Indexes*, and other publications. He was on the editorial board of *Derivatives Quarterly* and is a review board member of the *Journal of Indexes*. He has also contributed chapters in books such as *Global Investment Risk Management* and *ETF's: New Approaches and Global Reach.* He is a member of PRMIA, the professional risk managers' association, and of the Investment Analysts Society of Chicago. He is also President of the Chicago chapter of QWAFAFEW, a contrived name for an association of quantitative professionals in investment management and related fields. He has a Masters in Business from a school previously affiliated with MIT and is a CFA charterholder.

Joseph P. Pinsky, CFA
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Joe Pinsky has 5 years of experience in the financial services industry and has developed strategic asset allocation programs for more than 20 of the major U.S. insurance companies, broker-dealers, mutual fund firms, and retail banks. He assists clients with questionnaire development, asset allocation modeling, manager selection, and due diligence. He also assists in conducting research and has been published in the *Journal of Investing* for his work on direct energy investments. Mr. Pinsky is a CFA charterholder.

James A. Pupillo, CIMA, CIMC

Jim Pupillo graduated with a B.S. degree in Management-Administration and Marketing from Indiana University, Bloomington. He has been involved in the investment management consulting business since 1987.

As a senior institutional consultant for a major brokerage firm, Mr. Pupillo has been recognized for providing extraordinary investment consulting services and has qualified to serve institutional and private clients. In honor of the late John Coggins, Mr. Pupillo was the first recipient of the John Coggins Award exemplifying leadership through creative contributions and integrity. Mr. Pupillo is also the recipient of the Harry Irvine Award, given to the consultant who demonstrates the highest ethics and greatest commitment to assuring that his/her clients continue to achieve their long-term goals. Mr. Pupillo was chosen as one of "America's Top 100" investment management consultants by *On Wall Street* magazine and was selected by the Society of Senior Consultants to participate on the advisory workgroup for the High Net Worth Client Standards Initiative Project.

Mr. Pupillo is 2003–2004 President of the Association of Professional Investment Management and a past Advisory Board Chairman and President for the Institute for Certified Investment Management Consultants (ICIMC), a nonprofit professional society that certifies investment management consultants internationally. He has been an instructor for the Arizona State University (ASU) Nonprofit Management Institute's certification program. He also organized the first conference on university-based certification programs in nonprofit management, sponsored in conjunction with the ASU Nonprofit Management Institute and Consulting Group.

Mr. Pupillo cohosted the Financial Satellite Network's program *Managed Money*, an educational television series as well as the radio program *Money Managers Insight* on KFNN (1510 AM radio). He has also written several articles published by the financial media on the topic of investment management consulting and fiduciary responsibility. He has earned the Certified Investment Management Consultant (CIMC) designation from the Institute for Certified Investment Management Consultants. He has also obtained the Certified Investment Management Analyst (CIMA) designation offered by the Investment Management Consultants Association through the Wharton Business School, University of Pennsylvania. He works with his associates in Scottsdale, Arizona.

Gary G. Schlarbaum, Ph.D., CFA
Schlarbaum Capital Management, LP

Gary Schlarbaum is Principal and Portfolio Manager at Schlarbaum Capital Management, LP, a firm that he cofounded with his son in 2002. Dr. Schlarbaum has worked in the investment industry since 1980.

Prior to cofounding Schlarbaum Capital Management, LP, Dr. Schlarbaum was the head of the domestic equity team at Miller Anderson & Sherrerd, which merged with Morgan Stanley Asset Management in 1996. Dr. Schlarbaum was directly responsible for managing the Morgan Stanley Institutional Fund Trust U.S. Small Cap Value Portfolio from 1988 until March 2002. Prior to joining Miller Anderson & Sherrerd in 1987, Dr. Schlarbaum was Head of Asset Allocation at First Chicago Investment Advisors (now Brinson Partners), where he was employed from 1984 to 1987. He was Professor of Finance at Purdue University from 1969 to 1984.

Dr. Schlarbaum is on the board of trustees of Coe College and Bryn Mawr Presbyterian Church. He is currently a member of the Philadelphia Society of Security Analysts, CFAI, the American Finance Association, and the Shakespeare Society. He also served as the past Chairman of the Candidate Curriculum Committee of the Institute of Chartered Financial Analysts. He is a frequent writer and lecturer on many investment-related topics; his most recent document, "Value-Based Equity Strategies," has been reprinted in *Selected Topics in Equity Portfolio Management*, in English and in various other languages.

