

# 2018 MARKET VOLATILITY EFFECTS ON MUTUAL FUND MARKET TIMING TRADING

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## SYNOPSIS

The spirit of the SEC Rule 22c-2 was to ultimately reduce short term trading and market timing trades in mutual funds. Short term traders and market timers typically look to profit from market events or large pricing moves in markets. With the market volatility experienced in the first quarter of 2018, it is logical to believe that market timing trades in mutual funds would have increased during this period. To validate this hypothesis, an analytical review of mutual fund trading patterns was undertaken to determine if short term trading and market timing did increase during this period.

### Analysis Approach

The approach of the analysis is to review trading and 22c-2 compliance violation activity across 26 fund clients and compare trends to the VIX and to the market (S&P 500). The resulting violations will then be overlaid to the results to see if there was a correlation between the market movements and the activity trends. The timeframe of the data set analyzed was from May 1, 2017, through May 31, 2018. The trading trends will be evaluated across all the clients as a whole

To observe true trends, and in the spirit of looking for actual market timers, the data set was normalized. Trades that were executed due to share class transitions, plan fund changes, non-tax exchanges, etc. were removed from the data set. The Category 1 trade analysis only included fund categories that had fund actions taken at any point in the time period. This allowed the analysis to focus on fund types susceptible to market timing and not be skewed by trades in funds that were not relevant to market timing.

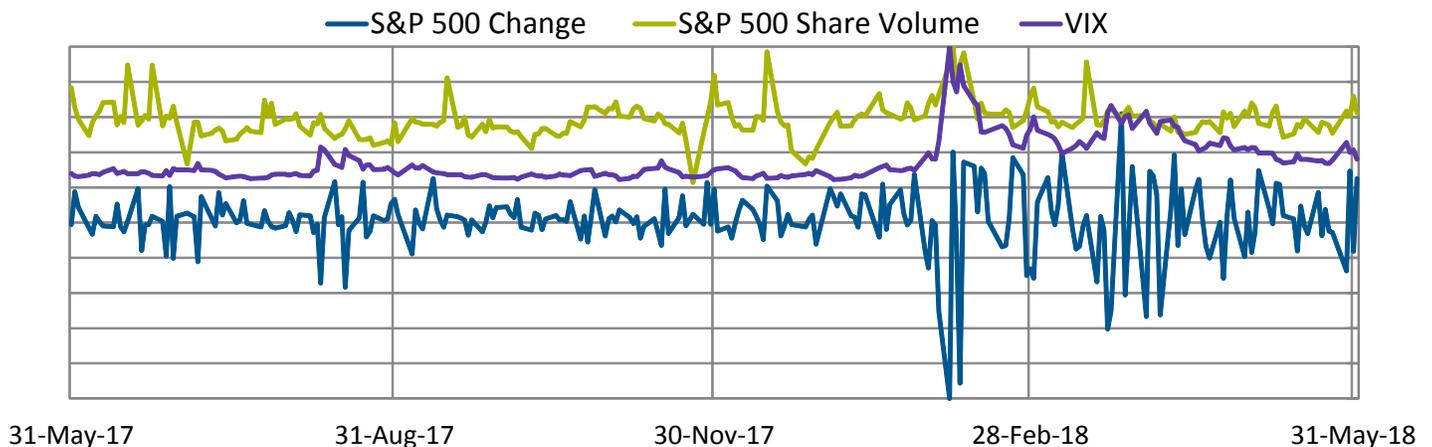
### Market Volatility Baseline

To establish a baseline, the S&P 500 price, volume, and movement were overlaid with the VIX. Although the VIX uses a complex formula that is based on short term trading futures, based on the hypothesis it should be a leading indicator.

Figure 1 shows the normalized market patterns. The chart clearly reflects the period of volatility after January 2018 with the VIX spiking, the S&P 500 index showing large movements, and the S&P 500 volume following the price movements. However, when looking at the S&P 500 volume prior to the period of volatility, there were large movements with no real movements in the S&P 500 index or the volatility index. This will impact the ability to show correlation between volume and market timing. Therefore, S&P 500 volume was removed from consideration in the analysis.

