Investment Analysis and Portfolio Management

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Three econometricians went out hunting, and came across a large deer. The first econometrician fired, but missed, by a meter to the left. The second econometrician fired, but also missed, by a meter to the right. The third econometrician didn't fire, but shouted in triumph, "We got it! We got it!" – Anonymous

"Forecasting is like trying to drive a car blindfolded and following directions given by a person who is looking out of the back window." – Anonymous

"We have 2 classes of forecasters: Those who don't know . . . and those who don't know they don't know." – John Kenneth Galbraith

"On the first day God created the sun - so the Devil countered and created sunburn. On the second day God created sex. In response the Devil created marriage. On the third day God created an economist. This was a tough one for the Devil, but in the end and after a lot of thought he created a second economist!" – CHEER, February 1993

The herd instinct among forecasters makes sheep look like independent thinkers. – Edgar R. Fiedler

I. *Objectives*:

The focus of this course is on the examination and valuation of the major investment vehicles and strategies popular today. In particular, we will consider how investors allocate their financial assets by forming, managing, and evaluating portfolios containing instruments such as stocks, bonds, futures and option contracts, and mutual funds. Although the ultimate objective will be to develop a conceptual and theoretical background upon which the student can expand his or her knowledge of the field of investments, the topical treatment will be rather practically oriented.

II. *Prerequisites:*

Quantitative Analysis – ECON 350 or MATH 240

III. *Text and Learning Resources*:

Required Texts:

Gitman, L., and M. Joehnk, (2005), *Fundamentals of Investing & Wharton's OTIS Student Access Kit Package*, 9th Edition, Addison-Wesley Publishing, 0-321-27533-0

Note: Make sure that the book you purchase provides the OTIS Student Access Kit. If you purchase a used textbook go to: https://register.pearsoncmg.com/reg/buy/buy1.jsp?productID=22806 to purchase access to OTIS

IV. *Student Responsibilities:*

Homework and Quizzes:

Homework problems are assigned for each chapter covered. Completing the assigned homework is an invaluable source of information. In fact, past experience indicates that those who complete the homework assignments as the course progresses do remarkably better than those who fail to make the attempt. Again, I cannot stress enough how much reviewing the assigned homework problems will assist you in learning the required material. We will cover a great deal of material in this class. As a result, the only way to gain a firm understanding of the material is to review the material on your own time, e.g., completion of the assigned homework. *Occasionally and at random, I will collect textbook assignments to be graded*. You should also remember to turn in (on time) all assigned homework that is not from the text.

Class Attendance:

In addition to regular attendance at lectures, students will be expected to read their assigned text(s) and complete a substantial number of practice problems and exercises (both graded and ungraded) applying key concepts. Students should also be encouraged to utilize available supplemental material including, but not limited to, course workbooks and interactive software and/or websites (typically accompanying a text) for additional practice.

V. *Examinations and Grading:*

The course will consist of two examinations, possible quizzes, assignments, weekly presentations to the class, an Online Trading and Investment Simulator (OTIS), and a term paper. Your final course grade can be determined using the following ***absolute*** (i.e., no curve) scale (*your final grade will reflect plus and minuses*):

A	450 – 500 points	Exams 1, and 2	200 points
B	400 – 449 points	Quizzes and Assignments	100 points
C	350 – 399 points	Journal Article Presentations	100 points
D	300 – 349 points	Participation in and Report on OTIS	100 points
F	000 – 299 points	OTIS Performance Modification	***[1]
		Total	500 points

Except in extreme circumstances, missed exams will not be tolerated. If you are involved in a DePauw University sponsored activity (i.e., sporting events, or other clubs) or ill, and will be unable to take an exam *on* the exam date then you must make special arrangements with me **BEFORE** the exam date! (No exceptions to this rule.) Otherwise, a student who misses an exam with a sufficient reason will have the weight of that exam added to the final. Specific requirements concerning the Journal Article Presentations, and OTIS will be provided at a later date.

VI. *Miscellaneous:*

Sources of Support:

Although my office hours are presented above, I want each of you to feel that you can come to my office at any time. If needed, I will try to arrange a time that we can meet and resolve whatever problems you may have encountered. If you have any questions and do not feel comfortable coming to me in person then, by all means, feel free to email your questions to me and, as far as that medium will allow, I will make an attempt to answer your questions. (I encourage you to take advantage of this resource!) This is probably the easiest way to contact me if you have questions. Keep in mind, however, that sending email is not a perfect substitute for stopping by my office.

