Investor Sentiment and the Return Generating Process of Equity and Bond Closed-end Funds

Marta Charrón, Ph.D.
Assistant Professor
Department of Finance

SUMMARY

The main objective of this research is to analyze the long-standing debate between traditional finance and behavioral finance by examining the return generating process of closed-end funds. A closed-end fund (CEF) is an investment company that holds or bundles other publicly traded securities. Several multifactor models will be used to tests the weak form of market efficiency. The research will also incorporate investor sentiment and examine if it enters the return generating process of CEF. The multifactor models will be developed following Fama and French (1992) and Carhart (1997) and will also include a combined model that will test separately two investor sentiment proxies. The first one is the Consumer Confidence Index from the University of Michigan, which measures investor sentiment toward the economy and the other one is the volatility index VIX which is used as a proxy for investor risk aversion. The regression results are obtained using generalized method of moments (GMM) with Newey-West corrections for contemporaneous correlation as well as heteroskedasticity. The results show that both proxies for investor sentiment and the risk premium for broad market portfolio enter the return generating process of closed end funds consistently.

Keywords: investor sentiment, closed-end funds, return generating process, multifactor model, asset pricing

INTRODUCTION

The traditional finance paradigm, which has dominated financial economics for more than 30 years, seeks to investigate and understand the behavior of financial markets with models or theories where rational agents, who transact in efficient markets, and are considered unbiased Bayesian forecasters, make choices that maximize their subjective expected utility. Using rational expectations theory from economics and scientific methodology comparable to that of the life sciences, traditional or modern finance has developed a set of aggregated theories for the purpose of describing financial phenomena.

One of its pillars, the efficient market hypothesis (EMH) formalized by Fama (1970) posits that markets are informational efficient, meaning that market prices respond accurately and quickly to available information, and market participants cannot profit from trading on available information in a way that would allow them to "beat the market". The market efficiency also rests on three sufficient conditions, namely that there are no transaction costs in trading securities, that all available information is costlessly available to all market participants, and that investors all agree or share homogenous expectations on the implications of current information for the current price and distributions of future prices of each security. Also, there are no arbitrage opportunities since when security prices stray away from fundamental values, traders become aware of the mis-pricing and trade the difference away or drive the market back to equilibrium.

Although proponents of traditional finance have conceded that traditional theory has done poorly as a positive theory of individual investor behavior, they contend that it does well as a descriptive or positive theory of the equilibrium that comes from the interaction of individuals in the markets (Statman, 1999). The positive theory follows Friedman's (1953) view of positive

economics that posits that the primary objective of a theory is to produce acceptable forecasts while remaining simple and fruitful, and that assumptions of the theory need not necessarily be an accurate description of reality.

Empirical testing of modern finance theories initially provided what was considered strong support for the theories. See Roy (1952), Hicks (1962), Sharpe (1964), Friedman (1953), Cootner (1962), Fama (1965), Keim (1988), Constantinides (1990), among others. But as early as the 1970s, research which seemed to contradict and challenge not only some of the predictions of the hypotheses, but the basic assumptions on which they were based on, started to emerge. The capital market seemed to be not as efficient as traditionalists thought, and the process of arbitrage seemed to have many limiting factors. New variables and models that seemed to explain the securities return generating process better than the CAPM started to surface, and the lack of arbitrage opportunities was questioned. See Ross (1976), Roll (1977), Fama (1992), Cochrane (1997), Jegadeesh and Titman (1993), and Shiller (1981) among others. Empirical research started providing results that questioned some of finance's long-standing and basic theories like EMH, CAPM among others.

Some of the so-called anomalies, puzzles or challenges include:

- Calendar effects. Donald Keim (1983) and Marc Reinganum (1981) found that small capitalization stocks tend to do better in January than the large capitalization stocks.
- Size effects. Rolf Banz (1981) and Reinganum (1981) found that small companies generate higher returns than what is consistent with the CAPM.
- Value effects. Sanjoy Basu (1977) found that companies with low price-earnings generated higher-than-expected returns relative to the CAPM. Eugene Fama and

Kenneth French (1992) extended the thinking, arguing that size and value effects are risk factors the CAPM does not capture.

- Momentum effects. Werner DeBondt and Richard Thaler (1985) found that stocks whose returns in recent months placed them in the top decile of prior return performance tend to outperform other stocks in subsequent months and vice versa.
- Closed-end fund puzzle. As early as 1973, Rosenfeldt and Tuttle, and then Lee, Shleifer, and Thaler (1991) found that closed-end funds shares typically sell at prices that are found not to be equal to the per share market value of the assets the funds hold.

