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RATING INVESTMENT RESEARCH BY EVALUATING PERFORMANCE OF PUBLISHED RECOMMENDATIONS

CHAPTER I

INTRODUCTION

> The evaluation of a portfolio is an evaluation of the investment manager's ability to make buy and sell decisions. (Keith Smith)

The securities investor often finds that intelligent decision-making requires some amount of dependence upon the capabilities of "outside" investment research and advice. However, the myriad of investment advisory services, bank trust departments, insurance companies, brokerage firms, and the flood of investment literature available to the investor is as overwhelming as the task of security selection itself.

To select from the abundance of "investment sources," the investor must first decide to what degree he will rely upon the investment source in the decision making process. One alternative is to permit the investment source full discretion to choose securities for the investor. In this situation, the investor usually limits his possible investment sources to: (1) bank trust departments, (2) insurance companies that manage security portfolios, (3) brokerage

firms which accept fiduciary responsibility, (4) investment companies (mutual funds), (5) investor services that specialize in portfolio management, or (6) some other third party "money manager." If the investor decides to retain his position as decision-maker in the selection process, he may still rely upon investment sources for research information and opinion. In this situation the investor usually chooses his source from: (1) brokerage firms which publish their recommendations in hope of attracting additional business, (2) investment advisors, counselors, and services, all of which offer published or verbal assistance for a fee, (3) bank trust departments willing to act in an advisory capacity, or (4) investment periodicals and other published literature.

Once the investor decides either to retain his decision-making capacity, or to delegate discretionary responsibility to a money manager, there still remains the quandary of determining capabilities of available investment sources. In contrast to the abundance of information available for selecting securities, information with which an investor can determine capability and credability of investment sources is scarce. Published literature which could help an investor choose a capable investment source is even more meager. Probable causes for this void of information are: insufficient application of measurement techniques, the attitude of laissez faire by the regulating

agencies of the securities industry, and the unwillingness of the securities industry to document its own capabilities.

If one assumes, as does the securities industry, that past record is indicative of future performance, then the technique of "portfolio performance measurement" is a good indicator of investment source capabilities. Portfolio performance measurement has become an acceptable technique for measuring capabilities of money managers. For example, capability comparisons of mutual funds often include an analysis of their past performance. Knowledge of past performance can help the investor choose between mutual funds, and between mutual funds and other investment alternatives. The Securities and Exchange Commission (SEC) requires disclosure of performance of mutual funds, but does not require performance disclosure of most other types of investment media. The securities industry has accepted the task of measuring and comparing performance records of some money managers, particularly in the pension area. Yet there is no universal application of this measurement technique to the whcle securities industry. Bank trust departments do not universally publish the results of their performance. Advisory services, brokerage firms, and financial periodicals do not normally document performance. Unfortunately, the result to the investor is sketchy information from which to choose a capable investment information source.

Objective

The purpose of the study is to partially fill the void of information concerning investment source capabilities. The intent is to help answer the question: How can an investor determine which investment source will give him the best investment research and best advice? The existing techniques of portfolio performance measurement were used to supply some of the missing data, so that investors can better judge investment source capabilities.

More specifically, an investigation was made concerning the competence of twenty investment sources. Portfolio performance measurement was used to examine fifteen brokerage firms, a nationally-distributed financial periodical, a nationally-known financial newspaper, and three well-known financial services. A hypothetical portfolio, based upon recommendations for five years (May, 1969, to March, 1974) was manufactured for each investment source. Each portfolio was subjected to acceptable techniques of portfolio performance measurement. Investment sources' capabilities were compared to each other, based upon the results of portfolio performance measurement. These procedures are described in detail in a later section.

Historical Development

The stock selection process has, throughout history, been a time-consuming, frustrating, and often unsuccessful

task.[1] The many factors involved in investment decision-making necessitated the development of investment theory of some manner. The initial acceptance of the need for investment theory can be demonstrated by the success of Graham and Dodd's book on investment theory, Security Analysis, published first in 1934 and now in its fourth edition.[2] The growth and sophistication of investment theory can be traced to its relatively complex state, as evidenced by the theories and models of Markowitz, Sharpe, Baumol, Tobin, Fama, and others.[3] Portfolio theory became a technique which the investor could use in the stock selection process.

As portfolio theory became more sophisticated, did the investor become more efficient? It was not until the late 1950's and early 1960's that portfolio theorists concerned themselves with techniques to observe the results obtained by investment decision-makers in the stock selection processes.[4] Prior to the development of portfolio

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[1]For example, for the period 1963-1972, bank funds averaged 9.3 percent annual return and insurance company funds averaged 7.3 percent, compared to the Standard and Poors 500 return of 9.9 percent. Source: "Employee Benefit Fund Investment Performance, 1963-1972," A. S. Hansen, Inc., publication, 1972.

[2]Benjamin Graham and David Dodd, Security Analysis (New York: McGraw-Hill Book Company, 1962).

[3]"A book that almost literally ushered in a new era in the theory of diversification and portfolio structure is the study by Harry Markowitz. . . ." H. Sauvain, "Investment Management" (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967), p. 407.

[4]For example, the works of Jack Treynor, Michael Jonsen, and William Sharpe are discussed in Chapter II.

measurement techniques, the "performance" of an investment decision-maker was based primarily upon rate of return of investment. Performance ranking of third party money managers was not important, as most investors made their own buy-sell decisions. There were few investors who sought outside help. In other words, most portfolios were managed "in house."

As the 1960's approached, however, investors were becoming increasingly dissatisfied with their own capabilities in the selection process. More and more, they turned to third parties to make investment decisions for them. Thus, the era of the money manager was born (as evidenced by the tremendous growth of mutual funds in the 1950's and early 1960's, and of institutional investing in the late 1960's).[5]

The early part of this era saw that selection of a money manager was based upon historical rate of return. The selection possibly included a vague matching of investor risk-goals and money manager risk objectives--a naive risk class identification process.

As mentioned earlier, one of the first attempts at comparative performance disclosure was evidenced in the mutual fund sector, of which the Securities Exchange

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[5]For example, institutional volume on the NYSE increased from 24.3 percent of shares traded in 1960 to 41.1 percent of shares traded in 1969. By dollar volume, share rose from 28.9 percent to 45.6 percent in the sample period. Source: NYSE Fact Books, 1969 and 1970.

Commission (SEC) has regulatory responsibility. The method of reporting mutual fund performance was standardized for comparative purposes.

Required disclosure of rates of return on investment for mutual funds did three things: First, it gave the theorists data from which to develop ex-post portfolio theory, the theory of performance measurement. Second, it created an interest in performance measurement as a tool for comparing third party money managers. This enabled investors to better judge the quality of investment management. Third, as a result of performance comparison, disclosure created a frantic attempt to increase investment performance. The effort to improve investment performance resulted in an unfortunate neglect of risk considerations,[6] thereby necessitating a new definition of performance--one which included risk, as well as rate of return.

Coincident with the growth in mutual funds as third party money managers, there was a change in pension portfolio management from "in-house" management and insured policy plans to third party investment managers. Money managers actively sought the management of large portfolios which caused competition between them for investor accounts. The number of money managers grew as dollars were attracted. By the late 1960's bank trust departments, insurance companies,

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[6] J. M. Birmingham, "The Quest for Performance," Financial Analysts' Journal, September, 1966, p. 93.

investment advisers, mutual funds, and brokerage firms (over 4000 institutional money managers in 1970) were all actively soliciting investment accounts.[7]

The investment dilemma had switched from one of stock selection to one of selection of a money manager.

On Performance Data Disclosure

A review of performance data disclosure demonstrates that its existence is haphazard, at best. As mentioned before, the SEC helped validate performance data by requiring disclosure of performance records of mutual funds. The mutual fund prospectus was required to include risk objectives, enabling investors to match their goals with mutual fund objectives. To date, however, bank trust departments are not required to disclose performance data. Some banks voluntarily disclose performance. The validity of these data is questionable. A typical bank trust department performance report is shown below.[8] Was this a random selection from all portfolios? What size portfolios were tested? This writer believes that a release of this type data could be misleading and should be subject to regulation. Some investment advisory services voluntarily publish performance

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[7]Dana Thomas, "Rating the Money Managers," Barrons (October 22, 1973), p. 3.

[8]The writer requested a report on performance of the common trust fund of this bank. The brochures contained no performance information.

MANUFACTURERS HANOVER TRUST COMPANY

350 PARK AVENUE, NEW YORK, N.Y. 10022

December 20, 1973

Mr. Tom Tole
1219 Columbia Court
Norman, Oklahoma 73069

Dear Tom:

I enjoyed speaking with you today and we wish to thank you for your interest in our Investment Management area.

I am pleased to enclose the brochures which describe our two Investment Management Services. Outlined below is the performance of some of our growth oriented investment management portfolios:

Year 1971 - Plus 10.82 to plus 31.16 - 22 accounts
Plus 19.20 median

Year 1972 - Plus 11.69 to plus 43.90 - 40 accounts
Plus 23.70 median

Nine months
1973 - Plus 2.33 to minus 16.14 - 61 accounts
Minus 6.18 median

We would welcome the opportunity to discuss our Investment Management area with you in greater detail. If I can be of any further assistance please do not hesitate to telephone me. I may be reached at area code 212/350-6106.

With kind regards,

Sincerely yours,

Leslie E. Bains
Assistant Trust Officer

records. A few register their records with the SEC.[9] Some services disclose sample portfolio returns (as do some banks), or nothing at all. Some insurance companies that manage portfolios guarantee a rate of return, much lower than they expect to achieve (Plan Administration Account), and then verbally state historic, and expected, rates at much higher annual returns. Brokerage firms which manage accounts also follow the above pattern. This writer personally viewed a New York Stock Exchange member firm which kept performance records during upswings and dropped them during down periods in the market.[10] Of the myriad of market letters, advisory reports, and news letters published and advertised for subsciption, few keep a thorough record of performance.

In summary, a weakness exists in disclosing performance of all recommendations and all portfolios managed.

In defense of inadequate disclosure is the lack of sufficient tools for investment source performance measurement. But this excuse is rapidly losing validity as ex-post portfolio theory is applied to investment sources which do not manage portfolios.

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[9]For example, Wright Investors Service of Bridgeport, Connecticut, is registered with the SEC, enabling it to publish its complete investment record.

[10]The writer was previously employed by a NYSE member firm as a stockbroker from May, 1969, to May, 1971.

On Portfolio Performance Measurement Theory (A Technique)

Ex-post portfolio theory is mentioned here and developed in detail in the next chapter. The purpose of this section is to trace the acceptance and use of portfolio performance measurement theory in the securities industry.

The securities industry's passion for performance grew (with a few years' lag) with the growth in third party investment management. In 1957 Bernard Baruch spoke of the growth and importance of third party investment management.

> The emergence of this new profession of disinterested and careful investment analysts, who have no allegiance or alliances and whose only job is to judge a security on its merits, is one of the more constructive and healthy developments of the last half century.[11]

At the time of Baruch's comment, the ability to measure investment performance was in an embryonic stage. Reliance upon performance as a technique for selecting investment management was growing rapidly. Yet, this was primarily limited to mutual fund performance comparisons for which data were readily available.

However, the increasing popularity of performance measurement motivated the private sector of the investment industry to obtain data which the SEC could not. Since pension assets are reported annually to the Department of Labor and the Internal Revenue Service, "Pension Consultants"

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[11] R. E. Diefenbach, "How Good Is Institutional Brokerage Research?," Financial Analysts' Journal (January-February, 1972), p. 54.

began to compile data from these reports. These data enabled them to rank money managers' performance. A. G. Becker, a national brokerage firm specializing in corporate accounts, was a pioneer in performance ranking. Interest expanded beyond pension portfolio ownership, and A. G. Becker was able to entice other investors to voluntarily submit their portfolios to its ranking system.[12]

By the mid-1960's, a dozen or so "pension consultants" played a significant role in the portfolio measurement business.[13] Both Merrill Lynch and Blyth Eastman Dillon are the major brokerage firms who followed A. G. Becker into the performance measurement field. To date, most portfolio evaluation is done in the highly competitive pension area. The services offered by brokerage firms are usually performed in return for directed commission securities transactions.

It was not until 1965 that risk was introduced into portfolio performance measurement in a manner more sophisticated than identifying objective risk-classes. In 1965 Jack Treynor quantitatively measured risk:

> Although many believe the quality of investment management is important, no one has devised a satisfactory way to measure its impact on performance. In this

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[12]By 1973 Becker evaluated over 2,600 institutional money managers, or almost half the money management industry. Source: Dana Thomas, "Rating Money Managers," p. 3.

[13]Ibid., p. 3.

> article we shall look at a new way to rate the performance of fund's investment management.[14]

Treynor's article added a new dimension to ex-post portfolio theory. Measurement of the quality of investment management was not to be limited to rate of return, but should also contain a measurement of risk. Other theorists followed his initiative,[15] to the point that ex-post theory has received a significant share of the print (along with stock selection theory), especially during the late 1960's and early 1970's. (This literature is reviewed in detail in the next chapter.)

The securities industry was not as quick as academia in reacting to Treynor's article. Industry assumed away stock selection risk with diversification of portfolio (for example, notice the number of stocks in mutual fund portfolios).

Typical of treatment of risk in the late 1960's is the practice of Capital Management Systems (CMS). Their technique is summarized below:

First, rate of return is determined for portfolios being scrutinized. Then, portfolios are subjectively classified by risk objective into five risk categories. Each client's portfolio rate of return is then compared to other portfolios in the same risk class.

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[14]Jack L. Treynor, "How to Rate Management of Investment Funds," Harvard Business Review, Volume LIII (January-February, 1965), p. 63.

[15]For example, William F. Sharpe, "Mutual Fund Performance," Journal of Business, January, 1966.

As recently as 1973, this approach to the treatment of risk has been called "unique."[16] Although CMS was started in 1969, its treatment of risk class does not analytically approach Treynor's theory.

Blyth Eastman Dillon's Performance Measurement Service was also started in 1969, and is a direct offspring of a study made by the Bank Administration Institute (BAI).[17] The BAI realized the need for a uniform performance evaluating technique in the securities industry. It recommended a method derived originally from William Sharpe. The recommendations of the BAI study and the model of William Sharpe are explained in the next chapter.

The 1968 BAI report was the investment industry's first step toward acceptance of ex-post portfolio theory. It seems that a three-year lag existed between development of theory in 1956 and adaptation for use by the investment industry in 1968.

Portfolio performance measurement, which was approved by the BAI and utilized by Blyth Eastman Dillon and others, was used in this study to evaluate recommendations of investment sources. A detailed description of portfolio performance measurement is described in Chapter II.

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[16]Thomas, "Rating Money Managers," p. 17.

[17]Measuring the Investment Performance of Pension Funds (Chicago: Bank Administration Institute, 1968).

Assumptions and Limitations

In evaluating investment advisors, research companies, research analysts, and brokerage firms, an overlap of operation was observed. This overlap made classification of investment sources somewhat subjective. Therefore, an attempt was made to list the institutions by their primary function. For example, a brokerage firm often acts as an investment advisor. However, it was still separated from that group because of different primary functions.

The magnitude of data published by all brokerage firms, investment advisors, and research companies was overwhelmingly beyond the data collection capabilities of the study. Selection of representatives of each category of investment sources was not done randomly, but rather was based upon availability.

Brokerage firms resisted relinquishing five years of recommendations for analysis. Therefore, an alternate source of data, the Wall Street Transcript, which weekly publishes "market letters" of brokerage firms, was used to obtain recommendations. The Transcript makes no attempt to alter these letters, but merely reprints the letters in their entirety. It was assumed that letters submitted to the Transcript were not chosen randomly by brokerage firms, but rather based on material content, popularity of a stock, or timing with a major price movement.

Standard and Poors, Moody's, and Value Line all

offer investment management services. They were selected as representatives of the investment services classification, though not necessarily representative. A random selection of all services would have added statistical validity to the study. As mentioned, however, availability was a limiting factor.

Not all source recommendations were included in the development of the hypothetical portfolios which are introduced in Chapter III. Acceptable recommendations were limited solely to common stocks of corporations which are listed on the Quarterly Industrial File of the COMPUSTAT TAPES.[18] The number of recommendations of each source which were not used is disclosed in Table 3 in Chapter III.

Some investment sources failed to indicate for what type of investor a recommendation was intended. In this situation, the recommendations were subjectively assigned by the writer to one of three risk classes: (1) conservative capital gains, or growth, (2) speculative, or (3) income.

Prices used in the study are all monthly closing prices, due to limitations of COMPUSTAT data output. The effect of monthly prices on contributions, withdrawals, and portfolio valuation is presented in Chapter III.

Starting dates for portfolios were based on market highs and lows. The logical choices for starting dates are

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[18]COMPUSTAT Tapes are a product of Industrial Management Services. This service includes common stock prices, dividends, and splits of 2637 leading corporations.

discussed in Chapter III. A randomly selected starting date could have affected rate of return. However, random selections would have required a multiple number of portfolios, which is beyond the scope of the study.

Purchases and sales of stocks ignore costs of transactions. Brokerage commissions, taxes, odd-lot differentials, etc., would reduce rate of return.

Definition of Terms

Terms which might be unfamiliar to the casual reader are defined as encountered in the study. However, to avoid misunderstandings and as an aid to readers, the following list of definitions, though incomplete, should be helpful.

Money Manager (portfolio manager)--Person(s) responsible for buy-sell decisions of a portfolio. This may be a "disinterested" or "third party," or it may be the owner of the portfolio.

Third Party--Individual who is not a buyer or seller of a security or portfolio. He does not "take a position" in the security.

Investment Source--Any source of investment information from a published market letter.

Recommendation--A buy or sell opinion or decision, of a money manager, depending upon his responsibility to the owner of a portfolio.

Portfolio--Any combination of cash and securities.

Performance--Growth of a portfolio through increase

in value and accumulation of dividends. Usually considers risk taken.

Risk--(has several definitions discussed within the study). In a general sense, it means chance of loss of value of portfolio. May include a lesser gain than expected.

Market Letter--Any published recommendation. Usually distributed by a brokerage firm or investment advisor weekly or monthly.

Research--Collection of data relating to a security, securities, industry, or the economy. Usually includes an opinion based upon analysis of the data.

Analyst--Individual(s) who specializes in research activities.

Naive Portfolio--Portfolio of stocks which were selected randomly.

Organization of the Study

Chapter I is an introductory chapter. The objective of the study is explained, followed by an historical development of performance measurement in the securities industry.

In Chapter II, literature relating to portfolio performance measurement theory is reviewed in a step-by-step development of the topic. A review of applied performance measurement literature demonstrated its concentration in institutional portfolio measurement.

In Chapter III, the methodology used in this study is developed. Assumptions, data, data collection, and analytical procedures are detailed.

The empirical studies are presented in Chapter IV

and V. Performance evaluations were made which included portfolio measurement of available data and ranking of investment sources. The rankings were based upon the results of the measurement.

Conclusions of the study, hypotheses for future studies, and a summary are the topics of Chapter VI.

CHAPTER II

REVIEW OF RELATED LITERATURE

In the preceding chapter, the objectives of the study were introduced. An historical development of portfolio performance measurement suggested two distinct areas to be investigated: (1) the theory of performance measurement, and (2) the application of performance measurement by the securities industry. In this chapter consideration is given to the literature relevant to both areas.

Literature on ex-post portfolio theory is abundant. Much of this work includes empirical testing of hypotheses. However, the literature pertaining directly to "application" is practically non-existent. The information available is primarily concentrated around institutional portfolio measurement. The apparent dearth of literature concerning the application of portfolio measurement theory to the evaluation of the capabilities of investment sources is a primary reason the study was undertaken.

Ex-Post Portfolio Theory

Portfolio performance measurement includes: (1) determination of rate of return, (2) measurement of risk taken to achieve that rate of return, and (3) a composite measure

of both risk and return which is used to evaluate portfolio performance and for making comparisons against standards.[1] The literature relating to these areas are presented in the given order.

Determination of Rate of Return

Portfolio return, or yield, in its simplest context can be defined by relating market value of a portfolio to initial cost of that portfolio,

$$Y_1 = \left(\frac{M(T)}{M(C)}\right)^{1/T} - 1 \qquad (1)$$

where Y_1 is yield, M is portfolio value, and T is the number of time periods (years, for Y_1 to be annual return).[2] The return on investment becomes more complex, however, if contributions and withdrawals occur. M(C), or cost, becomes meaningless, unless a time-weighted average cost for the period were calculated. Even this would vary in accuracy with changes in cash flow.

In 1968, Robert A. Levy discussed different measures of rate of return.[3] The effect of cash flow can be seen from his example.

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[1]Keith Smith, Portfolio Management: Theoretical and Empirical Studies of Portfolio Decision-Making (New York: Holt, Rinehart, and Winston, 1972), p. 176.

[2]Ibid., p. 177.

[3]Robert A. Levy, "Measurement of Investment Performance," Journal of Financial and Quantitative Analysis (March, 1968), pp. 36-38.

TABLE 1

HYPOTHETICAL PORTFOLIO NO. 1

Month Number	Beginning of Month Contribution (Withdrawal)	End of Month Portfolio Value
1	$100	$106
8		110
9	(50)	50
18		40
19	250	320
24		330
	$300	

From Table 1, the ratio of value to cost at the end of the time period is 330/300, which equals 1.10. Applying Equation 1, $Y_1 = 1.10^{1/2} - 1 = 4.9\%$, which is obviously not correct. Cash flow during the time period interfered with the value of M(C).

To compensate for cash flow adjustments to cost, both Smith and Levy indicated the inadequacy of the popular internal-rate-of-return (IRR). To find the internal rate of return, the interest rate which would produce sufficient profits (losses) to equalize contributions (withdrawals) and the value of the ending portfolio must be determined. The general formula is:

$$V = C_1(1+R)^{Y_1} + C_2(1+R)^{Y_2} + \ldots + C_n(1+R)^{Y_n} \qquad (2)$$

where C_i is the i^{th} contribution (if positive) or withdrawal (if negative) and Y_i is the remaining time period in years when the i^{th} contribution or withdrawal is made.[4]

The IRR is often used in the investment industry because it produces a rate of return which can be compared against actuarially computed requirements of trust and pension funds.[5] In other words, if a pension fund determined its total liability and then discounted that liability at 6 percent to find the required contribution, the performance of that contribution is best measured using the IRR. This is true because the IRR assumes constant discounting. However, a major weakness exists in the IRR method, as pointed out by Eric Fisher and Van Messner:

> Were it not for contributions to and withdrawals from an account, its return could be measured as the rate of change in account value over time. However, the value of an account (such as a pension fund) is increased or decreased by the flow of cash between trustor, trustee and beneficiaries. Thus, when measuring return some notice must be taken of the size and timing of cash flows.[6]

Therefore, the weakness is that the IRR does not reflect the size of investment being made.[7] Robert Levy pointed out the major problem of the IRR method. The advantages to

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[4]Ibid., p. 36.

[5]Ibid., p. 37.

[6]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," Reprinted from Trusts and Estates (February, 1972), p. 3.

[7]Smith, Portfolio Management, p. 81.

which he referred are actuarial advantages:

> Unfortunately, these advantages are outweighed by one disadvantage of major significance. Portfolio managers usually have no control over the timing or amount of contributions to and withdrawals from a fund. The fact that the portfolio illustrated above (Table 2) performed exceedingly well from months 19 through 24 when the least dollar amount was invested, was happenstance as far as the portfolio manager was concerned. Certainly the portfolio benefited from varying dollar investments in this instance; but the benefits should not be credited to the skill of the manager. In measuring return, some method of eliminating the effect of varying "dollar weights" should be utilized.[8]

Eric Fisher and Van Messner added that cash flow should not be considered when evaluating the performance of money managers:

> The dollar-weighted rate includes the results of two types of decisions--the decisions about how much money should be invested (made by the manager) and the decisions about the size and timing of cash flows to the fund (made by the owner of the money). The time-weighted rate includes only decisions about how the money should be invested. Thus, when measuring the manager's skill at making investment decisions, the time-weighted rate is preferable to the dollar-weighted rate.[9]

To calculate a "time-weighted" rate of return, a unit method" which is already in use by mutual funds and common trust funds of banks is preferred. Since the amount of capital available for investment is beyond the control of the portfolio manager, as with mutual funds, the effect of size and timing should be eliminated. The units method eliminates unwanted effects of large cash flows.

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[8]Robert A. Levy, "Measurement of Investment Performance," p. 37.

[9]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," p. 3.

Levy demonstrated the effect of cash flows in another example. He introduced Table 2 for a "units" basis comparison of rate of return to the portfolio in Table 1.

TABLE 2

HYPOTHETICAL PORTFOLIO NO. 2

Month Number	Beginning of Month Contribution or (Withdrawal)	End of Month Portfolio Value
1	$100	$110
8		130
9	(50)	90
18		120
19	250	360
24		330
	$300	

The tables are similar in investment timing, dollar amount of contributions and withdrawals, ending portfolio value, and the compound annual return. The only difference is the interim portfolio valuations. In the first portfolio, the manager performed better when the greatest number of dollars was invested. In the second table the manager was more effective with a lesser amount of funds.

A comparison of portfolios Nos. 1 and 2 on a "unit" basis are found in Table 3. For Portfolio No. 1:

$$r = R^{1/y} - 1 \text{ (from Equation 1)}$$

$$= .835^{1/2} - 1$$

TABLE 3

UNIT BASIS COMPARISON OF PORTFOLIOS NO. 1 AND NO. 2

Portfolio No. 1

	Beginning of Month			End of Month		
Month	Contribution (Withdrawal) (1)	Value Per Unit (2)	No. of Units (3=1÷2)	Portfolio Value (4)	No. of Units (5)	Value Per Unit (6=4÷5)
1	$100	$1.000	100.00	$106	100.00	$1.060
8	-	-	-	110	100.00	1.100
9	(50)	1.100	(45.45)	50	54.55	.917
18	-	-	-	40	54.55	.733
19	250	.733	340.91	320	395.46	.809
24	-	-	-	330	395.46	.835

Portfolio No. 2

	Beginning of Month			End of Month		
Month	Contribution (Withdrawal) (1)	Value Per Unit (2)	No. of Units (3=1÷2)	Portfolio Value (4)	No. of Units (5)	Value Per Unit (6=4÷5)
1	$100	$1.000	100.00	$110	100.00	$1.100
8	-	-	-	130	100.00	1.300
9	(50)	1.300	(38.46)	90	61.54	1.462
18	-	-	-	120	61.54	1.950
19	250	1.950	128.21	360	189.75	1.897
24	-	-	-	330	189.75	1.739

$= -8.6\%$

and for Portfolio No. 2:

$r = R^{1/y} - 1$ (from Equation 1)

$= 1.729^{1/2} - 1$

$= 31.9\%$

where R is the value per unit at the end of twenty-four months (in Table 3). Previously, r = 4.9%. The difference in rate of return is in the value of R. Before $R = \frac{M(T)}{M(C)}$ where M(C) was influenced by cash flows. In the units method, M(T) is already adjusted for cash flow.

Equally as acceptable a measure of time-weighted rate of return as the unit method, is the "linked relatives" method. Levy compared Portfolios No. 1 and No. 2 using linked relatives (see Table 4).[10] In the linked relatives method, portfolio value must be determined prior to each change in cash flow. This was also true for the units method. Note that value relatives, in Table 4 are multiplied tc obtain the cumulative, and not merely summed. The values of R are the same as the units method. Initial response would be an inclination to weight each increment by time and find an arithmetic cumulative. A simple example demonstrates this fallacy. Assume a stock falls from $10 to $8 then increases to $10 again, as shown in Table 5.

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[10]Robert A. Levy, "Measurement of Investment Performance," p. 38.

TABLE 4

LINKED RELATIVES METHOD

Portfolio No. 1

	Beginning Value*	Ending Value	Value Relative
Months 1 through 8	$100	$110	1.100
Months 9 through 18	60	40	0.667
Months 19 through 24	290	330	1.138
Cumulative			0.835

*Portfolio value at the end of the preceding period plus contribution or minus withdrawal.

Portfolio No. 2

	Beginning Value	Ending Value	Value Relative
Months 1 through 8	$100	$130	1.300
Months 9 through 18	80	120	1.500
Months 19 through 24	370	330	0.892
Cumulative			1.739

TABLE 5

ARITHMETIC CUMULATIVE FALLACY

Beginning Value	End Value	Change	Value Relative
10	8	-20%	.8
8	10	+25%	1.25
		+ 5%	1.00

Notice that an arithmetic cumulative yields an absurd 5% gain, while a value relative correctly shows no gain or loss. The results from both the units method and the linked relatives method is exactly the same. Both methods are "time-weighted" returns which correctly ignore the effect of cash flows in different periods. By eliminating the effect of dollar weights, the portfolio manager is neither benefited nor discredited; his skill at making investment decisions is accurately realized.

James Lorie defined the problem of "time-weighted" rates of return in his contribution to the Bank Administration Institute's 1968 study:

> To compute a time-weighted rate of return ideally, one requires the following information: the values of the fund at the beginning and at the end of the time period of the study, the date and amount of each cash flow into and out of the funds, and the value of the fund at the date of each such cash flow.
>
> For many banks, computing the time weighted rate of return ideally would be costly at this time because

of the costs of making precise market valuations of all assets so frequently.[11]

The BAI study undertook the task of approximating the time-weighted rate of return. An approximation would not require valuation at the time of each contribution. In Chapter II of that study Lawrence Fisher introduces two approximations: (1) the linked internal return method and (2) the regression method.[12]

The Linked Internal Rate of Return

The basic idea was developed by Peter O. Dieztz.[13] The time span is divided into periods (idealistically into months). The internal rate of return (IRR) is computed for each subperiod (month). The value of the fund, cash inflow, and cash outflow for each subperiod must be known to find the IRR for each subperiod. The arithmetic mean of the subperiods IRR's (expressed as annual rates) is the "appropriate" time-weighted rate. In calculating the arithmetic mean, the weights for each subperiod are the lengths of each subperiod.

The BAI researched the magnitude of the errors in estimating time-weighted rates of return using the linked

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[11]James Lorie Study: Measuring the Investment Performance of Pension Funds (Bank Administration Institute, 1968), Chapter 1, p. 5.

[12]Lawrence Fisher, "Measuring Rates of Return," Chapter 2 of the Bank Administration Institute Study, pp. 21-26.

[13]Peter O. Dietz, Pension Funds, Measuring Investment Performance (New York: Free Press, 1966).

IRR method and found the results displayed in Table 6.

TABLE 6

TYPICAL MEAN ABSOLUTE ERRORS (PERCENT PER ANNUM) IN TIME-WEIGHTED RATES OF RETURN BY USING THE LINKED INTERNAL-RATE-OF-RETURN METHOD

Precision of Dating Cash Flows	Frequency of Valuation		
	Monthly	Quarterly	Annually
Monthly	.12	.48	.62
Quarterly		.51	.64
Annually			.69

Source: Measuring the Investment Performance of Pension Funds, Bank Administration Institute, 1968, p. 22.

The Regression Method

This approximation method was developed specifically for the BAI study. It is primarily intended for calculating rate of return for portfolios where cash flows and portfolio valuations are not often updated. Bank trust departments, which update portfolio values quarterly, would better approximate rates of return using the regression method than the linked-IRR method. The linked-IRR method assumes constant discounting between valuation periods. However, as the time span between valuation dates increases, empirical study by the BAI has shown that errors in estimate also increase. The regression method does not assume constant discounting during subperiods and is more accurate over long subperiods. The discount rate is estimated for each subperiod of any length.