STEPS TO RECEIVING AN 'A' IN THIS COURSE:

Step 1: Study!
Step 2: Stop by my office!
Step 3: Complete the homework assignments!
Step 4: Study!
Step 5: Stop by my office!
Step 6: Complete the homework assignments!
Step 7: Relax. This course should not be simply memorizing equations. If you view it as such, it will become tedious to you, as well as myself. Ask questions and get involved!

What's in an 'A' – What grades mean?

Below is a description of what I think grades mean (annotated from Dr. Balensuela):

A **C** indicates that the work shows a competent understanding of the assignments but the work will not go beyond the obvious. A **C** may indicate work with clear factual errors or writing that is difficult to follow or is inconsistent. Mere attendance of the class with little attempt to join in discussions or seek additional explanation in a timely manner can be seen as acceptable, but not exceptional work. A **C** can be seen as a default grade – the grade I assume will be given for any assignment, but which is revised (up or down) as I evaluate the assignment. As I evaluate your work, I ask myself, "Why is this more or less average?"

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[1] This will be discussed in more detail at a later date.

A **B** indicates that the student's work is good (i.e., the student has a good understanding of the material and writes in a clear and effective manner), but the work is weak in some areas. These weaknesses may be problems of organization, style, factual materials, or other deficiencies.

An **A** indicates that the student has near complete mastery of the material. Few changes, corrections, or suggestions can be made to the work submitted. An **A** also indicates that the student has taken an active role in learning the material through participation, class discussion, and getting outside help, *when needed*, in a timely manner.

A **D** indicates work that has some merit (that a student attempted to understand the material), but also has clear problems of factual understanding, clarity of writing, or organizational problems. A **D** indicates that there are some good aspects to the student's work, but that there are many areas of improvement and correction. Often **D** work indicates an attempt to merely repeat material of the text or lecture without a full understanding of the material.

An **F** indicates work that is consistently weak, reflecting little thought or effort. An **F** also indicates serious problems with participation, factual information, or clarity of writing. It is possible for a student to devote a moderate amount of work to an assignment and still earn only an **F** if that work is sufficiently problematic. In other words, **F** is not a default grade for only lack of effort, but the grade given for lack of comprehension.

Web Page: For your convenience I have provided a web page (the address is provided above) for this class. This page is meant to provide students with their most recent grades. If you feel that the grade on the web page does not accurately reflect your grade in the class, then please notify me and I will attempt to correct the discrepancy. Furthermore, from time-to-time I will try to keep a list of all recently assigned work and important dates. However, claiming that you missed an exam date because I failed to post it on the web page is not a valid excuse.

Academic Integrity Policy: Cheating, plagiarism, submission of work of others, etc. violates DePauw Policy on academic integrity and may result in failure or expulsion. It is your responsibility to be familiar with the University's policy regarding academic integrity. Negligence or ignorance of the policy will not be accepted as an excuse for violation of the policy. I take cheating personally. It represents: a lack of respect for your fellow students as well as myself, a lack of effort on your part to learn the required material, a total disregard for higher learning, and signifies your untrustworthiness.

Changes to Syllabus: I reserve the right to amend the syllabus at any time.

VII. *Covered Topics:**

Week	Chapter	Topic	
Week 1	NA	Introduction to Class	
Week 2	Chapter 1	The Investment Environment	
Week 3	Chapter 2 and 3	Investment Markets and Transactions (Read Ch 3 on you're your own)	
Week 4, 5	Chapter 4	Risk and Return and Modern Portfolio Concepts	
Week 6, 7, 8	Chapter 5	Modern Portfolio Concepts	Exam 1
Week 9	FALL BREAK	Mutual Funds – Read Ch 13 and 14 (Ch 12 and 13 in 10th edition)	
Week 10, 11	Chapter 9 and 6	Market Price Behavior and Common Stocks (Read Ch 6 on your own)	
Week 11, 12	Chapter 8 and 7	Stock Valuation and Analyzing Common Stocks	
Week 13	Chapter 10 and 11	Bonds and Bond Valuation (Read Ch 10 on your own)	
Week 14, 15	Chapter 15	Options (Ch 14 in 10th edition) ~ *Tentatively*	
Week 15	Chapter 16	Futures (Ch 15 in 10th edition) ~ *Tentatively*	
Week 16	Presentations	Presentations	Exam 2

* Note: this outline should be considered representative of the material we will cover during the semester; it is subject to change upon proper notification. Thus, this timeline should be viewed as an **APPROXIMATION**!

