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Mutual fund flows: Where does the money go?

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H I G H L I G H T S:

1. Explains the simultaneous relation between mutual fund returns and investment.
2. Demonstrates the interrelationship between equity markets, fixed income and money market.
3. Highlights the impact of lagged returns.
4. Shows how the new investment drives investment returns.
5. Discusses how investment returns influence future fund flows.

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A B S T R A C T

We examine three broad mutual fund sectors: equities, fixed income, and money market funds, to ascertain whether fund flows explain investment returns or whether investment returns attract funds. This question has been studied before but for the most part, research results have not been intuitive. Our findings are substantially different from the results of previous studies. We believe that our results are intuitively more obvious. We fail to reject both causal hypotheses. That is, we find that investment returns are affected by funds flows and that funds flows towards high returns.

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1.0 Introduction

As of the end of 2012, over $13 trillion had been invested in mutual funds with an additional $265 billion invested in closed-end funds, $1.3 trillion in ETFs, and $72 billion in unit investment trusts (UITs), (see 2003 Investment Company Fact Book). These dollars represent approximately 20.8% of total household wealth.[1] Mutual funds are an important financial intermediary for savings and investment with their holdings comprising more than 24% of all US corporate equities, 14% of US and international corporate bonds, and 12% of US Treasury and government agencies securities.

The industry has more than 776 fund sponsors (or investment companies) some with just a single fund and others with hundreds of funds. The plethora of mutual fund categories, styles, and objectives creates an investment mosaic of surprising depth which includes more than 8,750 mutual funds, 600 closed-end funds, 1,239 ETFs, and 5,787 UITs, (see 2003 Investment Company Fact Book). From amongst these many offerings, investors choose where to place their investable funds. But first they decide whether they want to invest in corporate equities, fixed income securities, or money market funds. These data are summarized below in Table 1.

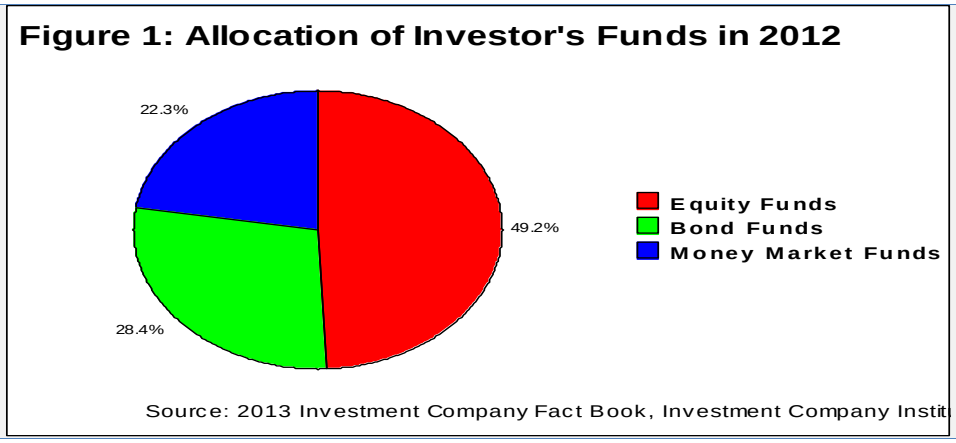
[1] Estimates of total household wealth are taken from the Federal Reserve, see Norris, 2013.

Table 01: Dollars investment in mutual funds, closed-end funds, ETFs, and UITs and the number of funds by category as of December 31, 2012

	Dollars invested	Number of funds
Mutual Funds	$13 Trillion	8,750
Closed-end Funds	$265 Billion	600
ETFs	$1.3 Trillion	1,239
UITs	$72 Billion	5,787

Source: 2013 investment company fact book

A plethora of forces influence an individual's decision about which sector to invest in. Amongst these are their age and life expectancy, holdings of other assets, tolerance for risk, liquidity preference and personal expectations of future returns from each investment sector. Our paper is concerned with the choice between equities, bonds,[2] and money market funds - probably the broadest categorization of investment vehicles.



By the end of 2012 as seen in Figure 1, investor's allocation choices placed approximately 50% of their mutual fund investments into the equities category, 28% into fixed income funds, and the remaining 22% in money market accounts. The mix between these three aggregate categories is not fixed. For example, in 2002 fewer than 44% of investment dollars were deployed to equities, slightly more than 37% went to fixed income investments, and about 19% was in money market accounts (2003 Investment Company Fact Book). It is the forces influencing this consumer choice between sectors that are studied in this paper as well as factors affecting investment returns.