To determine the discount rate for each subperiod, the rate of return of an appropriate stock price index must be known. Additionally, the relation of portfolio rate of return to the index rate of return must also be known.[14] This relationship is found by linear regression of portfolio return to index return. The discount rate for any subperiod, then, is the rate of return for the stock price index adjusted by the regression coefficient. For example, if the rate of return of an index, during a subperiod, was 1% and the regression coefficient indicated that, over the long-term, the portfolio moved up or down twice as much as the index, then the discount rate for that subperiod is 2%.

The magnitude of error in estimating time-weighted rates of return, using the regression method, is shown in Table 7.

This study uses monthly subperiods. Because there are no cash flows within the subperiods (by assumption, all cash flows occur on the last day of each month), the exact rate of return can be calculated. An approximation method is not necessary.

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[14]The stock price index could be the Dow Jones Industrial Average or Standard & Poors, or any other index which would indicate general market movements.

TABLE 7

TYPICAL MEAN ABSOLUTE ERRORS (PERCENT PER ANNUM) IN TIME-WEIGHTED RATES OF RETURN BY USING THE REGRESSION METHOD

Precision of Dating Cash Flows	Frequency of Valuation		
	Monthly	Quarterly	Annually
Monthly	.12	.17	.71
Quarterly		.25	.36
Annually			.57

Source: Measuring the Investment Performance of Pension Funds, Bank Administration Institute, 1968, p. 22.

Risk

Portfolio performance measurement considers risk as important a factor as rate of return. However, determination of risk is not as clear-cut as the determination of rate of return:

> The major difficulty encountered in attempting to evaluate the performance of a portfolio in these two dimensions has been the lack of a thorough understanding of the nature and measurement of "risk."[15]

Application of risk to performance measurement has lagged in the securities industry until recently:

> The day when performance reports consisted of trustors and trustees meeting over drinks and discussing securities has passed . . . in addition, most owners of money want to examine their managers' performance in three areas; first, they want to know how well he did

[15]Michael Jensen, "The Performance of Mutual Funds in the Period 1946-1964," Journal of Finance, Vol. XXIII (May, 1968), p. 389.

> in absolute terms. What was the rate of return? How much risk did he take? . . .[16]

With the introduction of ex-post portfolio theory, risk measurement grew rapidly:

> Today's mounting "risk" consciousness results largely from concerns that have been initiated by the academic community and the Securities and Exchange Commission (S.E.C.). Interestingly enough, one would almost be forced to search in vain for a textual reference on the subject prior to 1960. Yet, only ten years later, the S.E.C. utilized econometric techniques in its Institutional Investor Study Report to measure fund volatility, which is often used as a risk proxy.[17]

Definition and Measurement of Risk

William Sharpe defined risk as--uncertainty for future prices--but was of the opinion that a quantitative measure must be derived to measure risk. Unfortunately, that measure is based on past prices.[18]

In the introductory chapter to the BAI study, James Lorie also conceived of risk as uncertainty of future events (prices):

> If one security is said to be more risky than another, the implication is that future values of the first security are believed to be more uncertain than future values of the second.[19]

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[16]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," p. 1.

[17]Performance Measurement Service Guidelines (New York: Blyth, Eastman, Dillon & Co., Incorporated, 1972), p. 5.

[18]William F. Sharpe, "Risk, Market Sensitivity and Diversification," Financial Analysts Journal (January-February, 1972), p. 74.

[19]James Lorie, Measuring the Investment Performance of Pension Funds, p. 6.

Levy defined risk in terms of "uncertainty of the rate of return." He felt that "risk could not be quantified in a vacuum, ignorant of the investors utility function for risk."[20] Looking for a quantitative measure of risk, he observed a correlation between rate of return and variability of that return:

> In view of these problems, it is not possible to measure the degree of risk attributable to a given security at a given point in time. It is possible, however, to express quantitatively one characteristic of stocks which rational investors, in the aggregate, would probably rely upon in their determination of risk. This characteristic is variability of rate of return. Available empirical evidence indicates that common stock investors demand and receive a higher level of return with increased variability, thus suggesting that variability and risk are related if not synonymous.[21]

Variability as a Measure of Risk

Kalman J. Cohen, who wrote Chapter III in the BAI study, confirmed Levy's observation of correlation of risk and variability of return:

> It seems reasonable to believe that ex ante uncertainty is related to ex post variability in rates of return. For those reasons, most studies of the relationship between risk and rate of return are studies of the relationship between some measure of variability in rates of return and average rates of return.
>
> With such ideas in mind, the Committee recommends that the degree of risk to which an investor has subjected himself be estimated ex post by measuring

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[20]Robert A. Levy, "Measurement of Investment Performance," p. 42.

[21]Ibid., p. 43.

the observed variability in that investor's rate of return.[22]

If it appears that the majority of professional opinion is in favor of using variability of return to estimate risk, what is the most acceptable measure of variability? Standard deviation of return would seem to be the most likely candidate to estimate risk. Robert Levy observed that:

> The method most widely used to date has been to divide the period over which performance is to be measured into subperiods, and compute the standard deviation of the subperiod value relatives (or rate of return).[23]

However, standard deviation of rates of return present shortcomings when used to estimate risk of a portfolio. Both Robert Levy and Kalman Cohen agree on a dislike for standard deviation to estimate risk. Further, Levy confessed that investors prefer to measure risk, not as a variance from its own mean, but as a variance from the market in general. He credited Jack Treynor as originator of this theory of risk measurement, called "volatility." (Treynor's model follows.) Levy concluded by criticizing both variability and volatility as measures of dispersion to estimate risk:

> A portfolio advancing in value at a non-constant rate would be assigned non-zero risk; whereas a portfolio

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[22]Kalman J. Cohen, Op. Cit., p. 29.

[23]Robert A. Levy, "Measurement of Investment Performance," p. 43.

> declining in value at a constant rate would be labeled riskless. Yet, if risk is to be associated with the probability of unfavorable occurrence, it is clearly the latter portfolio which is more risky.[24]

Levy suggested a measure of risk which assigned a zero value to all positive variability. This restricted the measurement to downside risk only. He called this measure of risk "vulnerability."

Kalman Cohen preferred the mean absolute deviation to standard deviation to measure variability of rates of return:

> The mean absolute deviation is like the standard deviation in giving weight to both declines and rises in the rate of return; it differs in that it gives much less weight to very large changes, since deviations are not squared. The reason for preferring the mean absolute deviation is that a ranking of stock according to this measure is likely to be more nearly stationary through time.[25]

Eugene Fama, writing in the same study, concurred with Cohen on the application of the mean absolute deviation to measure risk:

> If, as the empirical evidence seems to indicate, it is also reasonable to assume that probability distributions on future market values for investment assets and portfolios are of the same general type (specifically, symmetric stable), then the dispersion of any distribution can be completely summarized by a single parameter, such as the mean absolute deviation. . . .[26]

Based upon the conclusions of Cohen and Fama, both

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[24]Robert Levy, Ibid., p. 42.

[25]Kalman J. Cohen, Measuring the Investment Performance of Pension Funds, p. 30.

[26]Eugene Fama, Ibid., p. 199.

of whom were members of Advisory Committee, the BAI adopted mean absolute deviation of rate of return as the appropriate measure of risk in a portfolio measurement model.

Volatility as a Measure of Risk

A different risk measurement model, referred to earlier measures risk as dispersion around the market in general. It was termed "volatility" when introduced by Jack Treynor. Until Treynor's treatise, risk had not been separated into parts but measured only as total risk. Treynor is credited with dividing risk into two parts. The first part of risk is generated by market fluctuations. Variance in return is due solely to market movements. This type of risk has more recently been called "systematic" or "undiversifiable" risk. The second part of risk results from fluctuations in the particular securities held. However, this second part of risk can be assumed away with adequate diversification.[27] This type of risk has been called "unsystematic" or "undiversifiable" risk.

Eric Fisher and Van Messner applied Treynor's theory of dividing risk into parts to portfolio measurement:

> When attempting to compare one manager's risk level with another's variability is the measure to use. However, in isolating how much of that total risk was due to market fluctuations (as opposed to stock fluctuations), this part of total risk is measured by volatility.[28]

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[27]Jack L. Treynor, "How to Rate Management of Investment Funds," Harvard Business Review, January-February, 1965, p. 63.

[28]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," p. 5.

Which measure of central tendency is more appropriate in evaluating portfolio performance measurement, variability or volatility? If one assumes adequate diversification, risk due to fluctuations of stocks is avoided. Then the question becomes a choice of dispersion around the mean return of a portfolio, or a variance from the market return. Should risk be measured by variability of a portfolio's return or by its sensitivity to market fluctuations? To date, no definite conclusion has been drawn.

It is not a goal of this study to hypothesize on the adequacy of either theory. Rather, both measures of risk are used in the study (in Chapters IV and V) in order to better support comparative results.

A Composite Measure

> Ex post risk is not by itself a particularly used quantity. When combined with a suitable measure of ex post yield, however, it offers a means of comparing the performance of a given portfolio with similar portfolios and also against market standards. Just as the theory of portfolio selection is built upon the dual criteria of return and risk, the evaluation of portfolio performance should include both dimensions.[29]

Prior to the development of ex post portfolio theory, performance was measured only by rate of return. With a newly-acquired competence to measure risk, composite measures of portfolio performance became possible.

Most composite measures, or models, are direct

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[29]Keith Smith, Portfolio Management, p. 187.

offsprings of William Sharpe's model, or Jack Treynor's model. Both of these models are discussed below.

Treynor's Model

Jack Treynor first presented his portfolio performance model in 1965.[30] He separated risk into volatility and residual risk. Volatility is risk produced by general market fluctuations. Residual risk is risk inherent to the individual securities in the portfolio.[31] Treynor then assumed away residual risk through adequate diversification: "If a fund is properly diversified the latter risk (residual), which tends to be casually unrelated one security from another, tends to average out."[32]

In Treynor's model, a characteristic line was developed by plotting rate of return of portfolio on the Y-axis and rate of return of market on the X-axis, for each time period considered. (See Figure 1.) A sum-of-least squares fit showed a linear relationship between mutual fund returns for a ten year period ending January 1, 1963.

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[30]Jack L. Treynor, "How to Rate Management of Investment Funds," p. 63.

[31]Treynor did not label this type of risk until a subsequent article in 1968: Jack Treynor, William Priest, Lawrence Fisher, and Catherine Higgins, "Using Portfolio Composition to Estimate Risk," Financial Analysts Journal (September-October, 1968).

[32]Jack L. Treynor, "How to Rate Management of Investment Funds," p. 66.

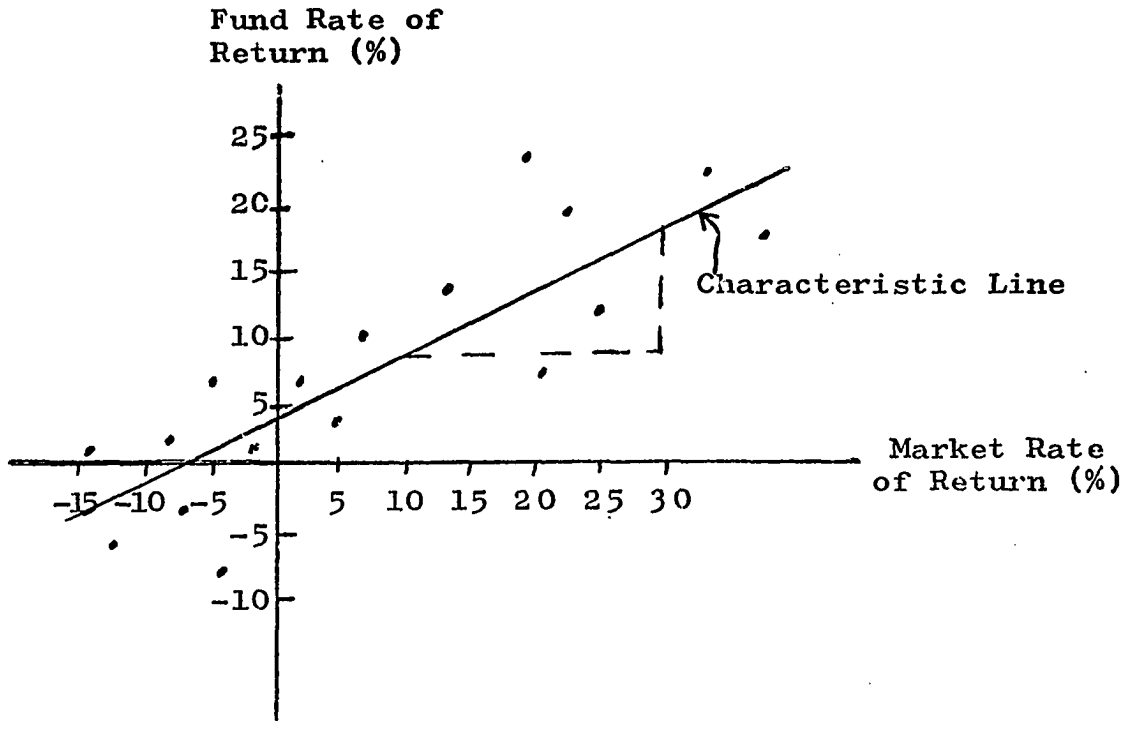

Figure 1. Treynor's model of portfolio performance measurement.

According to Treynor, the characteristic line contains information about both expected rate of return and risk. The slope of the line measures volatility. A steep slope means fund return is relatively sensitive to the market, and vice versa. Treynor suggested that the slope is a better way to categorize mutual funds' volatility than the usual categories of "balanced" stock, "growth stock," or "income fund." He found that mutual fund volatility (slope) ranged from .33 to 2. A volatility of 2 means that a 1% change in the market suggests a 2% change in portfolio rate of return.

If there are excessive deviations from the characteristic line, Treynor stated that either the fund is not efficiently diversified to minimize risk unrelated to the market, or management has intentionally altered volatility of the portfolio.[33] In other words, the money manager attempted to increase volatility if the market were expected to rise and to decrease volatility if the market were expected to fall. (A polynomial regression would be more appropriate than linear regression if the money manager were able to forecast market movements.)

If two portfolios were plotted on the same graph, both with equal volatility, the higher line would demonstrate consistently higher performance. If the slopes vary, which is more probable, a second line would be needed in the basic model. This line would be a horizontal line which intersects the vertical axis at a point representing the rate of return available on a riskless security (Treynor assumed 4%). The point at which the horizontal line intersects the characteristic line determines the rating of the portfolio, which is read off the horizontal axis as a percentage. The lower the percentage, the higher the ranking. In Figure 2, Fund B performed better than Fund A which did better than Fund C.

Keith Smith further explained Treynor's ranking system, by assigning a notation, Ψ (psi), to the ranking index.

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[33]Ibid., p. 66.

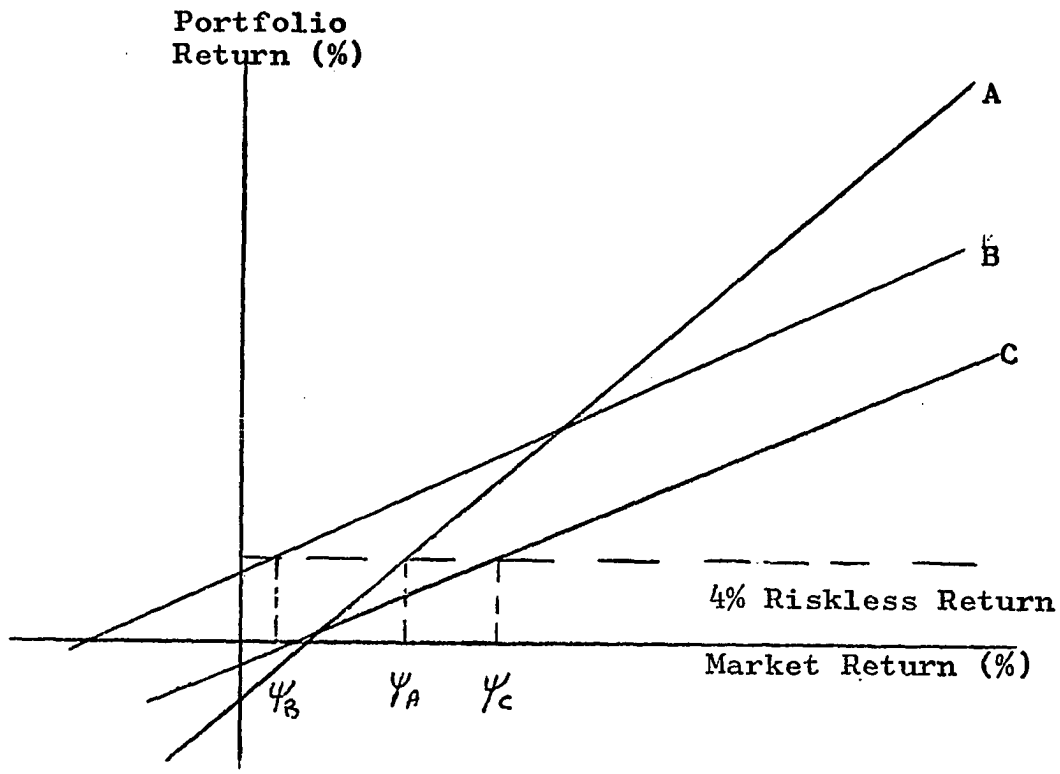

Figure 2. A comparison of portfolio performance (Treynor's Model)

> This measure may be interpreted as the particular level of the market for which the portfolio manager has been able, over a past period of time, to produce a portfolio yield equal to the risk-free yield attainable, for example, from a savings and loan account. The smaller the value of ψ, the better the ex post performance of the portfolio. If two characteristic lines were exactly parallel, then the one higher in the space would have a lower ψ_j and thus would exhibit the preferred performance.[34]

Michael C. Jensen developed a portfolio performance model similar to that of Treynor.[35]

As did Treynor, Jensen assumed away residual risk

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[34]Keith Smith, Portfolio Management, p. 190.

[35]Michael C. Jensen, "The Performance of Mutual Funds in the Period 1945-1964," and William F. Sharpe, "Mutual Fund Performance," Journal of Business (January, 1966).

through diversification. Where Treynor's axes represented market and portfolio return, Jensen used "excess yields" on market return and portfolio return. The X-axis was defined as market yield greater than the interest rate and the Y-axis as portfolio yield greater than the interest rate.[36]

Jensen introduced the formula

$$Y_t - E_o = \alpha + B(I_T - E_o) + e_t \quad [37] \qquad (2)$$

where $Y_t - E_o$ is excess portfolio return, $I_T - E_o$ is excess market return, α and B are intercept and slope terms, and e_t is a random term with mean zero:

> Thus, if the portfolio manager has an ability to forecast security prices, alpha will be positive. Indeed, it represents the average incremental rate of return on the portfolio per unit time which is due solely to the manager's ability to forecast future security prices.[38]

A randomly selected portfolio should have a zero intercept. Therefore, the intercept in Jensen's portfolio line is a measure of the manager's ability in the security selection process:

> It should be emphasized that in estimating α_j, the measure of performance, we are explicitly allowing for the effects of risk on return as implied by the asset pricing model. Moreover, it should also be noted that if the model is valid, the particular nature of general economic conditions or the particular market conditions over the sample or evaluation period has no effect whatsoever on the measure of performance. Thus our measure

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[36] Keith Smith, Portfolio Management, p. 191.

[37] Michael C. Jensen, "The Performance of Mutual Funds in the Period 1945-1964," p. 393.

[38] Ibid., p. 394.

> of performance can be legitimately compared across funds of different risk levels and across differing time periods irrespective of general economic and market conditions.[39]

Which measures of performance is better: Treynor's or Jensen's? Keith Smith indicated a similarity between them:

> Because ψ and α both assume away residual risk and because both use a regression analysis of portfolio performance on market performance, they should be related. . . . Treynor showed that his measure compares with the α index of Jensen (Jack Treynor, "Discussion: The Performance of Mutual Funds in the Period 1945-1963," Journal of Finance, May, 1968).[40]

Smith introduced an example (Figure 3) which demonstrated differences in ranking of portfolios using both indices. Portfolio C has a smaller alpha (inferior performance) and also a smaller psi (superior performance) than does Portfolio B. From this example, Smith concluded that alpha is a better measure when comparing to the market and that psi is better when comparing a series of portfolios: "For ranking the performance of a series of portfolios, the composite measure, psi, would appear to be a preferred method because it adjusts for the level of systematic risk, Beta."[41]

In an attempt to clarify portfolio evaluation theory for implementation by the securities industry, Eric Fisher and Van Messner wrote on the application of ex-post theory

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[39]Ibid., p. 394.

[40]Keith Smith, Portfolio Management, p. 192.

[41]Ibid., pp. 195-196.

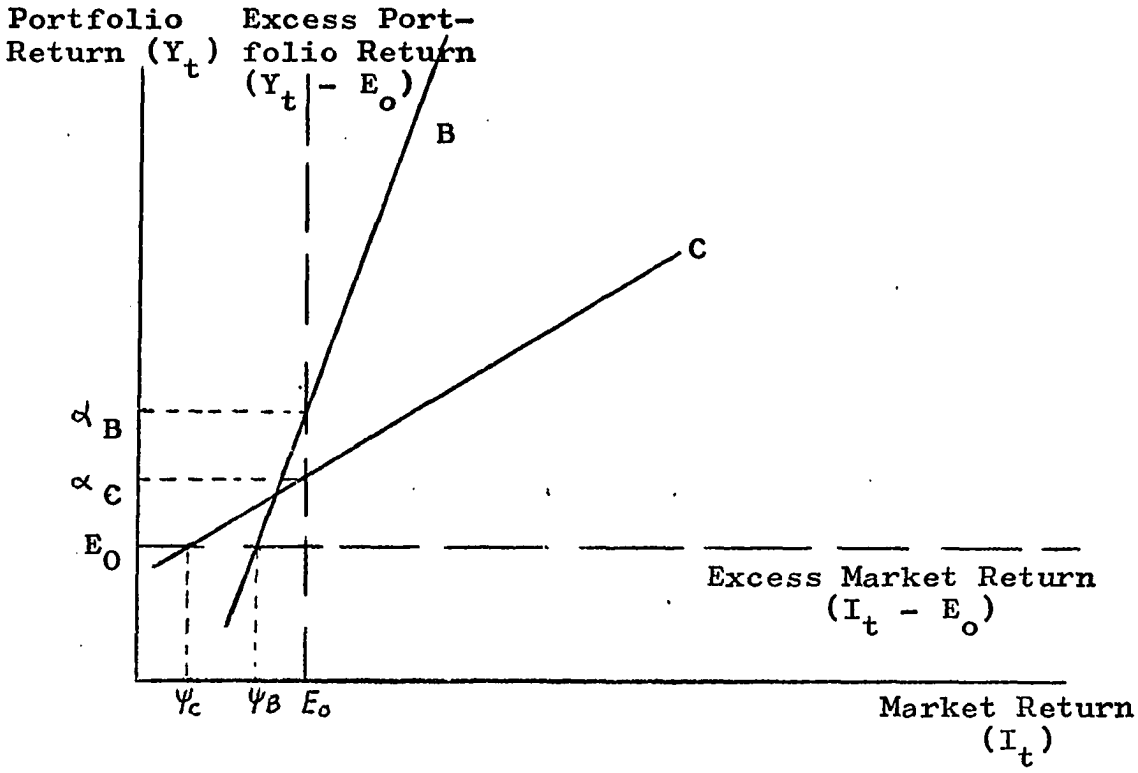

Figure 3. Comparison of portfolio ranking. Smith's model, which compares Treynor's and Jensen's models.

to pension portfolio measurement.[42] They stated that their study relied quite heavily on the Bank Administration Institute's study of pension fund performance measurement in 1968.[43] A composite measure was developed which they felt could solve the Treynor-Jensen dilemma concerning which model best measures relative performance.

Fisher's and Messner's model, which they call "the risk adjusted market method," follows. Portfolio return and

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[42]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," p. 5.

[43]Measuring the Investment Performance of Pension Funds (Chicago: Bank Administration Institute, 1968.

market return are measured on the Y- and X-axes, respectively. A characteristic line is developed in the same manner suggested by Treynor and Jensen, but alpha represents the Y-intercept and beta the slope. (Figure 4)

"Alpha may be viewed as the rate of return a manager would earn if the market had a flat (zero) rate of return."[44] Beta measures the risk taken by the portfolio manager relative to the market risk.

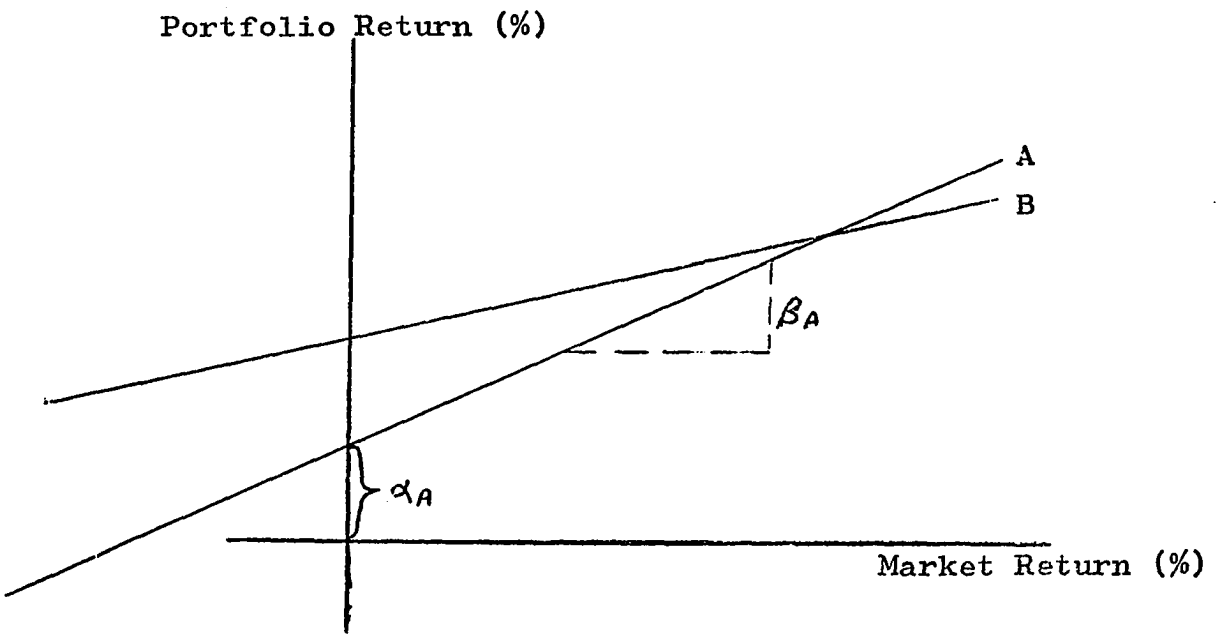

Figure 4. Fisher and Messner performance measurement model.

In a recent article, Franco Modigliani agreed with Fisher's and Messner's capability measurement (alpha).

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[44]Eric E. Fisher and Van A. Messner, "A Guide to Pension Fund Performance Measurement," p. 5.

He defines the same alpha as "the average of the residual returns," where the residual returns are the perpendicular distances of the points from the line.[45] In defining beta, Modigliani stated: "Since the systematic return is perfectly correlated with the market return, it can be expressed as a factor, designated beta, times the market return, R_M. The beta factor is a market sensitivity index."[46]

He further explained that unsystematic return (return from risk of individual stock movements) is independent of market returns, and is identified as e'. With systematic and unsystematic return defined, return on portfolio can be expressed:

$$R_p = BR_M + e' \qquad (3)$$

> The security returns model (Equation 5) is usually written in such a way that the average value of the residual term, e', is zero. This is accomplished by adding a factor, alpha (α), to the model to represent the average value of the unsystematic returns over time. That is, we set $e' = \alpha + e$ so that
>
> $$R_p = \alpha + BR_M + e \qquad (4)$$
>
> where the average e over time is equal to zero.[47]

As before, the beta is the slope of the line. The alpha factor is the Y-axis intercept, which is the average value over time of the unsystematic returns (e') on the portfolio.

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[45]Franco Modigliani, "An Introduction to Risk and Return: Concepts and Evidence," Financial Analysts Journal (March-April, 1974), p. 77.

[46]Modigliani, Ibid., p. 76.

[47]Modigliani, Ibid., p. 76.

The results of his empirical tests on systematic and unsystematic risk were described by Modigliani: ". . . roughly 40 to 50 percent of total security risk can be eliminated by diversification. The remaining risk is equal to beta times market risk."[48] Modigliani concluded that rates of return over several time periods are related to systematic, not total risk. Therefore, beta is useful as a "relative" risk measure.[49] From Modigliani's model, if no unsystematic risk were taken (achieved through adequate diversification), then

$$R_p = BR_M + e \qquad (5)$$

where $e = 0$, over time. In this case, if $R_M = 0$, then $R_p = 0$. Under this circumstance, the only difference in portfolio choice for an investor is the level of risk, as measured by beta, that the investor would prefer. If Portfolio 1 has a beta of 1 and Portfolio 2 has a beta of 2, return to Portfolio 2 should be twice as great as, or two times less than, return to Portfolio 1, depending upon market movement. If one assumes market return is positive, Portfolio 2 outperforms Portfolio 1, solely because it had taken more risky stocks.

Is the manager of Portfolio 2 better at selecting securities than the manager of Portfolio 1? Under the given

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[48] Ibid., p. 78.

[49] Ibid., p. 79.

assumptions, the manager of Portfolio 2 achieved superior returns only because he was willing to accept additional risk. In other words, the manager of Portfolio 2 demonstrated his ability to predict market movement because he selected a more risky portfolio for the up market.

To rank ability to pick winners, one must consider unsystematic return, return which is a result of accepting unsystematic risk, as measured by alpha. Alpha is not the average rate of return. Alpha is a measure of a money manager's ability to select winners. It measures the average value of unsystematic returns over time. The following is intended to better explain the meaning of alpha.

From Equation 5, $R_p = BR_M + e'$ was constructed in Figure 5.

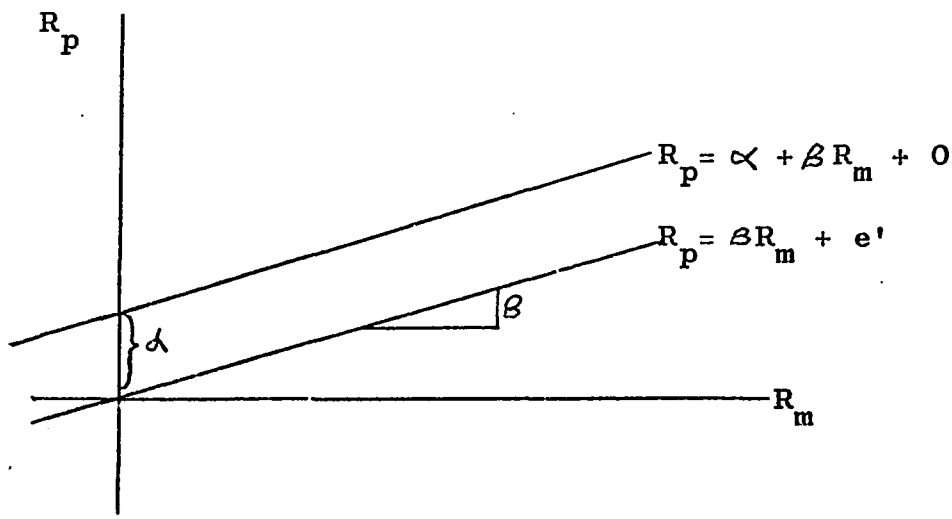

Figure 5. Modigliani's market model.