The following represents some of the seminal pieces of literature in finance.

I. Introduction: The Statistical Properties Of Stock Returns

1. *Siegel, Jeremy J., "The Equity Premium: Stock and Bond Returns Since 1802," *Financial Analysts Journal*, 48 (January-February 1992) 28-38.
2. *Schwert, G. W., "Stock Market Volatility: Ten Years After the Crash," *Brookings-Wharton Papers on Financial Services*, 1 (1998) 65-114.
3. *Kritzman, Mark, "What Practitioners Need to Know . . . About Lognormality," *Financial Analysts Journal*, 48 (July-August 1992) 10-12.
4. French, Kenneth R. and Richard Roll, "Stock Return Variances: The Arrival of Information and the Reaction of Traders," *Journal of Financial Economics*, 17 (September 1986) 5-26.
5. French, Kenneth R., G. William Schwert and Robert F. Stambaugh, "Expected Stock Returns and Volatility," *Journal of Financial Economics*, 19 (September 1987) 3-29.
6. Keim, Donald B. and Robert F. Stambaugh, "Predicting Returns in Stock and Bond Markets," *Journal of Financial Economics*, (December 1986) 357-390.
7. Fama, Eugene F. and Kenneth R. French, "Permanent and Transitory Components of Stock Prices," *Journal of Political Economy*, 96 (April 1988) 246-273.
8. Fama, Eugene F. and Kenneth R. French, "Dividend Yields and Expected Stock Returns," *Journal of Financial Economics*, 22 (October 1988) 3-25.
9. Fama, Eugene F. and Kenneth R. French, "Business Conditions and Expected Returns on Stocks and Bonds," *Journal of Financial Economics*, 25 (November 1989) 23-49.

II. Efficient Capital Markets

1. *Mikkelson W., and M. M. Partch, "Stock Price Effects and Costs of Secondary Distributions," *Journal of Financial Economics*, 14 (June 1985) 165-194.
2. Fama, Eugene F., "Efficient Capital Markets II," *Journal of Finance*, 46 (December 1991) 1575-1617.
3. Roberts. H., "Stock Market 'Patterns' and Financial Analysis: Methodological Suggestions," *Journal of Finance*, (March 1959) 1-10.
4. Jensen, M., and Bennington, G., "Random Walks and Technical Theories: Some Evidence," *Journal of Finance*, (May 1970) 469-482.
5. Fama, E.F., and M. Blume, "Filter Rules and Stock Market Trading," *Journal of Business*, (January 1966) 226-241.
6. Fama, E.F., L. Fisher, M. Jensen and R. Roll, "The Adjustment of Stock Prices to New Information," *International Economic Review*, (February 1969) 1-21.
7. Grinblatt, M., R. Masulis, and S. Titman, "The Valuation Effects of Stock Splits and Stock Dividends," *Journal of Financial Economics*, (December 1984) 461-490.
8. Ohlson, J., and S. Penman, "Volatility Increases Subsequent to Stock Splits," *Journal of Financial Economics,* (June 1985) 251-266.
9. Ball, R., and P. Brown, "An Empirical Evaluation of Accounting Income Numbers," *Journal of Accounting Research*, (Autumn 1968) 159-178.
10. Patell, J., and M. Wolfson, "The Intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements," *Journal of Financial Economics*, (June 1984) 223-252.
11. Watts, R., "Does it Pay to Manipulate EPS?" *Chase Financial Quarterly*, (Spring 1982) 8-26.
12. Brown, S., and J. Warner, "Measuring Security Price Performance," *Journal of Financial Economics* (September 1980) 205-258.
13. Brown, S., and J. Warner, "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics,* (March 1985) 3-31.
14. Jensen, M., "Some Anomalous Evidence Regarding Market Efficiency," *Journal of Financial Economics*, (June 1978) 95-101.
15. Schwert, G. W., "Size and Stock Returns, and Other Empirical Regularities," *Journal of Financial Economics*, (June 1983) 3-12.
16. Lloyd-Davies, P., and M. Canes, "Stock Prices and the Publication of Second-Hand Information," *Journal of Business*, (January 1978) 43-56.
17. Seyhun, H. Nejat, "Insiders' Profits, Cost of Trading and Market Efficiency," *Journal of Financial Economics*, (June 1986) 189-212.
18. Ball, R., "Anomalies in Relationships Between Securities' Yields and Yield-Surrogates," *Journal of Financial Economics*, (June 1978) 103-126.
19. Thompson, R., "The Information Content of Discounts and Premiums on Closed-End Fund Shares," *Journal of Financial Economics*, (June 1978) 151-186.
20. French, K., "Stock Returns and the Weekend Effect," *Journal of Financial Economics*, (March 1980) 55-70.
21. Ariel, Robert A., "A Monthly Effect in Stock Returns," *Journal of Financial Economics*, (March 1987) 161-174.

