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Market Volatility and Mutual Fund Cash Flows

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Abstract

This paper examines the relation between market volatility and monthly mutual fund cash flows. We find that bond fund investors in the period of 1984 through 1998 do not respond to past stock market volatility at the aggregate level after we take into account the persistency of volatility over time and the relation between risks and returns. On the other hand, stock fund investors respond negatively to concurrent and past long term (semi-annual and annual) market volatility. Stock fund investors' volatility timing behavior explains why fund managers decrease market exposure during periods of high market volatility. We also find that the negative relation between stock fund flows and market volatility is not entirely driven by the persistency of volatility over time or the relation between risks and returns. Using semi-variance of daily stock market returns, we find no evidence that investors are only concerned about downside volatility. Both upside volatility and downside volatility have negative impact on subsequent stock fund flows. We also find that stock fund flows in our sample period have strong positive impact on the subsequent market volatility. It provides some evidence that the momentum of mutual fund investors, often referred to as "noisy traders", do destabilize the overall stock market to some extent.

INTRODUCTION

In the previous paper, we examined if investors chase past market performance at the aggregate level by studying the relation between mutual fund flows and market returns. We find strong evidence for the positive feedback trading behavior among bond fund investors over the period of 1984-1998 and mutual fund investors over the period of 1964-1983. On the other hand, monthly equity fund flows over the period of 1984-1998 are negatively correlated with lagged stock market returns, indicating that equity fund investors follow some contrarian feedback strategy, i.e. they tend to buy funds when the market is down and to sell funds when the market is up. It seems to suggest that aggregate investors could pursue very different investment strategies according to which market they are investing in. In the bond markets, they seem to pursue the past performance, buying high and selling low. In the equity markets, they seem to follow the fundamentals, buying low and selling high. One possible explanation of this behavior difference among investors is that our analysis didn't consider investors' risk preferences, a very important factor affecting their asset allocation decisions. Investors pursue higher returns, but risk is an equally important factor in determining investors' asset allocation decisions. Moreover, since bond fund investors and stock fund investors may have very different risk preferences, their reaction to market returns might be significantly affected by their attitude to the market risk and also by different risk characteristics of the stock market and the bond market. In this paper, we examine how stock fund and bond fund investors react to the market volatility, a measure of risk of investing in the aggregate security markets. By studying the relation between fund flows and the market volatility, we will have a better understanding of mutual fund investors' behavior, not only their reaction to past market performances, but also their attitude to investment risks at the aggregate level.

The risk aversion on the part of economic decision makers is a common assumption and many theories and analyses in economics and finance that deal with the uncertainty and the risk preference of decision makers start from the assumption of concave utility functions that imply the risk aversion on decision makers. The mean-variance portfolio analysis is a typical example.[1] Some of the empirical research also lends support to the risk aversion assumption. Goetzmann and Massa (1998) suggests that S&P 500 index fund investors show certain level of risk aversion. They also find the causality link from volatility to investors' demand for the fund. If investors have certain common preferences over market risks, stock market volatility would play an important role in their asset-allocation decisions. As discussed before, since mutual funds grew to be a more and more important component of the assets held by U.S. households, cash flows into different types of mutual funds could be a very good indicator of changes in investors' demand for financial securities. Studying the relationship between market volatility and mutual fund cash flows might be able to reveal how aggregate investors react to the more and more volatile asset markets.[2]

Investors would react to the future volatility instead of the past volatility if they are rational since what investors care about are what return their investments will make and how risky their investments will be in the future. However, if the volatility

[1] See Markowitz (1952, 1959), Sharpe (1964), and Lintner (1965) among others.

[2] The stock market crashes of October 1987 and October 1997 attracted an immense amount of interest in stock market volatility. There have been many papers in the finance literature studying movements in the stock market volatility. To name a few, see Campbell (1987), French, Schwert, and Stambaugh (1987), Schwert (1989a,b, 1998), Shiller (1981,1989, 1990), Engle and Rodrigues (1989), Hamiliton and Susmel (1994), and Warther (1998). In recent years, not only the academics pay more interest to the market volatility, the easy access to the internet and the rapid development of E-trading brings individual investors extremely closer to the stock market and makes them able to react to the market movement very quickly. Therefore the stock market volatility becomes a more and more important topic for the press and in the lives of individual investors.

series is a mean-reverting process or, in other words, persistent over the time, then it is reasonable for investors to react to past volatility since a high volatility level in the past indicates that the market will probably also be volatile in the future. Also, an unsophisticated average investor in the real world would often turn to past for clues about the future market, instead of constructing complex models to forecast how the market will behave in the future.

Extensive studies in the literature have documented significant time variation in the conditional variance of stock returns.[3] Attanasio (1991) discovered that dividend yields are an important factor in predicting stock return volatility. Compell (1987) found that higher stock market volatility can be predicted by higher short term interest rates. Engel and Rodrigues (1989) identified oil prices and money supply to be important factors in predicting the volatility of bond returns. Schwert (1989a, b) examined a number of potential variables and concluded that the level of real economic activity is the most important factor in determining the conditional variance of stock returns. Hamilton and Lin (1996) studied a bivariate GARCH model and concluded that economic recessions are the primary factor that drives fluctuations in the volatility of stock returns.[4] Harvey and Whaley (1992) examined the volatility implied in the transaction prices of Standard & Poor's 100 index options and found that the implied volatility series from both calls and puts have significant positive serial correlation, indicating persistence in the level of volatility. They identified several significant factors in predicting changes of future volatility and one of them is the lagged volatility changes. The positive serial correlation in the level of volatility series is also documented by Fleming, Ostdiek, and Whaley (1995) where they study

[3]See Bollerslev, Chou, and Kroner (1992) and Engle (1993) for recent surverys.

[4]Chen, Roll, and Ross (1986), Keim and Stambaugh (1986), Fama and French (1989), Fama (1990), Schwert (1990b), and Chen (1991) among others argue that fluctuations in the level of real economic activity are a key determinant of stock returns and therefore macroeconomic fundamentals are among potential important factors in determining the conditional variance of stock returns.

the behavior of the CBOE Market Volatility Index (VIX). French, Schwert, and Stambaugh (1987) reported similar results about the persistence in the volatility series using monthly standard deviations of daily S&P 500 returns. Earlier studies confirmed that volatility is predictable and persistent over time. Therefore, past volatility may serve as a good indicator of how volatile the future market would be.

The Sharpe (1964)/Lintner (1965) and Merton (1973) capital asset pricing models predict a positive relation between risks and returns.[5] More risks have to compensated by higher expected returns. Previous research on predicting market volatility has also documented intertemporal relation between stock market returns and expected volatility. Black (1976) and Christie (1982) find that stock market prices are negatively correlated with changes in ex post future volatility and relation is strong. French, Schwert, and Stambaugh (1987) find evidence that the expected market risk premium is positively correlated with the predictable volatility of stock returns using daily returns of S&P composite portfolio from January 1928 through December 1984. Fleming, Ostdiek, and Whaley (1995) show that the inverse relation between stock market prices and volatility changes is consistent with their empirical findings from the study of the CBOE Market Volatility Index. If stock returns and expected future volatility are correlated and the volatility series are persistent over time, then the past volatility incorporates certain information about future stock market returns and may have potential impact on investors' asset allocation decisions.

Our study of mutual fund investors' reaction to market volatility is also related to the volatility timing literature. For example, Busse (1999) studies equity mutual fund managers' volatility timing ability using daily data and finds that the systematic risk of most funds in his sample is very sensitive to market volatility. Fund manages reduce market exposure when market volatility is higher than average. However, his study

[5]Merton (1980) notes that the expected market risk premium will be approximately proportional to the variance of the market returns under certain conditions in a capital market equilibrium model.

also finds that volatility timing can not be used to predict fund's future performance. In other words, he finds no relation between fund managers' volatility timing ability and funds' superior performance in the future. Questions is that then why fund managers time market volatility if volatility timing does not enhance funds' future performance. Although Busse (1999) argues that fund managers' volatility timing could hedge certain degree of market volatility risk,[6] our study of fund investors' reaction to market volatility might help better understand fund mangers' volatility timing behavior since those two groups of market participants often interact with each other. Action taken by one group usually have impact on the other. For example, if fund investors negatively respond to market volatility and fund managers are able to predict this pattern, fund managers would decrease market exposure and hold more cash when market volatility is high since they expect investors invest less into the funds or even withdraw money from the funds.

Another interesting issue in the relation between fund flows and market volatility is, do investment cash flows affect market volatility? The theoretical support for the causal link from cash flows to the stock market movement comes from the classical demand and supply theory. The shift in demand for stocks represented by investment cash flows drives the market price to the new equilibrium level to equate the supply with the new demand. Grossman and Shiller (1981) and Shiller (1984) examine how stock market price levels are determined by the interaction of aggregate demand and supply and emphasize the importance of demand shock in driving the stock market movement. Empirical evidence documented by academic research also lends support to the causal link from demand shocks to the stock market movement. Goetzmann and Massa (1998) examined the relation between daily flows of three Fidelity index funds and S&P 500 market returns from 1993 to 1998 and they found a two-way-

[6]Busse (1999) examines funds' conditional alphas and finds that funds' risk-adjusted returns are higher during periods of higher conditional volatility.

causality between the volatility and cash flows. The evidence from the buyer- and seller-initiated large block trades as documented in Scholes (1972), Holthausen, Leftwich and Mayers (1987), and Mikkelson and Partch (1985) suggests price pressure on stocks due to demand shocks. Shleifer (1986) finds evidence for a permanent price effect consistent with the supply and demand theory by examining the market reaction to the announcement of addition to the S&P 500 index. Changes in mutual fund cash flows reflect the shift in investors' demand for financial assets and hence they are a potential factor in determining the overall stock market movement. As previously reviewed, a number of factors including real economic activity and certain financial variables such as interest rates, dividend yields, or money supply were found to be important factors in determining the conditional variance of stock returns. In a general supply-demand framework, demand shocks reflected by changes in cash flows could either trigger real supply changes or reveal certain information about the changes in real economic activity or in other financial variables. Through those channels cash flows could have significant impact on the stock market volatility. Our previous paper finds that stock cash flows and bond fund flows exert temporary pressures on market returns. If demand shocks drive market returns, do they have any impact on the second-order measure of market returns, i.e. the variance of market returns?

By studying the relation between mutual fund cash flows and market volatility in this paper, we find that stock fund investors react negatively to concurrent and past long-term market volatility over the period of 1984-1998 even after we take into account the persistency of volatility over time and the relation between risks and returns. They withdraw money out of the stock market after or during a volatile market. It offers a reasonable explanation about stock fund manages' volatility timing behavior found in Busse (1999). Fund managers reduce market exposure when volatility is high since they expect that fund investors negatively react to market volatility and withdraw money from the funds in response to a more volatile market. On the other hand, bond fund investors do not seem to significantly respond to the past market volatility. By utilizing the daily stock market return data and the semi-variance of stock market returns, we find that stock investors do not distinguish between a good volatility or a bad volatility, so to speak. Both upside volatility and downside volatility have negative impact on subsequent stock fund flows. We also find that mutual fund flows have positive impact on the subsequent market volatility. More fund flows are normally followed by a more volatile market. It is consistent with the "noisy trader" theory, i.e. mutual fund flows, or the momentum of mutual fund investors who are frequently referred to as "noisy traders", do destabilize the overall stock market to some extent.

The outline of the paper is as follows. In section 2, we describe the data used in this paper. In section 3, we discuss the methodologies. In section 4, we examine if flows of stock funds and bond funds react to past market volatility using monthly flow data and monthly return data. In section 5, we utilize daily stock market return data to further examine the relation between stock fund flows and the stock market volatility. In section 6, we introduce conditional volatility and implied volatility into our analysis. In section 7, we examine if fund flows have any significant impact on the subsequent market volatility. In section 8, the impact of upside volatility and downside volatility on subsequent stock fund flows is examined. In section 9, we draw the conclusion.

DATA

Data sources

We use the same mutual fund flow data as in the previous paper. A brief introduction to the data is presented in this section. The monthly mutual fund cash flow data is provided by the Investment Company Institute.[7] The data set covers the period of January, 1984 through September, 1998. Mutual funds are grouped into 19 categories by their investment objectives in our sample period. The categories for stock funds include aggressive growth, growth, growth and income, precious metals, international, global equity, income equity, and option income funds. The categories for bond funds include flexible, balanced, income-mixed, income-bond, government, GNMA, global bond, corporate bond, high-yield bond, municipal, and state municipal funds. Within each category, the information on new sales excluding reinvested dividend, redemptions, exchange sales, exchange redemptions, and net asset values are available. Our measure of net sales is new sales plus exchange sales minus redemptions and exchange redemptions. Reinvested dividend is not included since they are money that is already in the fund.

Monthly returns of each group of stock funds and bond funds are extracted from the Stocks, Bonds, Bills and Inflation Series of Ibbotson and Associates. Daily stock market returns and risk-free rates come from Center for Research in Security Prices (CRSP) at the University of Chicago.

The net sales of stock funds and bond funds are normalized by the total value of the stock market and the bond market at the end of the previous month to avoid the nonstationarity in the net sale series.[8] Normalization controls for inflation so that we can make time series comparison. It also controls for the size effect so that we can make comparisons across asset categories. The total value of the stock market and the bond market are extracted from CRSP and DataStream.

[7] The Investment Company Institute is a trade association for the mutual fund industry, and Institute members include all U.S. mutual funds.

[8] We also use funds' net asset value to normalize fund flows. Basic findings are robust to different normalization methods.

Properties of Data

The properties of monthly fund flows were discussed in the previous paper. Normalized monthly flows are stationary and auto-correlated. Most of the auto-correlation occurs in the past three months. Monthly fund flows are also correlated with current returns and past long-term returns according to our findings in the previous paper. The new variable that needs some introduction is the time series of return volatility. Table 1a reports summary statistics of monthly volatility of stock market returns for the period of 1984 through 1998. Monthly volatility is calculated based on daily percentage returns of the stock market. Table 1b reports the autocorrelation patterns of the volatility series in the sample period. It is obvious that volatility series are serially correlated. During the period of 1984 to 1998, volatility has a strong positive correlation with the lag-one and lag-two volatility.[9]

METHODOLOGY

In this paper, we mainly use simple linear regression estimation (OLS). A simple introduction to OLS and the estimation procedure can be found in the previous paper. One concept that needs some explanation here is the semi-variance of market returns.

Semi-Variance

The variance (or standard deviation) is widely used to measure the risks of asset returns in many areas, such as portfolio management, risk management or performance analysis. One important feature of the variance is that it treats positive as

[9] The upside volatility and downside volatility are also examined. See the methodology section for definitions of upside volatility and downside volatility. Since the autocorrelation patterns of both upside and downside volatility are very similar to those of overall volatility, we do not report them here.

well as negative volatility as equally undesirable. The semi-variance, or second lower partial moment, as a risk measure only concerns about the downside or "below-target" volatility of asset returns. The concept of semi-variance was put forward by Markowitz (1959) in his breakthrough work on portfolio management to measure the magnitude of the downside volatility of portfolio returns.[10] The sample semi-variance is defined as

$$sv = \frac{1}{n}\sum_{i=1}^{n} \min[0, (x_i - \tau)]^2$$

where n is the sample size and τ is the pre-specified target rate required for the return on the asset. The population semi-variance is given by

$$sv = \int_{-\infty}^{\tau} (x - \tau)^2 f(x) dx$$

In this paper, we expand the semi-variance concept to deal with both upside volatility and downside volatility of stock market returns. The upside volatility of stock market returns is defined as

$$sv(up) = \frac{1}{n}\sum_{i=1}^{n} \max[0, (x_i - r)]^2$$

where n is the sample size and r is the risk free rate.[11] And the downside volatility is given by

$$sv(down) = \frac{1}{n}\sum_{i=1}^{n} \min[0, (x_i - r)]^2$$

[10]Semi-variance is of most use when the distribution of asset returns is asymmetric. See Hansen (1993), Bond (1998), and Knight, Satchell, and Tran (1995) for more discussions on capturing asymmetry in financial market data.

[11]We use long-term U.S. government bond return as the risk-free rate in this paper.

FUND FLOWS AND PAST VOLATILITY: MONTHLY RETURNS

In this section, we examine the relation between fund flows and past volatility of monthly market returns. If an average investor's decision is indeed affected by past volatility of market returns, we suspect that at first he might want to look at the big picture or long-term trend of the market in the past. The historical volatility based on monthly returns reflects this long-term trend of market return variations and it could be used by investors as a rough measure of how volatile the market was.

We calculate market volatility in the past six months and the past year based on monthly returns. In this section, we examine the relation between fund flows and this measure of market risk for both stock funds and bond funds during the period of January 1984 through September 1998.

Stock funds in the period 1984-1998

First we conduct a set of linear regressions of stock fund flows on the volatility of returns of all stock funds, aggressive growth funds, growth funds, growth and income funds, precious metal funds, international funds, global equity funds, and income equity funds.

$$Netsales_t = \alpha + \beta * Volatility_{-1} + \varepsilon_t$$

where Netsales_t is net sales of each equity fund group and Volatility_{-1} is volatility of returns on each fund group in the past six months or past year.