In this model, e' is positive, negative, or zero. It represents unsystematic return, or residual return. A best-fits linear regression would move the line in Table 8 in a direction which would cause e' to approach zero. As the Y-intercept moves away from the origin, alpha takes on real values (see the dotted line). When e' equals zero, α becomes a mean of residual returns because the "best-fit" implies equal distribution of individual e's above and below the line, forcing alpha to be the mean of unsystematic returns.

Sharpe's Theory

The ability to pick winners, as defined by William Sharpe, is the ability to choose a portfolio of stocks that are efficient. Sharpe defined efficient as, "greater average return at the same level of variability."[50]

Denoting reward as (R) and variability as (V), Sharpe developed his R/V ratio.

$$\text{R/V ratio} = \frac{\text{(average return - 3.0 percent)}}{\text{variability}} \qquad (6)$$

where 3% was assumed the return on a riskless asset, or the interest rate. Therefore, the numerator becomes the reward for bearing risk. Variability, according to Sharpe was measured as the standard deviation of the annual rate of return.

The R/V model was tested on thirty-four mutual funds. The R/V varied from .43 to .78. Sharpe attributed the range

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[50]William F. Sharpe, "Mutual Fund Performance," Journal of Business, Vol. 39, January, 1966, p. 121.

to differences in managers' skills. Sharpe compared fund return with return on the Dow Jones Industrial Average (DJIA) for the 10 years, 1954 to 1963. He found that "almost 90% of the variance of return on the typical fund in our sample was due to its comovement with the return of the market (DJIA)."[51]

For a diversified portfolio, such as mutual funds, Treynor's Index of volatility is a good indication of risk:

> Treynor has taken advantage of this relationship by using the volatility of a fund as a measure of its risk instead of the total variability used in the R/V ratio. Since the returns on all diversified portfolios move with the market, the extent to which changes in the market are reflected in changes in a fund's rate of return can stand as a good measure of the total variability of the fund's return over time.[52]

However, Sharpe added, that if a portfolio is not adequately diversified, then Treynor's Index fails because it ignores that portion of variability resulting from a lack of diversification.

Comparing the rankings of mutual funds as determined by the "Treynor Index" to his own index, Sharpe found a correlation coefficient of .974.[53]

Sharpe concluded that the funds in his test were adequately diversified, based upon the high correlation of their rates of return. Therefore, differences in performance

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[51]William F. Sharpe, Ibid., p. 127.

[52]Ibid., p. 127.

[53]Ibid., p. 129.

"ranking" must be attributed to "ability of management to find incorrectly priced securities. . . ."[54]

The next section discusses the theoretical contribution of Eugene Fama to portfolio performance measurement.

Eugene Fama

Fama did not involve himself with the volatility-variability conflict. His objective was to establish a market line for a benchmark and then to demonstrate why some portfolio returns did not fall on that benchmark. The theory discussed below was incorporated into the BAI Study, to which Fama was a major contributor.

Fama started his theory with the development of the market line. R_a is defined as actual return over one time period. R_x is defined as the return of a naively selected portfolio such that:

$$R_x = R_f + \left(\frac{R_m - R_F}{(R_m)}\right) B_x \qquad (7)$$

where R_f is return on a riskless asset, R_m is return on the market portfolio, and (R_m) is the standard deviation of return for the market portfolio (M). Equation 7 is a benchmark portfolio where return is found on the Y-axis and risk (as measured by) on the X-axis.[55] (See Figure 6)

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[54]Ibid., p. 131.

[55]Eugene F. Fama, "Components of Investment Performance," Journal of Finance (June, 1972), p. 551.

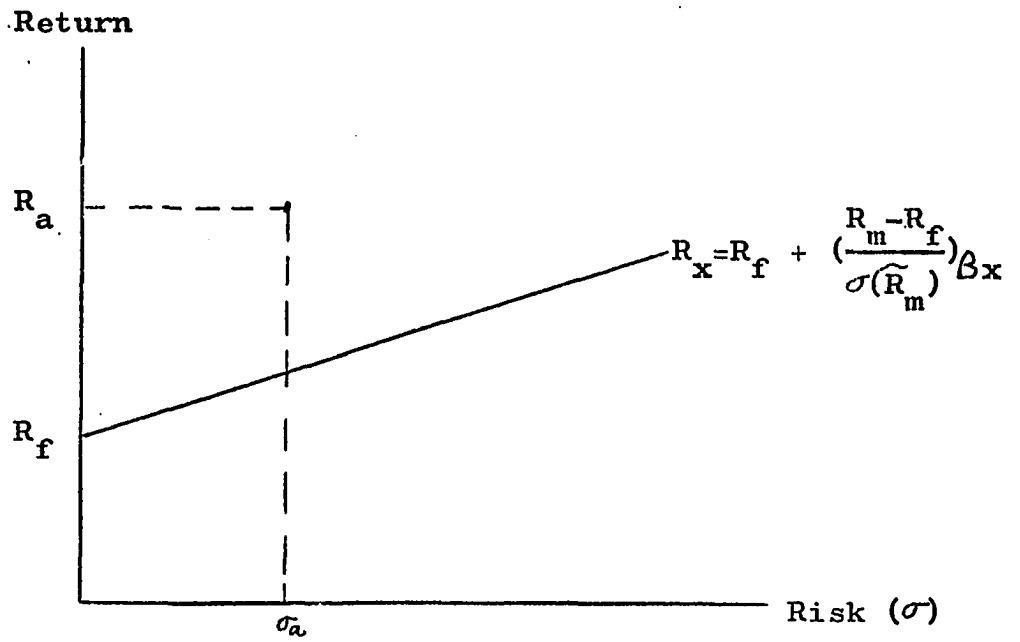

Figure 6. Eugene Fama's risk-return model.

Fama defined "selectivity" as the difference between actual return (R_a) and the return of a naive portfolio (R_x) with the same risk level (B_a). Fama broke down "selectivity" into components: "Selectivity, or some slight variant thereof, is the sole measure of performance in the work of Sharpe, Jensen, and Treynor. But more detailed breakdowns are possible."[56]

$$\underset{\substack{\text{Overall}\\\text{Perfor-}\\\text{mance}}}{(R_a - R_f)} = \underset{\substack{\text{Selec-}\\\text{tivity}\\\text{Return}}}{(R_a - R_x(B_a))} + \underset{\substack{\text{Risk}\\\text{Return}}}{(R_x(B_a) - R_f)} \qquad (8)$$

In Equation 8 above, overall performance is the

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[56]Ibid., p. 557.

difference between return on chosen portfolio and return on riskless asset. Selectivity has already been defined above. Return from risk is obtained by deciding to take on positive amounts of risk. It will be determined by the level of risk chosen (the value of B_a) and by the difference between return on market portfolio (R_m) and return on the riskless asset (R_f).

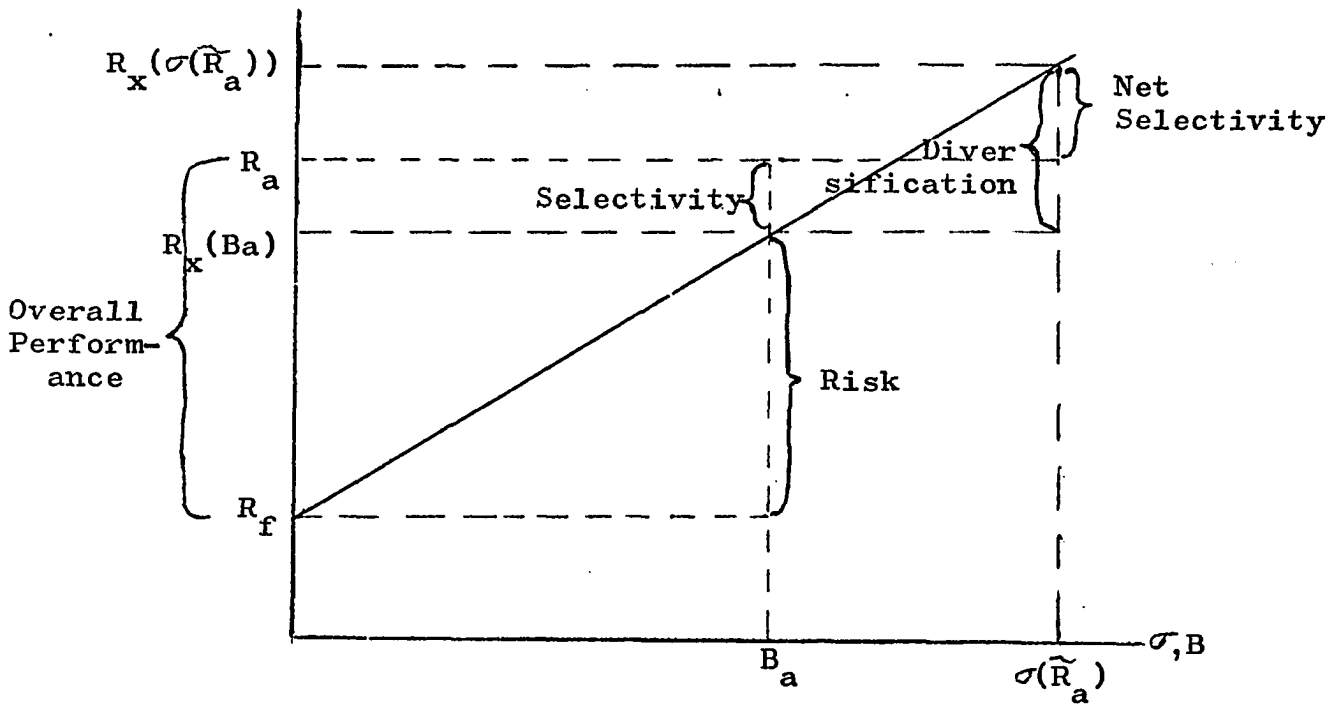

Figure 7. Eugene Fama's model showing a breakdown of overall performance.

In the above figure (7), assume a return on actual portfolio of R_a. Risk taken would then be $\sigma(\tilde{R}_a)$, the standard deviation of the expected return of Portfolio A. Note that $\sigma(\tilde{R}_a)$ is not necessarily the same value as B_a. This is discussed below.

Selectivity, $R_a - R_x(B_a)$, is positive. Thus, a

naive portfolio (R_x) of risk level (B_a) had less return than actual portfolio (R_a).

The other component of overall performance is $R_x(B_a) - R_f$, the return for accepting some portion of R_x (market portfolio) combined with R_f.

A new concept was then introduced, one which has been assumed away until now. As long as the portfolio's return is less than perfectly correlated with the return on market portfolio, B_a is less than total risk accepted by the investor, $\sigma(\tilde{R}_a)$, the standard deviation of its return.

Proof of this relationship is in the correlation coefficient, K_{ax}, between R_a and R_x:

$$K_{ax} = \frac{\text{cov}\ (\tilde{R}_a, \tilde{R}_x)}{(\tilde{R}_a)\ \ (\tilde{R}_x)} \quad [57] \qquad (9)$$

Earlier in his article, Fama showed that

$$B_a = \frac{\text{cov}\ (\tilde{R}_a, \tilde{R}_x)}{\sigma\ (\tilde{R}_x)} \qquad (10)$$

so that

$$B_a = K_{ax}\,\sigma(\tilde{R}_a) \quad [58] \qquad (11)$$

and, therefore,

$$B_a \leq \sigma\ (\tilde{R}_a) \qquad (12)$$

as long as $K_{ax} \leq 1.0$, which is true since only naive portfolios are literally perfectly correlated.

The above is intended to show that the total risk is

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[57] Ibid., p. 557.

[58] Ibid., p. 558.

greater than B_a of the portfolio because portfolio's return is not perfectly correlated to market return. There is less than perfect diversification, to the extent that the portfolio manager decided to take on some portfolio dispersion which could have been diversified away, because he thought he could choose securities or concentrate resources in a profitable manner.

$R_x(\sigma(R_a))$ is the return on the combination of riskless asset, f, and market portfolio, M, that has risk equivalent to that of the actual portfolio A. Return from diversification is measured by

$$R_x(\sigma(R_a)) - R_x(B_a) \quad . \tag{13}$$

Equation 14 (below) measures the extra portfolio return the portfolio manager must produce in order to justify concentration of resources.

Fama introduced the term "net selectivity" as that part of selectivity exclusive in diversification:

$$\begin{aligned} \text{Net Selectivity} &= \text{Selectivity} - \text{Diversification} \qquad (14) \\ &= (R_a - R_x(B_a)) - (R_x(\sigma(R_a)) - R_x(B_a)) \\ &= R_a - R_x(\sigma(R_a)) \end{aligned}$$

In the given example:

> Though the manager chose a portfolio that outperformed the naively selected portfolio with the same level of market risk, his "selectivity" was not sufficient to make up for the avoidable risk taken so that net selectivity was negative.[59]

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[59] Ibid., p. 557.

Fama concluded that a measure of manager's performance may include either selectivity or net selectivity. If the investor dictates to the manager that the manager should not maximize diversification, then "selectivity" is the proper measure. If the manager chooses not to fully diversify, of his own accord, then "net selectivity" is the proper measure.

The BAI Study Evaluation Model

Eugene Fama wrote a Supplement to the BAI Study titled "Risk and the Evaluation of Pension Fund Portfolio Performance."[60] This section discusses Fama's contribution to the BAI Study.

It was mentioned earlier that Treynor's model assumed diversification, and that Sharpe's model would work better if the portfolio were not diversified. Neither model demonstrated the effect of intentionally or unintentionally not diversifying. Both authors assumed a portfolio manager had the intention of diversification. Fama agrees with Sharpe and Treynor that an objective of every money manager is to choose stocks with the highest level of return within a given risk parameter. However, he added: "In addition, if the fund's owners decide that portfolio efficiency is desirable, the success or failure of the manager also depends

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[60] Measuring the Investment Performance of Pension Funds, A Study by the Bank Administration Institute (Chicago: 1968), Supplement, pp. 191-224.

on his ability to diversify. . . ."[61]

Fama stated the total risk, or dispersion in the distribution of the market value of a portfolio should be split into two components:

> . . . that part (undiversifiable) which remains even when the asset is included in a naively selected efficient portfolio and that part (diversifiable) which can be eliminated when the asset is included in a naively selected efficient portfolio.[62]

Fama noted that undiversifiable risk is only equivalent to total risk for naively selected efficient portfolios. Therefore, when portfolio performance is measured in terms of return and <u>total</u> risk, this measurement includes: (1) the manager's ability to diversify (to minimize avoidable risk) and (2) his ability to choose stocks which will outperform other stocks with the same amount of undiversifiable (systematic) risk. If one desires to look solely at ability to pick winners (to ignore ability to diversify) total risk cannot be used. To emphasize that total risk should not be used in all cases, Fama determined a beta (β) which measures undiversifiable risk. He also introduced e_p, similar to Modigliani's e', which is diversifiable risk. If D_p is total risk, or total dispersion,

$$D_p = (B_p + e_p) \tag{15}$$

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[61] Ibid., p. 201.

[62] Ibid., p. 206.

or in other words, total dispersion equals undiversifiable dispersion plus diversifiable dispersion of a portfolio, P.

If a portfolio is fully diversified, $(\beta)_p$ equals market risk, D_M, and e_p is zero. Therefore, D_p must also equal D_M. The ratio D_p/D_M equals 1.0, so that $D_p/D_M = {}_p$. If a portfolio is not fully diversified, D_p/D_M is larger than beta , because e_p has a positive value.

Referring to Figure 8 below, Rx, Bx, and Dx must be known for Portfolio X. Plotting both (Bx,Rx) for X and $(D_x/D_T, R_x)$ for X', the vertical distances to the market line from X and from X' measures manager ability.

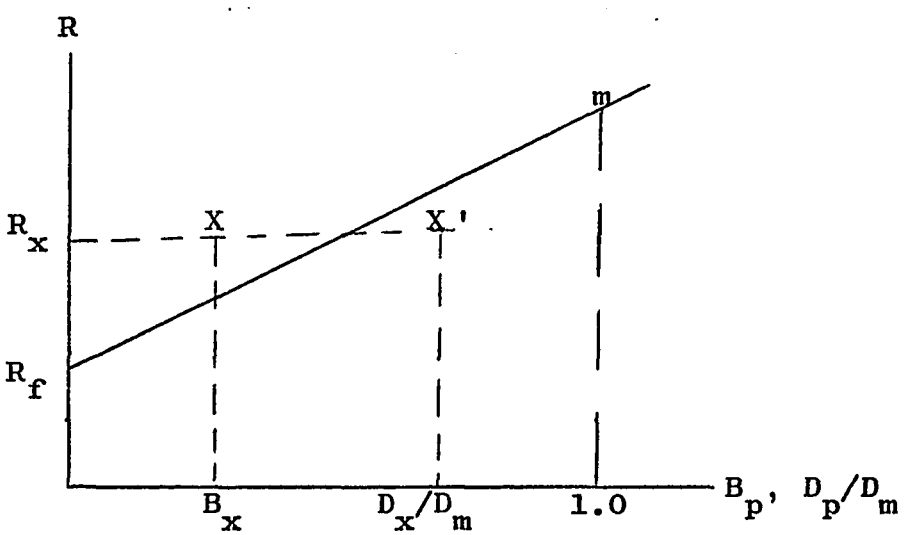

Figure 8. The BAI model for portfolio performance measurement.

The distance from X' to the market line includes ability to pick winners and ability to diversify. The distance from X to that line represents the manager's ability to pick assets, uneffected by the degree of diversification. In this example, the manager's inability to diversify forced the portfolio to accept additional risk to the extent that performance, which had been superior to a naive portfolio, is now inferior.

Some of the major work in the theory of portfolio performance measurement has been presented. The performance measurement theories of Treynor, Jensen, Sharpe, Modigliani, and Fama, which have been discussed in this review, are probably the best known and most widely accepted. But, by no means, is this review complete.

Other contributors to the theory of portfolio performance have not been included because: (1) their work was an offshoot of the above theories, (2) their work was in a specialized area of portfolio performance theory which is not directly related to the study, or (3) their efforts were empirical in nature, with the intention of proving or disproving existing theory, rather than application of existing theory.

For example, Marshall Blume is best known for his efforts in measuring distribution of returns.[63] Latane and

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[63]Marshall Blume, "Portfolio Theory: A Step Toward Its Practical Application," Journal of Business, April 1970; and "The Assessment of Portfolio Performance--An Application to Portfolio Theory," unpublished Ph.D. dissertation, University of Chicago, 1968.

Young built hypothetical portfolios from 224 selected stocks. These portfolios were built under five portfolio management policies and tested against random portfolios and a stock index.[64] Cohen and Pogue empirically tested ex-ante and ex-post performances of a number of portfolio selection models.[65] These portfolios were based on Markowitz formulation.

The remainder of this chapter is devoted to the literature concerning application of the theory of performance measurement.

Literature Relating to the Application of Performance Measurement

Important work has been done by corporations, private pension consultants, and brokerage firms in the applications of performance measurement theory. Most applications have been in the area of mutual funds and, more recently, in pension funds. Very little has been done in empirically measuring performance of investment source capability. Although it is assumed that some investment advisors, bank trust departments, investment research services, and brokerage firms who make buy and sell recommendations keep some record of their performance, there is no published literature available containing evidence that this is being done on any

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[64] H. A. Latane and W. E. Young, "Test of Portfolio Building Rules," Journal of Finance, September, 1969.

[65] R. J. Cohen and J. A. Pogue, "Empirical Evaluation of Alternative Portfolio Selection Models," Journal of Business, April, 1967.

large scale.

The major study in quantitatively measuring investment source capability was done in 1972 by R. E. Diefenbach. He criticized the capability of institutional brokerage research.[66] Included in his data were all "specific recommendations" to buy or sell a stock, received during an 80 week period from November 17, 1967, through May 23, 1969. The subsequent rate of return of each stock was measured for a 52 week period. The rate of return of each stock was compared to the Standard and Poors 425 Index for the same time period. From Table 6, Diefenbach calculated the performance differential of each stock which was obtained by comparing that stock's value change in one year to Standard and Poor's change during the same time period:

> If a stock were to increase by 15.2% in one year while Standard and Poors decreased 1.5% over the same period, the percentage point difference in performance would be 16.7%. This method of measuring performance relative to the market was selected because of ease of calculation.[67]

The above comment indicates the weaknesses in Diefenbach's study. Does the mean price change include dividends? By holding a stock for exactly one year, Diefenbach fails to simulate the selling practice of most investors. How did the sources compare in different market conditions? What risk

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[66] R. E. Diefenbach, "How Good Is Institutional Brokerage Research?," Financial Analysts Journal, January-February, 1972, p. 54.

[67] Ibid., p. 54.

TABLE 8

52-WEEK MARKET PERFORMANCE OF BUY RECOMMENDATIONS
Received during the 80 Weeks Ending 11/17/67 through 5/23/69

	Source	Number of Buy Recs.	Mean Price Change	Percent Outperforming S. & P. 425	Mean Performance Differential from S. & P. 425
1.	A	12	+24.6%	75%	+25.9%
2.	B	11	+ 6.7	36	+13.8
3.	C	26	+ 1.8	54	+13.7
4.	D	5	- 1.6	60	+11.8
5.	E	12	+ 8.9	50	+11.6
6.	F	288	+10.8	56	+ 9.8
7.	G	49	+ 3.5	51	+ 6.9
8.	H	192	+ 5.8	47	+ 5.9
9.	I	13	+ 0.7	38	+ 5.7
10.	J	91	+ 3.2	48	+ 4.3
11.	K	59	+ 7.2	53	+ 4.0
12.	L	24	- 1.5	50	+ 0.1
13.	M	21	- 8.0	48	- 0.2
14.	N	39	-13.9	46	- 1.6
15.	O	147	-11.1	39	- 4.0
16.	P	67	- 9.6	43	- 4.5
17.	Q	39	-11.4	36	- 4.9
18.	R	33	-10.7	39	- 6.3
19.	S	14	-18.7	21	-11.1
20.	T	23	-21.6	35	-11.7
21.	U	9	-25.5	11	-13.4
22.	V	8	-26.0	0	-19.3
23.	W	9	-29.5	22	-21.3
24.	X	18	-38.8	17	-25.3
Aggregate:	All Sources	1,209	- 0.3%	47%	+ 2.7%
Mean:	By Source	50	- 6.4%	40%	- 0.4%

Source: R. E. Diefenbach, Financial Analysts Journal (January-February, 1972), p. 54.

levels are recommended by the sources? If risk had been a factor in determining performance, how would the sources have ranked?

By creating hypothetical portfolios from recommendations and by submitting the hypothetical portfolios to portfolio performance measurement tests, answers to some of the above problems could have been resolved.

A treatise by Edward Malca in 1973 tested the capabilities of 37 large commercial banks' trust departments.[68] Common trust funds were submitted to portfolio performance measurement. The results of the study appear in Table 9.

TABLE 9

DISTRIBUTION OF PERFORMANCE MEASURE USING ALPHA, FOR THE PERIOD JANUARY 2, 1962, THROUGH SEPTEMBER 30, 1970, FOR 37 COMMERCIAL BANKS

Alpha	Number of Funds	Mean Alpha
Greater than or equal to 4%	1	+6.3%
Greater than zero, less than 4%	6	+1.2%
Less than zero, greater than -4%	28	-1.2%
-4% or less	2	-5.7%
Total	37	-1.6%

[68] Edward Malca, "Bank's Records: Pension Fund Performance," Commercial & Financial Chronicle, Aug. 23, 1973, p. 12.

Malca found the mean alpha was -1.6%, the maximum was 6.3%, and the minimum was -6.1%. In other words, the average bank is incapable of outperforming the market. In fact, thirty of the thirty-seven banks performed worse than an "unmanaged" portfolio. The comingled equity funds had a beta coefficient equal to .96.

These results were used in Chapter VI as a comparison to the performance results of the investment sources tested in this study.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

In the previous chapter, the more important contributions to the theories of portfolio performance measurement were disclosed. Some of these theories have been modified and applied by the securities industries in an effort to increase disclosure of performance. But the application has been limited primarily to pension fund performance measurement. The purpose of this study, stated once more, is to broaden the application of performance evaluation to other types of investment sources, so that investors will have better information to help them decide which investment source best fits their needs.

Procedure

Buy and sell recommendations of twenty investment sources, covering a five year period from May, 1969, to March, 1974, were put into hypothetical portfolios. These portfolios were submitted to portfolio performance measurement techniques for evaluation. The evaluation of each investment source included: (1) rate of return an investor could expect if he were to follow every recommendation, (2) the amount of risk the investor

would have to accept if he were to accept the advice of an investment source, (3) a ranking of performance of each source compared to similar sources in similar market conditions, and (4) a comparison of performance to the performance of other sources under different market conditions.

Appropriate Evaluation Techniques

As indicated in the previous chapter, no measurement apparatus has been universally applied to evaluate the capabilities of investment media. Most evaluation models were similar in their agreement that performance must include measurement of both rate of return and risk. Most models were in accord concerning the use of a "time-weighted" rate of return. However, the major differences in models pertained to measurement of risk. Even here, most models agreed that risk should be measured by variance in rate of return. The major conflict developed over how the dispersion of rates of return should be measured.

Jack Treynor and his followers believed that risk should be measured as dispersion of portfolio returns in relation to market returns. This theory was based on the assumption that a portfolio is sufficiently diversified so that any risk inherent in an individual security, called unsystematic risk, is offset by other securities in the portfolio. The remaining risk is undiversifiable. As mentioned before, it is often called systematic risk. Treynor's model measures the "volatility" of a portfolio to

market movements.

William Sharpe postulated that total risk, including both systematic and unsystematic risk, should be measured by the dispersion of rates of return of a portfolio around the mean return of that portfolio. He claimed that, if a portfolio is not adequately diversified, it takes on unsystematic risk, which can only be measured by "variability" of rates of return.

Eugene Fama agreed with Sharpe's postulation. Total risk measures both systematic and unsystematic risk. However, he added that if a portfolio is not fully diversified, that amount of risk due to concentration of assets can be measured as total risk less systematic risk, at any given level of rate of return.

Prior to undertaking this study, the adequacy of portfolio diversification of investment sources was not known. Rather than arbitrarily choosing a measurement model, a decision was made to test performance of investment sources using both volatility and variability models. Discrepancy between the results of the tests would indicate a lack of diversification.

Sharpe's evaluation model was employed in Chapter IV to obtain comparative performance data. The BAI sanctioned the use of the mean absolute deviation of rates of return to measure total risk (variability).[1]

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[1] Measuring the Investment Performance of Pension Fund, Bank Administration Institute Study, 1968, p. 7.

The COMVEST computer program, which is discussed below, is a product of the BAI. COMVEST was used to obtain "time-weighted" rates of return and to calculate the mean absolute deviations of the rates of return, thus providing the two variables in Sharpe's evaluation model.

In Chapter V, systematic risk, or undiversifiable risk, was found by linear regression of portfolio rates of return (the dependent variable) on market rates of return (the independent variable). Standard and Poors Industrial Index of 425 Stocks was assumed to be representative of the market.[2] Correlation coefficients and standard errors were calculated to test the quality of the regressions. From the regression equation, $Y = \alpha + \beta X$, beta is used to measure risk for each portfolio, and alpha is used to compare the ability of investment sources to select stocks.[3] In other words, alpha is used to rank portfolios, according to their manager's ability to select stocks. (In this study, the manager was an investment source.) Note that the model used in Chapter V is not exactly the same as Treynor's, but

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[2]"Either the S&P or NYSE Composite are reasonable guages for measuring performance of portfolios entirely invested in Common Stocks." (George C. Briggs, "Performance and Portfolio Management," Financial Analysts Journal, September-October, 1967, p. 124.)

[3]The words of Eric Fisher and Von Messner best describe alpha: "Alpha measures the extra push or drag exerted by the fund manager above and beyond mere comovement with the market," from "A Guide to Pension Fund Performance Measurement," Trusts and Estates, February, 1972.

rather, a modification which is, in the words of Fisher and Messner, "the most commonly used method to evaluate performance."[4] It is the model adopted by Edward Malca (see Chapter II), where alpha is the Y-intercept and beta is the slope of the regression line.[5]

Sources of Data

Buy and sell recommendations were compiled from the following investment sources for the period May, 1969, to December, 1973. Some sources did not specifically recommend purchase of every security mentioned. If no specific buy or sell was recommended, this study ignored that security. An unequivocal buy or sell must have been stated to be included in the data.

Brokerage Firms

Recommendations of fifteen brokerage firms were taken from the Wall Street Transcript, a weekly publication of brokerage firm market letters. Most recommendations included a risk class specification such as "for speculative accounts" or "for long term growth," which required classifying recommendations according to investor objective of: (1) growth, (2) income, or (3) speculation. Brokerage firm recommendations

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[4]Eric E. Fisher and Van A. Messner, op. cit., p. 7.

[5]For a complete analysis of this model see Franco Modigliani's article, "An Introduction to Risk and Return: Concepts and Evidence," Financial Analysts Journal, March-April, 1974.

were compiled into three portfolios, one portfolio for each type of investor objective as mentioned above.

Investment Research Companies

The three most often used research sources are Standard and Poors, Moody's and Value Line. Both Standard and Poors and Moody's publish portfolios composed of stocks they feel best satisfy investor objectives. Standard and Poor's "Stock Guide" publishes three portfolios: (1) stocks for price appreciation, (2) aggressive stocks, and (3) stocks for good income return. Moody's "Stock Survey" also publishes three portfolios: (1) stocks for long-term capital gains, (2) stocks for rapid growth, and (3) stocks for large current income.

For both sources, no hypothetical portfolio development was necessary. Portfolio performance measurement was undertaken on the published portfolios, as developed by their sources. Separate portfolios were maintained for each of three investor objectives: conservative, income, and speculation, as mentioned before.

Value Line does not publish a portfolio of stocks. However, in their "Selection and Opinion," a favorite stock for appreciation during the next twelve months is often recommended. Three hypothetical portfolios were created for these recommendations. Value Line did not follow the traditional investor objective descriptions, as did most of the other sources. Rather, each stock is assigned a safety

factor from "one" to "five." "One" is the safest and "five" is least safe, in a system which defines safety as variability of prices.

For convenience and uniformity, Value Line safety factors were converted from five classes to three classes as follows:

TABLE 10

PORTFOLIO INVESTOR OBJECTIVE IDENTIFICATION NUMBERS ASSIGNED TO VALUE LINE'S SAFETY FACTORS

Value Line Safety Factor		Portfolio Identification Based upon Investor Objective
(safest)	1	4 (safest)
	2	4
	3	5
	4	5
(least safe)	5	6 (least safe)

Recommendations could not be classified by objective into: (1) a growth portfolio, (2) an income portfolio, and (3) a speculative portfolio, as before. The writer assigned recommendations with a safety factor of "1" or "2" to a growth portfolio, and recommendations with a safety factor of "5" to a speculative portfolio. The writer was at first undecided how to classify recommendations which had a safety factor of "3" or "4". After tests were completed, however,

it was apparent that these recommendations fit best into a speculative portfolio. This decision was based on the level of risk taken relative to other speculative portfolios. In a manner similar to Moody's and Standard and Poors, the monthly periodical, Financial World, published portfolios for different investor objectives. During the test period, however, Financial World changed portfolio descriptions which required reclassification of the study's portfolio descriptions as follows:

TABLE 11

RECLASSIFICATION OF INVESTOR OBJECTIVES

Study Classification		Original Financial World Classification	Financial World Classification After Changes
Number	Description		
1	Conservative Growth	Growth	Blue Chips, Diversified, Growth
2	Income	Income	--
3	Speculative		Aggressive

Financial World's changes occurred in 1970. Therefore the "income" portfolio was rather short-lived, ending in June, 1970. The original "growth" portfolio was changed to include blue chips and diversified stocks, which were the new portfolios created at that time by Financial World.

