MUTUAL FUND PERFORMANCE IN BULL AND BEAR MARKETS:

AN EMPIRICAL EXAMINATION

by

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ABSTRACT

Performance of active fund managers continues to be examined in finance literature. Current convictions are that different investment styles perform at different stages of the market cycle. Specifically, active manager's claim that performance is better in bear markets rather than in bull markets. Therefore, this paper examines whether active managers risk adjusted performance is superior in down-markets rather than in up-markets.

The performance of 58 mutual funds is examined, as well as the performance of the Fama and French 25 portfolios sorted by size and book-to-market equity. Performance is measured by Jensen's (1968) alpha and Fama and French (1993) and Carhart (1997) asset-pricing models. The results show little evidence of manager's outperformance. The results also show no evidence to performance being superior in down-markets rather than in up-markets. Rather, the number of positive alphas is greater in bull markets; however differences between the two market stages are not statistically significant.

DEDICATION

I dedicate this project to my family, as without their support, it was close to impossible for me to be where I am today.

I would like to give a special dedication to my late friend, Saad Aman. We were to do this program together, and I would like to think that we did.

ACKNOWLEDGEMENTS

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I. INTRODUCTION

The question as to whether or not markets are efficient has been much debated by academics and practitioners in the finance industry. The dilemma is that if markets are efficient, then over the long run, no one should be able to outperform the market. To further this debate, if market efficiency holds, what rationale do investors have for investing in mutual funds, which should not be able to outperform the market? Why have investors agreed to pay high fees to invest in mutual funds when an index fund with a low MER will outperform? This question has been reviewed and tested by numerous academics, yet the question still holds.

After the recent bull and bear markets, another question has surfaced. The question asked now is if market efficiency does not hold, and mutual funds can outperform the market, when do they outperform? The extraordinary bull market of the late '90s demonstrated that growth managers did not necessarily outperform the market. After the tech bubble burst, and the market cycled into a bear market, growth managers were simply trying to keep their heads above water. However, the question of timing arises from the peculiar performance of value managers. During the bull market, majority of the value managers underweighted the technology sectors and subsequently underperformed the market. Cycling into the bear market, those very same value managers significantly outperformed. Hence, assuming market efficiency does not hold and that mutual funds can outperform the market, questioning at which points in the market cycle they outperform is logical with such recent situations as mentioned above.

This paper primarily utilizes the performance measure developed by Jensen (1968) using a one-factor model (or the Securities Market Line), a three-factor model (Fama and French, 1993), and a four-factor model developed by Carhart (1997). Each

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of the three models have been altered to incorporate market timing developed by Francis and Fabozzi (1979) and are applied to the mutual fund data obtained from the CRSP US Mutual Fund Database, and to the Fama and French 25 value weighted portfolios sorted by size and book-to-market equity. In section 2 of this paper, I review some of the empirical studies that have been completed that directly relate to the question at hand. In section 3, I present the data that I used in my analysis. In section 4, I explain the methodologies I used in performing my analysis and in section 5, I discuss my results. To conclude, section 6 provides a summary of the paper.

II. LITERATURE REVIEW

A. Asset Pricing Models

The Sharpe (1964) – Lintner (1965) Capital Asset Pricing Model (CAPM) is the primary and most often used tool by academics and practitioners to price assets. The CAPM states that in equilibrium, expected returns are linearly related to their level of risk, more specifically, their beta or systematic risk. This linear function states that all assets (and portfolios) plot on the Securities Market Line (SML):

$$E(r_p) = r_f + \beta_p (E(r_m) - r_f), \tag{1}$$

where $E(r_p)$ = the expected portfolio return,

r_f = the return on the riskless asset,

β_p = the portfolio's exposure to systematic risk, and

$E(r_m)$ = the expected return on the market portfolio.

Mathematically, β_p is the covariance of the return on asset (or portfolio) p with the return on the market portfolio divided by the variance of the return on the market portfolio; it is a measure of how the return of the asset (or portfolio) tends to move with the return of the market portfolio.

The CAPM to this day continues to be the primary and dominant model when it comes to asset pricing models. However, soon there after the introduction of the CAPM, academics presented many critiques invalidating its statistical significance. The

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consistent argument has been that the CAPM's single factor (or beta) is unable to capture all risks associated to the explanation of an asset's expected returns.

The above argument and implication brought forth a new asset pricing model – the Fama and French Three-Factor Model. Fama and French (1993) note that to explain an asset's (or portfolio's) returns, additional risks (factors) must be considered:

$$E(r_p) = r_f + \beta_p (E(r_m) - r_f) + s_p E(SMB) + h_p E(HML), \qquad (2)$$

where E(SMB) = the expected average return on three small portfolios less the average return on three big portfolios,

E(HML) = the expected average return on two value portfolios less the average return on two growth portfolios.

Fama and French argue that the inclusion of two additional factors help explain the excess returns on an asset (or portfolio) far better than the CAPM. The addition of SMB (small minus big), or size, represents the average return on three small portfolios less the average return on three big portfolios. The inclusion of HML, or book-to-market equity, represents the average return on two value portfolios less the average return on two growth portfolios.

As in the case of the CAPM, the Fama and French three-factor model has also received much criticism from academics and even from Fama and French themselves. The critical assessment of the three-factor model is very similar to that of the CAPM in the sense that the factors did not fully explain the variation in stock returns. This implication begs the question do we need a more sophisticated model? Carhart (1997)

answers the question by adding an additional factor capturing Jegadeesh and Titman's (1993) one-year momentum anomaly. The model is as follows:

$$E(r_p) = r_f + \beta_p (E(r_m) - r_f) + s_p E(SMB) + h_p E(HML) + p_p E(PR1YR), \qquad (3)$$

where E(PR1YR) = the expected average return on the two high prior return portfolios less the average return on the two low prior return portfolios.

Carhart (1997) argues that the four-factor model's pricing is superior to the CAPM or the Fama and French three-factor model. He notes that the four factors correlations with each other and the market proxies can aid in explaining sizeable time-series variation. He states that the four-factor model can "be interpreted as a performance attribution model, where the coefficients and premia on the factor-mimicking portfolios indicate the proportion of mean return attributable to four elementary strategies: high versus low beta stocks, large versus small market capitalization stocks, value versus growth stocks, and one-year return momentum versus contrarian stocks" Carhart (1997, p. 61).

B. Performance Measures

Many tests and models have been developed over the years to measure performance and/or time the market. Jensen's (1968) alpha is perhaps the best known, as is discussed below. Studies of Treynor and Mazuy (1966) and Henriksson and Merton (1981) have developed various models by altering the underlying notion of Jensen's alpha. However, the model of interest is one that was developed by Fabozzi and Francis (1979).

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Jensen's alpha is used to measure performance relative to the security market line. The Jensen (1968) performance measure is based on the following regression:

$$R_{pt} = \alpha_p + \beta_p (R_{mt}) + \mu_{pt}, \tag{4}$$

where $R_{pt} = r_{pt} - r_{ft}$ is the excess return on portfolio p over the Treasury bill rate,

α_p = the measure of the portfolio's performance (Jensen's Alpha),

$R_{mt} = r_{mt} - r_{ft}$ is the excess return on the market, and

β_p = is the unconditional measure of risk.

The intercept, α_p, referred to as Jensen's Alpha, was developed as a performance measure. But, Black, Jensen, and Scholes (1972) used it as a test of asset pricing theories, specifically the CAPM. If the CAPM holds in equilibrium, then all assets plot on the SML and the alphas would be equal to zero. However, if the regression is performed, and the alpha for the portfolio is positive, this would mean that the portfolio (mutual fund) is able to outperform the market.

Fabozzi and Francis (1979) modified the Jensen model and developed a method to test for market timing. They modified the Jensen model so that the alphas and beta were allowed to vary with differing market conditions. Altering equation (4), the following is their model:

$$R_{pt} = \alpha_{1p} + \alpha_{2p} (D_t) + \beta_{1p} (R_{mt}) + \beta_{2p} (D_t R_{mt}) + \mu_p, \tag{5}$$

where D_t = a dummy variable that is one if the period is a bull market and zero

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otherwise,

β_1 = the bear market beta,

β_2 = the difference between the bear and bull market beta so that the bull

market beta is $\beta_1 + \beta_2$,

α_1 = the bear market alpha,

α_2 = the difference between the bear and bull market alphas so that the

bull market alpha is $\alpha_1 + \alpha_2$.

The concept of allowing alphas to change during up and down market cycles is essential to the rest of this paper. The reason for this is that it allows us to determine whether or not the portfolios (or mutual funds) are outperforming in bull or bear markets.

To summarize the results of their tests, Fabozzi and Francis noticed that the alphas did not significantly change with differing market conditions. Furthermore, they concluded that there was no evidence to the notion of managers being able to forecast (or time) the market.

III. DATA

This paper studies two data sets. Both sets of data are of the time period from January 1963 to June 2003, a total of 486 observations for each fund. The first data set studies monthly returns for 58 mutual funds obtained from the Center for Research in Security Prices (CRSP) US Mutual Fund Database, which is free from survivorship bias. These mutual funds are those that are listed in Ferson and Schadt (1996). A total of eight mutual funds listed in Ferson and Schadt (1996) were either not found in the database, or were not available for the time period being tested. Table I records the names of the funds with summary statistics and are grouped with their objectives as classified by Wiesenberger at the end of 2000. The second data set studies the Fama and French 25 value weighted portfolios sorted by size and book-to-market equity obtained from the Kenneth French website.

In addition, the paper employs market wide data. The riskless asset used was the 30-day Treasury bill returns. Robert Grauer provided the data for the 30-day Treasury bill rates. The proxy for the market portfolio, which was the CRSP value-weighted index, the Fama and French three-factor model and for the Carhart four-factor model were obtained from the Kenneth French website.

Table 1: List of Mutual Funds and Return Statistics 1963:01 – 2003:06

The following table presents a list of 58 mutual funds used in this research. The following funds are divided into three categories: Equity, Balance and Income Funds as per their investment policy. Funds that invest primarily in growth stocks are categorized in the Equity group. The investment policy of Balance Funds, on average, over the last 38 years is 53% in stocks, 39% bonds and 8% in cash or cash equivalents. Income funds are those that invested primarily in bonds. The primary objective and investment policy of the following funds according to the Wiesenberger Classification is provided, and all abbreviations are explained at the bottom of the table. Also provided are the statistics calculated from the monthly returns of the mutual funds in excess of the monthly return on a one-month Treasury bill.

Mutual Fund by 2000 Name	Wiesenberger Classification		Max Return %	Min Return %	Mean	Standard Deviation
	Primary Objective	Investment Policy				
Equity (Growth) Mutual Funds:						
Colonial Select Value Fund	g	cs	20.01	-24.71	0.09	5.01
Dreyfus Fund	gi	cs	17.16	-17.48	0.37	4.37
Dreyfus Premier Core Value Fund	g	cs	18.96	-21.61	0.48	4.44
Fidelity Trend Fund	g	cs	20.99	-29.57	0.38	5.54
Keystone Growth Fund (K2)	g	cs	18.94	-24.65	0.41	5.06
Lexington Growth and Income Fund	gi	flex	14.38	-21.96	0.43	4.82
Neuberger Berman Guardian Fund	gi	cs	14.74	-23.80	0.58	5.66
Oppenheimer Fund	gi	cs	15.84	-16.69	0.53	4.85
Putnam Growth and Income	gi	cs	19.94	-19.48	0.46	4.25
Putnam Growth and Income Value Fund	g	flex	17.60	-22.06	0.49	4.93
Putnam Investors Fund	g	cs	27.93	-28.22	0.59	5.52
Scudder Large Company Value Fund	g	cs	17.42	-25.88	0.41	4.43
Security Equity Fund	g	cs	18.66	-24.89	0.46	5.41
Stein, Roe Investment Trust: Growth	g	cs	19.82	-26.67	0.49	5.25
Templeton Growth Fund	g	cs	12.40	-22.74	0.38	3.96
T. Rowe Price Growth Stock Fund	g	cs	20.20	-23.59	0.33	4.78
Twentieth Century Growth Shares	g	cs	25.94	-28.18	0.61	7.02
United Accumulative Fund	g	cs	20.10	-17.15	0.48	4.33
United Science & Technology Fund	g	cs	26.56	-22.23	0.54	5.77
Value Line Fund	g	cs	22.79	-21.75	0.47	5.75
Value Line Special Situations Fund	g	cs	30.97	-31.00	0.59	7.10
Vanguard Windsor	gi	cs	18.67	-20.23	0.61	4.72
Equity (Growth) Fund Average			**20.00**	**-23.39**	**0.46**	**5.14**
Balance Mutual Funds:						
Composite Fund	bal	bal	12.74	-17.62	0.47	4.18
Delaware Fund	bal	flex	14.93	-27.99	0.48	4.42
Fidelity Fund	bal	flex	18.22	-24.68	0.46	4.41
Fidelity Puritan Fund	bal	bal	11.66	-14.77	0.46	3.21
Founders Mutual Fund	bal	bal	15.66	-21.14	0.47	4.42