For good reason, considerable attention has focused on the substantial and growing mutual fund industry. One topic which has attracted academic researchers is the determination of the causal relationship between fund flows and security returns. There is some evidence that returns are highest in the broad sectors where money has recently flowed into and additional evidence that to some extent money flows where returns are highest. Untangling these simultaneous processes is the key focus of this paper.

Unlike most of the previous work on this topic, this paper views the investor's sectoral financial-allocation decision to be as important as the question of whether higher returns attract new funds or whether the investment of new funds drives returns. We study sectoral allocation decisions, aggregate returns, and fund flows across three aggregate mutual fund sectors: equities, fixed income, and money market funds.[3][4] Our work considers the investor's allocation decision within a simultaneous system of equations thereby recognizing that investment in any one sector is constrained by their total investable funds and that overinvestment of money flows into one sector must be balanced by underinvestment or outflows from another sector. The use of a simultaneous framework enables us to untangle the interrelationship between funds flows and sector returns.

2.0 Previous literature

Relatively few researchers have investigated how investors choose between equity, fixed income, and money market funds. The principal topic studied has been how investment flows influence security returns. These researchers posit the idea that additional money flows into an investment sector leads to incremental demand for

[2] Most U.S. traded investment grade bonds are represented in our sample. Municipal bonds and Treasury Inflation-Protected Securities are excluded, due to tax treatment issues. The AGG index employed in this study includes Treasury securities, government agency bonds, mortgage-backed bonds, corporate bonds, and a small amount of foreign bonds traded in U.S.

[3] Hybrid funds which generally combine elements of fixed income and equity investments are excluded from the analysis for two reasons: their mixed strategic nature and their relative small size.

[4] Mutual fund returns are captured by market returns as an alternative to creating a weighted average value across various mutual funds. Differences between the two series are presumed to be minor.

securities in that sector which results in increased absolute and relative returns. Other researchers have evaluated the opposite relationship: how security returns contribute to the flow of funds. A smaller subset of studies has looked simultaneously at the two relationships, investment flows effect on returns and the impact of returns on flows.

In a key paper, Warther (1995) proposed a multistage-regression process in which to decompose aggregate mutual fund flows into expected and unexpected components. He tested this methodology using monthly data on stock funds, bond funds and gold funds. After decomposing fund flows into two parts, Warther (1995) security returns to be highly correlated with unexpected cash flows but to be unrelated to expected flows. Receipt of unexpected investor deposits result in funds reporting higher returns. Warther (1995) estimated model coefficients to determine an elasticity of market returns with respect to unexpected inflows that equaled 5.7. That is, additional (unexpected) funds given to mutual funds result in substantial boosts in aggregate market returns. He also found fund flows to be correlated with direct (i.e., same sector) security returns but not correlated with the returns of other types of securities. His finding conforms to a reasonable set of expectations about the forces influencing investor decisions. Oddly though, Warther (1995) found a negative relationship between fund flows and lagged security returns which suggests that investors withdraw money from fund categories in the month following their achieving positive returns.

Remolona, Kleiman, and Gruenstein (1997) also considered correlations between mutual fund flows and market returns. Like Warther (1995) they used an early stage regression to generate expected and unexpected mutual fund flows. Three types of stock funds and five types of bond funds were examined with a relatively small database of 118 observations each. Using an instrumental variables regression technique to account for the simultaneity between fund flows and returns, Remolona et.al, (1997) did not generally find a relationship between market returns and fund flows, except for funds with conservative investment objectives where they did find some level of significance for this relationship. For other types of funds, short term market returns had little effect on mutual fund flows. In other words, Remolona et.al, (1997) were unable to confirm Warther's (1995) results. They did not consider the reverse effect, the impact of mutual fund flows on market returns.

In an earlier study, Ippolito's (1992) proposed a different methodology than the two previously discussed studies. His work used annual data on 143 open-ended mutual funds representing 80% of the assets of all mutual funds for the period 1965-1984. He found that investors pay close attention to information about quality (i.e., returns). Ippolito's (1992) shows that investors move their money towards recent good performing mutual funds and away from recent poor performers. Evidence of serial correlation in mutual fund returns led Ippolito's (1992) to argue that better performing mutual funds maintain their return advantage which endorses the idea of investors chasing after good returns.