Dr. Schlarbaum graduated from Coe College (B.A.) in 1965 and the University of Pennsylvania (Ph.D. in Finance) in 1971. He is a CFA charterholder.

Clifford A. Sheets, CFA

Cliff Sheets is a seasoned investment professional with over 24 years of direct capital market experience in various institutional settings. His experience includes individual company analysis, market analysis, investment strategy and investment policy formulation, portfolio management, investment performance review, and the development and management of professional investment staff.

He currently serves on the board of trustees of the American Red Cross Retirement System and chairs the finance committee, which oversees the management of the investments of the pension plan. Mr. Sheets was Director of Securities at AEGON USA, where he was the senior executive responsible for fixed-income securities assets totaling approximately $70 billion. In this capacity he served on various group decision-making committees that oversaw the portfolio strategy for the general account and approved investments in nonpublic assets, including private placements, alternative investments, and commercial mortgage loans. During his eleven years as a manager at AEGON USA, he was also responsible for public corporate portfolio management and credit analysis.

Prior to joining AEGON USA, Mr. Sheets headed the fixed income management department at Bank One, Indianapolis. In addition to his supervisory duties there, he managed taxable fixed income portfolios with an emphasis on employee benefit accounts of both government and corporate sponsors. He also managed a closed-end bond mutual fund portfolio and supervised the management of open-end bond and money market portfolios. Mr. Sheets began his career as a securities analyst at American United Life Insurance Co. in Indianapolis, where he analyzed credits of both public and private placement borrowers across multiple industries.

Mr. Sheets received an M.B.A. in Finance from Indiana University in 1982, and a B.A. in Business Management from the University of Northern Iowa in 1977. He is a CFA charterholder.

Hilary Till
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Hilary Till cofounded the Chicago-based Premia Capital Management, LLC, of which she is a Portfolio Manager, with Joseph Eagleeye. Premia Capital specializes in detecting pockets of predictability in derivatives markets using statistical techniques. She is also a principal of Premia Risk Consultancy, Inc., which advises investment firms on derivatives strategies and risk management policy.

Prior to coming to Premia, Ms. Till was Chief of Derivatives Strategies at Boston-based Putnam Investments. Her group was responsible for the management of all derivatives investments in domestic and international fixed income, tax-exempt fixed income, foreign exchange, and global asset allocation. In 1997, for example, the total notional value of derivatives structured and executed by her group amounted to $93.2 billion. Prior to coming to Putnam Investments, Ms. Till was a quantitative analyst at Harvard Management Company (HMC) in Boston. HMC is the investment management company for Harvard University's endowment.

Ms. Till has a B.A. in Statistics with General Honors from the University of Chicago and a M.Sc. in Statistics from the London School of Economics (LSE.) She studied at LSE under a private fellowship administered by the Fulbright Commission. Her articles on derivatives, risk management, and alternative investments have been published in the *Journal of Alternative Investments, Derivatives Quarterly, Quantitative Finance, Risk* magazine, and the *Singapore Economic Review*.

Kenneth E. Volpert, CFA
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Ken Volpert oversees the Valley Forge, PA–based Vanguard's Bond Indexing Group, which manages over $42 billion in mutual fund assets. He also comanages Vanguard's $6.5 billion Inflation-Protected Securities Fund.

Mr. Volpert currently manages over $32 billion in three bond index mutual fund portfolios and EUR 1 billion in five offshore nondollar bond index funds. He comanages the $6.5 billion Vanguard Inflation-Protected Securities Fund. The investments in his portfolios cover the full range of domestic markets (Treasury, mortgage-backed, and corporate securities with maturities of up to 100 years) as well as the world government and corporate markets. Prior to joining Vanguard in 1992, Mr. Volpert was vice president and senior portfolio manager with Mellon Bond Associates, where he was responsible for managing over $5 billion in bond index portfolios.

Mr. Volpert wrote a chapter on "Managing Indexed and Enhanced Indexed Bond Portfolios" published in numerous Fabozzi publications. He is also a member of the Lehman Index Advisory Council, the Association for Investment Management and Research, and the Philadelphia Analysts' Society. He has over 20 years of fixed income management experience (more than 15 years of bond indexing experience), is a CFA charterholder, and holds a B.S. in Finance from the University of Illinois-Urbana and an M.B.A. from the University of Chicago.

