EVOLUTION, PERFORMANCE, PERSISTENCE AND TOURNAMENT ASPECTS OF U.S. CLOSED-END FUNDS

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Abstract

EVOLUTION, PERFORMANCE, PERSISTENCE AND TOURNAMENT ASPECTS OF U.S. CLOSED-END FUNDS

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The thesis deals with the evolution of Closed End Funds (CEFs) styles over time, performance of CEFs by investment objective, persistence of CEF performance, and the tournament aspects of within-calendar-year performance. The number and dollar investment in CEFs with various investment objectives are studied. The change in investment in funds with particular investment objective(s) is also studied for the period, 1981-1995.

Empirical results based on the Jensen measure are obtained for funds with different investment objectives. These results are obtained using several different criteria for both weekly market price returns and weekly NAV returns. Empirical results suggest that Corporate Bond CEFs and Municipal Bond CEFs have cross-sectional alphas of more than 1.5% and International Equity CEFs have negative cross-sectional alpha of 2.1%. International Equity CEFs beta values suggest higher sensitivity relative to the CRSP equity index. Tests using data for the common period 1991-95 reveals that all CEFs have positive cross-sectional alphas except for International Equity CEFs. Also, our hypothesis that mean alphas are negative during the first year of fund inception is confirmed by our regression results.

Tests of winner-winner or winner-loser effects (tests for continuation or reversal of persistence) using monthly data reveals that four of fourteen years exhibited persistence, four years had reversals and one year had ambiguous results.

A study of significant mid-tournament time period in altering risk/return postures of CEFs reveal that major decisions on re-balancing are taken in the first half of a calendar year. Tests are done for funds with different year-ends. Tests reveal that, regardless of the year-end for any CEF considered within the portfolio, the January to June period exhibits very significant changes in the risk/return postures of CEFs.

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TABLE OF CONTENTS

EVOLUTION, PERFORMANCE, PERSISTENCE AND TOURNAMENT ASPECTS OF U.S. CLOSED-END FUNDS

1. INTRODUCTION

Closed-End Investment Companies (CEICs) were the dominant form of investment company in the United States before the market crash of 1929. Interest in CEICs declined after the crash, and revived since 1985 *(Anderson and Born, 1992).*

Like an open-end mutual fund, a Closed End Fund (CEF) is created when investors pool their money for a shared investment goal. Money collected through an initial public offering (IPO) is invested in a professionally managed portfolio of investments. CEF shares trade on market exchanges like the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) *(Sam Raja, The Internet Closed-end Investor web-page, 1997).*

CEFs differ from open-end mutual funds in their capitalization and pricing. Unlike open-end funds, CEFs have a fixed capitalization, since they do not continually issue or redeem shares. Share redemption at Net Asset Value (NAV) only occurs when a CEF becomes open-ended or liquidated, or when a tender offer is made.

Since the shares of CEFs trade publicly on national stock exchanges and in the over-the-counter markets, the market forces of supply and demand determine their share prices. Whether shares trade at a premium, par, or discount is a result of general market sentiment, portfolio composition, yield, and extraneous factors such as year-end tax selling.

There are several different types of CEFs that offer a wide array of investment choices for investors. These include diversified domestic funds, sector funds, single country funds, regional funds, emerging market funds, global funds, bond funds, dual-purpose funds, and specialty funds *(Capiello et al, 1989)*.

CEFs have often been cited as an exception to the weak form of the Efficient Market Hypothesis (EMH). Some empirical studies (Richards et al, 1980); Anderson, 1986) find that, since the market for CEFs is inefficient, opportunities for abnormal returns exist. The strategies suggested by these researchers and other practitioners will be covered in the literature review section of this thesis.

One of the most perplexing anomalies in finance is the "Closed-end Puzzle" where share prices (SPs) of CEFs typically do not equal their Net asset values (NAVs). Historically, discounts (where the SP is less than the NAV) are the rule. However, premiums have become more common (Cumby and Glen, 1990). Often, agency costs, tax liabilities, and illiquidity of assets are mentioned as the potential explanations for the discount puzzle. More recent studies assert that in addition to these three factors, changes in investor sentiment is a potential explanation for fluctuations in the discounts of closed-end funds.

Different types of closed-end funds have evolved. Basically, CEFs are distinguished from one another based on their investment objectives. The required returns from each fund depend upon investment objectives. CEFs have been introduced in the 1980s and 1990s using investment objectives as a tool to attract buyers whose risk profiles match those of the CEF. Thus, the first objective of this thesis is to study the evolution of closed-end fund styles using descriptive statistics. The study covers entry but not exit of funds due to data unavailability. This adds some survivorship bias to this study.

While the performance of mutual funds has been tested using daily, weekly and monthly data, the performance of CEFs by investment objective using weekly data has not been published to the best of our knowledge. We use the Jensen measure to study the performance of CEFs based on market returns and NAV returns using appropriate benchmark indexes for each investment objective considered as significant for this study. The use of an appropriate index for each of the investment objectives for CEFs has not yet been reported in the finance literature.

Empirical studies find that, since relative performance of equity mutual funds persists from year to year, a fund manager's track record contains information about future performance. Some of the reasons advanced to explain this persistence are that persistence is correlated among managers due to the adoption of common strategies among managers, and that losing funds have an increased probability of disappearance but that not all of them are eliminated. Thus, the second objective of this thesis is to test for persistence in closed-end fund performance.

Several studies on managerial incentives in the mutual fund industry conclude that managers of investment portfolios likely to end up as "losers" will manipulate fund risk differently than those managing portfolios likely to be "winners", when compensation is linked to relative performance. However, the size and age of a fund also directly affects a manager's willingness or ability to alter risk substantially. A manager may be unable to make the necessary revisions in a timely manner because of investor clientele or liquidity reasons. Also, in order to survive, a smaller newer fund has an incentive to pursue new investments more aggressively than would a portfolio with considerable existing assets to protect. Finally, investors are more likely to be negatively influenced by bad short-term performance for a fund with a brief track record than for one with an extensive history. This may motivate new fund interim losers to be more proactive in attempting to reverse mid-tournament [@] losses. Thus, the above conclusion is more likely to hold for small, new

[@] The mutual fund industry is viewed as a tournament in which all funds having comparable investment objectives compete with one another. This methodology provides a useful framework for a better understanding of portfolio management decision-making process. Similar to the payoffs for golf and tennis competitions, the amount of remuneration a fund receives for "winning" the tournament depends upon its performance relative to the other participants (Brown et al., 1996).

funds than for large and well entrenched funds. Thus, the third objective of this thesis is to test the mid-tournament time period that may be significant for occurrence of this reversal phenomenon in CEF industry.

The reminder of this thesis proceeds as follows:

In the first section, the literature is reviewed and the scope and area of our study is specified. In the second section, data and models used for the study are described. Then empirical results are discussed in the third section. Our major findings, and the implications and directions for future research are discussed in the last section.

2. LITERATURE REVIEW

2.1 Efficient Market Hypothesis

The efficient market hypothesis holds that stocks are accurately priced at every point in time because they always reflect all currently available market information. The major implication of this theory is that no one can consistently beat the market after adjusting for risk. Many empirical studies have concluded that closed-end fund shares may contradict the EMH. According to Anderson, researchers have reached this conclusion because of the inability to explain the existence and behavior of discounts between NAV and SP. Past data can effectively be used to predict future prices of CEFs.

Many researchers use discount-based trading strategies to conduct tests of market efficiency. Richards, Fraser, and Groth (RFG) (1980) use mechanical trading rules to determine the effect that different trading strategies have on the value of an investment portfolio. For weekly data for the period 1970-76 for 18 funds that included specialized, non-diversified and letter stock funds, they choose arbitrary buy and sell points as given in Table 1. They conclude that the rules are more profitable when applied to specialized funds than when they are applied to highly diversified funds. They also use eight different filter rule strategies to determine what filter produce the best return (See Table 2). They find that, while it may be possible to employ trading rules to earn excess returns, the various strategies need to be adjusted over time.

Anderson (1986) tests more general strategies using weekly data for 17 funds covering three different time periods. He identifies trading strategies that could enable investors to earn excess rates of return, and demonstrates that the market inefficiencies for closed-end fund shares offer potential for profit. Anderson's findings generally support those of RFG. Anderson finds that the most successful strategy is to buy closed-end funds at large discounts and then to sell them when the discounts shrink. Like RFG, Anderson uses eight filter strategies to test for abnormal returns. He concludes that an investor should not expect consistent profits from the utilization of price filter rules using closed-end fund shares.

2.2 Investor Sentiment vis–a -vis Closed-end Funds

One of the most perplexing problems in finance is the Closed-end puzzle, that is, the empirical finding that closed-end fund shares sell at prices not equal to the per share market value of their underlying assets. Past studies cite three potential explanations; namely, agency costs, tax liabilities, and illiquidity of assets. The agency cost theory states that management expenses incurred in running the fund are too high and/or the potential for inferior managerial performance reduces asset value. The tax explanation argues that tax liabilities associated with capital gains on unrealized appreciations (at the fund level) are not captured by the standard calculation of NAV. The illiquidity argument is that restricted or letter securities are overvalued in the calculation of NAV.

Four important phases jointly characterize the life cycle of a closed-end fund. First, closed-end funds start at a premium of almost 10 percent, when organizers raise money from new investors and use it to purchase securities (Weiss, 1989 and Peavy, 1990). Most of this premium results from underwriting and start-up costs which are removed from the IPO proceeds. This reduces the NAV relative to the stock price. Why investors pay a premium for new funds when the existing funds trade at a discount is the first part of the puzzle.

Second, while CEFs start at a premium, they move to an average discount of over 10 percent within 120 days from the beginning of trading (Weiss, 1989). Thereafter, discounts are the norm.

Third, discounts fluctuate widely over time, and are not a constant fraction of net asset value (or a constant dollar amount). The fluctuations appear to be mean reverting (Sharpe and Sosin, 1975). Thompson (1978), Richards, Fraser and Groth (1980), Herzfeld (1980), Anderson (1986), and Brauer (1988) all document significant positive abnormal returns from assuming long positions in funds with large discounts.

Fourth, when closed-end funds are terminated through either a liquidation or an open-ending, share prices rise and discounts shrink (Brauer, 1984; Brickley and Schalheim, 1985). Most of the positive returns to shareholders accrue when discounts narrow around the announcement of a termination. However, a small discount persists, until final termination or open-ending.

2.3 Performance Persistence

2.3.1 Performance Persistence of mutual funds

Empirical studies of equity mutual funds conclude that relative performance persists from year to year. Carlson (1970) finds evidence that funds with above-median returns over the preceding year typically repeat their superior performance. Lehmann and Modest (1987) report some evidence of persistent mutual fund alphas, and Grinblatt and Titman (1988, 1992) show that the effect is statistically significant. Goetzmann and Ibbotson (1994) conclude that performance persistence exists in raw and risk-adjusted returns for equity funds at observation intervals from one month to three years. Brown and Goetzmann (1995) report that, in their study using benchmarks such as S&P 500 and Vanguard Index Trust (an S&P Index fund), in most of the years of 1980s the mutual funds included in the portfolio substantially under-performed. These studies conclude that the track records of fund managers contain information about future performance because funds repeatedly lag passive benchmarks.

Reasons advanced to explain this persistence include the adoption of common strategies among managers, and that losing funds have an increased probability of disappearance although not all of them are eliminated.

Brown and Goetzmann (1995) explore the performance persistence of mutual funds using a sample which is largely free of survivorship bias. They conclude that persistence is due to funds that lag the S&P 500. They use a probit analysis to test for the probability of disappearance and conclude that poor performance increases the probability of disappearance.

2.3.2 Winner-Loser Effect

De Bondt and Thaler (1985) report that stocks with the lowest returns (so-called "losers") over a period subsequently outperform stocks with the highest returns (so-called "winners") over the same prior period. Chan (1988) and Ball and Kothari (1989) find that this winner-loser effect is due almost entirely to inter-temporal changes in risks and expected returns. In contrast, De Bondt and Thaler (1987) and Zarowin (1990) find that the winner-loser effect is not explained by risk differences. Fama and French (1986) and Zarowin (1989, 1990) propose that this phenomenon is a manifestation of the well-known size effect.

Kryzanowski and Zhang (1992) test the market overreaction hypothesis (or winner-loser effect) using monthly data for stocks listed on the Toronto Stock Exchange over the 1950-1988 period. In contrast to De Bondt and Thaler (1985, 1987), they find a statistically significant continuation behavior for the next one (and two) year(s) for winners and losers, and insignificant reversal behavior for winners and losers over longer formation/test periods of up to ten years. While the systematic risks of the winners decrease significantly over all test periods, the systematic risks of the losers increase significantly for only the 12-month formation/test periods [unlike Chan (1988)]. Their findings are robust for various performance measures (specifically, market-adjusted CAR, and the Jensen (1968) and Sharpe (1966) portfolio performance measures).

Performance persistence may also exist for CEFs. Some of the strategies using CEF investment to beat the market recommend a buy strategy when a CEF is selling at a deep discount and a sell strategy when the discount shrinks. Several empirical studies demonstrate that this strategy may work. If true, this contradicts the weak form of the efficient market hypothesis. In such a market, investors would already exploit the signals, and the signals would lose their value as they became widely known. The null hypothesis is that the winner-loser effect is not present in the CEF industry. Thus, we contribute to the literature by testing the winner-loser effect for CEFs using risk and return computations adopted by Brown and Goetzmann (1995).

2.4 Tournament Aspects of Within Calendar Year Performance Caused by Managerial Incentives

Given the profession's current system of assessing and reporting fund performance on an annual basis, managers with either extremely good or bad relative returns at mid-year have incentives to alter the investment characteristics of their portfolios. Those funds most likely to be "losers" will increase their risk levels relative to the group of probable "winners" (Brown et al, 1996). For 334 growth-oriented mutual funds during 1976 to 1991, Brown et al. (1996)

demonstrate that mid-year losers tend to increase fund volatility more in the latter part of an annual assessment period than mid-year winners. Herein, we also test whether loser CEFs have greater risk levels than winners, and over which time period losers tend to increase fund volatility more than winners.

3. DATA

Our initial sample consists of 522 CEFs (as of December 1996) obtained from CDA/Wiesenberger. The data fields include weekly/monthly market prices, weekly/monthly NAVs, and weekly/monthly returns on market prices and NAV from the date of inception of each and every CEF covered by the CDA/Wiesenberger database.

A fund is included in the sample if its date of inception precedes 1996, with the exception of the tracking of fund styles where all funds are considered for the period from 1981 to 1996. The period covered by the sample for other studied aspects of CEFs is from January 1, 1982 to December 31, 1995. If a fund has an inception date later than January 1, 1982, then the data for that fund was available from the date of inception to December 31, 1995.