The regression results are presented in tables 2a and 2b. Table 2a shows net flows of all stock funds, aggressive growth funds, growth funds, growth and income funds, global equity funds, and income equity funds have a significant negative relation with return volatility in the past six months. R-square statistics suggest that about 20% of the flow variation of all stock funds and growth and income funds can be explained by the model. Our model can also explain more than 10% of the flow variation for aggressive growth funds, growth funds, and income equity funds. As we use volatility in the past year in the regressions, the results in table 2b indicate that more variation of fund flows are explained and those negative coefficients of the past volatility are more significant in term of both magnitude and statistical significance. Fund flows negatively react to the past annual volatility and the relation is significant for all groups but precious metal funds. For all stock funds, 37% of the flow variation can be explained by the past annual volatility. For growth and income funds, the simple estimation model captures about 33% of the flow variation.

Since fund flows are serially correlated, part of the impact of the past volatility could come from the auto-correlation of fund flows. To examine the impact of past volatility on unexpected fund flows, we include past fund flows into our regressions.[12]

$$Netsales_t = \alpha + \beta_1 Netsales_{t-1} + \beta_2 Netsales_{t-2} + \beta_3 Netsales_{t-3} + \gamma * Volatility_{-1} + \varepsilon_t$$

The results are presented in tables 3a through 3c. Table 3a and 3b report the results using semi-annual volatility. In table 3a, we use just one lag of volatility and the coefficients of the lagged volatility are negative for all stock funds, aggressive growth funds, growth funds, growth and income funds, international funds, and global equity funds though none of them are statistically significant. In table 3b, we use two lags of the semi-annual volatility and the lag-two semi-annual volatility are negatively correlated with fund flows for all groups. Moreover, the coefficients of the lag-two semi-annual volatility are statistically significant at 5% significant level for all stock funds, aggressive growth funds, global equity funds, and income equity funds. Table 3c reports the results using past annual volatility. The relation between fund flows

[12]Three lags of monthly fund flows are used based on the serial correlation pattern of fund flows. Most of the auto-correlations of fund flows occur within the first three lags. Different lags are also used but the results are robust.

and the past annual volatility is negative for all fund groups and it is very significant for all stock funds and global equity funds.[13]

Why does the past market volatility affect stock fund investors' current asset allocation decision? There are two plausible explanations about investors' reaction to past market volatility. 1. Since volatility is persistent over time, past volatility reveals certain information about how volatile the market will be in the future and hence affect investors' asset allocation decision. We call it the persistency hypothesis. 2. According to the CAPM, risks are positively correlated with returns. Since stock fund flows react to past returns from our previous study, past volatility could just serve as a proxy for past returns in our regressions. Moreover, as discussed in the introduction section, expected future volatility is negatively correlated with current returns. If the volatility is persistent over time, past volatility could be correlated with current returns. If the past volatility just serves as a proxy for current returns, the reaction of stock fund investors to past volatility could just come from the strong correlation between fund flows and concurrent returns.[14] Since this explanation focuses on the relation between returns and volatility, we call it the risk/return hypothesis. In this section, we will test if the second hypothesis, i.e. the risk/return hypothesis, could help explaining the correlation between stock fund flows and past market volatility.[15] The testing is straightforward. If past market volatility serves as a proxy for either past returns or concurrent returns, including past returns and concurrent returns in our regressions will eliminate the negative relation between fund flows and past market volatility. We conduct the following regressions:

[13]More lags of volatility are also used in our regressions. Results (not reported here) show that the relation between fund flows and lagged semi-annual or annaul volatility is consistently negative.

[14]In our previous paper, we show that mutual fund flows are significantly correlated with concurrent market returns.

[15]Since we are unable to construct a current volatility series using monthly return data, we will test the persistency hypothesis in the next section when we have the daily return data.

$$Netsales_t = \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{p} \delta_j \operatorname{Re}turns_{t-j} + \sum_{j=1}^{q} \gamma_j Volatility_{-j} + \varepsilon_t$$

where q=2 for semi-annual volatility and q=1 for annual volatility.

Tables 4a and 4b present the regression results using three lags of monthly returns. Concurrent returns are positively correlated with fund flows and lag-one monthly returns are negatively correlated with fund flows, which are consistent with the findings from our previous paper. The coefficients of past volatility are slightly reduced in terms of both the magnitude and the significance, suggesting the relation between risk and returns can explain a small part of the negative impact of past market volatility on fund flows. However, adding concurrent returns and past returns in the regressions doesn't eliminate the negative relation between fund flows and past market volatility. Table 4a reports the results using two lags of semi-annual volatility. Only one coefficient of the past semi-annual volatility is not negative. It is the lag-one semi-annual volatility for income equity funds and the coefficient is almost zero. The negative relation between fund flows and the lag-one semi-annual volatility is significant for growth and income funds and global equity funds. The negative relation between fund flows and lag-two semi-annual volatility is significant for all stock funds and income equity funds. Table 4b reports the results using one lag of annual volatility. All coefficients of the past annual volatility are negative and they are significant for all stock funds and growth and income funds.

To examine the robustness of our results, we use different lags of monthly returns, semi-annual volatility and annual volatility. We also use past semi-annual returns and past annual returns to replace the lagged monthly returns in our regression. The results (not reported here) show that the relation between fund flows and past long-term volatility is consistently negative.

In summary, the strong negative relation between net flows of equity funds and past long-term volatility seems to be present in our data sample even after we consider the serial correlation of fund flows and the strong relation between flows and returns. The relation between risks and returns can only explain a small part of this negative relation. Stock fund investors seem to be averse to the past market volatility by pulling money out of funds if the market was volatile in the past.

Bond funds in the period 1984-1998

Compared to stock fund investors, bond fund investors pursue a very different trading strategy in terms of their reaction to past market returns. In this section, we examine if bond fund investor also respond differently to the past market volatility from stock fund investors. We conduct the same regressions of bond fund net flows on past volatility. First we regress bond fund net flows on the past volatility only.

$$Netsales_t = \alpha + \beta * Volatility_{-1} + \varepsilon_t$$

Table 5a and table 5b report the results using past semi-annual volatility and annual volatility, respectively. Contrasting with the results from equity funds, flows of most fund groups react positively to past volatility. In table 5a , the coefficients of past semi-annual volatility are positive except for corporate funds and high yield funds[16] and they are significant for all bond funds, government funds, and municipal funds. About 8 percent and 21 percent of the variation of flows can be explained by the past semi-annual volatility for all bond funds and government funds, respectively. In

[16] Net flows of corporate funds and high yield funds have a negative correlation with past return volatility. Those investors behave more like equity fund investors. It is not surprising since corporate funds and high yield funds share some common features with equity funds, e.g. higher returns and higher risks. In our previous paper corporate funds and high yield funds investors also show very different behavior from the rest of bond fund investors in terms of their reaction to past market returns. Instead of chasing trends like other bond fund investors, they react negatively to past market returns like equity fund investors do.

table 5b, the results of using past annual volatility are more significant. The relation between fund flows and past annual volatility are positive for all groups except for high yield funds and it is statistically significant for all bond funds, government funds, and GNMA funds. All positive coefficients are now bigger in terms of the magnitude. About 10 percent and 26 percent of the variation of flows can be explained by past annual volatility for all bond funds and government funds, respectively.

Since fund flows are serially correlated, part of the impact of the past volatility could come from the auto-correlation of fund flows. To examine the impact of past volatility on unexpected fund flows, we include past fund flows into our regressions.[17]

$$Netsales_t = \alpha + \beta_1 Netsales_{t-1} + \beta_2 Netsales_{t-2} + \beta_3 Netsales_{t-3} + \gamma * Volatility_{-1} + \varepsilon_t$$

Tables 6a and 6b report the regression results. Adding lagged fund flows significantly reduced the coefficients of the past volatility in terms of the magnitude and the significance. However, the positive relation between past volatility and fund flows are still obvious. In table 6a and 6b, fund flows of each fund group still react positively to the past semi-annual or the annual volatility. The coefficients of the past volatility are statistically significant for GNMA funds.

Since net flows of bond funds have a strong positive correlation with the concurrent and the past monthly returns, we add those returns into the regressions to examine if the risk/return hypothesis can explain away the observed positive relation between fund flows and past volatility.

$$Netsales_t = \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{p} \delta_j \mathrm{Re}\,turns_{t-j} + \sum_{j=1}^{q} \gamma_j Volatility_{-j} + \varepsilon_t$$

where q=2 for semi-annual volatility and q=1 for annual volatility.

[17]Three lags of monthly fund flows are used based on the serial correlation pattern of fund flows. Most of the auto-correlations of fund flows occur within the first three lags. Different lags are also used but the results are robust.

Tables 7a through 7c present the results using 3 lags of monthly returns. Now none of the coefficients of the past volatility is significantly positive. The coefficients of past semi-annual and annual volatility for all bond funds become insignificantly negative. The coefficients of past volatility for GNMA fund is still positive but insignificantly different from zero. Different lags of net flows, returns, or volatility are also used in the regressions. The result keeps the same, i.e. the positive relation between fund flows and past volatility disappears after including the returns in the regressions.[18]

We also observe from tables 7a thought 7c that net flows still react positively to past monthly returns even after we include past volatility of market returns in the analysis. It confirms the trend-chasing behavior of bond fund investors identified in the previous paper.

Our analysis of bond fund flows shows that bond fund investors seem to have a different attitude to the past market volatility than stock fund investors. In general, the market volatility seems to have a positive impact on subsequent bond fund flows. However, the positive relation between the past market volatility and bond fund flows can be explained away by the risk/return relation. It suggests that the past bond market volatility just serve as a proxy for the past or current bond market returns.

FUND FLOWS AND VOLATILITY: DAILY RETURNS

In the previous section, past volatility of returns was calculated based on monthly market returns, which largely ignores day-to-day market variations. In this section, we use daily market returns to construct the high-frequency volatility series. We will not only examine the relation between fund flows and past volatility, but also study the relation between monthly fund flows and concurrent monthly volatility. Since daily bond market returns are not readily available, we only focus on studying stock

[18]We also use past semi-annual returns and past annual returns to replace the lagged monthly returns in the regressions. The coefficients of past volatility become more insignificant.

fund investors' behavior in this section.

Based on daily stock market returns, we construct several volatility series: current monthly volatility, lagged monthly volatility, lagged quarterly volatility, lagged semi-annual volatility, and lagged annual volatility. First we regress fund flows on each volatility series.

$$
\begin{aligned}
Netsales_t &= \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} \\
&\quad + \gamma * Volatility_t / Volatility_{t-1} / QVolatility_{-1} / SVolatility_{-1} / AVolatility_{-1} + \varepsilon_t
\end{aligned}
$$

where $Volatility_t$, $Volatility_{t-1}$, $QVolatility_{-1}$, $SVolatility_{-1}$, and $AVolatility_{-1}$ denote concurrent monthly volatility, lagged monthly volatility, lagged quarterly volatility, lagged semi-annual volatility, and lagged annual volatility, respectively.

Tables 8a through 8c report the regression results for concurrent monthly volatility, lagged semi-annual volatility, and lagged annual volatility, respectively.[19] In table 8a, fund flows have a strong negative relation with concurrent stock market volatility for all groups except precious metal funds. In table 8b, fund flows are negatively correlated with the lag-one semi-annual volatility for all fund groups except income equity funds and the negative relation is significant for growth and income funds. Fund flows also negatively respond to the lag-two semi-annual volatility for all fund groups. The relation is significant for all stock funds, international funds, and income equity funds. Regression results in table 8c show that stock investors also negatively respond to the past annual market volatility. Fund flows of all groups are negatively correlated with the past annual volatility and the correlation is strong for all stock funds, growth and income funds, and global equity funds.

Using daily instead of monthly stock market returns we reached the similar con-

[19]The lagged monthly and lagged quarterly volatillity don't have significant impact on unexpected fund flows.

clusion, i.e. stock fund investors react negatively to long-term past market volatility. As discussed in the previous section, the negative relation between fund flows and past market volatility could be due to the persistency of volatility over time or the relation between risk and returns. Since stock fund flows are significantly correlated with concurrent and past market returns, we include those returns into our regressions to test if the negative relation between fund flows and past market volatility could be could be driven by the relation between risks and returns.

$$Netsales_t = \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{3} \delta_j \operatorname{Re}turns_{t-j} + \gamma_1 SVolatility_{-1} + \gamma_2 SVolatility_{-2} + \varepsilon_t$$

$$Netsales_t = \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{3} \delta_j \operatorname{Re}turns_{t-j} + \gamma_1 AVolatility_{-1} + \varepsilon_t$$

Three lags of monthly returns are used in our regressions.[20] Table 9a reports the results of regressions using past semi-annual volatility. Compared to the results in table 8b, adding returns into the regressions reduced the negative correlation between fund flows and the past market volatility in terms of both the magnitude and the significance of the coefficients of past semi-annual volatility. However, it doesn't completely explain away the negative relation. Fund flows negatively responds to the lag-one semi-annual volatility for all fund groups except income equity funds. The correlation between fund flows and the lag-two semi-annual volatility is also negative for all fund groups. The coefficient of the lag-one semi-annual volatility is significantly negative for growth and income funds. The coefficient of the lag-two semi-annual volatility is significantly negative for income equity funds. Table 9b presents the regression results using past annual volatility. The correlation between fund flows and the past annual volatility is negative for all fund groups except precious metal funds and is statistically significant for growth and income funds and global equity funds.

[20] Different lags of monthly returns are also used in our regressions and the results are robust.

Our regression results suggest that the relation between risks and returns can only explain part of the negative relation between stock fund flows and past market volatility. Since volatility is persistent over time, the negative relation between fund flows and past volatility could just serve as a proxy for the relation between fund flows and concurrent or future volatility. To test our persistency hypothesis, we include concurrent monthly volatility, dividend yields, real interest rates into our regressions.

$$\begin{aligned} Netsales_t &= \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{3} \delta_j \operatorname{Re} turns_{t-j} + \gamma_1 Volatility_t \\ &\quad + \gamma_2 DY_t + \gamma_3 TB_t + \gamma_4 SVolatility_{-1} + \gamma_5 SVolatility_{-2} + \varepsilon_t \end{aligned}$$

$$\begin{aligned} Netsales_t &= \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{3} \delta_j \operatorname{Re} turns_{t-j} + \gamma_1 Volatility_t \\ &\quad + \gamma_2 DY_t + \gamma_3 TB_t + \gamma_4 AVolatility_{-1} + \varepsilon_t \end{aligned}$$

Concurrent monthly volatility is included since it was shown to have a strong correlation with fund flows. Since previous research in the literature shows that dividend yields and real T-bill rates are important factors in predicting future volatility,[21] we include those variables as proxies for future volatility in our regressions. Tables 10a and 10b report the results using past semi-annual volatility and past annual-volatility, respectively. Concurrent volatility are still significantly correlated with fund flows. Real T-bill rates do not seem to have a strong impact on fund flows, but dividend yields have an often strong negative correlation with fund flows. Although concurrent volatility and dividend yields can explain part of the variation in fund flows,

[21] See Attanasio (1991) and Compell (1987). Fama and French (1989) shows that dividend yields and term variables are also important factors in predicting expected returns. Therefore, dividend yields and term variables predict changes in the future investment opportunities. We also include the term spread in our regression but it doesn't have a significant impact on the negative relation between fund flows and past market volatility.

adding those variables into the regressions doesn't have any significant impact on the negative correlation between fund flows and past volatility. Some of the negative coefficients of past volatility even become more statistically significant. In table 10a, lag-one semi-annual volatility is negatively correlated with fund flows of all groups except for income equity funds. Lag-two semi-annual volatility is negatively correlated with fund flows of all groups and the correlation is now strong for all stock funds and income equity funds. In table 10b, past annual volatility are negatively correlated with fund flows of all groups and the correlation is significant for all stock funds, aggressive growth funds, and growth and income funds. If the past volatility just serves as a proxy for concurrent or future volatility because of the persistency of the volatility over time, adding concurrent volatility and dividend yield should eliminate the negative impact of past volatility on fund flows. Our results, however, suggest that the persistency of volatility over time cannot explain why stock fund investors negatively react to past market volatility.

Using monthly stock fund flows and daily stock market returns, we find that fund investors negatively respond to concurrent and past long-term (semi-annual and annual) market volatility. The negative relation between stock fund cash flows and past market volatility cannot be completely justified by the relation between risks and returns or by the persistency of volatility over time. To test if the persistency of volatility over time induces investors' negative reaction to past market volatility, instruments (dividend yield and term spread) that have predicting power of future volatility are used in our analysis as proxies for the future volatility. There are some issues of using those instruments. The predicting power of those instruments varies in different sample periods or in different studies and they hardly capture most of the variations in future volatility. In the next section, we will use an alternative proxy for the future volatility, implied volatility of options on a market index, to test the persistency hypothesis. Volatility implied in the prices of options on a market index represents a market-consensus estimate of future stock market volatility and hence is a better instrument in capturing variations of future market volatility.