Cashman, Nardari, Deli, and Villupuram (2012) chose a different methodological approach. They identified how persistence in funds flow is at least as important as fund performance to predict future fund flows. Though not identified as such by the authors, persistence may be functionally equivalent to expected funds flow as identified by both Warther (1995) and Remolona et.al, (1997). In addition, Cashman et.al, identify how some investors evaluate mutual fund performance in a short-term trading like context rather than, as is more traditionally assumed, in a longer run context. Moreover, Bensen, Faff, and Smith (2010) worked with data from 7,000 individual equity mutual funds. They looked for contemporaneous and lagged simultaneously relationships between fund flows and returns. Unlike findings attributed to other recent authors, Bensen et.al, (2010) did not find current and lagged funds flows to affect current returns, across all types of funds. However, they do find that current mutual fund returns significantly affect current investment flows. Ippolito's (1992) argued that higher returns attract investment funds while higher investment flows do not have any effect on returns.

Our research is motivated in part by the Bensen et.al, (2010) paper in that like them we assume endogeneity between fund flows and returns but unlike them we also recognize that investors have a choice between equity, fixed-income, and money market funds. Moreover, while their work analyzes individual mutual funds we propose to study aggregate sectoral mutual funds. Our contribution to the literature then is to evaluate the process of funds flow and security returns with a regression method design for simultaneous models that yields consistent and unbiased coefficient estimates.

3.0 Methodology

3.01 Data

Fund flows

Monthly mutual fund data were obtained for our study from the Investment Company Institute (ICI). The data spans the period 1990-2012. Mutual funds are classified into four categories based on their portfolio components; equity,

bond, money market, and hybrid fund. Data for hybrid funds (which combine investment across several fund types) were not included as our research thesis is concerned with investor's discrete choices between specific types of funds.

For the three types of mutual funds the following data series are collected:

1. New Investment Sales - Dollar value of new purchases of mutual fund shares. Does not include shares purchased through the reinvestment of dividends on existing accounts.
2. Reinvested Dividends - Dollar value of distributed income dividends used to purchase more shares of mutual funds.
3. Redemptions - Dollar value of money returned to an investor who has sold shares of a fund (i.e. investor cashes in shares).

Monthly data series measuring investment flows by asset type are generated with the data series as follows:

Flow of Investments $_{i,t}$ = Total Sales $_{i,t}$ - Redemptions $_{i,t}$

= New Sales $_{i,t}$ + Reinvested Dividends $_{i,t}$ – Redemptions $_{i,t}$

Where, i represent equity funds, fixed income funds, and money market funds and t represents months. Flow of Investments $_{i,t}$ represents the net dollars invested each month in each fund category.

Mutual fund returns

Aggregate equity fund returns are measured by the return on the S&P 500 index. Use of the S&P 500 index is an expedient alternative to the massive task of creating a weighted average of returns for all individual funds. The S&P 500 index is selected because of its substantial correlation with other broad indexes and because it is available for the period of our study.

Aggregate fixed income returns are measured by Barclay's aggregate bond index known as the AGG. The index tracks the broad bond market and is both well-known and highly regarded. The AGG is obtained from Bloomberg.

3.02 Model formulation

Similar to models proposed by Remolona et. al, (1997) and Bensen et. al, (2010), we study two related investment concepts in a simultaneous framework. Our study considers how the flow of dollars into three separate types of mutual fund investments (equities, fixed income, and money market funds) are affected by each sector's investment returns and how sectoral investment returns are affected by investment flows. By using a simultaneous estimation method, the model assumes that investors select between the three investment-vehicles using a conjoint analysis that compares opportunities from each type of investment.

The research paradigm tests whether investors make investment choices after reviewing current and lagged returns reported by equity and fixed income securities. In addition we ask whether investment returns earned in the equity and fixed income markets are affected by current or lagged flows into the three types of funds. The portion of the model representing funds flows is described in equations 1-3 where EQ is the annual net flow of money into equity funds, Bond is the annual net flow of money into fixed income funds, and MM is the annual net flow of money into money market funds. Returns earned by equity funds are measured with the current and lagged returns on the S&P 500, R_SP and R_SPlagged. Current and lagged returns in the fixed income sector are measured by the return on the aggregate bond index, R_AGG and R_AGGlagged. The final factors tested for their effect on investment flows are the flow of investment dollars into the other two markets in both the current and lagged period. That is, for example, we examine how the flow of investment dollars into equities affects the flow of dollars into fixed income and money market funds. For clarity reasons, the subscripts i and t are not included in equations 1 – 3.