Individual Financial Analysts

An effort was made to determine whether an investment source restricts the recommendations of an individual security analyst employed by that investment source. In other words, if a security analyst likes a risky investment, will his "favorite" recommendation become an investment source recommendation, or do fiduciary responsibilities and other constraints restrict the investment source from supporting the analyst's "favorite" recommendation?

A portfolio of individual analysts "favorite" recommendations was created for the purpose of comparing performance of recommendations of these individuals to the performance of recommendations of the firms who employed them. To achieve this purpose over one hundred analysts' "favorite recommendations" were selected from The Commercial and Financial Chronicle's column, "Stocks I Like Best," which appears weekly. These recommendations were not subdivided by investor objective because usually none was given by the analysts.

Quality of the Data

As mentioned in Chapter 1, a limitation to the study was that stocks which were recommended, but were not listed on the COMPUSTAT TAPES, were not included in the study. The number of recommendations of each source which were used or excluded in the study are shown in Table 12. Eliminated recommendations were primarily unlisted industrial corporations, although a few eliminations were of listed companies.

TABLE 12

NUMBER AND PERCENT OF TOTAL SOURCE RECOMMENDATIONS NOT USED IN THE STUDY

Source	Number of Recommendations Used	Number of Recommendations Not Used	Total Recommendations Made	Percent of Recommendations Not Used
A	426	18	444	4.05%
B	147	6	153	3.92
C	130	101	231	43.72
D	280	8	288	2.77
E	227	8	235	3.40
F	364	49	413	11.86
G	61	28	89	31.46
H	162	40	202	19.80
I	273	37	310	11.93
J	196	13	209	6.22
K	180	30	210	14.28
L	77	14	91	15.38
M	159	18	177	10.16
N	128	15	143	10.49
O	93	74	171	43.27
P	128	13	141	9.22
R	51	15	66	22.72
S	240	8	248	3.23
T	170	65	235	27.66
U	79	13	92	14.13
Total	3571	573	4144	13.82%

A few additional eliminations were a result of mergers, a situation where pre-merger prices were not available on the COMPUSTAT TAPES. An assumption was made that most major corporations are on the TAPES. Also, eliminations, had they been included, would have increased the portfolio risk factor because of additions of less proven companies. No

hypothesis was made on the effect of eliminations on rate of return of each portfolio, but only a comment that these eliminations were necessary to the completion of the study.

The authenticity of the data in the study suffered due to constraints of the COMPUSTAT TAPES. The TAPES contain sixty data items for each corporation listed. Three of the data items which were used in the study are: monthly closing prices, dividends per share, and a cumulative adjustment factor which accounts for stock splits and stock dividends.

All of the prices used in the study were monthly closing prices. Therefore, stocks recommended during a month were assumed purchased on the last trading day of that month, rather than the day recommended.

In a situation where a corporation paid a stock dividend with stock from another corporation (as in a stock spin-off), this information was unavailable to the study.

Valuations of portfolios were calculated on the last trading day of the month. This aligns with reality as: "The majority of the employee benefit funds for which data is maintained in the data bank are usually valued at the month end of each calendar quarter."[6]

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[6] Employee Benefit Fund Investment Performance: 1963-1972 (A. S. Hansen, Inc., 1973), p. 19.

Time Periods

A problem with any portfolio performance study is choosing a representative time period. A shift in the time period could have a significant effect on rates of return. A. H. Hansen, Inc., an acturarial firm, encountered the time period problem when evaluating the performance of pension funds: "Faced with this uncertainty as to the period of time to be used, this report accentuates features of the funds both during multi-year periods, and during market cycles."[7]

An alternative solution would have been to randomly select starting and ending dates, as did Lawrence Fisher and James Lorie in their well-known rate of return study of stocks listed on the New York Stock Exchange.[8] The Fisher-Lorie methodology would have been unsuitable for this study, however. A major problem in using randomly selected dates arises from the length of time periods and total time length of the study.

The Fisher-Lorie study covered forty years, this study covered only five years, and many portfolios where of even shorter duration. The Fisher-Lorie study used exact dates for buy and sell prices. This study used month end prices. In other words, the Fisher-Lorie report

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[7]A. S. Hansen, Inc., Ibid., p. 6.

[8]Lawrence Fisher and James Lorie, "Rates of Return on Investments in Common Stocks," Pamphlet: The Center for Research in Security Prices, Graduate School of Business, University of Chicago, 1963.

covered about 14,600 days from which a random process selected one buy and one sell day. (An expected average holding period was twenty years.) This study has a maximum total of sixty time periods from which a random process would select one buy and one sell month. (The expected average holding period would only have been two and one-half years.)

The other major objection to randomly selected time periods was the data storage constraints for the study. The Fisher-Lorie model bought a single stock, held that single stock for a random period, and then sold that single stock. The iterative process yielded a distribution of rates of return. No portfolios were involved. However, in a portfolio comparison study, time periods must be synonymous for all portfolios involved. Data storage and manipulation of up to 280 stocks in a single portfolio make the iterative process next to impossible in the study.

Therefore, this writer opted to follow the time period choice of the A. H. Hansen study. Time periods were subjectively chosen to satisfy the multi-year and market cycle criteria.

A Multi-Year Period

An objective was to choose a period as current as possible, yet of sufficient duration to meet the multi-year requirement. The starting year, 1969, was chosen for several reasons: (1) a post-war market was desired, (2) the start of the Nixon Administration seemed to indicate a turning

point in economic policy, and (3) 1969 marked the end of the great Bull Market of 1942 to 1968, which saw the Dow Jones Industrial Average climb from less than 100 to a "bounce" off 1000 in 1968. The month of May was affectionately chosen because it was the month in 1969 that this writer started his two year stint as a stockbroker. In a more pragmatic tone, May, 1969, indicated the start of a down cycle, as discussed below.

The ending date of March, 1974, was selected because it was the most current month on COMPUSTAT TAPES which contained the necessary data.

Market Cycles

In order to correctly compare performances of separate portfolios, the analysis must cover a complete market cycle. Investment sources which perform well in an "up" market might do poorly in a "down" market, or worse in a "neutral" market.

The five year time period was, therefore, broken into three sub-periods to reflect all types of market conditions, as shown in Table .

The market cycle break points were chosen based upon the monthly closing Standard and Poors Index of 425 Industrial Stocks. In addition, ending months were required by COMVEST to be an ending month of a calendar quarter.

Classification of recommendations required each investment source to be divided into three portfolios:

TABLE 13

DIVISION OF THE TIME PERIOD TO REFLECT MARKET CYCLES

	S&P 425 Index		Market Period Dates
	Beginning of	End of	
Down Market	113	80	May, 1969 to June, 1970
Up Market	80	109	June, 1970 to June, 1971
Neutral Market	109	106	June, 1971 to March, 1974

(1) growth, (2) income, and (3) speculative. Each portfolio was further divided by market periods into: (1) whole market, (2) up market, (3) down market, and (4) neutral market. Divided in this manner, each source was represented by twelve portfolios. For coding purposes each portfolio was assigned a prefix which identified investor objective and a suffix which represented market period. For investment source "A," all twelve portfolios are listed in Table 14.

TABLE 14

THE TWELVE PORTFOLIOS FOR SOURCE "A"

A1--Growth	1A1--Five Year Portfolio
	2A1--Down Market Portfolio
	3A1--Up Market Portfolio
	4A1--Neutral Market Portfolio
A2--Income	1A2--Five Year Portfolio
	2A2--Down Market Portfolio
	3A2--Up Market Portfolio
	4A2--Neutral Market Portfolio
A3--Speculative	1A3--Five Year Portfolio
	2A3--Down Market Portfolio
	3A3--Up Market Portfolio
	4A3--Neutral Market Portfolio

The Portfolio

At every buy signal, $1000 was invested in the common stock recommended. It was possible to buy fractional shares. This may appear, at first, to depart from reality. However, cash invested in a mutual fund, in a bank common trust fund, or to procure part of a pension fund, are done in fractional shares.[9]

On a sell signal, all holdings in the portfolio where a sell recommendation occurred were eliminated from that portfolio. Any sell signal, for which no stock existed in the portfolio prior to that sell, was ignored. In other words, short sales were not permitted. Any buy signal for a stock already in the portfolio was treated as a new recommendation if the previous recommendation had occurred at least two months prior. Otherwise it was treated as a repeat recommendation and ignored.

In a situation where the investment source published a portfolio--in contrast to merely recommending individual stocks--treatment was similar. The only difference was that in a published portfolio the whole portfolio was bought the first month, rather than the accumulation of stocks over time. The influx of cash in the first month had no effect

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[9]An individual investor may also buy fractional shares of stocks on the New York Stock Exchange through the Monthly Investment Plan (MIP).

on rate of return because the time-weighted rate was used. Another difference was that the published portfolio's total value remained fairly stable, because a buy recommendation was usually accompanied by a sell recommendation. In a non-portfolio situation, the size of the portfolio was constrained only by the number of buy and sell signals.

On Portfolio Size

In a non-portfolio situation, when buy signals predominated, the portfolio's value increased tremendously due to the excess of cash inflows over outflows. This may appear unrealistic as, in reality, no portfolio has an unlimited supply of cash from which to draw. A reasonable question could arise concerning the validity of comparing a limited-sized portfolio, which occurred when an investment source published a portfolio, to a portfolio of unlimited size.

Justification of portfolio comparisons was made on the basis that time-weighted rates of return ignore the effects of an imbalance between funds resulting from different cash flows. Still, one could argue that the unlimited-sized portfolios would better approximate reality if size constraints were imposed. If this constraint were imposed, either not buying recommended stocks or selling stocks without

a sell signal would be necessary. Not purchasing at a buy signal would defeat the purpose of the study. Selling without a sell recommendation could require adopting a "selling policy." This would force the study to choose between "when to sell" theories, or to test these theories in order to optimize returns. If forced selling were imposed, a random sell selection could be feasible. However, the writer would rather be criticized for not using a random-sell, which is a theoretical tool, than be criticized for distorting rate of return by selling without a signal or without testing the most appropriate "sell" theory.

If the reader is not yet convinced of the benefits of not restricting portfolio size, the question of how many stocks should be in the portfolio would open the study to the yet unresolved problem of efficient diversification, which is not an objective of the study.

A final reason for adopting a policy of unlimited sized portfolios can be found in a macro approach to the "portfolio size" dilemma. The total dollars invested by those following the advice of a single investment source impose fewer cash inflow constraints than does the limited cash flow of a single investor.

Data Manipulation and Computer Programs

This section is intended to explain the steps taken from the time the data were collected from investment sources to the point where comparative results were obtained.

Initial Data Collection

Buy and sell recommendations were collected from investment sources. The following information was recorded:

1. Investment source name.
2. Corporation name of the recommendation.
3. Type of security recommended.
4. Date of recommendation.
5. Buy or sell.
6. Source's identification of investor objective for which recommendation was made.

Data Check

Not all recommendations were for the common stock of a corporation. The data were culled to eliminate recommendations which were not for common stock.

A computer program was designed to access the COMPUSTAT TAPES in order to determine if recommended stocks were on the TAPES. A listing of corporate names and "company identification numbers" was printed. This step was necessary because visual check found that the Company Index to the TAPES was inaccurate.

Each recommended corporation, whose record existed on the TAPES was coded and then punched onto data cards. Data cards contained the following information:

1. Investment source.
2. Investor objective.
3. Company serial number (identifying the position of the company on the COMPUSTAT TAPE).
4. Date of recommendation.
5. Buy or sell.

A count of data cards showed 3714 recommendations.

Disk Load

A computer program was designed which searched the TAPES for the existence of a company serial number. If successful, prices, dividends and cumulative adjustment factors were printed. For example, if the fourth record on the TAPES was of a recommended company (which would have a serial equal to four), prices, dividends and cumulative adjustment factor were listed for April, 1969, through March, 1974. A visual check of the listing showed that prices were incomplete for many company records, mostly due to fiscal year changes. The missing prices were obtained from Standard and Poor's "Stock Guide."

Another program was designed to change fiscal years of all the companies to actual calendar years. Prices, which had been adjusted for splits and stock dividends for fiscal quarters, were readjusted for calendar quarters. The cumulative adjustment factors were changed to show splits and stock dividends on a non-accumulative basis. A "direct access" disk was loaded and missing prices on the TAPES were "patched." In other words, a new data set was created which was directly accessable by serial number and each record contained sixty monthly prices, twenty quarterly dividends per share, and twenty adjustment factors.

Portfolio Development

A computer program was developed to search the data cards for repeat buy recommendations and for sell recommendations for which no stock existed. Ninety-seven cards were eliminated.

The next step was to simulate portfolio management for the time period of each portfolio. Purchases and sales were made at the end of each month. In addition, a portfolio valuation was needed at the end of each month. A program was designed which accepted the data cards as input and transferred monthly valuations and monthly cash flows to a tape, as output. Dividends were withdrawn at the end of the month, after the portfolio was valued. In other words, the valuation included price per share times the number of shares for each stock held in the portfolio during a month. Dividends were then added to the valuation, after which, they were withdrawn from the portfolio. The dollar amount of all sales was also withdrawn after the valuation had taken place. An alternative to withdrawal of dividends would have been reinvestment of dividends. However, this would assume that dividends were reinvested at the same rate of return as the remainder of the portfolio.

COMVEST

COMVEST is a computer program developed by the BAI for the purpose of portfolio performance measurement. The monthly net cash flow and valuations, which were calculated

previously, became input to COMVEST. COMVEST calculated the time-weighted rate of return (TWR) and the mean absolute deviation (MAD) for each portfolio. These data were used in Chapter IV to evaluate investment source capability.

COMVEST also created on tape a data set of monthly time-weighted rates of return for all portfolios to be used in the regression described below.

Regression Program

This program regressed the portfolios' rates of return (output from COMVEST) against the rate of return of Standard and Poors Index of 425 Industrials. From the linear equation, $Y = a + bX$, "a" is the Y-intercept which represents alpha in the portfolio measurement model, and "b" is the regression coefficient which represents beta in the model. The program listed alpha and beta which were used in Chapter V to determine investment source performance. For each regression, correlation coefficients and standard errors were also listed.

Hypotheses

An application of acceptable measures of portfolio performance (as used in this study) was intended primarily to rank investment sources upon which many investors rely for investment advice. Also, results of this study are intended to demonstrate the rate of return one would achieve if he followed every recommendation of a specific investment

source, and the amount of risk which would have to be accepted by obliging investor. Other questions this study intended to answer are:

1. How did the performance of recommendations of investment sources compare to the performance of the market?
2. Did the relative performance ranks of investment sources vary considerably when using different performance ranking models?
3. How did sources with fewer recommendations perform compared to sources which recommended many stocks? What is the effect of diversification?
4. Did some investment sources continually outperform other investment sources under different market conditions?
5. Did investment sources which publish portfolios perform better than investment sources which merely recommend stocks?
6. Did investment sources perform better than common trust funds of banks? Did they require taking more risk than trust departments of banks require?

CHAPTER IV

PERFORMANCE EVALUATION OF INVESTMENT SOURCES, USING THE MODELS OF SHARPE AND FAMA: THE EMPIRICAL RESULTS

The portfolio performance models of Eugene Fama and William Sharpe both require knowledge of a rate of return (R) of a portfolio and the variability (V) of that rate. Given R and V, both models determine a relative performance rank for all portfolios in an evaluation.

In the study, R and V were calculated for the growth, income, and speculative portfolios of twenty investment sources (the results are in Appendix 1). In this chapter, the performance of investment source portfolios are measured and evaluated. The analysis includes: (1) a comparison of the growth, income, and speculative portfolios, as groups, to the Standard and Poors 425 Index, and (2) a comparison of the performance of the portfolios to each other, first using William Sharpe's Index, then Eugene Fama's model.

Time Periods

The evaluation process was carried out over: (1) a five year time period and (2) over a complete market cycle which included a down market, an up market, and a neutral mark.

Time 1--In this period, portfolios of stock which were recommended from May, 1969, to December, 1973, and then held until March, 1974, were evaluated. This is referred to as the "whole period."

Time 2--In this period, portfolios of stocks which were recommended from May, 1969, to May, 1970 (the down market) and then held to March, 1974, were evaluated.

Time 3--In this period, portfolios of stocks which were recommended from June, 1970, to May, 1971 (the up market) and then held to March, 1974, were evaluated.

Time 4--In this period, portfolios of stocks which were recommended from June, 1971, to December, 1973 (the neutral market) and then held to March, 1974, were evaluated.

Time 5--In this period, portfolios of stocks purchased in the down market (see Time 2) and held only an additional month, until June, 1970, were evaluated.[1]

Time 6--In this period, portfolios of stocks purchased in the up market (see Time 3) and held only an additional month were evaluated.

Time 7--In this period, portfolios of stocks purchased in the down market were evaluated in the up market.

Time 8--In this period, portfolios of stocks purchased in the down market were evaluated in the neutral market.

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[1]Portfolios were held one additional month to coincide with the end of a market period. Purchases made in the last month of a market period were evaluated in the first month of the next market period.

Time 9--In this period, portfolios of stocks purchased in the up market were evaluated in the neutral market.

The nine time periods described above enabled portfolios purchased in any time period to be analyzed in that period or in any other time period. Table 15 summarizes the time periods in which evaluations can occur.

TABLE 15

THE NINE TIME PERIODS OF THE STUDY, DATES DURING WHICH PORTFOLIOS WERE PURCHASED, AND DATES DEFINING HOLDING PERIODS

Portfolio Purchase Dates (Portfolio Prefix)	Holding Period			
	Down Market May, 1969 to June, 1970	Up Market June, 1970 to June, 1971	Neutral Market June, 1971 to March, 1974	Whole Market May, 1969 to March, 1974
May, 1969 to (2) May, 1970	Time 5	Time 7	Time 8	Time 2
June, 1970 to (3) May, 1971		Time 6	Time 9	Time 3
June, 1971 to (4) December, 1974			Time 4	Time 4
May, 1969 to (1) December, 1973				Time 1

The portfolio prefix alluded to in Table 15 was explained in Chapter III. Risking repetition to achieve

clarity, the following example details the portfolio coding system used in the study. Given a portfolio identification "2A3", the prefix number "2" refers to portfolio purchase dates as explained in Table 15. "A" is the investment source identifier and can be any letter from A to U. The suffix number "3" identifies the portfolio as: growth (1), income (2), or speculative (3). (In this case, "A" is a speculative portfolio).

The identification letters for the investment sources are listed in Table 16.

TABLE 16

LIST OF NAMES AND PORTFOLIO IDENTIFICATION SYMBOLS FOR THE TWENTY INVESTMENT SOURCES USED IN THE STUDY

Portfolio Identification Symbol	Investment Source
A	Standard & Poor's "Stock Guide"
B	Financial World
C	Commercial and Financial Chronicle
D	Moody's "Stock Survey"
E	Value Line "Selection & Opinion"
F	Bache & Co.
G	Baird
H	Blair
I	duPont-Glore Forgan-Walston
J	Harris Upham
K	Hornblower & Weeks-Hemphill
L	W. E. Hutton
M	Merrill Lynch
N	Openheimer
O	Piper Jaffray
P	Reynolds
R	Shearson Hammill
S	Thompson and McKinnon
T	Walston
U	Weis, Voisin, Cannon

Performance Results of Growth, Income, and Speculative Portfolios for Different Time Periods

Rates of Return (R) and variability (V) of rates for each portfolio for each time period are displayed in Appendix 1. Although these data are referred to throughout the study, and used in preparing some of the tables in the study, the data were so numerous that they required relegation to an appendix.

An analysis of growth portfolios, income portfolios, and speculative portfolios, as groups, produced information of interest to an investor who has a risk class preference. He may compare investment sources which have performed well within a specific risk classification.

In this study, variability was measured by the mean absolute deviations of portfolio returns. $\overline{R}$ is the mean rate of return of all growth, income, or speculative portfolios in a given time period. $\overline{V}$ is the mean V for a given time period. They were calculated from the data in Appendix 1, and are presented in Tables 17, 18, and 19. The rate of return and variability of the Standard and Poors 425 Index (S&P) are presented as representing R and V for the market. In a report on pension fund performance, A. S. Hansen, Inc., justified the use of S&P as representative of the market: ". . . even though investments of the fund are not restricted to the S&P stocks, that index is a good benchmark against

TABLE 17

MEAN RATES OF RETURN (R) AND MEAN ABSOLUTE DEVIATIONS (V) OF ALL GROWTH PORTFOLIOS FOR ALL MARKET PERIODS AND A COMPARISON TO STANDARD & POORS 425 INDEX FOR EACH PERIOD, MAY, 1969, TO MARCH, 1974

Growth Portfolios Based Upon Recommendations Purchased for the:	Portfolio Prefix	Down Market	Up Market	Neutral Market	Whole Market
Down Market	2 ($\bar{R}$)	-42.93%	+41.01%	- 2.64%	- 2.54%
	($\bar{V}$)	65.04	36.66	45	53.72
Up Market	3 ($\bar{R}$)	--	+37.5 %	- 3.86%	+ 5.88%
	($\bar{V}$)	--	45.7	51.8	53.48
Neutral Market	4 ($\bar{R}$)	--	--	- 7.19%	- 7.19%
	($\bar{V}$)	--	--	57.9	57.9
Whole Study	1 ($\bar{R}$)	--	--	--	- 2.72%
	($\bar{V}$)	--	--	--	53.01
Standard & Poors	($\bar{R}$)	-26.06%	+30.81%	- 0.99%	- 0.89%
	($\bar{V}$)	48.85	31.32	30.15	38.74

TABLE 18

MEAN RATES OF RETURN (R) AND MEAN ABSOLUTE DEVIATIONS (V) OF ALL INCOME PORTFOLIOS FOR ALL MARKET PERIODS AND A COMPARISON TO STANDARD & POORS 425 INDEX FOR EACH PERIOD, MAY, 1969, TO MARCH, 1974

Income Portfolios Based Upon Recommendations Purchased for the:	Portfolio Prefix		Down Market	Up Market	Neutral Market	Whole Market
Down Market	2	$(\bar{R})$	-21.20%	+34.38%	+ 0.47%	+ 4.21%
		$(\bar{V})$	60.48	41.07	49.65	52.68
Up Market	3	$(\bar{R})$	--	+23.04%	+ 2.95%	+ 7.63%
		$(\bar{V})$	--	49.43	47.92	49.87
Neutral Market	4	$(\bar{R})$	--	--	+ 0.35%	+ 0.35%
		$(\bar{V})$	--	--	51.88	51.88
Whole Study	1	$(\bar{R})$	--	--	--	+ 4.00%
		$(\bar{V})$	--	--	--	47.68
Standard & Poors		$(\bar{R})$	-26.06%	+30.81%	- 0.99%	- 0.89%
		$(\bar{V})$	48.85	31.32	30.15	38.74

TABLE 19

MEAN RATES OF RETURN (R) AND MEAN ABSOLUTE DEVIATIONS (V) OF ALL SPECULATIVE PORTFOLIOS FOR ALL MARKET PERIODS AND A COMPARISON TO STANDARD & POORS 425 INDEX FOR EACH PERIOD, MAY, 1969, TO MARCH, 1974

Speculative Portfolios Based Upon Recommendations Purchased for the:	Portfolio Prefix		Down Market	Up Market	Neutral Market	Whole Market
Down Market	2	$(\bar{R})$	-53.07%	+47.01%	- 7.56%	- 5.03%
		$(\bar{V})$	83.84	50.65	65.95	72.74
Up Market	3	$(\bar{R})$	--	+ 30.14	-13.08%	- 4.47%
		$(\bar{V})$	--	63.12	76.09	76.73
Neutral Market	4	$(\bar{R})$	--	--	-18.01%	-18.01%
		$(\bar{V})$	--	--	78.02	78.02
Whole Study	1	$(\bar{R})$	--	--	--	- 5.95%
		$(\bar{V})$	--	--	--	68.46%
Standard & Poors		$(\bar{R})$	-26.07%	+30.31%	- 0.99%	- 0.89%
		$(\bar{V})$	48.85	31.32	30.15	38.74

which to judge the long-term performance of the funds."[2]

Performance over the Whole Study Period

From Table 17, the mean annual return for all growth portfolios consisting of recommendations from May, 1969, to December, 1974 (Time 1), was -2.72%. In the same time period, S&P had a rate of return of -0.89%. The mean risk, $\overline{V}$, was 37% greater than the variability in return of S&P.[3]

From Table 18 (Time 1), the mean annual return for all income portfolios was +4.00%. Mean variability was 23.5% greater than S&P's.

From Table 19 (Time 1), the mean annual return on speculative portfolios was -5.95%, with a mean risk measurement 77% greater than the S&P's.

As a group, the income portfolios clearly outperformed the growth and speculative portfolios. Income portfolios were the only group to perform better than S&P over the whole study period (Time 1).

Performance under Different Market Conditions

For growth, income, and speculative portfolios, $\overline{R}$ and $\overline{V}$ for each group are displayed in Table 20.[4] The table

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[2]Employee Benefit Fund Investment Performance: 1963-1972, A study by A. S. Hansen, Inc., Actuary and Consultant, 1973, p. 8.

[3]$\overline{V}/V_{stp} = 53.01/38.74 = 1.37$.

[4]Data in Table 20 was derived from Tables 17, 18, and 19.

TABLE 20

PERFORMANCE COMPARISONS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS FOR DIFFERENT MARKET CONDITIONS FROM MAY, 1969, TO MARCH, 1974, S&P IS BENCHMARK

Portfolios	$\overline{R}$(%)	$\overline{V}$	$\overline{V}/V$(S&P)
	Down Market (Time 5)		
Growth	-42.93%	65.04	1.33
Income	-21.20	60.48	1.23
Speculative	-53.07	83.04	1.71
S&P	-26.06	48.85	--
	Up Market (Time 6)		
Growth	+37.5%	45.70	1.46
Income	+23.04	49.43	1.58
Speculative	+30.14	63.12	2.02
S&P	+30.81	31.32	--
	Neutral Market (Time 4)		
Growth	- 7.19%	57.9	1.92
Income	+ 0.35	51.8	1.72
Speculative	-18.01	78.02	2.59
S&P	- 0.99	30.15	--

was separated into down market, up market, and neutral market so that group comparisons could be made for each market condition.

In the down market, income portfolios, as a group, had the best mean rate of return while taking less risk than did the growth and speculative portfolios. In the up market, growth portfolios outperformed. However, in the neutral market, income portfolios were again the winner.

A risk-averting investor should have chosen income portfolios in the down and neutral markets, had he possessed foresight of the results. But should the investor have switched from income portfolios to growth portfolios in the up market? A comparison of Time 6 and Time 3 for both Tables 17 and 18 shows that income stocks purchased during the up market were outperformed by growth stocks during that period. If the stocks were held until March, 1974, however, the income stocks would have achieved a higher rate of return with less risk. To switch portfolios in the up market, therefore, must depend upon one's propensity to trade.

The purpose of this section has been to present rates of return and risk levels for growth, income, and speculative portfolios, treated as groups. A comparison of these data in different time periods was intended to help an investor determine what type of portfolio has performed best under different market conditions during the time period of the study.

Once a preference for a particular type of stock has been determined, an investor would like to know which investment source is most capable of advising and recommending. The next section of this chapter provides the investor with information concerning capabilities of investment sources, for a complete market cycle and for a multi-year time period.

Ranking Individual Investment Sources Using Sharpe's Index

As mentioned in Chapter II, William Sharpe's model for ranking investment performance requires calculating R and V for each portfolio in the evaluation. If SI represent Sharpe's Index, then,

$$SI = (R - I)/V \qquad (16)$$

where I is the risk-free interest rate. In this study, I was chosen to equal 5.0%.

Changing the Risk-Free Rate of Return--Effect on Ranks

It was mentioned in Chapter II that Sharpe used 3.0% as the risk free interest rate. It is necessary in this study to determine how a different value of I would affect the accuracy of the rankings of portfolios.

Each point in Figure 9 represents a hypothetical portfolio plotted according to its (V,R) values. The solid line from R_f, the risk-free return, through point P defines an angle, $\emptyset$, with an imaginary horizontal line. From Equation 16:

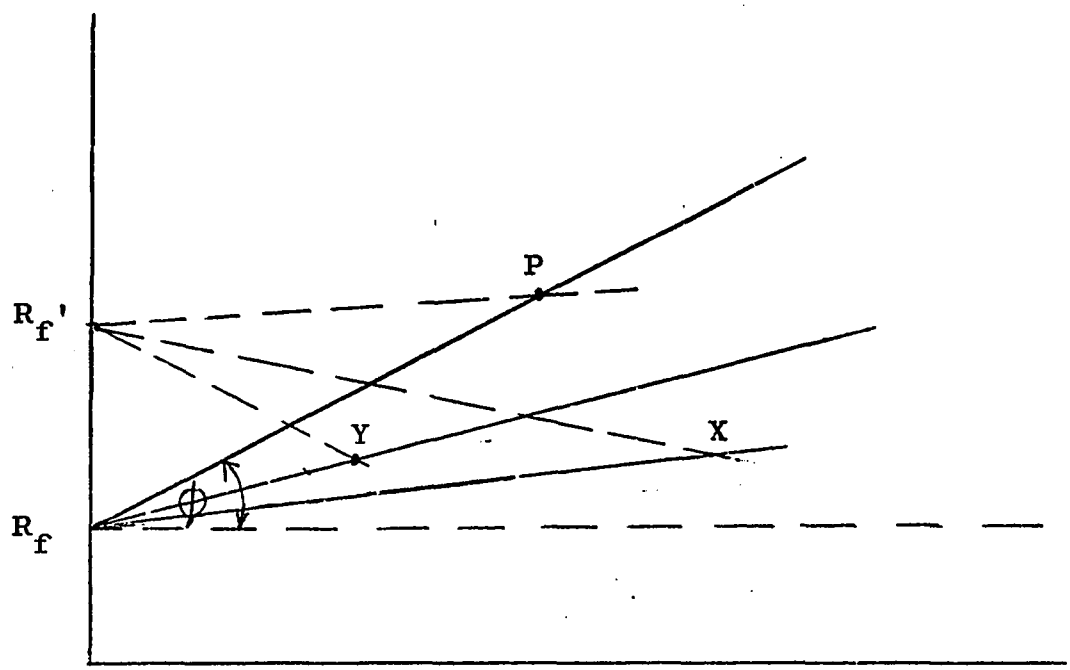

Figure 9. Example of the effect of changing interest rates on relative performance ranks, as determined by Sharpe's Index.

$$SI = \frac{R}{V} - \frac{I}{V} \qquad (17)$$

The value of SI can be increased by increasing R or decreasing V. Since R/ V defines the slope of the solid line, and TAN $\emptyset$ measures R/ V, then the angle, $\emptyset$, can be used as a ranking indicator. If imaginary lines are drawn from R_f through each portfolio point, the "portfolio-link" with the largest positive slope is ranked first. The portfolio-line with the next largest slope is ranked second, and so forth. In Figure 9, Portfolio P is first, Y is second, and X is third.

If the risk-free return were increased to R_f', the slopes would change so that X and Y have negative slopes. Since the negative slope of X is less than that of Y, portfolio X would be ranked as a better performer than portfolio Y. In other words, portfolios with returns less than the risk-free return would be rewarded for accepting additional risk. In this example, portfolios Y and X have the same return, yet X is ranked higher than Y. Therefore, increasing the value of I can inaccurately alter the ranks.

Sharpe was not confronted with this ranking problem because the minimum rate of return from his sample of mutual fund portfolios was well above the risk-free return. However, the problem did arise in this study because R_f has increased above the 3.0% used by Sharpe. Also, rates of return of some portfolios were negative.