FURTHER STUDY OF STOCK FUND FLOWS AND MARKET VOLATILITY

Conditional volatility

In the previous section, we find that stock fund flows are negatively correlated with concurrent realized volatility. In this section, we decompose monthly realized volatility into conditional volatility and unexpected volatility to examine how stock fund investors react to conditional volatility and volatility shocks.[22]

First we regress concurrent volatility on lagged volatility, dividend yields and real T-bill rates.[23]

$$Volatility_t = \alpha + \beta_i \sum_{i=1}^{p} Volatility_{t-i} + \gamma_1 DY_{t-1} + \gamma_2 TB_{t-1} + \varepsilon_{1t}$$

The fitted values of the regression are taken as the conditional component of volatility. The residuals from the regression, $\widehat{\varepsilon_{1t}}$, are a proxy for unexpected volatility shocks.

Then we regress stock fund flows on conditional volatility and unexpected volatility shocks, respectively.

$$Netsales_t = \alpha + \sum_{i=1}^{p} \beta_i Netsales_{t-i} + \sum_{j=0}^{q} \delta_j \operatorname{Re}turns_{t-j} + \gamma CVolatility_t + \varepsilon_t$$

$$Netsales_t = \alpha + \sum_{i=1}^{p} \beta_i Netsales_{t-i} + \sum_{j=0}^{q} \delta_j \operatorname{Re}turns_{t-j} + \gamma XVolatility_t + \varepsilon_t$$

[22]The volatility timing behavior of mutual fund managers in Busse (1999) is mainly inferred from the sensitivity of funds' betas to conditional volatility. The study of stock fund investors' response to conditional volatility will help us better understand fund managers' behavior if we assume that fund managers can predict fund investors' behavior and act accordingly.

[23]Different lags of volatility, dividend yields, and T-bill rates are also used and our basic results are robust.

where $CVolatility_t$ denotes the conditional volatility at time t and $XVolatility_t = \widehat{\varepsilon_{1t}}$, denotes the unexpected volatility shock at time t.

Lagged fund flows are included since fund flows are serially correlated. Concurrent and lagged returns are included to correct for the risk-return relation.[24] Tables 11a and 11b present the regression results using 3 lags of fund flows and 3 lags of returns.[25] In table 11a, fund flows of all groups except for precious metal funds are negatively correlated with conditional volatility and the negative coefficients of conditional volatility are all statistically significant. In table 11b, fund flows of most groups are also negatively correlated with unexpected volatility shocks although only the coefficient for growth and income funds is statistically significant.

The strong negative relation between stock fund flows and conditional volatility indicates that stock fund investors are market volatility timers. They withdraw money from the stock market during periods of high conditional volatility. It is consistent with the finding in Busse (1999) that fund managers reduce market exposures when volatility is higher than average. If we assume that fund investors' volatility timing can be predicted based on past behavior, then it is rational for fund managers to reduce market exposure and hold more cash during periods of high market volatility since they expect that investors then invest less into stock funds or even withdraw money from the funds. The negative relation between stock fund cash flows and volatility shocks, although not very strong, suggests that fund investors' overall negative response to volatility is not entirely driven by the relation between fund flows and conditional volatility.

[24]Since volatility series is mean-reverting, an increase of the concurrent volatility forecasts a decrease in the future volatility and hence market prices will rise if changes in the future volatility are inversely related with market prices. It might induce a positive relation between fund flows and volatility shocks. Therefore we include returns in our regressions to exclude the possibility that the unexpeted volatility just serves as a proxy for returns.

[25]Using different lags has no significant impact on our results.

Implied Volatility

An alternative to instruments (dividend yield and term spread) used in the previous section as proxies for future market volatility is the implied volatility of options on a market index since it represents a market-consensus estimate of future stock market volatility. The Chicago Board Options Exchanges (CBOE) quotes a daily implied volatility index (VIX) that begins in January 1996. VIX is constructed from the implied volatilities of eight S&P 100 options using Black-Scholes option valuation framework. In this section, we use VIX as a proxy for the expected future stock market volatility.

First we regress stock fund cash flows on conditional volatility and implied volatility to see how investors react to conditional volatility and implied volatility simultaneously.

$$Netsales_t = \alpha + \sum_{i=1}^{p} \beta_i Netsales_{t-i} + \sum_{j=0}^{q} \delta_j \operatorname{Re}turns_{t-j} + \gamma_1 CVolatility_t + \gamma_2 VIX_t + \varepsilon_t$$

where $CVolatility_t$ denotes the conditional volatility at time t and VIX_t denotes the CBOE implied volatility index value at time t.

Regression results are presented in table 11c. Fund flows of all groups are negatively correlated with both conditional volatility and implied volatility. The negative coefficients of conditional volatility are statistically significant for all stock funds, aggressive growth funds, growth funds, growth and income funds, and global equity funds. The negative coefficients of implied volatility are statistically significant for all stock funds, growth and income funds, international funds, global equity funds, and income equity funds. The negative response of stock fund investors to both conditional volatility and implied volatility confirms that stock fund investors are market volatility timers. It also indicates that conditional volatility doesn't just serve as a proxy for the future expected market volatility.

To test if the negative relation between stock fund flows and past long-term market volatility documented in the previous section is caused by the persistency of volatility over time, we regress fund flows on both implied volatility and past long-term volatility.

$$\begin{aligned} Netsales_t &= \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \sum_{j=0}^{3} \delta_j \operatorname{Re}turns_{t-j} + \gamma_1 Volatility_t \\ &\quad + \gamma_2 VIX_t + \gamma_3 AVolatility_{-1} + \varepsilon_t \end{aligned}$$

Concurrent monthly volatility is included since it was shown to have a significant correlation with fund flows. Lagged fund flows are included since fund flows are serially correlated. Concurrent and lagged returns are included to correct for the risk-return relation. Regression results using past annual volatility are presented in table 11d.[26] Fund flows of all groups except for precious metal funds are still negatively correlated with past annual volatility even after taking into account the impact of implied volatility, concurrent volatility, and market returns on fund flows. It confirms our earlier results that the negative response of stock fund investors to past long-term volatility is not fully driven by the risk-return relation or by the persistency of volatility over time.

Our results indicate that fund investors react to the concurrent and past market volatility not just because they reveal information about future returns or future volatility. Busse (1999) also finds no relation between fund manages' volatility timing ability and funds' superior performance in the future. Then why do fund investors and fund managers time market volatility? Busse (1999) examines funds' conditional alphas and finds that funds' risk-adjusted returns are higher during periods of higher conditional volatility. Based on this finding he argues that fund managers' volatility timing ability can provide investors with a valuable volatility hedge. This argument can also be applied to fund investors' volatility timing behavior if we can show that

[26] Results of using past semi-annual volatility are similar to those of using past annual volatility.

risk-adjusted market returns are positively correlated with market volatility. However, Busse (1999) find no evidence between market returns and market volatility using both daily and monthly data of S&P 500, CRSP equally weighted, and CRSP value-weighted indices. Another explanation is that investors could over-react to market volatility. Investors' over-reaction to market returns is well documented in the literature.[27] Would they also over-react to market volatility? If investors are irrational and do over-react, it would well explain why part of fund investors' reaction to market volatility can not be explained by the risk/return hypothesis and the volatility persistency hypothesis, both of which are based on the assumption that investors are rational and smart enough to utilize complex models and relevant past information to predict changes in future investment opportunities. Testing for the over-reaction hypothesis could be an interesting subject of future research.

THE OTHER SIDE OF THE RELATION: DO PAST FUND FLOWS AFFECT THE VOLATILITY OF MARKET RETURNS?

The previous sections study one side of the relation between fund flows and volatility, i.e. if the past volatility of market returns has any impact on investors' asset allocation decisions. In this section we examine the other side of the relation: Do past fund flows affect the market volatility?

A primary concern of many practitioners was that the sentiments and activities of mutual fund investors, mainly small investors, some of whom are the newcomers in the stock market and presumably unsophisticated, can destabilize the equity market. They fear that a large market decline will make mutual fund investors panic and flee the market which would, in turn, exacerbate the price decline. The impact of mutual fund investors' sentiment on the market performance is also of interest to the

[27] For example, Shiller (1988) surveys investors in the wake of the 1987 market crash and finds that the reason for most investors to sell their stocks is the falling prices in the market.

academics. The so-called "noise trader" theory suggests that "noise traders", mainly individual small investors with no access to inside information, who irrationally act on noise as if it were information, can create excess stock market volatility.[28] Our previous paper finds that past fund flows, especially stock fund flows, do have certain impact on the market performance. In this section, we use our data sample to examine if past fund flows have impact on the second order of market returns, the market volatility.

In this section, we also focus on the stock fund flows during the period of 1984 to 1998 since daily returns of the bond market are not readily available. To examine the impact of stock fund flows on the subsequent stock market volatility, we regress monthly volatility series on current and lagged net flows of each fund group. To incorporate the autocorrelation of volatility into our analysis, volatility of different lags are also included in the regressions.

$$Volatility_t = \alpha + \sum_{i=0}^{p} \beta_i Netsales_{t-i} + \sum_{j=1}^{q} Volatility_{t-j} + \varepsilon_t$$

Table 12a presents the results using 3 lags of fund flows and 3 lags of volatility and table 12b presents the results using 6 lags of fund flows and 6 lags of volatility.[29] In table 12a, past flows of all stock funds have a positive impact on stock market volatility. The coefficients of lag-one, lag-two and lag-three fund flows are all positive and the coefficient of the lag-three fund flows is statistically significant. The joint F-test suggests that flows of all stock funds in the past three months together have a statistically significant positive impact on the stock market volatility at any reasonable confidence level. For aggressive growth funds, growth funds, growth and income funds, and income equity funds, net flows of past three months all have positive im-

[28]See De-Long, Shleifer, Summers and Waldmann (1990a, 1990b, 1991)

[29]Different lags of fund flows and volalitility are also used in our regressions. The basic results keep robust.

pact on stock market volatility and the joint impact is significant at a 99% confidence level for growth funds, growth and income funds, and income equity funds.

In table 12b, adding more lags of fund flows and volatility has no significant impact on our basic results. Flows of all stock funds, aggressive growth funds, growth funds, growth and income funds, and income equity funds in the past three months all have positive impact on market volatility and the joint impact is significant at a 95% confidence level for all stock funds and growth funds.

In summary, the study of stock fund flows in the period of 1984-1998 shows that fund flows have a strong positive impact on the subsequent stock market volatility. Since mutual funds are held mostly by small and inexperienced investors, the strong positive impact of past fund flows on the market volatility provides some evidence that the momentum of "noisy traders" can create excess stock market volatility.[30]

SEMI-VARIANCE: ARE INVESTORS ONLY CONCERNED ABOUT DOWNSIDE VOLATILITY?

Risk, and how it should be measured, has been one of the most hotly debated topic in the financial literature and in the investment world. Variance, or standard deviation, has been the conventional measure of risk in an investment portfolio ever since Markowitz (1952) introduced the EV criterion in his modern portfolio theory. However, as recognized in Markowitz (1959), variance may not provide a good description of a portfolio's risk if security returns are not normally distributed. Moreover, variance doesn't distinguish between upside volatility and downside volatility. Positive deviations cause variance to rise just as much as do negative ones. If investors

[30]A more appropriate way of examining the impact of fund flows on the market volatility is to decompose flow data into inflows and out flows and to study their relation with market volatility separately. See Goetzmann and Massa (1998). Unfortunately, the inflow and out flow information is not available for our data set.

are only concerned about the downside risk or safety first, then variance or standard deviation is not consistent with the risks perceived by financial and investment managers.[31] The semi-variance, or downside volatility, was therefore introduced in order to measure downside risk. Compared to variance, semi-variance measures the variation of below-mean or below-target returns and is supposedly a better measure of risks perceived by investors. Since the concept was introduced in the 1950s, there have been extensive studies in financial literature on semi-variance and alternative measures of risks. Quirk and Saposnik (1962) demonstrated the theoretical superiority of the semi-variance versus variance. Mao (1970) provided a strong argument that investors will only be interested in downside risk and the semi-variance measure should be used. Bawa (1975) and Fishburn (1977) introduced the Lower Partial Moment (LPM) risk measure and Fishburn (1977) argued that LPM is compatible with a broader class of utility function compared to variance or semi-variance and hence is a superior measure of risks.[32] Since 1990 the downside risk measures started to appear in the practitioner literature[33] and the use of the downside risk analysis in portfolio management and performance measurement has excited an intense debate, dividing both academic and practitioners.[34] One question that often came from both sides of the fence was: Are investors only concerned about downside volatility? In the

[31]Roy (1952) introduced the safety first rule and argued that investors would prefer an investment with the smallest probability of going below certain disaster level or target return.

[32]The lower partial moment is defined as:

$$LPM_n = \int_{-\infty}^{\tau} (\tau - x)^n f(x) dx$$

where f(x) is the distribution of portfolio returns, τ is the target rate, and n is the degree of the lower partial moment. LPM is equivalent to the semi-variance when n=2.

[33]See Sortino and Van der Meer (1991), Sortino and Price (1994), Rom and Ferguson (1993), and Balzer (1994) among others.

[34]See, for example, Rom and Ferguson (1993, 1994) and Kaplan and Siegel (1994a, b).

previous sections, we find stock fund investors negatively respond to the past market volatility using our monthly flow data and daily stock market return data. We also show that the reaction to past volatility cannot be completely justified by either the persistency of volatility over time or the relation between risks and returns. In this section, we use our data set to examine if fund investors react to past upside volatility and downside volatility differently. If investors are more concerned about the downside volatility, or the bad volatility, we should be able to observe this asymmetry in their attitudes to the past volatility.

As discussed in the methodology section, we construct upside volatility and downside volatility series using 10 year government bond return as the threshold return. That is, we calculate the upside volatility based on the returns higher than the threshold returns and calculate the downside volatility based on the returns lower than the threshold returns. Only stock fund flows are examined in this section since daily bond market returns are not available.

Tables 13a through 13c report the results of regressing fund flows on lagged fund flows and upside volatility of the current month, the last six months, and the last year, respectively.

$$Netsales_t = \alpha + \sum_{i=1}^{3} \beta_i Netsales_{t-i} + \gamma UpVolatility_t / UpSVolatility_{-1} / UpAVolatility_{-1} + \varepsilon_t$$

For all fund groups, flows respond negatively to upside volatility of the current month, the last six months, or the last year. We also add concurrent and lagged returns to correct for the risk/returns relation. The results in table 13d show that flows are still negatively correlated with the lagged annual volatility for all fund groups.[35]

Results in tables 13a through 13d are reproduced using downside volatility and

[35]Variables that have predicting power of the future volaitlity, e.g. dividend yields or interest rates, are also included in the regressions. Basic results keep unchanged.

they are presented in tables 14a through 14d. The regression results using downside volatility are not much different if compared to the results using the volatility or upside volatility. Downside volatility, especially concurrent or past annual, also have a negative impact on fund flows even after taking into account the autocorrelation of fund flows and the impact of returns on fund flows.

If fund investors were only concerned about the downside volatility, fund flows would react to upside volatility and downside volatility differently. A negative correlation between flows and the downside volatility and non-correlation or a positive correlation between fund flows and the upside volatility would be expected. However, our results indicate that fund investors treat those two measures of volatility with almost no difference. Therefore, stock fund investors in the sample period do not seem to be only concerned about the downside volatility. They also view the upside volatility as a measure of risk related to their investments.

CONCLUSION

In this paper, we study the relation between mutual fund flows and market volatility to examine how investors react to market volatility. A strong negative relation between stock fund flows and stock market volatility (both concurrent and past) during the period of 1984-1998 was identified even after we take into account other variables that might have potential impact on fund flows. Bond fund flows in this period, on the other hand, do not have any significant relation with past market volatility. The negative response of stock fund flows to conditional and past market volatility indicates that stock fund investors are volatility timers. It supports the finding in Busse (1999) that fund mangers time market volatility by reducing market exposure during periods of higher volatility. By utilizing semi-variance of stock market returns, we find no evidence that stock fund investors in this period are only concerned about downside volatility. Upside volatility of stock market returns also has negative impact on subsequent fund flows. Our finding that past fund flows have a strong positive impact on the stock market volatility provide some evidence that mutual fund investors' momentum destabilize the stock market to some extent.

Since our study shows that stock fund flows negatively respond to past market volatility based on either daily returns or monthly returns, we include both of them in our regressions to see which one has a bigger impact. The results (not reported here) show that stock fund flows react only to the past long-term volatility based on monthly returns. It seems to suggests that investors are more interested in the big picture of the market behavior without getting into details of how the market behaves on a daily basis.

As for the reaction of fund flows to past market returns, even after taking into account other variables that might have impact on investors' asset allocation decisions, bond investors still exhibit the trend-chasing behavior and stock investors still react negatively to the past market returns. Monthly fund flows do not seem to be sufficient to explain why fund investors behave very differently based on what market they are investing in. Using higher-frequency fund flow data, either weekly, daily or intra-day, looks more promising to reconcile this behavioral difference among stock investors and bond investors.

