

## **EQUITY MUTUAL FUND HISTORICAL PERFORMANCE RATINGS AS PREDICTORS OF FUTURE PERFORMANCE**

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### **Abstract**

This study investigates the usefulness of *Forbes* equity fund performance ratings in predicting future mutual fund returns. Specifically, this study examines the relationships between (1) a fund's *Forbes* equity fund rating and its performance during subsequent periods and (2) the predictive ability of *Forbes* equity fund ratings and the investment horizon. Results suggest that *Forbes* up-market ratings would have helped predict betas but would have been of little use in predicting future fund performance. *Forbes* down-market ratings may have helped predict fund returns over the following year and fund risk-adjusted returns over periods greater than one year.

### **INTRODUCTION**

An issue of concern to mutual fund investors is the information content of various descriptors, which they may use in an attempt to select funds meeting their investment goals. Researchers have for some time [(McDonald, 1974; Kuhle, 1988; Madura and Cheney, 1989), for example] noted a clear relationship between a fund's objective and its raw return but a much weaker relationship between fund objective and risk-adjusted return (McDonald, 1974; Kuhle, 1988). Also, there appears to be a clear relationship between fund objective and beta (Klemkosky, 1976; Kuhle, 1988). In addition, researchers [for example, (Sharpe, 1966; Jensen, 1968; Carlson, 1970; Klemkosky, 1977; Dunn and Theisen, 1983)] have examined the ability of past performance to predict future performance, with mixed results.

The purpose of this study is to investigate the usefulness of another descriptor, the A+ through F equity performance rating system used by *Forbes*, in predicting future mutual fund returns. The period studied is September 1974 through August 1990. The ratings used in this study are the up-market and down-market ratings published by *Forbes* in its mutual fund issue, which appears annually in August.<sup>1</sup> The specific issues examined in this study are (1) whether equity funds with higher *Forbes* up-(down-)market ratings had greater raw or risk-adjusted returns than those with lower up-(down-)market ratings during subsequent periods and (2) the relationship between the ability of *Forbes* equity fund ratings to predict future performance and the length of time over which the performance is measured increases. This study extends the mutual fund research in that it examines the ability of historical performance *ratings* to predict future fund returns; other similar studies have dealt with the historical performance itself (Klemkosky, 1977) or examined a much shorter time than this study (Pope and Howe, 1990). While historical performance figures may be more precise than performance ratings, relatively unsophisticated investors may understand (or, more to the point, *think* they understand) performance ratings better than they do actual performance figures. This may be because performance ratings are based on a fund's performance relative to other funds or simply because using a rating scale assigns each fund to one of a relatively small number of groups.

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## METHODOLOGY

### Mutual Fund Performance Evaluation

The continuously-compounded return earned by a shareholder of mutual fund  $i$  in period  $t$ , ignoring the front-end load (if any) can be calculated as follows:

Equation 1

$$R_{it} = \ln[(NAV_{it} + D_{it}) / NAV_{it-1}]$$

where:

$NAV_{it}$  = net asset value of fund  $i$  at the end of period  $t$

$D_{it}$  = distribution of dividends or capital gains for fund  $i$  during period  $t$ .

A benchmark portfolio is defined as a combination of the risk-free asset and the market portfolio. Such a portfolio is perfectly diversified; thus, all its risk is systematic. The performance of fund  $i$  in period  $t$ , after adjusting for systematic risk, can be expressed as follows:

Equation 2

$\alpha_{it}$  = Fund Excess Return - Excess Return on Benchmark Portfolio of Equal  $\beta$

$$= (R_{it} - R_{ft}) - \beta_i(R_{mt} - R_{ft})$$

where:

$R_{ft}$  = the risk-free rate in period  $t$

$R_{mt}$  = the market return in period  $t$

$\beta_i$  = the beta coefficient of fund  $i$ .

$\alpha_{it}$ , the Jensen's (1968) alpha of fund  $i$  for period  $t$ , measures how well the fund performed relative to a perfectly-diversified portfolio with equal systematic risk. In the  $n$ -month case, a fund's Jensen's alpha can be calculated as follows:

Equation 3

$$a_i = \sum R_{it} / n - \sum R_{ft} / n - b_i(\sum R_{mt} / n - \sum R_{ft} / n), \quad t=1, \dots, n$$

where  $b_i$  is the ordinary least squares estimate of  $\beta_i$  based on observations 1 through  $n$ .

