Investor Behavior during the Financial Crisis: An Examination of Mutual Fund Cash Flows

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This paper examines aggregate mutual fund cash flows to determine whether investors move money in and out of 6 mutual fund investment objectives differently over bull and bear market cycles. This question is examined by analyzing periods before and during the bear market of 2008. Information on how investors shift assets given market cycles provide valuable information to asset managers and adds to the literature on investor psychology and market cycles. Results indicate that new money or those investors purchasing into a mutual fund family may be more rational than those redeeming or selling out of a mutual fund family.

INTRODUCTION

The financial crisis of 2008 offers a ripe environment to examine investor behavior over a bull and bear market cycle. While prior literature have examined issues pertaining to investor reactions to various market events over market cycles, little has been done to examine how aggregate investor cash flows change during a bear market cycle relative to a preceding bull market cycle. Further, to my knowledge no work has examined this topic given the market cycle and financial crisis of 2008.

Hwang and Salmon (2004) analyze investor behavior by devising a means of detecting and measuring herding behavior in the US and South Korean stock markets. Their approach enables them to evaluate whether investors tend to herd towards specific market sectors, including the market index. They find evidence of herding in both bull and bear markets and also find that major financial crises in the Asian markets (such as the Russian Crisis) reduce investor herding. Kim and Nofsinger (2007) examine Japanese retail investors and compare their investment behavior over a bull and bear market in an attempt to determine whether these investors' preferences towards equity risk and market valuations differ over market cycles. They also assess the performance of these investors' choices. They conclude that Japanese investors behave differently over bull and bear markets and that their overall decision making is associated with poor investment performance outcomes. Siganos and Chelley-Steeley (2006) look at the profitability of a momentum strategy following bull and bear markets. They suggest that investors following a 'continuation strategy' can earn significant momentum profits. Daniel, Hirshleifer and Subrahmanyam (1998) propose a theory which characterizes the stock markets under and overreaction to investor overconfidence and investor self-attribution bias. These investor psychological biases were found to relate to both short and long lag autocorrelations, excess volatility and short term earnings drift.

Warther (1995) and Fant (1999) both examine the relationship between aggregate mutual fund flows and security returns. Warther (1995) decomposes aggregate mutual fund flows into expected and unexpected components and concludes that security returns and concurrent unexpected cash flows are

highly correlated (not expected cash flows). He also finds evidence that the fund flow /return relationship only exists between the returns of the assets held by the fund. This would seem to imply that we should not expect to find this fund flow/return relationship for asset returns corresponding to uncorrelated sectors. Fant (1999) examines stock market returns and aggregated equity mutual fund cash flows. In a test of linear feedback, he shows that the return/flow relationship exists between those investors that exchange money in and out of mutual funds of the same fund family. He finds that this relationship does not exist between new sales and redemptions which represent new cash flows coming into the fund family and cash leaving the mutual fund family, respectively.

The preceding two papers most closely resemble the analysis presented here but with significant differences. This paper examines monthly aggregate mutual fund cash flow data during the January 2004 – June 2007 bull market cycle to determine to what extent investor cash management decisions changed relative to the significant volatility and market downturn associated with the financial crisis of 2008. The bear market cycle characterized by uncertainty and high levels of volatility in this analysis cover July 2007 – August 2010. Specifically, this paper examines aggregate fund flow movements in 6 common mutual fund investment objectives: aggressive growth, balanced, emerging market, equity income, growth and international equity to determine-

1) Whether mutual fund cash flows move in and out of these various mutual fund investment objectives/sectors differently over bullish and bearish markets
2) Whether aggregate fund flows are significantly related to security returns, and
3) Whether investor behavior given the market cycle has any implication for portfolio returns.

Further insight on how investors shift their assets given market cycles provides valuable information to mutual fund and other asset managers and adds to the literature on market timing and investor behavior.

Year-end 2010 totals as reported by the Investment Company Institute (ICI) show that worldwide mutual fund assets totaled $24.7 trillion. The US represented almost half of total world assets with approximately $11.8 trillion, or 48%. Mutual fund companies make money by charging a fee which is a function of total assets under management. Accordingly, it is plausible that the cash flow movements of significant interest from their point of view are those that are either new to the firm/fund company (new sales) or those cash flows that are leaving the fund family altogether (redemptions). For this reason this analysis focuses on the cash flows associated with new sales and redemptions as opposed to exchanges in or exchanges out which simply represent cash moving from one fund in the same fund family into another fund within that family.