It was not an objective of the study to prove or disprove Sharpe's model. It was not an objective to test the validity of rank changes caused by increasing risk-free return. To avoid this conflict and, yet, to maintain validity, a risk-free interest rate was chosen which was as close to 3% as realistically possible.

Typically, the risk-free interest rate has been the yield on short-term treasury bills. However, during the time-period of the study, yield on treasury bills has varied tremendously, and the average yield was greater than 6%. The interest rate paid on savings accounts has been fairly

stable through the whole study. It was chosen as the risk-free interest rate because of its stability. In addition, it was chosen because it was relatively low and would have a minimal effect on the rank.

It was mentioned in Chapter III that performance should be measured for a complete market cycle and for a multi-year period. Analysis for a market cycle is presented first, followed by an analysis for the whole study period.

Ranking Investment Sources for a Complete Market Cycle

All the investment sources in the study were ranked using Equation 16. The results, categorized by growth, income, and speculative portfolios, appear in Appendix 1. The results are summarized in Tables 21, 22, 23, and 24 below.

Ranking Growth Portfolios for a Market Cycle

In Table 21, ranks of growth portfolios are presented for the down market, for the up market, and for the neutral market. For the down market, both Time 5 and Time 2 are shown. Time 5 contains the relative performance during the down market only. Time 2 shows the relative performance had all stocks which were purchased in the down period been held until the end of the study. For the up market, relative performances are disclosed for stocks purchased in and held for the up period only (Time 6), and for stocks purchased in the up period but held until the end of the study (Time 3).

TABLE 21

RANKS OF GROWTH PORTFOLIOS FOR ALL PERIODS IN A MARKET CYCLE, FROM MAY, 1969, TO MARCH, 1974, USING SHARPE'S INDEX, INCLUDES A COMPOSITE RANK

Source	Down Market		Up Market		Neutral Market	Composite Rank (5+6+4)	
	Time		Time		Time		
	5	2	6	3	4	Total Points	Rank
A1	7	2	11	1	7	25	4½
B1	3	3	6	6	17	26	6
C0	18	17	12	15	2	32	12½
D1	16	11	18	20	16	50	20
E4	1	4	20	11	1	22	3
F1	10	16	7	9	12	29	8
G1	17	19	8	16	5	30	9½
H1	13	10	5	4	3	21	2
I1	6	5	4	13	4	14	1
J1	14	13	7	17	9	30	9½
K1	2	15	15	2	18	35	15
L1	5	4	13	8	14	32	12½
M1	12	6	3	5	10	25	4½
N1	11	9	19	14	8	38	18
O1	9	7	16	12	6	31	11
P1	20	20	14	18	13	47	19
R1	4	1	9	19	20	33	14
S1	15	18	1	3	11	27	7
T1	19	8	2	7	15	36	16
U1	8	12	10	10	19	37	17

An investor, buying in the down market, would have achieved the best performance by following the recommendations of investment source E, if he intended to sell at the end of the down period. If the investor intended to hold, rather than trade, then source R would have been a better source of opinion and recommendation.

An investor buying for the up market period only would have performed best by following the advice of source S. However, if the investor were to hold his purchases, which were made in the up market, source A should have been his choice.

In the neutral market, source E was again the best performer.

In order to determine which source performed best over the whole market cycle, a composite rank was calculated by summing the ranks for the down market (Time 5), the up market (Time 6), and the neutral market (Time 4). The composite rank assumed stocks were sold at the end of each market period. Because whole period ranks were held through the entire study, the two ranks cannot be expected to correspond exactly. The composite rank indicates that investment source I was the most consistent performer, even though I ranked no better than fourth in any particular market period.

Ranking Income Portfolios for a Market Cycle

Comparative ranks of the income portfolios of investment sources are given in Table 22. Missing data occurred when an investment source gave no income purchase recommendations in a particular time period. Sources which had missing data were not included in the composite rank. See Appendix 3 for a list of sources with no available data.

In the down market, source K offered the best advice not only to investors who were buying only for the down market but also for investors buying for the long-pull. In the up market, source D performed best for both types of investors. Source S offered the best advice in the neutral market.

As was the case with growth portfolios, no source of income portfolios was the top performer in more than one market period. The composite rank indicates that source N performed best over all three market periods, doing no better than fourth in any period.

Had data existed for sources L and O in the up market, it is possible that sources L and O might have performed well overall. Both did well in the down and neutral markets. Source S made only four recommendations, all in the last month of the down market (see Appendix 3). Inadequate time made it impossible to rank performance for source S in that period. However, those four recommendations did well when held until the end of the study (Time 2). Source S

TABLE 22

RANKS OF INCOME PORTFOLIOS FOR ALL PERIODS IN A MARKET CYCLE, FROM MAY, 1969, TO MARCH, 1974, USING SHARPE'S INDEX, INCLUDES A COMPOSITE RANK

Source	Down Market		Up Market		Neutral Market	Composite Rank (5+6+4)	
	Time		Time		Time	Total	
	5	2	6	3	4	Points	Rank
A2	10	10	2	2	7	19	4½
B2	12	16	--	--	--	--	--
D2	13	13	1	1	13	27	9
E2	6	11	4	7	8	18	2½
H2	4	6	--	--	10	--	--
I2	15	14	3	5	2	20	6
J2	7	2	--	--	15	--	--
K2	1	1	7	8	12	19	4½
L2	5	3	--	--	6	--	--
M2	9	5	10	12	14	23	7½
N2	8	7	5	4	4	17	1
O2	2	8	--	--	5	--	--
P2	11	12	9	3	3	23	7½
S2	--	4	8	9	1	--	--
T2	3	9	6	6	9	18	2½
U2	14	15	11	11	11	36	10

performed well in the up and neutral markets. Had data been available, S could have been a top contender in the composite rank.

Ranking Speculative Portfolios for a Market Cycle

Comparative rankings of the speculative portfolios of investment sources are given in Table 23. In the down market source U offered the best performance for "traders" and second best for investors who held until the end of the study. Investment scurce B was ranked first for the up market for both "traders" and "holders." Source O was ranked first for the neutral market. The composite rank indicated that source K was the most consistent over the whole market cycle, ranking second in the down market, second in the up market, and eighth in the neutral market.

Ranking Investment Sources over the Whole Study Period

In the previous section, investment sources were ranked for each market condition. Also, a composite rank was calculated for the investment sources which performed most consistently over the entire market cycle. The composite rank assumed mass sellouts at the end of each market period.

In this section, performance was measured for the whole market period. Portfolios were created from purchase and sell recommendations from May, 1969, to December, 1973. The portfolios were held an additional three months, until the end of the study in March, 1974. In other words, the

TABLE 23

RANKS OF SPECULATIVE PORTFOLIOS FOR ALL PERIODS IN A MARKET CYCLE, FROM MAY, 1969, TO MARCH, 1974, USING SHARPE'S INDEX, INCLUDES A COMPOSITE RANK

Source	Down Market		Up Market		Neutral Market	Composite Rank (5+6+4)	
	Time		Time		Time	Total	
	5	2	6	3	4	Points	Rank
A3	9	3	5	5	13	27	8
B3	--	--	1	1	16	--	--
D3	3	4	14	9	6	23	5
E5	11	8	3	6	10	24	6
E6	16	19	9	10	14	40	15
F3	14	18	4	7	4	22	4
G3	19	7	19	20	2	40	15
H3	13	10	12	4	15	40	15
I3	7	11	11	14	9	27	8
J3	5	13	6	13	17	28	10
K3	2	9	2	17	8	12	1
L3	17	12	--	--	18	--	--
M3	6	5	7	2	7	20	2
N3	4	1	13	11	12	27	8
O3	8	6	16	16	1	31	11
P3	10	15	8	3	19	37	13
R3	15	14	10	18	20	45	18
S3	12	17	18	15	3	33	12
T3	18	16	17	12	11	41	17
U3	1	2	15	8	5	21	3

analysis occurred in Time 1, from Table 15.

At first appearance, it seems that the rankings from Time 1 should have been exactly the same as the composite rank found by summing the ranks of Time 2 + Time 3 + Time 4. There is a fine distinction. When a sell recommendation occurred in the neutral market, it had no effect on stocks purchased in a Time 2 or Time 3 situation. However, for a Time 1 situation, that sell recommendation would have entirely eliminated that stock from the portfolio, irregardless of purchase date.

Results of ranking investment sources over the whole time period are shown in Table 24. Performance comparisons were differentiated by growth, income, and speculative portfolios, as before. Whole period ranks were also compared to composite ranks in Table 24. As indicated before, the composite rank is a good measure of investment performance for a "trader" because the composite rank assumed mass sell-outs at the end of each market period. An investor who wishes to maintain a portfolio over a whole market cycle would be more interested in the whole period ranks of investment sources.

Over the whole period, no single investment source achieved the top ranking for more than one type of portfolio. Investors, interested primarily in growth stocks, would have performed best by following the advice of source A. Income oriented investors would have achieved superior performance

TABLE 24

OVERALL RANKS OF INVESTMENT SOURCES FOR THE WHOLE STUDY, FROM MAY, 1969, TO MARCH, 1974, BASED UPON THE RANKS FOR GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS WHICH WERE PURCHASED OVER THE WHOLE STUDY, INCLUDES COMPOSITE RANKS FOR COMPARISON

Source	Portfolios						Total Points for the Whole Period	Overall Rank** for the Whole Period
	Growth		Income		Speculative			
	Whole Period	Composite	Whole Period	Composite	Whole Period	Composite		
A	1	4½	10	4½	8	8	19	3
B	5	6	15	---	5	---	20	4
C	18	12½	---	---	---	---	---	---
D	7	20	14	9	4	5	25	8
E	2	3	---	---	9,19*	6,15*	30	12
F	15	8	12	2½	16	4	43	16
G	17	9½	---	---	20	15	---	---
H	11	2	4	---	10	15	25	8
I	4	1	13	6	11	8	28	11
J	16	9½	8	---	13	10	37	15
K	12	15	6	4½	7	1	25	8
L	6	12½	2	---	17	---	25	8
M	8	4½	3	7½	3	2	14	1
N	9	18	7	1	2	8	18	2
O	10	11	9	---	6	11	25	8
P	20	19	11	7½	14	13	45	17
R	3	14	---	---	15	18	---	---
S	19	7	1	---	12	12	22	5
T	13	16	5	2½	18	17	36	14
U	14	17	16	10	1	3	31	13

*E had two portfolios in the speculative group; E5 was ranked No. 9, E6 was ranked No. 19 for the whole period; E5 was sixth and E6 was fifteenth for the composite.

**Five sources had 25 total points. Sequential ordering would have ranked them: #6, #7, #8, #9, #10. All were assigned the rank of #8, which is the median of the sequential order.

by listening to source S. The "gamblers" would have survived best by following the advice of source U.

The investor seeking diversification by purchasing some growth stocks, some income stocks, and some speculative stocks would have had two choices: (1) follow the advice of source A for growth stocks, the advice of S for income stocks, and U for speculative stocks, or (2) rely upon a single investment source for all advice. If he chose a single investment source, the overall rank in Table 24 indicates that he should have followed the recommendations of source M. Source M had a whole period rank no better than third for any portfolio, but was most consistent for all portfolio types over the whole period.

Investment Source Performance Compared to S&P

The previous section detailed the ranks of individual investment sources by comparing their relative portfolio performances. The first section of this chapter compared $\overline{R}$ and $\overline{V}$ of growth, income, and speculative portfolios (as groups) and found that recommended income stocks generally outperformed recommended growth and speculative stocks. In Tables 17, 18, and 19 it was found that over the whole study growth stocks had a mean return of -2.72%, income stocks yielded +4.00%, and speculative stocks lost -5.95% annually. During this time S&P lost -0.89%.

From the R/V ratios of Appendix 1, the number of investment sources which outperformed S&P in each market

period was determined.[5] The results are shown in Table 25 for the whole market, in Table 26 for the down market, in Table 27 for the up market, and in Table 28 for the neutral market.

In the whole study period, as mentioned above, growth and speculative portfolios did not achieve a mean rate of return as great as S&P's. However, twelve of the twenty investment sources recommending growth stocks outperformed S&P, and ten of twenty sources recommending speculative stocks outperformed S&P (see Table 25). Three sources recommending growth stocks exceeded S&P by more than 50%, as did two recommending speculative stocks.

In the down market (from Table 26), only 30% of the sources recommending growth stocks did better than S&P, while 31.6% recommending speculative stocks outperformed S&P. In the same period, 67% of those recommending income stocks did better; 26.6% did more than 50% better than S&P.

In the up market (from Table 27), 40% of the sources recommending growth stocks had better performance than S&P, and 26.3% recommending speculative stocks did better. However, only 15.2% of those recommending income stocks exceeded S&P. Of these, 63.6% had performance ratios less than S&P's by over 25%.

In the neutral market (from Table 28), 50% of the

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[5] R/V ratios are the same as SI (Sharpe's Index).

TABLE 25

INVESTMENT SOURCE PERFORMANCE COMPARED TO S&P 425 INDEX, REQUIRED R/V RATIO, NUMBER & PERCENT ACHIEVING FOR THE WHOLE PERIOD APRIL, 1969, TO MARCH, 1974

To Outperform S&P 425 by:	R/V Ratio	Growth		Income		Speculative	
		No.	%	No.	%	No.	%
50% or More	-.076	3	15%	12	75 %	2	10%
25% or More	-.114	8	40	14	87.5	6	30
Matching or Exceeding	-.152	12	60	14	87.5	10	50
Less Than		8	40	2	12.5	10	50
Less than by 25% or more	-.190	4	20	1	6.3	6	30
Less than by 50% or more	-.228	2	10	1	6.3	2	10

TABLE 26

INVESTMENT SOURCE PERFORMANCE COMPARED TO S&P 425 INDEX, REQUIRED R/V RATIO, NUMBER & PERCENT ACHIEVING FOR THE DOWN MARKET APRIL, 1969, TO JUNE, 1970

To Outperform S&P 425 by:	R/V Ratio	Growth		Income		Speculative	
		No.	%	No.	%	No.	%
50% or More	-.3180	0	0	4	26.6%	1	5.3%
25% or More	-.4770	0	0	9	60	2	10.5
Matching or Exceeding	-.6358	6	30%	10	67	6	31.6
Less Than	-.6358	14	70	5	33	13	68.4
Less than by 25% or more	-.7948	6	30	1	6.7%	8	42.1
Less than by 50% or more	-.9538	2	10	0	0	0	0

TABLE 27

INVESTMENT SOURCE PERFORMANCE COMPARED TO S&P 425 INDEX, REQUIRED R/V RATIO, NUMBER & PERCENT ACHIEVING FOR THE UP MARKET JUNE, 1970, TO JUNE, 1971

To Outperform S&P 425 by:	R/V Ratio	Growth		Income		Speculative	
		No.	%	No.	%	No.	%
50% or More	1.236	2	10%	0	0	3	15.8%
25% or More	1.030	2	10	1	9.09%	4	21.1
Matching or Exceeding	.8240	8	40	2	18.2	5	26.3
Less Than		12	60	9	81.8	14	73.7
Less than by 25% or more	.618	5	25	7	63.6	12	63.2
Less than by 50% or more	.412	2	10	3	27.3	8	42.1

TABLE 28

INVESTMENT SOURCE PERFORMANCE COMPARED TO S&P 425 INDEX, REQUIRED R/V RATIO, NUMBER & PERCENT ACHIEVING FOR THE NEUTRAL MARKET JUNE, 1971, TO MARCH, 1974

To Outperform S&P 425 by:	R/V Ratio	Growth		Income		Speculative	
		No.	%	No.	%	No.	%
50% or More	-.100	3	15%	8	53.3%	6	30%
25% or More	-.150	8	40	10	66.7	6	30
Marching or Exceeding	-.200	10	50	11	73.3	9	45
Less Than		10	50	4	26.2	11	55
Less than by 25% or more	-.250	8	40	3	20	9	45
Less than by 50% or more	-.300	4	20	3	20	8	40

sources recommending growth stocks did better than S&P. Of those recommending income stocks, 73% did better, while only 45% of those recommending speculative stocks outperformed S&P.

Ranking Individual Investment Sources Using Fama's Model

The variables used in the portfolio performance model of Eugene Fama are basically the same as those used by Sharpe. R and V calculations are necessary for each portfolio in the evaluation. A risk-free rate of return is again assumed at 5%, to enable a direct comparison of the results to those obtained using Sharpe's Index.

The purpose of introducing a new set of empirical data is to validate the results already introduced. In other words, the objective is to determine whether or not Fama's model substantiates the ranks already determined using Sharpe's Index.

In Chapter II, Fama's portfolio performance model was discussed in detail. A quick review may be helpful to the reader. Simply stated, a line from a risk-free return is passed through a point (V,R) which represents variability and annual rate of return of S&P. (See Figure 10) For each portfolio in the evaluation, a point (V,R) is plotted. The vertical distance from the portfolio point to the line is measured. Portfolios are ranked based upon the distance. In Figure 10, Portfolio A would be ranked first, C would be

ranked second, followed by portfolio B.

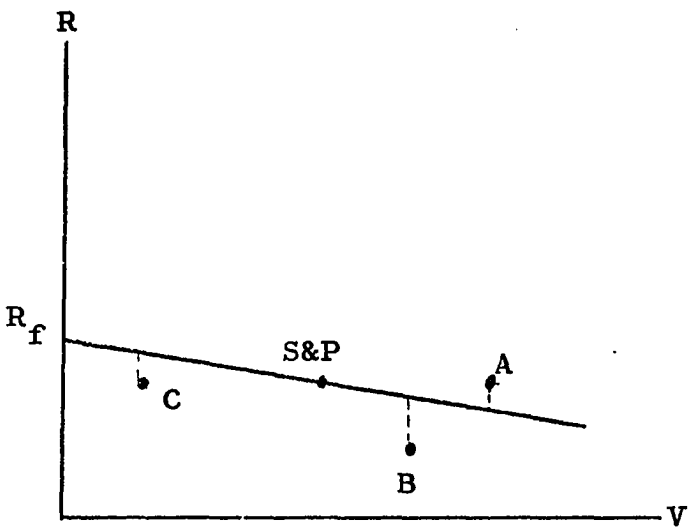

Figure 10. Example of Eugene Fama's portfolio performance model; the portfolio line extends from the risk-free return (R_f) through the rate of return of S&P.

In this study, rates of return (R) and variability of return (V) for the whole market period are plotted in Figure 11. Fama's "market line" was extended from a risk-free return of 5.0% through a point representing (V,R) of S&P for the whole time period. Vertical distances (in graph paper squares) were calculated from each portfolio point to Fama's market line. The distances were recorded in Table 29 for the growth, income, and speculative portfolios of each investment source. Ranks were based upon

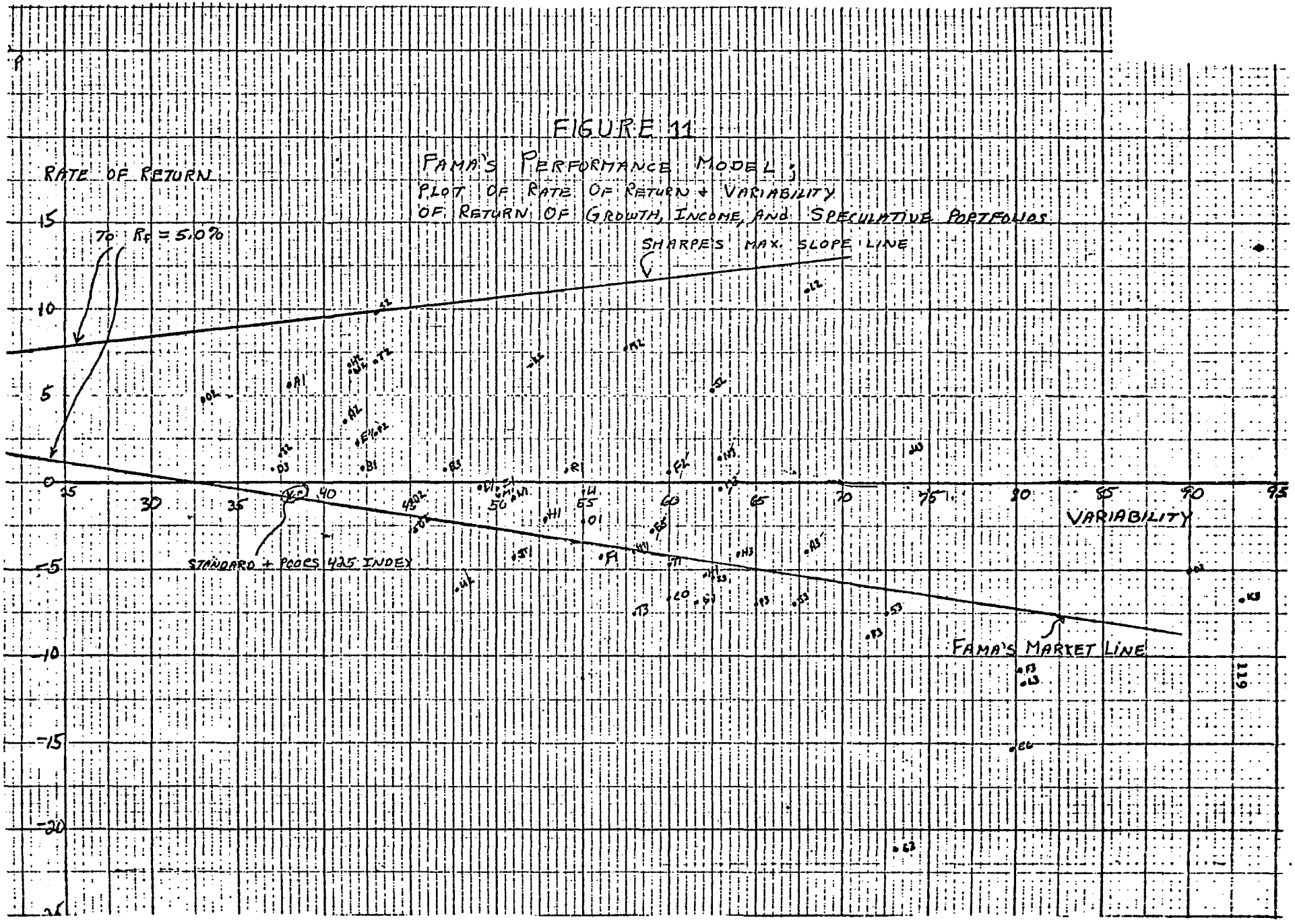
FIGURE 11
FAMA'S PERFORMANCE MODEL;
PLOT OF RATE OF RETURN + VARIABILITY
OF RETURN OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS
RATE OF RETURN
VARIABILITY
SHARPE'S MAX. SLOPE LINE
70 R_f = 5.0%
STANDARD + POOR'S 425 INDEX
FAMA'S MARKET LINE
15
10
5
0
-5
-10
-15
-20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

TABLE 29

RANKS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS OVER THE WHOLE TIME PERIOD FROM MAY, 1969, TO MARCH, 1974, USING FAMA'S MODEL, DISTANCE IS MEASURED FROM THE GRAPH IN FIGURE 11

Source	Growth		Income		Speculative	
	Distance	Rank	Distance	Rank	Distance	Rank
A	12.5	1	9.75	9	3.0	7
B	4.75	5	-1.5	15	6.0	5
CO	-4.5	17	--	--	--	--
D	4.5	7	2.0	14	2.75	8
E4,5,6	7.25*	3	--	--	2.25,-16.0**	9,19
F	-1.25	14	9.5	11	-7.0	16
G	-4.75	18	--	--	-30.0	20
H	2.0	11	16.5	7	1.75	10
I	4.75	6	4.5	13	-1.75	11
J	-2.75	16	19.75	5	-3.5	13
K	0.0	12	20.5	4	5.0	6
L	6.0	4	33.0	1	-8.25	18
M	4.0	8	23.5	2	8.50	3
N	3.75	9	16.0	8	11.75	2
O	2.50	10	9.5	10	7.5	4
P	-15	20	8.75	12	-4.0	14
R	7.75	2	--	--	-5.75	15
S	-11.0	19	23.0	3	-2.75	12
T	-0.5	13	17.25	6	-7.0	17
U	-1.5	15	-7.5	16	+16.75	1

*Includes E4

**Includes both E5 and E6

the recorded distances.

In order for Fama's model to verify the ranks assigned each investment source using Sharpe's Index, a strong correlation must exist. In Table 30, ranks are listed using both models. The high positive correlation in Table 30 is evidence that both models have similarly ranked investment sources.

Fama's model was applied only to portfolios which were maintained over the whole study period (Time 1). The high degree of correlation which was found for this time period is assumed for the subperiods as well.

In the next chapter, performance of investment sources is based upon regressions of portfolio returns to market returns.

TABLE 30

RANKS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS FOR THE WHOLE STUDY, FROM MAY, 1969, TO MARCH, 1974, AS CALCULATED BY BOTH SHARPE'S INDEX AND FAMA'S MODEL, CORRELATION OF THE RESULTS IS INCLUDED

Source	Growth		Income		Speculative	
	Sharpe	Fama	Sharpe	Fama	Sharpe	Fama
A	1	1	10	9	8	7
B	5	5	15	15	5	5
CO	18	17	--	--	--	--
D	7	7	14	14	4	8
E4	2	3	--	--	--	--
E5	--	--	--	--	9	9
E6	--	--	--	--	19	19
F	15	14	12	11	16	16
G	17	18	--	--	20	20
H	11	11	4	7	10	10
I	4	6	13	13	11	11
J	16	16	8	5	13	13
K	12	12	6	4	7	6
L	6	4	2	1	17	18
M	8	8	3	2	3	3
N	9	9	7	8	2	2
O	10	10	9	10	6	4
P	20	20	11	12	14	14
R	3	2	--	--	15	15
S	19	19	1	3	12	12
T	13	13	5	6	18	17
U	14	15	16	16	1	1
Correlation:	r=0.985		r=0.947		r=0.971	

CHAPTER V

PERFORMANCE EVALUATION OF INVESTMENT SOURCES USING THE REGRESSION MODEL, THE EMPIRICAL RESULTS

The portfolio performance model created by Jack Treynor defined risk as dispersion of rates of return for a portfolio from rates of return for the market. In Chapter II, the model of Jack Treynor was presented in detail. The Treynor model was modified by Franco Modigliani, and others, so that relative performance ranks could be read directly from the Y-intercept, alpha, obtained from the linear equation:

$$Y_p = \alpha_p + \beta_p X \qquad (18)$$

The definition of risk as intended by Treynor has not been altered. In Equation 18 beta is the slope of the rates of return of portfolio P against rates of return of a market index. This regression line is Treynor's "characteristic line." Beta in the regression equation is the same as the beta of the characteristic line. For both lines, beta measures the "volatility" of a portfolio to market movements. Beta is typically used as a measure of systematic risk. Use of beta to measure risk requires that unsystematic

risk has been assumed away through adequate diversification.

In this study, linear regression was used to solve Equation 18. The rates of return for the S&P 425 Index were the independent variables. From the regression equation the Y-intercept (alpha) and the regression coefficient (beta) were found. A correlation coefficient was also calculated for each portfolio. The results were relegated to Appendix 2 due to the extensive amount of data. In Appendix 2, the letter "A" represents the Y-intercept, "B" represents the slope, and "R" the correlation coefficient. ("A", Y-intercept, and alpha are used interchangeably in this chapter. Also "B", beta, regression coefficient, and slope of the regression line all have similar meanings.)

Time Periods

Time periods are the same as in Chapter IV. Portfolio identification are also the same as before. Each portfolio identification contains three characters. The first character represents the time period during which the portfolio was purchased: (1) whole study period, (2) down market, (3) up market, or (4) neutral market. The second character represents the investment source recommending the portfolio (see Table 16, Chapter IV). The third character indicates the type of portfolio: (1) growth, (2) income, or (3) speculative, into which source recommendations have been subjectively classified.

Errors in the Accuracy of the Regression

The correlation coefficients for the regressions are included in Appendix 2. Correlations are presented as evidence of the quality of the regression relationship of rates of return for portfolios on the S&P rate. A high positive correlation would add validity to the values of alpha and beta. A low (or negative) correlation would be caused by: (1) inadequate diversification, (2) too small a data set, (3) anti-cyclical movement, or (4) a wide dispersion of returns.

Inadequate Diversification

In Appendix 3 the number of recommendations is shown for each portfolio. Some portfolios contain only very few stocks. For example, portfolio 3R3 contains only one stock. From Appendix 2, Table 3.3, one can see that the correlation coefficient for portfolio 3R3 was equal to 0.41 during the period of purchase, but fell to 0.05 during the neutral market. From Appendix 3, a visual check verifies a tendency for relatively lower correlations in smaller portfolios. For example, in Appendix 3, the down market contains relatively high correlations. (All portfolios with a correlation less than 0.60 are circled.) Seven of the nine portfolios which are circled contain ten securities or less.

Size of Data Sets

The rate of return of a portfolio, for each month the portfolio was maintained, became an element in the data set. Not all portfolios were started at the same time. Therefore, not all portfolios have the same sized data sets. A portfolio which was started well into a market period would have relatively few elements. The fewer the elements in a portfolio's data set, the lower the value of the correlation coefficient (from basic statistics). The up market contains fewer months than either the down or neutral markets. Therefore, it is expected that correlation coefficients for the up market should be somewhat less than the other market periods. After eliminating correlation coefficients of portfolios of ten stocks or less, which had a correlation coefficient less than 0.60, the mean correlation coefficient was 0.874 for the down market, and 0.778 for the up market. Part of this difference is attributed to wider dispersion (see below) and part to the smaller data sets.

Anti-Cyclical Movement

Portfolios not moving in the same direction as the S&P 425 Index would have a low correlation coefficient, possibly negative. Income portfolios, as a group, generally had lower correlation coefficients than did growth or speculative portfolios. For example, in the neutral market, Table 31 shows that income portfolios were the only group to

have a positive rate of return (data is from Chapter IV). However, income portfolios had the lowest correlation coefficients. Does this indicate that regressions of income portfolios are not statistically valid? An example is presented below which shows that anti-cyclical portfolios should have low correlations. This study suggests that the hypothetical example actually occurred in the neutral market period.