III. Bond Markets & Interest Rates

1. Fama, E.F., and G.W. Schwert, "Asset Returns and Inflation,"*Journal of Financial Economics*, (November 1977) 115-146.
2. Fama, E.F., "Short-term Interest Rates As Predictors of Inflation," *American Economic Review*, (June 1975) 269-282.
3. Nelson, C.R., and G.W. Schwert, "On Testing the Hypothesis that the Real Rate of Interest is Constant," *American Economic Review*, (June 1977) 478-486.
4. Huberman, G., and G.W. Schwert, "Information Aggregation, Inflation, and the Pricing of Indexed Bonds," *Journal of Political Economy*, (February 1985) 92-114.

IV. The Pricing of Options

1. *Black, Fischer, "How to Use the Holes in Black-Scholes," (in *Chew*, 419-425).
2. *Kritzman, Mark, "What Practitioners Need to Know . . . About Option Replication," *Financial Analysts Journal*, 48 (January-February 1992) 21-23.
3. Brenner, Menachem and Marti G. Subrahmanyam, "A Simple Approach to Option Valuation and Hedging in the Black-Scholes Model," *Financial Analysts Journal*, 50 (March-April 1994) 25-28.
4. Whaley, R., "Valuation of American Call Options on Dividend-Paying Stocks: Empirical Tests," *Journal of Financial Economics*, (March 1982) 29-59.
5. Smith, C., "Option Pricing: A Review," *Journal of Financial Economics*, (January 1976) 3-51.
6. Cox, J., S. Ross and M. Rubinstein, "Option Pricing: A Simplified Approach," *Journal of Financial Economics*, (September 1979) 229-263.
7. Black, F., and M. Scholes, "The Valuation of Option Contracts and a Test of Market Efficiency," *Journal of Finance*, (May 1973) 399-417.
8. Black, F., and M. Scholes, "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, (May/June 1973) 637-654.
9. Phillips. S., and C. Smith, "Trading Costs for Listed Options: The Implications for Market Efficiency," *Journal of Financial Economics*, (June 1980) 179-201.
10. Roll, R., "An Analytic Valuation Formula for Unprotected American Call Options on Stocks with Known Dividends," *Journal of Financial Economics*, (November 1977) 251-258.
11. Geske, R., "A Note on an Analytical Valuation Formula for Unprotected American Call Options on Stocks with Known Dividends," *Journal of Financial Economics*, (December 1979) 375-380.
12. Whaley, R., "On Valuation of American Call Options on Stocks with Known Dividends," *Journal of Financial Economics*, (June 1981) 207-211.
13. Geske, R., "The Valuation of Compound Options," *Journal of Financial Economics*, (March 1979) 63-81.
14. Galai, D., and R. Masulis, "The Option Pricing Models and the Risk Factor of Stocks," *Journal of Financial Economics*, (January 1976) 53-82.
15. Merton, R., "The Impact on Option Pricing of Specification Error in the Underlying Stock Price Returns," *Journal of Finance*, (May 1976) 333-350.
16. Merton, R., "Option Pricing When Underlying Stock Returns are Discontinuous," *Journal of Financial Economics*, (January 1976) 125-144.
17. Cox, J., and S. Ross, "The Valuation of Options for Alternative Stochastic Process," *Journal of Financial Economics*, (January 1976) 145-166.
18. Beckers, Stan, "The Constant Elasticity of Variance Model and Its Implications for Option Pricing," *Journal of Finance*, (June 1980) 661-673.
19. MacBeth, J., and L. Merville, "An Empirical Examination of the Black-Scholes Call Option Pricing Model," *Journal of Finance*, (December 1979) 1173-1186.
20. Hill, Joanne M. and Frank J. Jones, "Equity Trading, Program Trading, Portfolio Insurance, Computer Trading and All That," *Financial Analysts Journal*, (July 1988) 29-38.
21. Clarke, Roger G. and Robert D. Arnott, "The Cost of Portfolio Insurance: Tradeoffs and Choices," *Financial Analysts Journal*, (July 1987) 35-47.