Interestingly, large volume swings occurred consistently at roughly 15 days prior to quarter end followed by a large decrease in volume the next day. This movement roughly coincides with triple/quadruple witching days.

**Figure 1**  
Normalized Chart Depicting S&P Price and Volume Change and VIX



### Analysis 1: T/A and Sub-T/A Trading Activity

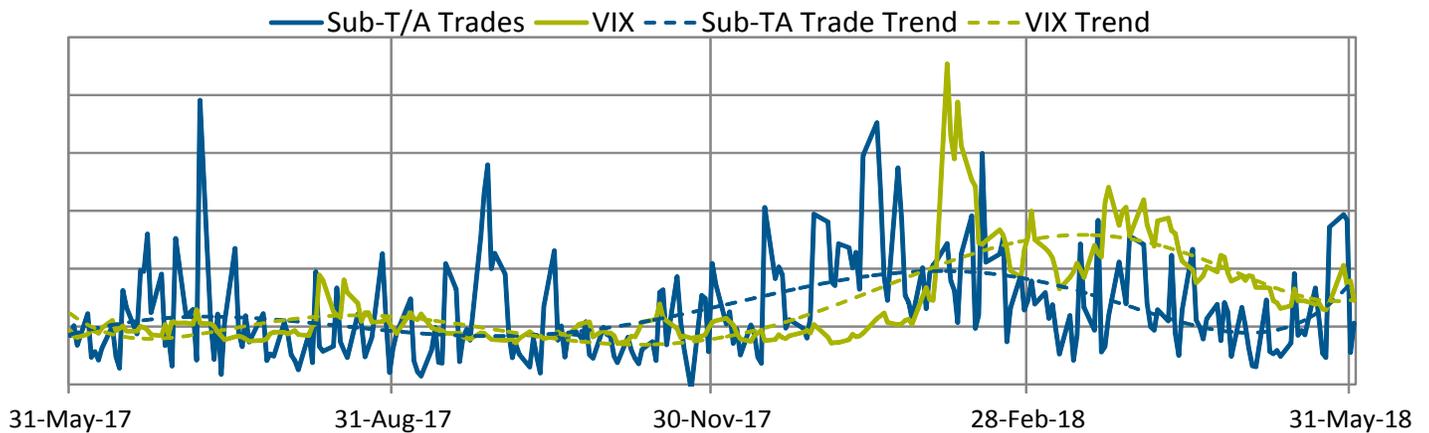
The trade counts and dollars of the client population were analyzed versus the VIX and showed no correlation. This was expected since the T/A data included all trades within omnibus accounts, and the Sub-T/A data included systematic trades which are not considered eligible for marketing timing violations.