### Hypotheses

The issue of whether historical mutual fund performance ratings could have predicted which funds would have earned the greatest raw returns can be examined by testing the following null hypothesis:

$H^1$ : There is no relationship between a mutual fund's performance rating and its raw return.

The issue of whether mutual fund performance ratings could have predicted mutual fund returns adjusted for systematic risk can be examined by testing the following null hypothesis:<sup>2</sup>

$H^2$ : There is no relationship between a mutual fund's performance rating and its Jensen's alpha.

Since the performance rating scales are ordinal rather than nominal, correlation tests are more appropriate than analysis of variance. This study uses Spearman rank correlation coefficients, rather than Pearson correlation coefficients, because the performance rating scale is ordinal rather than interval and because the distribution of raw or risk-adjusted returns may be nonnormal.

Because *Forbes* ratings are published annually, an investor has the opportunity to switch funds in response to rating changes annually. Thus, this study examines annual performance based on the most recent ratings available as of the beginning of the period over which the performance is measured. However, investors may not wish to switch funds annually, whether because of load fees or because of having an investment horizon longer than one year. Because of this, this study also examines the two-year, four-year, eight-year, and sixteen-year performance of funds selected on the basis of their rating at the beginning of the two-, four-, eight-, or sixteen-year period. These periods are also subdivided into up- and down-markets. This enables one to examine the ability of *Forbes* ratings to predict which funds would best survive future down-markets, and would be of interest to investors who are explicitly concerned with the probability of a rate of return less than the minimum they consider to be acceptable [Roy's (1952) safety-first criterion].

### ***A priori* Expectations**

The decomposition of fund performance presented in equation (2) can be used to formulate the *a priori* expectations regarding the hypotheses. If  $\beta_i$  is held constant, there is a direct relationship between selectivity, measured by  $\alpha_i$ , and  $R_i$ . If  $\alpha_i$  is held constant,  $R_i$  and  $\beta_i$  are directly related when  $R_m > R_f$  and inversely related when  $R_m < R_f$ .

A fund's *Forbes* down-market rating is based on its raw returns over the three most recent down-markets. *Forbes* uses the Standard and Poor's 500 for defining the up- and down-markets used in rating the funds. During the down-markets used by *Forbes* in determining the ratings,  $R_m$  is negative, not to mention less than  $R_f$ . This implies that equity funds with high *Forbes* down-market ratings tend to be those with relatively low values of  $\beta_i$  or high values of  $\alpha_i$  during the three most recent down-markets. During down-markets, these two factors reinforce each other. Thus, if historical levels of systematic risk or risk-adjusted performance predict future levels, one would expect that equity funds with higher returns during previous down-markets would tend to have higher returns during future down-markets.

The equity funds which would be expected to have the highest returns during up-markets, during which  $R_m > R_f$ , would be those with relatively high levels of both systematic risk and risk-adjusted performance. Thus, the direction of the relationship between an equity fund's *Forbes* down-market rating and its return during up-markets theoretically depends on which factor—the systematic risk or the risk-adjusted return—dominates. However, based on the results of studies such as (Bauer, Hays, and Upton, 1987; Dunn and Theisen, 1983; Klemkosky, 1977), one would expect the systematic risk component to dominate; thus, this correlation is expected to be negative, where category 1 is the poorest rating category, followed by category 2, and so on.

An equity fund's *Forbes* up-market rating is based on its raw returns over the three most recent up-markets. Thus, following reasoning analogous to that for *Forbes* down-market ratings, one would expect the relationship between *Forbes* up-market rating and return to be direct during up-markets and inverse during down-markets.

Since the *Forbes* ratings are based on raw mutual fund returns, which contain a risk-adjusted return component, the correlation between a fund's *Forbes* rating (either up-market or down-market) and its  $\alpha_i$  is hypothesized to be positive, regardless of the performance of the market as a whole.

It is unclear whether to expect the correlation between *Forbes* ratings and fund performance to increase or decrease as the length of the investment horizon increases. On one hand, one would expect the one-year performance of funds to be more erratic than the performance of funds over a longer period. This would suggest that the correlations would increase as the length of the investment horizon increases. On the other hand, as the investment horizon increases, the fund ratings become more out-of-date; this would suggest that the correlations between rating and performance would decrease as the length of the investment horizon increases.

### **Sample Description**

This study examines mutual fund performance from September 1974 through August 1990. This sixteen-year period is broken into:

1. Sixteen non-overlapping one-year periods.
2. Eight non-overlapping two-year periods.
3. Four non-overlapping four-year periods.
4. Two non-overlapping eight-year periods.