DATA

This paper examines whether the behavior of mutual fund investors differ given the bull/bear market cycle surrounding the 2008 financial crisis. In order to examine this and related questions, monthly data on mutual fund cash flows are obtained from the Investment Company Institute (ICI) over our sample period. Observations include monthly 'redemptions' which represent cash outflows as investors sell out of the investment class and mutual fund family, and 'new sales' which represent cash inflows or newly invested dollars to the asset class and mutual fund family. Total net assets (TNA) are also provided by the ICI. The data are collected for the following 6 asset classes/investment objectives: aggressive growth, balanced, emerging markets, equity income, growth and international equity. Benchmark returns for each market sector are provided by Lipper Indices. These monthly benchmark returns are used in the return analysis to be discussed in a later section. Monthly returns for the S&P 500 are collected from Bloomberg. Table 1, Panels A and B, provide summary statistics for the sample over the bull market and bear market periods, and the correlations between the market return (S&P 500) and each market sectors return, respectively. Contrary to what might be expected, the average total net assets for 4 of the 6 asset class/investment objectives *increased* as we move from the bull market into the sample period corresponding to the bear market. Only aggressive growth experienced a significant drop in TNA while balanced funds realized a fairly insignificant drop in TNA. It is also noted that aggressive growth and

growth funds represent the majority of the total net assets. Finally, Panel A of Table 1 indicates that the average return of each benchmark is higher than that of the market (SP 500) in 10 of the 12 cases. This was the case for all 6 investment classes during the bear market and was the case 4 out of 6 times during the bull market.

Panel B of Table 1 indicates that the correlations between the market returns and each benchmarks return is low over our sample period however, the correlations increase significantly as we move from the bull market to the bear market. Correlations increase in all 6 cases. This finding is consistent with the literature. Campbell, Koedijk and Kofman (2002) utilize data on international equity markets and find that there is a significant increase in these returns during bear markets. Meric, Ratner and Meric (2008) examine the global markets and determine that investors fair significantly better by diversifying in the global market over a diversification strategy that focuses on the domestic market. This was even the case when diversifying in the same sector across different countries over diversifying across sectors in a domestic market. This gain does not hold in a bear market given. They find that the sectors across different countries are more highly correlated which limits this diversification benefit.

ANALYSIS

Regression analysis is used to determine the relationship between fund flows and the concurrent return on the market (SP 500) as well as the concurrent return on the appropriate benchmark.

$$\text{Fund Flows}_{I,t} = \alpha_{I,t} + \text{Indexret}_{I,t} + \text{SPret}_{I,t} + e_{I,t} \tag{1}$$

where fund flows represent the dollar flows at time t into mutual fund i with one of the 6 stated investment objectives. Indexret and SPret represent the concurrent return on the appropriate mutual fund sector benchmark and the return on the SP 500, respectively. This regression is estimated for new sales and redemptions over both the bull and bear market cycles. Table 2 provides the results from equation 1. Focusing on the new sales results we see that new cash flows aren't significantly related to the benchmark or market concurrent return. However, the results over the bear market indicate that new sale flows are significantly related to the appropriate benchmark return in 4 of the 6 cases (aggressive growth, growth, income equity and international equity). The relationship is negative indicating that when the benchmark return is up for the month investors were not purchasing into the fund as much, but when the benchmark return was down more investors were buying into the fund. This finding seems be run counter to the literature on momentum in mutual fund flows (see Frazzini and Lamont (2008)). Findings along these lines imply that investors tend to buy when asset prices are high and sell when assets prices are falling.

The findings for redemptions are similar to the findings for new sales given a bull market. However, the results differ over the bear market. Specifically, in all 6 cases redemptions (fund flows leaving the mutual fund family) show a negative relationship with concurrent *market* returns as opposed to the return on the appropriate benchmark. We interpret this to mean that when the return on the market is down there are higher levels of redemptions. If we agree that a rational investor holding a sector portfolio should monitor and make investment decisions given that *sectors* level of return we would expect the significant relationship to be between the *benchmark* and fund flows.

One potential implication of these findings could be that cash inflows, or new money, may make more informed investment decisions relative to those currently invested in a sector. It is possible that those redeeming, or selling out of the mutual fund family altogether, may make investment decisions based on news and the state of the overall market over making decisions based on the actual performance of the individual sector. This could prove detrimental to the redeeming investor and their portfolio returns as we have shown that in almost all cases, the benchmark return over both the bull and bear market cycles were *higher* than that of the market.