$$EQ = a + b_1 R\_SP + b_2 R\_SPlagged + b_3 R\_AGG + b_4 R\_AGGlagged + b_5 Bond + b_6 Bond\ lagged + b_7 MM + b_8 MM\ lagged + c_1 EQ\ lagged + \epsilon 1 \quad \ldots\ \ldots\ \ldots\ldots\ldots\ldots \text{ Equation (01)}$$

$$Bond = a + b_1 R\_SP + b_2 R\_SPlagged + b_3 R\_AGG + b_4 R\_AGGlagged + b_5 Eq + b_6 Eq\ \ lagged + b_7 MM + b_8 MM\ lagged + c_1 Bond\ lagged + \epsilon 2 \quad \ldots\ \ldots\ \ldots\ldots\ldots\ldots \text{ Equation (02)}$$

$$MM = a + b_1 R\_SP + b_2 R\_SPlagged + b_3 R\_AGG + b_4 R\_AGGlagged + b_5 Eq + b_6 Eq\ \ lagged + b_7 Bond + b_8 Bond\ lagged + c_1 MM\ lagged + \epsilon 3 \quad \ldots\ \ldots\ \ldots\ldots\ldots\ldots \text{ Equation (03)}$$

The second portion of our work which explains the returns earned by equity and fixed income securities is described in equations 4-5. The basic hypothesis asks whether the flow of funds into a sector drives sectoral

returns; our objective is not to explain total return which of course depends on a multitude of factors including economic conditions, interest rates, innovation, and other forces. Rather we focus on the narrower question of how the flow of funds into a sector affects that sectors returns. Returns earned by the S&P 500 is thought to depend upon money flows in both the current and lagged periods into money market accounts, equity funds, and fixed income funds and on the current and lagged returns of fixed income sector. Similarly, the return earned by the aggregate bond fund is thought to depend on the flow of money into the three sectors as well as on the current and lagged return earned by the equity sector. Again, in equations 4-5 the subscripts i and t are not included for clarity reasons.

$$R\_SP = a+C_1*MM+C_2*MM\_LAG+C_3*EQ+C_4*EQ\_LAG+C_5*BOND+C_6*BOND\_LAG+ C_7*R\_AGG+C_8*R\_AGG\_LAG+ \epsilon 4$$
… …. …….. Equation (04)

$$R\_AGG = a+C_1*MM+C_2*MM\_LAG+C_3*EQ+C_4*EQ\_LAG+C_5*BOND+C_6*BOND\_LAG+ C_7*R\_SP+C_8*R\_SP\_LAG+ \epsilon 5$$
… …. …….. Equation (05)

4.0 Model estimation

The model's five equations are estimated using ordinary least squares (OLS) and then a second time to reflect the simultaneity in the decision process with seemingly unrelated regression techniques (SUR). The need for SUR estimation methods for equations 1-3 arises because the three error terms, ϵ1, ϵ2, and ϵ3, are thought not to be independent of the explanatory variables in each equation. When the error process is related to the covariates in a regression, OLS does not produce consistent or unbiased estimates. The same lack of independence affects regression results for equations 4-5 where the error processes, ϵ4 and ϵ5, are related to the independent variables in those equations.

A further complication affecting estimation of the first three equations is the presence of serially correlated error terms. Durbin Watson statistics equaled 0.94 for the equity flow model, 0.42 for the bond flow model, and 1.39 for the money market flow model. The presence of serial correlation is not surprising since there is a strong similarity between successive time periods in many of the factors that influence investor's choice between the three types of investments.[5] To alleviate this problem, lagged dependent variables is added to each equation (1-3). The models depicted above in equations (1-3) include the lagged dependent variables. Estimation results presented below do not include the uncorrected OLS results without the lagged dependent variables. Estimated coefficients on the lagged dependent variables represent the impact on the current dependent variable of past values of independent variables not already included in the equation.

Regression results are presented below in Tables 2a, 2b, and 2c and 3a and 3b. The discussion that follows addresses first the funds flow models (equations 1-3) and then looks at asset returns (equations 4-5).