For any given period examined in this study, the sample includes open-end equity funds for which the following data were available: (1) a complete set of monthly returns for the period examined and (2) *Forbes* up- and down-market ratings based on the three previous up-markets or down-markets. Risk-adjusted performance of balanced or international funds would at least in part be a reflection the performance of the debt or international equity markets, respectively. Therefore, funds that at any time between 1974 and 1989 were classified as balanced or international funds were excluded from the samples for all periods. Sample sizes for each period analyzed and each category of fund, including breakdowns by rating category, are shown in Table 1. All returns, including those on Treasury bills and the Standard and Poor's 500, were obtained from Northfield Information Services, Boston MA.

## RESULTS

### Beta vs. Rating

Tables 2 and 3 show the values of the Spearman (rank) correlation coefficient,  $r$ , between rating category and beta. Full results, not reported here, are available upon request. As expected, there was a negative correlation between a fund's beta and its *Forbes* down-market rating and a positive correlation between its beta and its *Forbes* up-market rating. The correlation between *Forbes* up-market ratings and betas was significant at the 0.01 level for all periods examined. The correlation between *Forbes* down-market ratings and betas was significant at the 0.01 level for all periods examined except 1978-1979, 1979-1980, and 1978-1980.

### Average Return vs. Rating

Tables 2 and 3 present the Spearman correlation coefficients between rating category and average monthly return. In addition, since the sign of the Spearman correlation coefficient would be expected to depend on the market conditions, the average monthly excess return on the Standard and Poor's 500 is presented. For the up-market ratings, the signs of the correlation coefficients for only ten of the one-year periods are as expected given the performance of the market—positive when the excess return on the Standard and Poor's 500 is positive and negative when the excess return on the Standard and Poor's 500 is negative. Also, the signs of eight of the two-, four-, eight-, and sixteen-year correlation coefficients are opposite what would be expected given the performance of the market during the respective period. When examining up-market periods only, similar conclusions are reached. The correlation coefficient between up-market rating and average monthly return was positive for only six out of the ten up-market years.

In contrast, for the down-market ratings thirteen of the one-year correlation coefficients are consistent with expectations. A binomial test indicates that this is significant at the 0.01 level.<sup>3</sup> However, the signs of the nearly half of the two-, four-, eight-, and sixteen-year correlations are contrary to expectations. Comparison of Tables 2 and 3 with Table 4 shows the correlation coefficients between beta and average return to be generally higher and more consistent with expectations than the correlation coefficients between rating category and average return. Still, many of the two-, four-, eight-, and sixteen-year correlation coefficients have signs opposite those expected. Possible explanations for this include beta nonstationarity, which has been documented by Miller and Gressis (1980) and Bauer, Hays, and Upton (1987) and instability in the variance of the market.

The ability of *Forbes* down-market ratings to predict returns during future down-markets appears to be much better than the ability of *Forbes* up-market ratings to predict returns during future up-markets. The correlation coefficient between down-market rating and average monthly return was positive for all six of the down-market years, a finding which is significant at the 0.05 level.

## Risk-Adjusted Performance vs. Rating

Tables 2 and 3 present the Spearman correlation coefficients between alpha and rating. For both the up- and down-market ratings, the number of statistically significant correlation coefficients is considerably greater than expected by chance. Also, all except two of the significant correlation coefficients between alpha and down-market rating were positive, consistent with the possibility that performance during past down-markets predicts future risk-adjusted performance to some extent.

The significant correlation coefficients between up-market rating and alpha are negative in most cases. In addition, the correlation coefficients between alpha and beta, reported in Table 5, are generally negative and highly significant. This suggests that spurious correlation is present, although it is not clear which relationships (alpha vs. up-market rating, alpha vs. down-market rating, or alpha vs. beta) are spurious and which, if any, are the real relationships. Thus, it empirically appears that from September 1974 through August 1990 *Forbes* down-market ratings could have been used to predict which funds would earn the greatest risk-adjusted returns. However, it is unclear whether this relationship reflects a tendency for past risk-adjusted performance to repeat itself or is purely spurious.

The ability of *Forbes* down-market ratings to predict risk-adjusted performance during future down-markets appears to be much better than the ability of *Forbes* up-market ratings to predict risk-adjusted performance during future up-markets. The correlation coefficient between down-market rating and alpha was positive for five of the six down-market years; this is significant at the 0.10 level. On the other hand, the correlation coefficient between up-market rating and alpha was positive for only four out of the ten up-market years.