REFERENCES

[1] Attanasio, O., 1991, Risk, Time-Varying Second Moments and Market Efficiency, *Review of Economic Studies*, 58, 479-494.

[2] Balzer, Leslie A., 1994, Measuring investment risk: A review, *Journal of Investing,* 3, 47-58.

[3] Bawa, Vijay S., 1975, Optimal rules for ordering uncertain prospects, *Journal of Financial Economics,* 2, 95-121.

[4] Black, Fisher, 1976, Studies of stock price volatility changes, Proceedings of 1976 meetings of the Business and Economic Statistics Section of the American Statistical Association, 177-181.

[5] Black, Fisher, 1992, Living up to the model, *From Black-Sholes to Black Holes: New Frontier in Options,* London: Risk Magazine Ltd.

[6] Bollerslev, T., R.Y. Chou and K.F. Kroner, 1992, ARCH modeling in the finance: a review of the theory and empirical evidence, *Journal of Econometrics,* 52, 5-59.

[7] Bond, S.A., 1998, An econometric model of downside risk, in *Forecasting Volatility in the Financial Markets,* J. Knight and S.E. Satchell (eds), Butterworth Heinemann, Oxford.

[8] Busse, Jeffrey, 1999, Volatility timing in mutual funds: evidence from daily returns, *The review of Financial Studies,* 12, 1009-1041.

[9] Campbell, John Y., 1987, Stock returns and the term structure, *Journal of Financial Economics* 18, 373-400.

[10] Campbell, John, S. Kim, and M. Lettau, 1993, Dispersion and Volatility in Stock Returns: an Empirical Investigation, Mimeograph, Princeton University.

[11] Chen, Nai-fu, 1991, Financial investment opportunities and the macroeconomy, *Journal of Finance,* 46, 529-554.

[12] Chen, Nai-fu, R. Roll, and S. A. Ross, 1986, Economic forces and the stock market, *Journal of Business*, 56, 383-403.

[13] Christie, Andrew A., 1982, The stochastic variance of common stock variance: Value, leverage and interest rate effects, *Journal of Financial Economics* 10, 407-432.

[14] De-Long, J. Bradford, Andrei Shleifer, Lawrence H. Summers and Robert J. Waldmann, 1991, The Survival of Noise Traders in Financial Markets, *Journal of Business*, 64(1), 1-19.

[15] De-Long, J. Bradford, Andrei Shleifer, Lawrence H. Summers and Robert J. Waldmann, 1990a, Noise Trader Risk in Financial Markets, *Journal of Political Economy*, 98(4), 703-738.

[16] De-Long, J. Bradford, Andrei Shleifer, Lawrence H. Summers and Robert J. Waldmann, 1990b, Positive Feedback Investment Strategies and Destabilizing Rational Speculation, *Journal of Finance*, 45(2), 379-395.

[17] Engle, R.F., and A. P. Rodrigues, 1989, Tests of International CAPM with Time-varying Covariances, *Journal of Applied Econometrics,* 4, 119-138.

[18] Engle, R.F. 1993, Statistical models for financial volatility, *Financial Analyst Journal*, 49, 72-78

[19] Fama, Eugene F, 1990, Stock returns, expected returns, and real activity, *Journal of Finance*, 45, 1089-1108.

[20] Fama, Eugene F., and Kenneth R. French, 1989, Business conditions and expected returns on stock and bonds, *Journal of Financial Economics*, 25, 23-49

[21] Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns on Bonds and Stocks, *Journal of Financial Economics*, 33, 3-53.

[22] Fishburn, Peter C., 1977, Mean-risk analysis with risk associated with below-target returns, *American Economic Review,* 1977, 67, 116-126.

[23] Fleming, Jeff, Barbara Ostdiek, and Robert E. Whaley, 1995, Predicting stock market volatility: A new measure, *Journal of Future Markets*, 15, 265-302.

[24] French, Kenneth R., G. William Schwert, and Robert F. Stambaugh, 1987, Expected Stock Returns and Volatility, *Journal of Financial Economics* 3-29.

[25] Glosten, L. R., R. Jagannathan, and D. Runkle, 1993, On the Relation between the Expected Value and the Volatility of the Nominal Excess Return on Stocks, *Journal of Finance*, 48, 1779-1801.

[26] Goetzmann, William N. and Massimo Massa, 1998, Index Funds and Stock Market Growth, Yale University Working Paper.

[27] Goetzmann, William N., and Roger G. Ibbotson, 1994, Do Winners Repeat? Patterns in Mutual Fund Performance, *Journal of Portfolio Management* 20, 9-17.

[28] Grossman, Sanford J., and Robert J. Shiller, 1981, The Determinants of the Variability of Stock Market Prices, *American Economic Review,* 71, 222-227.

[29] Hamilton D. James, and Gang Lin, 1996, Stock Market Volatility and the Business Cycle, *Journal of Applied Econometrics*, 11, 573-593.

[30] Hamilton, James D., and R. Susmel, 1994, Autoregressive Conditional Heteroskedasticity and Change in Regime, *Journal of Econometrics,* 64, 307-333.

[31] Hansen, B. E., 1994, Autoregressive Conditional Density Estimation, *International Economic Review,* 35, 705-30.

[32] Harvey R. Campbell, and Robert E. Whaley, 1992, Market Volatility prediction and the efficiency of the S&P 100 Index Option Market, *Journal of Financial Economics*, 31, 43-73.

[33] Holthausen, Robert W., Richard W. Leftwich, and David Mayers, 1987, The effect of Large Block Transactions On Security Prices: A Cross-Sectional Analysis. *Journal of Financial Economics*, 19, 237-267.

[34] Kaplan, Paul D., and Laurence B. Siegel, 1994a, Portfolio theory is alive and well, *Journal of Investing*, 3, 18-23.

[35] Kaplan, Paul D., and Laurence B. Siegel, 1994b, Portfolio theory is alive and well, *Journal of Investing*, 3, 45-46.

[36] Keim, Donald, and Robert F. Stambaugh, 1986, Predicting returns in the stock and bond markets, *Journal of Financial Economics*, 17, 357-390

[37] Kim, Dongcheol and Kon Stanley J., 1994, Alternative Models for the Conditional Heteroskedasticity of Stock Returns, *Journal of Business* 67, 563-599.

[38] Knight J.L., Satchell, S.E. and Tran, K.C., 1995, Statistical modelling of asymmetric risks in asset returns, *Applied Mathematical Finance*, 2, 155-172.

[39] Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny, 1991, Do Institutional Investors Destabilize Stock Prices? Evidence on Herding and Feedback Trading, National Bureau of Economic Research Working Paper: 3846.

[40] Lintner, John, 1965, The valuation of risk assets and the selection of risky investment in stock portfolios and capital budgets, *Review of Economics and Statistics*, 47, 13-37.

[41] Mankiw, N. Gregory, David Romer, and Matthew Shapiro, 1985, An Unbiased Reexamination of Stock Market Volatility, *Journal of Finance*, 40, 677-687.

[42] Mao, James C. T., 1970, Models of capital budgeting, E-V vs. E-S, *Journal of Financial and Quantitative Analysis*, 5, 657-676.

[43] Markowitz, Harry, 1952, Portfolio selection, *Journal of Finance*, 7, 77-91

[44] Markowitz, Harry, 1959, *Portfolio selection: Efficient diversification of investment.* New York: John Wiley & Sons.

[45] Marsh, Terry A. and Robert C. Merton, 1986, Dividend Variability and Variance Bounds Tests for the Rationality of Stock Market Prices, *American Economic Review,* 76, 483-98.

[46] Merton, Robert C., 1973, An intertemporal capital asset pricing model, *Econometrica*, 41, 867-888.

[47] Merton, Robert C., 1980, On estimating the expected returns on the market: An exploratory investigation, Journal of Financial Economics, 8, 323-361.

[48] Officer, R. R., 1973, The Variability of the Market Factor of the New York Stock Exchange, *Journal of Business,* 46, 434-453.

[49] Poterba, James M., and Lawrence H. Summers, 1986, The Persistence of Volatility and Stock Market Fluctuations, *American Economic Review,* 76, 1142-1151.

[50] Pound, John and Robert Shiller, 1987, Are Institutional Investors Speculators?, *Journal of Portfolio Management*, 13(3), 46-52.

[51] Scholes, Myron S., 1972, The market for securities: Substitution versus price pressure and the effects of information on share prices," *Journal of Business*, 45, 179-211.

[52] Quirk, J.P., and R. Saposnik, 1962, Admissibility and measurable utility functions, *Review of Economic Studies*, (February 1962).

[53] Rom, Brian M., and Kathleen W. Ferguson, 1993, Post-modern portfolio theory comes of age, *Journal of Investing*, 3, 11-17.

[54] Rom, Brian M., and Kathleen W. Ferguson, 1994, Portfolio theory is alive and well: A response, *Journal of Investing*, 3, 24-44.

[55] Roy, A.D., 1952, Safety first and the holding of asset, *Econometrica*, 20, 431-449.

[56] Schwert, William, G., 1989a, Why Does Stock Market Volatility Change Over Time? *Journal of Finance*, 44, 1115-1153.

[57] Schwert, William, G., 1989b, Business Cycles, Financial Crises, and Stock Volatility, *Carnegie-Rochester Conference Series on Public Policy,* 31, 83-126.

[58] Schwert, William, G., 1990a, Stock volatility and the crash of '87, *Review of Financial Studies*, 3, 77-102.

[59] Schwert, William, G., 1990b, Stock returns and real activity: a century of evidence, *Journal of Finance*, 45, 1237-1257.

[60] Schwert, William, G., 1998, Stock Market Volatility: Ten Years After the Crash, *Brookings-Wharton Papers on Financial Services,* 65-113.

[61] Schlarbaum, Gary G., Wilber G. Lewellen and Ronald C. Lease, July 1977, Patterns of Investment Strategy and Behavior among Individual Investors, *Journal of Business*, 296-333.

[62] Sharpe, William F. 1964, Capital asset prices: a theory of market equilibrium under conditions of risks, *Journal of Finance*, 19, 425-42.

[63] Shefrin, Hersh and Meir Statman, September 1994, Behavioral Capital Asset Pricing Theory, *Journal of Financial and Quantitative Analysis*, 29(3), 323-349.

[64] Shiller, Robert, 1990, Market Volatility and Investor Behavior, *American Economic Review*, 58-62.

[65] Shiller, Robert, 1989, *Market Volatility*, Cambridge, Mass. and London: MIT Press.

[66] Shiller, Robert, 1984, Theories of Aggregate Stock Price Movements, *Journal of Portfolio Management,* 1, 28-37.

[67] Shiller, Robert, 1981, The Use of Volatility Measures in Assessing Market Efficiency, *Journal of Finance*, 36, 291-304.

[68] Shiller, Robert, 2000, *Irrational Exuberance.*

[69] Shleifer, Andrei and Lawrence H. Summers, Spring 1990, The Noise Trader Approach to Finance, *Journal of Economic Perspectives*, 4(2), 19-33.

[70] Shleifer, Andrei, 1986, Do Demand Curves for Stocks Slope Down?, *Journal of Finance*, 41(3), 579-590.

[71] Sirri, Erik and Peter Tufano, 1992, The Demand for Mutual Fund Services by Individual Investors, Harvard Business School Working Paper.

[72] Sortino, Frank A., and Robert Van Der Meer, 1991, Downside risk, *Journal of Portfolio Management,* 17, 27-32.

[73] Sortino, Frank A, and Lee N. Price, 1994, Performance measurement in a downside risk framework, *Journal of Investing*, 3, 59-64.

[74] Warther, Vincent A., 1998, Has the Rise of Mutual Funds Increased Market Instability, *Brookings-Wharton Papers on Financial Services,* 239-280.

Table 1a

Summary statistics of monthly stock return volatility. The volatility is calculated based on daily percentage returns of the stock market.

	Period: 1984:1 to 1998:9
Mean	0.733
median	0.639
Std. Dev.	0.436

Table 1b

Autocorrelation of monthly stock market return volatility. The volatility is calculated based on daily percentage returns of the stock market.

	Period: 1984:1 to 1998:9
lag 1	0.3353
	(2.883)
lag 2	0.2179
	(2.688)
lag 3	0.1347
	(1.686)
Lag 4	-0.1393
	(-1.92)
Lag 5	0.0525
	(0.51)
Lag 6	0.1779
	(1.355)
lag 7	0.0689
	(1.181)
lag 8	-0.0128
	(-0.181)
lag 9	0.0291
	(0.322)
Lag 10	0.0887
	(0.831)
Lag 11	0.0129
	(0.19)
Lag 12	0.0250
	(0.317)

Table 2a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on volatility of returns in the past six months:

$$\mathbf{NetSales_t = \alpha + \beta * SVolatility_{-1} + \varepsilon_t}$$

Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. Data are monthly from 1984:1 to 1998:9. The volatility is calculated based on the monthly returns of each fund group. The estimations are corrected for heteroskedasticity and autocorrelation.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metals	Intl. funds	Global Equity	Income Equity
Constant	0.1837	0.0377	0.0399	0.0505	-0.0001	0.0186	0.0135	0.0153
	(11.915)	(8.344)	(9.728)	(13.241)	(-0.072)	(4.165)	(6.352)	(8.759)
$SVolatility_{-1}$	-0.0222	-0.0044	-0.0041	-0.0058	0.0001	-0.0010	-0.0017	-0.0016
	(-8.648)	(-6.189)	(-6.16)	(-7.519)	(0.523)	(-1.357)	(-4.531)	(-3.986)
Adjusted R^2	0.195	0.126	0.104	0.203	-0.006	-0.002	0.053	0.102

Table 2b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on volatility of returns in the past year:

$$\mathbf{NetSales_t = \alpha + \beta * AVolatility_{-1} + \varepsilon_t}$$

Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. Data are monthly from 1984:1 to 1998:9. The volatility is calculated based on the monthly returns of each fund group. The estimations are corrected for heteroskedasticity and autocorrelation.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metals	Intl. funds	Global Equity	Income Equity
Constant	0.2465	0.0508	0.0529	0.0639	0.0013	0.0263	0.0208	0.0206
	(15.301)	(10.599)	(11.571)	(16.357)	(1.092)	(5.176)	(7.04)	(12.165)
$AVolatility_{-1}$	-0.0367	-0.0071	-0.0067	-0.0088	-0.0002	-0.0024	-0.0034	-0.0029
	(-12.431)	(-8.179)	(-8.569)	(-10.927)	(-0.786)	(-3.251)	(-6.577)	(-8.024)
Adjusted R^2	0.372	0.226	0.200	0.327	-0.005	0.015	0.154	0.244

Table 3a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and volatility of returns in the past six months:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1SVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0200	0.0061	0.0043	0.0076	0.0003	0.0030	0.0025	0.0002
	(1.318)	(0.921)	(0.991)	(1.992)	(0.367)	(0.785)	(1.922)	(0.14)
$SVolatility_{-1}$	-0.0014	-0.0002	-0.0001	-0.0009	0.0000	-0.0001	-0.0004	0.0002
	(-0.602)	(-0.238)	(-0.167)	(-1.309)	(0.013)	(-0.136)	(-1.684)	(0.834)
$NetSales_{t-1}$	0.4247	0.2557	0.3521	0.5878	0.0762	0.6439	0.7167	0.5869
	(5.556)	(2.773)	(3.995)	(4.956)	(0.333)	(5.462)	(5.613)	(6.884)
$NetSales_{t-2}$	0.2337	0.2569	0.2416	0.1341	-0.0191	0.0228	-0.0736	0.2693
	(2.837)	(2.743)	(2.815)	(1.369)	(-0.148)	(0.117)	(-0.375)	(4.065)
$NetSales_{t-3}$	0.2156	0.2426	0.2711	0.1565	0.1536	0.1478	0.2363	0.0574
	(2.894)	(2.821)	(2.926)	(1.866)	(1.031)	(1.354)	(1.732)	(0.781)
Adjusted R^2	0.644	0.358	0.554	0.737	-0.005	0.569	0.725	0.729