4.01 Estimation results: funds flow models

The three models explaining the flow of funds into mutual fund sectors are first estimated with OLS. Overall model structures are confirmed with these regressions based on the high significance of the reported F statistics. Each of the three models appears to suffer from serial correlation based on the values of the Durbin Watson statistics. To remedy this situation, lagged dependent variables are added to the three funds flow equations. Re-estimation of the models yielded Durbin Watson statistics in the range that indicates the lack of serial correlation. The remaining discussion of these models is based on the SUR regressions.

The model explaining the flow of money into equity funds estimated with SUR regression has a high adjusted R^2 with a value of 0.52 as seen in Table 2a. The same set of significant independent variables observed in the OLS regression remains significant with SUR regression. A significant positive relationship exists between equity fund flows and the return on the S&P 500, the flow of money into bond funds, and the lagged flow of money into money market funds. Contrasting with these results, there are significant negative relationships found between the flow of money into equity funds and the returns earned on fixed income sector, the lagged flow of money into bond funds, and the flow of money into money market accounts. Two independent variables in the equity funds flow model, lagged returns of both equities and bond sectors are insignificant in the equity flow model.

Unlike equity fund model results, which had the same set of significant independent variables in both OLS and SUR regressions, SUR regression estimation of funds flows into fixed income funds had two additional significant variables beyond those which are significant in the OLS regression as seen in Table 2b. This finding is not unexpected given that OLS estimation is consistent but not as efficient as is SUR regression. A relatively efficient

[5] Ippolito (1992) argues that serial correlation is evidence of better performing funds maintaining their relative return advantage.

estimator has a smaller variance which may reduce the standard errors of coefficient estimates. Like the equity funds flow model above, the return earned in the fixed income sector is a positive determinant of the flow of money into fixed income funds; however, unlike equity fund flows which were unrelated to lagged returns, the lagged return earned in the fixed income sector is significantly related to the current funds flow into fixed income. The comparison between the two sector funds flow models also diverges when examining the impact of the opposite sector's returns on fund flows: equity fund flows are significantly and negatively impacted by bond returns while fixed income fund flows are not affected by equity returns.

Like the equity fund flows model which is significantly related to a) current and lagged fixed income flows and b) current and lagged money market flows, the fixed income flow is significantly related positively (negatively) to current equity (money market) fund flows and negatively (positively) related to lagged equity flows (money market flows).

As occurred in the fixed income flow model, the money market flow model also acquires two significant additional explanatory variables in the SUR regressions when compared with the OLS regression as seen in Table 2c. Fewer significant variables explain money market flows as compared with both equity and fixed income flows. Flows of money into money market funds are negatively related to current flows into equity and fixed income funds and are positively related to lagged bond returns and lagged flows into

Table 2a: Money Flow into Equity Funds

OLS Regressions					SUR Regressions				
Variable	Coefficient	Std. Error	t-Statistic	Probability	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	6481.981	1063.49	6.095*	0.000	Constant	7014.158	1042.017	6.726*	0.000
R_SP	95744.135	12860.00	7.446*	0.000	R_SP	89189.203	12613.080	7.071*	0.000
R_SP_LAG	20357.310	13788.85	1.476	0.141	R_SP_LAG	18306.446	13527.670	1.353	0.176
R_AGG	-145113.95	53641.09	-2.705*	0.007	R_AGG	-167570.441	52600.630	-3.186*	0.015
R_AGG_LAG	22093.032	52652.32	0.420	0.675	R_AGG_LAG	21762.073	51635.28	0.421	0.674
BOND	0.232	0.116	1.997**	0.047	BOND	0.425	0.113	3.762*	0.000
BOND_LAG	-0.426	0.119	-3.569*	0.000	BOND_LAG	-0.640	0.116	-5.495*	0.000
MM	-0.037	0.015	-2.477**	0.014	MM	-0.069	0.015	-4.756*	0.000
MM_LAG	0.065	0.015	4.3996*	0.000	MM_LAG	0.070	0. 015	4.838*	0.000
EQ_Lag	0.514	0.047	10.995*	0.000	EQ_Lag	0.511	0.046	11.154*	0.000
R-squared	0.537	F-statistic		33.085	R-squared	0.522			
Adjusted R-squared	0.521	Prob (F-statistic)		0.000	Adjusted R-squared	0.505			
Durbin-Watson	2.177				Durbin-Watson	2.135			

Note: EQ is the annual net flow of money into equity funds, Bond is the annual net flow of money into fixed income funds, and MM is the annual net flow of money into money market funds. Current and lagged (lag) returns are denoted with R.
* Indicates statistical significance at the 0.01 level; ** indicates statistical significance at the 0.05 level.