CONCLUSIONS

By examining aggregate mutual fund cash flows this analysis attempts to determine whether the cash flows of new investment dollars, or those investors purchasing into a new mutual fund, differ from the investment behavior of redeeming investors, or those that are selling out of a mutual fund sector and fund family. This question is asked relative to a period that corresponds to a bull and bear market cycle. When examining the fund flows resulting from new sales and redemptions, no significant relationship is found between flows and the returns on either the market index or the appropriate benchmark. When in a bear market, new sales are significantly related to the appropriate benchmark return in 4 of the 6 cases and the relationship is negative indicating that when the benchmark return is up for the month investors were not purchasing into the fund as much, but when the benchmark return was down more investors were buying into the fund. The results for redeeming investor flows differ and indicate that those investors may make decisions based off of movements in the overall market as opposed to return movements in their appropriate benchmark. One implication is that new money to mutual funds (new sales) may make more rational investment choices.

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Table 1 Panel A & B

Summary statistics for the monthly dollar cash flows (in millions) are reported for each of the 6 mutual fund asset classifications. The statistics for total net assets (TNA) and the return on the market as proxied by the S&P 500 and the Lipper benchmark return for each asset class are reported as well.

PANEL A			Bear Market		
Variable	Obs	Mean	Std Dev	Min	Max
Aggressive Growth					
New Sales	42	15030	2759.7	10170.5	20333.3
Redemptions	42	15975.11	2778.76	11740.8	22380.1
TNA	42	720119.86	68908.28	601562.6	851410
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0086667	0.0253962	-0.05	0.0554
Balanced					
New Sales	42	4830.08	981.20532	3498.3	7511.7
Redemptions	42	4309.35	1122.2	2858.9	7434.7
TNA	42	293490.95	33094.08	237325	357064
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0065571	0.014407	-0.021	0.0288
Emerging Market					
New Sales	42	2053.39	959.90343	579.7	3959.7
Redemptions	42	1225.11	702.68967	476.6	3533.7
TNA	42	63233.75	30733.85	27264.6	127834.3
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0240119	0.0467643	-0.1099	0.1151
Growth					
New Sales	42	27460.51	5429.99	18558.2	41265.5
Redemptions	42	23645.97	5140.39	16586.5	38032.3
TNA	42	1386806.6	220262.44	1107671	1817682.9
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0071405	0.0244721	-0.0508	0.046
Income Equity					
New Sales	42	3769.71	972.32094	2306.9	6147.7
Redemptions	42	2436.22	770.027	1281.3	4166.7
TNA	42	208838	46485.23	145233.1	306709.1
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0089333	0.0202521	-0.0384	0.0447
International Equity					
New Sales	42	13625.53	5081.75	6508.9	25549.3
Redemptions	42	8912.69	3594.02	4616	17694.3
TNA	42	502885.84	178317.27	283098.8	860723.5
SP 500 Ret	42	0.0074121	0.0205175	-0.03429	0.0432907
Benchmark Ret	42	0.0152357	0.0272766	-0.0457	0.066

PANEL B			Bull Market		
Variable	Obs	Mean	Std Dev	Min	Max
Aggressive Growth					
New Sales	38	15403.14	2553.88	11155.5	21824.4
Redemptions	38	17581.33	4244.3	10758.3	29376.9
TNA	38	596804.69	143010.15	356592.9	863224.4
SP 500 Ret	38	-0.007614	0.0599141	-0.1694245	0.0939251
Benchmark Ret	38	4.211E-05	0.0641739	-0.1754	0.1082
Balanced					
New Sales	38	5215.28	1114.78	3007.6	7506.7
Redemptions	38	5716.62	1331.14	3027.5	9111.4
TNA	38	291317.55	43475.91	208471.9	362854
SP 500 Ret	38	-0.007614	0.0599141	-0.1694245	0.0939251
Benchmark Ret	38	0.0005184	0.0427826	-0.1282	0.0689
Emerging Market					
New Sales	38	3846.07	962.61714	1857.4	5925.1
Redemptions	38	3018.13	1005.8	1280	5678.7
TNA	38	135021.18	32682.35	67312.3	174482.3
SP 500 Ret	38	-0.007614	0.0599141	-0.169424	0.0939251
Benchmark Ret	38	0.0046053	0.0962267	-0.2904	0.1812
Growth					
New Sales	38	31535.92	5547.88	20063.3	44112.9
Redemptions	38	31833.72	7217.13	21499.5	55343.7
TNA	38	1440490.5	268541.05	917131.7	1924316.8
SP 500 Ret	38	-0.007614	0.0599141	-0.169424	0.0939251
Benchmark Ret	38	-0.002355	0.0668754	-0.1898	0.1161
Income Equity					
New Sales	38	3427.96	886.33502	2320.8	5690.2
Redemptions	38	4053.33	959.71069	2696.6	6899.2
TNA	38	227470.9	49304.04	152507.6	314915.5
SP 500 Ret	38	-0.007614	0.0599141	-0.1694245	0.0939251
Benchmark Ret	38	-0.003134	0.0596865	-0.1632	0.0947
International Equity					
New Sales	38	16686.67	4093.19	9393.9	26667.4
Redemptions	38	15895.98	4901.39	8813.6	29132
TNA	38	680617.03	155182.96	385600.6	955119.6
SP 500 Ret	38	-0.007614	0.0599141	-0.1694245	0.0939251
Benchmark Ret	38	-0.002386	0.0755432	-0.2106	0.1355