FOREWORD

Fiduciaries of pension, endowment, and eleemosynary funds generously accept substantial responsibilities, face complex challenges, and assume significant personal liability in order to serve their beneficiaries. The primary compensation they receive is the deep personal satisfaction of helping many faceless people, some yet unborn, finance their future needs.

The training many fiduciaries receive to prepare for their substantial duties and decide difficult issues, however, is often limited and unrelated to their primary professional activities. This book, *Core-Satellite Portfolio Management*, is designed for and directed to such fiduciaries. Therefore, the perspective is deliberately high-level and broad-ranging, intending more to familiarize fiduciaries with the "big picture" issues and to help them mentally organize the process, rather than to convert them into technical experts in any particular discipline.

The "core-satellite" approach advocated by this book is, in my view, less a new portfolio management approach than a useful way to organize, think about, analyze, and describe portfolio management approaches that have been used and tested for many years, but using different words and rubrics. The core-satellite approach merely formalizes and better articulates portfolio management practices that existed even prior to the formal recognition of passive and active/passive management styles, which can be traced back to the 1970s. In some sense, passive management, which has come to be formally recognized and accepted during the last quarter century or so, was practiced in less formal ways during prior years, as many "core" holdings were held more for core diversification purposes than for extraordinary expected returns. (Think about how virtually all pension funds held IBM in earlier years as a core holding, more as a diversifying anchor vs. the S&P 500 index instead of a truly judgment-based active holding.) Such holdings were not in any sense actively managed (considered continuously for sale or purchase depending upon changing judgments regarding expected returns or risks).

With increasing volumes of portfolio data and the growing precision and uniformity of performance measurements, it has become convincingly clear that certain parts of the capital markets are quite competitively priced by thousands of investors vying for returns in an increasingly transparent marketplace. Investing is perhaps the only competitive arena where the "average" result is mechanically obtainable using computers, or nearly so. Very few professional investment managers demonstrate any persistent ability to outperform the average result for large capitalization equity portfolios after transaction costs and management expenses, and the few that claim to do so are balanced by the few who persistently underperform. (These persistent underperformers tend neither to advertise their records nor to win new clients; eventually they fall by the wayside.) Other market sectors, such as high-quality fixed income, demonstrate similar characteristics wherein the "passive average" (after costs) result ranks toward the upper portions of the competitive performance rankings. Academic logic and quantitative risk analyses demonstrate very plausible reasons for these results and indicate that we should not be surprised by these findings, which have obtained for many years through various market cycles. Therefore, it makes sense to implement "core" portfolio holdings in efficiently priced sectors in the lowest-cost form possible, which means some portion is invested using passive management techniques. This approach is developed further in Chapter 1.

Chapter 1 also emphasizes the easy-to-accept importance of *asset allocation* as the key driver of portfolio investment results over time. Fiduciaries must decide on the definition of the asset classes they wish to include in the portfolio and must decide whether each asset class should be viewed as core or satellite. (The considerations importantly include the investment expertise and experience set of the fiduciaries.) How the respective asset class weighting targets are established by the fiduciaries and how they are maintained through time (reweighted with differential market performance) will probably be the most important determinants of portfolio results. The fiduciaries' choice of benchmark for each asset class is also mentioned as very important in Chapter 1 and further explored with helpful details in Chapters 3 and 4. While no prescription is offered—or can be offered—to make benchmark selection easy, considering the nature and timing of the portfolio liabilities is correctly identified as the key input to this process.

To provide important explanatory background that fiduciaries should become familiar with, Chapter 2 provides a review of the *quantitative investment concepts*, but does so without excessive technical detail or requirement for mathematical expertise to understand. It explores the important concept of correlation and explains why diversification works to reduce risk. It reviews the concept of the "efficient frontier" and identifies the important assumptions behind much quantitative research and indicates how those assumptions are not perfect reflections of reality, but are still relevant enough to be useful. Finally, it reviews the concept of risk factors and stresses the importance of risk measures and risk monitoring.

Chapters 3 and 4 focus on management of the *core portion* for equities (Chapter 3) and fixed income (Chapter 4) assets.