Missing observations are dealt with as follows:

If a fund's NAV is not reported for a week, the previous week's NAV is used and returns are computed accordingly. In the rare cases where market prices are missing, the previous week's market price is used to compute returns. Funds with a lot of missing observations (no observations for many weeks for the period of study) are dropped permanently from the sample. Since data for the first few weeks from the inception date were irregular for some funds, the returns for these funds for the first few weeks are permanently dropped from the sample.

The CEFs are classified by the ten investment objectives which are listed in

Table 3.

The risk-free rate (R_f) for a t-bill with 90-days to maturity is extracted from an internet source "HSJ Associates". The weekly yield is computed by taking the 52nd root of the annualized yield.

The weekly/monthly returns on the CRSP equity index are from the CRSP tapes. Returns for the S&P 500 Industrial bonds, Municipal bond, and Long Government bond are obtained from the Security Price Index Record (a statistical service provided by Standard and Poors). The appropriate index considered for each investment objective is listed in Table 4.

The total rate of return on market price is computed by the following formulae:

$R_{it} = [(P_t + I_t + D_t + C_t) \div (P_{t-1})] - 1$

where, R_{it} is the total return on market price at week/month t, P_t is the market price at week/month t, I_t is the income distribution at week/month t, D_t is the dividend distribution at week/month t, and C_t is the capital gains distribution at week/month t. The total return of return on NAV is computed by the following formulae:

$R_{NAVit} = [(NAV_t) \div (NAV_{t-1}] - 1,$

where R_{NAVit} is the total return of return on NAV for week/month t.

4. EMPIRICAL RESULTS

As identified in the earlier sections, our empirical tests deal with the evolution of CEF styles over time, performance of CEFs by investment objective, persistence of CEF performance, and the tournament aspects of within calendar year performance.

4.1 Some Descriptive Statistics on CEFs

The number of funds and the amount of funds managed by the CEFs classified by investment objective are shown in Table 3. Further classification by year is given in Table 3A.

The 294 fixed income CEFs have attracted $65,634 million (CBOND, CHYLD, IBOND, MBOND and MSSTA), while the 197 equity CEFs have attracted $43,014 million (EQTYI, IEQTY, LTGRO and OTHER). Only 16 CEFs with proceeds of 8,875 million were introduced up to 1981. In 1981, there were 22 corporate bond fund IPOs with initial proceeds of $2,405 million.

Few CEF IPOs occurred during the 1982-85 period. There were 16 CEF IPOs in 1986, and 30 in each year until 1991. After a peak of 91 CEF IPOs in 1992, there were only 3 and 28 CEF IPOs in 1995 & 1996. Figure 1 depicts the total proceeds in CEF IPOs and their corresponding number of funds by investment objective.

The major investment activity is in Municipal bond CEFs with $30,604 million (96 in number), followed by International equity CEFs with $17,992 million (116 in number). Other investment objectives worth mentioning are OTHER CEFs with $14,326 million (54 in number), Municipal Single State CEFs with $11,927 million (105 in number), and Government backed mortgage CEFs with $10,001 million (31 in number).

Table 5 gives the mean returns based on market price and NAV by investment objective by year. This shows significant variation from year to year in the mean return for each and every investment objective. In 13 of the 20 years, the average was $\geq$ 10%; and in 4 of 20 years, the average was below 0%. Mean returns range from –12.90% in 1994 to 31.30% in 1991. An average of the yearly returns by investment objective reveals that International equity CEFs offered the highest returns of 17.74% based on market price (only 13.22% based on NAV). International Bond CEFs followed with an average of 14.06% based on market price returns and 15.96% based on NAV returns (second highest).

Table 6 shows median returns based on market price and NAV by investment objective by year. The median return by investment objective statistics are particularly notable for their wide range of values. This high volatility suggests that a study of performance persistence (winner-loser effect) may be worthwhile. This is studied in a subsequent section.

The average, in 12 of the 20 years, was $\geq 10\%$; and in 4 of 20 years, the average was less than 0%. Median returns ranges from –12.46% in 1994 to 28.08% in 1991.

4.2 Risk- and Market-adjusted Performance of CEFs

The Jensen (1968) performance measure, α_i, is obtained by running a time-series regression of the *i*th security's excess return (R_i - R_f) on the market portfolio's excess rate of return (R_m - R_f), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$

where β_i is the slope or beta of security i; e_i is the error term of security i; and all the other terms are as defined previously. If the fund is correctly priced so that returns embody the appropriate risk premium, then the Jensen alpha is zero.

The Jensen measure is a widely used method for evaluating portfolio performance within the CAPM framework because it uses systematic risk and lends itself easily to statistical tests of significance. There is also a limitation to the use of the Jensen measure (Cumby and Glen, 1990). One of the many limitations to the use of the Jensen measure is errors in inference when fund managers are market timers. The Jensen performance measure of each fund, α_j, is estimated on an ex-post basis by running an Ordinary Least Squares (OLS) regression in SAS.

Tables 7 to 14 provide a summary of the regression results of closed-end funds using

Jensen's measure, by investment objective under the following scenarios:

a. Based on weekly market price returns and weekly NAV returns from the date of inception of each fund included in the portfolio up to the year 1995.
b. Based on weekly market price returns and weekly NAV returns for the common period 1991-1995.
c. Based on weekly market price returns and weekly NAV returns for the first year of inception of each fund included in the portfolio.
d. Cross-sectional test of alphas considering all funds together for the period from the date cf inception up to the year 1995.

While data from inception until 1995 is used to study the general performance characteristics of all CEFs with a certain investment objective, the use of a common period data is used to ascertain similarity/ dissimilarity in performance. Since the returns for the first year of a CEF are believed to be poor, this phenomenon is tested by using returns for a period of one year since inception for each and every CEF included in the portfolio. Cross-sectional tests of the alphas are also computed to ascertain the performance characteristics of CEFs as a whole.

Table 7 provides the summary regression results based on weekly market price returns by investment objective. The data covers the period from the inception of every fund to the year 1995.

Corporate Bond CEFs and Municipal Bond CEFs have cross-sectional alphas of more than 1.5%. Equity CEFs and Long term growth CEFs have cross-sectional alphas of more than 1% but below 1.5%. Corporate High Yield CEFs and Other CEFs have positive cross-sectional alphas. International equity CEFs have negative cross-sectional alpha of 2.1%. International bond CEFs, Government mortgage-backed security CEFs, and Municipal Single State CEFs have negative cross-sectional alphas.

The number of significant alphas are very few given the large sample size. There are 5 significant alphas under International equity CEFs, and only one for the International Bond CEFs.

The p-values reveal that in all the cases, except for Other CEFs, the null hypothesis that alpha is equal to zero is not rejected at the 5% significance level. Sign tests of the median reveals that in six out of the ten investment objectives, the null hypothesis is rejected. Of the six rejections, four favor the alternate hypothesis that the median is above zero , and two favor the alternate hypothesis that the population median is below zero.

An analysis of the beta values reveals that the International equity CEFs have the highest sensitivity relative to CRSP equity index with a cross-sectional beta of 0.930. Long term growth CEFs follow with a beta of 0.535. The Other CEFs have a cross-sectional beta of 0.488. The other CEFs seem to have a lower degree of sensitivity relative to their respective indexes. Corporate Bond CEFs, International Bond CEFs, and Corporate High Yield CEFs have negative betas indicating a negative correlation with their respective indexes. A major proportion of the betas within each investment objective are significant.

Table 8 presents the regression results based on weekly market price returns by investment objective using data for the common period 1991-1995. All CEFs have positive cross-sectional alphas except for International Equity CEFs. Cross-sectional alpha are highest for Corporate High Yield CEFs (31.6% abnormal return). Other CEFs follow with 13% abnormal return. Corporate High Yield CEFs and Other CEFs have 14 and 5 significant alphas, respectively.

The null hypothesis that α is equal to zero is rejected at the 5% significance level for International equity CEFs and Corporate High Yield CEFs. Based on the Sign test of the median, the null hypothesis that the population median is equal to zero is rejected in all cases except for International Equity CEFs and Equity CEFs. In case of Equity CEFs, the test is inconclusive due to inadequate sample size. In all cases of rejection, the median was above zero indicating positive abnormal returns. The failure to reject the null hypothesis for International CEFs is consistent with the results obtained with returns from inception to the year 1995.

The cross-sectional betas are similar to those obtained earlier using data from inception to the year 1995.

To test the hypothesis that mean alphas are negative during the first year of fund inception, regression results are obtained for all CEFs using the weekly market returns for the first year only. These results are summarized in Table 9 for CEFs classified by investment objective.

As expected, all of the cross-sectional mean αs are negative for all the investment objectives. There are 37 significant alphas, 35 of which are International Equity CEFs.

Very significant abnormal negative returns are observed for International Equity CEFs (31.3%), Other CEFs (30.2%), International Bond CEFs (28.4%), and Corporate High Yield CEFs (19.9%).

The null hypothesis that alpha is equal to zero is rejected at the 5% significance level for all the investment objectives. Based on the Sign test of the median, the null hypothesis is rejected for all investment objectives except for MBOND CEFs and MSSTA CEFs. The population median is found to be less than zero in all cases of rejections signifying negative abnormal returns.

Results for a cross-sectional test of the alphas for all of the funds together for the entire period since inception to year 1995 are summarized in Table 10. For the sample of 481 CEFs, only six alphas are significant. The mean α indicates a negative abnormal return of -4%. The null hypothesis that α is equal to zero is not rejected at the 5% significance level. Based on the Sign test, the null that the population median is zero cannot be rejected. Of the 481 betas, 327 are significant.

The regression results for data using the weekly NAV returns for the four criterion are summarized in Tables 11 to 14. Table 11 provides the regression results for the weekly NAV returns by investment objective from inception date to the year 1995. The Mean αs are positive for all the investment objectives, except for International equity CEFs. There are 87 significant αs. The null hypothesis that α is equal to zero is rejected for Corporate Bond CEFs, Municipal Bond CEFs and Municipal Single State CEFs. Based on the Sign test, the null hypothesis that the median is equal to zero is rejected for all cases except for CHYLD CEFs and IEQTY CEFs. The betas are very similar to those obtained using weekly market returns. The cross-sectional mean beta for the International CEFs is lower at 0.376.

Table 12 presents the summary regression results for weekly NAV returns by investment objective for the common period 1991-1995. Positive alphas occur for all investment objectives, and 92 alphas are significant. The null hypothesis is rejected in five cases. Based on the sign test, the null is rejected for all but two investment objectives; namely, Equity CEFs and International Equity CEFs. For Equity CEFs, the results are inconclusive because of inadequate sample size.

While it was hypothesized that the first year of a CEF has a negative return based on market price data, the same may not hold for NAV returns. Based on Table 13, there are positive alphas for six of the investment objectives. The negative alphas based on the market price return data may be attributed to the fact that these CEFs sell at a discount within four months from the date of inception. This particular phenomenon is explained in the second stage of the life cycle of a CEF as discussed earlier in the literature review section under the topic, "Closed-end fund puzzle". International equity CEFs now have a positive alpha. The null hypothesis that α is equal to zero is rejected for Government mortgage CEFs, International Equity CEFs and Long term growth CEFs. Based on the Sign test, the null hypothesis that median is equal to zero is rejected for all Corporate

Bond CEFs, Corporate High Yield CEFs, Equity CEFs, Government mortgage-backed CEFs, International Bond CEFs, and Long term Growth CEFs.

Table 14 presents regression results for the cross-sectional tests of the alphas using weekly NAV data using all the funds for the period from inception up to the year 1995. The mean alpha is positive, unlike the case based on the weekly market price returns.

Based on t- test, the null hypothesis that the mean is equal to zero is rejected. Sign test for median is not rejected indicating that median is not significantly different than zero. There are 87 significant alphas and 440 significant betas for the total sample of 481 CEFs.

4.3 Persistence of CEF Performance

As in Brown et al. (1992) and Goetzmann and Ibbotson (1994), we study the winner-loser effect using a non-parametric methodology based upon contingency tables for monthly returns based on market prices and NAVs. A CEF is classified as a winner in the year if its return is above the median of all funds reporting returns for that year. Ties are not considered. If the median returns are negative, the median return is assumed to be zero. Thus, a winner-winner (WW) for 1986 is a winner in 1986 who was also a winner in the previous year 1985. This methodology differs slightly from that of Brown and Goetzmann (1995) who count winners if they are winners in both the current and subsequent year. Both methodologies should yield similar results.

Tables 15 and 16 report the frequency counts of winner-winner and related categories based on monthly market returns and monthly NAV returns by year. The column "New funds" gives the number of new funds introduced in that year. New funds introduced in the year are excluded for the purposes of determining persistence, as new funds generally do not do very well in the year of inception.

The null hypothesis is that the percentage of the sample population falling into each of the four categories is equal to 25%. This implies that the two classifications (winner, loser) are independent and have no association. The alternate hypothesis is that the Loser/Winner and Winner/Loser categories would have larger frequencies than the other two categories. The statistical significance of these frequencies is established using a chi-square test with one degree of freedom at the 5% significance level. The table value for the chi-square with 1 d.f. is 3.84.

Significant chi-square statistics are obtained in 9 out of the 14 years using monthly market price returns, and in 10 of the 14 years using monthly NAV returns. While a significant chi-square statistic rejects the null hypothesis, it does not by itself support the alternate hypothesis. If the frequencies of Winner/Winner and Loser/Loser are more than the other two categories, we would find that the chi-square would still be significant in rejecting the null but supporting continuation of persistence. Continuation of persistence means that the winning funds continue to be winning funds, and losing funds continue to be losing funds over the two years. Dis-aggregation by year permits further analysis of continuation / reversal behavior.

Of the fourteen years examined based on monthly market price returns, four years (1985, 1987, 1992, and 1993) have continuation of persistence, and four years (1990, 1991, 1994, and 1995) have reversal of persistence, and one year (1989) has ambiguous results. Ambiguity arises due to high frequencies for three of the criteria. This makes it difficult to attribute the result to the presence of a particular form of persistence. It also means that persistence is not correlated between managers in this year.

In three of the four years that exhibit a reversal pattern, the Loser-Winner frequency count exceeded that of the Winner-Loser count. This suggests that a loser in the previous year is more likely to be a winner in each of these three years. Winner-Winner has a higher frequency count in two of the years of continuation of persistence. For one year, their counts are equal, and in the other year the Loser-Loser count exceeded that of the Winner-Winner count.

Using monthly NAV returns produces similar results for the last five years, that is, from 1991 to 1995 (See Table 16).

The reversal phenomenon is more common between 1990 and 1995. In three of these six years, losing funds in the previous year were more likely to be winning funds in the current year.