Traditional finance has not been able to provide conclusive explanations for the existence and persistence of many of these anomalies or puzzles. Empirical studies have basically culminated in mixed or inconclusive results. As a consequence, researchers began paying attention to behavioral finance, in part, in response to the difficulties faced by the traditional finance paradigm in explaining what seemed to be deviations from what its main theories should predict.

Behavioral finance, which began introducing psychology into finance research and decision making as early as the 1950's, is the study of how psychological factors of individual behavior, sentiment among others, affects market pricing. It represents a new paradigm in financial economics and is often considered by some as a possible substitute of the traditional paradigm.

Behavioral finance incorporates tools from psychology, sociology, and anthropology, which are social sciences that have relied extensively in the use of experimental or laboratory methodologies. Its building blocks are mainly cognitive psychology and the concept of arbitrage. Cognitive psychology deals with how people think and behave. Arbitrage, which is

the simultaneous purchase and sale of a security in different markets for advantageously prices, is examined in terms of the limits imposed by costs and other market frictions that might render arbitrage ineffective in driving prices to equilibrium in some situations.

Behavioral finance posits that markets are not always efficient, i.e., prices deviate from fundamental values, that investors not always make rational decisions, i.e., , they can be biased non-Bayesian forecasters and behave as loss-averse expected regret minimizers, and that risk is not priced in accordance to the capital asset pricing model, in obvious contrast with what traditional finance posits.

Besides the obvious contrast in the model of investor behavior (rational versus irrational) assumed by both paradigms, other important differences between traditional and behavioral finance paradigms have been singled out. For traditional finance, fundamental prices reflect utilitarian characteristics such as risk, but not psychological or value expressive characteristics such as sentiment, which behavioralists contend is essential in a good asset pricing model. For traditionalists, in a market in equilibrium, prices are right and investors, on average, cannot systematically beat the market. For behavioralists, the fact that the market cannot be beaten systematically does not imply that the prices are right or reflect market equilibrium.

Research in behavioral finance has taken different objectives and paths. Some researchers look into behavioral finance as a substitute of the traditional paradigm and focus their research in terms of competing theories where one has to win at the expense of the other (Statman, 1999). Others believe behavioral finance ought to complement traditional finance, hence promoting a coexistence of both theories, and the recognition of the importance of human behavior in financial markets. The long standing debate between traditional finance and behavioral finance continues to exist.

The main objective of this research is to analyze the long-standing debate between traditional finance and behavioral finance by examining the return generating process of closed-end funds. A closed-end fund (CEF) is an investment company that holds or bundles other publicly traded securities. They operate in a way similar to any business corporation, but their corporate business consists largely of investing funds in the securities of other corporations and managing these investment holdings for income and profit. It has been observed over the years, that CEF shares typically sell at prices that are found not to be equal to the per share market value of the assets the funds hold. This observation is considered a puzzle or anomaly because it seems to challenge the traditional finance paradigm in the sense that two assets, which appear to offer a claim to the same risk-return distribution, the fund's underlying assets and the fund's shares, are trading at different prices at the same time, which appears to contradict the no-arbitrage implication of an efficient market. Also, the fact that the act of bundling the assets (creation of the fund itself) could add or subtract value (selling at discounts or premiums), goes against Modigliani and Miller's (MM) proposition of value additivity, which states that the value of the whole (group or bundle of assets) should equal the sum of the values of its parts, under perfect market conditions (Dimson, Minio-Koserski 1999).

This research will examine the return-generating process of closed-end funds from the perspective of both traditional finance and behavioral finance. It will use multifactor tests of weak form efficiency. The multifactor models will be developed following Fama and French (1992) and Carhart (1997) and will also include a combined model that will test separately two investor sentiment proxies. The first one is the Consumer Confidence Index from the University of Michigan, which measures investor sentiment toward the economy and the other one is the volatility index VIX which is used as a proxy for investor risk aversion.

This research will analyze market efficiency taking into consideration both traditional and behavioral finance. This research will also expand the work of Fama and French (1992) on multifactor models and the cross-section of stock and bond returns, and Carhart's (1997) multifactor explanations of mutual funds returns, by testing closed-end funds, which were not examined in Fama and French, and Carhart's samples, thus providing out of sample evidence of multifactor testing. It will also contribute to the traditional finance literature specifically the efficient market hypothesis, to the behavioral finance literature, to the current debate between both paradigms, and the to the closed-end fund literature by examining the CEF returns.