TABLE 31

A COMPARISON OF RATES OF RETURN TO MEAN CORRELATION COEFFICIENTS (FOR PORTFOLIO RATES OF RETURN ON MARKET RATE OF RETURN) FOR THE NEUTRAL MARKET PERIOD, JUNE, 1971, TO MARCH, 1974

Portfolio	Rate of Return	Mean Correlation Coefficient
Growth	-7.19%	.503
Income	+0.35%	.346
Speculative	-18.01%	.438
S&P	-0.99%	

In Figure 12, hypothetical unit values for the neutral market are presented. Though the unit values are not actual values, they are intended to simulate the neutral market. Ending values were taken from Chapter IV and the S&P unit values are approximate monthly unit values for that time period. The correlation of both growth and speculative portfolios should be high in Figure 12 because their unit

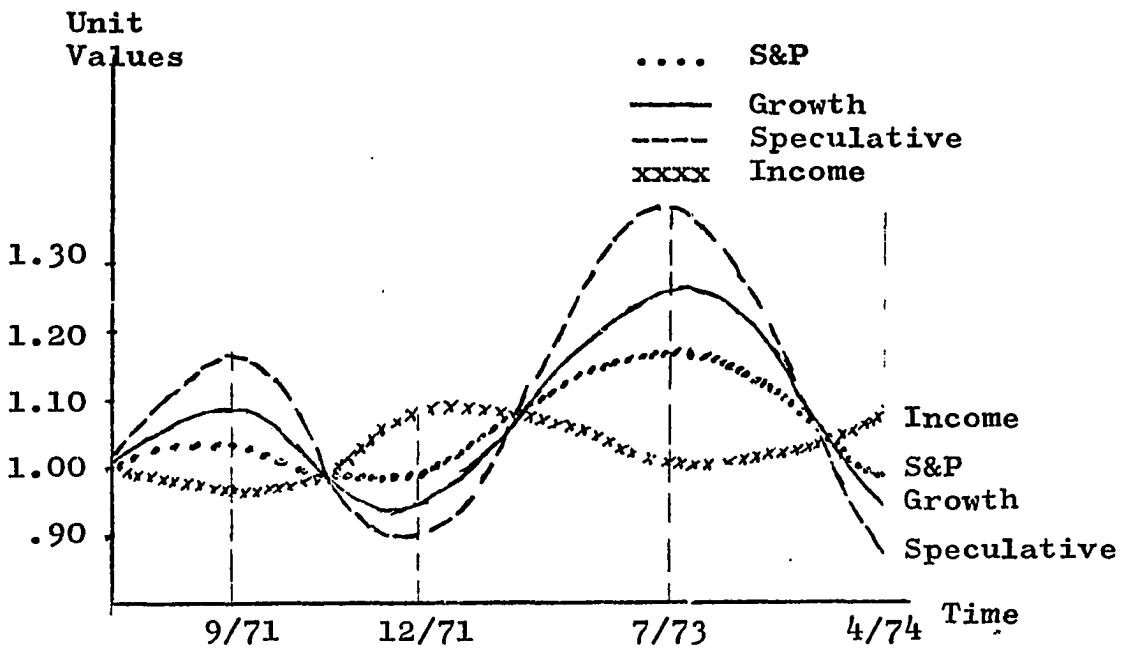

Figure 12. An example of low correlation of anti-cyclical portfolios (income portfolios) to S&P; growth and speculative portfolios have greater variability of return than income portfolios, but have higher correlation with S&P.

value changes are timely, when compared to S&P. However, income portfolios had a tendency to increase (decrease) when the market decreased (increased), even though overall variation was low. Therefore, correlation of income portfolios with S&P would be less than that for growth or speculative portfolios.

Wide Dispersion of Returns

A wide dispersion of returns would reduce the correlation coefficient. In Figure 13 correlation decreases as

dispersion increases. A comparison of dispersion of portfolios to market movements for the down market, the up market, and the neutral market is shown in Table 32. Data were obtained from Table 20, Chapter IV.

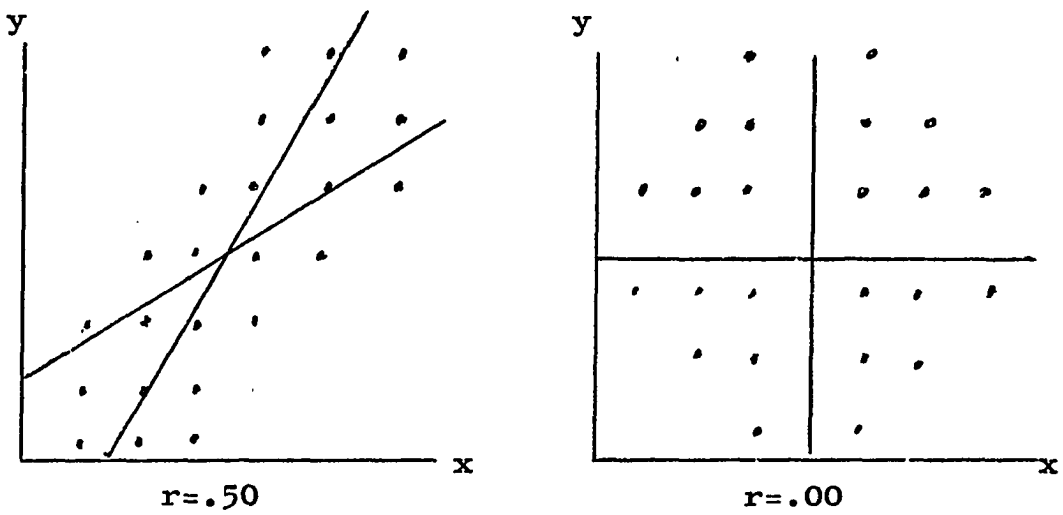

Figure 13. Examples of linear regression, where correlation decreases with increased dispersion.

Table 32 indicates that, relative to S&P, more variance of return occurred in the neutral market than in either the down market or the up market. The correlation coefficients for the neutral market were much lower than for either the down market or the up market (from Appendix 3). Part of the lower correlation is a result of portfolio size (inadequate

TABLE 32

MEAN VARIABILITY OF RATES OF RETURN ($\overline{V}$) RELATIVE TO VARIABILITY OF MARKET RATES ($V_{S\&P}$), MEASURED BY THE RATIO, $\overline{V}/V_{S\&P}$; THE RELATIONSHIP OF THE AVERAGES OF $\overline{V}/V_{S\&P}$ FOR A COMPLETE MARKET CYCLE TO THE MEAN CORRELATION COEFFICIENTS FOR EACH PERIOD IN THE MARKET CYCLE

Portfolios	Market Periods		
	Down Market	Up Market	Neutral Market
Growth ($\overline{V}/V_{S\&P}$)	1.33	1.46	1.92
Income ($\overline{V}/V_{S\&P}$)	1.23	1.58	1.72
Speculative ($\overline{V}/V_{S\&P}$)	1.72	2.02	2.59
Average ($\overline{V}/V_{S\&P}$)	1.43	1.08	2.08
Mean Correlation Coefficient*	.874	.778	.373

*From Appendix 3.

diversification), but most is due to wider dispersion of rates of return.

The intent of this section was to explain why correlation coefficients have varied from one portfolio to the next, and why the correlation coefficients are smaller for the neutral market than for the other markets. This does not necessarily mean that the regression model fails for the neutral market. Consistency of the correlation coefficients in the neutral market tend to support the use of the regression model. (Additional studies are needed to verify use of regression when low correlation coefficients are presented.)

Performance Results of Growth, Income, and Speculative Portfolios (as Groups) for Different Time Periods

Alpha (α) and Beta (β) for each portfolio for each time period are displayed in Appendix 2. From these data, a mean alpha ($\bar{\alpha}$) and a mean beta ($\bar{\beta}$) were calculated for growth portfolios, for income portfolios, and for speculative portfolios (as groups). The results are presented in Tables 33, 34, and 35 respectively.

The purpose of presenting mean alphas and mean betas for each group is to provide information to the investor who is interested in a specific investment objective.

Performance over the Whole Study Period

From Table 33, the mean alpha for all growth portfolios consisting of recommendations from May, 1969, to December, 1973 (Time 1) was -1.42%. Beta was 1.05. In other words, investment sources which recommended growth stocks would have done better by recommending a naive portfolio. Not only was the rate of return, on average, less than that of the S&P, but slightly more risk was taken to achieve that inferior performance.

From Table 34 (Time 1), one can see that investment sources recommending the purchase of income stocks outperformed the market (S&P) while accepting only 75% of the risk inherent in the naive portfolio.

From Table 35 (Time 1), investment sources, on average, did a very poor job of recommending speculative stocks.

TABLE 33

MEAN ALPHAS ($\bar{\alpha}$) AND MEAN BETAS ($\bar{\beta}$) FOR ALL GROWTH PORTFOLIOS FOR ALL MARKET PERIODS FROM MAY, 1969, TO MARCH, 1974

Growth Portfolios Based on Recommendations Purchased for the:	Portfolio Prefix		Down Market	Up Market	Neutral Market	Whole Market
Down Market	2	$\bar{\alpha}$	- 5.17%	+12.43%	- 1.92%	- 1.26%
		$\bar{\beta}$	1.18	0.93	0.84	1.04
Up Market	3	$\bar{\alpha}$	--	+10.46%	- 3.07%	+ 0.78%
		$\bar{\beta}$	--	1.13	0.93	1.01
Neutral Market	4	$\bar{\alpha}$	--	--	--7.29%	- 7.29%
		$\bar{\beta}$	--	--	0.96	0.96
Whole Study	1	$\bar{\alpha}$	- 5.17%	+10.94%	- 1.98%	- 1.42%
		$\bar{\beta}$	1.18	0.94	0.85	1.05

TABLE 34

MEAN ALPHAS ($\bar{\alpha}$) AND MEAN BETAS ($\bar{\beta}$) FOR ALL INCOME PORTFOLIOS FOR ALL MARKET PERIODS FROM MAY, 1969, TO MARCH, 1974

Income Portfolios Based on Recommendations Purchased for the:	Portfolio Prefix		Down Market	Up Market	Neutral Market	Whole Market
Down Market	2	$\bar{\alpha}$	+11.83	+ 6.24%	+ 0.99%	+ 3.79%
		$\bar{\beta}$	0.96	0.92	0.66	0.76
Up Market	3	$\bar{\alpha}$	--	+ 5.63%	+ 3.58%	5.15%
		$\bar{\beta}$	--	1.08	0.62	0.68
Neutral Market	4	$\bar{\alpha}$	--	--	1.96%	+1.96%
		$\bar{\beta}$	--	--	0.58	0.58
Whole Study	1	$\bar{\alpha}$	+11.83	+ 4.27%	+ 0.67%	+ 3.49%
		$\bar{\beta}$	0.96	0.96	0.60	0.75

TABLE 35

MEAN ALPHAS ($\bar{\alpha}$) AND MEAN BETAS ($\bar{\beta}$) FOR ALL SPECULATIVE PORTFOLIOS FOR ALL MARKET PERIODS FROM MAY, 1969, TO MARCH, 1974

Speculative Portfolios Based on Recommendations Purchased for the:	Portfolio Prefix		Down Market	Up Market	Neutral Market	Whole Market
Down Market	2	$\bar{\alpha}$	-11.27%	+12.21%	- 6.00%	- 4.81%
		$\bar{\beta}$	1.50	1.13	1.07	1.29
Up Market	3	$\bar{\alpha}$	--	+11.08%	-10.57%	- 8.49%
		$\bar{\beta}$	--	1.02	1.23	1.21
Neutral Market	4	$\bar{\alpha}$	--	--	-15.15%	-15.15%
		$\bar{\beta}$	--	--	1.09	1.09
Whole Study	1	$\bar{\alpha}$	-11.27%	14.11%	- 7.84%	- 5.67%
		$\bar{\beta}$	1.50	1.08	1.09	1.28

An hypothetical investor, who purchased all speculative stock recommendations, took on 28% more risk than a naive portfolio would have given him. The investor also received a rate of return grossly inferior to that naive portfolio. Mean alpha over the whole study period was -5.67%. Mean alpha could be interpreted as the rate of return when S&P had a zero rate. In this case, investment sources which recommend speculative portfolios performed worse than if they had recommended a naive portfolio.

Performance Under Different Market Conditions

For growth, income, and speculative portfolios, $\bar{\alpha}$ and $\bar{\beta}$ for each group are displayed in Table 36. The table was separated into down market, up market, and neutral market so that group comparisons could be made for each market condition.

In the down market, income portfolios were the only group to outperform a naive portfolio. It was the only group which accepted less risk than S&P. It was the only group to achieve a rate of return higher than that naive portfolio.

In the up market, an investor would have received better performance by purchasing either growth portfolios or speculative portfolios rather than income stocks. It appears rather unique that speculative portfolios accepted the least amount of risk during this period, while achieving the best return relative to the S&P.

TABLE 36

PERFORMANCE COMPARISONS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS IN DIFFERENT MARKET PERIODS, MEAN ALPHA AND BETA ARE GIVEN FOR EACH PORTFOLIO GROUP, FOR EACH MARKET PERIOD FROM MAY, 1969, TO MARCH, 1974

Portfolios	$\bar{}$ (%)	$\bar{}$
	Down Market (Time 5)	
Growth	-5.17%	1.18
Income	+11.83	0.96
Speculative	-11.27	1.50
	Up Market (Time 6)	
Growth	+10.46%	1.13
Income	+5.63	1.08
Speculative	+11.08	1.02
	Neutral Market (Time 4)	
Growth	-7.29%	0.96
Income	+1.96	0.58
Speculative	-15.15	1.09

In the neutral market, income portfolios again outperformed both growth and speculative portfolios. Much less risk was taken by income portfolios in achieving superior performance.

In Chapter IV a conclusion was reached that risk-averting investors should have chosen income portfolios in the down and neutral markets to achieve superior performance. The data from Table 36 of this chapter verifies that conclusion. Income portfolios outperformed the other groups in both the down and neutral markets.

The same question asked in Chapter IV is relevant again. Should the investor have switched from income port folios to growth portfolios (or speculative portfolios) in the up market? The answer is similar to the answer given in Chapter IV. An examination of Time 6 and Time 3 in Tables 33, 34, and 35 shows that income stocks purchased during the up market were outperformed during that time period by both growth and speculative stocks. However, if the investor did not wish to sell his portfolio at the end of the up market, he would have been better off holding an income portfolio than either a growth or speculative portfolio. From Time 3, a speculative portfolio bought in the up market and held until the end of the study, on average, performed worse than the S&P. Growth and income portfolios outperformed the S&P by a small margin for this time period. However, income portfolios took on only 67% of the risk accepted by

growth portfolios. To swtich from income portfolios to speculative or growth portfolios in the up market must, then, depend upon one's propensity for "trading."

The purpose of this section has been to present mean alphas and mean betas for growth, income, and speculative portfolios, treated as groups. A comparison of these data in different time periods was intended to help the investor determine what type of portfolio has performed best under different market conditions over the time period of the study.

Ranking Individual Investment Sources Using The Regression Model

The purpose of this section is to provide the investor with information regarding investment source capability for a complete market cycle and for a multi-year time period.

It was mentioned in Chapter III that performance should be measured for a complete market cycle and for a multi-year period. Analysis for a complete market cycle is presented first, followed by an analysis for the whole study period.

Ranking Investment Sources for a Complete Market Cycle

All the investment sources in the study were ranked based upon their value of alpha, using the regression equation:

$$Y = \alpha + \beta X \qquad (19)$$

The results are summarized in Tables 37, 38, and 39 below.

Ranking Growth Portfolios for a Market Cycle

In Table 37 ranks of growth portfolios are presented for the down market, for the up market, and for the neutral market. For the down market, investment source ranks were based on performance during the down market period only (Time 5). In other words, one could assume that the portfolios were liquidated at the end of that time period. The same assumption also holds for the up and neutral markets.

An investor, buying in the down period, would have achieved the best performance by following the recommendations of investment source K. In the up market, the investor would have received the best advice from source T. In the neutral market, investment source E had the best recommendations.

In order to determine which investment source performed best over the complete market cycle, a composite rank was calculated by summing the ranks for the down market, the up market, and the neutral market (Table 37). The composite rank assumed massive portfolio sellouts at the end of each market period. On the other hand, ranks based on holding portfolios for the entire study did not assume massive sellouts. Therefore, the composite rank and whole period rank cannot be expected to exactly correspond. The composite rank for growth stocks indicates that portfolio I was the most consistent performer, even though it did no better than fifth in any particular market period.

TABLE 37

RANKS OF GROWTH PORTFOLIOS FOR EACH PERIOD IN A COMPLETE MARKET CYCLE FROM MAY, 1969, TO MARCH, 1974, USING THE REGRESSION MODEL, INCLUDES A COMPOSITE RANK FOR THE MARKET CYCLE

Source	Down Market (Time 5)	Up Market (Time 6)	Neutral Market (Time 4)	Composite Rank (Time 5 + Time 6 + Time 4)	
				Total Points	Rank
A1	5	12	4	21	2½
B1	4	10	16	30	10
C0	16	11	3	30	10
D1	19	7	--	--	--
E4	2	20	1	23	4
F1	8	6	12	26	5
G1	18	3	8	29	8
H1	11	8	2	21	2½
I1	6	9	5	20	1
J1	12	19	9	40	18
K1	1	14	15	30	10
L1	3	15	13	31	12½
M1	13	4	10	27	6½
N1	9	18	7	34	14
O1	14	16	6	36	15½
P1	20	17	17	54	19
R1	7	13	18	38	17
S1	17	5	14	36	15½
T1	15	1	11	27	6½
U1	10	2	19	31	12½

In Table 37, Portfolio 4D1 was eliminated because of an exceptionally low correlation coefficient.

Ranking Income Portfolios for a Market Cycle

Comparative performances of investment sources recommending income portfolios are exhibited in Table 38. Missing data in this table resulted from either a lack of recommendations for a particular portfolio or exceptionally low correlation coefficients, which caused elimination of the portfolio. Sources with missing data for any market period were restricted from the composite ranking.

In the down market, portfolio M offered investors superior performance. In the up market, source A was the top performer. In the neutral market, investors would have fared best with source S.

As was the situation for growth prrtfolios, no investment source offered superior recommendations in more than one market period. The composite rank for the whole market cycle indicated that portfolio F was most consistent. Portfolio F fared no better than third for any market period.

In Chapter IV, using Sharpe's Index, source S performed well in both the up market and the neutral market. However, it was restricted from the composite rating because there was no data for the down market. A comment in Chapter IV revealed that, had data been available, source S might have been a top contender. The regression method used in this chapter verifies that comment. In the up market,

TABLE 38

RANKS OF INCOME PORTFOLIOS FOR EACH PERIOD IN A COMPLETE MARKET CYCLE FROM MAY, 1969, TO MARCH, 1974, USING THE REGRESSION MODEL, INCLUDES A COMPOSITE RANK FOR THE MARKET CYCLE

Source	Down Market (Time 5)	Up Market (Time 6)	Neutral Market (Time 4)	Composite Rank (Time 5 + Time 6 + Time 4)	
				Total Points	Rank
A2	8	1	6	15	3
B2	12	--	--	--	--
D2	11	2	12	25	7½
F2	3	3	7	13	1
H2	6	--	10	--	--
I2	13	9	2	24	5½
J2	4	--	14	--	--
K2	5	10	11	26	9
L2	9	--	5	--	--
M2	1	11	13	25	7½
N2	10	8	4	22	4
O2	7	--	--	--	--
P2	14	7	3	24	5½
S2	--	6	1	--	--
T2	2	4	8	14	2
U2	15	5	9	29	10

source S was ranked higher using the regression model than when it was ranked by Sharpe's Index.

Ranking Speculative Portfolios for a Market Cycle

Comparative performances of investment sources which recommended speculative portfolios are exhibited in Table 39. In the down market, source U was superior. Source K was top ranked for the up market. Source O was ranked first for the neutral market. The composite rank indicated that Source K was the most consistent performer over the entire market cycle. Source K was ranked first by a significant margin over source M, which was ranked second.

Ranking Investment Sources for the Whole Study Period

In addition to comparing performance over a complete market cycle, a multi-year measurement of performance was determined for all investment sources. Results from ranking portfolios over the whole study period are displayed in Table 40. Performance comparisons were made by growth, income, and speculative portfolios, as before. Table 40 also contains composite ranks for investment sources. These ranks were calculated in the previous section and are included for comparative purposes.

An investor who purchases stocks for long-term holding purposes would be more interested in the whole period results than in the composite measure. As stated before, the composite measure assumed massive sellouts at the

TABLE 39

RANKS OF SPECULATIVE PORTFOLIOS FOR EACH PERIOD IN A COMPLETE MARKET CYCLE FROM MAY, 1969, TO MARCH, 1974, USING THE REGRESSION MODEL, INCLUDES A COMPOSITE RANK FOR THE MARKET CYCLE

Source	Down Market (Time 5)	Up Market (Time 6)	Neutral Market (Time 4)	Composite Rank (Time 5 + Time 6 + Time 4)	
				Total Points	Rank
A3	7	9	13	29	9
B3	--	3	15	--	--
D3	3	13	2	18	3½
E5	8	6	8	22	5
E6	18	11	14	43	15½
F3	11	2	5	18	3½
G3	14	--	11	--	--
H3	12	10	17	39	13
I3	5	12	9	26	7
J3	4	5	16	25	6
K3	2	1	7	10	1
L3	17	--	18	--	--
M3	6	4	6	16	2
N3	9	15	12	36	12
O3	10	16	1	27	8
P3	15	8	19	42	14
R3	16	7	20	43	15½
S3	13	17	3	33	10½
T3	19	14	10	33	10½
U3	1	--	4	--	--

TABLE 40

OVERALL RANK OF INVESTMENT SOURCES FOR THE WHOLE STUDY PERIOD, FROM MAY, 1969, TO MARCH, 1974, USING THE REGRESSION MODEL, BASED UPON RANKS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS WHICH WERE PURCHASED OVER THE WHOLE STUDY PERIOD, INCLUDES A COMPARISON TO COMPOSITE RANKS

Source	Portfolios						Total Points For the Whole Period	Overall Rank for the Whole Period
	Growth		Income		Speculative			
	Whole Period	Composite	Whole Period	Composite	Whole Period	Composite		
A	1	2½	8	3	7	9	16	1½
B	4	10	15	--	8	--	27	8½
CO	17	10	--	--	--	--	--	--
D	8	--	13	7½	1	3½	22	5½
E4	2	4	--	--	6,19*	5,15½*	27	8½
F	13	5	14	1	15	3½	42	16
G	18	8	--	--	20	--	--	--
H	10	2½	2	--	10	13	22	5½
I	5	1	12	5½	2	7	19	4
J	14	18	10	--	11	6	35	12½
K	12	10	6½	9	17	1	35½	14
L	6	12½	1	--	18	--	25	7
M	7	6½	5	7½	4	2	16	1½
N	9	14	6½	4	3	12	18½	3
O	11	15½	9	--	9	8	29	10
P	20	19	11	5½	16	14	47	17
R	3	17	--	--	13	15½	--	--
S	19	15½	4	--	12	10½	35	12½
T	15	6½	3	2	14	10½	32	11
U	16	12½	16	10	5	--	37	15

*E had two portfolios in the speculative group.

E5 was ranked sixth for the whole period and fifth for the composite, while E6 was nineteenth and tied for fifteenth.

end of each market period. An additional element of risk would have been added by attempting to guess market changes. A long-term investor would wish to avoid this risk. A trader would be willing to accept this risk because of the potential greater earnings from trading.

Over the whole period, no single investment source achieved the top ranking more than once. Investors seeking growth would have performed best by following the advice of Source A. Income oriented investors should have listened to source L for the best recommendations. Speculative investors would have outperformed the market by following the advice of Source D.

An investor seeking diversification by purchasing some growth stocks, some income stocks, and some speculative stocks could have followed the advice of source A in the down market, source L in the up market, and source D in the neutral market. Or, the diversifying investor could have relied upon a single source for all advice. The second choice seems to be more simple. The overall rank in Table 40 showed that Source A and Source M were tied as being the most consistent performs for all types of portfolios. Either source would have given the diversifying investor a single source for advice, superior to the other sources.

Correlation of Ranks Determined by the Regression Model and by Sharpe's Index

In Table 41, the relative performance ranks of growth, income, and speculative portfolios of all investment sources are shown. A comparison of these ranks, which were calculated by both the regression model and Sharpe's Index, indicates a strong correlation between them, suggesting verification of both methods of ranking portfolios. The correlation for growth and income portfolios was very high. The correlation for speculative portfolios was statistically significant, though somewhat lower, than the correlation for growth and income portfolios. The cause of the lower correlation can be found in the quality of the regression relationships of speculative portfolios to the S&P.

Diversification and Portfolio Risk

In Chapter II it was mentioned that risk has two components: (1) systematic risk which cannot be diversified away, and (2) unsystematic risk which can be diversified away. If total risk (D_p) equals systematic risk (B) plus unsystematic risk (ϵ), $D_p = B + \epsilon$, then the amount of unsystematic risk in a portfolio can be measured by subtracting systematic risk from total risk such that: $\epsilon = D_p - B$.

In Chapter II, Eugene Fama's theory for measuring unsystematic risk was discussed. In summary, Fama said that

TABLE 41

RANKS OF GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS WHICH WERE PURCHASED DURING AND MAINTAINED FOR THE WHOLE STUDY PERIOD, FROM MAY, 1969, TO MARCH, 1974, CALCULATED BY BOTH THE REGRESSION METHOD AND BY SHARPE'S INDEX, INCLUDES A CORRELATION (r) OF THE RESULTS OF THE REGRESSION METHOD TO THE RESULTS OF SHARPE'S INDEX

Source	Growth		Income		Speculative	
	Regression	Sharpe	Regression	Sharpe	Regression	Sharpe
A	1	1	8	10	7	8
B	4	5	15	15	8	5
CO	17	18	--	--	--	--
D	8	7	13	14	1	4
E4	2	2	--	--	--	--
E5	--	--	--	--	6	9
E6	--	--	--	--	19	19
F	13	15	14	12	15	16
G	18	17	--	--	20	20
H	10	11	2	4	10	10
I	5	4	12	13	2	11
J	14	16	10	8	11	13
K	12	12	6½	6	17	7
L	6	6	1	2	18	17
M	7	8	5	3	4	3
N	9	9	6½	7	3	2
O	11	10	9	9	9	6
P	20	20	11	11	16	14
R	3	3	--	--	13	15
S	19	19	4	1	12	12
T	15	13	3	5	14	18
U	16	14	16	16	5	1
Correlation	r=0.9834		r=0.9448		r=0.8163	

beta represents systematic risk because beta only measures a portfolio's sensitivity to market movements. Inadequate diversification cannot be observed from beta alone. If one were to take the ratio of portfolio dispersion (D_p) to market dispersion (D_m), then the ratio, D_p/D_m, would indicate total risk, but in the same units as beta. For a naively selected portfolio, $D_p/D_m = B$. For a portfolio that is not highly diversified, D_p/D_m would be greater than B because of the added unsystematic risk. Therefore:

$$\epsilon = (D_p/D_m) - B \qquad (20)$$

would be positive.

In this study, beta was calculated by the regression method. In Chapter IV, total dispersion was measured by the mean absolute deviation (MAD). D_m has also been presented earlier.

An attempt was made to determine how many stocks a portfolio should contain to be "adequately" diversified. A list of portfolios is presented in Table 42. The portfolio containing the greatest number of stocks is listed first and the portfolio containing the least number of stocks is listed last. All portfolios were taken from Time 1. In other words, the portfolios were all bought and held over the whole study period. The values of beta for all portfolios were taken from Appendix 2. The values of D_p (MAD) were taken from the columns headed "V" in Appendix 1.

TABLE 42

TOTAL RISK, SYSTEMATIC RISK, AND UNSYSTEMATIC RISK FOR A SAMPLE OF PORTFOLIOS OF VARYING SIZES, UNSYSTEMATIC RISK AS A PERCENT OF TOTAL RISK IS USED TO DETERMINE THE EFFECT OF DIVERSIFICATION ON PORTFOLIO RISK

Portfolio	Number of Stocks	Systematic Risk	Total Risk D_p	Standardized Total Risk D_p/D_m $D_m=38.74$	Unsystematic Risk (D_p/D_m) -	% of D_p	Rate of Return for Whole Study (%)
1F1	249	1.12	56	1.44	.32	22%	-4.40%
1I1	142	1.00	51	1.30	.30	23	-0.21
1C0	130	1.16	60	1.54	.38	25	-6.67
1T1	94	1.20	60	1.54	.34	22	-4.75
1P1	74	1.11	55	1.41	.30	21	-11.23
101	64	1.04	55	1.41	.37	26	-2.28
1T2	53	.71	38	.97	.26	27	1.58
1T2	45	.75	44	1.13	.38	34	7.00
1U1	39	1.20	62	1.59	.39	25	-5.24
1E6	39	1.56	80	2.05	.49	24	-15.14
1T3	31	.99	58	1.49	.50	34	-7.61
1P2	28	.70	43	1.10	.40	36	2.66
1N2	23	.62	42	1.08	.46	43	6.30
103	22	1.44	90	2.31	.87	38	-5.10
1N3	20	1.04	63	1.62	.58	36	1.57
1L3	15	1.57	80	2.05	.48	24	-11.79
1G3	10	1.49	73	1.87	.37	20	-21.27
1U2	10	.76	48	1.23	.47	38	-6.35
102	7	.24	33	.84	.60	71	4.86
1M2	4	.86	58	1.49	.63	43	7.75
1L2	2	.93	68	1.74	.81	47	11.10

D_m was assigned a value of 38.74 which is the mean absolute deviation for the rate of return of S&P over the whole study period. The unsystematic risk in each portfolio was determined from the equation:

$$\text{Unsystematic Risk } (\varepsilon) = (D_p/D_m) - \beta \qquad (21)$$

Unsystematic risk appears fairly stable in portfolios containing a large number of stocks. From the sample of portfolios in Table 42, one can conclude that unsystematic risk accounts for about 20% to 25% of total risk in diversified portfolios. As portfolio size is decreased, the first notable increase in unsystematic risk occurs at a portfolio size of 64 stocks. A marked increase in unsystematic risk occurs at a portfolio size of 31 stocks (portfolio 1T3). Reducing portfolio size below thirty stocks requires acceptance of a significant increase in unsystematic risk, with two exceptions: portfolios 1L3 and 1G3.

One would assume, if the managers of portfolios 1L3 and 1G3 were able to eliminate unsystematic risk, they should also have been able to match the performance of the market. However, portfolio 1L3 had an α = -11.76% and 1G3 had an α = -22.63%, over the whole study period. (An interesting study would be an examination of correlation of rate of return to degree of unsystematic risk. This study would determine the effect of increasing unsystematic risk on rate of return. However, this is the topic for another paper.)

In this chapter portfolios were ranked by values of

alpha and beta which were determined by linear regression of portfolio return on market return. There was a high correlation between relative performance rank determined by the regression method and relative performance rank determined by Sharpe's index from Chapter IV.

CHAPTER VI

SUMMARY AND CONCLUSIONS

A Summary of the Study

An objective of this study is to help investors determine which investment source can best supply competent research and advice. Information which could help the investor choose from the myriad of investment sources has been meager. In an attempt to partially fill that void of information, the study will determine relative performance ranks of twenty investment sources. Over 3500 recommendations of investment sources were collected for the period May, 1969, to December, 1973. Hypothetical portfolios were created from these recommendations. Ex-post portfolio theory was used to determine rates of return, risk taken, and relative performance ranks for all investment sources. The relative performances were calculated for a complete market cycle and for period of nearly five years, from May, 1969, to March, 1974.

Rates of return for recommendations of investment sources and risk taken to achieve those rates were topics of Chapter IV. Relative performance ranks for each investment source, for different market conditions, were

the topics of both Chapter IV and Chapter V.

Conclusions of the Study

In addition to determining relative performance for twenty investment sources, this study intended to answer the questions introduced in Chapter III. Answers to these questions are presented in the study. However, a convenient way to summarize the study is to sequentially discuss answers to those questions.

How did the performance of recommendations of investment sources compare to the performance of the market?

Over the whole study period, all twenty sources recommended growth stocks. Twelve of the twenty investment sources outperformed Standard and Poors 425 Industrial Index (S&P). The rate of return of S&P over the whole study period was -0.89%. The mean rate of return of all growth recommendations was -2.72%. For the same time period, sixteen investment sources recommended income stocks. Of these, fourteen outperformed S&P. The mean rate of return for all income recommendations was 4.00%. All twenty sources recommended speculative stocks. Half of them performed better than S&P. The mean rate of return for all speculative recommendations was -5.95%.

The market cycle was divided into a down market, an up market, and a neutral market. In the down market, 30% of all sources recommending growth stocks outperformed S&P. The mean rate of return on growth recommendations for the

down period was -42.93%. During this period S&P had a rate of return of -26.06%. For the down period, 67% of all sources recommending income stocks did better than S&P. The mean rate of return for all income recommendations was -21.20%. Of the sources which recommended speculative stocks in the down period, 32% fared better than S&P. The mean rate of return for speculative recommendations during the down period was -53.07%.