Table 2b: Money Flow into Fixed Income Funds

OLS Regressions					SUR Regressions				
Variable	Coefficient	Std. Error	t-Statistic	Probability	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-595.890	605.349	-0.984	0.326	Constant	-795.696	593.202	-1.341	0.180
R_SP	13591.522	7510.575	1.810	0.072	R_SP	7253.726	7357.780	0.986	0.325
R_SP_LAG	6795.071	7369.141	0.922**	0.357	R_SP_LAG	5430.958	7229.283	0.751	0.453
R_AGG	125517.607	27920.920	4.496*	0.000	R_AGG	132091.431	27890.000	4.823*	0.000
R_AGG_LAG	72206.086	27712.570	2.606*	0.010	R_AGG_LAG	74409.077	27186.570	2.737*	0.006
EQ	0.066	0.033	2.000**	0.050	EQ	0.121	0.032	3.762*	0.000
EQ_LAG	-0.038	0.030	-1.279	0.202	EQ_LAG	-0.068	0.030	-3.762*	0.002
MM	-0.011	0.008	-1.425	0.155	MM	-0.020	0.008	-2.542*	0.002
MM_LAG	0.019	0.008	2.349	0.020	MM_LAG	0.018	0.007	2.285*	0.002
Bond_Lag	0.899	0.033	26.971*	0.000	Bond_Lag	0.898	0.033	27.479*	0.000
R-squared	0.802	F-statistic		115.759	R-squared	0.800			
Adjusted R-squared	0.795	Probability (F-statistic)		0.000	Adj. R-squared	0.792			
Durbin-Watson	2.011				Durbin-Watson stat	2.02			

Note: * Indicates statistical significance at the 0.01 level; ** indicates statistical significance at the 0.05 level.

Table 2c: Money Flow into Money Market Funds

OLS Regressions					SUR Regressions				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	17821.582	4554.555	3.913*	0.000	Constant	20811.320	4462.668	4.663*	0.000
R_SP	3396.405	58426.370	0.058	0.954	R_SP	70365.166	57201.090	1.230	0.219
R_SP_LAG	7074.811	57057.160	0.124	0.901	R_SP_LAG	23736.041	55972.570	0.424	0.672
R_AGG	15398.116	221456.901	0.069	0.945	R_AGG	11062.968	219782.700	0.050	0.960
R_AGG_LAG	469422.904	215049.343	2.183**	0.029	R_AGG_LAG	516991.328	210965.201	2.451**	0.014
EQ	-0.629	0.254	-2.477**	0.014	EQ	-1.172	0.246	-4.756*	0.000
EQ_LAG	0.226	0.232	0.972	0.332	EQ_LAG	0.505	0.228	2.217**	0.027
BOND	-0.684	0.480	-1.425	0.140	BOND	-1.193	0.469	-2.254*	0.001
BOND_LAG	-0.728	0.502	-1.450	0.148	BOND_LAG	-0.363	0.491	-0.739	0.460
MM_Lag	0.330	0.060	5.516*	0.000	MM_Lag	0.372	0.059	6.346*	0.000

R-squared	0.283	F-statistic	11.257	R-squared	0.265	
Adj R-squared	0.258	Prob. (F-statistic)	0.000	Adj. R-squared	0.239	
Durbin-Watson	2.104			Durbin-Watson stat	2.09	

Note: * Indicates statistical significance at the 0.01 level; ** indicates statistical significance at the 0.05 level.

Table 3a: Returns of Equity Funds

OLS Regressions					SUR Regressions				
Variable	Coefficient	Std. Error	t-Statistic	Probability	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.010	0.005	-2.075**	0.039	Constant	-0.014	0.005	-2.969*	0.003
MM	3.81E-09	6.65E-08	0.057	0.954	MM	1.18E-09	6.53E-08	0.018	0.986
MM_LAG	-1.95E-07	6.61E-08	-2.949*	0.003	MM_LAG	-1.92E-07	6.50E-08	-2.957*	0.003
EQ	1.85E-06	2.47E-07	7.484*	0.000	EQ	1.92E-06	2.43E-07	7.903*	0.000
EQ_LAG	-8.59E-07	2.35E-07	-3.659*	0.0003	EQ_LAG	-8.48E-07	2.31E-07	-3.673*	0.0002
BOND	9.22E-07	5.10E-07	1.810	0.072	BOND	5.80E-07	5.00E-07	1.159	0.247
BOND_LAG	-4.17E-07	5.36E-07	-0.778	0.438	BOND_LAG	-4.70E-08	5.27E-07	-0.089	0.929
R_AGG	0.547	0.235	2.332**	0.020	R_AGG	1.063	0.228	4.650*	0.000
R_AGG_LAG	-0.043	0.228	-0.186	0.852	R_AGG_LAG	-0.032	0.222	-0.145	0.885