Table 3b

Regressions of net sales of stock funds (All stock funds, Aggressive growth funds, Growth funds, Growth and Income funds, Precious metal funds, Intl funds, Global equity funds and Income equity funds) on lagged net sales, and lagged semi-annual volatility of returns in the past twelve months:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1SVolatility_{-1}+ c_2SVolatility_{-2}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0645	0.0184	0.0112	0.0132	0.0011	0.0053	0.0045	0.0026
	(3.532)	(2.335)	(2.208)	(2.738)	(0.928)	(1.314)	(2.578)	(1.835)
$SVolatility_{-1}$	-0.0026	-0.0005	-0.0001	-0.0010	0.0000	0.0000	-0.0004	0.0002
	(-1.151)	(-0.594)	(-0.211)	(-1.432)	(0.065)	(0.046)	(-1.62)	(0.735)
$SVolatility_{-2}$	-0.0079	-0.0020	-0.0013	-0.0011	-0.0002	-0.0005	-0.0005	-0.0005
	(-3.315)	(-2.296)	(-1.771)	(-1.896)	(-1.104)	(-1.086)	(-1.971)	(-3.23)
$NetSales_{t-1}$	0.3823	0.2207	0.3374	0.5742	0.0719	0.6417	0.6998	0.5585
	(5.151)	(2.465)	(3.848)	(5.055)	(0.315)	(5.413)	(5.48)	(6.588)
$NetSales_{t-2}$	0.1937	0.2112	0.2178	0.1120	-0.0219	0.0232	-0.0736	0.2550
	(2.457)	(2.276)	(2.615)	(1.089)	(-0.17)	(0.119)	(-0.377)	(4.063)
$NetSales_{t-3}$	0.2035	0.2162	0.2645	0.1514	0.1519	0.1440	0.2300	0.0567
	(2.652)	(2.541)	(2.826)	(1.735)	(1.017)	(1.322)	(1.695)	(0.808)
Adjusted R^2	0.659	0.375	0.560	0.741	-0.006	0.568	0.727	0.737

Table 3c

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and volatility of returns in the past year:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0531	0.0158	0.0101	0.0107	0.0016	0.0055	0.0042	0.0021
	(2.853)	(2.033)	(1.963)	(2.397)	(1.414)	(1.287)	(2.454)	(1.46)
$AVolatility_{-1}$	-0.0077	-0.0020	-0.0012	-0.0015	-0.0003	-0.0005	-0.0008	-0.0002
	(-2.489)	(-1.653)	(-1.436)	(-1.757)	(-1.244)	(-0.877)	(-2.306)	(-0.87)
$NetSales_{t-1}$	0.3876	0.2243	0.3349	0.5848	0.0803	0.6406	0.7019	0.5679
	(5.157)	(2.467)	(3.807)	(5.242)	(0.356)	(5.366)	(5.469)	(6.287)
$NetSales_{t-2}$	0.2052	0.2199	0.2237	0.1200	-0.0074	0.0227	-0.0741	0.2566
	(2.487)	(2.258)	(2.609)	(1.189)	(-0.057)	(0.116)	(-0.38)	(3.811)
$NetSales_{t-3}$	0.2026	0.2135	0.2621	0.1467	0.1684	0.1460	0.2294	0.0483
	(2.591)	(2.509)	(2.797)	(1.714)	(1.109)	(1.331)	(1.702)	(0.664)
Adjusted R^2	0.653	0.368	0.559	0.739	0.004	0.570	0.729	0.729

Table 4a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and lagged semi-annual volatility of returns in the past twelve months:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1\ SVolatility_{-1} + d_2\ SVolatility_{-2} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0435	0.0107	0.0054	0.0121	0.0013	0.0051	0.0045	0.0026
	(2.756)	(1.898)	(1.518)	(2.583)	(1.643)	(1.314)	(2.516)	(2.193)
$Return_t$	0.0109	0.0035	0.0030	0.0017	0.0007	0.0013	0.0004	0.0007
	(12.226)	(13.452)	(16.433)	(4.281)	(6.683)	(5.9)	(3.13)	(4.084)
$Return_{t-1}$	-0.0035	-0.0012	-0.0014	-0.0002	0.0000	-0.0001	0.0000	-0.0001
	(-2.277)	(-2.562)	(-3.51)	(-0.636)	(0.4)	(-0.521)	(-0.291)	(-0.737)
$Return_{t-2}$	0.0003	-0.0005	0.0002	0.0001	0.0001	-0.0005	-0.0001	0.0000
	(0.223)	(-1.063)	(0.475)	(0.239)	(1.89)	(-2.422)	(-0.848)	(0.448)
$Return_{t-3}$	-0.0002	0.0000	-0.0001	0.0002	0.0000	-0.0004	-0.0001	0.0000
	(-0.209)	(0.099)	(-0.38)	(0.647)	(0.267)	(-2.112)	(-1.256)	(-0.163)
$SVolatility_{-1}$	-0.0034	-0.0007	-0.0004	-0.0013	-0.0000	-0.0002	-0.0005	0.0000
	(-1.645)	(-0.983)	(-0.72)	(-1.958)	(-0.274)	(-0.287)	(-2.121)	(0.034)
$SVolatility_{-2}$	-0.0049	-0.0011	-0.0005	-0.0009	-0.0001	-0.0005	-0.0004	-0.0005
	(-3.035)	(-1.794)	(-1.204)	(-1.811)	(-0.761)	(-1.067)	(-1.782)	(-3.232)
$NetSales_{t-1}$	0.5246	0.3974	0.6050	0.4868	-0.0201	0.6317	0.6957	0.5585
	(4.982)	(4.097)	(6.209)	(4.37)	(-0.121)	(6.253)	(4.875)	(4.894)
$NetSales_{t-2}$	0.1546	0.2906	0.1284	0.1589	-0.0857	0.1627	-0.0199	0.1909
	(1.403)	(2.968)	(1.188)	(1.329)	(-0.752)	(0.947)	(-0.117)	(1.931)
$NetSales_{t-3}$	0.1730	0.0983	0.1825	0.1937	0.0936	0.0660	0.1921	0.1119
	(2.095)	(1.138)	(2.085)	(2.05)	(0.843)	(0.573)	(1.55)	(1.154)
Adjusted R^2	0.859	0.744	0.832	0.803	0.495	0.681	0.748	0.815

Table 4b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and lagged annual volatility of returns:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1\ AVolatility_{-1} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0357	0.0091	0.0052	0.0100	0.0013	0.0052	0.0042	0.0022
	(2.529)	(1.674)	(1.534)	(2.387)	(1.627)	(1.298)	(2.394)	(1.861)
$Return_t$	0.0110	0.0035	0.0030	0.0017	0.0007	0.0014	0.0004	0.0007
	(12.371)	(13.739)	(16.779)	(4.261)	(6.678)	(5.848)	(3.17)	(4.053)
$Return_{t-1}$	-0.0036	-0.0012	-0.0014	-0.0002	0.0000	-0.0001	0.0000	-0.0001
	(-2.317)	(-2.69)	(-3.549)	(-0.663)	(0.415)	(-0.501)	(-0.369)	(-0.906)
$Return_{t-2}$	0.0004	-0.0004	0.0002	0.0001	0.0001	-0.0005	-0.0001	0.0000
	(0.307)	(-1.044)	(0.498)	(0.355)	(1.904)	(-2.423)	(-0.8)	(0.374)
$Return_{t-3}$	-0.0003	0.0000	-0.0001	0.0002	0.0000	-0.0004	-0.0001	0.0000
	(-0.274)	(0.059)	(-0.412)	(0.807)	(0.3)	(-2.13)	(-1.187)	(-0.411)
$AVolatility_{-1}$	-0.0064	-0.0014	-0.0008	-0.0016	-0.0001	-0.0007	-0.0008	-0.0004
	(-2.347)	(-1.507)	(-1.364)	(-1.975)	(-0.856)	(-1.115)	(-2.52)	(-1.439)
$NetSales_{t-1}$	0.5364	0.4055	0.6045	0.5050	-0.0190	0.6300	0.7014	0.5747
	(4.996)	(4.203)	(6.203)	(4.525)	(-0.114)	(6.201)	(4.907)	(4.944)
$NetSales_{t-2}$	0.1528	0.2929	0.1269	0.1598	-0.0829	0.1616	-0.0242	0.1866
	(1.366)	(2.974)	(1.182)	(1.342)	(-0.717)	(0.942)	(-0.141)	(1.883)
$NetSales_{t-3}$	0.1751	0.0993	0.1841	0.1842	0.0959	0.0686	0.1896	0.1056
	(2.096)	(1.15)	(2.124)	(1.927)	(0.864)	(0.600)	(1.544)	(1.101)
Adjusted R^2	0.858	0.744	0.834	0.801	0.500	0.684	0.749	0.811

Table 5a

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, Highyield funds and Municipal funds) on volatility of returns in the past six months:

$$\mathbf{NetSales_t = \alpha + \beta * SVolatility_{-1} + \varepsilon_t}$$

Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. Data are monthly from 1984:1 to 1998:9. The volatility is calculated based on the monthly returns of each fund group. The estimations are corrected for heteroskedasticity and autocorrelation.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	0.0357	-0.0243	0.0003	0.0041	0.0114	-0.0079
	(1.752)	(-4.667)	(0.062)	(5.413)	(3.903)	(-0.606)
$SVolatility_{-1}$	0.0906	0.0478	0.0071	0.0000	-0.0023	0.0217
	(3.781)	(6.362)	(1.678)	(-0.086)	(-1.761)	(2.12)
Adjusted R^2	0.078	0.211	0.010	-0.008	0.012	0.023

Table 5b

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, High yield funds and Municipal funds) on volatility of returns in the past year:

$$\mathbf{NetSales_t = \alpha + \beta * AVolatility_{-1} + \varepsilon_t}$$

Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. Data are monthly from 1984:1 to 1998:9. The volatility is calculated based on the monthly returns of each fund group. The estimations are corrected for heteroskedasticity and autocorrelation.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	0.0078	-0.0412	-0.0095	0.0038	0.0103	-0.0143
	(0.343)	(-6.735)	(-2.202)	(5.222)	(3.398)	(-0.841)
$AVolatility_{-1}$	0.1085	0.0599	0.0141	0.0002	-0.0015	0.0247
	(3.974)	(6.723)	(3.99)	(0.354)	(-1.304)	(1.913)
Adjusted R^2	0.099	0.260	0.063	-0.007	-0.001	0.028

Table 6a

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, High yield funds and Municipal funds) on lagged net sales, and volatility of returns in the past six months:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_1 SVolatility_{-1} + \varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	-0.0044	-0.0048	-0.0049	0.0004	0.0015	-0.0078
	(-0.336)	(-1.649)	(-2.13)	(0.677)	(0.509)	(-0.644)
$SVolatility_{-1}$	0.0288	0.0065	0.0047	0.0004	0.0006	0.0169
	(1.512)	(1.477)	(2.702)	(0.931)	(0.534)	(1.722)
$NetSales_{t-1}$	0.4381	0.8393	0.7244	0.6396	0.3312	0.1416
	(4.443)	(6.538)	(6.905)	(8.765)	(2.39)	(1.179)
$NetSales_{t-2}$	0.2350	-0.0407	0.0029	-0.0239	0.1613	0.1056
	(2.469)	(-0.205)	(0.02)	(-0.231)	(1.812)	(1.215)
$NetSales_{t-3}$	0.1316	0.1158	0.1983	0.2123	0.1982	0.0295
	(0.873)	(0.958)	(1.559)	(1.857)	(1.977)	(0.201)
Adjusted R^2	0.564	0.868	0.816	0.572	0.277	0.040

Table 6b

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, High yield funds and Municipal funds) on lagged net sales, and volatility of returns in the past year:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	-0.0073	-0.0036	-0.0056	0.0004	0.0011	-0.0121
	(-0.442)	(-1.058)	(-2.419)	(0.802)	(0.368)	(-0.704)
$AVolatility_{-1}$	0.0294	0.0046	0.0049	0.0003	0.0008	0.0191
	(1.345)	(0.954)	(3.296)	(0.741)	(0.751)	(1.440)
$NetSales_{t-1}$	0.4382	0.8501	0.7182	0.6399	0.3310	0.1447
	(4.443)	(6.697)	(7.128)	(8.714)	(2.386)	(1.214)
$NetSales_{t-2}$	0.2351	-0.0470	-0.0077	-0.0261	0.1606	0.0981
	(2.469)	(-0.232)	(-0.054)	(-0.251)	(1.782)	(1.111)
$NetSales_{t-3}$	0.1272	0.1191	0.2009	0.2107	0.1972	0.0162
	(0.844)	(0.932)	(1.577)	(1.842)	(1.996)	(0.11)
Adjusted R^2	0.563	0.866	0.816	0.571	0.277	0.043

Table 7a

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, High yield funds and Municipal funds) on current monthly returns, lagged monthly returns, lagged net sales, and lagged semi-annual volatility of returns in the past 12 months:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 SVolatility_{-1} + d_2 SVolatility_{-2} + \varepsilon_t}$$

We use 3 lags for the net sales 3 lags for returns in the model. Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	0.0618	0.0017	-0.0039	0.0010	0.0022	-0.0191
	(3.018)	(0.559)	(-1.804)	(1.577)	(0.945)	(-1.576)
$Return_t$	0.0386	0.0063	0.0033	0.0014	0.0050	0.0238
	(2.853)	(3.099)	(2.297)	(3.676)	(7.077)	(4.457)
$Return_{t-1}$	0.0419	0.0080	0.0023	0.0002	-0.0006	0.0084
	(4.158)	(3.097)	(2.418)	(0.71)	(-0.841)	(1.888)
$Return_{t-2}$	0.0099	-0.0002	-0.0007	-0.0003	0.0002	0.0103
	(0.89)	(-0.079)	(-0.645)	(-1.162)	(0.314)	(2.08)
$Return_{t-3}$	0.0180	0.0001	0.0007	-0.0001	-0.0010	0.0068
	(1.765)	(0.058)	(0.941)	(-0.486)	(-1.906)	(1.53)
$SVolatility_{-1}$	-0.0124	0.0013	0.0026	-0.0002	-0.0010	0.0148
	(-0.851)	(0.346)	(1.377)	(-0.46)	(-0.928)	(1.735)
$NetSales_{t-1}$	0.2597	0.7282	0.6416	0.5623	0.2139	0.0341
	(2.783)	(7.307)	(6.439)	(7.025)	(1.531)	(0.309)
$NetSales_{t-2}$	0.2167	0.0519	0.0576	0.0501	0.1625	0.1009
	(2.764)	(0.337)	(0.405)	(0.569)	(2.063)	(1.054)
$NetSales_{t-3}$	0.1944	0.0869	0.1831	0.2104	0.3065	0.0203
	(1.642)	(1.011)	(1.567)	(2.47)	(3.265)	(0.177)
Adjusted R^2	0.659	0.895	0.835	0.650	0.561	0.320

Table 7b

Regressions of net sales of bond funds (All bond funds, Government funds, GNMA funds, Corporate funds, High yield funds and Municipal funds) on current monthly returns, lagged monthly returns, lagged net sales, and lagged annual volatility of returns:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 AVolatility_{-1} + \varepsilon_t}$$

We use 3 lags for the net sales 3 lags for returns in the model. Net sales of bond funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the monthly returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$					
Independent variables	All bond funds	Government funds	GNMA funds	Corporate funds	High Yield funds	Municipal funds
Constant	0.0747	0.0034	-0.0043	0.0016	0.0028	-0.0127
	(3.602)	(0.887)	(-1.851)	(2.227)	(1.179)	(-0.814)
$Return_t$	0.0399	0.0064	0.0032	0.0014	0.0050	0.0238
	(2.916)	(3.154)	(2.235)	(3.897)	(6.86)	(4.507)
$Return_{t-1}$	0.0427	0.0081	0.0023	0.0002	-0.0006	0.0078
	(4.365)	(3.217)	(2.411)	(0.925)	(-0.807)	(1.785)
$Return_{t-2}$	0.0118	0.0000	-0.0008	-0.0002	0.0002	0.0102
	(1.11)	(0.004)	(-0.664)	(-0.861)	(0.41)	(2.019)
$Return_{t-3}$	0.0195	0.0003	0.0006	0.0000	-0.0009	0.0066
	(1.982)	(0.147)	(0.743)	(-0.18)	(-1.512)	(1.481)
$AVolatility_{-1}$	-0.0130	-0.0004	0.0028	-0.0006	-0.0013	0.0103
	(-0.903)	(-0.103)	(1.512)	(-1.223)	(-1.281)	(0.974)
$NetSales_{t-1}$	0.2541	0.7277	0.6390	0.5543	0.2104	0.0494
	(2.711)	(7.378)	(6.444)	(6.884)	(1.503)	(0.449)
$NetSales_{t-2}$	0.2137	0.0499	0.0538	0.0431	0.1588	0.1009
	(2.713)	(0.326)	(0.385)	(0.49)	(2.045)	(1.02)
$NetSales_{t-3}$	0.2059	0.0935	0.1836	0.2153	0.3015	0.0139
	(1.797)	(1.052)	(1.567)	(2.577)	(3.238)	(0.122)
Adjusted R^2	0.661	0.895	0.835	0.653	0.562	0.312