For the up market, 40% of all sources recommending growth stocks, 18% of all sources recommending income stocks, and 26% of all sources recommending speculative stocks outperformed S&P. The mean rates of return for the up market were 37.5% for growth recommendations, 23.04% for income recommendations, and 30.14% for speculative recommendations. S&P had a 30.31% rate of return for this period.

In the neutral market, 50% of all sources which recommended growth stocks outperformed S&P. 73% of sources which recommended income stocks and 45% of sources which recommended speculative stocks performed better than S&P. The mean rates of return for the neutral market were -7.19% for growth recommendations, 0.35% for income recommendations, and -18.01% for speculative recommendations. For the neutral market, S&P had a -0.99% rate of return.

Did the relative performance ranks of investment sources vary considerably when using different performance ranking models?

The models of William Sharpe, Eugene Fama, and a

regression model which can be traced back to Jack Treynor were used to rank performance. Relative performance ranks of investment sources which were calculated from the different models were correlated for the whole study. The correlations are given in Table 43.

TABLE 43

CORRELATION OF DIFFERENT PERFORMANCE MEASUREMENT MODELS FOR GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS WHICH WERE MAINTAINED OVER THE WHOLE MARKET PERIOD, MAY, 1969, TO MARCH, 1974

Correlation of:	Portfolios		
	Growth	Income	Speculative
Sharpe and Fama	.985	.947	.971
Treynor and Sharpe	.983	.945	.816

How did sources with fewer recommendations perform compared to sources which recommended many stocks? What is the effect of diversification?

In Table 42, Chapter V, Twenty-one portfolios are listed according to the number of stocks held over the whole study period. A comparison of portfolio rates of return to number of stocks provides no relationship. However, there is evidence that unsystematic risk in a portfolio increases when a portfolio contains less than thirty stocks. In other words, in this study, portfolios containing greater than 30 stocks were able to minimize diversifiable risk.

Did some investment sources continually outperform other investment sources under different market conditions?

Relative performance comparisons were made twelve times in the study. The top ranked investment source for each test is shown in Table 44.

TABLE 44

TOP RANKED INVESTMENT SOURCES FOR ALL TWELVE PERFORMANCE TESTS

Portfolios	Time Periods			
	Down Market	Up Market	Neutral Market	Whole Period
Growth	E	S	E	A
Income	K	D	S	S
Speculative	U	B	O	U

From Table 44 one might assume that investment sources S, U, and E dominated the performance ranks. This is misleading. In Table 45, each investment source received a point each time it was ranked among the top five in any of the twelve tests. No investment source went scoreless. From sixty possible points, no investment source received more than five points. There were no investment sources which continually outperformed the others.

TABLE 45

INVESTMENT SOURCE SCORES FOR APPEARING IN THE TOP FIVE RANK POSITIONS IN EACH OF TWELVE TESTS, FROM A TOTAL OF SIXTY POINTS

Source	Score	Source	Score	Source	Score	Source	Score
A	3	F	3	K	4	P	1
B	4	G	2	L	3	R	2
C	1	H	4	M	3	S	4
D	3	I	5	N	4	T	3
E	4	J	1	O	3	U	3

Did investment sources which publish portfolios perform better than investment sources which merely recommend stocks?

Sources A, B, and D maintained published portfolios. These portfolios contained their favorite recommendations. Over the whole study, they performed no better than sources which merely recommend stocks, as can be seen in Table 45.

Did investment sources merely recommend the whole market?

If investment sources merely recommended the whole market, systematic risk, measured by beta in Chapter V, should have been equal to market risk. In other words, beta should have approached unity. Additionally, rates of return for portfolios should have been no better or no worse than the rate of return for the market. In other words, alpha should have approached a zero value.

TABLE 46

MEAN ALPHA ($\bar{\alpha}$) AND MEAN BETA ($\bar{\beta}$) FOR GROWTH, INCOME, AND SPECULATIVE PORTFOLIOS FOR THE DIFFERENT MARKET PERIODS, FROM MAY, 1969, TO MARCH, 1974

Portfolio Group		Down Market	Up Market	Neutral Market	Whole Period
Growth	$\bar{\alpha}$	- 5.17%	+10.46%	- 7.29%	-1.42%
	$\bar{\beta}$	1.18	1.13	.96	1.05
Income	$\bar{\alpha}$	+11.83%	+ 5.63%	1.96%	+3.49%
	$\bar{\beta}$	.96	1.08	0.58	0.75
Speculative	$\bar{\alpha}$	-11.27%	-11.08%	-15.15%	-5.67%
	$\bar{\beta}$	1.50	1.02	1.09	1.28

In Table 46, mean alpha and mean beta can be observed for each market period. Investment sources, on average, did not recommend stocks which performed in a manner similar to the market. A glance at the wide ranges of alpha and beta in Appendix 2 this comment. For example, growth portfolios over the whole period had a mean beta of 1.05. However, Table 1.1 in Appendix 2 shows that the range of beta for twenty sources was 0.72 to 1.25. For speculative portfolios the mean beta was 1.28 and the range of 20 sources was .60 to 1.57. The wide range of beta values supports the comment that investment sources were not content to recommend the whole market. Table 46 indicates that investment sources generally possessed the ability to outperform the market in up markets, but failed to demonstrate this ability in down and neutral markets.

Did investment sources perform better than common trust funds of banks? Did they require taking more risk than trust departments of banks require?

For an investor, an alternative to following the advice of an investment source would be to request a third party to manage investment funds. Since alpha measures return relative to the market, performance comparisons can be made for different time periods. Because beta measurements contain market risk in the denominator, risk comparisons can also be made for different time periods.

As discussed in Chapter II, Edward Malca calculated alpha and beta for 37 large commercial banks. Mean alpha was -1.6% and mean beta was 0.96. Malca obtained these results by analyzing pension funds managed by bank trust departments. Most pension funds are assumed to desire long-term growth. If this is true, the stocks owned by pension funds are similar to the stocks held in the growth portfolios in the study.

Over the whole study, mean alpha for growth portfolios was -1.42%, while mean beta was 1.05. These results are very similar to Malca's. Therefore, one can conclude that investment sources performed no better or no worse than bank trust departments. They both required an acceptance of approximately the same level of risk.

Implications for the Future and for Additional Studies

The dearth of investment source information has been observed in this study. Not only is there a need for more

information, but a way to communicate this information to the general public must be developed. To date, only mutual funds are required to disclose performance results. Pension funds must file statements annually, from which performance can be calculated. However, bank trust departments, investment advisors, and brokerage firms are not required to disclose performance of recommendations. This should be rectified.

As performance measurement becomes more popular, better tools for measurement will be needed. Performance theorists admit to the need for a better measure of risk. This study pointed out a weakness in Sharpe's Index when interest rates are very high. The regression model is only as effective for measurement as the regression is accurate. This study indicated low correlation coefficients. More work must be done to test the accuracy of the regression model. It is already used by several "pension consultants," even though its adequacy is questionable.

The results of this study indicate that investors would achieve better performance by purchasing randomly-selected stocks than by following the advice of many of the investment sources which were included in the study. Needless to say, much more work must be done not only to improve performance disclosure but also to improve performance.

APPENDIX 1

TABLE 1.1

RETURN (R), VARIABILITY (V), AND R/V RATIO, AND RANK OF ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE WHOLE STUDY PERIOD)

Portfolio	R(%)	V	R/V Ratio	Rank
A1	5.30%	38.58	.0078	1
B1	0.74	42.35	-.1005	5
C0	-6.67	59.16	-.1972	18
D1	-0.24	48.93	-.1071	7
E4	2.12	42.13	-.0068	2
F1	-4.36	56.0	-.1671	15
G1	-6.93	61.47	-.1940	17
H1	-2.11	53.28	-.1335	11
I1	-0.21	50.58	-.1003	4
J1	-4.30	51.19	-.1816	16
K1	-4.0	57.93	-.1553	12
L1	-0.72	55.72	-.1026	6
M1	-0.62	49.99	-.1124	8
N1	-0.82	50.79	-.1145	9
O1	-2.28	54.96	-.1324	10
P1	-11.23	55.08	-.2946	20
R1	0.89	53.96	-.0762	3
S1	-9.02	56.23	-.2493	9
T1	-4.75	59.94	-.1627	13
U1	-5.24	61.96	-.1652	14
N 20				
Mean	-2.72	53.01		

TABLE 1.2

RETURN (R), VARIABILITY (V), AND R/V RATIO, AND RANK OF ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE WHOLE STUDY PERIOD)

Portfolio	R(%)	V	R/V Ratio	Rank
A2	+3.66%	41.22	-.0325	10
B2	-2.85	45.24	-.1735	15
D2	-0.96	45.12	-.1321	14
F2	0.59	59.83	-.0737	12
H2	6.94	41.45	.0468	4
I2	1.58	37.62	-.0909	13
J2	5.18	62.39	.0029	8
K2	6.65	52.07	.0317	6
L2	11.10	68.19	.0895	2
M2	7.75	57.47	.0479	3
N2	6.30	41.50	.0313	7
O2	4.86	33.25	-.0042	9
P2	2.66	42.80	-.0546	11
S2	9.83	43.24	.1117	1
T2	7.00	43.77	.0457	5
U2	-6.35	47.79	-.2375	16
N 16				
Mean	4.00%	47.68		

TABLE 1.3

RETURN (R), VARIABILITY (V), AND R/V RATIO, AND RANK OF ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE WHOLE STUDY PERIOD

Portfolio	R(%)	V	R/V Ratio	Rank
A3	-4.08%	67.71	-.1341	8
B3	0.92	47.12	-.0866	5
D3	1.92	36.81	-.0837	4
E5	-2.89	59.08	-.1335	9
E6	-15.14	79.88	-.2521	19
F3	-10.83	80.21	-.1974	16
G3	-21.27	73.16	-.3582	20
H3	-3.98	64.08	-.1401	10
I3	-5.24	62.43	-.1640	11
J3	-7.18	67.29	-.1810	13
K3	-6.83	93.30	-.1267	7
L3	-11.79	80.57	-.2084	17
M3	-0.17	63.22	-.0818	3
N3	1.57	63.19	-.0542	2
O3	-5.10	90.25	-.1119	6
P3	-6.97	65.15	-.1837	14
R3	-8.71	71.42	-.1920	15
S3	-7.46	72.68	-.1710	12
T3	-7.61	58.17	-.2167	18
U3	1.83	74.14	-.0427	1
N 20				
Mean	-5.95%	68.46		

TABLE 2.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A1	3.78	38.09	-.0320	2
2B1	1.91	44.53	-.0694	3
2C0	-7.40	62.58	-.1981	17
2D1	-1.47	45.74	-.1415	11
2E4	-1.58	38.72	-.1699	14
2F1	-4.49	54.53	-.1740	16
2G1	-10.18	62.31	-.2436	19
2H1	-2.00	53.64	-.1305	10
2I1	-0.18	51.80	-.1000	5
2J1	-3.29	50.24	-.1650	13
2K1	-6.00	63.61	-.1729	15
2L1	0.48	54.82	-.0999	4
2M1	0.27	51.37	-.1026	6
2N1	0.98	50.37	-.1187	9
2O1	0.42	53.82	-.1007	7
2P1	-9.84	52.60	-.2821	20
2R1	3.42	52.88	-.0299	1
2S1	-8.30	63.07	-.2108	18
2T1	-2.04	65.65	-.1072	8
2U1	-5.19	64.06	-.1591	12
N 20				
Mean	-2.54%	53.72		

TABLE 2.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A2	1.25	39.40	-.0951	10
2B2	-2.41	45.70	-.1621	16
2D2	0.61	44.67	-.0982	13
2F2	-1.42	67.19	-.0955	11
2H2	7.19	41.58	+.0527	6
2I2	0.31	37.18	-.1261	14
2J2	10.50	64.78	+.0849	2
2K2	11.38	68.78	+.0927	1
2L2	11.58	83.52	+.0787	3
2M2	9.78	72.45	+.0659	5
2N2	6.88	42.15	+.0446	7
2O2	5.52	32.29	+.0161	8
2P2	0.92	42.63	-.0957	12
2S2	8.01	41.80	+.0720	4
2T2	2.92	48.63	-.0428	9
2U2	-5.65	70.26	-.1516	15
N 16				
Mean	+4.21%	52.68		

TABLE 2.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A3	0.52	76.07	-.0589	3
2D3	2.47	39.96	-.0633	4
2E5	-0.71	54.28	-.1052	8
2E6	-19.91	86.03	-.2895	19
2F3	-14.26	79.52	-.2422	18
2G3	-2.53	83.95	-.0897	7
2H3	-3.30	63.00	-.1317	10
2I3	-4.58	63.03	-.1520	11
2J3	-5.58	66.34	-.1595	13
2K3	-5.46	87.58	-.1194	9
2L3	-8.14	85.98	-.1528	12
2M3	0.01	65.92	-.0757	5
2N3	5.72	63.41	+.0114	1
2O3	-3.32	98.53	-.0844	6
2P3	-6.57	66.39	-.1742	15
2R3	-7.77	73.69	-.1733	14
2S3	-14.88	87.88	-.2262	17
2T3	-8.54	65.75	-.2059	16
2U3	1.30	74.72	-.0495	2
N 19				
Mean	-5.03%	72.74		

TABLE 3.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A1	14.60	38.24	+.2510	1
3B1	7.58	31.41	+.0821	6
3C0	2.79	59.05	-.0374	15
3D1	0.06	48.14	-.1026	20
3E4	5.92	53.00	+.0173	11
3F1	6.57	55.08	+.0285	9
3G1	1.88	66.39	-.0470	16
3H1	10.09	48.77	+.1043	4
3I1	5.57	50.52	+.0013	13
3J1	2.65	46.94	-.0501	17
3K1	9.75	37.47	+.1267	2
3L1	6.81	61.34	+.0295	8
3M1	8.60	40.51	+.0887	5
3N1	4.26	55.86	-.0132	14
3O1	5.50	63.17	+.0079	12
3P1	0.54	85.30	-.0523	18
3R1	-1.29	63.90	-.0984	19
3S1	9.20	39.16	+.1072	3
3T1	9.89	64.94	+.0753	7
3U1	6.69	60.43	+.0280	10
N 20				
Mean	+5.88%	53.48		

TABLE 3.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A2	18.43	52.04	+.2580	2
3D2	16.14	35.42	+.3145	1
3F2	6.06	43.45	+.0244	7
3I2	7.65	38.72	+.0684	5
3K2	4.39	36.16	-.0168	8
3M2	-0.15	43.08	-.1195	12
3N2	10.76	49.65	+.1160	4
3O2	2.64	38.76	-.0609	10
3P2	18.86	79.91	+.1734	3
3S2	0.62	75.85	-.0577	9
3T2	7.07	48.56	+.0426	6
3U2	-1.11	56.91	-.1074	11
N 12				
Mean	+7.63%	49.87		

TABLE 3.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A3	8.04	58.40	+.0520	5
3B3	14.31	42.86	+.2172	1
3D3	4.94	35.18	-.0017	9
3E5	5.87	64.31	+.0135	6
3E6	-3.91	78.50	-.1135	10
3F3	5.42	80.76	+.0052	7
3G3	-58.03	104.23	-.6052	20
3H3	10.14	91.67	+.0560	4
3I3	-4.43	62.62	-.1506	14
3J3	-5.46	70.71	-.1479	13
3K3	-13.32	82.41	-.2223	17
3L3	-43.80	127.31	-.3833	19
3M3	10.97	50.22	+.1189	2
3N3	-3.80	67.52	-.1303	11
3O3	-9.40	82.71	-.1741	16
3P3	16.47	85.56	+.1107	3
3R3	-20.89	108.77	-.2380	18
3S3	-4.51	62.25	-.1527	15
3T3	-2.95	56.59	-.1405	12
3U3	4.80	122.07	-.0016	8
N 20				
Mean	-4.47%	76.73		

TABLE 4.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1971, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE NEUTRAL MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
4A1	0.76	34.84	-.1217	7
4B1	-12.52	50.40	-.3476	17
4C0	2.35	58.97	-.0449	2
4D1	-4.37	32.20	-.2910	16
4E4	9.64	48.39	+.0958	1
4F1	-8.05	52.58	-.2481	12
4G1	-1.88	62.48	-.1101	5
4H1	-0.93	98.74	-.0601	3
4I1	0.23	44.45	-.1073	4
4J1	-3.03	47.43	-.1693	9
4K1	-12.22	48.99	-.3515	18
4L1	-12.15	63.34	-.2707	14
4M1	-3.90	44.91	-.1981	10
4N1	-2.89	56.20	-.1404	8
4O1	-1.34	55.91	-.1133	6
4P1	-12.37	64.71	-.2684	13
4R1	-30.98	83.07	-.4331	20
4S1	-9.78	62.55	-.2363	11
4T1	-6.68	42.99	-.2717	15
4U1	-33.75	104.59	-.3705	19
N 20				
Mean	-7.19%	57.89		

TABLE 4.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1971, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE NEUTRAL MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
4A2	0.90	51.04	-.0803	1
4D2	-10.10	44.22	-.3415	13
4F2	0.96	41.37	-.0977	8
4H2	-2.92	58.67	-.1350	10
4I2	13.48	57.25	+.1659	2
4J2	-16.78	56.37	-.3863	15
4K2	-4.78	42.37	-.2308	12
4L2	3.67	64.97	-.0205	6
4M2	-15.44	57.43	-.3559	14
4N2	5.83	38.48	+.0216	4
4O2	-4.70	73.53	-.0041	5
4P2	10.03	45.19	+.1113	3
4S2	27.25	64.32	+.3459	1
4T2	-0.99	44.81	-.1337	9
4U2	-1.11	37.66	-.1622	11
N 15				
Mean	+0.35%	51.88		

TABLE 4.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1971, TO DECEMBER, 1973, AND HELD UNTIL MARCH, 1974 (THE NEUTRAL MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
4A3	-19.09	66.60	-.3617	13
4B3	-20.25	63.27	-.3990	16
4D3	2.25	32.40	-.0849	6
4E5	-8.10	61.65	-.2125	10
4E6	-17.98	65.96	-.3636	14
4F3	0.16	73.39	-.0659	4
4G3	-14.54	103.65	+.0920	2
4H3	-39.33	108.90	-.3979	15
4I3	-9.52	79.98	-.1815	9
4J3	-26.51	76.90	-.4097	17
4K3	-8.03	84.28	-.1546	8
4L3	-40.45	94.10	-.4830	18
4M3	-5.35	67.48	-.1534	7
4N3	-18.31	82.94	-.2810	12
4O3	16.25	107.03	+.1051	1
4P3	-86.44	136.55	-.6696	19
4R3	-55.92	78.59	-.7752	20
4S3	1.30	56.19	-.0658	3
4T3	-10.56	63.68	-.2444	11
4U3	0.21	56.50	-.0848	5
N 20				
Mean	-18.01%	78.02		

TABLE 5.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL JUNE, 1970 (THE DOWN MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
A1	-26.79	49.07	-.6478	7
B1	-32.27	63.31	-.5887	3
C0	-53.32	64.19	-.9085	18
D1	-52.41	64.08	-.8959	16
E4	-21.07	54.20	-.4810	1
F1	-39.17	62.05	-.7118	10
G1	-58.51	70.79	-.8972	17
H1	-43.75	65.09	-.7490	13
I1	-30.29	55.34	-.6377	6
J1	-42.62	62.92	-.7568	14
K1	-43.28	100.05	-.4825	2
L1	-34.74	66.12	-.6010	5
				12
M1	-39.43	59.39	-.7481	12
N1	-37.30	58.04	-.7288	11
O1	-39.77	63.84	-.7013	9
P1	-71.67	67.00	-1.1592	20
R1	-33.47	65.31	-.5890	4
S1	-63.52	80.79	-.8481	15
T1	-54.33	61.44	-.9656	19
U1	-41.08	67.68	-.6660	8
N 20				
Mean	-49.93%	65.04		

TABLE 5.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL JUNE, 1970 (THE DOWN MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
2A2	-20.73	43.68	-.5866	10
B2	-29.17	47.39	-.7210	12
D2	-31.96	49.32	-.7494	13
F2	-41.17	130.97	-.3449	6
H2	-11.25	50.04	-.3247	4
I2	-28.41	36.66	-.9113	15
J2	-21.97	68.01	-.3966	7
K2	4.43	94.32	-.0007	1
L2	-23.25	86.14	-.3279	5
M2	-14.53	48.18	-.4053	9
N2	-12.27	43.49	-.3971	8
O2	-1.17	32.31	-.1910	2
P2	-28.20	51.56	-.6439	11
T2	-8.99	56.34	-.2483	3
2U2	-49.40	68.85	-.7901	14
N 15				
Mean	-21.20%	60.48		

TABLE 5.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD UNTIL JUNE, 1970 (THE DOWN MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
2A3	-51.93	75.19	-.7571	9
D3	-19.93	51.17	-.4872	3
E5	-43.39	62.42	-.7752	11
E6	-74.29	95.02	-.8345	16
F3	-70.07	92.66	-.8102	14
G3	-78.82	88.85	-.9434	19
H3	-57.32	77.68	-.8023	13
I3	-38.34	67.52	-.6419	7
J3	-37.68	70.86	-.6023	5
K3	-43.62	142.41	-.3414	2
L3	-76.36	93.67	-.8686	17
M3	-47.32	84.64	-.6300	6
N3	-34.55	75.64	-.5229	4
O3	-56.30	90.87	-.6746	8
P3	-61.55	84.60	-.7866	10
R3	-71.91	83.97	-.8152	15
S3	-69.13	93.39	-.7938	12
T3	-51.53	61.20	-.9237	18
2U3	-24.27	101.35	-.2880	1
N 19				
Mean	53.07%	83.84		

TABLE 6.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL JUNE, 1971 (THE UP MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
3A1	27.16	29.97	.7394	11
3B1	31.33	28.40	.9271	6
3C0	39.92	47.93	.7286	12
3D1	25.72	52.98	.3911	18
3E4	6.43	48.98	.0292	20
3F1	46.86	47.60	.8794	7
3G1	48.29	49.99	.8660	8
3H1	49.37	46.09	.9627	5
I1	41.65	37.95	.9657	4
J1	26.72	40.49	.5364	17
K1	28.31	37.11	.6281	15
L1	43.13	58.27	.6547	13
M1	36.36	33.03	.9494	3
N1	23.46	61.40	.3055	19
01	43.65	61.82	.6252	16
P1	61.73	88.67	.6398	14
R1	27.99	29.04	.7908	9
S1	33.06	19.32	1.4524	1
3T1	65.65	45.37	1.336	2
3U1	42.61	49.55	.7590	10
N 20				
Mean	37.47%	45.698		

TABLE 6.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL JUNE, 1971 (THE UP MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
3A2	52.28	46.72	1.0119	2
3D2	35.31	29.31	1.0341	1
3F2	31.34	40.90	.6440	4
3I2	27.27	33.98	.6554	3
3K2	20.08	32.70	.4611	7
3M2	5.04	58.65	.0007	10
3N2	40.97	64.44	.5577	5
3P2	29.00	85.93	.2793	9
3S2	33.44	69.09	.4116	8
3T2	30.25	45.51	.5548	6
3U2	-51.48	36.56	-1.5448	11
N 11				
Mean	+23.04%	49.43		

TABLE 6.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, AND HELD UNTIL JUNE, 1971 (THE UP MARKET)

Portfolio	R(%)	V	R/V Ratio	Rank
3A3	44.72	46.86	.8476	5
B3	48.43	23.03	1.8858	1
D3	17.87	44.46	.2895	14
E5	53.69	37.62	1.2943	3
E6	38.07	63.71	.5235	9
F3	58.40	50.13	1.0652	4
G3	-74.43	107.82	-.7367	19
H3	39.40	85.01	.4047	12
I3	24.76	43.79	.4512	11
J3	47.82	52.34	.8181	6
K3	57.15	29.69	1.7564	2
M3	51.90	58.44	.8025	7
N3	29.02	61.78	.3893	13
O3	13.59	85.49	.1004	16
P3	46.12	67.96	.6051	8
R3	55.25	100.31	.5009	10
S3	-7.35	62.91	-.1963	18
T3	0.35	56.18	-.0827	17
3U3	27.99	121.72	.1889	15
N 19 Mean	+30.14%	63.12		

TABLE 7.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD FOR THE PERIOD JUNE, 1970, TO JUNE, 1971

Portfolio	R(%)	V	R/V Ratio	Rank
2A1	36.11	25.74	1.2086	4
B1	40.02	38.73	.9042	13
C0	48.85	39.32	1.1152	6
D1	29.82	30.09	.8249	16
E4	29.59	39.55	.6470	20
F1	41.58	35.05	1.0436	9
G1	41.47	40.73	.8954	15
H1	43.81	29.91	1.2975	1
I1	49.89	35.27	1.2728	2
J1	34.00	37.36	.7762	18
K1	43.15	34.58	1.1032	7
L1	39.44	34.28	1.0046	12
M1	44.10	37.33	1.0474	10
N1	37.28	35.47	.9031	14
O1	35.59	45.86	.6670	19
P1	38.21	29.38	1.1304	5
R1	51.17	37.74	1.2233	3
S1	44.17	38.47	1.0182	11
T1	46.16	50.88	.8089	17
2U1	45.76	37.44	1.0887	8
N 20				
Mean	+41.01%	36.66		

TABLE 7.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD FOR THE PERIOD JUNE, 1970, TO JUNE, 1971

Portfolio	R(%)	V	R/V Ratio	Rank
2A2	32.96	31.19	.8964	5
B2	33.45	36.94	.7702	9
D2	34.31	27.91	1.0502	1
F2	42.81	39.99	.9455	3
H2	35.26	36.18	.8364	7
I2	29.05	35.47	.6780	10
J2	32.87	56.40	.4932	14
K2	45.55	47.23	.8586	6
L2	64.30	58.97	1.0056	2
M2	55.40	55.43	.9086	4
N2	23.85	29.68	.6353	11
O2	17.50	37.73	.3313	15
P2	26.82	34.98	.6238	12
S2	23.69	32.54	.5744	13
T2	33.77	34.37	.7705	8
2U2	18.53	62.20	.2175	16
N 16				
Mean	+34.38%	41.07		

TABLE 7.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, AND HELD FOR THE PERIOD JUNE, 1970, TO JUNE, 1971

Portfolio	R(%)	V	R/V Ratio	Rank
2A3	58.83	37.89	1.4206	2
D3	29.10	39.24	.6412	15
E5	38.19	38.42	.8639	12
E6	14.87	74.86	.1318	9
F3	52.60	38.75	1.2283	3
G3	48.93	28.56	1.5333	1
H3	49.10	41.09	1.0732	5
I3	45.24	43.51	.9248	10
J3	56.05	43.02	1.1866	4
K3	70.31	68.95	.9472	9
L3	65.46	56.70	1.0663	7
M3	48.38	45.31	.9574	8
N3	38.69	37.47	.8991	11
O3	57.48	68.30	.7683	14
P3	42.10	44.35	.8365	13
R3	53.17	45.13	1.0673	6
S3	49.08	81.50	.5405	16
T3	35.82	58.41	.5276	17
2U3	39.81	70.96		
N 19				
Mean	+47.01%	50.65		

TABLE 8.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A1	4.05	28.68	-.0331	3
B1	2.55	32.10	-.0763	6
C0	-9.78	56.91	-.2597	16
D1	7.19	37.52	+.0584	1
E4	-5.25	28.95	-.3541	19
F1	-7.59	46.41	-.2712	17
G1	-14.37	57.32	-.3379	18
H1	-2.23	40.83	-.1771	11
I1	-6.54	46.99	-.2456	15
J1	-1.38	40.20	-.1587	10
K1	-9.21	47.68	-.2980	20
L1	.17	47.45	-.1018	8
M1	-.05	43.31	-.1166	9
N1	2.85	40.97	-.0524	4
O1	3.45	48.60	-.0319	2
P1	-2.99	39.01	-.2048	13
R1	0.57	44.57	-.0994	7
S1	-5.64	55.79	-.1907	12
T1	1.02	58.65	-.0679	5
2U1	-9.59	57.48	-.2538	14
N 20				
Mean	-2.64%	44.97		

TABLE 8.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A2	-1.63	34.10	-.1944	12
B2	-4.10	39.91	-.2280	16
D2	1.17	39.19	-.0977	10
F2	-5.51	47.01	-.2236	15
H2	2.55	34.79	-.0704	7
I2	-2.33	33.90	-.2162	14
J2	9.23	64.69	+.0654	1
K2	1.27	63.73	-.0585	5
L2	2.92	87.77	-.0237	3
M2	-3.84	75.61	-.1169	11
N2	7.09	42.79	+.0484	2
O2	3.60	30.04	-.0460	4
P2	2.10	35.92	-.0806	8
S2	2.08	44.06	-.0663	6
T2	-5.78	50.47	-.2136	13
2U2	-1.25	70.53	-.0886	9
N 16				
Mean	+0.47%	49.65		

TABLE 8.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM MAY, 1969, TO MAY, 1970, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
2A3	-0.03	71.04	-.0708	3
D3	1.61	32.82	-.1033	6
E5	1.94	47.78	-.0640	1
E6	-19.44	81.82	-.2987	15
F3	-16.61	70.79	-.3052	17
G3	-0.49	89.51	-.0613	2
H3	-2.70	49.11	-.1568	9
I3	-9.41	57.48	-.2507	14
J3	-15.36	58.83	-.3461	18
K3	-20.31	65.42	-.3869	19
L3	-10.11	80.14	-.1885	10
M3	-0.36	55.30	-.0969	5
N3	-7.13	59.50	-.2038	12
O3	-4.58	102.12	-.0938	4
P3	-5.98	56.55	-.1942	11
R3	-4.69	68.31	-.1419	8
S3	-16.79	80.18	-.2718	16
2T3	-9.03	60.62	-.2314	13
2U3	-4.19	65.82	-.1396	7
N 19				
Mean	-7.56%	65.95		

TABLE 9.1

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL GROWTH PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A1	10.81	38.85	+.1495	1
B1	1.85	29.37	-.1073	5
3C0	-9.56	58.84	-.2480	19
D1	-3.77	46.68	-.1879	11
E4	5.75	54.34	+.0138	2
F1	-6.83	51.74	-.2286	15
G1	-10.74	67.17	-.2343	17
H1	-2.97	43.03	-.1852	10
I1	-6.44	48.52	-.2358	18
J1	-5.35	44.58	-.2322	16
K1	3.57	36.05	-.0397	3
L1	-3.06	59.49	-.13548	7
M1	-0.64	40.91	-.1379	8
N1	-2.13	52.63	-.13547	6
O1	-6.01	57.86	-.1903	12
P1	-19.82	73.70	-.3368	20
R1	-9.25	66.26	-.2151	14
S1	1.26	40.68	-.0919	4
T1	-8.66	63.69	-.2145	13
3U1	-5.26	60.82	-.1687	9
N 20				
Mean	-3.86%	51.76		

TABLE 9.2

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL INCOME PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A2	8.22	49.66	+.0648	3
D2	9.76	35.98	+.1323	2
F2	-1.57	41.67	-.1577	12
I2	1.13	37.28	-.1038	8
K2	.60	34.62	-.1271	10
M2	1.72	38.43	-.0853	7
N2	0.72	40.07	-.1068	9
O2	2.64	38.76	-.0609	5
P2	15.80	78.11	+.1382	1
S2	-6.31	75.70	-.1494	11
T2	0.77	47.94	-.0851	6
3U2	1.95	56.84	-.0537	4
N 12				
Mean	+2.95%	47.92		