The reversal behavior observed in three of the five years during which the sample size more than doubled suggests that persistence is correlated among managers. This suggests that persistence is probably not due to individual managers selecting stocks that are overlooked or ignored by other managers. Whatever the cause, winning is evidently a group phenomenon (Brown et al, 1996). This correlation in persistence is consistent with recently identified herding behavior among equity fund managers (Grinblatt, Titman, and Wermers, 1994). Persistence behavior could be due to the adoption of common management strategies (Brown et al, 1996). These strategies include dynamic re-balancing proposed by Connor and Korjczyk (1991), trend-chasing identified by Grinblatt, Titman and Wermers (1993), and common conditioning upon macro-economic variables, suggested by Ferson and Schadt (1995).

4.4 Tournament Aspects of within Calendar Year Performance

When managerial compensation is linked to relative performance, managers of investment portfolios which are likely to end up as "losers" bear more fund risk than those managing portfolios likely to be "winners". Let the interim loser and winner strategies be denoted by the subscripts L and W, respectively, and the corresponding portfolio risk levels in the first and second sub-periods by σ_1 and σ_2, respectively. Then:

$$(\sigma_{2L} / \sigma_{1L}) > (\sigma_{2w} / \sigma_{1w})$$

Thus, the "risk adjustment ratio" (RAR) for the interim losers exceeds that for the interim winners.

Sub-periods examined herein include (2 months, 10 months), (3,9), (4,8), (5,7), (6,6), (7,5), (8,4), (9,3) and (10,2). As discussed earlier, the size and age of the fund directly affects a manager's willingness or ability to alter risk substantially.

The above is true for open-end funds whose performance is based on the assets under administration which vary based on past performance. This is not the case for closed-end funds.

Subgroups of interim winners and losers are formed according to each fund's relative return performance between January and month M. As in Brown et al (1996), the M-month cumulative return for fund j in year Y is calculated using

$$RTN_{jMy} = [(1+r_{j1y})\,(1+r_{j2y})\ldots(1+r_{jMy})]$$

where r_{j1y} is the monthly return or change in fund j's net asset value plus distributions, during month 1 of year Y. After calculating the set of RTNs for each sample year, the funds in the tournament are ranked from highest to lowest, and the winner and loser appellations (i.e., generic names) are attached to each fund according to the fund's ranking. CEFs are "winners" or "losers" if they are above or below the median RTN value, respectively.

The ratio of each fund's volatility measured before and after the interim assessment period is used to test the null hypothesis that winners and losers make the same adjustments to the investment characteristics of their portfolios. If the interim assessment date is month M, the fund j risk adjustment ratio, RAR, for a particular year y is given by

$$RAR_{jy} = \sqrt{\left(\frac{\sum_{m=M+1}^{12} (r_{jmy} - \bar{r}_{j(12-M)y})^2}{(12-M)-1}\right)} \div \sqrt{\left(\frac{\sum_{m=1}^{M} (r_{jmy} - \bar{r}_{my})^2}{M-1}\right)}$$

These calculations emit a pair of (RTN,RAR) values for every fund for each pair of study months for each of the fourteen years.

A 2 X 2 contingency table is then created by placing each pairing into one of four cells: HIGH RTN, HIGH RAR ; LOW RTN, HIGH RAR; HIGH RTN, LOW RAR; and LOW RTN, LOW RAR.

The null and alternate hypothesis tested are as follows:

H_0 : No persistence or reversal in behavior; i.e., equal frequencies
H_{A1} : Persistence in behavior; i.e., higher frequencies of either winner-winner or loser-loser
H_{A2} : Reversal in behavior; i.e., higher frequencies of either winner-loser or loser-winner

The statistical significance of the frequencies is examined using a chi-square test having one degree of freedom (i.e., the product of one unrestricted row and one unrestricted column in the contingency table) at the 5% significance level.

Our tests use monthly data for three sets of portfolios of funds using three different criteria. The first criterion considers funds with December year-end as participating in a tournament of CEFs. The second criterion includes funds with October year-ends only. The third criterion includes all CEFs in the tournament using monthly data. The logic for using three different criterion is to test if a common period(s) exists which has a significant chi-square which indicates continuation or reversal of persistence. This would indicate the most significant time period when major decisions are made to rebalance or revise portfolio risk and return postures. This would validate our alternate hypothesis.

Table 17 reports the cell frequencies of several different experimental designs using the sample with funds having December year-ends only. We calculate separate contingency tables for all 9 combinations of performance assessment month M = 2,3... 10. The table reports the frequency counts for four combinations, namely, LOWRETURN/LOWRISK, LOWRETURN/HIGHRISK, HIGHRETURN/LOWRISK, and LOWRETURN/LOWRISK.

Tests using market price return reveals that 4 of the 14 significant chi-square statistics support the alternative hypothesis of the presence of reversal behavior, and the balance support the presence of continuation behavior. Cross-sectional tests for the entire period 1982-1995 reveal that only one chi square statistic (July) is significant and indicates the presence of continuation behavior. Cross-sectional tests for the five-year period 1991-1995 yield no significant chi-square statistics.

Similar tests using the returns based on NAV for funds with December year ends (see Table 18) reveal that 78 funds have statistically significant chi-squares. However, only 1 (July) supports the alternate hypothesis of the presence of reversal behavior. The majority of winners for each month continued to be winners for all the months throughout the year, and the majority of losers tend to be losers for all the months throughout the year.

Tests for funds with October year ends (see Table 19) reveal that 41 chi-square statistics are statistically significant for tests based on return and risk based on market price returns. Of these, 18 are in support of the alternate hypothesis of the presence of reversal behavior. The significant months are December (3 cases), January (3 cases), February (1 case), March (2 cases), April (2 cases), May (2 cases), June (1 case), and July (1 case).

Tests based on the NAV returns, which are reported in Table 20, reveal 33 cases that are statistically significant. Of these, 14 support the alternate hypothesis. These results provide much more validity to the alternate hypothesis than the tests that only use December year-end funds.

Since the sample sizes for these tests are very small compared to the total funds included in the sample, all funds were examined by using a period of reference which is the calendar year.

Based on the chi-square tests for the contingency tables reported in Table 21, 31 funds had statistically significant chi-square values based on return and risk using market prices. Only 9 of these funds had larger frequencies of lowreturn/highrisk and highreturn/lowrisk. Cross-sectional tests for the entire period as reported in Table 22, reveal that all chi-square statistics are significant and in support of the alternate hypothesis A1. The months of February and June support the alternate hypothesis. Tests for 1991-95 also result in significant chi-squares for all months, with June supporting the alternate hypothesis.

Overall, at least one or more months of the first six months of a calendar year are significant for all the criteria considered. This suggests that major decisions on altering risk/return postures are taken in the first half of a calendar year. It also suggests that regardless of the year-end for any CEF considered within the portfolio, the January to June period is very significant in altering risk/return postures of CEFs.

5.0 MAJOR FINDINGS, IMPLICATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

Our empirical tests deal with the evolution of CEF styles over time, performance of CEFs by investment objective, persistence of CEF performance, and the tournament aspects of within-calendar-year performance.

A study of evolution of CEF styles over time reveals that major investment activity in terms of dollar investment was in Municipal Bond and International Equity CEFs from early 1990s. Toward the end of 1996, International equity was still popular with 26 IPOs with dollar investment of $612 million. But the popularity of other styles was decreasing at this point in time. A study of mean returns reveals that mean returns based on market price and NAV by investment objective shows significant variation from year to year. Mean returns range between –12.90% to 31.30%. On average, International equity CEFs offered the highest returns of 17.74% based on market price (13.22% based on NAV). A study based on median returns based on market price and NAV by investment objective is also notable for its wide range of values. Median returns range from –12.46% to 28.08%.

Empirical results based on the Jensen measure are obtained done using several criteria. Regression results based on weekly market price returns by investment objective using data covering the period from inception of every fund to the year 1995 reveal that Corporate Bond CEFs, and Municipal Bond CEFs have cross-sectional alphas of more than 1.5%. International Equity CEFs have negative cross-sectional alpha of 2.1%. Beta values for International Equity CEFs are the highest. This suggests higher sensitivity relative to the CRSP equity index.

Regression results based on weekly market price returns by investment objective using data for the common period 1991-95 reveals that all CEFs have positive cross-sectional alphas except for International Equity CEFs. Cross-sectional alpha for Corporate High Yield CEFs was the highest with 31.6% abnormal return (based on weekly market price return).

The hypothesis that mean alphas are negative during the first year of fund inception is confirmed by our regression results for all CEFs using the weekly market returns for the first year only. The same hypothesis is not supported for data using the weekly NAV returns. There are positive alphas for six of the investment objectives. This is due to the fact that CEFs sell at a discount within 4 months from the date of inception. This behavior of the CEF is more commonly quoted in the finance literature as one of the stages in the life cycle of a CEF under the heading "Closed-end fund Puzzle".

Tests for continuation or reversal of persistence reveals that four of fourteen years exhibited persistence, four years had reversals, and one year had ambiguous results. Results for the period 1991-95 were similar for data using both market price returns and NAV returns. Over the period 1991-95, reversals were more common. In three of these six years, losing funds in the previous year were likely to be winning funds in the current year.

A study of tournament aspects of CEFs reveals that major decisions on altering risk/return postures are taken in the first half of a calendar year. This also suggests that regardless of the year-end for any CEF considered within the portfolio, the January to June period is very significant in altering risk/return postures of CEFs.

The initial study included 522 CEFs. While this study was being done, as many as 70 CEFs were open-ended. The decline in interest in CEFs has major implications. A study on the reasons for the decline in the interest of CEFs and the future of CEFs in general would be a topic of interest for the future.

Common period data was available only for five years, namely 1991-95. So our study is limited by its sample size. A study using common period data for the entire CEF universe for a period of ten years with a larger sample size using appropriate indexes would be a topic that would provide more insight into the behavior of CEFs by investment objective.

TABLE 1

CLOSED-END FUND TRADING RULES

STRATEGY	PURCHASE	SALE
1	0.05	0.00
2	0.10	0.05
3	0.15	0.10
4	0.20	0.10
5	0.25	0.10
6	0.20	0.15
7	0.25	0.15
8	0.30	0.15

NOTES:

1. Table 1 shows some arbitrary buy and sell decision points for 8 alternative strategies that would permit the investor to profit from potential inefficiencies in the market for CEFs.

2. For example, under Strategy 1, the investor would purchase a CEF if the price were below 5% below NAV. The investor would sell the CEF if the discount disappeared.

3. Richards et al. (1990) state that the frequency of trades would be a function of:

   a. the level of discount required for a purchase decision to be made,
   b. the spread between the purchase discount and the sale discount, and
   c. the changes in the spread.

4. Once a CEF is included in the portfolio, it is held until the discount dropped to zero (under Strategy 1). If in a particular week a new fund met the criterion for inclusion, or if CEF(s) in a fund held in the portfolio were to be sold, the portfolio composition is adjusted to ensure equal dollar investments in each fund retained.

Table 1 adapted from Richards et al. Fall (1980).

TABLE 2

FILTER RULE TRADING STRATEGIES

ALL FUNDS

STRATEGY	FILTER	RETURN (%)
1	0.030	-48
2	0.050	-47
3	0.075	-17
4	0.100	-4
5	0.125	+5
6	0.150	+28
7	0.175	+33
8	0.200	+35

NOTES:

1. Table 2 shows some arbitrary filter rule trading strategies that would permit the investor to earn abnormal returns.
2. For example, under Strategy 1 he would monitor the portfolio of CEFs for a rise or fall of 3%, 3% being the amount of the filter. If a fund increased by 3%, then he would purchase a CEF for a certain dollar amount say $1,000. If a fund declined by 3%, then he would go short in the fund for a $1,000.
3. When the purchase rules add a fund to the portfolio (long position), the fund remains in the portfolio until the market price falls 3% in a particular week. Once that occurred, the portfolio sells the shares and also sells an equivalent number short.
   Short positions are maintained until the fund in question advances 3% in a week. At that point, the position is covered and the money available is used to establish a long position.
4. The above table also shows some sample returns (percent) achieved using the above-mentioned filter rules. The use of 20% filter results in many funds not coming into favor. Alternatively, the use of 3% filter brought every fund tested into the portfolio. This demonstrates that the success of the trading strategy is not related to day-to-day fluctuations in security prices as much as it is to particular funds either coming into favor or falling from favor. In other words, the superior performance with the large filters may not have been caused by fluctuations in the market as a whole.

Table 2 adapted from Malcolm Richards et al. Fall (1980).

TABLE 3

TABLE SHOWING THE NUMBER OF CEFs AND DOLLAR INVESTMENTS IN MILLIONS FOR EACH OF THE FUND CATEGORIES BASED ON INVESTMENT OBJECTIVE

INVESTMENT OBJECTIVE	SYMBOL	$ MILLIONS	# OF FUNDS
Corporate Bond	CBOND	9,018	39
Corporate High Yield	CHYLD	4,471	27
Equity Income	EQTYI	1,295	9
Govt. Mortgage-backed	GMMOR	10,001	31
International Bond	IBOND	9,614	27
International Equity	IEQTY	17,992	116
Long-term Bond	LTGRO	9,401	18
Municipal Bond	MBOND	30,604	96
Municipal Single State	MSSTA	11,927	105
Others	OTHER	14,326	54
TOTAL (AS OF DECEMBER 97)		118,649	522

CBOND seeks current income through investment primarily in corporate bonds;
CHYLD pursues maximum income and sometimes growth investing in lower-rated bonds;
EQTYI seeks current income through dividend paying common stocks and equities;
GMMOR seeks income primarily through mortgage-backed issues including GNMAs;
IBOND invests in fixed income securities of other issuers of other nations;
IEQTY invests in equity securities of other nations;
LTGRO seeks long-term growth with income usually a secondary goal;
MBOND seeks tax-free income through investment in municipal securities;
MSSTA seeks income exempt from both Federal and State income taxes; and
OTHER includes all other CEFs. Definitions are adopted from "HYSALES", A CEF software of CDA Wiesenberger.