Table 1 - Continued

Mutual Fund by 2000 Name	Wiesenberger Classification		Max Return %	Min Return %	Mean	Standard Deviation
	Primary Objective	Investment Policy				
Franklin Custodian Fund: Income Series	bal	flex	22.15	-13.29	0.41	3.29
Guardian Mutual Fund	bal	flex	14.74	-23.36	0.51	4.72
INVESCO Equity Income Fund	i	flex	14.42	-17.97	0.59	3.86
Investment Company of America	i	flex	13.76	-17.44	0.43	4.01
Investment Trust of Boston	bal	bal	11.70	-12.09	0.39	3.20
Keystone High-Grade Common Stock	bal	bal	9.33	-13.52	0.32	2.85
Liberty Fund	bal	bal	9.87	-17.51	0.38	3.49
National Industries Fund	bal	flex	16.00	-20.17	0.46	4.69
Philadelphia Fund	bal	flex	18.09	-20.62	0.38	4.33
Phoenix-Oakhurst: Income & Growth	bal	bal	13.12	-9.15	0.37	2.87
Pioneer Fund	bal	bal	15.62	-24.40	0.43	4.27
Safeco Equity Fund	bal	flex	15.93	-26.39	0.46	4.56
Security: Growth and Income Fund	gi	flex	11.99	-17.41	0.33	3.88
Selected American Shares	bal	flex	18.27	-21.32	0.46	4.62
Sentinel Balanced Fund	bal	bal	10.24	-11.46	0.31	2.72
Sentinel Common Stock Fund	bal	flex	12.75	-18.55	0.36	3.95
United Income Fund	i	flex	16.07	-12.48	0.50	4.13
Value Line Income & Growth Fund	i	flex	15.82	-15.95	0.39	3.85
Vanguard Wellington/Inv	bal	bal	12.40	-13.20	0.34	3.13
Wall Street Fund	bal	bal	16.65	-19.32	0.38	3.20
Washington Mutual Investors	bal	flex	15.92	-17.89	0.44	4.13
Balance Fund Average			**14.54**	**-18.06**	**0.42**	**3.86**
Income Mutual Funds:						
Boston Foundation Fund	i	flex	20.58	-16.21	0.39	3.24
Century Shares Trust	i	flex	27.20	-19.58	0.45	5.62
Financial Industrial Fund	i	flex	24.68	-30.77	0.51	5.71
Keystone Income Fund (K1)	i	bonds	8.13	-4.03	0.19	1.59
Mutual Shares Corporation	i	bonds	13.06	-18.84	0.34	3.74
Nationwide Securities	i	flex	12.13	-11.75	0.36	3.13
Northeast Investors Trust	i	bonds	12.83	-7.42	0.21	2.10
Provident Fund for Income	i	bonds	13.81	-19.88	0.36	3.52
Putnam Income Fund	i	bonds	16.40	-14.27	0.40	3.42
Scudder Income Fund	i	bonds	12.19	-10.57	0.11	2.58
Income Fund Average:			**16.10**	**-15.33**	**0.32**	**3.47**

Table 1 – Continued

Wiesenberger Classifications

Primary Objective		Investment Policy	
g	growth	cs	holdings are predominantly common stock
i	income	bal	sr. securities and common stock held at all times
s	stability	bonds	investments concentrated in bonds
bal	balanced	flex	flexibly diversified; usually, but not necessarily, balanced
		spec	specialized; holdings are concentrated in one or more specified industry groups or types of securities

IV. METHODOLOGY

In this paper, I apply the Fabozzi and Francis test to the three asset pricing models discussed: CAPM, Fama and French three-factor model, and Carhart's four-factor model. I use the Fabozzi and Francis (1979) specification for the alphas and apply this to Jensen's measure. Note that I only use the alpha specification from Fabozzi and Francis' test, and not the beta specification. By simply using the alpha specification from the Fabozzi and Francis test, it allows me to test whether mutual funds perform differently in bull and bear markets. To demonstrate the difference that allowing for two alphas makes, I first begin by running regression (4).

I then modified the Jensen regression ("CAPM Modified") to allow for bull and bear market alphas:

$$R_{pt} = \alpha_{p1} + \alpha_{p2}d_t + \beta_p R_{mt} + \mu_{pt}, \tag{6}$$

where d_t = a vector where $d_t = 1$ if $R_{mt} > 0$, i.e. if the excess return on the market is positive; and zero otherwise,

α_{p1} = the bear market alpha

α_{p2} = the difference between the bull and bear market alphas.

I then ran a regression on both sets of data based on the Fama and French three-factor model:

$$R_{pt} = \alpha_p + \beta_p R_{mt} + s_p \, (SMB) + h_p \, (HML) + \mu_{pt}, \tag{7}$$

where SMB = the average return on three small portfolios less the average return

on three big portfolios,

HML = the average return on two value portfolios less the average return

on two growth portfolios,

α_p = the Fama and French performance measure.

I then modified the Fama and French three-factor model ("Fama and French Modified")
to allow for bull and bear market alphas:

$$R_{pt} = \alpha_{p1} + \alpha_{p2}\, d_t + \beta_p R_{mt} + s_p\, (SMB) + h_p\, (HML) + \mu_{pt}, \qquad (8)$$

where d_t = a vector where $d_t = 1$ if $R_{mt} > 0$ and zero otherwise,

α_{p1} = the bear market alpha

α_{p2} = the difference between the bull and bear market alphas

I then employed the Carhart four-factor model:

$$R_{pt} = \alpha_p + \beta_p R_{mt} + s_p\, (SMB) + h_p\, (HML) + p_p\, (PR1YR) + \mu_{pt}, \qquad (9)$$

where PR1YR = the average return on the two high prior return portfolios less

the average return on the two low prior return portfolios,

α_p = the Carhart performance measure.

Lastly, I modified Carhart's four-factor model ("Carhart Modified") to allow for bull and bear market alphas:

$$R_{pt} = \alpha_{p1} + \alpha_{p2}\, d_t + \beta_p R_{mt} + s_p\, (SMB) + h_p\, (HML) + p_p\, (PR1YR) + \mu_{pt}, \qquad (10)$$

where d_t = a vector where $d_t = 1$ if $R_{mt} > 0$ and zero otherwise,

α_{p1} = the bear market alpha,

α_{p2} = the difference between the bull and bear market alphas.

V.   RESULTS

Table 2 shows a summary of the results. This summary corresponds to the

results of the three modified regressions on the US Mutual Fund data and on the Fama

and French 25 value-weighted portfolios sorted by size and book-to-market equity. Note

that results from all regressions held can be found in Table 3 through Table 10.

In Table 2, note that the alphas are provided for each of the three models. The

first alpha, α_1, is the bear market alpha. The second alpha, α_2, in the modified models

(CAPM Modified, Fama and French Modified, and Carhart Modified), represents the

difference between the bull and bear market alpha. To determine whether the two

alphas are different, I simply tested the significance of the second alpha. Generally, if

the second alpha is positive, this would imply that the bull market alpha is greater than

the bear market alpha. Whereas a negative alpha infers that the bear market alpha is

greater than the bull market's alpha.

Referring to Table 2, the CAPM Modified results show that only twelve of the

bear market alphas (α_1) were positive, where fifteen were statistically significant.

However, the number of mutual funds that had an alpha greater in a bull market than in

a bear market was forty-four with only ten being statistically significant. Recall α_2 is the

difference between bull and bear market alphas. Hence from a total of fifty-eight funds,

there were forty-three funds that had a positive alpha in an up-market. This trend

continues through the Fama and French Modified model and the Carhart Modified

model, where the number of bull market alphas was greater (though not statistically

significant) than the bear market alphas. Hence, the results demonstrate that mutual

funds do not perform better in down-markets rather than in up-markets.

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Table 2: Summary Statistics

The information presented below is a summary of the data given in Tables 3 and 4, where:

$$r_{pt} - r_{ft} = a_{p1} + a_{p2}d_t + \beta_p X_t + \mu_{pt}$$

$$r_{pt} - r_{ft} = a_{p1} + a_{p2} d_t + \beta_p X_t + s_p (SMB) + h_p (HML) + \mu_p$$

$$r_{pt} - r_{ft} = a_{p1} + a_{p2} d_t + \beta_p X_t + s_p (SMB) + h_p (HML) + p_p (PR1YR) + \mu_p$$

This table lays out the number of positive alphas (bear and bull) under each specification. The first alpha is the bear market alpha, whereas the second is the difference between bull and bear market alphas. The second statistic provided is the t-statistic (number significant). Note, this was a two-tailed test where: $1.96 < t\text{-stat} < -1.96$. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

	CAPM Modified			Fama and French Modified			Carhart Modified		
	α_1	α_2	α_{bull}	α_1	α_2	α_{bull}	α_1	α_2	α_{bull}
Ferson and Schadt 58 Mutual Funds									
Number Positive	12	44	**43**	14	42	**39**	12	43	**40**
Number Significant	15	10		17	9		14	9	
MAVA	0.26	0.36		0.25	0.35		0.26	0.33	
Fama and French 25 Portfolios									
Number Positive	15	23	**23**	7	21	**20**	4	20	**17**
Number Significant	3	1		6	4		1	3	
MAVA	0.30	0.31		0.20	0.25		0.21	0.24	

The results from testing the mutual fund data seems to counter the belief that active managers tend to outperform in bear markets rather than in bull markets. The results clearly state that the opposite is true. However, the t-tests show that these positive values found for bull markets are not significantly different from zero.

The tests completed on the Fama and French 25 portfolios sorted by size and book-to-market equity, provide results quite similar to the results obtained from the US

mutual funds. The bull market alphas dominated in the Fama and French dataset, where the number of positive alphas was in their low twenty's. As was the case in the previous data set, the t-statistics show that the positive values the bull markets obtained are not significantly different than zero. Only one bull alpha was significant in the CAPM Modified, four in the Fama and French Modified, and three in the Carhart Modified model.

Additionally, the mean absolute values of alphas (MAVA) are also provided in Table 2. MAVA demonstrates the effectiveness of an asset pricing model, where the model with the lowest mean absolute value of the alphas is the more effective model. Note for the Ferson and Schadt mutual funds, the mean absolute values are similar. However, in the case of the Fama and French 25 portfolios, the mean absolute value of alphas is lower for the Fama and French and Carhart Modified models.

Table 2 provides results that are extremely surprising, yet interesting. First, it shows reason to believe that mutual funds can not significantly outperform the market over long periods of time. The evidence shows a clear pattern from the one-factor model (CAPM), the three-factor model (Fama and French), and the four-factor model (Carhart). Second, the results indicate that style is also not a factor. The Fama and French 25 portfolios sorted by size and book-to-market equity are considered valid proxies for growth and value portfolios. Testing on these portfolios demonstrated that they did not outperform the market, nor did they perform differently with the market cycles ups and downs.

My results agree with Fabozzi and Francis (1979) and Tsakok (2004), who found evidence that mutual funds do not significantly outperform the markets and that there is no evidence of significance outperformance in bear markets.

VI.   CONCLUSION

Mutual fund managers outperforming the market at different periods in the market cycle has become a topic of much interest after the peculiar markets we have experienced over the last four to five years. The purpose of this paper is two fold; to examine whether or not fund managers are able to outperform the market on a risk adjusted basis, and to examine if there are different periods in the market cycle when managers tend to perform better. More specifically, the paper examines whether mutual fund managers perform better in bear markets rather than in bull markets.

The tests performed combined Jensen's Alpha (1968) and the Fabozzi and Francis (1979) test for bull and bear market parameters by testing three different asset pricing models: the CAPM, the Fama and French three-factor model, and the Carhart four-factor model. Of the Ferson and Schadt (1996) mutual funds, only twelve of the funds had positive bear market alphas using the CAPM, fourteen positive bear market alphas under the Fama and French, and twelve positive bear market alphas using the Carhart model. The bull market alphas dominated the bear market alphas, with forty-three, thirty-nine and forty, to their respective models. However, the results were statistically not significant according to their t-tests.

On the other data set, the Fama and French 25 portfolios, the bull market alphas again dominated the bear market alphas. In this case as well, however, the t-tests demonstrate that the bull and bear market alphas are not statistically significant.

The results concur with Fabozzi and Francis and Tsakok (2004) on the testing of the US mutual fund data and the Fama and French 25 portfolios. Hence, based on the results from the tests that were held, one can argue that the results show that markets are efficient, and that active mutual fund managers are not able to outperform the

market. Also, one can argue in saying that value fund managers may be mistaken in stating that they tend to outperform the market in down years, as the evidence obtained contradicts their claims.