R-squared	0.236	Prob. (F-statistic)	4.43E-12	R-squared	0.222	Durbin-Watson stat	1.978	
Adj. R-squared	0.212	Durbin-Watson	2.030	Adj. R-squared	0.197			

Note: * Indicates statistical significance at the 0.01 level; ** indicates statistical significance at the 0.05 level.

Table 3b: Returns of Fixed Income Funds

OLS Regressions					SUR Regressions				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.008	0.001	6.378*	0.000	Constant	0.008	0.001	6.690*	0.000
MM	4.97E-09	1.72E-08	0.288	0.773	MM	4.78E-09	1.70E-08	0.281	0.778
MM_LAG	-1.81E-10	1.77E-08	-0.010	0.992	MM_LAG	6.99E-09	1.74E-08	0.402	0.687
EQ	-1.90E-07	7.07E-08	-2.680*	0.008	EQ	-2.54E-07	6.94E-08	-3.655*	0.000
EQ_LAG	3.71E-08	6.47E-08	0.574	0.566	EQ_LAG	6.71E-08	6.35E-08	1.057	0.291
BOND	6.21E-07	1.27E-07	4.888*	0.000	BOND	5.76E-07	1.25E-07	4.608*	0.000
BOND_LAG	-6.71E-07	1.34E-07	-5.018*	0.000	BOND_LAG	-6.43E-07	1.31E-07	-4.893*	0.000
R_SP	0.037	0.016143	2.297**	0.022	R_SP	0.073	0.016	4.639*	0.000
R_SP_LAG	-0.026	0.015617	-1.666	0.097	R_SP_LAG	-0.025	0.015	-1.641	0.101
R-squared	0.146	Probability (F-statistic)	1.84E-06		R-squared	0.130	Durbin-Watson stat	1.812	
Adj. R-squared	0.120	Durbin-Watson	1.827		Adj. R-squared	0.103			

Note: * Indicates statistical significance at the 0.01 level; ** indicates statistical significance at the 0.05 level.

equity funds. These results are consistent with the view that money market fund investments are a holding action for many people while they await opportunities in either equity or fixed income funds. That is, when money moves into equity or fixed income funds, balances are drawn down in money market funds to pay for the new equity or bond investments.

As occurred in the fixed income flow model, the money market flow model also acquires two significant additional explanatory variables in the SUR regressions when compared with the OLS regression as seen in Table 2c. Fewer significant variables explain money market flows as compared with both equity and fixed income flows. Flows of money into money market funds are negatively related to current flows into equity and fixed income funds and are positively related to lagged bond returns and lagged flows into equity funds. These results are consistent with the view that money market fund investments are a holding action for many people while they await opportunities in either equity or fixed income funds. That is, when money moves into equity or fixed income funds, balances are drawn down in money market funds to pay for the new equity or bond investments.

Overall our results have some similarity with previous work but it is the differences between the new and older studies that are of most interest. Our findings contrast with Warther (1995) in several ways: a) he did not find, as we did, equity fund flows to be significantly affected by the returns earned by fixed income securities and b) he found a significant negative relationship between flows and lagged returns which we did not replicate. Our findings also differ from Remolona et.al, (1997) who did not find a relationship between current or lagged returns and fund flows. The smallness of their database may influence the differences between our study and theirs. Our findings are consistent with Ippolito's (1992) results that returns influence fund flows though his work was directed only at equity funds and was not estimated simultaneously. Finally, our results support the findings of a positive relationship between current sector returns and fund flows observed by Remolona et.al, (2010) though our finding of an additional significant relationship between lagged returns and current flows extends beyond their results.