TABLE 3A
CLOSED-END FUNDS
NUMBER AND DOLLAR INVESTMENT UNDER EACH INVESTMENT OBJECTIVE

S.NO.	Investment Objective	INVOB	UPTO 1981	UPTO 1981	1981	1981	1982	1982	1983	1983	1984	1984
			$	#	$	#	$	#	$	#	$	#
1	Corporate Bond	CBOND			2,405	22						
2	Corporate High Yield	CHYLD										
3	Equity Income	EQTYI										
4	Government Mortgage-Backed	GMMOR										
5	International Bond	IBOND										
6	International Equity	IEQTY	323	2	920	1			27	1	689	1
7	Long-Term Growth	LTGRO	7,473	8								
8	Municipal Bond	MBOND										
9	Municipal Single State	MSSTA										
10	Others	OTHER	1,079	6					255	2		
	TOTAL		8,875	16	3,325	23	0	0	282	3	689	1

S.NO.	Investment Objective	INVOB	1985	1985	1986	1986	1987	1987	1988	1988	1989	1989
			$	#	$	#	$	#	$	#	$	#
1	Corporate Bond	CBOND					1,468	3	2,909	6	1,153	3
2	Corporate High Yield	CHYLD					279	3	1,618	10	294	4
3	Equity Income	EQTYI							134	1	285	2
4	Government Mortgage-Backed	GMMOR							1,510	3	395	2
5	International Bond	IBOND			1,627	2			2,547	4	122	1
6	International Equity	IEQTY	189	1	750	4	1,351	7	1,096	6	1,231	6
7	Long-Term Growth	LTGRO			1,702	3						
8	Municipal Bond	MBOND			331	1	3,127	5	3,190	9	4,437	15
9	Municipal Single State	MSSTA					428	3	113	3	427	2
10	Others	OTHER	694	4	2,001	6	4,361	10	3,547	12	252	3
	TOTAL		883	5	6,411	16	11,014	31	16,664	54	8,596	38

S.NO.	Investment Objective	INVOB	1990	1990	1991	1991	1992	1992	1993	1993	1994	1994
			$	#	$	#	$	#	$	#	$	#
1	Corporate Bond	CBOND							1,032	4	51	1
2	Corporate High Yield	CHYLD							2,253	9	27	1
3	Equity Income	EQTYI	147	1	153	1	136	1	440	3		
4	Government Mortgage-Backed	GMMOR	604	2	637	2	4,353	13	2,376	8	126	1
5	International Bond	IBOND			446	1	707	5	3,502	8	663	6
6	International Equity	IEQTY	3,048	19	664	3	1,222	10	1,206	7	4,563	21
7	Long-Term Growth	LTGRO	13	1							177	4
8	Municipal Bond	MBOND	2,090	5	5,517	14	7,150	25	4,392	20	370	2
9	Municipal Single State	MSSTA	734	5	3,471	17	3,920	34	2,723	39	111	2
10	Others	OTHER	58	1			680	3	502	3	766	2
	TOTAL		6,694	34	10,888	38	18,168	91	18,426	101	6,854	40

S.NO.	Investment Objective	INVOB	1995	1995	1996	1996	TOTAL	TOTAL
			$	#	$	#	$	#
1	Corporate Bond	CBOND					9,018	39
2	Corporate High Yield	CHYLD					4,471	27
3	Equity Income	EQTYI					1,295	9
4	Government Mortgage-Backed	GMMOR					10,001	31
5	International Bond	IBOND					9,614	27
6	International Equity	IEQTY	101	1	612	26	17,992	116
7	Long-Term Growth	LTGRO	11	1	25	1	9,401	18
8	Municipal Bond	MBOND					30,604	96
9	Municipal Single State	MSSTA					11,927	105
10	Others	OTHER	99	1	32	1	14,326	54
	TOTAL		211	3	669	28	118,649	522

TABLE 4

Ten investment objectives and their corresponding benchmark indexes

INVESTMENT OBJECTIVE	BENCHMARK INDEX
CORPORATE HIGH YIELD	S&P 500 COMPOSITE INDUSTRIALS BOND INDEX (average of composite AAA, AA and BBB industrials)
EQUITY INCOME	CRSP EQUITY INDEX
LONG-TERM GROWTH	CRSP EQUITY INDEX
INTERNATIONAL EQUITY	CRSP EQUITY INDEX
INTERNATIONAL BOND	S&P 500 COMPOSITE INDUSTRIALS BOND INDEX (average of composite AAA, AA and BBB industrials)
CORPORATE BOND	S&P 500 COMPOSITE INDUSTRIALS BOND INDEX (average of composite AAA, AA and BB industrials)
MUNICIPAL BOND	S&P 500 MUNICIPAL BOND INDEX
MUNICIPAL SINGLE STATE	S&P 500 MUNICIPAL BOND INDEX
GOVERNMENT MORTGAGE BACKED	S&P 500 LONG GOVERNMENT BOND INDEX
OTHERS [@]	CRSP EQUITY INDEX

[@]OTHERS includes energy/natural resources, financial services, flexible income, gold and precious metals, government securities, growth and current income, health care, maximum capital gain, small company growth, technology and utilities.

CBOND seeks current income through investment primarily in corporate bonds;
CHYLD pursues maximum income and sometimes growth investing in lower-rated bonds;
EQTYI seeks current income through dividend paying common stocks and equities;
GMMOR seeks income primarily through mortgage-backed issues including GNMAs;
IBOND invests in fixed income securities of other issuers of other nations;
IEQTY invests in equity securities of other nations;
LTGRO seeks long-term growth with income usually a secondary goal;
MBOND seeks tax-free income through investment in municipal securities;
MSSTA seeks income exempt from both Federal and State income taxes; and
OTHER includes all other CEFs. Definitions are adopted from "HYSALES", A CEF software of CDA Wiesenberger.

TABLE 5

CLOSED-END FUNDS

MEAN MARKET RETURN (%) – BY INVESTMENT OBJECTIVE

SYMBOL	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG.
CBOND	-3.2810	8.1350	11.1962	-0.4278	29.8578	10.6084	10.5526	-9.2637	22.3146	7.6764	8.7369
CHYLD	0.0000	6.7300	-11.2269	-29.4229	65.4441	26.8812	23.9400	-8.8515	23.6767	18.0367	12.8008
EQTYI	0.0000	0.0000	32.2200	-18.5700	38.6000	17.4160	3.8733	-12.5256	28.1356	17.8211	13.3713
GMMOR	0.0000	0.0000	5.7100	13.3660	23.3400	6.2156	0.8533	-13.6380	15.8887	9.6642	7.6750
IBOND	6.1100	42.2200	2.8250	10.4057	24.3686	3.8425	21.0438	-18.2081	21.5081	26.4719	14.0588
IEQTY	5.7630	28.3994	76.4245	-26.0154	26.1072	2.7206	72.2615	-18.8778	0.6170	9.9780	17.7378
LTGRO	-8.0273	20.7045	32.7991	-4.1145	39.9750	8.7683	7.3767	-5.1817	25.6644	17.0118	13.4976
MBOND	-12.1600	21.9283	9.2680	3.1633	17.2671	8.3263	12.2077	-13.7946	22.1081	7.1725	7.5487
MSSTA	0.0000	4.0800	5.8683	6.6063	12.3677	10.3570	11.5043	-17.1162	24.2461	9.1405	7.4504
OTHER	-9.6357	10.2379	20.2619	-5.1524	35.6449	14.6249	23.5456	-11.5362	27.0628	16.4863	12.1540
AVG.	-3.5385	17.8044	18.5346	-5.0162	31.2972	10.9761	18.7159	-12.8993	21.1222	13.9459	

MEAN NAV RETURN (%) – BY INVESTMENT OBJECTIVE

SYMBOL	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG.
CBOND	2.4686	10.7625	9.7331	3.6784	22.3397	10.2572	14.2679	-3.5842	20.8333	7.7508	9.8507
CHYLD	0.0000	11.6233	-6.446	-20.2006	46.2388	19.3259	24.1135	-5.6112	20.7700	15.5444	11.7066
EQTYI	0.0000	0.0000	26.8400	-1.4567	31.4800	12.9860	14.3767	-8.9811	28.2456	11.7411	14.4039
GMMOR	0.0000	0.0000	9.8967	12.9920	21.4586	7.6078	7.0914	-6.7467	22.4361	6.3719	10.1385
IBOND	30.0300	28.3500	6.0667	11.9286	18.1200	1.0988	23.8985	-12.3310	23.3137	29.1289	15.9604
IEQTY	6.1850	23.1606	32.4191	-9.7925	19.3268	-1.8480	51.0302	-3.5890	-0.2363	15.5410	13.2197
LTGRO	5.0064	16.1000	25.8791	-1.7791	31.3775	7.9492	10.9500	0.6258	30.0006	15.8159	14.1925
MBOND	2.4500	12.0833	9.8753	6.4637	12.5494	9.7135	14.4508	-7.4941	21.1042	4.7416	8.5938
MSSTA	0.0000	9.7667	9.5817	5.5563	13.1662	10.9317	16.5495	-11.3319	25.3031	4.0739	9.2886
OTHER	0.1250	8.5517	16.7147	-3.5503	29.1754	12.7497	21.0541	-6.1040	28.0866	15.3151	12.2118
AVG.	7.7108	15.0498	14.0562	0.3840	24.5232	9.0772	19.7783	-6.5147	21.9857	12.6025	

Note: The symbols CBOND, CHYLD etc. are defined in Table 3.

TABLE 6
CLOSED-END FUNDS
MEDIAN MARKET RETURN (%) – BY INVESTMENT OBJECTIVE

SYMBOL	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG.
CBOND	-2.8900	8.9350	12.5900	1.4950	28.0350	9.8400	10.2850	-8.9200	22.1200	6.3700	8.7860
CHYLD	0.0000	6.3600	-11.3700	-30.5700	62.2700	25.2300	22.2200	-8.5950	24.0600	17.1900	11.8661
EQTYI	0.0000	0.0000	32.2200	-20.2800	37.7800	19.1000	4.3700	-12.1500	32.7900	13.5000	13.4163
GMMOR	0.0000	0.0000	5.9300	12.8100	24.7300	2.8500	3.7200	-12.8600	17.2100	9.6900	8.0100
IBOND	6.1100	42.2200	4.3900	8.5000	18.9000	2.9700	16.7100	-18.2000	21.5500	23.8300	12.6980
IEQTY	-16.4050	28.8300	68.6700	-34.5050	15.4600	-1.7400	66.5400	-18.7600	4.3100	9.0850	12.1485
LTGRO	-10.5800	21.1700	30.7400	-1.4300	35.8450	7.9950	5.1100	-5.3600	25.8000	15.4900	12.4780
MBOND	-12.1600	26.3000	9.7100	4.0300	17.1000	10.0400	12.4800	-13.7400	22.6600	7.0000	8.3420
MSSTA	0.0000	1.4000	4.5550	6.7000	13.4400	10.1150	12.6300	-16.6850	25.0600	8.9400	7.3506
OTHER	-11.0400	10.4200	17.5050	-2.9250	27.2800	12.4200	17.9700	-9.3300	22.0000	14.5200	9.8820
AVG.	-7.8275	18.2044	17.4940	-5.6175	28.0840	9.8820	17.2035	-12.4600	21.7560	12.5615	

MEDIAN NAV RETURN (%) – BY INVESTMENT OBJECTIVE

SYMBOL	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG.
CBOND	2.3700	10.6150	10.7500	5.1700	20.0200	9.6950	14.2950	-3.5700	20.2500	6.1300	9.5725
CHYLD	0.0000	12.3500	-7.5600	-23.0500	46.7000	18.5600	22.3400	-5.4550	21.0700	13.9100	10.9850
EQTYI	0.0000	0.0000	26.8400	-3.2700	31.1550	11.0600	15.0700	-7.6500	27.7500	10.1900	13.8931
GMMOR	0.0000	0.0000	10.6700	12.4600	21.3700	6.8600	7.8600	-5.9300	22.8200	6.7100	10.3525
IBOND	30.0300	28.3500	5.2900	11.4000	14.8000	1.4650	17.1200	-13.0700	19.7400	26.3000	14.1425
IEQTY	-6.8850	17.8000	28.7250	-8.9600	12.0900	-5.2900	40.6700	-2.3050	1.5900	16.6350	9.4070
LTGRO	4.2900	16.6000	26.7500	-0.0500	27.2800	5.4850	8.9700	0.3600	31.4400	18.4500	13.9575
MBOND	2.4500	12.0500	10.2200	6.4900	12.9500	10.3300	14.7300	-7.1200	19.9500	4.8100	8.6860
MSSTA	0.0000	9.4500	9.4850	5.7800	13.2400	11.0050	16.9400	-11.1600	25.1050	4.1300	9.3306
OTHER	-4.0600	11.4550	13.8650	-0.0050	24.7000	10.0500	15.3100	-2.6300	25.5300	15.0500	10.9265
AVG.	4.6992	14.8338	13.5035	0.5965	22.4305	7.9220	17.3305	-5.8530	21.5245	12.2315	

Note:
The symbols CBOND, CHYLD etc. are defined in Table 3.

TABLE 7

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY MARKET PRICE RETURNS BY INVESTMENT OBJECTIVE RETURNS FROM INCEPTION UPTO THE YEAR 1995

Symbol	Index used as benchmark	No. of funds	No. of significant αs	Mean α based on market price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	38	0	0.027	32	6	0.3999	Ho rejected	-0.319	33
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	27	0	0.008	18	9	0.0883	Ho rejected	-0.262	11
EQTYI	CRSP EQUITY	9	0	0.010	6	3	0.1196	Ho rejected	0.343	8
GMMOR	S&P 500 LONG GOVT. BOND	31	0	-0.051	10	21	0.4881	Ho rejected	0.257	18
IBOND	S&P 500 COMPOSITE INDL. BOND	27	1	-0.069	8	19	0.3183	Ho rejected	-0.303	9
IEQTY	CRSP EQUITY	87	5	-0.211	21	66	0.4851	Ho concluded	0.930	74
LTGRO	CRSP EQUITY	16	0	0.014	11	5	0.0603	Ho rejected	0.535	10
MBOND	S&P 500 MUNICIPAL BOND	95	0	0.016	65	30	0.1953	Ho concluded	0.193	67
MSSTA	S&P 500 MUNICIPAL BOND	102	0	-0.009	49	53	0.0929	Ho concluded	0.212	58
OTHERS	CRSP EQUITY	49	0	0.001	29	20	**0.0103**	Ho concluded	0.488	39

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure (1968), α_i, is obtained by running a time-series regression of the *ith* security's excess return ($R_i - R_f$) on the market portfolio's excess rate of return ($R_m - R_f$), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i,$$ where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional α_s across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho: $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2: M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 8

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY MARKET PRICE RETURNS BY INVESTMENT OBJECTIVE

DATA : RETURNS FOR THE COMMON PERIOD 1991-1995

Symbol	Index used as benchmark	No. of funds	No. of Significant αs	Mean α based on market price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	31	1	0.080	31	0	0.1821	Ho rejected	-0.323	26
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	17	14	0.316 @	17	0	**0.0000**	Ho rejected	-0.203	3
EQTYI	CRSP EQUITY	4	0	0.083	4	0	0.1099	Inconclusive	0.380	4
GMMOR	S&P 500 LONG GOVT. BOND	7	0	0.035	6	1	0.3128	Ho rejected	0.265	5
IBOND	S&P 500 COMPOSITE INDL. BOND	7	0	0.062	6	1	0.4099	Ho rejected	-0.176	3
IEQTY	CRSP EQUITY	44	1	-0.007	17	27	**0.0341**	Ho concluded	0.855	42
LTGRO	CRSP EQUITY	12	1	0.075	7	5	0.4381	Ho rejected	0.563	11
MBOND	S&P 500 MUNICIPAL BOND	35	0	0.079	34	1	0.0882	Ho rejected	0.138	20
MSSTA	S&P 500 MUNICIPAL BOND	13	0	0.073	12	1	0.1138	Ho rejected	0.122	5
OTHERS	CRSP EQUITY	39	5	0.130	36	3	0.3926	Ho rejected	0.356	24