TABLES

Table 3: Alphas for US Mutual Funds

This table contains the alphas for all specifications on the Ferson and Schadt US Mutual Funds data. For all three asset pricing models, the unmodified model's alphas and t-stats are provided, whereas for the modified model, both alphas along with their respective t-statistics are reported.

Mutual Fund	CAPM Original α	CAPM Original T-Stat	CAPM Modified α1	CAPM Modified T-Stat	CAPM Modified α2	CAPM Modified T-Stat	FF Original α	FF Original T-Stat	FF Modified α1	FF Modified T-Stat	FF Modified α2	FF Modified T-Stat	Carhart Original α	Carhart Original T-Stat	Carhart Modified α1	Carhart Modified T-Stat	Carhart Modified α2	Carhart Modified T-Stat
Boston Foundation Fund	0.00	0.05	-0.18	1.02	0.33	1.16	-0.02	0.04	-0.21	1.03	0.31	1.13	-0.04	0.01	-0.23	0.98	0.29	1.11
Investment Trust of Boston	-0.13	2.26	-0.21	1.87	0.15	0.84	-0.15	2.24	-0.14	1.78	0.13	0.91	-0.19	2.20	-0.18	1.81	0.09	0.87
Century Shares Trust	0.05	0.25	-0.26	0.74	0.58	1.01	0.03	0.21	-0.26	0.72	0.61	1.01	0.02	0.22	-0.27	0.71	0.55	1
Scudder Income Fund	-0.07	0.74	-0.29	1.64	0.42	1.46	-0.18	0.66	-0.36	1.71	0.35	1.39	-0.17	0.64	-0.35	1.65	0.43	1.4
Selected American Shares	0.04	0.34	-0.17	0.78	0.39	1.11	-0.01	0.32	-0.05	0.61	0.29	1.23	-0.04	0.26	-0.08	0.7	0.31	1.2
Putnam Income Fund	0.03	0.32	-0.26	1.59	0.54	2.04	-0.03	0.29	-0.33	1.60	0.55	1.97	-0.01	0.28	-0.31	1.55	0.5	1.99
Keystone Income Fund	0.05	0.84	0.00	0.00	0.09	0.50	0.05	0.83	0.07	-0.07	0.12	0.57	0.01	0.80	0.03	-0.04	0.05	0.53
Keystone High-Grade Common Stock	-0.23	4.10	-0.18	1.60	-0.10	0.57	-0.27	4.02	-0.17	1.67	-0.03	0.58	-0.29	4.04	-0.19	1.66	-0.04	0.56
Keystone Growth Fund K2	-0.09	0.72	-0.50	2.08	0.77	1.99	-0.08	0.72	-0.52	2.11	0.77	1.97	-0.12	0.69	-0.56	2.05	0.74	1.93
Investment Company of America	0.15	2.88	-0.03	0.27	0.34	2.03	0.06	2.82	0.07	0.08	0.26	2.13	0.05	2.78	0.06	0.17	0.24	2.12
Vanguard Wellington/Inv	-0.06	0.83	-0.34	1.81	0.71	1.89	-0.15	0.74	-0.40	1.78	0.67	1.83	-0.14	0.75	-0.39	1.73	0.63	1.84
Phoenix-Oakhurst: Income & Growth Fund	-0.01	0.11	-0.21	2.13	0.38	2.41	-0.02	0.09	-0.15	2.06	0.40	2.47	-0.05	0.07	-0.18	2.09	0.34	2.44
Nation-wide Securities	0.01	0.23	-0.02	0.17	0.06	0.34	-0.05	0.25	-0.05	0.22	0.02	0.31	-0.03	0.19	-0.03	0.21	0.1	0.33
Putnam Investors Fund	0.13	1.14	-0.42	1.91	1.03	2.90	0.11	1.09	-0.44	1.91	0.95	2.88	0.07	1.08	-0.48	1.85	0.97	2.84
United Accumulative Fund	-0.02	0.14	-0.36	1.43	0.65	1.58	-0.03	0.14	-0.25	1.31	0.67	1.69	-0.05	0.11	-0.27	1.4	0.62	1.67
United Income Fund	0.01	0.13	-0.31	2.60	0.59	3.10	-0.05	0.01	-0.32	2.55	0.56	3.09	-0.09	0.03	-0.36	2.5	0.49	3.05
United Science & Energy Fund	0.00	0.01	-0.39	1.66	0.74	1.94	-0.07	-0.04	-0.35	1.55	0.67	1.98	-0.08	-0.07	-0.36	1.58	0.66	1.97
Sentinel Common Stock Fund	0.06	0.85	0.02	0.13	0.08	0.35	0.01	0.85	0.00	0.10	0.07	0.33	0.02	0.81	0.01	0.09	0.04	0.34
Sentinel Balanced Fund	0.03	0.46	-0.07	0.63	0.19	1.00	0.02	0.41	-0.10	0.65	0.17	0.97	-0.01	0.42	-0.13	0.59	0.15	0.94
Fidelity Fund	0.05	0.95	-0.09	0.96	0.26	1.68	-0.03	0.91	-0.02	0.81	0.24	1.75	-0.01	0.89	0	0.9	0.2	1.77
Delaware Fund	-0.02	0.26	-0.09	0.56	0.13	0.49	-0.01	0.29	-0.10	0.64	0.22	0.48	-0.05	0.23	-0.14	0.59	0.16	0.44
Safeco Equity Fund	-0.01	0.08	-0.02	0.16	0.03	0.14	-0.09	-0.01	0.03	0.03	-0.15	0.19	-0.11	-0.02	0.01	0.06	-0.07	0.17
Financial Industrial Fund	-0.22	1.80	-0.12	0.49	-0.19	0.50	-0.26	1.75	-0.09	0.56	-0.15	0.53	-0.3	1.72	-0.13	0.55	-0.13	0.49
Founders Mutual Fund	-0.15	2.41	-0.19	1.61	0.09	0.44	-0.18	2.35	-0.24	1.63	0.10	0.39	-0.19	2.37	-0.25	1.57	0.05	0.38
Security Investment Fund	-0.08	0.92	-0.13	0.80	0.10	0.39	-0.13	0.91	-0.05	0.67	0.13	0.47	-0.12	0.88	-0.04	0.76	0.06	0.48
Philadelphia Fund	0.01	0.13	-0.08	0.38	0.17	0.52	-0.02	0.11	-0.10	0.37	0.12	0.50	-0.05	0.07	-0.13	0.32	0.11	0.47
Wall Street Fund	-0.24	1.55	-0.27	0.91	0.07	0.14	-0.29	1.51	-0.26	0.85	0.07	0.15	-0.27	1.52	-0.24	0.88	0.04	0.17
The Dreyfus Fund Inc.	-0.10	1.49	-0.20	1.56	0.19	0.93	-0.16	1.41	-0.17	1.46	0.09	0.96	-0.2	1.39	-0.21	1.46	0.09	0.92
Dreyfus Premier Core Value Fund	0.16	1.67	0.21	1.42	-0.06	0.09	0.10	1.65	0.17	1.34	-0.14	0.05	0.08	1.59	0.15	1.34	-0.13	0.03
Franklin Custodian Fund - Income	0.17	1.56	0.18	0.85	-0.02	0.06	0.17	1.53	0.31	0.81	-0.06	0.19	0.13	1.52	0.27	0.81	-0.06	0.15
Neuberger Berman Guardian Fund	-0.20	1.68	-0.34	1.11	-0.09	0.60	-0.23	1.67	-0.34	1.07	-0.13	0.60	-0.24	1.64	-0.35	1.07	-0.13	0.59

Table 3: Continued

Mutual Fund	CAPM Original α	T-Stat	CAPM Modified α1	T-Stat	α2	T-Stat	FF3F Original α	T-Stat	FF3F Modified α1	T-Stat	α2	T-Stat	Carhart Original α	T-Stat	Carhart Modified α1	T-Stat	α2	T-Stat
Composite Fund	0.01	0.09	-0.15	1.04	0.29	1.26	-0.01	0.11	-0.14	1.14	0.29	1.26	-0.04	0.07	-0.17	1.09	0.25	1.24
Value Line Fund	0.16	1.58	0.17	0.88	-0.03	0.09	0.20	1.60	0.17	0.82	-0.03	0.09	0.16	1.54	0.13	0.85	-0.09	0.05
Mutual Shares Corporation	0.08	1.34	0.01	0.36	-0.24	0.43	0.06	1.31	-0.06	0.38	-0.24	0.38	0.07	1.28	-0.05	0.37	-0.27	0.37
Northeast Investors Trust	0.11	1.36	0.14	0.86	-0.05	0.19	0.07	1.43	0.24	0.98	-0.05	0.26	0.05	1.44	0.22	0.92	-0.04	0.27
Price (T. Rowe) Growth	-0.03	0.45	-0.30	2.09	0.50	2.16	0.12	0.55	-0.22	1.91	0.50	2.21	0.06	0.47	-0.28	2.00	0.42	2.18
Guardian Mutual Fund	0.05	0.74	0.07	0.53	-0.04	0.18	0.01	0.73	0.03	0.63	-0.04	0.11	0.00	0.69	0.02	0.58	-0.08	0.13
Washington Mutual Investors	0.18	2.35	0.05	0.33	0.24	1.01	0.24	2.32	0.01	0.27	0.24	0.98	0.21	2.28	-0.02	0.30	0.20	0.94
Value Line Income Fund	0.09	1.21	0.14	0.88	-0.08	0.31	0.06	1.14	0.11	0.90	-0.08	0.32	0.08	1.20	0.13	0.89	-0.02	0.30
Scudder International	-0.01	0.06	0.38	1.31	-0.73	1.55	-0.04	0.06	0.38	1.43	-0.73	1.56	-0.07	0.03	0.35	1.37	-0.76	1.52
Fidelity Puritan Fund	-0.45	3.33	-0.72	2.75	0.52	1.21	-0.32	3.41	-0.70	2.57	0.52	1.20	-0.36	3.31	-0.74	2.66	0.42	1.19
Templeton Growth Fund	0.40	3.57	0.68	3.11	-0.53	1.50	0.34	3.61	0.63	3.21	-0.53	1.45	0.35	3.53	0.64	3.16	-0.61	1.46
Value Line Special Situations Fund	-0.16	0.90	-0.47	1.38	0.59	1.07	-0.11	0.88	-0.51	1.32	0.59	1.04	-0.13	0.84	-0.53	1.35	0.55	1.01
Fidelity Trend Fund	-0.12	1.35	-0.30	1.69	0.33	1.17	-0.07	1.39	-0.16	1.71	0.33	1.23	-0.13	1.43	-0.22	1.70	0.37	1.25
Lexington Growth & Income Fund	0.05	0.43	-0.28	1.37	0.62	1.85	0.00	0.51	-0.25	1.49	0.62	1.91	-0.01	0.45	-0.26	1.43	0.56	1.87
Putnam Growth & Income Fund	-0.15	1.52	-0.01	0.06	-0.26	0.83	-0.03	1.50	-0.03	-0.12	-0.26	0.80	-0.06	1.47	-0.06	-0.03	-0.29	0.78
Putnam Growth & Income Value Fund	0.03	0.39	-0.23	2.76	0.58	1.73	-0.04	0.42	-0.32	2.86	0.58	1.70	-0.02	0.32	-0.30	2.81	0.48	1.66
Security Equity Fund	-0.15	1.04	-0.50	1.81	0.66	1.48	-0.09	1.11	-0.48	1.75	0.66	1.48	-0.12	1.03	-0.51	1.78	0.58	1.47
Stein, Roe Investment Trust: Growth Stock Fund	-0.14	1.70	-0.46	2.93	0.60	2.39	-0.11	1.71	-0.45	2.95	0.60	2.35	-0.15	1.67	-0.49	2.94	0.56	2.36
Vanguard Windsor	0.06	1.24	-0.60	0.84	0.54	1.98	-0.01	1.26	-0.63	0.96	0.54	1.99	0.00	1.22	-0.62	0.90	0.50	1.96
INVESCO Equity Income Fund	-0.21	1.35	-0.38	1.35	0.08	2.56	-0.10	1.37	-0.40	1.17	0.08	2.50	-0.12	1.31	-0.42	1.26	0.02	2.52
Liberty Fund	0.09	1.23	-0.27	2.68	0.39	1.59	0.10	1.14	-0.27	2.78	0.39	1.57	0.04	1.17	-0.33	2.73	0.42	1.53
Oppenheimer Fund	-0.12	0.97	-0.71	2.87	1.10	2.76	-0.08	1.15	-0.62	2.81	1.10	2.86	-0.09	1.05	-0.63	2.84	1.00	2.84
Provident Fund for Income	0.16	1.99	0.10	0.69	0.09	0.38	0.18	1.95	0.15	0.71	0.09	0.44	0.15	2.01	0.12	0.70	0.15	0.40
National Industries Fund	-0.29	3.67	-0.61	3.97	0.60	2.42	-0.37	3.66	-0.68	4.09	0.60	2.38	-0.35	3.62	-0.66	4.03	0.56	2.37
Pioneer Fund	-0.44	5.47	-0.31	1.94	-0.25	0.99	-0.32	5.44	-0.35	1.76	-0.25	0.91	-0.35	5.40	-0.38	1.85	-0.29	0.92
Colonial Growth Shares	-0.02	0.16	-0.24	1.32	0.42	1.44	-0.03	0.21	-0.21	1.42	0.42	1.46	-0.07	0.15	-0.25	1.37	0.36	1.43
Twentieth Century Growth Investors	0.12	0.76	-0.39	1.21	0.96	1.86	0.14	0.76	-0.43	1.15	0.96	1.81	0.15	0.73	-0.42	1.18	0.93	1.83

Table 4: Alphas for the Fama and French 25 Portfolios

A summary of alphas for all specifications on the Fama and French 25 value-weighted portfolios. For all three asset pricing models, the unmodified model's alphas and t-stats are provided, whereas for the modified model, both alphas along with their respective t-stats are reported.