V. The Pricing of Futures

1. Cornell, B., and K. French, "Taxes and the Pricing of Stock Index Futures," *Journal of Finance*, (June 1983) 675-694.
2. Rendleman, R., and C. Carabini, "The Efficiency of the Treasury Bill Futures Market," *Journal of Finance*, (September 1979) 895-914.
3. Cox, J., J. Ingersoll and S. A. Ross, "The Relation Between Forward and Futures Prices," *Journal of Financial Economics*, (December 1981) 321-346.
4. Jarrow, R., and G. Oldfield, "Forward Contracts and Futures Contracts," *Journal of Financial Economics*, (December 1981) 373-382.
5. French, K., "A Comparison of Futures and Forward Prices," *Journal of Financial Economics*, (November 1983) 311-342.
6. Cornell, B., and M. Reinganum, "Forward and Future Prices: Evidence From the Foreign Exchange Markets," *Journal of Finance*, (December 1981) 1035-1046.
7. Gay, Gerald D. and Steven Manaster, "Implicit Delivery Options and Optimal Delivery Strategies for Financial Futures Contracts," *Journal of Financial Economics*, (May 1986) 41-72.
8. Brennan, Michael, "A Theory of Price Limits in Futures Markets," *Journal of Financial Economics*, (June 1986) 213-233.

VI. Portfolio Selection - Diversification and Efficient Portfolios

1. Bloomfield, T., R. Leftwich, and J. Long, "Portfolio Strategies and Performance," *Journal of Financial Economics*, 5 (November 1977) 201-218.
2. Markowitz, H., "Portfolio Selection," *Journal of Finance*, (March 1952) 77-91.
3. Sharpe, W., "A Simplified Model for Portfolio Analysis," *Management Science*, (January 1963) 277-293.