TABLE 9.3

RETURN (R), VARIABILITY (V), R/V RATIO, AND RANK FOR ALL SPECULATIVE PORTFOLIOS CONTAINING RECOMMENDATIONS COLLECTED FROM JUNE, 1970, TO MAY, 1971, HELD FOR THE PERIOD JUNE, 1971, TO MARCH, 1974

Portfolio	R(%)	V	R/V Ratio	Rank
3A3	-3.02	57.53	-.1394	7
B3	6.09	42.92	+.0254	1
D3	1.42	31.50	-.1137	6
E5	-10.04	62.03	-.2425	11
E6	-17.87	75.30	-.3170	15
F3	-12.21	84.79	-.2029	10
G3	-54.13	102.81	.5751	19
H3	1.32	92.23	-.0390	4
I3	-14.14	64.49	-.2968	13
J3	-19.95	65.74	-.3795	17
K3	-32.49	80.06	-.4862	19
L3	-40.49	127.93	-.3556	16
M3	1.11	47.42	-.0820	5
N3	-14.72	63.01	-.3130	14
O3	-15.65	82.45	-.2505	12
P3	6.61	90.83	+.0177	2
R3	-39.25	108.97	-.4060	18
S3	-3.66	61.70	-.1404	8
T3	-3.95	56.29	-.1590	9
3U3	3.39	121.72	-.0132	3
N 20				
Mean	-13.08%	76.09		

APPENDIX 2

TABLE 1.1

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL GROWTH PORTFOLIOS PURCHASED FROM MAY, 1969, TO DECEMBER, 1973--EVALUATIONS MADE

	Time											
	From May, 1969 To March, 1974			From June, 1971 To March, 1974			From June, 1970 To June, 1971			From May, 1969 To June, 1970		
	A	B	R	A	B	R	A	B	R	A	B	R
1A1	6.36	0.79	0.81	7.70	0.55	0.60	9.59	0.81	0.88	4.48	0.97	0.66
1B1	2.05	0.95	0.82	2.37	0.61	0.61	8.93	0.89	0.81	6.40	1.30	0.95
1C0	-5.26	1.16	0.75	-7.10	1.02	0.58	13.24	1.10	0.79	-17.40	1.13	0.86
1D1	0.66	0.72	0.56	10.24	0.59	0.44	13.30	0.53	0.48	-32.72	0.64	0.52
1E4	2.89	0.74	0.65	2.28	0.53	0.39	0.46	0.86	0.79	9.24	0.95	0.92
1F1	-2.86	1.12	0.76	-7.01	0.97	0.59	13.98	0.94	0.81	1.84	1.28	0.92
1G1	-7.16	1.12	0.66	-8.49	1.13	0.61	15.09	0.92	0.72	-30.32	0.85	0.52
1H1	-0.59	1.09	0.79	-1.19	0.81	0.60	13.12	0.96	0.89	-0.73	1.34	0.90
1I1	1.19	1.00	0.75	-4.95	0.87	0.56	16.84	1.00	0.90	3.18	1.04	0.91
1J1	-2.88	1.06	0.80	-2.05	0.84	0.60	0.20	1.07	0.83	-2.72	1.25	0.94
1K1	-2.27	1.25	0.78	-3.12	0.90	0.64	10.81	0.90	0.74	14.85	1.82	0.88
1L1	0.83	1.13	0.82	-1.60	0.97	0.65	8.15	1.07	0.94	7.49	1.32	0.95
1M1	0.71	1.05	0.79	-0.87	0.87	0.59	12.90	1.00	0.90	-2.96	1.14	0.94
1N1	0.58	1.05	0.81	0.65	0.86	0.63	4.89	1.03	0.88	1.75	1.22	0.96
1O1	-0.85	1.04	0.71	-0.51	0.91	0.54	5.71	0.98	0.71	-3.27	1.14	0.86
1P1	-9.91	1.11	0.73	-5.22	0.81	0.57	11.45	0.90	0.92	-32.80	1.22	0.75
1R1	2.44	1.07	0.78	-1.75	0.97	0.66	21.93	0.86	0.72	2.86	1.14	0.87
1S1	-7.44	1.16	0.72	-5.30	0.83	0.52	14.53	0.89	0.86	-18.81	1.39	0.78
1T1	-3.26	1.20	0.76	-4.37	0.95	0.55	7.67	1.36	0.87	-15.39	1.21	0.94
1U1	-3.72	1.20	0.75	-9.28	1.06	0.58	16.02	1.01	0.83	1.57	1.33	0.91
N	20			20			20			20		
Mean	-1.42%	1.05		-1.98%	0.85		10.94%	0.94		-5.17%	1.18	

TABLE 1.2

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL INCOME PORTFOLIOS PURCHASED FROM MAY, 1969, TO DECEMBER, 1973--EVALUATIONS MADE

	Time											
	From May, 1969	To March, 1974		From June, 1971	To March, 1974		From June, 1970	To June, 1971		From May, 1969	To June, 1970	
	A	B	R	A	B	R	A	B	R	A	B	R
1A2	4.70	0.70	0.67	2.03	0.48	0.41	10.69	0.82	0.85	6.78	0.85	0.87
1B2	-1.74	0.84	0.73	-4.38	0.67	0.51	1.81	1.04	0.86	-2.87	0.88	0.92
1D2	0.23	0.86	0.74	-1.96	0.69	0.53	14.60	0.72	0.78	0.43	1.00	0.93
1F2	0.22	1.14	0.67	-0.21	0.63	0.51	13.90	0.81	0.61	32.17	2.30	0.84
1H2	6.66	0.71	0.63	2.54	0.44	0.38	5.42	0.97	0.81	21.78	1.05	0.86
1I2	0.87	0.71	0.66	-0.29	0.54	0.45	-0.70	1.00	0.87	-5.49	0.71	0.86
1J2	4.43	0.93	0.61	1.36	0.86	0.49	-1.50	1.13	0.62	28.29	1.17	0.86
1K2	5.36	0.65	0.44	-0.49	0.41	0.32	-9.49	1.23	0.71	22.29	0.81	0.43
1L2	10.70	0.93	0.48	3.05	0.79	0.40	38.50	0.84	0.46	2.39	0.84	0.40
1M2	5.98	0.86	0.56	-2.60	0.75	0.42	9.90	1.17	0.79	58.16	1.24	0.99
1N2	5.36	0.62	0.57	4.09	0.50	0.42	0.04	0.99	0.85	1.02	0.56	0.57
1O2	4.68	0.24	0.25	2.10	-0.02	-0.02*	-3.13	0.66	0.50	9.81	0.38	0.54
1P2	2.54	0.70	0.60	5.09	0.47	0.36	-3.13	0.98	0.80	-5.58	0.79	0.76
1S2	6.17	0.59	0.47	4.47	0.60	0.42	4.52	0.69	0.64	--	--	--
3T2	6.39	0.75	0.61	0.19	0.68	0.46	10.45	0.83	0.84	34.85	1.01	0.88
1U2	-6.75	0.76	0.57	-2.89	0.42	0.36	-23.57	1.46	0.80	-26.63	0.75	0.52
N	16			16			16			15		
Mean	+3.49%	0.75		0.67%	0.60		4.27%	0.96		11.83%	0.96	

*Eliminated

TABLE 1.3

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL SPECULATIVE PORTFOLIOS PURCHASED FROM MAY, 1969, TO DECEMBER, 1973--EVALUATIONS MADE

	Time											
	From May, 1969		To March, 1974	From June, 1971		To March, 1974	From June, 1970		To June, 1971	From May, 1969		To June, 1970
	A	B	R	A	B	R	A	B	R	A	B	R
1A3	-2.21	1.28	0.75	-6.13	0.98	0.55	29.74	0.87	0.70	-1.80	1.57	0.90
1B3	-2.77	0.88	0.66	-9.65	0.84	0.62	33.04	0.59	0.79			
1D3	2.81	0.60	0.61	2.68	0.29	0.31	-6.31	0.99	0.75	5.99	0.80	0.77
1E5	-1.35	1.09	0.72	-3.53	0.91	0.51	16.16	0.93	0.84	-3.75	1.22	0.93
1E5	-14.74	1.56	0.71	-16.93	1.37	0.58	-8.20	1.33	0.66	-30.31	2.42	0.91
1F3	-8.92	1.51	0.73	-10.60	1.31	0.57	30.48	0.82	0.61	-13.69	1.77	0.88
1G3	-22.63	1.49	0.75	-22.83	1.58	0.69	12.45	0.55	0.44	-22.06	1.73	0.89
1H3	-3.79	1.29	0.81	-2.76	1.01	0.65	14.97	1.10	0.76	-14.70	1.49	0.93
1I3	1.19	1.00	0.75	-4.95	0.87	0.56	16.84	1.00	0.90	0.54	1.04	0.91
1J3	-5.50	1.27	0.75	-17.41	1.18	0.61	25.95	1.01	0.78	5.46	1.35	0.90
1K3	-10.01	1.81	0.60	-23.15	1.39	0.66	28.25	1.53	0.72	6.87	2.32	0.64
1L3	-11.76	1.57	0.70	-14.97	1.24	0.51	20.70	1.42	0.71	-29.33	1.55	0.83
1M3	-0.12	1.30	0.77	-0.04	1.03	0.60	14.58	1.11	0.78	-1.35	1.60	0.89
1N3	-0.04	1.04	0.64	1.54	0.81	0.47	5.76	1.02	0.69	-6.28	1.26	0.78
1O3	-3.46	1.44	0.64	-4.61	1.39	0.52	8.96	1.35	0.62	-10.68	1.40	0.73
1P3	-9.20	1.36	0.78	-5.99	1.10	0.63	3.66	1.28	0.78	-26.70	1.56	0.90
1R3	-7.09	1.38	0.69	-5.56	1.14	0.54	15.44	1.23	0.80	-27.85	1.39	0.70
1S3	-5.64	1.39	0.71	-3.09	1.11	0.60	19.81	0.98	0.46	-17.07	1.63	0.79
1T3	-7.62	0.99	0.65	-5.99	1.08	0.63	-1.44	1.16	0.78	-34.57	0.59	0.44
2U3	-0.62	1.30	0.64	-2.89	1.22	0.60	1.26	1.29	0.58	7.08	1.43	0.67
N	20			20			20			20		
Mean	-5.67%	1.28		-7.84%	1.09		14.11%	1.08		-11.27%	1.50	

TABLE 2.1

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL GROWTH PORTFOLIOS PURCHASED FROM MAY, 1969, TO MAY, 1970--EVALUATIONS MADE

	Time											
	From May, 1969		To March, 1974	From June, 1971		To March, 1974	From June, 1970		To June, 1971	From May, 1969		To June, 1970
	A	B	R	A	B	R	A	B	R	A	B	R
2A1	4.86	0.79	0.81	4.46	0.56	0.57	10.87	0.82	0.91	4.48	0.97	0.95
2B1	3.04	0.93	0.77	2.77	0.49	0.46	8.63	1.02	0.86	6.40	1.30	0.95
2C0	-5.89	1.21	0.76	-8.84	1.16	0.64	17.81	1.01	0.73	-17.40	1.13	0.86
2D1	-0.70	0.69	0.56	7.82	0.58	0.49	22.79	0.23	0.24	-32.72	0.64	0.52
2E4	-0.84	0.71	0.68	-5.04	0.48	0.44	7.09	0.72	0.63	9.24	0.95	0.92
2F1	-3.01	1.09	0.77	-6.79	0.91	0.59	13.37	0.92	0.82	1.84	1.28	0.92
2G1	-10.38	1.19	0.68	-13.01	1.29	0.66	14.07	0.89	0.71	-30.32	0.85	0.52
2H1	-0.48	1.06	0.78	-1.52	0.76	0.57	16.23	0.90	0.84	-0.72	1.34	0.90
2I1	1.26	1.00	0.73	-5.62	0.86	0.54	19.42	0.99	0.89	3.18	1.04	0.91
2J1	-1.84	1.05	0.81	-0.60	0.81	0.62	1.28	1.07	0.82	-2.72	1.25	0.94
2K1	-4.13	1.33	0.80	-8.21	1.06	0.70	15.00	0.92	0.75	14.85	1.82	0.88
2L1	1.95	1.08	0.80	0.98	0.87	0.60	8.80	0.99	0.93	7.49	1.32	0.95
2M1	1.61	1.05	0.79	0.64	0.87	0.60	11.03	1.07	0.90	-2.96	1.14	0.94
2N1	2.38	1.01	0.82	3.63	0.78	0.62	6.55	1.00	0.87	1.75	1.22	0.96
2O1	1.78	1.01	0.69	4.19	0.87	0.53	8.81	0.88	0.62	-3.27	1.14	0.86
2P1	-8.58	1.08	0.73	-2.49	0.74	0.56	12.33	0.84	0.90	-32.80	1.22	0.75
2R1	4.91	1.02	0.77	1.51	0.85	0.63	25.85	0.83	0.68	2.86	1.14	0.87
2S1	-6.76	1.19	0.67	-5.08	0.86	0.45	13.01	1.02	0.84	-18.81	1.39	0.78
2T1	-0.74	1.19	0.72	1.43	0.93	0.49	2.99	1.39	0.83	-15.39	1.21	0.94
2U1	-3.61	1.21	0.75	-8.72	1.09	0.57	12.66	1.08	0.86	1.57	1.33	0.91
N	20			20			20			20		
Mean	-1.26%	1.04		-1.92%	0.84		+12.43%	0.93		-5.17%	1.18	

TABLE 2.2

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL INCOME PORTFOLIOS PURCHASED FROM MAY, 1969, TO MAY, 1970--EVALUATIONS MADE

	Time											
	From May, 1969 To March, 1974			From June, 1971 To March, 1974			From June, 1970 To June, 1971			From May, 1969 To June, 1970		
	A	B	R	A	B	R	A	B	R	A	B	R
2A2	2.26	0.70	0.67	-1.19	0.49	0.43	9.72	0.76	0.77	6.78	0.85	0.87
2B2	-1.30	0.85	0.73	-3.51	0.67	0.51	0.87	1.06	0.86	-2.87	0.88	0.92
2D2	1.75	0.82	0.71	1.72	0.62	0.47	10.92	0.75	0.79	0.43	1.00	0.93
2F2	-1.79	1.27	0.70	-4.90	0.85	0.57	15.58	0.90	0.67	32.17	2.30	0.84
2H2	6.94	0.70	0.62	2.99	0.42	0.37	5.42	0.97	0.81	21.78	1.05	0.86
2I2	-0.39	0.70	0.66	-1.98	0.54	0.45	-0.81	0.97	0.84	-5.49	0.71	0.86
2J2	9.97	0.74	0.44	9.44	0.47	0.23	-1.50	1.13	0.62	28.29	1.17	0.86
2K2	10.36	0.65	0.38	1.75	0.41	0.18	18.42	0.88	0.53	22.29	0.81	0.43
2L2	11.38	0.98	0.42	4.34	0.91	0.33	38.50	0.84	0.46	2.39	0.84	0.40
2M2	7.83	1.00	0.51	-2.93	0.97	0.42	21.84	1.11	0.65	58.16	1.24	0.99
2N2	6.01	0.57	0.52	7.51	0.50	0.38	-0.27	0.78	0.81	1.02	0.56	0.57
2O2	5.36	0.18	0.19	3.14	-0.17	-0.15	-3.13	0.66	0.50	9.81	0.38	0.54
2P2	0.84	0.69	0.59	2.26	0.43	0.33	-3.59	0.98	0.79	-5.58	0.79	0.76
2S2	5.14	0.46	0.37	2.53	0.43	0.30	4.68	0.61	0.61			
2T2	2.29	0.82	0.60	-5.11	0.87	0.51	11.75	0.71	0.66	34.85	1.01	0.88
2U2	-6.08	0.99	0.56	-0.22	0.91	0.44	-28.95	1.55	0.82	-26.63	0.75	0.52
N	16			16			16			15		
Mean	+3.79%	0.76		+0.99%	0.60		+6.24%	0.92		11.83%	0.96	

TABLE 2.3

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL SPECULATIVE PORTFOLIOS PURCHASED FROM MAY, 1969, TO MAY, 1970--EVALUATIONS MADE

	Time											
	From May, 1969		To March, 1974	From June, 1971		To March, 1974,	From June, 1970		To June, 1970	From May, 1969		To June, 1970
	A	B	R	A	B	R	A	B	R	A	B	R
2A3	2.16	1.[illegible]	0.68	0.61	0.97	0.45	34.00	0.81	0.65	-1.80	1.57	0.90
2D3	3.34	0.5[illegible]	0.58	1.78	0.26	0.25	1.68	0.89	0.73	5.99	0.80	0.77
2E5	0.68	1.07	0.75	2.53	0.89	0.54	7.90	0.98	0.81	-3.75	1.22	0.93
2E6	-19.66	1.57	0.66	-18.25	1.43	0.53	-34.47	1.60	0.68	-30.31	2.42	0.91
2F3	-12.26	1.51	0.74	-15.53	1.29	0.59	25.50	0.90	0.60	-13.69	1.77	0.88
2G3	-3.67	1.33	0.62	0.41	1.09	0.44	26.89	0.71	0.72	-22.06	1.73	0.89
2H3	-3.08	1.26	0.80	-1.79	0.94	0.63	15.37	1.10	0.75	-14.70	1.49	0.93
2I3	-3.10	1.13	0.69	-8.58	0.96	0.49	9.27	1.17	0.83	0.54	1.22	0.88
2J3	-3.90	1.28	0.76	-14.28	1.23	0.63	25.74	0.99	0.77	5.46	1.35	0.90
2K4	-8.41	1.63	0.62	-19.44	1.05	0.53	25.58	1.45	0.64	6.87	2.32	0.64
2L3	-8.15	1.53	0.65	-9.24	1.15	0.43	22.94	1.39	0.71	-29.33	1.66	0.83
2M3	-0.02	1.31	0.76	0.28	1.04	0.58	13.13	1.14	0.80	-1.35	1.60	0.89
2N3	4.16	1.03	0.64	8.03	0.82	0.47	10.11	0.93	0.66	-6.28	1.26	0.78
2O3	-1.77	1.43	0.59	-4.08	1.39	0.45	21.20	1.17	0.57	-10.68	1.40	0.73
2P3	-8.81	1.34	0.76	-5.17	1.06	0.59	2.42	1.30	0.78	-26.70	1.56	0.90
2R3	-6.09	1.41	0.70	-3.65	1.22	0.56	14.64	1.25	0.83	-27.85	1.39	0.70
2S3	-12.95	1.47	0.63	-15.76	1.30	0.50	17.51	1.04	0.42	-17.07	1.63	0.79
2T3	-8.62	0.96	0.58	-8.48	0.92	0.50	-5.17	1.33	0.75	-34.57	0.59	0.44
2U3	-1.22	1.32	0.65	-3.41	1.26	0.61	-2.22	1.37	0.61	7.08	1.43	0.67
N	19			19			19			19		
Mean	-4.81%	1.29		-6.00%	1.07		+12.21%	1.13		11.27%	1.50	

TABLE 3.1

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL GROWTH PORTFOLIOS PURCHASED FROM JUNE, 1970, TO MAY, 1971--EVALUATIONS MADE

	May 69 to March 74			June 71 to March 74			June 70 to June 71		
	A	B	R	A	B	R	A	B	R
3A1	11.04	0.76	0.68	11.38	0.75	0.65	8.95	0.80	0.75
3B1	4.75	0.66	0.66	2.38	0.60	0.60	11.50	0.76	0.85
3C0	-3.65	1.08	0.57	-8.87	0.98	0.50	10.14	1.14	0.72
3D1	0.12	1.07	0.70	-2.44	1.02	0.66	14.00	1.36	0.98
3E4	1.61	0.65	0.38	5.53	0.58	0.32	-24.13	1.17	0.74
3F1	-0.21	1.13	0.66	-6.03	1.02	0.58	14.17	1.23	0.83
3G1	-3.21	1.34	0.66	-9.56	1.28	0.62	22.83	1.20	0.77
3H1	3.81	1.06	0.70	-2.22	0.89	0.64	13.68	1.35	0.78
3I1	-0.36	1.02	0.64	-5.50	0.92	0.56	12.88	1.09	0.88
3J1	-2.94	0.95	0.66	-4.58	0.88	0.59	-3.45	1.15	0.83
3K1	5.10	0.80	0.64	4.29	0.79	0.62	8.16	0.77	0.58
3L1	2.31	1.17	0.63	-2.01	1.01	0.54	7.73	1.61	0.93
3M1	3.28	0.89	0.62	0.03	0.88	0.58	17.69	0.71	0.64
3N1	-1.50	0.96	0.59	-1.41	0.99	0.61	0.92	0.86	0.45
3O1	0.30	1.13	0.54	-5.21	0.92	0.45	4.74	1.69	0.77
3P1	-7.53	1.45	0.59	-18.59	1.07	0.48	3.64	2.24	0.76
3R1	-6.24	1.28	0.68	-7.96	1.35	0.66	8.22	0.92	0.81
3S1	5.15	0.70	0.60	1.92	0.67	0.53	16.37	0.64	0.84
3T1	2.87	1.18	0.57	-7.90	1.01	0.48	34.91	1.16	0.76
3U1	0.95	0.97	0.52	-4.66	0.97	0.50	26.21	0.65	0.11
N	20			20			20		
Mean	+0.78%	1.01		-3.07%	0.93		+10.46%	1.13	

TABLE 3.2

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL INCOME PORTFOLIOS PURCHASED FROM JUNE, 1970, TO MAY, 1971--EVALUATIONS MADE

	May 69 to March 74			June 71 to March 74			June 70 to June 71		
	A	B	R	A	B	R	A	B	R
3A2	14.79	0.77	0.50	8.72	0.66	0.44	32.14	0.87	0.54
3D2	12.17	0.66	0.60	10.31	0.66	0.56	19.93	0.58	0.60
3F2	2.93	0.64	0.48	-1.21	0.57	0.42	14.51	0.72	0.54
3I2	3.52	0.69	0.54	1.46	0.56	0.43	-0.80	1.07	0.89
3K2	1.53	0.58	0.49	0.64	0.48	0.40	-5.54	0.98	0.83
3M2	-1.78	0.30	0.23	-1.81	0.09	0.08	*-22.78	1.17	0.57
3N2	6.18	0.78	0.54	1.11	0.52	0.42	1.99	1.48	0.73
3P2	15.33	0.69	0.28	16.10	0.61	0.26	3.76	1.06	0.34
3S2	-2.25	1.04	0.49	-4.97	0.96	0.43	4.90	1.28	0.71
3T2	3.70	0.80	0.51	1.13	0.70	0.43	7.01	1.06	0.72
3U2	0.54	0.49	0.30	2.54	0.43	0.26	6.85	1.63	1.00
N	11			10			11		
Mean	5.15%	0.68		+3.58%	0.62		+5.63%	1.08	

*Eliminated

TABLE 3.3

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL SPECULATIVE PORTFOLIOS PURCHASED FROM JUNE, 1970, TO MAY, 1971--EVALUATIONS MADE

	May 69 to March 74			June 71 to March 74			June 70 to June 71		
	A	B	R	A	B	R	A	B	R
3A3	3.11	1.06	0.59	-2.08	0.98	0.53	19.40	1.08	0.70
3B3	10.96	0.82	0.66	7.06	0.81	0.62	33.04	0.59	0.79
3D3	3.01	0.45	0.41	1.52	0.26	0.25	-7.71	1.15	0.80
3E5	-0.76	1.15	0.60	-8.93	1.03	0.51	23.37	1.15	0.90
3E6	-12.54	1.50	0.64	-16.34	1.43	0.60	-2.04	1.53	0.69
3F3	-3.32	1.44	0.59	-11.05	1.49	0.56	37.26	0.79	0.53
3G3	-64.40	1.32	0.40	-52.52	1.92	0.58	-61.69	-0.57	-0.16 *
3H3	2.37	1.56	0.56	2.44	1.71	0.58	17.23	0.94	0.36
3I3	-11.08	1.09	0.51	-13.43	1.06	0.46	-3.32	1.06	0.73
3J3	-9.47	1.15	0.58	-18.64	1.03	0.53	24.27	1.12	0.68
3K3	-19.32	1.56	0.67	-30.91	1.59	0.67	39.76	0.81	0.72
3L3	-40.46	2.13	0.48	-37.86	2.12	0.48			
3M3	7.04	0.93	0.59	2.07	0.89	0.59	32.09	0.75	0.46
3N3	-9.36	0.94	0.50	-13.98	0.73	0.39	-10.57	1.48	0.69
3O3	-15.59	1.44	0.54	-14.71	1.41	0.51	-22.44	1.60	0.67
3P3	8.74	1.37	0.52	8.29	1.45	0.52	19.56	1.02	0.45
3R3	-23.99	0.54	0.16 *	-39.70	0.16	0.05 *	23.09	1.16	0.41
3S3	-8.88	0.84	0.39	-3.13	0.96	0.42	-23.87	0.69	0.35
3T3	-8.55	1.15	0.61	-2.89	1.39	0.71	-10.68	0.48	0.24
3U3	7.28	1.01	0.26	4.20	1.19	0.30	176.36	-5.71	-1.00 *
N	19			19			17		
Mean	-8.49%	1.21		-10.57%	1.23		11.08%	1.02	

*Eliminated

TABLE 4.1

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL GROWTH PORTFOLIOS PURCHASED FROM JUNE, 1971, TO DECEMBER, 1973 EVALUATIONS MADE FROM JUNE, 1971, TO MARCH, 1974

	A	B	R
4A1	1.44	0.55	0.51
4B1	-11.34	0.63	0.36
4C0	1.72	1.11	0.56
4D1	-3.26	0.19	0.15*
4E4	9.02	0.68	0.43
4F1	-8.45	1.04	0.57
4G1	-2.30	1.00	0.50
4H1	2.49	0.72	0.26
4I1	-0.35	0.91	0.59
4J1	-3.49	0.78	0.50
4K1	-11.14	0.92	0.54
4L1	-9.86	1.53	0.73
4M1	-4.35	0.82	0.52
4N1	-2.24	0.79	0.43
4O1	-1.61	0.93	0.51
4P1	-13.08	0.84	0.40
4R1	-31.77	1.52	0.58
4S1	-10.30	1.13	0.53
4T1	-6.93	0.71	0.45
4U1	-35.99	1.57	0.44
N	19		
Mean	-7.29%	0.96	

*Eliminated

TABLE 4.2

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL INCOME PORTFOLIOS PURCHASED FROM JUNE, 1971, TO DECEMBER, 1973 EVALUATIONS MADE FROM JUNE, 1971 TO MARCH, 1974

	A	B	R
4A2	2.36	0.58	0.33
4D2	-10.40	0.66	0.47
4F2	0.38	0.55	0.41
4H2	-4.29	0.74	0.39
4I2	16.97	0.59	0.29
4J2	-12.49	0.77	0.39
4K2	-5.22	0.29	0.21
4L2	4.46	0.75	0.38
4M2	-11.26	0.65	0.31
4N2	5.48	0.33	0.26
4O2	-3.48	0.22	0.08 *
4P2	10.58	0.42	0.28
4S2	32.81	0.89	0.43
4T2	-0.46	0.60	0.39
4U2	-1.54	0.28	0.23
N	14		
Mean	+1.96%	0.58	

*Eliminated

TABLE 4.3

Y-INTERCEPT, REGRESSION COEFFICIENTS, AND CORRELATION COEFFICIENTS FOR ALL SPECULATIVE PORTFOLIOS PURCHASED FROM JUNE, 1971, TO DECEMBER, 1973 EVALUATIONS MADE FROM JUNE, 1971 TO MARCH, 1974

	A	B	R
4A3	-17.79	0.91	0.44
4B3	-19.37	0.95	0.51
4D3	2.74	0.32	0.31
4E5	-8.59	0.89	0.45
4E6	-18.66	1.06	0.46
4F3	-1.23	1.10	0.46
4G3	-9.62	1.99	0.57
4H3	-36.50	1.58	0.43
4I3	-8.70	0.45	0.16
4J3	-27.68	1.23	0.50
4K3	-6.53	1.40	0.52
4L3	-42.24	1.11	0.37
4M3	-5.84	1.23	0.58
4N3	-17.37	0.76	0.28
4O3	15.18	1.64	0.48
4P3	-76.26	1.28	0.28
4R3	-112.91	-1.63	-0.86*
4S3	0.85	1.01	0.59
4T3	-9.42	0.91	0.45
4U3	-0.79	0.93	0.48
N	19		
Mean	-15.15	1.09	

*Eliminated

APPENDIX 3

NUMBER OF RECOMMENDATIONS AND CORRELATION COEFFICIENTS (r) FOR ALL PORTFOLIOS IN THE STUDY PURCHASED DURING EACH PERIOD OF THE MARKET CYCLE, MAY, 1969, TO DECEMBER, 1973

Portfolio	Down Market		Up Market		Neutral Market	
	Number	r	Number	r	Number	r
A1	135	.95	22	.75	51	.51
A2	72	.87	12	.54	17	.33
A3	39	.90	26	.70	52	.44
B1	21	.95	45	.85	10	.36
B2	49	.92	2	-	0	-
B3	0	-	9	.79	11	.51
C0	36	.86	29	.75	65	.56
D1	18	.52	6	.98	11	.15
D2	60	.93	49	.60	77	.47
D3	15	.77	18	.80	26	.31
E4	16	.92	7	.74	24	.43
E5	23	.93	20	.90	78	.45
E6	6	.91	14	.69	19	.46
F1	100	.92	60	.83	91	.46
F2	4	.84	10	.54	21	.57
F3	30	.88	24	.53	24	.41
G1	19	.52	7	.71	25	.50
G2	0	-	0	-	0	-
G3	3	.89	3	-.16	4	.57
H1	56	.90	28	.78	7	.26
H2	20	.86	0	-	1	.39
H3	44	.93	2	.36	4	.43
I1	67	.91	47	.88	29	.59
I2	29	.86	17	.89	9	.29
I3	58	.88	2	.73	11	.16
J1	66	.94	28	.83	38	.50
J2	8	.86	0	-	11	.39
J3	23	.90	11	.68	11	.50

Portfolio	Down Market		Up Market		Neutral Market	
	Number	r	Number	r	Number	r
K1	12	.88	35	.58	57	.54
K2	2	.43	31	.83	19	.21
K3	4	.64	9	.72	11	.52
L1	31	.95	8	.93	17	.73
L2	1	.40	0	-	3	.38
L3	10	.83	1	-	6	.37
M1	59	.94	31	.64	32	.52
M2	2	.99	1	.57	1	.31
M3	21	.89	7	.46	5	.58
N1	47	.96	22	.45	16	.43
N2	10	.57	9	.73	4	.26
N3	13	.78	5	.69	2	.28
O1	21	.86	9	.77	34	.51
O2	3	.54	3	-	1	.08
O3	10	.73	5	.67	7	.48
P1	54	.75	4	.76	16	.40
P2	17	.76	1	.34	10	.28
P3	23	.90	1	.45	2	.28
R1	22	.87	5	.81	4	.58
R2	0	-	0	-	0	-
R3	18	.70	1	.41	1	-.86
S1	19	.78	16	.84	111	.53
S2	0	-	1	.71	17	.43
S3	10	.79	8	.35	54	.59
T1	17	.94	19	.76	58	.45
T2	8	.88	8	.72	29	.39
T3	7	.44	7	.24	17	.45
U1	29	.91	7	.41	3	.44
U2	2	.52	1	1.00	7	.23
U3	25	.67	2	-1.00	3	.48
N	54		50		55	
N with r .60	8		15		54	
Mean r ignoring portfolios with 10 stocks or less & r less than .60	.874		.778		.373*	

*The mean contains all portfolios except O2 & R3 which were eliminated.

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