		CAPM						Fama and French Three-Factor Model						Carhart Four-Factor Model					
		Original		Modified				Original		Modified				Original		Modified			
Size	Portfolio	α	T-Stat	α 1	T-Stat	α 2	T-Stat	α	T-Stat	α 1	T-Stat	α 2	T-Stat	α	T-Stat	α 1	T-Stat	α 2	T-Stat
Small	Low	-0.394	-1.673	-0.711	-1.543	0.595	0.800	-0.486	-4.072	-0.61	-2.614	0.223	0.601	-0.471	-3.746	-0.594	-2.546	0.232	0.623
	2	0.181	0.893	-0.122	-0.307	0.569	0.888	0.008	0.090	-0.14	-0.786	0.269	0.972	-0.065	-0.693	-0.187	-1.080	0.231	0.838
	3	0.318	1.909	0.088	0.270	0.431	0.821	0.087	1.196	-0.03	-0.232	0.225	0.991	-0.038	-0.512	-0.122	-0.879	0.158	0.716
	4	0.570	3.590	0.611	1.965	-0.077	-0.153	0.290	3.931	0.42	2.914	-0.237	-1.034	0.135	1.802	0.304	2.203	-0.321	-1.459
	High	0.649	3.766	0.628	1.861	0.039	0.072	0.256	3.440	0.30	2.085	-0.084	-0.363	0.089	1.189	0.181	1.304	-0.174	-0.786
2	Low	-0.334	-1.912	-0.812	-2.382	0.897	1.632	-0.325	-3.979	-0.64	-4.068	0.592	2.340	-0.234	-2.744	-0.573	-3.653	0.643	2.569
	2	0.067	0.481	-0.062	-0.226	0.242	0.548	-0.110	-1.628	-0.15	-1.113	0.067	0.319	-0.109	-1.528	-0.144	-1.096	0.068	0.323
	3	0.356	2.796	0.209	0.841	0.274	0.684	0.116	1.680	0.03	0.195	0.169	0.784	0.021	0.286	-0.042	-0.315	0.118	0.557
	4	0.468	3.711	0.412	1.668	0.105	0.265	0.165	2.371	0.14	1.027	0.050	0.228	0.016	0.230	0.032	0.246	-0.030	-0.145
	High	0.504	3.338	0.191	0.647	0.587	1.233	0.113	1.429	-0.17	-1.134	0.538	2.188	-0.091	-1.162	-0.318	-2.194	0.430	1.859
3	Low	-0.270	-1.866	-0.750	-2.657	0.901	1.977	-0.202	-2.641	-0.55	-3.702	0.643	2.720	-0.089	-1.122	-0.461	-3.176	0.706	3.047
	2	0.154	1.438	0.091	0.436	0.117	0.347	-0.003	-0.044	-0.02	-0.151	0.036	0.150	-0.044	-0.541	-0.051	-0.343	0.014	0.060
	3	0.212	1.990	0.101	0.486	0.208	0.618	-0.025	-0.323	-0.13	-0.853	0.196	0.800	-0.092	-1.121	-0.177	-1.161	0.161	0.660
	4	0.380	3.381	0.259	1.180	0.226	0.637	0.089	1.112	-0.05	-0.298	0.253	1.018	-0.033	-0.401	-0.133	-0.868	0.189	0.774
	High	0.514	3.739	0.501	1.863	0.023	0.054	0.120	1.405	0.09	0.536	0.059	0.220	-0.022	-0.247	-0.013	-0.077	-0.017	-0.066
4	Low	-0.111	-1.020	-0.401	-1.888	0.544	1.588	0.018	0.243	-0.18	-1.235	0.366	1.587	0.092	1.191	-0.122	-0.854	0.407	1.780
	2	-0.034	-0.381	-0.175	-1.014	0.265	0.953	-0.151	-1.849	-0.29	-1.825	0.258	1.017	-0.127	-1.477	-0.270	-1.699	0.271	1.070
	3	0.234	2.408	0.126	0.663	0.202	0.659	0.025	0.306	-0.11	-0.697	0.253	0.997	-0.019	-0.216	-0.140	-0.882	0.231	0.909
	4	0.381	3.677	0.210	1.037	0.320	0.980	0.138	1.655	-0.07	-0.410	0.383	1.476	0.059	0.677	-0.121	-0.751	0.342	1.326
	High	0.410	3.008	0.381	1.428	0.054	0.126	0.057	0.553	-0.03	-0.132	0.155	0.487	-0.084	-0.789	-0.126	-0.642	0.081	0.257
Big	Low	-0.072	-0.964	-0.077	-0.526	0.009	0.039	0.100	1.681	0.11	0.922	-0.012	-0.064	0.208	3.407	0.184	1.625	0.046	0.253
	2	-0.002	-0.022	-0.051	-0.346	0.092	0.390	-0.031	-0.466	-0.12	-0.930	0.168	0.805	-0.043	-0.602	-0.128	-0.980	0.162	0.778
	3	0.099	1.081	0.217	1.205	-0.220	-0.759	-0.007	-0.093	0.05	0.329	-0.106	-0.440	-0.106	-1.324	-0.022	-0.150	-0.159	-0.671
	4	0.199	1.850	0.144	0.683	0.104	0.305	-0.018	-0.236	-0.16	-1.099	0.269	1.140	-0.087	-1.098	-0.210	-1.429	0.233	0.992
	High	0.188	1.361	-0.104	-0.385	0.548	1.258	-0.120	-1.159	-0.51	-2.533	0.726	2.255	-0.252	-2.335	-0.599	-3.007	0.658	2.068

Table 5: Jensen's Performance Measures on US Mutual Funds

The following presents all results obtained from testing the Ferson and Schadt US Mutual Funds data using the CAPM and the CAPM Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + \mu_{pt}$ is the CAPM and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2}d_t + \beta_p X_t + \mu_{pt}$ is the CAPM Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

Mutual Fund	CAPM				CAPM Modified						
	α	T-St-t	β	T-St-t	α	T-St-t	$\alpha 2$	T-St-t	α_{bull}	β	T-St-t
Boston Foundation Fund	0.00	0.05	0.52	26.74	-0.18	1.02	0.33	1.16	0.15	0.50	16.13
Investment Trust of Boston	-0.13	2.26	0.91	72.68	-0.21	1.87	0.15	0.84	-0.06	0.90	45.61
Century Shares Trust	0.05	0.25	0.87	21.84	-0.26	0.74	0.58	1.01	0.32	0.82	13.12
Scudder Income Fund	-0.07	0.74	0.36	18.21	-0.29	1.64	0.42	1.46	0.13	0.33	10.48
Selected American Shares	0.04	0.34	0.81	33.51	-0.17	0.78	0.39	1.11	0.22	0.78	20.48
Putnam Income Fund	0.03	0.32	0.26	14.24	-0.26	1.59	0.54	2.04	0.28	0.22	7.52
Keystone Income Fund	0.05	0.84	0.56	44.79	0.00	0.00	0.09	0.50	0.09	0.56	28.11
Keystone High-Grade Common Stock	-0.23	4.10	0.92	74.58	-0.18	1.60	-0.10	0.57	-0.28	0.93	47.88
Keystone Growth Fund K2	-0.09	0.72	0.91	34.05	-0.50	2.08	0.77	1.99	0.27	0.85	20.20
Investment Company of America	0.15	2.88	0.87	74.24	-0.03	0.27	0.34	2.03	0.31	0.84	45.84
Vanguard Wellington/Inv	-0.06	0.83	0.64	32.91	-0.34	1.81	0.71	1.89	0.37	1.01	33.34
Phoenix-Oakhurst: Income & Growth Fund	-0.01	0.11	0.73	66.45	-0.21	2.13	0.38	2.41	0.17	0.70	40.64
Nation-wide Securities	0.01	0.23	0.63	47.58	-0.02	0.17	0.06	0.34	0.04	0.62	30.00
Putnam Investors Fund	0.13	1.14	1.05	42.09	-0.42	1.91	1.03	2.90	0.61	0.96	24.76
United Accumulative Fund	-0.02	0.14	1.10	38.57	-0.36	1.43	0.65	1.58	0.29	1.05	23.37
United Income Fund	0.01	0.13	0.86	64.17	-0.31	2.60	0.59	3.10	0.28	0.81	38.81
United Science & Energy	0.00	0.01	1.12	42.24	-0.39	1.66	0.74	1.94	0.35	1.06	25.46
Sentinel Common Stock Fund	0.06	0.85	0.80	52.68	0.02	0.13	0.08	0.35	0.10	0.80	33.24
Sentinel Balanced Fund	0.03	0.46	0.52	39.26	-0.07	0.63	0.19	1.00	0.12	0.50	24.22
Fidelity Fund	0.05	0.95	0.95	88.27	-0.09	0.96	0.26	1.68	0.17	0.92	55.00
Delaware Fund	-0.02	0.26	0.88	47.03	-0.09	0.56	0.13	0.49	0.04	0.87	29.54
Safeco Equity Fund	-0.01	0.08	0.95	62.09	-0.02	0.16	0.03	0.14	0.01	0.95	39.38
Financial Industrial Fund	-0.22	1.80	1.11	41.23	-0.12	0.49	-0.19	0.50	-0.31	1.13	26.61
Founders Mutual Fund	-0.15	2.41	0.93	69.35	-0.19	1.61	0.09	0.44	-0.10	0.92	43.77
Security Investment Fund	-0.08	0.92	0.76	42.37	-0.13	0.80	0.10	0.39	-0.03	0.75	26.65
Philiadelphia Fund	0.01	0.13	0.82	36.93	-0.08	0.38	0.17	0.52	0.09	0.81	23.09
Wall Street Fund	-0.24	1.55	1.07	31.57	-0.27	0.91	0.07	0.14	-0.20	1.06	19.97
The Dreyfus Fund Inc.	-0.10	1.49	0.91	64.19	-0.20	1.56	0.19	0.93	-0.01	0.90	40.14
Dreyfus Premier Core Value Fund	0.16	1.67	0.58	21.13	0.21	1.42	-0.06	0.09	0.15	0.50	13.29
Franklin Custodian Fund - Income	0.17	1.56	0.44	18.08	0.18	0.85	-0.02	0.06	0.16	0.44	11.54
Neuberger Berman Guardian Fund	-0.20	1.68	0.49	37.68	-0.34	1.11	-0.09	0.60	-0.43	0.61	27.28