## Summary Of The Results

In summary, it appears that *Forbes* down-market ratings would have helped predict which funds would earn the greatest return only over the coming year, and then only if the excess return over the year was negative. Given that the correlation coefficients between beta and average return over the two-, four-, eight-, and sixteen- year periods (1) are generally much lower than the correlations over one-year periods and (2) often have signs opposite what would be expected given the performance of the market, the ability of *Forbes* down-market ratings is about as good as one could hope for. *Forbes* up-market ratings, however, show little ability to predict future returns, even during subsequent up-markets.

Over the period studied, the correlation between a fund's *Forbes* down-market rating and its risk-adjusted performance over future periods was usually positive, and in many cases statistically significant. On the other hand, a fund's risk-adjusted performance over future periods was in general negatively correlated with its *Forbes* up-market rating, particularly over periods of four or more years.

While *Forbes* equity fund ratings show only limited ability to predict future performance, they do appear to show some ability to predict the fund's beta over virtually every period examined. This is consistent with the correlation between fund objective and beta reported by Klemkosky (1976) and Kuhle (1988) and with the finding of Bauer, Hays, and Upton (1987) that mutual fund betas are more stable than mutual fund alphas.

## SUMMARY AND CONCLUSION

This study has used correlation analysis to examine the relationship between an equity mutual fund's published performance rating and its raw or risk-adjusted return over subsequent periods. It has also examined the effect of lengthening the investment horizon on these correlations.

Over the period covered in this study, September 1974 through August 1990, results suggest that *Forbes* up-market ratings would have been useful in predicting betas. However, the ratings appear to be of little use in predicting future fund performance. This is consistent with the correlation between fund objective and beta reported by Klemkosky (1976) and Kuhle (1988) and with the finding of Bauer, Hays, and Upton (1987) that mutual fund betas are more stable than mutual fund alphas. There are two possible exceptions to these findings. First, *Forbes* down-market ratings may have helped predict fund returns over the following year. Second, *Forbes* down-market ratings appeared useful in predicting fund risk-adjusted returns over periods greater than one year—perhaps even for the entire sixteen-year period studied. It is unclear, however, whether this reflects true predictive ability on the part of *Forbes* down-market ratings or is a spurious relationship.

## ENDNOTES

1. There are two reasons for using *Forbes* ratings, rather than other published ratings, in this study. First, *Forbes* ratings are widely available, even to the relatively unsophisticated investor. Second, other mutual fund performance studies have examined periods of eight years or longer. Of the widely available fund performance ratings, only *Forbes* ratings have been in existence that long.
2. Individual investors, the group of investors most likely to be interested in performance ratings, may be poorly diversified. Therefore, a fund's net selectivity (Fama, 1972), that is, its performance after adjusting for *total* risk may also be relevant. The conclusions regarding the relationship between a fund's rating and its net selectivity were identical to those regarding the relationship between rating and alpha. The results are available on request.
3. That is, if there were no relationship between return and down-market rating, the probability that thirteen or more of the correlation coefficients were consistent with expectations would be less than 0.01.

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**TABLE 1**  
**Numbers Of Funds, By Rating Category**

**Up-Market Rating**

<b>Period</b>	<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>A+</b>	<b>Total</b>
1974-1975	0	19	27	23	17	4	90
1975-1976	0	26	25	25	14	9	99
1976-1977	0	20	25	35	8	11	99
1977-1978	0	22	26	37	7	11	103
1978-1979	0	37	41	44	31	19	172
1979-1980	0	38	44	43	29	19	173
1980-1981	0	40	42	45	27	19	173
1981-1982	0	38	42	43	31	20	174
1982-1983	0	40	44	40	36	18	178
1983-1984	0	45	47	53	30	23	198
1984-1985	0	43	55	58	27	19	202
1985-1986	7	53	53	61	34	13	221
1986-1987	7	55	50	65	33	13	223
1987-1988	7	56	59	63	34	11	230
1988-1989	9	55	65	52	38	11	230
1989-1990	11	71	75	67	49	17	290