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return $(R_i - R_f)$ on the market portfolio's excess rate of return $(R_m - R_f)$, specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional αs across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

@ - CHYLD HAD EXCEPTIONAL ABNORMAL RETURNS

TABLE 9

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY MARKET PRICE RETURNS BY INVESTMENT OBJECTIVE

DATA : RETURNS FOR FIRST YEAR OF INCEPTION

Symbol	Index used as benchmark	No. of funds	No. of Signifi-cant αs	Mean α based on market price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	18	0	-0.113	3	15	0.3872	Ho rejected	**-0.155**	**5**
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	27	0	-0.199	5	21	0.3383	Ho rejected	**-0.258**	**4**
EQTYI	CRSP EQUITY	9	0	-0.060	3	6	0.1925	Ho rejected	**0.203**	**1**
GMMOR	S&P 500 LONG GOVT. BOND	31	0	-0.114	8	22	0.4951	Ho rejected	**0.221**	**6**
IBOND	S&P 500 COMPOSITE INDL. BOND	26	0	-0.284	2	24	0.3812	Ho rejected	**-0.278**	**7**
IEQTY	CRSP EQUITY	85	35	-0.313	20	65	0.4311	Ho rejected	**0.826**	**53**
LTGRO	CRSP EQUITY	8	1	-0.073	1	7	0.1196	Ho rejected	**0.324**	**1**
MBOND	S&P 500 MUNICIPAL BOND	95	0	-0.053	39	56	0.2676	Ho concluded	**0.195**	**25**
MSSTA	S&P 500 MUNICIPAL BOND	102	0	-0.079	39	62	0.3384	Ho concluded	**0.170**	**17**
OTHERS	CRSP EQUITY	43	1	-0.302	0	43	0.3744	Ho rejected	**0.516**	**21**

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return (R_i - R_f) on the market portfolio's excess rate of return (R_m - R_f), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional αs across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho: $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6.Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 10

SUMMARY OF REGRESSION RESULTS BASED ON MARKET PRICE WEEKLY RETURNS BY INVESTMENT OBJECTIVE

CROSS-SECTIONAL TEST OF ALPHAS FOR ALL FUNDS FOR THE PERIOD SINCE INCEPTION TO 1995

No. of funds	No. of Significant αs	Mean α based on market price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
481	6	-0.040	249	232	0.1771	Ho concluded	0.285	327

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return $(R_i - R_f)$ on the market portfolio's excess rate of return $(R_m - R_f)$, specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional αs across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 11

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY NAV RETURNS BY INVESTMENT OBJECTIVE

DATA : RETURNS FROM INCEPTION UPTO THE YEAR 1995

Symbol	Index used as benchmark	No. of funds	No. of Significant αs	Mean α based on nav price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	38	12	0.048	36	2	**0.0207**	Ho rejected	-0.251	37
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	27	1	0.027	20	7	0.4461	Ho concluded	-0.215	25
EQTYI	CRSP EQUITY	9	2	0.062	8	1	0.3308	Ho rejected	0.359	9
GMMOR	S&P 500 LONG GOVT. BOND	31	6	0.054	27	4	0.2264	Ho rejected	0.238	30
IBOND	S&P 500 COMPOSITE INDL. BOND	27	3	0.017	19	7	0.1126	Ho rejected	-0.339	20
IEQTY	CRSP EQUITY	87	11	-0.068	33	54	0.2168	Ho concluded	0.376	63
LTGRO	CRSP EQUITY	16	0	0.040	11	5	0.2329	Ho rejected	0.743	14
MBOND	S&P 500 MUNICIPAL BOND	95	32	0.080	95	0	**0.0119**	Ho rejected	0.253	95
MSSTA	S&P 500 MUNICIPAL BOND	102	15	0.081	101	0	**0.0111**	Ho rejected	0.332	102
OTHERS	CRSP EQUITY	49	5	0.026	37	12	0.2728	Ho rejected	0.474	45

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return ($R_i - R_f$) on the market portfolio's excess rate of return ($R_m - R_f$), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional α_s across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6.Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 12

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY NAV RETURNS BY INVESTMENT OBJECTIVE

DATA : RETURNS FOR THE COMMON PERIOD 1991-1995

Symbol	Index used as benchmark	No. of funds	No. of Signifi-cant αs	Mean α based on nav price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	31	19	0.097	31	0	**0.0087**	**Ho rejected**	-0.207	31
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	17	17	0.230	17	0	**0.0000**	**Ho rejected**	-0.165	13
EQTYI	CRSP EQUITY	4	1	0.067	4	0	0.0783	Inconclusive	0.409	4
GMMOR	S&P 500 LONG GOVT. BOND	7	4	0.083	7	0	**0.0052**	**Ho rejected**	0.328	7
IBOND	S&P 500 COMPOSITE INDL. BOND	7	1	0.064	7	0	0.0711	**Ho rejected**	-0.197	6
IEQTY	CRSP EQUITY	44	2	0.047	25	19	0.2585	Ho concluded	0.367	35
LTGRO	CRSP EQUITY	12	1	0.015	6	6	0.1893	**Ho rejected**	0.773	12
MBOND	S&P 500 MUNICIPAL BOND	35	26	0.079	35	0	**0.0035**	**Ho rejected**	0.128	35
MSSTA	S&P 500 MUNICIPAL BOND	13	10	0.082	13	0	**0.0078**	**Ho rejected**	0.148	13
OTHERS	CRSP EQUITY	39	11	0.084	31	8	0.4444	**Ho rejected**	0.460	35

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return (R_i - R_f) on the market portfolio's excess rate of return (R_m - R_f), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional α_s across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 13

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY NAV RETURNS BY INVESTMENT OBJECTIVE DATA : RETURNS FOR THE FIRST YEAR OF INCEPTION

Symbol	Index used as benchmark	No. of funds	No. of Signifi-cant αs	Mean α based on nav price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
CBOND	LONG GOVT BOND	18	3	-0.014	10	8	0.0979	Ho rejected	-0.197	9
CHYLD	S&P 500 COMPOSITE INDUSTRIAL BOND	27	8	-0.116	6	20	0.4476	Ho rejected	-0.183	13
EQTYI	CRSP EQUITY	9	3	0.067	2	7	0.2351	Ho rejected	0.340	9
GMMOR	S&P 500 LONG GOVT. BOND	31	6	0.008	20	11	**0.0395**	Ho rejected	0.215	21
IBOND	S&P 500 COMPOSITE INDL. BOND	26	1	-0.099	6	20	0.2795	Ho rejected	-0.343	12
IEQTY	CRSP EQUITY	85	10	0.001	35	50	**0.0024**	Ho concluded	0.333	42
LTGRO	CRSP EQUITY	8	1	0.110	2	6	**0.0006**	Ho rejected	0.554	7
MBOND	S&P 500 MUNICIPAL BOND	95	12	0.073	72	22	0.4888	Ho concluded	0.267	73
MSSTA	S&P 500 MUNICIPAL BOND	102	17	0.057	68	34	0.3391	Ho concluded	0.286	11
OTHERS	CRSP EQUITY	43	2	-0.102	17	26	0.3513	Ho concluded	0.445	33

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return ($R_i - R_f$) on the market portfolio's excess rate of return ($R_m - R_f$), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional αs across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: $M = 0$ and Ha1: $M > 0$ or Ha2 : $M < 0$. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 14

SUMMARY OF REGRESSION RESULTS BASED ON WEEKLY NAV RETURNS BY INVESTMENT OBJECTIVE
DATA : CROSS-SECTIONAL TEST OF ALPHAS COVERING ALL FUNDS TOGETHER FOR THE PERIOD 1991-1995

No. of funds	No. of Signifi-cant αs	Mean α based on NAV price	No. of +ve αs	No. of -ve αs	p-values of αs	Sign test of median	βs based on market price	No. of significant βs
481	87	0.036	387	92	0.2204	Ho concluded	0.233	440

Notes :

1. The above table provides a summary of the regression results obtained for the Jensen performance measure.

2. The Jensen performance measure(1968), α_i, is obtained by running a time-series regression of the *i*th security's excess return (R_i - R_f) on the market portfolio's excess rate of return (R_m - R_f), specifically :

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + e_i$$, where β_i is the slope or beta of security i; and e_i is the error term of security i.

3. This study uses the appropriate index for each investment objective.

4. Mean α_s are cross-sectional αs across funds within each investment objective.

5. P values are for a t-test of the null hypothesis Ho : $\alpha = 0$. Ho rejections at the 5% significance level are bolded.

6. Sign test of the hypotheses Ho: M = 0 and Ha1: M > 0 or Ha2 : M < 0. The test statistic is the smaller of the number of positive or negative alphas. Critical value is obtained from Statistical table for 5% level of significance. If test statistic > critical value, then Ho is not rejected. If test statistic < critical value, then Ho is rejected. Ties are excluded for the purpose of this study. The sign test of median tests for median equal to zero to determine the number of positive and negative alphas.

TABLE 15

FREQUENCY OF CONTINUATIONS AND REVERSALS OF PERFORMANCE OF CEFs;

ENTIRE SAMPLE BASED ON MARKET PRICE RETURNS USING MONTHLY DATA

YEAR	NEW FUNDS	WINNER WINNER	WINNER LOSER	LOSER WINNER	LOSER LOSER	TOTAL	TOTAL EXCL.NEW	$\chi^2_{0.05}$	PERSISTENCE
1982	34	0	0	0	0	34	0	N/A	N/A
1983	0	9	8	8	9	34	34	0.1176	NONE
1984	3	7	11	11	5	37	34	3.1765	NONE
1985	3	14	4	5	14	40	37	**9.8108**	CONTINUATION
1986	3	9	11	11	9	43	40	0.4000	NONE
1987	16	16	5	8	14	59	43	**7.3256**	CONTINUATION
1988	31	11	18	17	13	90	59	2.2203	NONE
1989	51	33	12	24	21	141	90	**10.0000**	AMBIGUOUS
1990	36	25	41	40	29	171	135	**5.6519**	REVERSAL
1991	33	36	53	62	26	210	177	**17.9153**	REVERSAL
1992	39	68	37	39	66	249	210	**16.0952**	CONTINUATION
1993	89	69	55	54	71	338	249	**3.8996**	CONTINUATION
1994	101	84	85	115	54	439	338	**22.0237**	REVERSAL
1995	40	98	121	129	91	479	439	**8.9909**	REVERSAL

Notes :

1. Winner-winner indicates the number of above median funds in previous year that were also above median funds in the current year. Loser-Winner, Winner-Loser, and Loser-Loser are defined similarly.
2. New funds shows the number of new funds that appeared in that year.
3. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%. This implies that the two classifications (winner, loser) are independent and have no association. The alternate hypothesis is that the Loser/Winner and Winner/Loser categories would have larger frequencies than the two other outcomes.
4. The statistical significance of these frequencies is established with a chi-square test having one degree of freedom at the 5% level.
5. Corresponding statistical table value for chi-square with 1 d.f. is 3.84. Significant chi-square values are bolded.
6. Form of persistence observed is shown in the last column. Continuation of behavior would mean that the winner continued to be a winner and loser continued to be loser. Reversal of behavior would mean either winner turned into a loser or vice-versa. Ambiguity would result if neither of these are observable.

TABLE 16

FREQUENCY OF CONTINUATIONS AND REVERSALS OF PERFORMANCE OF CEFs;

ENTIRE SAMPLE (BY CALENDAR YEAR) BASED ON NAV RETURNS USING MONTHLY DATA

YEAR	NEW FUNDS	WINNER WINNER	WINNER LOSER	LOSER WINNER	LOSER LOSER	TOTAL	TOTAL EXCL.NEW	$\chi^2_{0.05}$	PERSISTENCE
1982	34	0	0	0	0	34	0	N/A	N/A
1983	0	4	13	13	4	34	34	**9.5294**	**CONTINUATION**
1984	3	3	14	14	3	37	34	**14.2353**	**CONTINUATION**
1985	3	6	12	13	6	40	37	**4.6216**	**REVERSAL**
1986	3	10	10	10	10	43	40	0.0000	NONE
1987	16	9	12	13	9	59	43	1.1860	NONE
1988	31	16	13	15	15	90	59	0.3220	NONE
1989	51	31	14	25	20	141	90	**6.9778**	**REVERSAL**
1990	36	24	42	40	29	171	135	**6.6593**	**CONTINUATION**
1991	33	31	58	67	21	210	177	**32.1525**	**REVERSAL**
1992	39	63	42	28	77	249	210	**27.0667**	**CONTINUATION**
1993	89	65	59	49	76	338	249	**13.2366**	**CONTINUATION**
1994	101	76	93	126	43	439	338	**6.1486**	**REVERSAL**
1995	40	57	162	165	55	479	439	**105.3554**	**REVERSAL**

Notes :

1. Winner-winner indicates the number of above median funds in previous year that were also above median funds in the current year. Loser-Winner, Winner-Loser, and Loser-Loser are defined similarly.
2. New funds shows the number of new funds that appeared in that year.
3. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%. This implies that the two classifications (winner, loser) are independent and have no association. The alternate hypothesis is that the Loser/Winner and Winner/Loser categories would have larger frequencies than the two other outcomes.
4. The statistical significance of these frequencies is established with a chi-square test having one degree of freedom at 95% confidence level.
5. Corresponding statistical table value for chi-square with 1 d.f. is 3.84. Significant chi-square values are bolded.
6. Form of persistence observed is shown in the last column. Continuation of behavior would mean that the winner continued to be a winner and loser continued to be loser. Reversal of behavior would mean either winner turned into a loser or vice-versa. Ambiguity would result if neither of these are observable.