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Table 5 - Continued

Mutual Fund	CAPM				CAPM Modified						
	α	T-St-t	β	T-St-t	α	T-St-t	a2	T-St-t	αbull	β	T-St-t
Composite Fund	0.01	0.09	0.85	52.23	-0.15	1.04	0.29	1.26	0.14	0.82	32.30
Value Line Fund	0.16	1.58	0.92	42.54	0.17	0.88	-0.03	0.09	0.14	0.92	27.12
Mutual Shares Corporation	0.08	1.34	0.69	32.08	0.01	0.36	-0.24	0.43	-0.23	0.67	25.39
Northeast Investors Trust	0.11	1.36	0.24	13.45	0.14	0.86	-0.05	0.19	0.09	0.25	8.70
Price (T.Rowe) Growth	-0.03	0.45	1.03	63.65	-0.30	2.09	0.50	2.16	0.20	0.99	39.00
Guardian Mutual Fund	0.05	0.74	0.98	62.51	0.07	0.53	-0.04	0.18	0.03	0.98	39.89
Washington Mutual Investors	0.18	2.35	0.83	49.29	0.05	0.33	0.24	1.01	0.29	0.81	30.60
Value Line Income Fund	0.09	1.21	0.76	44.03	0.14	0.88	-0.08	0.31	0.06	0.76	28.24
Scudder International	-0.01	0.06	0.66	20.13	0.38	1.31	-0.73	1.55	-0.35	0.72	14.03
Fidelity Puritan Fund	-0.45	3.33	0.44	15.06	-0.72	2.75	0.52	1.21	-0.20	0.40	8.65
Templeton Growth Fund	0.40	3.57	0.69	28.10	0.68	3.11	-0.53	1.50	0.15	0.73	19.07
Value Line Special Situations Fund	-0.16	0.90	1.32	34.62	-0.47	1.38	0.59	1.07	0.12	1.27	21.21
Fidelity Trend Fund	-0.12	1.35	1.14	57.85	-0.30	1.69	0.33	1.17	0.03	1.12	35.94
Lexington Growth & Income Fund	0.05	0.43	0.75	32.24	-0.28	1.37	0.62	1.85	0.34	0.70	19.15
Putnam Growth & Income	-0.15	1.52	0.59	27.22	-0.01	0.06	-0.26	0.83	-0.27	0.61	17.97
Putnam Growth & Income Value Fund	0.03	0.39	0.63	23.64	-0.23	2.76	0.58	1.73	0.35	0.76	25.39
Security Equity Fund	-0.15	1.04	1.17	37.65	-0.50	1.81	0.66	1.48	0.16	1.11	22.85
Stein, Roe Investment Trust: Growth Stock Fund	-0.14	1.70	1.09	62.16	-0.46	2.93	0.60	2.39	0.14	1.04	37.92
Vanguard Windsor	0.06	1.24	0.96	53.68	-0.60	0.84	0.54	1.98	-0.06	0.93	32.22
INVESCO Equity Income Fund	-0.21	1.35	0.78	53.65	-0.38	1.35	0.08	2.56	-0.30	0.79	42.55
Liberty Fund	0.09	1.23	1.03	41.27	-0.27	2.68	0.39	1.59	0.12	1.26	29.26
Oppenheimer Fund	-0.12	0.97	0.86	30.96	-0.71	2.87	1.10	2.76	0.39	0.77	17.71
Provident Fund for Income	0.16	1.99	0.68	39.64	0.10	0.69	0.09	0.38	0.19	0.67	24.92
National Industries Fund	-0.29	3.67	0.96	55.64	-0.61	3.97	0.60	2.42	-0.01	0.91	33.73
Pioneer Fund	-0.44	5.47	0.20	11.29	-0.31	1.94	-0.25	0.99	-0.56	0.22	7.95
Colonial Growth Shares	-0.02	0.16	1.01	49.29	-0.24	1.32	0.42	1.44	0.18	0.97	30.30
Twentieth Century Growth Investors	0.12	0.76	1.33	36.97	-0.39	1.21	0.96	1.86	0.57	1.25	22.16

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Table 6: Jensen's Performance Measures on Fama and French 25 Portfolios

The following presents all results obtained from testing the Fama and French 25 Value-Weighted portfolios using the CAPM and the CAPM Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + \mu_{pt}$ is the CAPM and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2} d_t + \beta_p X_t + \mu_{pt}$ is the CAPM Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

Portfolio		CAPM				CAPM Modified						
		α	$T\text{-}St\text{-}t$	β	$T\text{-}St\text{-}t$	α	$T\text{-}Stat$	$\alpha2$	$T\text{-}Stat$	α_{bull}	β	$T\text{-}Stat$
Small	Low	-0.39	-1.67	1.42	27.51	-0.71	-1.54	0.59	0.80	-0.12	1.37	16.91
	2	0.18	0.89	1.22	27.31	-0.12	-0.31	0.57	0.89	0.45	1.17	16.71
	3	0.32	1.91	1.07	29.20	0.09	0.27	0.43	0.82	0.52	1.03	17.97
	4	0.57	3.59	0.98	28.15	0.61	1.97	-0.08	-0.15	0.53	0.99	18.04
	High	0.65	3.77	1.01	26.62	0.63	1.86	0.04	0.07	0.67	1.01	16.89
2	Low	-0.33	-1.91	1.42	37.10	-0.81	-2.38	0.90	1.63	0.09	1.35	22.42
	2	0.07	0.48	1.16	37.82	-0.06	-0.23	0.24	0.55	0.18	1.14	23.66
	3	0.36	2.80	1.02	36.62	0.21	0.84	0.27	0.68	0.48	1.00	22.79
	4	0.47	3.71	0.96	34.75	0.41	1.67	0.11	0.26	0.52	0.95	21.92
	High	0.50	3.34	1.04	31.34	0.19	0.65	0.59	1.23	0.78	0.99	19.03
3	Low	-0.27	-1.87	1.36	42.60	-0.75	-2.66	0.90	1.98	0.15	1.28	25.70
	2	0.15	1.44	1.09	46.58	0.09	0.44	0.12	0.35	0.21	1.08	29.39
	3	0.21	1.99	0.97	41.23	0.10	0.49	0.21	0.62	0.31	0.95	25.78
	4	0.38	3.38	0.91	36.91	0.26	1.18	0.23	0.64	0.49	0.89	23.02
	High	0.51	3.74	0.98	32.48	0.50	1.86	0.02	0.05	0.52	0.98	20.63
4	Low	-0.11	-1.02	1.25	52.37	-0.40	-1.89	0.54	1.59	0.14	1.21	32.20
	2	-0.03	-0.38	1.06	54.83	-0.18	-1.01	0.27	0.95	0.09	1.04	34.20
	3	0.23	2.41	0.97	45.56	0.13	0.66	0.20	0.66	0.33	0.95	28.51
	4	0.38	3.68	0.91	39.95	0.21	1.04	0.32	0.98	0.53	0.88	24.70
	High	0.41	3.01	0.99	33.03	0.38	1.43	0.05	0.13	0.44	0.98	20.93
Big	Low	-0.07	-0.96	1.02	61.93	-0.08	-0.53	0.01	0.04	-0.07	1.02	39.40
	2	0.00	-0.02	0.95	57.66	-0.05	-0.35	0.09	0.39	0.04	0.94	36.41
	3	0.10	1.08	0.85	42.23	0.22	1.21	-0.22	-0.76	0.00	0.87	27.48
	4	0.20	1.85	0.79	33.29	0.14	0.68	0.10	0.31	0.25	0.78	20.96
	High	0.19	1.36	0.84	27.54	-0.10	-0.39	0.55	1.26	0.44	0.79	16.59

Table 7: Three-Factor Model's Performance Measures on US Mutual Funds

The following presents all results obtained from testing the Ferson and Schadt US Mutual Funds data using the Fama and French 3-Factor Model and the Fama and French Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + s_p (SMB) + h_p (HML) + \mu_p$ is the Fama and French 3-Factor Model and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2} d_t + \beta_p X_t + s_p (SMB) + h_p (HML) + \mu_p$ is the Fama and French Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

Mutual Fund	Fama and French 3-Factor								Fama and French 3-Factor Modified										
	α	T-Stat	β	T-Stat	SMB	T-Stat	HML	T-Stat	α	T-Stat	α2	T-Stat	α bull	β	T-Stat	SMB	T-Stat	HML	T-Stat
Boston Foundation Fund	-0.02	0.04	0.59	25.55	0.40	-3.86	0.19	3.42	-0.21	1.03	0.31	1.13	0.10	0.53	23.94	0.37	-3.90	0.15	5.64
Investment Trust of Boston	-0.15	2.24	0.97	54.52	0.28	-5.00	-0.13	7.24	-0.14	1.78	0.13	0.91	-0.01	0.96	49.12	0.29	-5.06	-0.19	6.02
Century Shares Trust	0.03	0.21	0.90	24.21	-0.06	-2.26	0.16	9.55	-0.26	0.72	0.61	1.01	0.35	0.86	21.25	-0.07	-2.29	0.13	10.14
Scudder Income Fund	-0.18	0.66	0.32	19.46	0.43	6.64	-0.16	-4.55	-0.36	1.71	0.35	1.39	-0.01	0.34	18.23	0.29	6.54	-0.26	-2.64
Selected American Shares	-0.01	0.32	0.78	34.46	-0.13	3.19	0.06	-5.40	-0.05	0.61	0.29	1.23	0.24	0.75	31.64	-0.13	3.11	-0.02	-5.68
Putnam Income Fund	-0.03	0.29	0.31	20.51	-0.16	-1.19	0.36	-15.81	-0.33	1.60	0.55	1.97	0.22	0.34	20.13	-0.29	-1.23	0.32	-14.44
Keystone Income Fund	0.05	0.83	0.70	45.65	0.57	3.72	0.15	1.24	0.07	-0.07	0.12	0.57	0.19	0.67	46.25	0.54	3.68	0.11	-0.54
Keystone High-Grade Common Stock	-0.27	4.02	0.96	74.83	0.22	12.00	0.44	16.94	-0.17	1.67	-0.03	0.58	-0.20	0.93	60.64	0.20	11.94	0.38	17.27
Keystone Growth Fund K2	-0.08	0.72	0.87	37.76	0.13	3.61	0.16	1.73	-0.52	2.11	0.77	1.97	0.25	0.86	35.21	0.18	3.58	0.13	3.97
Investment Company of America	0.06	2.82	0.90	72.33	0.19	8.84	-0.09	-4.01	0.07	0.08	0.26	2.13	0.33	0.89	41.04	0.11	8.74	-0.19	-3.11
Vanguard Wellington/Inv	-0.15	0.74	0.70	21.45	0.11	-1.88	0.26	3.11	-0.40	1.78	0.67	1.83	0.27	0.65	23.43	0.01	-1.96	0.18	3.60
Phoenix-Oakhurst: Income & Growth Fund	-0.02	0.09	0.82	41.54	-0.17	-3.60	0.33	4.99	-0.15	2.06	0.40	2.47	0.25	0.79	35.84	-0.15	-3.64	0.29	2.91
Nation-wide Securities	-0.05	0.25	0.57	28.68	-0.07	11.05	-0.07	0.97	-0.05	0.22	0.02	0.31	-0.03	0.56	27.46	-0.15	11.01	-0.11	1.09
Putnam Investors Fund	0.11	1.09	1.04	40.74	0.39	-1.38	-0.45	2.18	-0.44	1.91	0.95	2.88	0.51	1.00	26.20	0.41	-1.44	-0.51	3.51
United Accumulative Fund	-0.03	0.14	1.09	45.89	0.09	-4.51	-0.44	4.50	-0.25	1.31	0.67	1.69	0.42	1.08	41.03	0.10	-4.54	-0.47	6.14
United Income Fund	-0.05	0.01	0.90	31.71	-0.12	15.56	0.01	1.72	-0.32	2.55	0.56	3.09	0.24	0.88	28.71	-0.14	15.46	-0.09	1.19
United Science & Energy	-0.07	-0.04	1.11	20.09	0.17	11.65	0.54	5.89	-0.35	1.55	0.67	1.98	0.32	1.09	18.21	0.11	11.57	0.46	8.03
Sentinel Common Stock Fund	0.01	0.85	0.82	43.08	0.53	5.55	0.11	4.59	0.00	0.10	0.07	0.33	0.07	0.87	38.25	0.47	5.51	0.07	5.61
Sentinel Balanced Fund	0.02	0.41	0.57	26.71	0.01	8.05	-0.13	0.06	-0.10	0.65	0.17	0.97	0.07	0.55	24.52	0.03	8.01	-0.17	0.63
Fidelity Fund	-0.03	0.91	1.00	32.80	0.35	4.73	0.00	2.13	-0.02	0.81	0.24	1.75	0.22	1.01	24.55	0.25	4.67	-0.06	4.01
Delaware Fund	-0.01	0.29	1.15	18.52	-0.11	-0.16	0.33	1.73	-0.10	0.64	0.22	0.48	0.12	1.10	15.33	-0.06	-0.19	0.30	1.85
Safeco Equity Fund	-0.09	-0.01	0.84	45.93	0.33	-3.16	0.04	3.76	0.03	0.03	-0.15	0.19	-0.12	0.81	44.60	0.27	-3.26	-0.06	5.01
Financial Industrial Fund	-0.26	1.75	0.69	33.51	-0.17	7.31	0.07	1.70	-0.09	0.56	-0.15	0.53	-0.24	0.68	35.24	-0.17	7.23	-0.01	3.38
Founders Mutual Fund	-0.18	2.35	0.88	35.92	0.29	-3.48	0.16	3.22	-0.24	1.63	0.10	0.39	-0.14	0.83	36.36	0.27	-3.52	0.12	3.47
Security Investment Fund	-0.13	0.91	1.11	25.24	-0.17	10.56	0.11	4.60	-0.05	0.67	0.13	0.47	0.08	1.12	22.83	-0.23	10.52	0.07	6.82
Philadelphia Fund	-0.02	0.11	0.94	39.78	0.39	9.25	0.19	-5.80	-0.10	0.37	0.12	0.50	0.02	0.93	36.69	0.39	9.19	0.13	-4.82
Wall Street Fund	-0.29	1.51	0.59	33.54	0.34	-2.25	0.15	4.88	-0.26	0.85	0.07	0.15	-0.19	0.61	26.46	0.27	-2.28	0.12	4.17
The Dreyfus Fund Inc.	-0.16	1.41	0.43	18.64	-0.09	10.93	-0.15	-5.64	-0.17	1.46	0.09	0.96	-0.08	0.38	16.56	-0.11	10.83	-0.25	-5.74
Dreyfus Premier Core Value Fund	0.10	1.65	0.48	53.51	0.40	-2.83	0.23	-0.16	0.17	1.34	-0.14	0.05	0.03	0.46	47.85	0.36	-2.91	0.15	-0.24
Franklin Custodian Fund - Income	0.17	1.53	0.46	26.94	-0.14	-6.21	-0.17	10.24	0.31	0.81	-0.06	0.19	0.25	0.43	22.35	-0.10	-6.25	-0.21	10.20
Neuberger Berman Guardian Fund	-0.23	1.67	0.53	43.58	-0.19	15.89	0.03	6.13	-0.34	1.07	-0.13	0.60	-0.47	0.51	40.99	-0.21	15.85	-0.01	6.09