**Down-Market Rating**

<b>Period</b>	<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>A+</b>	<b>Total</b>
1974-1975	18	27	27	15	9	0	96
1975-1976	22	25	26	13	11	1	98
1976-1977	23	28	25	11	10	1	98
1977-1978	34	42	42	23	4	1	146
1978-1979	32	42	43	20	8	1	146
1979-1980	32	43	42	20	9	1	147
1980-1981	33	40	45	18	10	1	147
1981-1982	34	44	45	17	10	0	150
1982-1983	41	55	52	26	16	0	190
1983-1984	44	57	49	31	11	0	192
1984-1985	52	61	57	25	11	2	208
1985-1986	10	56	51	54	33	10	214
1986-1987	10	59	52	55	30	10	216
1987-1988	10	57	55	57	33	10	222
1988-1989	13	62	57	64	41	12	249
1989-1990	12	60	67	63	39	11	252

**TABLE 2**  
**Spearman Correlation Coefficients—Up-Market Ratings**

Period	Correlation Between Rating And			S & P 500 Excess Return
	Beta	Return	Alpha	
1974-1975	0.414***	-0.242**	-0.368***	0.0142
1975-1976	0.468***	-0.299***	-0.461***	0.0129
1976-1977	0.339***	0.043	0.085	-0.0056
1977-1978	0.382***	0.512***	0.495***	0.0046
1978-1979	0.457***	-0.047	-0.131*	0.0020
1979-1980	0.381***	0.311***	0.252***	0.0052
1980-1981	0.421***	0.243***	0.438***	-0.0064
1981-1982	0.464***	-0.270***	-0.211***	-0.0072
1982-1983	0.457***	0.535***	0.213***	0.0236
1983-1984	0.450***	-0.572***	-0.559***	-0.0028
1984-1985	0.476***	-0.284***	-0.390***	0.0073
1985-1986	0.477***	0.064	-0.227***	0.0224
1986-1987	0.453***	0.316***	-0.067	0.0204
1987-1988	0.500***	-0.382***	-0.019	-0.0208
1988-1989	0.396***	0.382***	0.065	0.0213
1989-1990	0.404***	-0.162***	0.002	-0.0103
1974-1976	0.446***	-0.329***	-0.454***	0.0136
1976-1978	0.379***	0.312***	0.317***	-0.0005
1978-1980	0.384***	0.205***	0.122	0.0036
1980-1982	0.486***	-0.111	0.067	-0.0068
1982-1984	0.536***	0.068	-0.228***	0.0104
1984-1986	0.435***	-0.238***	-0.387***	0.0148
1986-1988	0.569***	-0.119*	-0.111*	-0.0002
1988-1990	0.398***	0.254***	0.136**	0.0055
1974-1978	0.458***	-0.029	-0.122	0.0065
1978-1982	0.403***	0.140*	0.195**	-0.0016
1982-1986	0.533***	-0.149**	-0.391***	0.0126
1986-1990	0.561***	0.077	-0.042	0.0026
1974-1982	0.526***	0.012	-0.060	0.0024
1982-1990	0.478***	-0.059	-0.285***	0.0076
1974-1990	0.555***	-0.089	-0.271***	0.0050

\*significant at the .10 level

\*\*significant at the .05 level

\*\*\*significant at the .01 level

**TABLE 3**  
**Spearman Correlation Coefficients—Down-Market Ratings**

Period	Correlation Between Rating And			S & P 500
	Beta	Return	Alpha	Excess Return
1974-1975	-0.325***	-0.050	0.137	0.0142
1975-1976	-0.504***	0.354***	0.533***	0.0129
1976-1977	-0.384***	0.143	0.102	-0.0056
1977-1978	-0.446***	-0.199**	-0.161*	0.0046
1978-1979	-0.161*	0.208**	0.229***	0.0020
1979-1980	-0.037	-0.141*	-0.145*	0.0052
1980-1981	-0.319***	0.187**	0.048	-0.0064
1981-1982	-0.366***	0.142*	0.084	-0.0072
1982-1983	-0.318***	-0.046	0.212***	0.0236
1983-1984	-0.247***	0.197***	0.182**	-0.0028
1984-1985	-0.366***	0.354***	0.413***	0.0073
1985-1986	-0.406***	-0.046	0.268***	0.0224
1986-1987	-0.399***	-0.251***	0.044	0.0204
1987-1988	-0.414***	0.469***	0.222***	-0.0208
1988-1989	-0.331***	-0.263***	0.056	0.0213
1989-1990	-0.480***	0.108*	-0.052	-0.0103
1974-1976	-0.359***	0.061	0.235**	0.0136
1976-1978	-0.440***	-0.111	-0.122	-0.0005
1978-1980	-0.110	-0.014	0.012	0.0036
1980-1982	-0.377***	0.225***	0.117	-0.0068
1982-1984	-0.289***	0.152**	0.275***	0.0104
1984-1986	-0.393***	0.179***	0.384***	0.0148
1986-1988	-0.442***	0.222***	0.218***	-0.0002
1988-1990	-0.445***	-0.161**	-0.047	0.0055
1974-1978	-0.368***	-0.148	-0.072	0.0065
1978-1982	-0.260***	0.183**	0.142*	-0.0016
1982-1986	-0.279***	0.138*	0.270***	0.0126
1986-1990	-0.451***	-0.011	0.074	0.0026
1974-1982	-0.465***	-0.174*	-0.113	0.0024
1982-1990	-0.274***	0.138*	0.246***	0.0076
1974-1990	-0.432***	0.061	0.196*	0.0050