Chapter 3 gets more into the "how to" of constructing the core portion of a core-satellite portfolio for *equity* holdings. It stresses the importance of benchmark construction and reviews the factors fiduciaries should consider in choosing indices. It provides a very useful table summarizing the key features of the popular equity indices from which benchmarks can be selected or constructed on a customized weighted basis. It reviews the differences between market risk and residual or "active" risks, measured as tracking error. Chapter 3 advocates the development of a "risk budget" for use in allocating tolerable risk between core and satellite positions. It makes clear that the risks that are important for investing are forecasts of future risks, which are not to be confused with past measurements of historical risks. Finally, it reviews important factors for several vehicles that can be selected by fiduciaries to implement various core strategies.

Chapter 4 suggests how best to use the core-satellite approach to exploit the efficiencies and in efficiencies in the *fixed income* markets, by locating the higher quality liquid sectors in the core, managed passively at very low costs, with more specialized sectors located in satellites, with the goal of outperforming the relevant benchmark. It reviews the different kinds of fixed income risks (duration, credit quality, convexity/prepayment/callability, sector, currency, inflation linkage, etc.) and suggests the tracking error associated with each in various strategies. It also reviews some of the most popular fixed income indices and indicates how they are comprised of differing quality levels and sectors.

Chapters 5 through 9 focus on specialized asset classes that are good candidates for *satellite portfolios*, which are intended to provide opportunity for extraordinary return along with diversification benefits to the remainder of the portfolio.

Chapter 5 provides an excellent overview of *high yield debt*, including public "junk bonds," Rule 144a securities, private placements, bank loans, and collateralized debt obligations (CDOs). It includes a discussion of market history and indicates the historical correlations between various categories. It also discusses *distressed debt*, which are bonds that have fallen into bankruptcy, liquidation, or have a high risk of ending up in either position. It discusses the special skills that are necessary to manage these asset classes and the management fees that should be expected.

Because fiduciaries must consider and decide whether to hedge or not to hedge *foreign currency exposures*, Chapter 6 deals with the impact that currency fluctuations can have and how they can or should be managed. It implicitly assumes that the portfolio has foreign currency exposures by virtue of its existing investment strategies, such as a foreign equity satellite portfolio, and advocates a separate currency "overlay" program managed by one or more foreign currency management experts to eliminate or possibly even enhance the foreign currency impact of the existing foreign exposure. Chapter 6 reviews the arithmetic a fiduciary should understand about how foreign currency exposure arises and how it is influenced by economic factors.

For fiduciaries that have an obligation to protect the future *purchasing power* of beneficiaries, Chapter 7 is particularly relevant. It deals with a relatively new and interesting U.S. asset class called *Treasury inflation-protected securities* (TIPS). TIPS offer fiduciaries an opportunity for portfolio diversification that no other satellite instrument or asset class can replicate. This chapter explains how TIPS work, explores their return patterns and relationships with those of other asset classes, and reviews their brief history, which reveals a small but rapidly growing presence. It explains how the difference between nominal bond yields and TIPS yields provides a good indication of the market's aggregate forecast for future inflation. Chapter 7 explains and quantifies with good charts why fiduciaries with other financial assets (like stocks and bonds) should be strongly motivated to include TIPS as a satellite portfolio.

Chapter 8 focuses on additional inflation hedges—hard assets, including nonperishable real assets like energy, precious metals, real estate, and timber—and soft assets, including agricultural products and livestock. These assets are typically not traded on exchanges (like stocks and bonds) and frequently have lower liquidity and other specialized features that often require specialized management. The chapter then focuses on direct energy assets (*oil and gas*) as a representative sample. Because of the lack of readily available and reliable performance data, the chapter also stresses the importance of building a synthetic historical return series for analytical purposes, and presents a methodology for doing so for direct energy investments. It advocates that cyclical patterns, linkages to inflation, and correlations with other asset classes must be studied and understood, so that likely risk and return impacts on the remaining portfolio can be modeled and predicted. The chapter demonstrates how an energy satellite can increase the expected return and/or reduce the expected risk of the total portfolio.

Chapter 9 explains and advocates a valuation methodology to manage a satellite portfolio consisting of *small capitalization* stocks. It reviews the results of a study covering the period from 1990 through 2003. During this period, the proposed valuation methodology, based on a weighted combination of P/E ratios and earnings revisions (both ranked within 12 sectors), handily outperformed the "average" for small stocks, which were defined as the stocks ranked 1001 through 3000 at the beginning of each calendar quarter. This provides food for thought for any fiduciary.

Chapters 10 and 11 provide useful practical *advice and checklists*