VII. The Capital Asset Pricing Model: Theory, Tests and Extensions

1. *Fama, Eugene F., Kenneth R. French, David G. Booth, and Rex Sinquefield, "Differences in Risks and Returns of NYSE and NASD Stocks," *Financial Analysts Journal*, 49 (January-February 1993) 37-41.
2. Sharpe, W., "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," *Journal of Finance*, (September 1964) 425-442.
3. Black, F., "Capital Market Equilibrium with Restricted Borrowing," *Journal of Business*, (July 1972) 444-454.
4. Jensen, M., "Capital Markets: Theory and Evidence," *Bell Journal of Economics and Management Science*, (Autumn 1972) 357-398.
5. Black, F., M. Jensen and M. Scholes, "The Capital Asset Pricing Model: Some Empirical Tests," in M. Jensen ed., *Studies in the Theory of Capital Markets*, Praeger, 1972.
6. Miller, M., and M. Scholes, "Rates of Return in Relation to Risk: A Re-examination of Some Recent Findings," in M. Jensen ed., *Studies in the Theory of Capital Markets*, Praeger, 1972.
7. Roll, R., "A Critique of the Asset Pricing Theory's Tests," *Journal of Financial Economics*, (March 1977)129-176.
8. Gibbons, M., "Multivariate Tests of Financial Models: A New Approach," *Journal of Financial Economics*, (March 1982) 3-28.
9. Shanken, Jay, "Multivariate Tests of the Zero-Beta CAPM," *Journal of Financial Economics*, (September 1985) 327-348.
10. Brenner, M., "A Note on Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy*, (April 1976) 407-409.
11. Fama, E. F., "A Note on the Market Model and the Two-Parameter Model," *Journal of Finance*, (December 1973) 1181-1185.
12. Amihud, Yakov and Haim Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics*, (December 1986) 223-249.
13. Brennan, M., "Capital Market Equilibrium with Divergent Borrowing and Lending," *Journal of Financial and Quantitative Analysis*, (December 1971) 1197-1205.
14. Mayers, D., "Non-Marketable Assets and Capital Market Equilibrium Under Uncertainty," *Journal of Business*, (August 1973) 258-267.
15. Fama, E. F., "Multiperiod Consumption-Investment Decisions," *American Economic Review*, (March 1970) 163-174.
16. Merton, R., "An Intertemporal Capital Asset Pricing Model," *Econometrica*, (September 1973) 867-887.
17. Long, J., "Stock Prices, Inflation, and the Term Structure of Interest Rates," *Journal of Financial Economics*, (July 1974) 131-170.
18. Ross, S., "The Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory*, (December 1976) 343-362.
19. Breeden, D., "An Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities," *Journal of Financial Economics*, (September 1979) 265-296.
20. Constantinides, G., "Admissible Uncertainty in the Intertemporal Asset Pricing Model," *Journal of Financial Economics*, (March 1980) 71-86.
21. Fama, E. F., and G. W. Schwert, "Human Capital and Capital Market Equilibrium," *Journal of Financial Economics*, (January 1977) 95-125.
22. Fama, E. F., and J. MacBeth, "Long-term Growth in a Short-term Market," *Journal of Finance*, (June 1974) 857-885.
23. Fama, E.F. and J. MacBeth, "Tests of the Multiperiod Two Parameter Model," *Journal of Financial Economics*, (May 1974) 43-66.
24. Stambaugh, R., "On the Exclusion of Assets, from Tests of the Two-Parameter Model: A Sensitivity Analysis," *Journal of Financial Economics*, (November 1982) 237-268.
25. Banz, R., "The Relationship Between Return and Market Value of Common Stocks," *Journal of Financial Economics*, (January 1981) 3-18.
26. Reinganum, M., "Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings' Yields and Market Values," *Journal of Financial Economics*, (January 1981) 19-46.
27. Roll, R., and S. Ross, "An Empirical Investigation of the Arbitrage Pricing Theory," *Journal of Finance*, (December 1980) 1073-1103.
28. Keim, Donald B., "Dividend Yields and Stock Returns: Implications of Abnormal January Returns," *Journal of Financial Economics*, (September 1985) 473-490.
29. Breeden, Douglas T., Michael R. Gibbons, and Robert H. Litzenberger, "Empirical Tests of the Consumption-Oriented CAPM," *Journal of Finance*, 44 (June 1989) 231-262.
30. Constantinides, G., "Optimal Stock Trading with Personal Taxes: Implication for Prices and the Abnormal January Returns," *Journal of Financial Economics*, (March 1984) 65-90.
31. Miller, M., and M. Scholes, "Dividends and Taxes," *Journal of Financial Economics*, (December 1978) 333-364.
32. Constantinides, G., "Capital Market Equilibrium with Personal Tax," *Econometrica*, (May 1983) 611-636.
33. Constantinides, G., and J. Ingersoll, "Optimal Bond Trading with Personal Taxes," *Journal of Financial Economics*, (September 1984) 299-336.

VIII. Portfolio Evaluation and Management

1. *Black, Fischer, "The Investment Policy Spectrum: Individuals, Endowment Funds, and Pensions," *Financial Analysts Journal*, 32 (January 1976) 23-31.
2. *Ippolito, Richard A., "On Studies of Mutual Fund Performance, 1962-91," *Financial Analysts Journal*, 49 (January-February 1993) 42-50.
3. Black, F., "Implications of the Random Walk Hypothesis for Portfolio Management," *Financial Analysts Journal*, (March/April 1971) 16-22.
4. Jensen, M., "The Performance of Mutual Funds in the Period 1945-64," *Journal of Finance*, (May 1968) 389-416.
5. Fama, E. F., "Components of Investment Performance," *Journal of Finance*, (June 1972) 551-567.
6. Treynor, J., and F. Black, "How to Use Security Analysis to Improve Portfolio Selection," *Journal of Business*, (January 1973) 66-86.