TABLE 17
FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR FUNDS WITH A DECEMBER YEAR END

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1982	23	LOWRETN	7	5	5	7	8	4	7	5	6	6	6	6	4	8	7	5	7	5
		HIGHRETN	7	4	5	6	4	7	5	6	6	5	6	5	8	3	5	6	5	6
		chisquare	1.1739		0.4783		2.2174		0.4783		0.1304		0.1304		3.6087		0.4783		0.4783	
1983	23	LOWRETN	5	7	6	6	6	6	4	8	6	6	9	3	6	6	6	6	5	7
		HIGHRETN	7	4	6	5	6	5	8	3	6	5	3	8	6	5	6	5	7	4
		chisquare	1.1739		0.1304		0.1304		3.6087		0.1304		5.3478 *		0.1304		0.1304		1.1739	
1984	24	LOWRETN	7	5	6	6	8	4	8	4	5	7	5	7	6	6	6	6	5	7
		HIGHRETN	5	7	6	6	4	8	4	8	7	5	7	5	6	6	6	6	7	5
		chisquare	0.6667		0.0000		2.6667		2.6667		0.6667		0.6667		0.0000		0.0000		0.6667	
1985	26	LOWRETN	6	7	6	7	5	8	6	7	7	6	6	7	7	6	6	7	5	8
		HIGHRETN	7	6	7	6	8	5	7	6	6	7	7	6	6	7	7	6	8	5
		chisquare	0.1538		0.1538		1.3846		0.1538		0.1538		0.1538		0.1538		0.1538		1.3846	
1986	28	LOWRETN	8	6	6	8	8	6	8	6	9	5	8	6	7	7	6	8	6	8
		HIGHRETN	6	8	8	6	6	8	6	8	5	9	6	8	7	7	8	6	8	6
		chisquare	0.5714		0.5714		0.5714		0.5714		2.2857		0.5714		0.0000		0.5714		0.5714	
1987	37	LOWRETN	10	9	11	8	11	8	13	6	14	5	13	6	13	6	13	6	11	8
		HIGHRETN	9	9	8	10	8	10	6	12	5	13	6	12	6	12	6	12	8	10
		chisquare	0.0811		0.7297		0.7297		4.6216 *		7.8649 *		4.6216 *		4.6216 *		4.6216 *		0.7297	
1988	48	LOWRETN	11	13	11	13	14	10	12	12	11	13	11	13	9	15	10	14	14	10
		HIGHRETN	13	11	13	11	10	14	12	12	13	11	13	10	15	9	14	10	10	14
		chisquare	0.3333		0.3333		1.3333		0.0000		0.3333		0.5833		3.0000		1.3333		1.3333	
1989	61	LOWRETN	13	18	12	19	10	21	12	19	11	20	17	14	18	13	18	13	15	16
		HIGHRETN	18	12	19	11	21	9	19	11	20	10	14	16	13	17	13	17	16	14
		chisquare	2.0164		3.7213		8.7049 *		3.7213		5.9508 *		0.4426		1.3607		1.3607		0.1803	
1990	69	LOWRETN	20	15	21	14	22	13	23	12	21	14	18	17	19	16	21	14	22	13
		HIGHRETN	15	19	14	20	13	21	12	22	14	20	17	17	16	18	14	20	13	21
		chisquare	1.2029		2.4783		4.2174 *		6.4203 *		2.4783		0.0435		0.3913		2.4783		4.2174 *	
1991	81	LOWRETN	19	22	22	19	23	18	20	21	21	20	20	21	20	21	22	19	24	17
		HIGHRETN	22	18	19	21	18	22	21	19	20	20	21	19	21	19	19	21	17	23
		chisquare	0.6296		0.3333		1.0247		0.1358		0.0370		0.1358		0.1358		0.3333		2.1111	
1992	88	LOWRETN	22	22	21	23	18	26	21	23	17	27	23	21	25	19	24	20	21	23
		HIGHRETN	22	22	23	21	26	18	23	21	27	17	21	23	19	25	20	24	23	21
		chisquare	0.0000		0.1818		2.9091		0.1818		4.5455 *		0.1818		1.6364		0.7273		0.1818	
1993	105	LOWRETN	30	23	29	24	28	25	30	23	27	26	27	26	28	25	29	24	33	20
		HIGHRETN	23	29	24	28	25	27	23	29	26	26	26	26	25	27	24	28	20	32
		chisquare	1.6286		0.7905		0.2571		1.6286		0.0286		0.0286		0.2571		0.7905		5.9714 *	
1994	118	LOWRETN	31	28	31	28	28	31	27	32	33	26	34	25	32	27	31	28	26	33
		HIGHRETN	28	31	28	31	31	28	32	27	26	33	25	34	27	32	28	31	33	26
		chisquare	0.3051		0.3051		0.3051		0.8475		1.6610		2.7458		0.8475		0.3051		1.6610	

TABLE 17
FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR FUNDS WITH A DECEMBER YEAR END

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1995	129	LOWRETN	30	35	29	36	30	35	25	40	31	34	37	28	37	28	34	31	33	32
		HIGHRETN	35	29	36	28	35	29	39	25	34	30	28	36	28	36	31	33	32	32
		chisquare	0 9535		1.7597		0 9535		6.5349 *		0 3953		2 2558		2 2558		0 2093		0 0233	
1982-95	860	LOWRETN	219	215	216	218	219	215	216	218	219	215	234	200	231	203	233	201	227	207
		HIGHRETN	217	209	216	210	215	211	217	209	215	211	200	225	203	223	201	225	207	219
		chisquare	0 2605		0 1674		0 1488		0 2326		0.1488		4.2372 *		2 8279		3 7953		1 3395	
1991-95	521	LOWRETN	132	130	132	130	127	135	123	139	129	133	141	121	142	120	140	122	137	125
		HIGHRETN	130	129	130	129	135	124	138	121	133	126	121	138	120	139	122	137	125	134
		chisquare	0.0365		0 0365		0.7274		2.1094		0 2668		2.6622		3 2610		2 1248		0 6810	

Notes :

1 The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%
This implies that the two classifications are independent and have no association.

The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes

The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f)

2 Significant chi-squares are marked with a * . Significance is tested at the 5% level, Table value for chisquare with 1 d f is 3 84

3 A word of caution in interpreting the results Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis

4 Out of the total, 14 were found to have significant chisquare statistics, and 4 of these were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR

5 Cross-sectional tests for the entire period reveal that only one chisquare statistic is significant Cross-sectional tests for the five-year period 1991-95 indicates no significant chi-square statistics

TABLE 18

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR FUNDS WITH A DECEMBER YEAR END

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1982	23	LOWRETN	5	7	7	5	7	5	9	3	6	6	5	7	6	6	6	6	7	5
		HIGHRETN	7	4	5	6	5	6	3	8	6	5	7	4	6	5	6	5	5	6
		chisquare	1.1739		0.4783		0.4783		5.3478 *		0.1304		1.1739		0.1304		0.1304		0.4783	
1983	23	LOWRETN	6	6	5	7	6	6	9	3	9	3	9	3	9	3	11	1	9	3
		HIGHRETN	6	5	7	4	6	5	3	8	3	8	3	8	3	8	1	10	3	8
		chisquare	0.1304		1.1739		0.1304		5.3478 *		5.3478 *		5.3478 *		5.3478 *		15.7826 *		5.3478 *	
1984	24	LOWRETN	4	8	4	8	6	6	6	6	6	6	3	9	8	4	8	4	4	8
		HIGHRETN	8	4	8	4	6	6	6	6	6	6	9	3	4	8	4	8	8	4
		chisquare	2.6667		2.6667		0.0000		0.0000		0.0000		6.0000 *		2.6667		2.6667		2.6667	
1985	26	LOWRETN	8	5	5	8	5	8	10	3	10	3	11	2	11	2	7	6	6	7
		HIGHRETN	5	8	8	5	8	5	3	10	3	10	2	11	2	11	6	7	7	6
		chisquare	1.3846		1.3846		1.3846		7.5385 *		7.5385 *		12.4615 *		12.4615 *		0.1538		0.1538	
1986	28	LOWRETN	9	5	10	4	10	4	11	3	10	4	8	6	10	4	6	8	8	6
		HIGHRETN	5	9	4	10	4	10	3	11	4	10	6	8	4	10	8	6	6	8
		chisquare	2.2857		5.1429 *		5.1429 *		9.1429 *		5.1429 *		0.5714		5.1429 *		0.5714		0.5714	
1987	37	LOWRETN	9	10	8	11	11	8	11	8	12	7	12	7	12	7	12	7	11	8
		HIGHRETN	10	8	11	7	8	10	8	10	7	11	7	11	7	11	7	11	8	10
		chisquare	0.2973		1.3784		0.7297		0.7297		2.2432		2.2432		2.2432		2.2432		0.7297	
1988	48	LOWRETN	14	10	15	9	14	10	15	9	15	9	14	10	13	11	13	11	14	10
		HIGHRETN	10	14	9	15	10	14	9	15	9	15	10	14	11	13	11	13	10	14
		chisquare	1.3333		3.0000		1.3333		3.0000		3.0000		1.3333		0.3333		0.3333		1.3333	
1989	61	LOWRETN	21	10	21	10	22	9	22	9	20	11	18	13	19	12	20	11	23	8
		HIGHRETN	10	20	10	20	9	21	9	21	11	19	13	17	12	18	11	19	8	22
		chisquare	7.2623 *		7.2623 *		10.2787 *		10.2787 *		4.7705 *		1.3607		2.8033		4.7705 *		13.8197 *	
1990	69	LOWRETN	23	12	24	11	26	9	26	9	26	9	26	9	24	11	24	11	23	12
		HIGHRETN	12	22	11	23	9	25	9	25	9	25	9	25	11	23	11	23	12	22
		chisquare	6.4203 *		9.0870 *		15.8116 *		15.8116 *		15.8116 *		15.8116 *		9.0870 *		9.0870 *		6.4203 *	
1991	81	LOWRETN	32	9	29	12	30	11	30	11	28	13	29	12	27	14	29	12	29	12
		HIGHRETN	9	31	12	28	11	29	11	29	13	27	12	28	14	26	12	28	12	28
		chisquare	25.0247 *		13.4691 *		16.9259 *		16.9259 *		10.4074 *		13.4691 *		7.7407 *		13.4691 *		13.4691 *	
1992	88	LOWRETN	35	9	33	11	32	12	33	11	33	11	34	10	35	9	33	11	30	14
		HIGHRETN	9	35	11	33	12	32	11	33	11	33	10	34	9	35	11	33	14	30
		chisquare	30.7273 *		22.0000 *		18.1818 *		22.0000 *		22.0000 *		26.1818 *		30.7273 *		22.0000 *		11.6364 *	
1993	105	LOWRETN	42	11	44	9	45	8	44	9	43	10	42	11	45	8	41	12	38	15
		HIGHRETN	11	41	9	43	8	44	9	43	10	42	11	41	8	44	12	40	15	37
		chisquare	35.4571 *		45.3619 *		50.7714 *		45.3619 *		40.2571 *		35.4571 *		50.7714 *		30.8619 *		19.3048 *	
1994	118	LOWRETN	55	4	54	5	53	6	54	5	53	6	50	9	50	9	49	10	48	11
		HIGHRETN	4	55	5	54	6	53	5	54	6	53	9	50	9	50	10	49	11	48
		chisquare	88.1695 *		81.3898 *		74.8814 *		81.3898 *		74.8814 *		56.9831 *		56.9831 *		51.5593 *		46.4068 *	

TABLE 18

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR FUNDS WITH A DECEMBER YEAR END

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	(2,10) HIGHRAR	(3,9) LOWRAR	(3,9) HIGHRAR	(4,8) LOWRAR	(4,8) HIGHRAR	(5,7) LOWRAR	(5,7) HIGHRAR	(6,6) LOWRAR	(6,6) HIGHRAR	(7,5) LOWRAR	(7,5) HIGHRAR	(8,4) LOWRAR	(8,4) HIGHRAR	(9,3) LOWRAR	(9,3) HIGHRAR	(10,2) LOWRAR	(10,2) HIGHRAR
1995	129	LOWRETN	47	18	54	11	52	13	56	9	58	7	59	6	57	8	57	8	56	9
		HIGHRETN	18	46	11	53	13	51	9	55	7	57	6	58	8	56	8	56	9	55
		chisquare	**25.2016 ***		**56.0233 ***		**45.9767 ***		**67.0620 ***		**79.0930 ***		**85.4806 ***		**72.9535 ***		**72.9535 ***		**67.0620 ***	
1982-95	860	LOWRETN	310	124	313	121	319	115	336	98	329	105	320	114	326	108	316	118	306	128
		HIGHRETN	124	302	121	305	115	311	98	328	105	321	114	312	108	318	118	308	128	298
		chisquare	**154.21 ***		**164.54 ***		**186.20 ***		**254.83 ***		**225.27 ***		**189.93 ***		**213.15 ***		**175.20 ***		**140.97 ***	
1991-95	521	LOWRETN	211	51	214	48	212	50	217	45	215	47	214	48	214	48	209	53	201	61
		HIGHRETN	51	208	48	211	50	209	45	214	47	212	48	211	48	211	53	206	61	198
		chisquare	**192.91 ***		**207.79 ***		**197.81 ***		**223.22 ***		**212.87 ***		**207.79 ***		**207.79 ***		**183.30 ***		**147.31 ***	

Notes :

1. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%
   This implies that the two classifications are independent and have no association

   The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes

   The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f)

2. Significant chi-squares are bolded. Significance is tested at the 5% level, Table value for chisquare with 1 d f is 3 84

3. A word of caution in interpreting the results Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis

4. Out of the total, 78 were found to have significant chisquare statistics and only 1 of these were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR

5. Cross-sectional tests for the entire period reveal that all chisquare statistics are significant Cross-sectional tests for the five-year period 1991-95 also gives similar results

TABLE 19
FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR FUNDS WITH A OCTOBER YEAR END