REVIEW OF LITERATURE

An investment company is a firm organized for the purpose of holding or bundling publicly traded securities. They operate in a way similar to any business corporation, but their corporate business consists largely of investing funds in the securities of other corporations and managing these investment holdings for income and profit. They may be classified as open-end or closed-end. An open-end mutual fund issues and redeems shares directly with investors at net asset value (NAV). A closed-end fund (CEF) is usually listed on a national exchange, where its shares are purchased and sold in transactions with other investors, not with the fund itself. This means that CEF capitalization is fixed, or closed, and the market value of the shares of a fund is a function of market supply and demand. Therefore, an important characteristic that makes closed-end funds unique is that they provide contemporaneous and observable market-based prices and rates of return for the fund's stocks, which can then be compared with the underlying asset portfolios.

The number of shares issued by a closed-end fund is fixed and only changes at the discretion of management. They can be increased by issuing shares in conjunction with rights offerings or

through dividend and capital gain reinvestments of certain dividend payments. Stock repurchase programs like tender offers can decrease the number of shares (CEFA 2010).

Closed-end funds specialize in either stocks or fixed income securities, and represent that they follow consistently the stated objective, such as current income or capital appreciation. Funds can also be highly specialized, investing in a specific type of security or in a particular region or country like the closed-end country funds. They can also issue major securities such as preferred stock or debentures, and borrow money to leverage their investment positions (CEFA 2010). As of December, 2010, the Closed-end Fund Association had 625 funds registered.

Most of the research in CEF centers on the discounts, basically because they are a main component of the closed-end fund puzzle. Not much has been done so far to study the return generating process of CEF and the few studies that have been carried out are mainly on country closed-end funds.

The behavior of country funds traded on the New York and American and Stock Exchanges is examined by Hardouvelis, et al. (1993). They study the discounts and return generating process of closed-end country funds. Stating that deep discounts are indicative of positive risk-adjusted returns, they examined the predictive power of discounts for country fund returns. They find a strong relationship between discounts and returns. Increases in fund's discounts were associated with increases in fund's returns. They also find no evidence in favor of market frictions caused by informational factors, or by non-synchronous data. They conclude that the strong predictability of fund's returns supported the hypothesis that sentiment is a component of the price of the fund.

Lin, Raman, and Yung (2008) study real estate closed-end funds. They confirm the significance of investor sentiment on REIT returns. When investors are optimistic (pessimistic),

REIT returns become higher (lower). Their results are robust when conventional control variables are considered.

Fujiwara (2006) finds evidence of investor sentiment in Japanese CEF. He finds a correlation between the changes in the discount rates and the small capital stock index. Halkos and Krintas (2006) using factor analysis find that discounts/premiums are related to a sentiment factor in Greek closed-end funds.

Richard, et al. (2000) examine whether premiums/discounts in closed-end country funds, contain information about future fund NAV returns. First, they test whether the discount forecasts the fund's future NAV performance, controlling for the return on the foreign market and exchange rate risk. They also test whether the CECF discount forecasts the future return on the market index of the foreign country. They posit that if U.S. investor opinion or sentiment, as manifested in the CECF share price, contains useful information about the foreign market not yet fully reflected in NAV, an above-average premium should be associated with above-average future foreign market returns. They conclude that country closed-end fund premiums and discounts contain valuable information about future NAV performance after controlling for foreign market return and exchange rate fluctuations. They also found that premium/ discounts also forecasted the return on the underlying foreign market.

Anderson, et al. (2001) address the return generating process of closed-end country funds using a multifactor model. In order to eliminate any bias generated by model instability during the early life of each fund, they use a sample of nineteen seasoned single-country funds, and collected weekly data for a period from 1992 to 1996. Among the factors included in the regression model were dummy variables for year and fund effect, the fund's discount, return from the fluctuation of target market's exchange rate, return from US S&P 500, the return from

the market portfolio proxy of fund's country, and the return from the fund's target country market portfolio proxy. Their study shows that returns of country funds traded in the US are more affected by market returns in their target markets than by returns of US market. Other variable strongly related to country fund's return changes in discounts, exchange rates, and other countries' markets.