Table 8a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and volatility of returns in the current month:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1Volatility_t+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0675	0.0221	0.0162	0.0127	0.0005	0.0094	0.0030	0.0051
	(8.42)	(7.226)	(6.851)	(5.169)	(0.822)	(4.569)	(4.138)	(4.723)
$Volatility_t$	-0.0666	-0.0213	-0.0162	-0.0119	-0.0002	-0.0092	-0.0030	-0.0049
	(-8.329)	(-8.012)	(-6.92)	(-4.453)	(-0.309)	(-5.41)	(-4.054)	(-3.834)
$NetSales_{t-1}$	0.3573	0.1997	0.3034	0.5204	0.0812	0.6290	0.7158	0.5151
	(5.782)	(2.728)	(4.178)	(5.702)	(0.364)	(5.247)	(5.834)	(5.225)
$NetSales_{t-2}$	0.1918	0.1840	0.2011	0.1240	-0.0196	0.0210	-0.0721	0.2464
	(2.518)	(2.336)	(2.536)	(1.357)	(-0.153)	(0.11)	(-0.37)	(3.268)
$NetSales_{t-3}$	0.2580	0.2452	0.3069	0.2235	0.1555	0.1279	0.2274	0.0731
	(3.128)	(2.876)	(3.518)	(2.813)	(1.008)	(1.168)	(1.71)	(0.901)
Adjusted R^2	0.721	0.460	0.629	0.763	-0.002	0.611	0.741	0.784

Table 8b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and lagged semi-annual volatility of returns:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1SVolatility_{-1}+ c_2SVolatility_{-2}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0479	0.0149	0.0101	0.0117	0.0008	0.0075	0.0032	0.0020
	(2.573)	(2.034)	(2.07)	(2.756)	(1.194)	(1.851)	(2.308)	(1.557)
$SVolatility_{-1}$	-0.0110	-0.0026	-0.0014	-0.0057	-0.0006	-0.0011	-0.0009	0.0008
	(-1.16)	(-0.692)	(-0.477)	(-2.098)	(-1.036)	(-0.518)	(-1.566)	(0.864)
$SVolatility_{-2}$	-0.0249	-0.0084	-0.0059	-0.0031	0.0000	-0.0049	-0.0019	-0.0018
	(-1.987)	(-1.545)	(-1.349)	(-1.316)	(-0.071)	(-2.330)	(-1.846)	(-2.685)
$NetSales_{t-1}$	0.3967	0.2352	0.3418	0.5618	0.0740	0.6277	0.7093	0.5614
	(5.644)	(2.806)	(4.17)	(5.39)	(0.329)	(5.141)	(5.557)	(6.776)
$NetSales_{t-2}$	0.1900	0.2015	0.1967	0.0895	-0.0182	0.0156	-0.0804	0.2584
	(2.355)	(2.254)	(2.374)	(0.92)	(-0.144)	(0.08)	(-0.411)	(4.092)
$NetSales_{t-3}$	0.2220	0.2269	0.2815	0.1890	0.1501	0.1348	0.2249	0.0576
	(3.064)	(2.894)	(3.213)	(2.383)	(1.003)	(1.211)	(1.669)	(0.838)
Adjusted R^2	0.643	0.349	0.562	0.728	-0.007	0.581	0.730	0.730

Table 8c

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and volatility of returns in the previous year:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0439	0.0139	0.0097	0.0111	0.0008	0.0066	0.0028	0.0018
	(2.488)	(2.025)	(2.117)	(2.826)	(1.344)	(1.761)	(2.222)	(1.433)
$AVolatility_{-1}$	-0.0304	-0.0094	-0.0065	-0.0079	-0.0007	-0.0048	-0.0023	-0.0007
	(-2.062)	(-1.539)	(-1.48)	(-2.299)	(-0.889)	(-1.58)	(-2.130)	(-0.682)
$NetSales_{t-1}$	0.3954	0.2347	0.3394	0.5649	0.0738	0.6282	0.7109	0.5596
	(5.562)	(2.775)	(4.118)	(5.435)	(0.327)	(5.159)	(5.566)	(6.379)
$NetSales_{t-2}$	0.1925	0.2022	0.1978	0.0885	-0.0198	0.0167	-0.0799	0.2578
	(2.374)	(2.225)	(2.369)	(0.91)	(-0.157)	(0.085)	(-0.407)	(4.018)
$NetSales_{t-3}$	0.2242	0.2256	0.2813	0.1861	0.1487	0.1365	0.2280	0.0590
	(3.037)	(2.843)	(3.169)	(2.36)	(0.993)	(1.223)	(1.69)	(0.833)
Adjusted R^2	0.644	0.350	0.564	0.729	0.001	0.582	0.731	0.728

Table 9a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and lagged semi-annual volatility of returns:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 SVolatility_{-1} + d_2 SVolatility_{-2} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0223	0.0066	0.0050	0.0096	0.0006	0.0058	0.0029	0.0017
	(1.869)	(1.442)	(1.716)	(2.425)	(1.001)	(1.486)	(1.918)	(1.375)
$SVolatility_{-1}$	-0.0107	-0.0023	-0.0031	-0.0064	-0.0002	-0.0018	-0.0013	0.0003
	(-1.017)	(-0.622)	(-1.172)	(-2.292)	(-0.225)	(-0.780)	(-1.785)	(0.276)
$SVolatility_{-2}$	-0.0111	-0.0038	-0.0021	-0.0019	0.0003	-0.0034	-0.0016	-0.0015
	(-1.746)	(-1.179)	(-0.820)	(-0.950)	(0.424)	(-1.598)	(-1.587)	(-2.198)
$Return_t$	0.0110	0.0035	0.0034	0.0017	0.0006	0.0013	0.0004	0.0007
	(13.088)	(14.153)	(19.113)	(4.48)	(6.11)	(5.721)	(3.169)	(4.01)
$Return_{t-1}$	-0.0036	-0.0011	-0.0019	-0.0003	0.0001	-0.0001	0.0000	-0.0001
	(-2.4)	(-2.479)	(-5.224)	(-0.961)	(0.842)	(-0.594)	(-0.321)	(-1.032)
$Return_{t-2}$	0.0004	-0.0005	0.0004	0.0001	0.0001	-0.0005	-0.0001	0.0001
	(0.304)	(-1.324)	(0.861)	(0.254)	(0.991)	(-2.597)	(-0.618)	(0.644)
$Return_{t-3}$	-0.0003	0.0000	-0.0002	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.301)	(0.066)	(-0.592)	(0.559)	(0.224)	(-2.018)	(-0.821)	(-0.129)
$NetSales_{t-1}$	0.5309	0.3826	0.6480	0.4804	-0.0337	0.6263	0.7119	0.5745
	(5.136)	(4.209)	(7.527)	(4.448)	(-0.199)	(6.108)	(5.078)	(5.24)
$NetSales_{t-2}$	0.1674	0.3173	0.0539	0.1486	-0.0470	0.1555	-0.0350	0.1939
	(1.536)	(3.573)	(0.558)	(1.296)	(-0.39)	(0.898)	(-0.201)	(2.045)
$NetSales_{t-3}$	0.2015	0.1286	0.2193	0.2260	0.1095	0.0539	0.1891	0.1103
	(2.419)	(1.538)	(2.912)	(2.519)	(0.946)	(0.46)	(1.528)	(1.179)
Adjusted R^2	0.851	0.736	0.855	0.792	0.445	0.689	0.748	0.809

Table 9b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and volatility of the past year:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 AVolatility_{-1} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0204	0.0061	0.0049	0.0093	0.0007	0.0053	0.0025	0.0015
	(1.854)	(1.46)	(1.821)	(2.504)	(1.17)	(1.457)	(1.838)	(1.268)
$AVolatility_{-1}$	-0.0190	-0.0054	-0.0049	-0.0075	0.0001	-0.0044	-0.0024	-0.0010
	(-1.828)	(-1.302)	(-1.71)	(-2.288)	(0.094)	(-1.441)	(-2.127)	(-0.871)
$Return_t$	0.0110	0.0035	0.0034	0.0017	0.0006	0.0013	0.0004	0.0007
	(13.092)	(14.181)	(19.077)	(4.422)	(6.104)	(5.802)	(3.234)	(4.076)
$Return_{t-1}$	-0.0036	-0.0011	-0.0019	-0.0003	0.0001	-0.0001	0.0000	-0.0001
	(-2.374)	(-2.469)	(-5.223)	(-0.933)	(0.832)	(-0.565)	(-0.307)	(-1.092)
$Return_{t-2}$	0.0004	-0.0006	0.0004	0.0001	0.0001	-0.0005	-0.0001	0.0001
	(0.307)	(-1.337)	(0.858)	(0.308)	(1.06)	(-2.577)	(-0.609)	(0.585)
$Return_{t-3}$	-0.0003	0.0000	-0.0002	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.334)	(0)	(-0.587)	(0.768)	(0.255)	(-2.068)	(-0.833)	(-0.361)
$NetSales_{t-1}$	0.5310	0.3834	0.6465	0.4873	-0.0327	0.6253	0.7133	0.5768
	(5.144)	(4.203)	(7.52)	(4.528)	(-0.192)	(6.136)	(5.077)	(5.166)
$NetSales_{t-2}$	0.1673	0.3165	0.0537	0.1462	-0.0503	0.1567	-0.0343	0.1902
	(1.529)	(3.55)	(0.56)	(1.28)	(-0.424)	(0.906)	(-0.197)	(2.018)
$NetSales_{t-3}$	0.2033	0.1307	0.2192	0.2174	0.1070	0.0558	0.1910	0.1141
	(2.439)	(1.572)	(2.917)	(2.432)	(0.926)	(0.475)	(1.542)	(1.229)
Adjusted R^2	0.852	0.738	0.856	0.793	0.449	0.691	0.750	0.808

Table 10a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on dividend yield, T-bill rate, current monthly returns, lagged monthly returns, lagged net sales, volatility of current monthly, and lagged semi-annual volatility:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 Volatility_t + d_2 DY_t + d_3 TB_t + d_4 SVolatility_{-1} + d_5 SVolatility_{-2} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.1952	0.0791	0.0327	0.0282	-0.0018	0.0200	0.0091	0.0040
	(3.104)	(4.258)	(2.956)	(2.163)	(-1.136)	(2.039)	(2.499)	(1.269)
$Volatility_t$	-0.0147	-0.0021	0.0020	-0.0036	0.0006	-0.0053	-0.0014	-0.0031
	(-2.054)	(-0.856)	(1.177)	(-0.981)	(1.089)	(-3.471)	(-1.552)	(-3.056)
DY_t	-46.3441	-22.6470	-9.8238	-4.7930	1.0616	-4.0245	-1.8889	0.1079
	(-2.679)	(-3.952)	(-2.769)	(-1.29)	(1.668)	(-1.51)	(-1.694)	(0.113)
TB_t	-0.7433	-0.1287	0.2098	-0.2782	-0.1334	-0.2643	-0.1192	-0.2516
	(-0.485)	(-0.279)	(0.545)	(-0.523)	(-1.481)	(-0.662)	(-0.57)	(-1.555)
$SVolatility_{-1}$	-0.0201	-0.0063	-0.0045	-0.0058	-0.0005	-0.0001	-0.0008	0.0013
	(-1.728)	(-1.849)	(-1.747)	(-1.780)	(-0.683)	(-0.034)	(-1.04)	(1.216)
$SVolatility_{-2}$	-0.0191	-0.0035	-0.0012	-0.0028	-0.0002	-0.0029	-0.0014	-0.0019
	(-3.087)	(-1.173)	(-0.455)	(-1.305)	(-0.245)	(-1.557)	(-1.578)	(-2.798)
$Return_t$	0.0101	0.0035	0.0035	0.0015	0.0006	0.0012	0.0004	0.0005
	(10.351)	(11.178)	(14.926)	(3.737)	(6.107)	(5.644)	(2.518)	(4.24)
$Return_{t-1}$	-0.0032	-0.0007	-0.0017	-0.0003	0.0001	-0.0001	0.0000	-0.0002
	(-2.271)	(-1.605)	(-4.651)	(-0.909)	(1.248)	(-0.438)	(-0.206)	(-1.529)
$Return_{t-2}$	0.0008	-0.0001	0.0005	0.0001	0.0001	-0.0005	-0.0001	0.0000
	(0.654)	(-0.123)	(1.142)	(0.378)	(1.397)	(-2.464)	(-0.436)	(0.341)
$Return_{t-3}$	0.0007	0.0006	0.0000	0.0003	0.0001	-0.0003	0.0000	0.0000
	(0.779)	(1.762)	(0.064)	(0.898)	(0.662)	(-1.679)	(-0.57)	(0.057)
$NetSales_{t-1}$	0.4469	0.2326	0.5932	0.4542	-0.0717	0.6017	0.6870	0.5788
	(4.163)	(2.614)	(6.638)	(4.316)	(-0.453)	(5.811)	(4.927)	(5.512)
$NetSales_{t-2}$	0.0962	0.1596	0.0196	0.1281	-0.0706	0.1342	-0.0476	0.1851
	(0.889)	(1.679)	(0.206)	(1.12)	(-0.608)	(0.788)	(-0.283)	(2.013)
$NetSales_{t-3}$	0.1028	-0.0327	0.1595	0.1835	0.0742	0.0333	0.1687	0.0831
	(1.221)	(-0.373)	(2.045)	(1.988)	(0.594)	(0.275)	(1.425)	(0.886)
Adjusted R^2	0.860	0.768	0.859	0.795	0.446	0.698	0.750	0.823

Table 10b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on dividend yield, T-bill rate, current monthly returns, lagged monthly returns, lagged net sales, volatility of current monthly, and volatility of the past year:

$$NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 Volatility_t + d_2 DY_t + d_3 TB_t + d_4 AVolatility_{-1} + \varepsilon_t$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.1939	0.0770	0.0321	0.0282	-0.0019	0.0204	0.0090	0.0047
	(3.201)	(4.343)	(2.972)	(2.166)	(-1.208)	(2.127)	(2.478)	(1.515)
$Volatility_t$	-0.0151	-0.0026	0.0015	-0.0041	0.0006	-0.0049	-0.0014	-0.0026
	(-2.053)	(-0.995)	(0.862)	(-1.218)	(1.091)	(-3.559)	(-1.700)	(-2.318)
DY_t	-46.7895	-22.1722	-9.5469	-4.7531	1.0993	-4.3943	-1.9806	-0.2530
	(-2.785)	(-4.063)	(-2.784)	(-1.275)	(1.762)	(-1.666)	(-1.768)	(-0.271)
TB_t	-0.7019	-0.1259	0.1901	-0.2886	-0.1372	-0.2470	-0.1105	-0.2364
	(-0.456)	(-0.272)	(0.496)	(-0.545)	(-1.518)	(-0.619)	(-0.524)	(-1.425)
$AVolatility_{-1}$	-0.0347	-0.0084	-0.0053	-0.0078	-0.0006	-0.0026	-0.0019	-0.0007
	(-2.918)	(-2.254)	(-1.881)	(-2.134)	(-0.829)	(-0.931)	(-1.900)	(-0.555)
$Return_t$	0.0101	0.0035	0.0035	0.0015	0.0006	0.0013	0.0004	0.0005
	(10.385)	(11.254)	(14.577)	(3.722)	(6.102)	(5.809)	(2.66)	(4.577)
$Return_{t-1}$	-0.0032	-0.0007	-0.0017	-0.0003	0.0001	-0.0001	0.0000	-0.0002
	(-2.266)	(-1.614)	(-4.67)	(-0.918)	(1.244)	(-0.381)	(-0.187)	(-1.524)
$Return_{t-2}$	0.0008	-0.0001	0.0005	0.0001	0.0001	-0.0005	-0.0001	0.0000
	(0.662)	(-0.141)	(1.101)	(0.39)	(1.471)	(-2.412)	(-0.421)	(0.359)
$Return_{t-3}$	0.0007	0.0006	0.0001	0.0003	0.0001	-0.0003	-0.0001	0.0000
	(0.755)	(1.767)	(0.178)	(1.027)	(0.700)	(-1.717)	(-0.59)	(-0.254)
$NetSales_{t-1}$	0.4460	0.2352	0.5921	0.4572	-0.0708	0.5979	0.6868	0.5772
	(4.171)	(2.661)	(6.68)	(4.347)	(-0.447)	(5.817)	(4.91)	(5.291)
$NetSales_{t-2}$	0.0954	0.1644	0.0228	0.1268	-0.0741	0.1351	-0.0469	0.1750
	(0.880)	(1.740)	(0.241)	(1.111)	(-0.651)	(0.793)	(-0.279)	(1.863)
$NetSales_{t-3}$	0.1040	-0.0283	0.1566	0.1773	0.0722	0.0341	0.1700	0.0870
	(1.230)	(-0.324)	(1.989)	(1.927)	(0.579)	(0.281)	(1.435)	(0.925)
Adjusted R^2	0.861	0.769	0.860	0.796	0.450	0.699	0.752	0.819