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1982	2	LOWRETN	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0	1
		HIGHRETN	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	1	0
		chisquare	2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000	
1983	2	LOWRETN	0	1	0	1	0	1	0	1	0	1	1	0	1	0	1	0	0	1
		HIGHRETN	1	0	1	0	1	0	1	0	1	0	0	1	0	1	0	1	1	0
		chisquare	2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000	
1984	4	LOWRETN	1	2	1	1	2	0	0	2	2	0	2	0	2	0	2	0	1	1
		HIGHRETN	1	0	1	1	0	2	2	0	0	2	0	2	0	2	0	2	2	0
		chisquare	2.0000		0.0000		4.0000 *		4.0000 *		4.0000 *		4.0000 *		4.0000 *		4.0000 *		2.0000	
1985	4	LOWRETN	2	0	1	1	1	1	2	1	1	1	1	1	2	1	2	1	2	0
		HIGHRETN	1	1	1	1	2	0	1	0	2	0	2	0	1	0	1	0	0	2
		chisquare	2.0000		0.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		4.0000 *	
1986	4	LOWRETN	2	0	2	0	2	1	2	0	3	0	3	0	3	0	3	0	2	1
		HIGHRETN	1	1	0	2	1	0	1	1	0	1	0	1	0	1	0	1	0	1
		chisquare	2.0000		4.0000 *		2.0000		2.0000		6.0000 *		6.0000 *		6.0000 *		6.0000 *		2.0000	
1987	6	LOWRETN	1	2	1	2	3	1	3	1	2	1	2	1	3	0	3	0	3	0
		HIGHRETN	2	1	2	1	0	2	0	2	1	2	1	2	0	3	0	3	0	3
		chisquare	0.6667		0.6667		3.3333		3.3333		0.6667		0.6667		6.0000 *		6.0000 *		6.0000 *	
1988	10	LOWRETN	4	1	4	1	3	2	4	1	4	1	3	2	3	2	3	2	3	2
		HIGHRETN	2	3	1	4	2	3	1	4	1	4	2	3	2	3	2	3	2	3
		chisquare	2.0000		3.6000		0.4000		3.6000		3.6000		0.4000		0.4000		0.4000		0.4000	
1989	19	LOWRETN	5	5	4	6	5	5	4	6	5	6	5	5	5	5	7	3	7	3
		HIGHRETN	5	4	6	3	5	4	6	3	5	3	5	4	5	4	3	6	3	6
		chisquare	0.1579		1.4211		0.1579		1.4211		1.0000		0.1579		0.1579		2.6842		2.6842	
1990	26	LOWRETN	4	9	3	10	5	8	6	7	5	8	6	7	9	4	7	6	7	6
		HIGHRETN	9	4	10	3	8	5	7	6	8	5	7	6	4	9	6	7	6	7
		chisquare	3.8462 *		7.5385 *		1.3846		0.1538		1.3846		0.1538		3.8462 *		0.1538		0.1538	
1991	41	LOWRETN	4	9	3	10	5	8	6	7	5	8	6	7	9	4	7	6	7	6
		HIGHRETN	9	4	10	3	8	5	7	6	8	5	7	6	4	9	6	7	6	7
		chisquare	7.9268 *		10.2683 *		6.3659 *		5.5854 *		6.3659 *		5.5854 *		7.9268 *		5.5854 *		5.5854 *	
1992	48	LOWRETN	14	10	10	14	10	14	11	13	12	12	14	10	14	10	13	11	12	12
		HIGHRETN	10	14	14	10	14	10	13	11	12	12	10	14	10	14	11	13	12	12
		chisquare	1.3333		1.3333		1.3333		0.3333		0.0000		1.3333		1.3333		0.3333		0.0000	
1993	84	LOWRETN	23	19	28	14	25	17	22	20	25	17	22	20	22	20	26	16	26	16
		HIGHRETN	19	23	14	28	17	25	20	22	17	25	20	22	20	22	16	26	16	26
		chisquare	0.7619		9.3333 *		3.0476		0.1905		3.0476		0.1905		0.1905		4.7619 *		4.7619 *	
1994	120	LOWRETN	19	41	29	31	41	19	30	30	22	38	20	40	21	39	22	38	30	30
		HIGHRETN	41	19	31	29	19	41	30	30	38	22	40	20	39	21	38	22	30	30
		chisquare	16.1333 *		0.1333		16.1333 *		0.0000		8.5333 *		13.3333 *		10.8000 *		8.5333 *		0.0000	

TABLE 19
FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR FUNDS WITH A OCTOBER YEAR END

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1995	133	LOWRETN	28	39	19	48	21	46	21	46	23	44	31	36	33	34	34	33	34	33
		HIGHRETN	39	27	48	18	46	20	46	20	44	22	36	30	34	32	33	33	33	33
		chisquare	**3.9925 ***		**26.1880 ***		**19.5714 ***		**19.5714 ***		**13.9173 ***		0 9248		0 0827		0 0226		0 0226	
1982-95	503	LOWRETN	108	138	106	139	123	124	111	136	109	138	117	129	128	119	131	116	134	112
		HIGHRETN	140	102	139	104	124	117	136	105	138	103	130	112	119	122	116	125	112	130
		chisquare	**9.80 ***		**9.66 ***		0 72		**6.83 ***		**8.73 ***		2 34		0 68		1 74		3 69	
1991-95	426	LOWRETN	88	118	89	117	102	104	90	116	87	119	93	113	99	107	102	104	109	97
		HIGHRETN	118	87	117	88	104	101	116	89	119	86	113	92	107	98	104	101	97	108
		chisquare	**9.27 ***		**8.16 ***		0 59		**7.13 ***		**10.45 ***		**4.48 ***		1.21		0 59		1.77	

Notes :

1. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal i.e. 25%. This implies that the two classifications are independent and have no association

The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes

The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f)

2 Significant chi-squares are bolded Significance is tested at 95% level, Table value for chisquare with 1 d f. is 3 84

3 A word of caution in interpreting the results Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis

4 Out of the total, 41 were found to have significant chisquare statistic and 18 were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR

5 Cross-sectional tests for the entire period reveal that 4 chisquare statistics are significant Cross-sectional tests for the *five-year period 1991-95 reveals 5 chisquare statistic*

TABLE 20

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR FUNDS WITH A OCTOBER YEAR END

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1982	2	LOWRETN	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0	1
		HIGHRETN	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	1	0
		chisquare	2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000	
1983	2	LOWRETN	0	1	0	1	0	1	0	1	0	1	1	0	1	0	1	0	0	1
		HIGHRETN	1	0	1	0	1	0	1	0	1	0	0	1	0	1	0	1	1	0
		chisquare	2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000	
1984	4	LOWRETN	1	1	1	1	2	0	0	2	2	0	2	0	2	0	2	0	1	1
		HIGHRETN	2	0	1	1	0	2	2	0	0	2	0	2	0	2	0	2	2	0
		chisquare	2.0000		0.0000		4.0000 *		4.0000 *		4.0000 *		4.0000 *		4.0000 *		4.0000 *		2.0000	
1985	4	LOWRETN	2	0	1	1	1	1	2	1	1	1	1	1	2	1	2	1	2	0
		HIGHRETN	1	1	1	1	2	0	1	0	2	0	2	0	1	0	1	0	0	2
		chisquare	2.0000		0.0000		2.0000		2.0000		2.0000		2.0000		2.0000		2.0000		4.0000 *	
1986	4	LOWRETN	2	0	2	0	2	1	2	0	3	0	3	0	3	0	3	0	2	1
		HIGHRETN	1	1	0	2	1	0	1	1	0	1	0	1	0	1	0	1	0	1
		chisquare	2.0000		4.0000 *		2.0000		2.0000		6.0000 *		6.0000 *		6.0000 *		6.0000 *		2.0000	
1987	6	LOWRETN	1	2	1	2	3	1	3	1	2	1	2	1	3	0	3	0	3	0
		HIGHRETN	2	1	2	1	0	2	0	2	1	2	1	2	0	3	0	3	0	3
		chisquare	0.6667		0.6667		3.3333		3.3333		0.6667		0.6667		6.0000 *		6.0000 *		6.0000 *	
1988	10	LOWRETN	4	1	4	1	3	2	4	1	4	1	3	2	3	2	3	2	3	2
		HIGHRETN	2	3	1	4	2	3	1	4	1	4	2	3	2	3	2	3	2	3
		chisquare	2.0000		3.6000		0.4000		3.6000		3.6000		0.4000		0.4000		0.4000		0.4000	
1989	19	LOWRETN	5	5	4	6	5	5	4	6	5	6	5	5	5	5	7	3	7	3
		HIGHRETN	5	4	6	3	5	4	6	3	5	3	5	4	5	4	3	6	3	6
		chisquare	0.1579		1.4211		0.1579		1.4211		1.0000		0.1579		0.1579		2.6842		2.6842	
1990	26	LOWRETN	4	9	3	10	5	8	6	7	5	8	6	7	9	4	7	6	7	6
		HIGHRETN	9	4	10	3	8	5	7	6	8	5	7	6	4	9	6	7	6	7
		chisquare	3.8462 *		7.5385 *		1.3846		0.1538		1.3846		0.1538		3.8462 *		0.1538		0.1538	
1991	41	LOWRETN	9	12	7	14	11	10	10	11	10	11	12	9	11	10	11	10	12	9
		HIGHRETN	12	8	14	6	10	10	11	9	11	9	9	11	10	10	10	10	9	11
		chisquare	1.2439		5.5366 *		0.0732		0.2683		0.2683		0.6585		0.0732		0.0732		0.6585	
1992	48	LOWRETN	14	10	10	14	10	14	11	13	12	12	14	10	14	10	13	11	12	12
		HIGHRETN	10	14	14	10	14	10	13	11	12	12	10	14	10	14	11	13	12	12
		chisquare	1.3333		1.3333		1.3333		0.3333		0.0000		1.3333		1.3333		0.3333		0.0000	
1993	84	LOWRETN	23	19	28	14	25	17	22	20	25	17	22	20	22	20	26	16	26	16
		HIGHRETN	19	23	14	28	17	25	20	22	17	25	20	22	20	22	16	26	16	26
		chisquare	0.7619		9.3333 *		3.0476		0.1905		3.0476		0.1905		0.1905		4.7619 *		4.7619 *	
1994	120	LOWRETN	19	41	29	31	41	19	30	30	22	38	20	40	21	39	22	38	30	30
		HIGHRETN	41	19	31	29	19	41	30	30	38	22	40	20	39	21	38	22	30	30
		chisquare	16.1333 *		0.1333		16.1333 *		0.0000		8.5333 *		13.3333 *		10.8000 *		8.5333 *		0.0000	

TABLE 20

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR FUNDS WITH A OCTOBER YEAR END

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1995	133	LOWRETN	28	39	19	48	21	46	21	46	23	44	31	36	33	34	34	33	34	33
		HIGHRETN	39	27	48	18	46	20	46	20	44	22	36	30	34	32	33	33	33	33
		chisquare	**3.9925** *		**26.1880** *		**19.5714** *		**19.5714** *		**13.9173** *		0 9248		0.0827		0 0226		0 0226	
1982-95	503	LOWRETN	113	140	110	143	129	126	115	140	114	141	123	131	130	125	135	120	139	115
		HIGHRETN	144	106	143	107	126	122	140	108	141	107	132	117	125	123	120	128	115	134
		chisquare	**8.66** *		**9.50** *		0 20		**6.65** *		**7.59** *		1 20		0.21		1.25		3 78	
1991-95	426	LOWRETN	93	121	93	121	108	106	94	120	92	122	89	115	101	113	106	108	114	100
		HIGHRETN	121	91	121	91	106	106	120	92	122	90	115	97	113	99	108	104	100	112
		chisquare	**7.92** *		**7.92** *		0 03		**6.88** *		**9.04** *		2.73		1 61		0 10		1 61	

Notes :

1. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%. This implies that the two classifications are independent and have no association

   The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes.

   The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f)

2. Significant chi-squares are bolded Significance is tested at the 5% level, Table value for chisquare with 1 d f is 3 84

3. A word of caution in interpreting the results. Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis.

4. Out of the total, 33 were found to have significant chisquare statistics and only 14 were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR

5. Cross-sectional tests for the entire period reveal that 4 chisquare statistics are significant Cross-sectional tests for the five-year period 1991-95 also gives similar results.

TABLE 21

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR ALL FUNDS FOR THE PERIOD JANUARY - DECEMBER

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10)		(3,9)		(4,8)		(5,7)		(6,6)		(7,5)		(8,4)		(9,3)		(10,2)	
			LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR	LOWRAR	HIGHRAR
1982	34	LOWRETN	8	9	9	8	10	7	9	8	9	8	7	9	8	9	9	8	9	8
		HIGHRETN	9	8	8	9	7	10	8	9	8	9	10	8	9	8	8	9	8	9
		chisquare	0.1176		0.1176		1.0588		0.1176		0.1176		0.5882		0.1176		0.1176		0.1176	
1983	34	LOWRETN	8	9	9	8	9	8	8	9	9	8	11	6	7	10	9	8	9	8
		HIGHRETN	9	8	8	9	8	9	9	8	8	9	6	11	10	7	8	9	8	9
		chisquare	0.1176		0.1176		0.1176		0.1176		0.1176		2.9412		1.0588		0.1176		0.1176	
1984	37	LOWRETN	11	8	9	10	11	8	13	6	11	8	7	12	8	11	9	10	7	12
		HIGHRETN	8	10	10	8	8	10	6	12	8	10	12	6	11	7	10	8	12	6
		chisquare	0.7297		0.2973		0.7297		4.8216 *		0.7297		3.3243		1.3784		0.2973		3.3243	
1985	40	LOWRETN	9	11	7	13	8	12	9	12	10	10	10	10	11	9	12	8	10	10
		HIGHRETN	11	9	13	7	12	8	11	8	10	10	10	10	10	10	8	12	10	10
		chisquare	0.4000		3.6000		1.6000		1.0000		0.0000		0.0000		0.2000		1.6000		0.0000	
1986	43	LOWRETN	13	9	10	12	15	7	14	8	15	7	13	9	11	11	12	10	12	10
		HIGHRETN	9	12	12	10	7	14	8	13	7	14	9	12	11	10	10	10	10	11
		chisquare	1.1860		0.3953		5.2791 *		2.8005		5.2791 *		1.1860		0.0698		0.3023		0.2558	
1987	59	LOWRETN	15	15	16	14	17	13	19	11	21	9	19	11	18	12	18	12	17	13
		HIGHRETN	15	14	14	15	13	16	11	18	9	20	11	18	12	17	12	17	13	16
		chisquare	0.0508		0.1864		0.8644		3.8475 *		9.0000 *		3.8475 *		2.0847		2.0847		0.8644	
1988	90	LOWRETN	21	24	19	26	21	24	19	26	20	25	19	26	17	28	19	26	23	22
		HIGHRETN	24	21	26	19	24	21	26	19	25	20	26	19	28	17	26	19	22	23
		chisquare	0.4000		2.1778		0.4000		2.1778		1.1111		2.1778		5.3778 *		2.1778		0.0444	
1989	141	LOWRETN	36	35	35	36	33	38	35	36	33	38	39	32	43	28	42	29	32	39
		HIGHRETN	35	35	36	34	38	32	36	34	38	32	32	38	28	42	29	41	39	31
		chisquare	0.0213		0.0780		0.8723		0.0780		0.8723		1.2128		5.9787 *		4.4468 *		1.6099	
1990	171	LOWRETN	39	47	43	43	46	40	53	33	48	38	46	40	47	39	51	36	55	31
		HIGHRETN	47	38	43	42	40	45	33	52	38	47	40	45	39	46	35	49	31	54
		chisquare	1.7018		0.0175		0.7193		8.9064 *		2.1228		0.7193		1.3275		4.9766 *		12.9298 *	
1991	210	LOWRETN	88	17	100	5	100	5	98	7	54	51	89	16	92	13	93	12	83	22
		HIGHRETN	17	88	5	100	5	100	7	98	51	54	16	89	13	92	12	93	22	83
		chisquare	96.0190 *		171.9048 *		171.9048 *		157.7333 *		0.1714		101.5048 *		118.8762 *		124.9714 *		70.8762 *	
1992	249	LOWRETN	54	71	59	66	64	61	60	65	56	69	62	63	66	59	70	55	61	64
		HIGHRETN	71	53	66	58	61	63	65	59	69	55	63	61	59	65	55	69	64	60
		chisquare	4.9277 *		0.9116		0.1084		0.4940		2.9357		0.0442		0.6867		3.3855		0.2048	
1993	338	LOWRETN	91	78	87	82	87	82	91	78	87	82	86	83	98	71	95	74	104	65
		HIGHRETN	78	91	82	87	82	87	78	91	82	87	83	86	71	98	74	95	65	104
		chisquare	2.0000		0.2959		0.2959		2.0000		0.2959		0.1065		8.6272 *		5.2189 *		18.0000 *	
1994	439	LOWRETN	121	99	109	111	102	118	96	124	105	115	103	117	105	115	111	109	101	119
		HIGHRETN	99	120	111	108	118	101	124	95	115	104	117	102	115	104	109	110	119	100
		chisquare	4.2164 *		0.0615		2.4852		7.4055 *		1.0091		1.9203		1.0091		0.0251		3.1230	