Bers and Madura (2000) study whether past performance of CEF could predict future performance i.e. performance persistence. Persistence is investigated for three holding periods and for two types of performance measures: (1) the market price return, which is the performance of the fund as perceived by the market, and (2) the net asset value return, which measures the actual performance of the underlying assets and is therefore a proxy for management skill. They use excess market and NAV returns as dependent variables and S&P500, and Lehman Brothers corporate and government index, S&P/BARRA, and Wilshire 4500 as independent variables. They find evidence that net asset values performance persistence and market price performance persistence for each type of closed-end, bond and equity funds fund over 12-, 24-, and 36-month holding periods exists. The results differ only slightly between fund groups and over different holding periods. They argue that net asset values performance persistence of closed-end funds could indicate that the fundamentally different management style of closed-end funds, as opposed to open-end mutual funds, can give closed-end fund managers an advantage in persistently performing well over time. They also argue that results for market price performance persistence of closed-end funds were consistent with the "snowballing hypothesis." Price pressure in the market could cause a higher demand for funds that have performed well in the past. This upward demand pressure in turn causes prices to increase in the next period resulting in the "snowballing effect" and therefore persistence. Market price

performance persistence over a shorter period of time (12 and 24 months), however, disappears when only time periods are studied during which the current manager has been responsible for managing a fund. This effect could indicate that investors are less likely to base their investment decisions on past performance of closed-end funds that experienced a change in portfolio managers.

Fama and French (1993) identify variables that, although not having any special standing in asset-pricing theory, show reliable power to explain the cross-section of average returns. The variables are size risk factor (SMB) or small minus big which is computed by subtracting the average return of large capitalization stocks from the average returns of small capitalization stocks, book to market equity (HML) or high minus low computed by subtracting the average return of low book to market (B/M) stocks from the average return of high B/M stock, and used as a proxy for value risk, and the market return minus the risk free rate as a proxy for market risk. They also include a proxy for the unexpected change in interest rates (Term) which was the difference between the monthly long term bond return and the one month Treasury bill measured at the end of the previous month, and a proxy for the likelihood of default as the difference between the return on a market portfolio of long-term corporate bonds and the long-term government bond return. The monthly returns on stocks and bonds is regressed on the returns to a market portfolio of stocks and mimicking portfolios for size, book-to-market equity (BE/ME), and term-structure risk factors in returns. For stocks, market, size and value proxies capture strong common variation in returns. For the bonds, term and default captured strong common variation in returns. The term-structure factors seem to capture strong variation in stock returns and the stock market factors seem to capture variation in the bond returns. When all the risk

factors were included for both stocks and bonds, the stochastic link between both seemed to come from the term-structure factors.

Carhart (1997) studies the persistence in open-end mutual fund performance. He argues that persistence does not reflect superior stock-picking skill, but rather that common factors in stock returns and persistent differences in mutual fund expenses and transaction costs explained almost all of the predictability in mutual fund returns. He demonstrates that expenses have at least a one-for-one negative impact on fund performance and that turnover also negatively impacts performance. In his study, he controls for survivorship bias and documented common-factor and cost-based explanations for mutual fund persistence. Carhart constructs a 4-factor model using Fama and French's (1993) 3-factor model which includes SMB, HML, and market return minus risk free rate, but also introduces a factor to capture Jegadeesh and Titman's (1993) one-year momentum anomaly. The 4-factor model was consistent with a model of market equilibrium with four risk factors. He finds that in contrast to the CAPM, the 4-factor model could explain most of persistence in equity mutual funds mean and risk-adjusted returns. The momentum factor and SMB seemed to account for most of the explanation.

DATA AND EMPIRICAL METHODS

The sample consists of all equity and taxable bond closed-end funds with available monthly data on the Center for Research in Security Prices U.S. Stock Databases (CRSP) for the 2005-2010 period. The factors (SMB, HML, UMD, market return, risk free rate, VIX index) are also taken from CRSP. The term and default factors are from the Federal Reserve Statistical Release and the Consumer Confidence Index is provided by the University of Michigan.