Table 7 - Continued

Mutual Fund	Fama and French 3-Factor								Fama and French 3-Factor Modified											
	α	T-Stat	β	T-Stat	SMB	T-Stat	HML	T-Stat	α	T-Stat	a2	T-Stat	a_b(t)	β	T-Stat	SMB	T-Stat	HML	T-Stat
Composite Fund	-0.01	0.11	0.82	52.23	0.48	7.56	0.32	5.59	-0.14	1.14	0.29	1.26	0.15	0.81	49.03	0.42	8.04	0.29	4.44
Value Line Fund	0.20	1.60	0.99	42.54	0.25	2.87	-0.28	1.98	0.17	0.82	-0.03	0.09	0.14	0.95	36.94	0.28	9.53	-0.34	-4.75
Mutual Shares Corporation	0.06	1.31	0.69	32.08	-0.30	-6.23	0.23	2.76	-0.06	0.38	-0.24	0.38	-0.30	0.61	31.39	-0.29	-6.25	0.13	2.73
Northeast Investors Trust	0.07	1.43	0.17	13.45	0.52	9.29	0.15	6.07	0.24	0.98	-0.05	0.26	0.19	0.28	11.65	0.43	9.17	0.26	6.33
Price (T. Rowe) Growth	0.12	0.55	1.15	63.65	1.08	7.27	-0.09	1.40	-0.22	1.91	0.50	2.21	0.28	1.20	60.45	1.14	10.61	-0.09	-2.01
Guardian Mutual Fund	0.01	0.73	0.91	62.51	-0.07	0.08	0.59	13.98	0.03	0.63	-0.04	0.11	-0.01	0.89	56.61	-0.15	4.48	0.51	9.58
Washington Mutual Investors	0.24	2.32	0.90	49.29	-0.36	-8.74	0.33	3.85	0.01	0.27	0.24	0.98	0.25	0.82	47.19	-0.32	-5.01	0.25	0.02
Value Line Income Fund	0.06	1.14	0.77	44.03	-0.21	-2.57	-0.33	-3.39	0.11	0.90	-0.08	0.32	0.03	0.72	41.73	-0.18	-0.61	-0.30	-5.35
Scudder International	-0.04	0.06	0.64	20.13	0.58	12.87	-0.29	0.15	0.38	1.43	-0.73	1.56	-0.35	0.60	14.53	0.53	16.14	-0.32	-3.09
Fidelity Puritan Fund	-0.32	3.41	0.54	15.06	-0.13	-3.37	0.36	7.76	-0.70	2.57	0.52	1.20	-0.18	0.55	14.37	-0.07	-3.80	0.28	8.08
Templeton Growth Fund	0.34	3.61	0.63	28.10	-0.13	-3.10	0.45	8.79	0.63	3.21	-0.53	1.45	0.10	0.59	26.30	-0.18	-1.99	0.32	7.69
Value Line Special Situations Fund	-0.11	0.88	1.38	34.62	-0.19	-5.61	0.67	12.88	-0.51	1.32	0.59	1.04	0.08	1.31	31.42	-0.15	-0.47	0.59	7.65
Fidelity Trend Fund	-0.07	1.39	1.11	57.85	0.55	6.55	0.39	16.87	-0.16	1.71	0.33	1.23	0.17	1.27	51.95	0.46	12.41	0.57	11.10
Lexington Growth & Income Fund	0.00	0.51	0.73	32.24	0.52	12.51	0.31	6.97	-0.25	1.49	0.62	1.91	0.37	0.72	30.14	0.49	13.18	0.28	6.38
Putnam Growth & Income	-0.03	1.50	0.70	27.22	0.06	2.58	0.58	10.42	-0.03	-0.12	-0.26	0.80	-0.29	0.66	24.92	0.14	3.13	0.53	9.73
Putnam Growth & Income Value Fund	-0.04	0.42	0.62	23.64	0.43	6.80	0.47	10.61	-0.32	2.86	0.58	1.70	0.26	0.49	18.04	0.44	12.66	0.28	4.73
Security Equity Fund	-0.09	1.11	1.21	37.65	0.65	11.02	-0.03	0.00	-0.48	1.75	0.66	1.48	0.18	1.22	36.96	0.66	9.40	-0.09	1.58
Stein, Roe Investment Trust: Growth Stock Fund	-0.11	1.71	1.07	62.16	-0.04	-0.65	0.15	3.31	-0.45	2.95	0.60	2.35	0.15	1.09	60.36	-0.10	0.02	0.12	2.62
Vanguard Windsor	-0.01	1.26	0.93	53.68	-0.08	-1.23	-0.43	-6.74	-0.63	0.96	0.54	1.99	-0.09	0.87	50.48	-0.10	1.30	-0.50	-9.23
INVESCO Equity Income Fund	-0.10	1.37	0.85	53.65	0.29	7.21	-0.59	-3.76	-0.40	1.17	0.08	2.50	-0.32	0.85	47.75	0.34	11.07	-0.67	-7.75
Liberty Fund	0.10	1.14	1.02	41.27	0.32	9.16	-0.37	-4.19	-0.27	2.78	0.39	1.57	0.12	0.98	39.17	0.25	11.08	-0.34	-6.12
Oppenheimer Fund	-0.08	1.15	0.91	30.96	0.26	2.84	-0.54	-4.07	-0.62	2.81	1.10	2.86	0.48	0.98	28.66	0.30	3.77	-0.55	-4.95
Provident Fund for Income	0.18	1.95	0.71	39.64	-0.27	-2.39	0.42	13.24	0.15	0.71	0.09	0.44	0.24	0.72	34.04	-0.27	1.53	0.53	9.35
National Industries Fund	-0.37	3.66	0.91	55.64	-0.05	-0.09	0.25	4.10	-0.68	4.09	0.60	2.38	-0.08	0.83	54.95	-0.08	0.22	0.14	3.80
Pioneer Fund	-0.32	5.44	0.28	11.29	-0.22	-0.41	0.52	9.69	-0.35	1.76	-0.25	0.91	-0.60	0.25	9.49	-0.17	-0.98	0.44	10.10
Colonial Growth Shares	-0.03	0.21	0.99	49.29	0.63	8.09	0.25	8.54	-0.21	1.42	0.42	1.46	0.21	0.99	46.09	0.57	10.18	0.22	6.49
Twentieth Century Growth Investors	0.14	0.76	1.34	36.97	0.42	5.59	0.39	16.49	-0.43	1.15	0.96	1.81	0.53	1.32	31.07	0.44	12.11	0.32	9.91

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Table 8: Three-Factor Model's Performance Measures on Fama and French 25 Portfolios

The following presents all results obtained from testing the Fama and French 25 Value-Weighted Portfolios using the Fama and French 3-Factor Model and the Fama and French Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + \beta_p X_t + s_p$ (SMB) + h_p (HML) + μ_p is the Fama and French 3-Factor Model and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2} d_t + \beta_{p1} X_t + s_p$ (SMB) + h_p (HML) + μ_p is the Fama and French Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

	Portfolio	Fama and French 3-Factor								Fama and French 3-Factor Modified										
		α	T-Stat	β	T-Stat	SMB	T-Stat	HML	T-Stat	α	T-Stat	a2	T-Stat	α bull	β	T-Stat	SMB	T-Stat	HML	T-Stat
Small	Low	-0.49	-4.07	1.06	37.38	1.48	36.95	-0.25	-6.40	-0.61	-2.61	0.22	0.60	-0.38	1.04	24.77	1.48	36.95	-0.25	-6.39
	2	0.01	0.09	0.92	43.69	1.37	45.91	-0.05	-1.62	-0.14	-0.79	0.27	0.97	0.13	0.90	28.77	1.37	45.93	-0.05	-1.60
	3	0.09	1.20	0.86	49.86	1.14	46.55	0.14	5.88	-0.03	-0.23	0.22	0.99	0.19	0.84	32.92	1.14	46.56	0.14	5.91
	4	0.29	3.93	0.82	46.95	1.06	42.96	0.27	11.02	0.42	2.91	-0.24	-1.03	0.18	0.84	32.46	1.06	43.02	0.27	11.01
	High	0.26	3.44	0.88	50.14	1.13	45.50	0.49	19.82	0.30	2.08	-0.08	-0.36	0.22	0.89	34.08	1.13	45.51	0.48	19.81
2	Low	-0.33	-3.98	1.12	57.97	1.07	38.92	-0.34	-12.56	-0.64	-4.07	0.59	2.34	-0.05	1.07	37.58	1.07	39.08	-0.34	-12.58
	2	-0.11	-1.63	0.99	61.80	0.93	41.24	0.09	4.11	-0.15	-1.11	0.07	0.32	-0.08	0.98	41.44	0.93	41.23	0.09	4.11
	3	0.12	1.68	0.92	55.92	0.80	34.45	0.26	11.51	0.03	0.19	0.17	0.78	0.19	0.90	37.16	0.80	34.45	0.26	11.53
	4	0.17	2.37	0.90	54.72	0.73	31.34	0.41	18.00	0.14	1.03	0.05	0.23	0.19	0.90	36.73	0.73	31.34	0.41	18.01
	High	0.11	1.43	0.99	52.48	0.87	32.67	0.56	21.36	-0.17	-1.13	0.54	2.19	0.36	0.94	33.94	0.87	32.77	0.56	21.51
3	Low	-0.20	-2.64	1.10	60.77	0.79	30.92	-0.38	-15.11	-0.55	-3.70	0.64	2.72	0.10	1.05	39.27	0.79	31.09	-0.38	-15.16
	2	0.00	-0.04	1.01	55.64	0.57	22.00	0.16	6.30	-0.02	-0.15	0.04	0.15	0.01	1.01	37.41	0.57	22.00	0.16	6.30
	3	-0.03	-0.32	0.95	51.06	0.47	17.63	0.36	13.85	-0.13	-0.85	0.20	0.80	0.07	0.94	33.86	0.47	17.62	0.36	13.87
	4	0.09	1.11	0.93	49.30	0.42	15.59	0.48	18.36	-0.05	-0.30	0.25	1.02	0.21	0.91	32.53	0.42	15.58	0.48	18.39
	High	0.12	1.41	1.01	49.96	0.57	19.98	0.65	23.22	0.09	0.54	0.06	0.22	0.15	1.01	33.53	0.57	19.98	0.65	23.22
4	Low	0.02	0.24	1.08	61.28	0.41	16.26	-0.39	-16.03	-0.18	-1.23	0.37	1.59	0.19	1.05	40.26	0.40	16.27	-0.39	-16.03
	2	-0.15	-1.85	1.05	54.60	0.24	8.60	0.17	6.51	-0.29	-1.83	0.26	1.02	-0.03	1.03	36.10	0.23	8.59	0.18	6.54
	3	0.03	0.31	1.02	52.68	0.19	6.88	0.38	14.15	-0.11	-0.70	0.25	1.00	0.14	1.00	34.82	0.19	6.86	0.38	14.18
	4	0.14	1.65	0.97	48.95	0.21	7.51	0.45	16.21	-0.07	-0.41	0.38	1.48	0.32	0.94	31.99	0.21	7.50	0.45	16.27
	High	0.06	0.55	1.08	44.71	0.27	7.85	0.66	19.57	-0.03	-0.13	0.16	0.49	0.13	1.07	29.80	0.27	7.84	0.66	19.58
Big	Low	0.10	1.68	1.00	70.99	-0.23	-11.55	-0.29	-14.89	0.11	0.92	-0.01	-0.06	0.09	1.00	47.92	-0.23	-11.55	-0.29	-14.89
	2	-0.03	-0.47	1.02	64.44	-0.22	-9.58	0.13	5.73	-0.12	-0.93	0.17	0.81	0.05	1.01	42.89	-0.22	-9.60	0.13	5.75
	3	-0.01	-0.09	0.96	52.78	-0.22	-8.39	0.29	11.35	0.05	0.33	-0.11	-0.44	-0.06	0.97	35.92	-0.22	-8.38	0.29	11.34
	4	-0.02	-0.24	0.95	52.82	-0.20	-7.76	0.51	20.62	-0.16	-1.10	0.27	1.14	0.11	0.93	34.83	-0.20	-7.79	0.52	20.67
	High	-0.12	-1.16	1.01	40.93	-0.08	-2.30	0.67	19.59	-0.51	-2.53	0.73	2.25	0.22	0.95	26.08	-0.08	-2.35	0.67	19.74