### Analysis 2: Category 1 Trading Activity

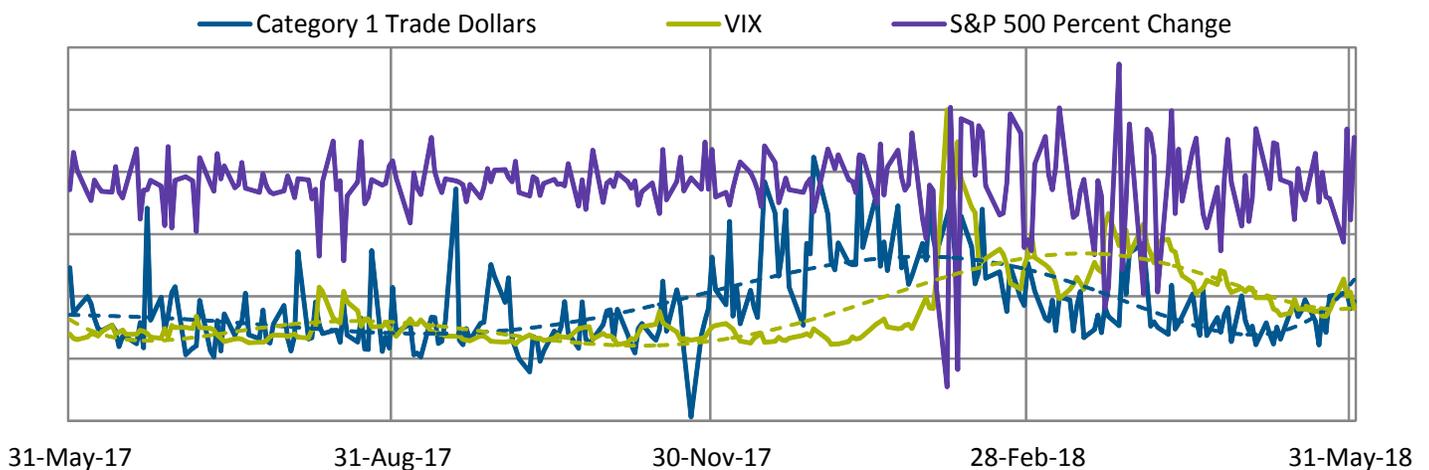
Sub-T/A trade counts and dollar volume of category 1 trades showed only a little more correlation to the market than the trade population as a whole. Figure 2 shows the trade counts versus the VIX. On the surface, there is not much discernable correlation. The more interesting finding of this analysis was the trend line correlation. Looking at the two trend lines, the trades precede the VIX by about two months, making it appear to be a leading indicator of volatility.

To further explore this pattern, the trading dollars were reviewed versus the VIX in Figure 3. During the market volatility, it does appear as if the Sub-T/A trade dollars lead the VIX. However, at closer glance, the trade dollars do not track at all with the VIX, thus eliminating this notion.

**Figure 2**  
Category 1 Sub-T/A Trade Volumes vs the VIX



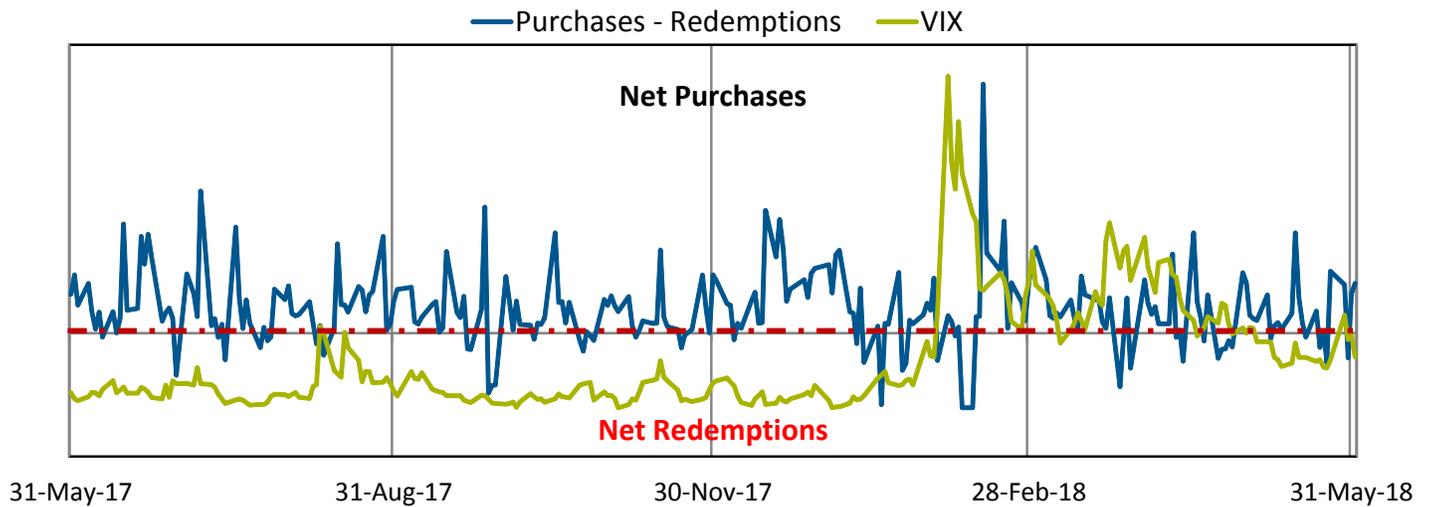
**Figure 3**  
Category 2 Sub-T/A Trade Dollars vs the VIX