4.02 Estimation results: return models

Models explaining returns earned in the equity and fixed income sectors do not evidence the presence of serial correlation in their OLS regressions. Nor is serial correlation a problem in the simultaneous estimation versions of the return's models when using SUR regression. Insignificant independent variables are not dropped from the estimation equation since this paper is exploratory rather than predictive. The two SUR return's models have comparatively high adjusted R^2s given the number of other factors such as economic conditions and corporate earnings that are known to influence investment returns that have purposefully been excluded as explanatory factors.

Returns earned in the equity sector are significantly affected by four independent variables as seen in Table 3a. Equity sector returns are higher the higher are the flow of funds into equities and the contemporaneous returns earned by bond sector; they are also higher the smaller are last period's money flows out of equities and money market funds. These results are not consistent with other researchers such as Remolona et. al, (1997) who did not find that money flows directly affect returns.

Similarly, the returns earned by fixed income funds are also influenced by four significant explanatory factors as seen in Table 3b. Fixed income returns are higher the higher are the flow of funds into fixed income accounts and the contemporaneous returns earned in the equity sector. Higher fixed income fund returns are significantly associated with smaller declines of a) money flows into bond funds last period and b) money flows into equity funds this period. Again, most previous studies do not find this association.

We believe that our findings are more intuitive than those reported by previous researchers; that is, we find that when money flows into either equity or fixed income funds that those sectors earn higher returns. The simple explanation of this phenomenon relies on nothing more than basic supply and demand: a higher demand for funds of either type leads to higher prices and therefore higher returns in corresponding sectors.

Our empirical work spans five separate models, three of which study money flows into equity, fixed-income, and money market funds while the other two models examine the returns earned in the equity and fixed-income sectors. The statistical significance and the direction of the relationship between independent variables and the five dependent variables are discussed above. In this section, we summarize the previous discussion to highlight the critical questions of do funds flow affect returns or do returns affect funds flow. Table 4 below provides an easy reference looking across the five different models with which to answer those questions.

Looking down the column labeled 'Funds Flow' it is clear that in our work current returns earned in the equity and fixed income markets significantly explain the flow of funds into both the equity and fixed income funds while lagged returns earned in the fixed income market also influences fixed income flows. Similarly, looking down the column labeled 'Returns', both current and lagged flows into the equity and fixed income markets are significant influences on the returns earned by both equity and fixed income sectors. Moreover, as our basic hypothesis of simultaneity in the decision process of individuals would suggest, our results show that all three fund types are significantly influenced by both the current and lagged flow of funds into other sectors. Returns earned in the fixed income sector are seen to be affected by the current flow of funds to other sectors while the returns earned in the equity sector is affected by lagged funds flow to other sectors.

Table 04: Identification of Causative Factors Which are Statistically Significant Influences on Models of Money Flows into Various Sectors and on the Returns of Those Sectors

Model/Causative Factor	Funds Flow	Returns
Own current returns	EQ, Bond	
Own lagged returns	Bond	
Own current flow of funds		EQ, Bond
Own lagged flow of funds		EQ, Bond
Other sector current returns	EQ, MM	
Other sector lagged returns		EQ, Bond
Other sector current flow of funds	EQ, Bond, MM	Bond
Other sector lagged flow of funds	EQ, Bond, MM	EQ

Note: EQ, Bond, or MM indicate which sector's funds flow or returns are influenced by a specific causative factor on the left hand side of the table.

These results are substantially different from those found in previous studies. In some respects, our results are more intuitively obvious. For example, we find that investment returns are affected by funds flows. That is what one would expect based on supply and demand analysis. When money flows into sectors those sectors earn higher returns. Similarly, we find that investment decisions are influenced by current investment returns in equity and fixed income funds and lagged returns for fixed-income funds. This too is not surprising given our understanding of how momentum investing and general financial innumeracy are common amongst many investors.

5.0 Conclusions

The results presented in this paper provide a realistic view of forces effecting how investors allocate their investments between equities, fixed income, and money markets. In specific, we find that returns influence the decision to invest in equities and fixed income and lagged returns also influence fixed income investments. Moreover, money flows into the three investment sectors are influenced by the amount of money flowing into other sectors. These results, while unusual in comparison to other researcher, are both logical and intuitive.

Likewise we show that an influx of money from investors both now and in the previous period affects the returns earned in both the equity and fixed income markets. In addition we find that equity and fixed income returns are influenced by the flow of funds into other sectors and by the lagged return in other sectors. These results too are not surprising.

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