Table 9: Four-Factor Model's Performance Measures on US Mutual Funds

The following presents all results obtained from testing the Ferson and Schadt US Mutual Funds data using the Carhart 4-Factor Model and the Carhart Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + s_p (SMB) + h_p (HML) + p_p (PR1YR) + \mu_p$ is the Fama and French 3-Factor Model and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2} d_t + \beta_p X_t + s_p (SMB) + h_p (HML) + p_p (PR1YR) + \mu_p$ is the Fama and French Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

Mutual Fund	Carhart 4-Factor Model										Carhart 4-Factor Model Modified													
	α	T-Stat	β	T-Stat	SMB	T-Stat	HML	T-Stat	PR1YR	T-Stat	α	T-Stat	α2	T-Stat	α bull	β	T-Stat	SMB	T-Stat	HML	T-Stat	PR1YR	T-Stat
Boston Foundation Fund	-0.04	0.01	0.57	23.25	0.42	-6.16	0.16	3.38	0.03	0.09	-0.23	0.98	0.29	1.11	0.06	0.51	21.64	0.35	-6.20	0.12	3.34	0.05	0.14
Investment Trust of Boston	-0.19	2.20	0.93	48.92	0.32	-3.90	-0.17	7.18	-0.03	-1.97	-0.18	1.81	0.09	0.87	-0.09	0.92	43.52	0.25	-3.96	-0.23	7.12	0.03	-2.00
Century Shares Trust	0.02	0.22	0.84	23.52	-0.05	-2.91	0.17	9.52	-0.06	-1.37	-0.27	0.71	0.55	1	0.28	0.80	20.56	-0.08	-2.94	0.14	9.49	0.00	-1.45
Scudder Income Fund	-0.17	0.64	0.40	17.66	0.42	4.64	-0.18	-4.54	0.02	0.61	-0.35	1.65	0.43	1.4	0.08	0.42	16.43	0.30	4.54	-0.28	-4.64	0.00	0.53
Selected American Shares	-0.04	0.26	0.80	31.26	-0.10	3.31	0.00	-5.48	0.03	0.09	-0.08	0.7	0.31	1.2	0.23	0.77	28.44	-0.16	3.23	-0.08	-5.56	0.05	0.14
Putnam Income Fund	-0.01	0.28	0.26	14.61	-0.18	-2.64	0.35	-15.65	-0.02	-0.44	-0.31	1.55	0.5	1.99	0.19	0.29	14.23	-0.27	-2.68	0.31	-15.89	-0.02	-0.37
Keystone Income Fund	0.01	0.60	0.63	43.55	0.61	5.42	0.12	1.20	0.04	2.64	0.03	-0.04	0.05	0.53	0.08	0.60	44.15	0.50	5.38	0.08	1.16	0.04	2.57
Keystone High-Grade Common Stock	-0.29	4.04	0.95	72.53	0.24	11.67	0.46	17.00	0.06	4.16	-0.19	1.66	-0.04	0.56	-0.23	0.92	58.34	0.18	11.61	0.40	16.94	0.00	4.15
Keystone Growth Fund K2	-0.12	0.69	0.84	32.16	0.17	1.31	0.13	1.70	0.02	4.87	-0.56	2.05	0.74	1.93	0.18	0.83	29.61	0.14	1.28	0.10	1.67	0.01	4.83
Investment Company of America	0.05	2.78	0.88	71.64	0.20	7.74	-0.13	-4.11	0.03	2.12	0.06	0.17	0.24	2.12	0.30	0.87	40.35	0.10	7.64	-0.23	-4.21	0.03	2.02
Vanguard Wellington/Inv	-0.14	0.75	0.66	19.65	0.10	-2.53	0.27	3.03	0.00	0.25	-0.39	1.73	0.63	1.84	0.24	0.61	21.63	0.02	-2.61	0.19	2.95	0.00	0.17
Phoenix-Oakhurst: Income & Growth Fund	-0.05	0.07	0.76	38.34	-0.14	-1.60	0.31	4.95	0.03	2.16	-0.18	2.09	0.34	2.44	0.16	0.73	32.64	-0.18	-1.64	0.27	4.91	0.03	2.14
Nation-wide Securities	-0.03	0.19	0.65	22.78	-0.09	10.93	-0.13	1.01	-0.02	-1.27	-0.03	0.21	0.1	0.33	0.07	0.64	21.56	-0.13	10.89	-0.17	0.97	-0.02	-1.30
Putnam Investors Fund	0.07	1.08	1.06	38.64	0.43	-2.83	-0.46	2.12	0.08	4.35	-0.48	1.85	0.97	2.84	0.49	1.02	24.10	0.37	-2.89	-0.52	2.06	0.07	4.25
United Accumulative Fund	-0.05	0.11	1.04	43.59	0.11	-6.21	-0.47	4.47	0.06	3.88	-0.27	1.4	0.62	1.67	0.35	1.03	38.73	0.08	-6.24	-0.50	4.44	0.06	3.75
United Income Fund	-0.09	0.03	0.83	26.11	-0.08	15.69	0.03	1.62	-0.03	-1.81	-0.36	2.5	0.49	3.05	0.13	0.81	23.11	-0.18	15.79	-0.07	1.52	-0.03	-2.01
United Science & Energy	-0.08	-0.07	1.10	19.40	0.18	9.35	0.51	5.81	0.02	4.95	-0.36	1.58	0.66	1.97	0.30	1.08	17.52	0.10	9.27	0.43	5.73	0.02	4.88
Sentinel Common Stock Fund	0.02	0.81	0.79	41.28	0.52	4.45	0.07	4.55	0.04	2.92	0.01	0.09	0.04	0.34	0.05	0.84	36.45	0.48	4.41	0.03	4.51	0.04	2.88
Sentinel Balanced Fund	-0.01	0.42	0.55	23.51	0.04	7.40	-0.12	0.02	0.03	2.65	-0.13	0.59	0.15	0.94	0.02	0.53	21.32	0.00	7.36	-0.16	-0.02	0.01	2.59
Fidelity Fund	-0.01	0.89	0.96	26.90	0.33	2.73	-0.02	2.07	0.05	3.35	0	0.9	0.2	1.77	0.20	0.97	18.65	0.27	2.67	-0.08	2.01	0.04	3.29
Delaware Fund	-0.05	0.23	1.09	16.42	-0.07	-0.28	0.27	1.76	0.08	3.48	-0.14	0.59	0.16	0.44	0.02	1.04	13.23	-0.10	-0.31	0.24	1.73	0.08	3.47
Safeco Equity Fund	-0.11	-0.02	0.92	43.63	0.35	-4.61	0.03	3.66	0.00	-0.28	0.01	0.06	-0.07	0.17	-0.06	0.89	42.30	0.25	-4.71	-0.07	3.56	-0.01	-0.28
Financial Industrial Fund	-0.3	1.72	0.71	27.91	-0.13	5.61	0.04	1.76	-0.04	-1.55	-0.13	0.55	-0.13	0.49	-0.26	0.70	29.64	-0.21	5.53	-0.04	1.68	-0.05	-1.51
Founders Mutual Fund	-0.19	2.37	0.83	35.23	0.30	-3.81	0.18	3.18	0.04	2.60	-0.25	1.57	0.05	0.38	-0.20	0.78	35.67	0.26	-3.65	0.14	3.14	0.04	2.59
Security Investment Fund	-0.12	0.88	1.04	23.44	-0.18	8.26	0.08	4.56	0.06	2.95	-0.04	0.76	0.06	0.48	0.02	1.05	21.09	-0.22	8.22	0.04	4.52	0.06	2.94
Philadelphia Fund	-0.05	0.07	0.93	36.58	0.42	8.15	0.15	-5.86	0.01	4.01	-0.13	0.32	0.11	0.47	-0.02	0.92	33.49	0.36	8.09	0.09	-5.92	0.01	4.00
Wall Street Fund	-0.27	1.52	0.56	27.64	0.32	-1.60	0.16	4.85	0.03	0.09	-0.24	0.88	0.04	0.17	-0.20	0.58	20.56	0.29	-1.63	0.13	4.82	0.05	0.14
The Dreyfus Fund Inc.	-0.2	1.39	0.43	18.64	-0.05	10.93	-0.17	-5.64	0.03	0.89	-0.21	1.46	0.09	0.92	-0.12	0.38	16.56	-0.15	10.83	-0.27	-5.74	0.02	0.85
Dreyfus Premier Core Value Fund	0.08	1.59	0.48	53.51	0.42	-2.83	0.17	-0.16	-0.03	-1.34	0.15	1.34	-0.14	0.03	0.01	0.46	47.85	0.34	-2.91	0.09	-0.24	-0.03	-1.37
Franklin Custodian Fund - Income	0.13	1.52	0.46	26.94	-0.10	-6.21	-0.18	10.24	0.08	-0.67	0.27	0.81	-0.06	0.15	0.21	0.43	22.35	-0.14	-6.25	-0.22	10.20	-0.05	-0.69
Neuberger Berman Guardian Fund	-0.24	1.64	0.53	43.58	-0.18	15.89	0.00	6.13	0.01	0.15	-0.35	1.07	-0.13	0.59	-0.48	0.51	40.99	-0.22	15.85	-0.04	6.09	0.01	0.11