Table 11a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and conditional volatility:

$$\mathbf{NetSales_t=a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_0Return_t+c_1Return_{t-1}+c_2Return_{t-2}+c_3Return_{t-3}+d_1CVolatility_t+\varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. CVolatility, the conditional volatility, is the fitted value from regressing concurrent volatility onto past volatility, dividend yields, and T-bill rates. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0419	0.0107	0.0076	0.0137	0.0006	0.0078	0.0037	0.0030
	(2.786)	(2.495)	(2.379)	(2.961)	(1.03)	(1.956)	(2.48)	(2.332)
$CVolatility_t$	-0.0399	-0.0098	-0.0075	-0.0119	0.0001	-0.0072	-0.0036	-0.0026
	(-2.903)	(-2.213)	(-2.269)	(-2.978)	(0.126)	(-2.049)	(-2.640)	(-2.027)
$Return_t$	0.0109	0.0035	0.0033	0.0017	0.0006	0.0013	0.0004	0.0007
	(12.156)	(13.946)	(18.489)	(4.18)	(6.106)	(5.742)	(3.216)	(3.85)
$Return_{t-1}$	-0.0042	-0.0014	-0.0020	-0.0004	0.0001	-0.0001	-0.0001	-0.0002
	(-2.789)	(-3.403)	(-5.257)	(-1.327)	(0.98)	(-0.548)	(-0.462)	(-1.18)
$Return_{t-2}$	0.0006	-0.0003	0.0002	0.0002	0.0001	-0.0005	-0.0001	0.0001
	(0.402)	(-0.651)	(0.458)	(0.509)	(1.354)	(-2.496)	(-0.398)	(0.823)
$Return_{t-3}$	-0.0004	-0.0001	-0.0001	0.0002	0.0000	-0.0004	-0.0001	0.0000
	(-0.382)	(-0.348)	(-0.221)	(0.568)	(0.336)	(-2.061)	(-1.078)	(-0.064)
$NetSales_{t-1}$	0.4987	0.4308	0.6331	0.4293	-0.0415	0.5733	0.6625	0.4809
	(4.909)	(4.85)	(6.871)	(4.308)	(-0.247)	(5.602)	(5.057)	(4.027)
$NetSales_{t-2}$	0.1860	0.2500	0.1270	0.1929	-0.0654	0.2003	0.0099	0.2489
	(1.772)	(2.771)	(1.226)	(1.864)	(-0.553)	(1.248)	(0.063)	(2.625)
$NetSales_{t-3}$	0.1586	0.0901	0.1209	0.1866	0.0967	0.0401	0.1758	0.1169
	(1.899)	(1.021)	(1.452)	(2.118)	(0.833)	(0.355)	(1.533)	(1.31)
Adjusted R^2	0.816	0.723	0.826	0.749	0.456	0.670	0.728	0.774

Table 11b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, and unexpected volatility:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 XVolatility_t + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. XVolatility, the unexpected volatility, is the residual from regressing concurrent volatility onto past volatility, dividend yields, and T-bill rates. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0042	0.0019	0.0008	0.0027	0.0007	0.0015	0.0006	0.0006
	(0.65)	(1.135)	(0.539)	(1.389)	(2.377)	(1.024)	(0.92)	(0.948)
$XVolatility_t$	-0.1207	-0.0138	0.0101	-0.0689	-0.0014	-0.0128	-0.0161	-0.0084
	(-0.945)	(-0.313)	(0.254)	(-2.028)	(-0.218)	(-0.560)	(-1.708)	(-0.829)
$Return_t$	0.0110	0.0036	0.0033	0.0017	0.0006	0.0013	0.0004	0.0007
	(11.814)	(14.049)	(18.352)	(3.993)	(6.25)	(5.782)	(3.216)	(3.722)
$Return_{t-1}$	-0.0046	-0.0015	-0.0021	-0.0006	0.0001	-0.0001	-0.0001	-0.0002
	(-2.974)	(-3.615)	(-5.68)	(-1.856)	(0.938)	(-0.491)	(-0.538)	(-1.425)
$Return_{t-2}$	0.0006	-0.0003	0.0002	0.0002	0.0001	-0.0005	0.0000	0.0001
	(0.41)	(-0.544)	(0.445)	(0.513)	(1.352)	(-2.246)	(-0.093)	(0.803)
$Return_{t-3}$	-0.0001	-0.0001	0.0000	0.0003	0.0000	-0.0003	-0.0001	0.0000
	(-0.076)	(-0.288)	(-0.023)	(1.073)	(0.323)	(-1.851)	(-0.673)	(0.041)
$NetSales_{t-1}$	0.5254	0.4577	0.6636	0.4617	-0.0404	0.5823	0.6773	0.4890
	(5.092)	(5.052)	(7.134)	(4.805)	(-0.238)	(5.599)	(5.192)	(4.012)
$NetSales_{t-2}$	0.2160	0.2735	0.1477	0.2213	-0.0640	0.2135	0.0188	0.2638
	(1.903)	(2.932)	(1.313)	(2.057)	(-0.545)	(1.307)	(0.115)	(2.464)
$NetSales_{t-3}$	0.1713	0.1113	0.1202	0.1853	0.0974	0.0626	0.1896	0.1348
	(1.931)	(1.212)	(1.338)	(2.047)	(0.847)	(0.564)	(1.604)	(1.462)
Adjusted R^2	0.807	0.713	0.820	0.741	0.456	0.662	0.721	0.768

Table 11c

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, conditional volatility, and implied volatility:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 CVolatility_t + d_2 VIX_t + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. CVolatility, the conditional volatility, is the fitted value from regressing concurrent volatility onto past volatility, dividend yields, and T-bill rates. VIX is the implied volatility extracted from CBOE's implied volatility index. Data are monthly from 1986:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0974	0.0196	0.0110	0.0252	-0.0003	0.0184	0.0069	0.0066
	(3.645)	(2.65)	(1.994)	(3.419)	(-0.307)	(3.377)	(3.563)	(3.399)
$CVolatility_t$	-0.0366	-0.0087	-0.0086	-0.0103	-0.0005	-0.0025	-0.0025	-0.0003
	(-2.937)	(-1.959)	(-2.549)	(-2.743)	(-0.472)	(-0.826)	(-1.971)	(-0.186)
VIX_t	-0.0024	-0.0004	-0.0001	-0.0005	0.0001	-0.0007	-0.0002	-0.0003
	(-2.835)	(-1.577)	(-0.380)	(-1.959)	(1.385)	(-3.331)	(-2.303)	(-2.757)
$Return_t$	0.0093	0.0033	0.0033	0.0013	0.0007	0.0012	0.0004	0.0005
	(9.141)	(10.479)	(12.709)	(3.292)	(6.508)	(5.728)	(2.823)	(3.746)
$Return_{t-1}$	-0.0042	-0.0015	-0.0020	-0.0003	0.0001	-0.0001	0.0000	-0.0002
	(-2.809)	(-3.543)	(-4.826)	(-0.978)	(0.648)	(-0.448)	(-0.291)	(-1.531)
$Return_{t-2}$	0.0002	-0.0002	0.0002	0.0001	0.0002	-0.0004	0.0000	0.0000
	(0.144)	(-0.59)	(0.427)	(0.375)	(2.225)	(-2.168)	(-0.183)	(0.207)
$Return_{t-3}$	-0.0002	0.0000	0.0000	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.15)	(0.024)	(-0.075)	(0.595)	(0.37)	(-1.761)	(-1.022)	(0.003)
$NetSales_{t-1}$	0.4948	0.4478	0.6435	0.4116	-0.0464	0.5667	0.6520	0.4943
	(4.781)	(4.976)	(6.342)	(4.053)	(-0.303)	(5.741)	(5.13)	(4.298)
$NetSales_{t-2}$	0.1611	0.2268	0.1204	0.1991	-0.1058	0.1654	-0.0009	0.2370
	(1.515)	(2.304)	(1.075)	(1.911)	(-0.953)	(1.092)	(-0.006)	(2.727)
$NetSales_{t-3}$	0.0868	0.0252	0.0897	0.1338	0.0543	0.0148	0.1566	0.0813
	(1.010)	(0.272)	(1.016)	(1.47)	(0.417)	(0.135)	(1.443)	(0.922)
Adjusted R^2	0.830	0.735	0.823	0.771	0.502	0.690	0.736	0.792

Table 11d

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on dividend yield, T-bill rate, current monthly returns, lagged monthly returns, lagged net sales, volatility of current monthly, volatility of the past year, and implied volatility:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 Volatility_t + d_2 AVolatility_{-1} + d_3 VIX_t + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on the daily stock market returns. VIX is the implied volatility extracted from CBOE's implied volatility index. Data are monthly from 1986:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0490	0.0114	0.0070	0.0145	-0.0001	0.0142	0.0051	0.0032
	(1.935)	(1.359)	(1.415)	(2.08)	(-0.066)	(2.217)	(2.617)	(1.796)
$Volatility_t$	-0.0080	-0.0005	0.0023	-0.0052	0.0002	0.0031	0.0004	-0.0026
	(-0.473)	(-0.089)	(0.604)	(-1.02)	(0.163)	(0.603)	(0.234)	(-1.469)
$AVolatility_{-1}$	-0.0214	-0.0062	-0.0060	-0.0077	-0.0004	0.0004	-0.0016	-0.0001
	(-2.159)	(-1.480)	(-1.903)	(-2.337)	(-0.407)	(0.148)	(-1.26)	(-0.053)
VIX_t	-0.0007	-0.0001	-0.0001	0.0000	0.0001	-0.0007	-0.0002	0.0000
	(-0.434)	(-0.309)	(-0.311)	(0.021)	(0.611)	(-1.470)	(-1.081)	(-0.085)
$Return_t$	0.0100	0.0034	0.0034	0.0014	0.0007	0.0013	0.0004	0.0005
	(9.687)	(10.066)	(13.232)	(3.54)	(6.701)	(5.585)	(2.728)	(4.125)
$Return_{t-1}$	-0.0040	-0.0013	-0.0020	-0.0002	0.0001	-0.0002	0.0000	-0.0002
	(-2.619)	(-2.794)	(-5.166)	(-0.776)	(0.721)	(-0.714)	(-0.388)	(-1.639)
$Return_{t-2}$	0.0002	-0.0005	0.0004	0.0001	0.0002	-0.0004	-0.0001	0.0000
	(0.16)	(-1.117)	(0.982)	(0.168)	(1.996)	(-2.264)	(-0.449)	(-0.144)
$Return_{t-3}$	-0.0002	0.0000	-0.0002	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.205)	(0.107)	(-0.488)	(0.753)	(0.451)	(-1.751)	(-0.79)	(-0.16)
$NetSales_{t-1}$	0.5398	0.4038	0.6701	0.4752	-0.0523	0.6083	0.7026	0.5933
	(5.019)	(4.278)	(7.456)	(4.073)	(-0.336)	(5.997)	(5.028)	(5.244)
$NetSales_{t-2}$	0.1522	0.2888	0.0320	0.1730	-0.1070	0.1404	-0.0406	0.1974
	(1.323)	(2.894)	(0.321)	(1.417)	(-0.938)	(0.844)	(-0.242)	(2.022)
$NetSales_{t-3}$	0.1527	0.0875	0.1887	0.1723	0.0597	0.0317	0.1729	0.0773
	(1.701)	(0.93)	(2.32)	(1.871)	(0.480)	(0.274)	(1.470)	(0.801)
Adjusted R^2	0.856	0.741	0.851	0.804	0.495	0.700	0.751	0.818

Table 12a

Regressions of stock market return volatility on current and lagged net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds), and lagged volatility:

$$\textbf{Volatility}_t = a+b_0\ \textbf{NetSales}_t+b_1\ \textbf{NetSales}_{t-1}+b_2\ \textbf{NetSales}_{t-2}+b_3\ \textbf{NetSales}_{t-3}+c_1\ \textbf{Volaitlity}_{t-1}+c_2\ \textbf{Volatility}_{t-2}+c_3\ \textbf{Volatility}_{t-3}+\varepsilon_t$$

We use 3 lags for the net sales and 3 lags for the volatility in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $Volatility_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.4528	0.4355	0.3829	0.4565	0.3131	0.3951	0.3842	0.4159
	(4.482)	(4.208)	(5.301)	(4.157)	(6.442)	(4.335)	(5.021)	(4.865)
$NetSales_t$	-3.3530	-8.5437	-9.8663	-11.2528	-1.0401	-7.9644	-14.8855	-43.3569
	(-1.699)	(-1.766)	(-1.64)	(-1.245)	(-0.108)	(-1.469)	(-1.696)	(-1.513)
$NetSales_{t-1}$	0.9618	0.7282	1.4767	2.1399	18.5366	5.6775	11.1394	23.7778
	(1.364)	(0.781)	(0.796)	(0.672)	(1.452)	(1.282)	(1.441)	(1.313)
$NetSales_{t-2}$	0.5129	0.9835	2.3468	3.1675	-7.9195	0.2753	-0.0497	7.1951
	(0.703)	(0.497)	(0.904)	(0.804)	(-0.606)	(0.154)	(-0.012)	(0.875)
$NetSales_{t-3}$	1.1683	3.0276	4.2895	4.0518	18.8045	-0.8852	-0.3222	4.9930
	(2.001)	(2.256)	(2.38)	(1.389)	(0.654)	(-0.41)	(-0.071)	(0.960)
$Volatility_{t-1}$	0.1941	0.2014	0.1998	0.1722	0.2551	0.2265	0.2218	0.2312
	(4.629)	(4.398)	(3.588)	(4.369)	(3.355)	(5.169)	(5.147)	(3.81)
$Volatility_{t-2}$	0.1216	0.1513	0.1736	0.1324	0.1189	0.1487	0.1428	0.1034
	(2.671)	(2.987)	(2.853)	(2.701)	(1.991)	(4.009)	(4.392)	(2.319)
$Volatility_{t-3}$	0.1470	0.1291	0.1472	0.1329	0.1608	0.1144	0.1249	0.1758
	(1.648)	(1.224)	(1.668)	(1.718)	(2.78)	(1.328)	(1.594)	(2.976)
Joint F-test	6.426	2.014	4.844	4.572	2.957	1.686	1.062	7.720
	(0.000)	(0.115)	(0.003)	(0.004)	(0.035)	(0.173)	(0.368)	(0.000)
Adjusted R^2	0.333	0.302	0.282	0.249	0.172	0.188	0.154	0.329

Table 12b

Regressions of stock market return volatility on current and lagged net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds), and lagged volatility:

$$\textbf{Volatility}_t = a+b_0\ NetSales_t+b_1\ NetSales_{t-1}+b_2\ NetSales_{t-2}+b_3\ NetSales_{t-3}+ b_4\ NetSales_{t-4}+b_5\ NetSales_{t-5}+b_6\ NetSales_{t-6}+c_1\ Volaitlity_{t-1}+c_2\ Volatility_{t-2}+c_3\ Volatility_{t-3}+ c_4\ Volaitlity_{t-4}+c_5\ Volatility_{t-5}+c_6\ Volatility_{t-6}+\varepsilon_t$$

We use 3 lags for the net sales and 3 lags for the volatility in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The volatility is calculated based on daily stock market returns. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: Volatility$_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.4259	0.3909	0.3530	0.4060	0.2388	0.3496	0.3268	0.3551
	(4.649)	(5.03)	(4.671)	(3.736)	(3.363)	(4.831)	(4.662)	(4.345)
NetSales$_t$	-3.2587	-8.6547	-9.6520	-9.9420	-0.2048	-8.4927	-15.7785	-41.8103
	(-1.831)	(-1.857)	(-1.665)	(-1.381)	(-0.025)	(-1.551)	(-1.732)	(-1.642)
NetSales$_{t-1}$	0.9902	0.5536	1.8003	3.2705	16.1698	7.1646	11.8021	25.2127
	(1.636)	(0.592)	(1.052)	(0.861)	(1.776)	(1.443)	(1.595)	(1.531)
NetSales$_{t-2}$	0.5133	1.2257	2.9611	2.0267	-6.6568	-0.6938	1.2624	5.0246
	(0.775)	(0.625)	(1.084)	(0.672)	(-0.792)	(-0.354)	(0.305)	(0.676)
NetSales$_{t-3}$	0.9862	2.6647	4.7611	4.3830	11.7334	-1.3409	-4.6442	0.6263
	(1.901)	(2.334)	(3.169)	(1.391)	(0.783)	(-0.546)	(-0.546)	(0.087)
NetSales$_{t-4}$	-0.6401	-0.6934	-1.3215	-5.0994	-10.7305	1.5948	5.5748	-5.8624
	(-1.254)	(-0.693)	(-1.116)	(-1.251)	(-1.162)	(0.92)	(0.939)	(-1.06)
NetSales$_{t-5}$	0.0177	0.9132	-0.4630	-1.7517	-14.9650	-3.4652	-8.5386	4.6672
	(0.036)	(0.932)	(-0.286)	(-0.49)	(-1.472)	(-1.307)	(-1.627)	(0.712)
NetSales$_{t-6}$	0.7997	1.0959	0.0649	5.9538	47.9626	2.7440	7.6497	6.6538
	(0.733)	(0.5)	(0.034)	(0.95)	(1.694)	(0.842)	(1.115)	(0.661)
Volatility$_{t-1}$	0.2154	0.2110	0.2201	0.2037	0.3258	0.2466	0.2406	0.2489
	(4.054)	(3.313)	(3.079)	(3.75)	(3.53)	(4.38)	(4.049)	(4.353)
Volatility$_{t-2}$	0.1576	0.1850	0.2158	0.1950	0.2085	0.1745	0.1641	0.1224
	(2.94)	(2.972)	(2.843)	(2.962)	(4.393)	(3.461)	(3.845)	(2.659)
Volatility$_{t-3}$	0.1289	0.1277	0.1527	0.1105	0.0353	0.1044	0.1104	0.1449
	(1.068)	(1.062)	(1.368)	(1.022)	(0.355)	(1.025)	(1.057)	(1.77)
Volatility$_{t-4}$	-0.1798	-0.1692	-0.1626	-0.2024	-0.0908	-0.1284	-0.1325	-0.1717
	(-2.346)	(-2.449)	(-2.457)	(-1.927)	(-1.741)	(-1.913)	(-1.863)	(-2.927)
Volatility$_{t-5}$	-0.0095	0.0211	-0.0049	-0.0133	-0.0338	-0.0281	-0.0034	0.0404
	(-0.147)	(0.337)	(-0.065)	(-0.158)	(-0.467)	(-0.565)	(-0.067)	(0.689)
Volatility$_{t-6}$	0.1758	0.1500	0.1423	0.1904	0.1824	0.1783	0.1785	0.1865
	(1.347)	(1.271)	(1.252)	(1.438)	(2.156)	(1.484)	(1.403)	(1.578)
Joint F-test	2.912	1.260	3.640	2.298	2.103	2.066	1.154	3.990
	(0.037)	(0.291)	(0.015)	(0.081)	(0.103)	(0.108)	(0.330)	(0.010)
Adjusted R^2	0.342	0.306	0.282	0.281	0.381	0.196	0.165	0.339