The models proposed in this research to examine the return generating process of CEF take into consideration the research of Fama and French (1993) on the returns of equity and bond portfolios and of Carhart (1997) on the returns of open-ended mutual funds. Both of them study the returns of different assets by using the Fama and French proxies for market risk, size risk (SMB) and value risk (HML) and adding a momentum factor (UMD). Fama and French also incorporate a default (Deflt) risk factor and an interest change risk factor (Term) to test their effect on both equity and bond portfolios. This research will incorporate investor sentiment into the multifactor models. The volatility index VIX developed by the Chicago Board Options Exchange (CBOE) and the consumer confidence index developed by the University of Michigan are used as proxies for investor sentiment. The VIX measures market expectations of near-term volatility conveyed by the S&P500 stock index option prices. The consumer confidence index measures confidence using a sample and questionnaire.

The following multifactor models will be used to study the return generating process of closed-end funds:

Model 1 Carhart Four Factor

$$\mathrm{Ret}\_rf_{it} = \alpha_0 + \beta_1 Rm\_rf_{it} + \beta_2 SMB_{it} + \beta_3 HML_{it} + \beta_4 UMD_{it}$$

Model 2 Fama and French Five Factor

$$\mathrm{Ret}\_rf_{it} = \alpha_0 + \beta_1 Rm\_rf_{it} + \beta_2 SMB_{it} + \beta_3 HML_{it} + \beta_4 Term_{it} + \beta_5 Deflt_{it} + \varepsilon_{it}$$

Model 3 Combined Fama and French, Carhart with sentiment index

$$\mathrm{Ret}\_rf_{it} = \alpha_0 + \beta_1 Rm\_rf_{it} + \beta_2 SMB_{it} + \beta_3 HML_{it} + \beta_4 UMD_{it} + \beta_5 SENT_{it} + \beta_6 Term_{it}$$

$$+ \beta_7 Deflt_{it} + \varepsilon_{it}$$

Where:

Ret_rf = CEF market return minus risk free rate

Rm_rf = market return minus risk free rate

SMB = average return smallcap minus average return large cap

HML= average return low B/M minus average return low B/M

UMD = average return high prior return portfolios minus average return down prior return portfolios

SENT = monthly sentiment index (VIX, Consumer Confidence Index)

Term = 10yr yield Treasury security - 1 yr yield Treasury security

Deflt = YTM Baa long term bonds minus YTM Aaa long term bonds

The multifactor analyses are performed for equity closed-end funds, taxable bond closed-end funds and a sample consisting of all funds. All regression results are obtained using the generalized method of moments (GMM) with Newey-West corrections for contemporaneous correlation as well as heteroskedasticity.

RESULTS

Table 1 shows the descriptive statistics for the excess returns for equity, bonds and all funds. Equity funds have the highest excess returns and the highest standard deviation of the three samples. It is also the smallest of the samples.

Table 1. Funds Descriptive Statistics for Excess Returns

	Equity	Bonds	All funds
Mean	.004246	.004146	.004173
Median	.009255	.005607	.006927
Max	.776119	.503051	.776019
Min	-.570880	-.404824	-.580780
Std. Dev	.079141	.060114	.069151
Sample	86	109	195
Observations	6192	7848	14040

Tables 2-4 show the regression results for all the samples, equity, taxable and all funds. For equity funds, all the regressions models have a positive and significant relationship with the excess return on the market portfolio. The HML factor shows consistently a negative relationship with the excess returns. Although it is sometimes a significant relationship, it does not have the expected sign. Smb is significant in the 3 and 7 factor model, but not significant for the others. The momentum factor (UMD) is significant in all models but does not have the expected positive sign. The sentiment factors are both highly significant but it can be observed that the coefficients are small. The adjusted r-squared is near .5 for all models, but the 7-factor model which includes the VIX index as the sentiment proxy has the highest. The default and term proxies also vary in terms of sign and significance.

Table 2. Regression Results for Equity Funds

Regressor	4-Factor Adj. r^2=0.4227	5-Factor Adj. r^2=0.4116	7-Factor Adj. r^2=0.4503	7-Factor Adj. r^2=0.4317
Alpha	.001166	-.009423	0.021386	-.083251
P-value ( )	(.4358)	(.0350)	(0.0002)	(0.0000)
Rm_Rf	.926503	1.013554	0.684310	0.911325
P-value ( )	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Smb	.148120	.092346	0.021593	0.147654
P-value ( )	(0.0279)	(0.1786)	(0.7359)	(0.0277)
Hml	-.228820	-.054030	-.333026	-.246731
P-value ( )	(0.0000)	(0.5823)	(0.0002)	(0.0098)
Umd	-.212735		-0.244865	-0.206850
P-value ( )	(0.0000)		(0.0000)	(0.0000)
Default		.008463	0.035483	0.005758
P-value ( )		(.0734)	(0.0000)	(0.3474)
Term		-.000003	.011559	.005392
P-value ( )		(.9681)	(0.0000)	(0.0000)
VIX			-.003654	
P-value ( )			(0.0000)	
Sent				.000905
P-value( )				(0.0000)

For the bond funds the HML, UMD and Rm_Rf, VIX and Sent factors behave basically the same way as for the equity sample. There is some change in the default and term. In the 7-factor model with VIX, both Term and Default have the expected sign and are highly significant. With the other models, results vary in sign and significance.