TABLE 21
FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR ALL FUNDS FOR THE PERIOD JANUARY - DECEMBER

RETURNS AND RAR BASED ON MARKET PRICE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1995	479	LOWRETN	88	152	77	163	82	158	97	143	106	134	113	127	108	132	113	127	123	117
		HIGHRETN	152	87	163	76	158	81	143	96	134	105	127	112	133	106	127	112	117	122
		chisquare	34.7453 *		62.4864 *		48.8747 *		18.0605 *		6.7871 *		1.7599		5.4509 *		1.7599		0.2568	
1982-95	2364	LOWRETN	602	584	588	597	605	581	621	566	584	602	624	561	639	547	663	524	646	540
		HIGHRETN	584	594	597	582	581	597	565	612	602	576	562	617	549	629	523	653	540	638
		chisquare	0.39		0.27		0.73		4.47 *		0.87		5.93 *		12.60 *		30.70 *		17.86 *	
1991-95	1715	LOWRETN	442	417	432	427	435	424	442	417	408	451	453	406	469	390	482	377	472	387
		HIGHRETN	417	439	427	429	424	432	417	439	451	405	406	450	391	465	377	479	387	469
		chisquare	1.30		0.04		0.22		1.30		4.63 *		4.84 *		13.87 *		25.00 *		18.27 *	

Notes .

1. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%. This implies that the two classifications are independent and have no association.

   The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes.

   The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f).

2. Significant chi-squares are bolded. Significance is tested at the 5% level, Table value for chisquare with 1 d f is 3.84.

3. A word of caution in interpreting the results. Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis. If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis.

4. Out of the total, 31 were found to have significant chisquare statistics and 9 were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR.

5. Cross-sectional tests for the entire period reveal that all chisquare statistics are significant. Cross-sectional tests for the five-year period 1991-95 also gives similar results.

TABLE 22

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK
ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995
FOR ALL THE FUNDS FOR THE PERIOD JANUARY - DECEMBER

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1982	34	LOWRETN	7	10	10	7	11	6	12	5	9	8	8	9	9	8	8	9	9	8
		HIGHRETN	10	7	7	10	6	11	5	12	8	9	9	8	8	9	9	8	8	9
		chisquare	1.0588		1.0588		2.9412		5.7647 *		0.1176		0.1176		0.1176		0.1176		0.1176	
1983	34	LOWRETN	9	8	8	9	10	7	12	5	12	5	13	4	10	7	14	3	11	6
		HIGHRETN	8	9	9	8	7	10	5	12	5	12	4	13	7	10	3	14	6	11
		chisquare	0.1176		0.1176		1.0588		5.7647 *		5.7647 *		9.5294 *		1.0588		14.2353 *		2.9412	
1984	37	LOWRETN	6	13	7	12	10	9	8	11	6	13	9	10	11	8	14	5	8	11
		HIGHRETN	13	5	12	6	9	9	11	7	13	5	10	8	8	10	5	13	11	7
		chisquare	6.1351 *		3.3243 *		0.0811		1.3784		6.1351 *		0.2973		0.7207		7.8649 *		1.3784	
1985	40	LOWRETN	11	9	5	15	7	13	12	8	11	9	16	4	13	7	11	9	10	10
		HIGHRETN	9	11	15	5	13	7	8	12	9	11	4	16	7	13	9	11	10	10
		chisquare	0.4000		10.0000 *		3.6000		1.6000		0.4000		14.4000 *		3.6000		0.4000		0.0000	
1986	43	LOWRETN	12	10	14	8	16	6	18	4	15	7	12	10	15	7	11	11	12	10
		HIGHRETN	10	11	8	13	6	15	4	17	7	14	10	11	7	14	11	10	10	11
		chisquare	0.2558		2.8605		8.4419 *		17.0000 *		5.2791 *		0.2558		5.2791 *		0.0698		0.2558	
1987	59	LOWRETN	15	15	12	18	22	8	21	9	21	9	22	8	22	8	24	6	19	12
		HIGHRETN	15	14	18	11	8	21	9	20	9	20	8	21	8	21	6	23	11	17
		chisquare	0.0508		2.8983		12.3898 *		9.0000 *		9.0000 *		12.3898 *		12.3898 *		20.7966 *		3.0339	
1988	90	LOWRETN	25	20	33	12	36	9	28	17	27	18	27	18	21	24	24	21	24	21
		HIGHRETN	20	25	12	33	9	36	17	28	18	27	18	27	24	21	21	24	21	24
		chisquare	1.1111		19.6000 *		32.4000 *		5.3778 *		3.6000		3.6000		0.4000		0.4000		0.4000	
1989	141	LOWRETN	49	22	45	26	37	34	35	35	40	31	40	31	45	26	49	22	39	32
		HIGHRETN	22	48	26	44	34	36	36	34	31	39	31	39	26	44	22	48	32	38
		chisquare	19.9362 *		9.7234 *		0.1915		0.0780		2.0638		2.0638		9.7234 *		19.9362 *		1.2128	
1990	171	LOWRETN	41	45	46	40	43	43	43	43	36	50	41	44	31	55	38	48	58	28
		HIGHRETN	45	40	40	45	43	42	43	42	50	35	44	42	55	30	48	37	28	57
		chisquare	0.4854		0.7193		0.0175		0.0175		4.9298 *		0.1579		14.0526 *		2.5906		20.3684 *	
1991	210	LOWRETN	89	16	102	4	102	3	99	6	40	65	94	11	86	19	97	8	89	16
		HIGHRETN	16	89	3	101	3	102	6	99	65	40	11	94	19	86	8	97	16	89
		chisquare	101.5048 *		182.9524 *		186.6857 *		164.7429 *		11.9048 *		131.2190 *		85.5048 *		150.8762 *		101.5048 *	
1992	249	LOWRETN	55	70	51	74	53	72	58	67	69	57	74	51	70	55	72	53	56	69
		HIGHRETN	70	54	74	50	72	52	67	57	56	67	51	73	55	69	53	71	69	55
		chisquare	3.8675 *		8.8795 *		6.1165 *		1.4578		2.1647		8.1406 *		3.3855		5.5060 *		2.9357	
1993	338	LOWRETN	50	119	89	80	80	89	83	86	72	97	78	91	82	87	80	89	83	86
		HIGHRETN	119	50	80	89	89	80	86	83	97	72	91	78	87	82	89	80	87	82
		chisquare	56.3432 *		0.9586		0.9586		0.1065		7.3964 *		2.0000		0.2959		0.9586		0.2012	
1994	439	LOWRETN	107	113	87	133	91	129	103	117	94	126	103	117	97	123	88	132	69	152
		HIGHRETN	113	106	133	86	129	90	117	102	126	93	117	102	123	96	132	87	151	67
		chisquare	0.3895		19.7062 *		13.5103 *		1.9203		9.6287 *		1.9203		6.4032 *		18.0478 *		63.5513 *	

TABLE 22

FREQUENCY DISTRIBUTIONS OF 2 x 2 CLASSIFICATION OF THE RISK ADJUSTMENT RATIO AND WINNER / LOSER VARIABLES , YEARS 1982-1995 FOR ALL THE FUNDS FOR THE PERIOD JANUARY - DECEMBER

RETURNS AND RAR BASED ON NET ASSET VALUE

Year	# of funds	M, (12-M)->	(2,10) LOWRAR	HIGHRAR	(3,9) LOWRAR	HIGHRAR	(4,8) LOWRAR	HIGHRAR	(5,7) LOWRAR	HIGHRAR	(6,6) LOWRAR	HIGHRAR	(7,5) LOWRAR	HIGHRAR	(8,4) LOWRAR	HIGHRAR	(9,3) LOWRAR	HIGHRAR	(10,2) LOWRAR	HIGHRAR
1995	479	LOWRETN	158	82	102	138	119	121	123	117	106	134	104	136	97	143	98	142	108	132
		HIGHRETN	82	157	138	101	121	118	117	122	134	105	136	103	143	96	142	97	132	107
		chisquare	**47.6054 ***		**11.1294 ***		0 0564		0 2588		**6.7871 ***		**8.8246 ***		**18.0605 ***		**18.5407 ***		**5.0167 ***	
1982-95	2364	LOWRETN	634	552	611	576	637	549	655	531	558	629	641	544	609	577	628	558	595	593
		HIGHRETN	552	626	575	602	549	629	531	647	628	549	544	635	577	601	558	620	592	584
		chisquare	**10.35 ***		1 70		**11.99 ***		**24.42 ***		**9.59 ***		**14.98 ***		1 38		**7.42 ***		0 12	
1991-95	1715	LOWRETN	459	400	431	429	445	414	466	393	381	479	453	406	432	427	435	424	405	455
		HIGHRETN	400	456	428	427	414	442	393	463	478	377	406	450	427	429	424	432	455	400
		chisquare	**7.72 ***		0 02		2 04		**11.93 ***		**23.11 ***		**4.84 ***		0 04		0 22		**6.46 ***	

Notes .

1. The null hypothesis is that the percentage of the sample population falling into each of these four categories is equal to 25%. This implies that the two classifications are independent and have no association

The alternative hypothesis is that the LOWRTN / HIGHRAR AND HIGHRTN / LOWRAR would have larger frequencies than the other two outcomes

The statistical significance of these frequencies is established with a chi-square test having one degree of freedom (d f)

2. Significant chi-squares are bolded Significance is tested at the 5% level. Table value for chisquare with 1 d f. is 3 84

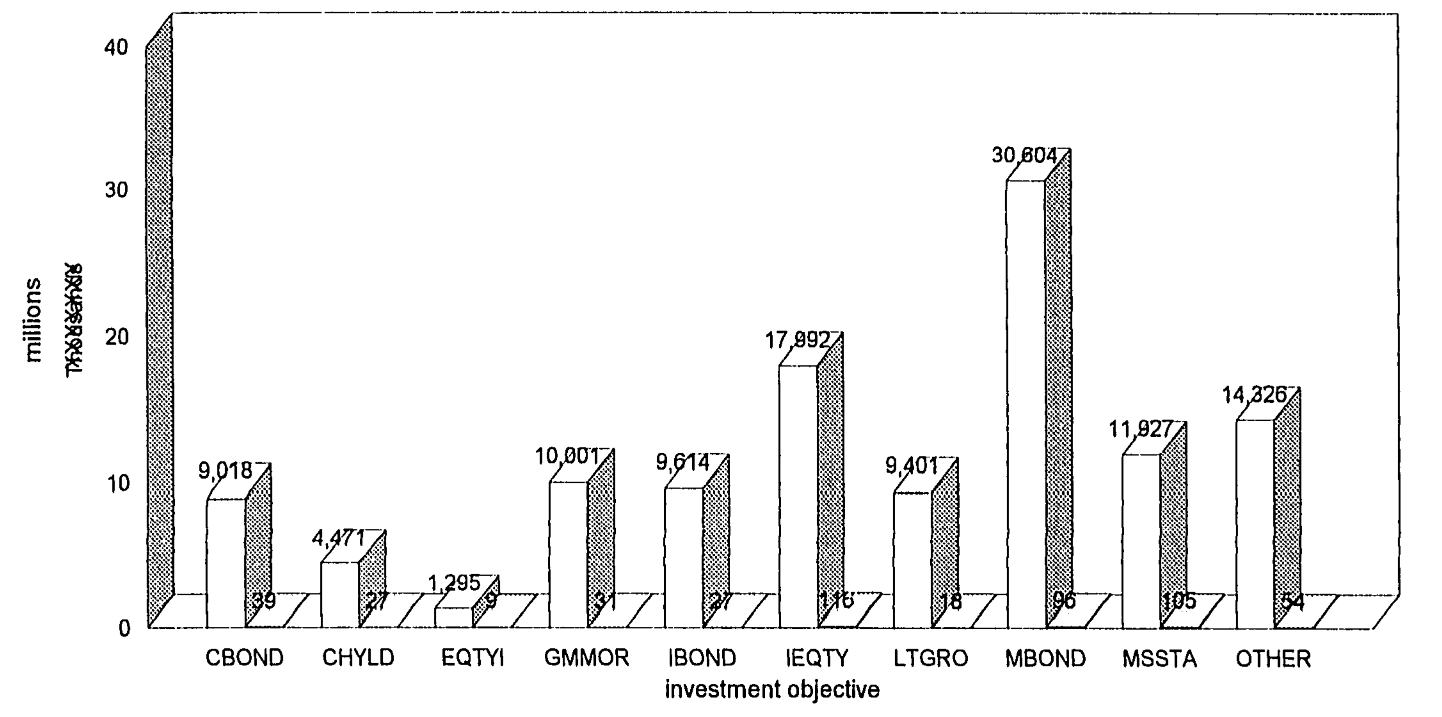
3. A word of caution in interpreting the results Merely rejecting null hypothesis does not by itself constitute evidence in favour of alternative hypothesis If the cell frequencies of LOWRETN / HIGHRAR AND HIGHRETN / LOWRAR are less than 25%, then the results would indicate exactly the opposite of alternative hypothesis

4. Out of the total, 60 were found to have significant chisquare statistics and only 24 were found to have larger frequencies of LOWRETN / HIGHRAR and HIGHRETN / LOWRAR

5. Cross-sectional tests for the entire period reveal that all chisquare statistics are significant. Cross-sectional tests for the five-year period 1991-95 also gives similar results

FIGURE 1

CEFs BY INVESTMENT OBJECTIVE (VALUE IN MILLIONS AND NOS.)



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