\*significant at the .10 level

\*\*significant at the .05 level

\*\*\*significant at the .01 level

**TABLE 4**  
**Spearman Correlation Coefficients—Average Monthly Return vs. Beta**

Correlation Coefficients			
Period	Funds With Up-Market Ratings	Funds With Down-Market Ratings	S & P 500 Excess Return
1974-1975	-0.097	-0.075	0.0142
1975-1976	-0.059	-0.043	0.0129
1976-1977	-0.263***	-0.249**	-0.0056
1977-1978	0.540***	0.523***	0.0046
1978-1979	-0.053	-0.045	0.0020
1979-1980	0.625***	0.621***	0.0052
1980-1981	-0.156**	-0.149*	-0.0064
1981-1982	-0.520***	-0.553***	-0.0072
1982-1983	0.564***	0.565***	0.0236
1983-1984	-0.584***	-0.582***	-0.0028
1984-1985	-0.518***	-0.508***	0.0073
1985-1986	0.077	0.062	0.0224
1986-1987	0.305***	0.300***	0.0204
1987-1988	-0.632***	-0.617***	-0.0208
1988-1989	0.578***	0.596***	0.0213
1989-1990	-0.328***	-0.313***	-0.0103
1974-1976	-0.158	-0.137	0.0136
1976-1978	0.189*	0.208**	-0.0005
1978-1980	0.525***	0.513***	0.0036
1980-1982	-0.548***	-0.561***	-0.0068
1982-1984	-0.060	-0.060	0.0104
1984-1986	-0.244***	-0.224***	0.0148
1986-1988	-0.368***	-0.350***	-0.0002
1988-1990	0.164**	0.166***	0.0055
1974-1978	0.007	-0.008	0.0065
1978-1982	0.155**	0.138*	-0.0016
1982-1986	-0.283***	-0.279***	0.0126
1986-1990	-0.159**	-0.136**	0.0026
1974-1982	0.070	0.102	0.0024
1982-1990	-0.280***	-0.289	0.0076
1974-1990	-0.276***	-0.216**	0.0050

\*significant at the .10 level

\*\*significant at the .05 level

\*\*\*significant at the .01 level

**TABLE 5**  
**Spearman Correlation Coefficients—Alpha vs. Beta**

Period	Funds With Up-Market Ratings	Funds With Down-Market Ratings
1974-1975	-0.459***	-0.455***
1975-1976	-0.397***	-0.386***
1976-1977	-0.156	-0.140
1977-1978	0.435***	0.433***
1978-1979	-0.234***	-0.218***
1979-1980	0.477***	0.476***
1980-1981	0.285***	0.296***
1981-1982	-0.376***	-0.411***
1982-1983	-0.205***	-0.200***
1983-1984	-0.523***	-0.520***
1984-1985	-0.767***	-0.766***
1985-1986	-0.507***	-0.525***
1986-1987	-0.444***	-0.433***
1987-1988	0.103	0.119*
1988-1989	-0.263***	-0.257***
1989-1990	0.049	0.052
1974-1976	-0.535***	-0.521***
1976-1978	0.210**	0.229**
1978-1980	0.335***	0.339***
1980-1982	-0.239***	-0.248***
1982-1984	-0.586***	-0.573***
1984-1986	-0.680***	-0.683***
1986-1988	-0.358***	-0.339***
1988-1990	-0.106	-0.103
1974-1978	-0.177*	-0.195*
1978-1982	0.273***	0.262***
1982-1986	-0.734***	-0.734***
1986-1990	-0.346***	-0.322***
1974-1982	-0.052	-0.018
1982-1990	-0.678***	-0.686***
1974-1990	-0.571***	-0.525***

\*significant at the .10 level

\*\*significant at the .05 level

\*\*\*significant at the .01 level