Table 3. Regression results for Bond Funds

Regressor	4-Factor Adj. r^2= .3163	5-Factor Adj. r^2=0.2796	7-Factor Adj. r^2=0.3708	7-Factor Adj. r^2=0.3341
Alpha	0.002576	-.017951	0.018091	-.101142
P-value ( )	(.0481)	(.0000)	(0.0001)	(0.0000)
Rm_Rf	.530300	.658144	0.281297	0.527366
P-value ( )	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Smb	.050789	-.064194	-.128835	0.007641
P-value ( )	(0.3698)	(0.2581)	(0.175)	(0.8921)
Hml	-.403845	-.145327	-.488713	-.394422
P-value ( )	(0.0000)	(0.1146)	(0.0000)	(0.0000)
Umd	-.298814		-0.311894	-0.269119
P-value ( )	(0.0000)		(0.0000)	(0.0000)
Default		.013593	0.046517	0.008893
P-value ( )		.0008	(0.0000)	(0.0768)
Term		.002574	.015427	.009002
P-value ( )		.0044	(0.0000)	(0.0000)
VIX			-.003966	
P-value ( )			(0.0000)	
Sent				.001042
P-value( )				(0.0000)

The results obtained are very similar for the sample consisting of all the funds, equity and bond. It is important to note that both proxies for sentiment, the VIX and consumer confidence index were highly significant and with the expected sign for all samples and models as well as the market risk premium Rm_Rf.

Table 4. Regression Results for All Funds

Regressor	4-Factor Adj. r^2= .3561	5-Factor Adj. r^2=0.3313	7-Factor Adj. r^2=0.3919	7-Factor Adj. r^2=0.3656
Alpha	0.001954	-.014190	0.019544	-.093252
P-value ( )	(.0647)	(.0000)	(0.0000)	(0.0000)
Rm_Rf	.705036	.814889	0.459036	0.696702
P-value ( )	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Smb	.093713	.004844	-1.424032	0.069390
P-value ( )	(0.0429)	(0.9174)	(0.1545)	(0.1307)
Hml	-.326655	-.105062	-.420051	-.329286
P-value ( )	(0.0000)	(0.1542)	(0.0000)	(0.0000)
Umd	-.260851		-0.282332	-0.241057
P-value ( )	(0.0000)		(0.0000)	(0.0000)
Default		.011331	0.038325	0.007510
P-value ( )		(.0006)	(0.0000)	(0.0722)
Term		.001421	.013721	.007410
P-value ( )		(.0441)	(0.0000)	(0.0000)
VIX			-.003828	
P-value ( )			(0.0000)	
Sent				.000982
P-value( )				(0.0000)

CONCLUSIONS

This paper examines the return-generating process of equity and taxable closed-end funds and market efficiency taking into consideration both traditional and behavioral finance. Expanding on the work by Fama and French (1992) on multifactor models and the cross-section of stock and bond returns, and Carhart's (1997) multifactor explanations of mutual funds returns, it tested closed-end funds, which were not examined in Fama and French, and Carhart's samples, thus providing out of sample evidence of multifactor testing. The models used in this research to examine the return generating process of CEF take into consideration the research of Fama and French (1993) on the returns of equity and bond portfolios and of Carhart (1997) on the returns of open-ended mutual funds. Both of them study the returns of different assets by using the Fama and French proxies for market risk, size risk (SMB) and value risk (HML) and adding a momentum factor (UMD). Fama and French also incorporate a default (Deflt) risk factor and an interest change risk factor (Term) to test their effect on both equity and bond portfolios. This research incorporates investor sentiment into the multifactor models. The volatility index VIX developed by the Chicago Board Options Exchange (CBOE) and the consumer confidence index developed by the University of Michigan are used as proxies for investor sentiment.