Table 13a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and upside volatility of returns in the current month:

$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1Volatility_t+\varepsilon_t}$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The upside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0448	0.0122	0.0084	0.0099	0.0011	0.0089	0.0027	0.0045
	(1.522)	(1.274)	(1.07)	(1.68)	(1.819)	(3.136)	(3.733)	(1.951)
$Volatility_t$	-0.0655	-0.0152	-0.0105	-0.0145	-0.0019	-0.0146	-0.0046	-0.0073
	(-1.012)	(-0.724)	(-0.583)	(-1.118)	(-1.517)	(-2.654)	(-3.691)	(-1.429)
$NetSales_{t-1}$	0.3991	0.2404	0.3438	0.5771	0.0914	0.6269	0.7137	0.5369
	(6.203)	(3.083)	(4.362)	(6.331)	(0.408)	(5.093)	(5.777)	(5.729)
$NetSales_{t-2}$	0.1952	0.2096	0.2061	0.1057	-0.0195	0.0135	-0.0751	0.2501
	(2.275)	(2.189)	(2.361)	(1.124)	(-0.151)	(0.069)	(-0.378)	(3.518)
$NetSales_{t-3}$	0.2398	0.2448	0.2915	0.1931	0.1666	0.1331	0.2302	0.0548
	(3.078)	(2.979)	(3.296)	(2.436)	(1.113)	(1.187)	(1.689)	(0.712)
Adjusted R^2	0.654	0.353	0.565	0.736	0.007	0.595	0.734	0.754

Table 13b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and upside volatility of returns in the previous six months:

$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1SVolatility_{-1}+\varepsilon_t}$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The upside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0389	0.0129	0.0085	0.0110	0.0007	0.0065	0.0027	0.0016
	(2.557)	(2.196)	(1.995)	(3.066)	(1.026)	(1.766)	(2.359)	(1.195)
$SVolatility_{-1}$	-0.0478	-0.0156	-0.0097	-0.0149	-0.0009	-0.0086	-0.0041	-0.0010
	(-2.023)	(-1.695)	(-1.396)	(-2.314)	(-0.579)	(-1.478)	(-2.276)	(-0.426)
$NetSales_{t-1}$	0.4075	0.2453	0.3486	0.5692	0.0759	0.6313	0.7141	0.5629
	(5.837)	(2.921)	(4.217)	(5.612)	(0.337)	(5.251)	(5.652)	(6.506)
$NetSales_{t-2}$	0.2024	0.2111	0.2065	0.0980	-0.0182	0.0179	-0.0793	0.2595
	(2.551)	(2.405)	(2.494)	(1.018)	(-0.144)	(0.092)	(-0.4)	(4.031)
$NetSales_{t-3}$	0.2241	0.2278	0.2815	0.1888	0.1510	0.1353	0.2276	0.0594
	(3.013)	(2.802)	(3.148)	(2.365)	(1.009)	(1.211)	(1.681)	(0.837)
Adjusted R^2	0.642	0.348	0.562	0.730	-0.001	0.581	0.730	0.728

Table 13c

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and upside volatility of returns in the previous year:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The upside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0586	0.0196	0.0121	0.0122	0.0010	0.0098	0.0039	0.0021
	(2.821)	(2.521)	(2.167)	(2.68)	(1.171)	(1.916)	(2.229)	(1.362)
$AVolatility_{-1}$	-0.0824	-0.0281	-0.0166	-0.0165	-0.0014	-0.0149	-0.0065	-0.0019
	(-2.41)	(-2.117)	(-1.621)	(-2.115)	(-0.815)	(-1.82)	(-2.185)	(-0.723)
$NetSales_{t-1}$	0.3931	0.2268	0.3396	0.5728	0.0738	0.6207	0.7051	0.5604
	(5.62)	(2.759)	(4.127)	(5.656)	(0.327)	(5.043)	(5.499)	(6.439)
$NetSales_{t-2}$	0.1862	0.1906	0.1956	0.0910	-0.0205	0.0123	-0.0830	0.2568
	(2.283)	(2.096)	(2.314)	(0.926)	(-0.162)	(0.063)	(-0.424)	(3.99)
$NetSales_{t-3}$	0.2127	0.2118	0.2761	0.1795	0.1483	0.1250	0.2189	0.0559
	(2.897)	(2.679)	(3.107)	(2.268)	(0.991)	(1.100)	(1.63)	(0.787)
Adjusted R^2	0.646	0.357	0.566	0.729	0.001	0.585	0.732	0.728

Table 13d

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, upside volatility of current monthly, and upside volatility of the past year:

$$\mathbf{NetSales_t=a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_0Return_t+c_1Return_{t-1}+c_2Return_{t-2}+c_3Return_{t-3}+d_1Volatility_t+d_2AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The upside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0337	0.0079	0.0050	0.0121	0.0003	0.0100	0.0043	0.0033
	(2.315)	(1.396)	(1.403)	(2.579)	(0.394)	(2.03)	(2.257)	(2.072)
$Volatility_t$	-0.0217	0.0017	0.0023	-0.0080	0.0018	-0.0091	-0.0028	-0.0057
	(-1.618)	(0.372)	(0.679)	(-1.289)	(1.247)	(-3.508)	(-1.753)	(-2.843)
$AVolatility_{-1}$	-0.0397	-0.0148	-0.0112	-0.0121	-0.0006	-0.0090	-0.0053	0.0000
	(-1.635)	(-1.637)	(-1.714)	(-1.59)	(-0.353)	(-1.161)	(-1.777)	(-0.004)
$Return_t$	0.0108	0.0036	0.0034	0.0016	0.0006	0.0013	0.0004	0.0006
	(13.846)	(13.462)	(18.234)	(5.152)	(5.934)	(5.983)	(3.005)	(6.245)
$Return_{t-1}$	-0.0037	-0.0011	-0.0019	-0.0003	0.0001	-0.0001	0.0000	-0.0002
	(-2.476)	(-2.374)	(-5.19)	(-1.067)	(1.129)	(-0.559)	(-0.305)	(-1.596)
$Return_{t-2}$	0.0004	-0.0005	0.0004	0.0001	0.0001	-0.0005	-0.0001	0.0000
	(0.299)	(-1.26)	(0.931)	(0.254)	(1.154)	(-2.636)	(-0.632)	(0.098)
$Return_{t-3}$	-0.0002	0.0000	-0.0002	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.21)	(0.08)	(-0.507)	(0.885)	(0.409)	(-1.943)	(-0.748)	(-0.201)
$NetSales_{t-1}$	0.5317	0.3798	0.6491	0.4959	-0.0689	0.6150	0.7023	0.5849
	(5.233)	(4.15)	(7.499)	(4.72)	(-0.425)	(5.896)	(5.037)	(5.44)
$NetSales_{t-2}$	0.1596	0.3140	0.0544	0.1508	-0.0586	0.1475	-0.0372	0.1974
	(1.46)	(3.43)	(0.57)	(1.306)	(-0.511)	(0.854)	(-0.213)	(2.153)
$NetSales_{t-3}$	0.1928	0.1250	0.2173	0.2036	0.0801	0.0424	0.1815	0.0841
	(2.314)	(1.521)	(2.877)	(2.301)	(0.632)	(0.351)	(1.469)	(0.937)
Adjusted R^2	0.853	0.737	0.855	0.794	0.451	0.697	0.751	0.821

Table 14a

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and downside volatility of returns in the current month:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1Volatility_t+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The downside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0591	0.0201	0.0151	0.0111	0.0003	0.0076	0.0024	0.0042
	(8.246)	(6.22)	(6.604)	(6.682)	(0.595)	(4.247)	(3.839)	(6.13)
$Volatility_t$	-0.0959	-0.0319	-0.0252	-0.0169	0.0001	-0.0116	-0.0038	-0.0064
	(-8.573)	(-5.458)	(-6.277)	(-8.365)	(0.071)	(-5.33)	(-3.647)	(-5.449)
$NetSales_{t-1}$	0.3549	0.2051	0.2978	0.4957	0.0763	0.6359	0.7229	0.5191
	(6.015)	(2.996)	(4.414)	(5.49)	(0.343)	(5.434)	(5.845)	(5.353)
$NetSales_{t-2}$	0.2069	0.1947	0.2113	0.1451	-0.0187	0.0271	-0.0707	0.2511
	(2.876)	(2.672)	(2.868)	(1.556)	(-0.147)	(0.144)	(-0.366)	(3.406)
$NetSales_{t-3}$	0.2630	0.2464	0.3129	0.2374	0.1497	0.1291	0.2275	0.0775
	(3.235)	(2.938)	(3.709)	(3.062)	(0.957)	(1.207)	(1.73)	(0.947)
Adjusted R^2	0.761	0.533	0.679	0.779	-0.002	0.616	0.743	0.796

Table 14b

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and downside volatility of returns in the previous six months:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1SVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The downside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0174	0.0059	0.0044	0.0068	0.0007	0.0028	0.0013	0.0003
	(1.511)	(1.264)	(1.435)	(2.536)	(1.756)	(1.173)	(1.834)	(0.381)
$SVolatility_{-1}$	-0.0058	-0.0012	-0.0011	-0.0056	-0.0008	-0.0008	-0.0010	0.0012
	(-0.514)	(-0.253)	(-0.331)	(-1.742)	(-1.232)	(-0.319)	(-1.304)	(1.264)
$NetSales_{t-1}$	0.4237	0.2615	0.3574	0.5740	0.0731	0.6433	0.7241	0.5804
	(5.936)	(3.007)	(4.256)	(5.348)	(0.326)	(5.418)	(5.71)	(7.096)
$NetSales_{t-2}$	0.2145	0.2298	0.2133	0.1015	-0.0182	0.0229	-0.0758	0.2682
	(2.682)	(2.631)	(2.569)	(1.066)	(-0.143)	(0.117)	(-0.381)	(4.169)
$NetSales_{t-3}$	0.2355	0.2466	0.2876	0.1992	0.1496	0.1485	0.2368	0.0638
	(3.261)	(3.083)	(3.271)	(2.550)	(1.003)	(1.356)	(1.736)	(0.907)
Adjusted R^2	0.638	0.341	0.559	0.727	0.002	0.578	0.727	0.729

Table 14c

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on lagged net sales, and downside volatility of returns in the previous year:

$$\mathbf{NetSales_t = a+b_1NetSales_{t-1}+b_2NetSales_{t-2}+b_3NetSales_{t-3}+c_1AVolatility_{-1}+\varepsilon_t}$$

We use 3 lags for the net sales in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The downside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0321	0.0100	0.0077	0.0090	0.0007	0.0047	0.0020	0.0015
	(2.169)	(1.746)	(2.041)	(2.69)	(1.474)	(1.634)	(2.124)	(1.476)
$AVolatility_{-1}$	-0.0272	-0.0077	-0.0063	-0.0084	-0.0008	-0.0040	-0.0021	-0.0007
	(-1.632)	(-1.101)	(-1.281)	(-2.139)	(-0.912)	(-1.312)	(-1.956)	(-0.559)
$NetSales_{t-1}$	0.4019	0.2436	0.3416	0.5655	0.0739	0.6340	0.7161	0.5607
	(5.588)	(2.831)	(4.128)	(5.332)	(0.328)	(5.252)	(5.622)	(6.39)
$NetSales_{t-2}$	0.1991	0.2123	0.2009	0.0901	-0.0194	0.0194	-0.0780	0.2593
	(2.466)	(2.35)	(2.42)	(0.934)	(-0.154)	(0.099)	(-0.395)	(4.055)
$NetSales_{t-3}$	0.2312	0.2353	0.2849	0.1919	0.1488	0.1426	0.2328	0.0611
	(3.143)	(2.98)	(3.215)	(2.44)	(0.994)	(1.291)	(1.718)	(0.862)
Adjusted R^2	0.642	0.346	0.563	0.729	0.001	0.580	0.730	0.728

Table 14d

Regressions of net sales of stock funds (All stock funds, Aggressive Growth funds, Growth funds, Growth and Income funds, Precious Metals funds, International funds, Global Equity funds, and Income Equity funds) on current monthly returns, lagged monthly returns, lagged net sales, downside volatility of current monthly, and downside volatility of the past year:

$$\mathbf{NetSales_t = a + b_1 NetSales_{t-1} + b_2 NetSales_{t-2} + b_3 NetSales_{t-3} + c_0 Return_t + c_1 Return_{t-1} + c_2 Return_{t-2} + c_3 Return_{t-3} + d_1 Volatility_t + d_2 AVolatility_{-1} + \varepsilon_t}$$

We use 3 lags for the net sales and 3 lags for returns in the model. Net sales of stock funds are normalized by the total value of the stock market at the end of the previous month. The downside volatility is calculated based on the daily returns of each fund group. Data are monthly from 1984:1 to 1998:9. The estimations are corrected for heteroskedasticity.

	Dependent Variables: $NetSales_t$							
Independent variables	All stock funds	Aggressive Growth	Growth	Growth & Income	Precious Metal	Intl funds	Global Equity	Income Equity
Constant	0.0230	0.0053	0.0031	0.0102	0.0006	0.0056	0.0024	0.0025
	(2.221)	(1.275)	(1.175)	(2.885)	(1.34)	(1.893)	(2.057)	(2.24)
$Volatility_t$	-0.0189	-0.0024	0.0018	-0.0073	0.0004	-0.0056	-0.0017	-0.0033
	(-1.963)	(-0.591)	(0.739)	(-1.738)	(0.701)	(-3.234)	(-1.813)	(-1.946)
$AVolatility_{-1}$	-0.0163	-0.0046	-0.0058	-0.0068	-0.0001	-0.0028	-0.0019	-0.0003
	(-1.446)	(-0.999)	(-1.869)	(-1.859)	(-0.068)	(-0.913)	(-1.705)	(-0.225)
$Return_t$	0.0099	0.0034	0.0035	0.0012	0.0006	0.0012	0.0003	0.0005
	(8.666)	(9.562)	(12.37)	(2.913)	(6.112)	(5.47)	(2.4)	(3.575)
$Return_{t-1}$	-0.0037	-0.0011	-0.0019	-0.0003	0.0001	-0.0001	0.0000	-0.0002
	(-2.534)	(-2.536)	(-5.289)	(-1.175)	(0.86)	(-0.59)	(-0.345)	(-1.522)
$Return_{t-2}$	0.0002	-0.0006	0.0004	0.0000	0.0001	-0.0005	-0.0001	0.0000
	(0.17)	(-1.382)	(0.905)	(0.042)	(1.077)	(-2.501)	(-0.596)	(0.187)
$Return_{t-3}$	-0.0004	0.0000	-0.0002	0.0002	0.0000	-0.0003	-0.0001	0.0000
	(-0.361)	(-0.029)	(-0.644)	(0.66)	(0.291)	(-1.96)	(-0.767)	(-0.374)
$NetSales_{t-1}$	0.5312	0.3855	0.6517	0.4827	-0.0402	0.6294	0.7183	0.5856
	(5.197)	(4.234)	(7.558)	(4.465)	(-0.238)	(6.219)	(5.166)	(5.4)
$NetSales_{t-2}$	0.1677	0.3171	0.0513	0.1577	-0.0507	0.1537	-0.0373	0.1983
	(1.522)	(3.507)	(0.539)	(1.358)	(-0.433)	(0.899)	(-0.214)	(2.161)
$NetSales_{t-3}$	0.2018	0.1348	0.2223	0.2141	0.0978	0.0560	0.1964	0.0935
	(2.383)	(1.616)	(2.961)	(2.397)	(0.789)	(0.479)	(1.576)	(1.014)
Adjusted R^2	0.853	0.735	0.855	0.797	0.446	0.696	0.749	0.816