Table 9 - Continued

Mutual Fund	Carhart 4-Factor Model														Carhart 4-Factor Model Modified								
	a	T-Stat	β	T-Stat	SMB	T-Stat	WML	T-Stat	PR1YR	T-Stat	a	T-Stat	a2	T-Stat	a_hat	β	T-Stat	SMB	T-Stat	WML	T-Stat	PR1YR	T-Stat
Composite Fund	-0.04	0.07	0.80	49.93	0.45	6.16	0.30	3.29	0.07	-3.77	-0.17	1.09	0.25	1.24	0.08	0.78	47.63	0.40	6.14	0.26	3.34	0.06	-3.86
Value Line Fund	0.16	1.54	0.95	43.64	0.21	3.97	-0.32	-3.62	0.01	4.79	0.13	0.85	-0.09	0.05	0.04	0.91	38.04	0.24	3.93	-0.38	-3.65	0.02	4.71
Mutual Shares Corporation	0.07	1.28	0.68	31.43	-0.29	-6.88	0.17	2.07	0.05	2.02	-0.05	0.37	-0.27	0.37	-0.32	0.62	30.74	-0.30	-6.94	0.14	2.08	0.03	2.07
Northeast Investors Trust	0.05	1.44	0.18	11.45	0.50	7.29	0.23	4.27	0.03	1.44	0.22	0.92	-0.04	0.27	0.18	0.26	9.65	0.44	7.37	0.24	4.33	0.03	1.46
Price (T.Rowe) Growth	0.06	0.47	1.12	63.77	1.02	7.39	-0.07	-1.80	-0.05	-3.45	-0.28	2.00	0.42	2.18	0.14	1.14	60.57	1.11	7.41	-0.15	-1.89	-0.06	-3.52
Guardian Mutual Fund	0.00	0.69	0.93	61.06	-0.08	-1.37	0.54	8.08	0.00	-0.03	0.02	0.58	-0.08	0.13	-0.06	0.88	55.16	-0.13	-1.42	0.50	8.13	0.00	-0.02
Washington Mutual Investors	0.21	2.28	0.86	50.99	-0.39	-7.04	0.26	1.75	0.02	1.56	-0.02	0.30	0.20	0.94	0.18	0.73	48.89	-0.36	-7.11	0.22	1.72	0.02	1.48
Value Line Income Fund	0.08	1.20	0.75	43.70	-0.19	-2.90	-0.34	-5.69	0.04	7.26	0.13	0.89	-0.02	0.30	0.11	0.74	41.40	-0.20	-2.91	-0.28	-5.68	0.03	7.32
Scudder International	-0.07	0.03	0.60	17.83	0.55	10.57	-0.32	-5.45	0.08	2.03	0.35	1.37	-0.76	1.52	-0.41	0.57	12.23	0.49	10.54	-0.35	-5.39	0.06	2.14
Fidelity Puritan Fund	-0.36	3.31	0.53	13.96	-0.17	-4.47	0.34	7.07	0.03	2.03	-0.74	2.66	0.42	1.19	-0.32	0.51	13.27	-0.08	-4.49	0.24	6.98	0.01	1.98
Templeton Growth Fund	0.35	3.53	0.64	27.45	-0.12	-3.75	0.41	6.99	0.02	0.70	0.64	3.16	-0.61	1.46	0.03	0.60	25.65	-0.17	-3.79	0.33	7.04	0.00	0.80
Value Line Special Situations Fund	-0.13	0.84	1.35	36.62	-0.21	-3.61	0.61	9.68	0.02	8.03	-0.53	1.35	0.55	1.01	0.02	1.29	33.42	-0.18	-3.67	0.57	9.65	0.02	7.99
Fidelity Trend Fund	-0.13	1.43	1.13	57.73	0.49	6.43	0.47	10.97	0.08	3.54	-0.22	1.70	0.37	1.25	0.15	1.21	51.83	0.48	6.51	0.51	10.98	0.05	3.51
Lexington Growth & Income Fund	-0.01	0.45	0.69	30.79	0.51	11.06	0.33	4.87	0.01	0.18	-0.26	1.43	0.56	1.87	0.30	0.71	28.69	0.45	11.08	0.27	4.93	0.01	0.14
Putnam Growth & Income	-0.06	1.47	0.68	25.52	0.03	0.88	0.53	8.12	-0.11	-1.17	-0.06	-0.03	-0.29	0.78	-0.35	0.63	23.22	0.12	0.83	0.50	8.03	-0.08	-1.09
Putnam Growth & Income Value Fund	-0.02	0.32	0.58	23.97	0.45	7.13	0.40	5.01	0.01	0.17	-0.30	2.81	0.48	1.66	0.18	0.51	18.37	0.40	7.06	0.30	5.06	0.02	0.14
Security Equity Fund	-0.12	1.03	1.20	35.35	0.62	8.72	-0.04	-0.69	-0.02	-0.15	-0.51	1.78	0.58	1.47	0.07	1.19	34.66	0.65	8.71	-0.12	-0.72	-0.03	-0.14
Stein, Roe Investment Trust: Growth Stock Fund	-0.15	1.67	1.08	61.06	-0.08	-1.75	0.12	1.51	0.04	5.70	-0.49	2.94	0.56	2.36	0.07	1.05	59.26	-0.09	-1.78	0.08	1.52	0.05	5.61
Vanguard Windsor	0.00	1.22	0.90	53.03	-0.07	-1.88	-0.45	-9.94	-0.09	-3.89	-0.62	0.90	0.50	1.96	-0.12	0.88	49.83	-0.13	-1.90	-0.49	-9.88	-0.06	-3.90
INVESCO Equity Income Fund	-0.12	1.31	0.87	51.65	0.27	5.21	-0.63	-9.66	0.08	4.64	-0.42	1.26	0.02	2.52	-0.40	0.83	45.75	0.36	5.17	-0.69	-9.75	0.09	4.68
Liberty Fund	0.04	1.17	0.98	41.15	0.26	9.04	-0.43	-6.29	0.05	3.95	-0.33	2.73	0.42	1.53	0.09	0.92	39.05	0.21	8.98	-0.40	-6.24	0.03	3.84
Oppenheimer Fund	-0.09	1.05	0.89	29.51	0.25	1.39	-0.46	-6.37	0.02	7.14	-0.63	2.84	1.00	2.84	0.37	0.97	27.21	0.28	1.47	-0.56	-6.40	0.02	7.03
Provident Fund for Income	0.15	2.01	0.67	37.94	-0.30	-4.09	0.44	7.64	0.04	1.82	0.12	0.70	0.15	0.40	0.27	0.69	32.34	-0.31	-4.07	0.50	7.65	0.04	1.80
National Industries Fund	-0.35	3.62	0.90	55.31	-0.03	-0.42	0.20	3.41	-0.03	-1.31	-0.66	4.03	0.56	2.37	-0.10	0.85	54.62	-0.09	-0.47	0.16	3.47	-0.03	-1.44
Pioneer Fund	-0.35	5.40	0.29	8.99	-0.25	-2.71	0.45	7.89	0.03	1.76	-0.38	1.85	-0.29	0.92	-0.67	0.22	7.19	-0.16	-2.78	0.41	7.80	0.02	1.82
Colonial Growth Shares	-0.07	0.15	0.96	48.19	0.59	6.99	0.24	5.34	0.09	3.62	-0.25	1.37	0.36	1.43	0.11	0.95	44.99	0.54	6.98	0.18	5.39	0.07	3.56
Twentieth Century Growth Investors	0.15	0.73	1.36	37.62	0.43	6.24	0.36	10.59	0.02	5.17	-0.42	1.18	0.93	1.83	0.51	1.33	31.72	0.46	6.21	0.33	10.56	0.03	5.09

Table 10: Four-Factor Model's Performance Measures on Fama and French 25 Portfolios

The following presents all results obtained from testing the Fama and French 25 Value-Weighted Portfolios using the Carhart 4-Factor Model and the Carhart Modified, where: $r_{pt} - r_{ft} = \alpha_{p1} + \beta_p X_t + s_p$ (SMB) $+ h_p$ (HML) $+ p_p$ (PR1YR) $+ \mu_p$ is the Fama and French 3-Factor Model and $r_{pt} - r_{ft} = \alpha_{p1} + \alpha_{p2} d_t + \beta_p X_t + s_p$ (SMB) $+ h_p$ (HML) $+ p_p$ (PR1YR) $+ \mu_p$ is the Fama and French Modified. The bull market alphas are calculated as follows: $\alpha_{bull} = \alpha_{p1} + \alpha_{p2}$.

Carhart 4-Factor Model

Portfolio		α	T-Stat	β	T-Stat	SMB	T-Stat	HML	T-Stat	PR1YR	T-Stat
Small	Low	-0.47	-3.75	1.05	36.44	1.48	36.65	-0.26	-5.86	-0.09	-1.48
	2	-0.06	-0.69	0.93	43.46	1.38	46.15	-0.01	-0.33	-0.11	-2.88
	3	-0.04	-0.51	0.88	51.19	1.15	48.13	0.20	7.79	-0.08	-2.64
	4	0.13	1.80	0.84	49.23	1.08	45.25	0.35	13.23	0.04	1.85
	High	0.09	1.19	0.91	52.87	1.16	48.22	0.57	21.71	0.02	0.96
2	Low	-0.23	-2.74	1.11	56.55	1.06	38.68	-0.38	-12.85	-0.01	-0.62
	2	-0.11	-1.53	0.99	60.35	0.93	40.93	0.09	3.63	-0.04	-2.27
	3	0.02	0.29	0.93	56.50	0.81	35.32	0.31	12.35	0.06	3.47
	4	0.02	0.23	0.93	57.23	0.75	33.29	0.49	19.78	0.08	5.81
	High	-0.09	-1.16	1.02	56.40	0.89	35.55	0.66	24.02	0.06	3.44
3	Low	-0.09	-1.12	1.08	59.60	0.78	30.78	-0.44	-15.79	-0.08	-4.79
	2	-0.04	-0.54	1.02	54.82	0.57	22.09	0.18	6.34	0.03	2.12
	3	-0.09	-1.12	0.96	50.75	0.47	17.92	0.39	13.57	0.04	2.38
	4	-0.03	-0.40	0.95	50.20	0.43	16.37	0.55	18.82	0.07	4.52
	High	-0.02	-0.25	1.03	51.14	0.59	20.96	0.72	23.52	0.00	-0.12
4	Low	0.09	1.19	1.07	59.76	0.40	15.93	-0.43	-15.78	-0.01	-0.40
	2	-0.13	-1.48	1.05	53.18	0.23	8.44	0.16	5.40	-0.01	-0.58
	3	-0.02	-0.22	1.03	51.93	0.19	7.04	0.40	13.35	0.02	1.07
	4	0.06	0.68	0.98	48.81	0.22	7.86	0.49	15.85	-0.03	-1.74
	High	-0.08	-0.79	1.11	45.33	0.29	8.43	0.73	19.62	-0.01	-0.62
Big	Low	0.21	3.41	0.99	70.27	-0.24	-12.49	-0.35	-16.20	-0.04	-4.51
	2	-0.04	-0.60	1.02	63.07	-0.21	-9.45	0.13	5.33	-0.02	-1.39
	3	-0.11	-1.32	0.98	53.17	-0.21	-7.99	0.34	12.03	0.00	0.26
	4	-0.09	-1.10	0.96	52.58	-0.19	-7.44	0.55	19.75	0.02	-0.95
	High	-0.25	-2.33	1.03	41.40	-0.06	-1.85	0.74	19.45	0.11	1.12

Carhart 4-Factor Model Modified

Portfolio		α_{bull}	β	T-Stat	SMB	T-Stat	HML	T-Stat	PR1YR	T-Stat	α	T-Stat	α^2	T-Stat
Small	Low	-0.36	1.48	24.26	1.48	36.63	-0.26	-5.87	-0.01	-0.40	-0.59	-2.55	0.23	0.62
	2	0.04	1.38	28.88	1.38	46.15	-0.01	-0.34	0.06	2.41	-0.19	-1.08	0.23	0.84
	3	0.04	1.15	34.21	1.15	48.12	0.20	7.79	0.10	5.25	-0.12	-0.88	0.16	0.72
	4	-0.02	1.08	34.53	1.08	45.37	0.35	13.26	0.13	6.66	0.30	2.20	-0.32	-1.46
	High	0.01	1.16	36.45	1.16	48.26	0.57	21.73	0.14	7.08	0.18	1.30	-0.17	-0.79
2	Low	0.07	1.05	36.71	1.05	38.85	-0.38	-12.96	-0.08	-3.55	-0.57	-3.65	0.64	2.57
	2	-0.08	0.93	40.70	0.93	40.92	0.09	3.63	0.00	-0.07	-0.14	-1.10	0.07	0.32
	3	0.08	0.81	37.92	0.81	35.30	0.31	12.35	0.08	4.18	-0.04	-0.32	0.12	0.56
	4	0.00	0.75	38.92	0.75	33.28	0.49	19.78	0.12	6.68	0.03	0.25	-0.03	-0.15
	High	0.11	0.89	37.02	0.89	35.62	0.66	24.09	0.16	8.13	-0.32	-2.19	0.43	1.86
3	Low	0.24	0.78	38.55	0.78	30.97	-0.44	-15.95	-0.10	-4.73	-0.46	-3.18	0.71	3.05
	2	-0.04	0.57	37.13	0.57	22.08	0.18	6.34	0.03	1.57	-0.05	-0.34	0.01	0.06
	3	-0.02	0.47	33.95	0.47	17.91	0.39	13.58	0.05	2.52	-0.18	-1.16	0.16	0.66
	4	0.06	0.43	33.50	0.43	16.35	0.55	18.83	0.10	4.62	-0.13	-0.87	0.19	0.77
	High	-0.03	0.59	34.73	0.59	20.96	0.72	23.52	0.12	5.09	-0.01	-0.08	-0.02	-0.07
4	Low	0.28	0.39	39.35	0.39	15.93	-0.43	-15.84	-0.06	-3.13	-0.12	-0.85	0.41	1.78
	2	0.00	0.23	35.32	0.23	8.42	0.16	5.40	-0.02	-0.94	-0.27	-1.70	0.27	1.07
	3	0.09	0.19	34.58	0.19	7.01	0.40	13.36	0.03	1.54	-0.14	-0.88	0.23	0.91
	4	0.22	0.22	32.19	0.22	7.84	0.49	15.87	0.06	2.78	-0.12	-0.75	0.34	1.33
	High	-0.05	0.29	30.55	0.29	8.42	0.73	19.62	0.11	4.15	-0.13	-0.64	0.08	0.25
Big	Low	0.23	-0.24	47.47	-0.24	-12.49	-0.35	-16.20	-0.09	-5.57	0.18	1.63	0.05	0.78
	2	0.03	-0.21	42.22	-0.21	-9.47	0.13	5.33	0.01	0.46	-0.13	-0.98	0.16	-0.67
	3	-0.18	-0.20	36.57	-0.20	-7.97	0.34	12.04	0.08	3.93	-0.02	-0.15	-0.16	0.26
	4	0.02	-0.19	34.96	-0.19	-7.47	0.55	19.76	0.06	2.69	-0.21	-1.43	0.23	0.99
	High	0.06	-0.07	26.68	-0.07	-1.91	0.74	19.52	0.10	3.74	-0.60	-3.01	0.66	2.07

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