Our results seem to provide evidence that investor sentiment measured using two different proxies, only which measures options volatility and other which polls consumers about their confidence in the economy, enters the return generating process of all samples in the study and for all models. The risk premium for broad market portfolio also enters the return generating process consistently.

REFERENCES

Anderson, S. C., Coleman, B. J., Frohlich, C. J., & Steagall, J. W. (2001, Fall). A multifactor analysis of country funds returns. *The Journal of Financial Research, 24* (3), 331-346.

Banz, R. (1981). The relation between return and market value of common stocks. *Journal of Financial Economics*, 9, 3-18.

Basu, S. (1977). The investment performance of common stocks in relation to their price-earnings ratio: A test of the efficient markets hypothesis. *Journal of Finance*, 32, 663-682.

Bers, M., & Madura, J. (2000). The performance persistence of closed-end funds. *The Financial Review*, 35 (3), 33-52.

Carhart, M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52 (1), 57-82.

Closed End Fund Association. (2010). Understanding the advantages of closed end funds. Retrieved from http://www.closed-endfunds.com

Constantinides, G. (1990). Habit formation: A resolution of the equity premium puzzle. *Journal of Political Economy,* 98, 519-543.

Cootner, P. (1962). Random changes vs. systematic changes. *Industrial Management Review*, 3, 24-45.

DeBondt, W. % Thaler, R.(1985). Does the Stock Market Overreact?. *Journal of Finance*. 40 (3), 793–805.

Dimson, E. & Minio-Kozerski, C. (1999). Closed-end funds: A survey. *Financial Markets Institutions and Instruments*, 8 (2), 1-40.

Fama, E. (1965, September/October). Random walks in stock market price. *Financial Analysts Journal*, 55-59.

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*. 25 (2), 383–417.

Fama, E., & French, F. (1992). The cross-section of expected stock returns. *Journal of Finance*, 47, 427-465.

Fama, E., & French, F. (1993). Common risk factors in the returns on stock and bonds. *Journal of Financial Economics*, 33, 3-56.

Friedman, M. (1953). Essays in positive economics. The University of Chicago Press, 3-43.

Fujiwara, K. (2006). Does the Japanese closed-end fund puzzle exist? An empirical study of the efficiency of the financial market in Japan. International Journal of Business, 11(1), 35-47.

Halkos, J., & Krintas, T. (2006). Behavioral and fundamental explanations of discounts on closed end funds: an empirical analysis. Applied Financial Economics, 16, 395-404.

Hardouvelis, G., La Porta, R., & Wizman, T. (1993, December). What moves the discount on country equity funds?. NBER Working Paper Series. Retrieved from http://www.nber.org

Hicks, J. R. (1962). Liquidity. *Economic Journal*, 72, 787-802.

Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for market efficiency. *Journal of Finance*, 48, 65-91..

Keim, D. B. (1983, June). Size-related anomalies and stock return seasonality: Further empirical evidence. *Journal of Financial Economics*, 12, 13-32.

Lee, C., Shleifer, A., & Thaler, R. (1991). Investor Sentiment and Closed End Fund Puzzle. *Journal of Finance*, 46, 75-110.

Lin, C.Y., Rhaman, H., & Yung, K.(2008). Investor sentiment and REIT returns. Journal of Real Estate Finance and Economics, 1-22.

Reinganum, M. R. (1981). Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values. *Journal of Financial Economics*, 9, 19-46.

Richard, J., & Wiggins, J. (2000, August). The information content of closed-end country fund discounts. *Financial Services Review*, 9, 171-181.

Roenfeldt, R., & Tuttle, D. (1973). An Examination of the discounts and premiums of closed-end investment companies. *Journal of Business Research* 1, 129–140.

Roll, R. (1977). A critique of the asset pricing theory test's; Part I; On past and potential testability of the theory. *Journal of Financial Economics*, 4, 129-176.

Ross, S. A., (1976, December). The arbitrage theory of capital asset pricing. *Journal of Economic Theory*, 341-360.

Roy, A. (1952). Safety first and the holding of assets. *Econometrica*, 20 (3), 431-499.

Sharpe, W. (1964). Capital asset price: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19 (3), 425-442.

Shiller, R. J. (1981, June). Do stock prices move too much to be justify by subsequent changes in dividends?. *American Economic Journal*, 71, 412-436 .

Statman, Meir. (1999, November/December). Behavioral finance: Past battles and future engagements. *Financial Analysts Journal*, 18-27.