TABLE 1 PANEL B

Correlations between the returns on the S&P 500 and the benchmark return for each market sector given the sample period corresponding to the bull market and the bear market

Market Sector	Bull	Bear
Aggressive Growth	0.04551	0.30946
Balanced	0.0795	0.27916
Emerging Market	0.01238	0.25604
Growth	0.02263	0.30276
Income Equity	0.04649	0.27143
International Equity	0.13102	0.25262

TABLE 2

Regression analysis of the relationship between the natural log of cash flows from mutual fund new sales and the return to the S&P 500 and market sector benchmark return. This regression is estimated for mutual fund redemptions as well.

$$\text{Fund Flows}_{I,t} = \alpha_{I,t} + \text{Indexret}_{I,t} + \text{SPret}_{I,t} + e_{I,t}$$

	New Sales		Redemptions	
	Bull Market	Bear Market	Bull Market	Bear Market
Aggressive Growth				
Intercept	9.61089	9.62676	9.67414	9.7378
	(0.0001)	(.0001)	(.0001)	(.0001)
Index Return	-1.36741	-0.75246***	-0.34657	-0.76429
	(0.2392)	(0.0826)	(0.7457)	(0.1777)
SP Return	0.29867	-0.33979	-0.88926	-1.3989**
	(0.834)	(0.4562)	(0.5024)	(0.0245)
Balanced				
Intercept	8.4858	8.543	8.34207	8.6123
	(0.0001)	(.0001)	(.0001)	(.0001)
Index Return	-2.9525	-0.76938	-1.88225	-0.30843
	(0.1749)	(0.385)	(0.4903)	(0.7331)
SP Return	-0.41269	0.78934	1.14479	-1.55881**
	(0.7847)	(0.2146)	(0.5499)	(0.0202)
Emerging Market				
Intercept	7.50203	8.22768	7.01216	7.9521
	(0.0001)	(.0001)	(0.0001)	(.0001)
Index Return	-0.59399	-0.49408	-0.67654	-1.25383**
	(0.7398)	(0.3097)	(0.7075)	(0.0153)
SP Return	2.48039	0.49775	-3.53758	-1.86212**
	(0.5436)	(0.5221)	(0.3911)	(0.0241)

Growth

Intercept	10.20838	10.33921	10.04938	10.33247
	(.0001)	*(.0001)*	*(0.0001)*	*(0.0001)*
Index Return	-0.94326	-0.94961**	-0.48772	-0.6545
	(0.4581)	*(0.034)*	*(0.724)*	*(0.1784)*
SP Return	0.04845	-0.30111	0.41987	-1.5216*
	(0.9744)	*(0.5347)*	*(0.7987)*	*(0.0071)*

Income Equity

Intercept	8.19525	8.09709	7.73667	8.26825
	(.0001)	*(.0001)*	*(0.0001)*	*(0.0001)*
Index Return	-0.21182	-1.50929**	0.61572	-0.68165
	(0.9142)	*(0.0272)*	*(0.803)*	*(0.2116)*
SP Return	1.43859	-0.88056	1.16541	-1.67776*
	(0.4602)	*(0.1857)*	*(0.6327)*	*(0.0034)*

International Equity

Intercept	9.44913	9.69117	9.02745	9.6164
	(.0001)	*(.0001)*	*(0.0001)*	*(0.0001)*
Index Return	-0.55245	-1.02128***	-0.63269	-1.081
	(0.8049)	*(0.0636)*	*(0.7808)*	*(0.072)*
SP Return	1.43207	-0.00787	0.55947	-1.65207**
	(0.6305)	*(0.9907)*	*(0.8531)*	*(0.0309)*