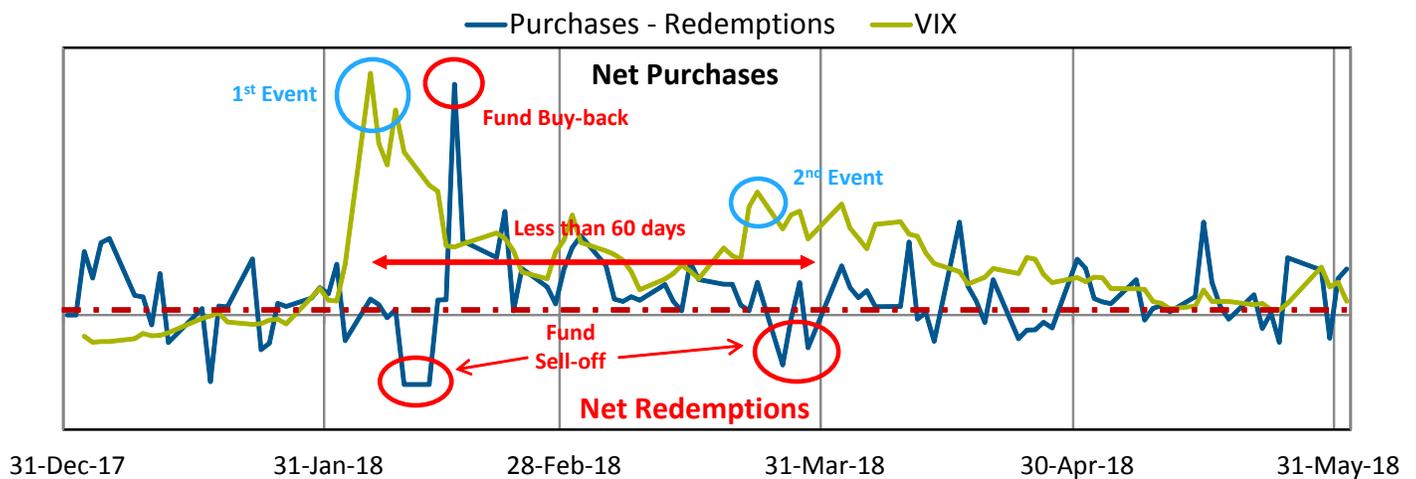
Taking another approach, the net trade count (purchase trade count – redemption trade count) and net dollar amounts were reviewed against the VIX. Figure 4 shows the net trade counts versus the VIX. Although there is no discernable correlation, it is interesting to note that extreme peaks (market volatility) in the VIX precede peaks in net trade counts. Unfortunately there are many less extreme peaks that are not preceded by a peak in the VIX. When applying several regression models, none of the models showed any relevant correlation.

Focusing in on the volatile market period that occurred in 2018, there does appear to be an observable correlation at the macro level. In Figure 5, the first market sell-off event exhibited a double-peak in the VIX. Following the double-peak, the category 1 trades had a period of sell-offs and then had a peak buy-back. There are many possible explanations for this. The steep sell-off could have been viewed as an opportunity to buy back into the market. The buy-back also may have had investors seeking refuge in less risky funds. When the second sell-off event occurred, the event was less dramatic, resulting in two peak sell-offs. The second event was more sustained, resulting in no quick return to the market.

**Figure 4**  
Category 1 Net Trades vs the VIX



**Figure 5**  
2018 Category 1 Net Trades vs the VIX

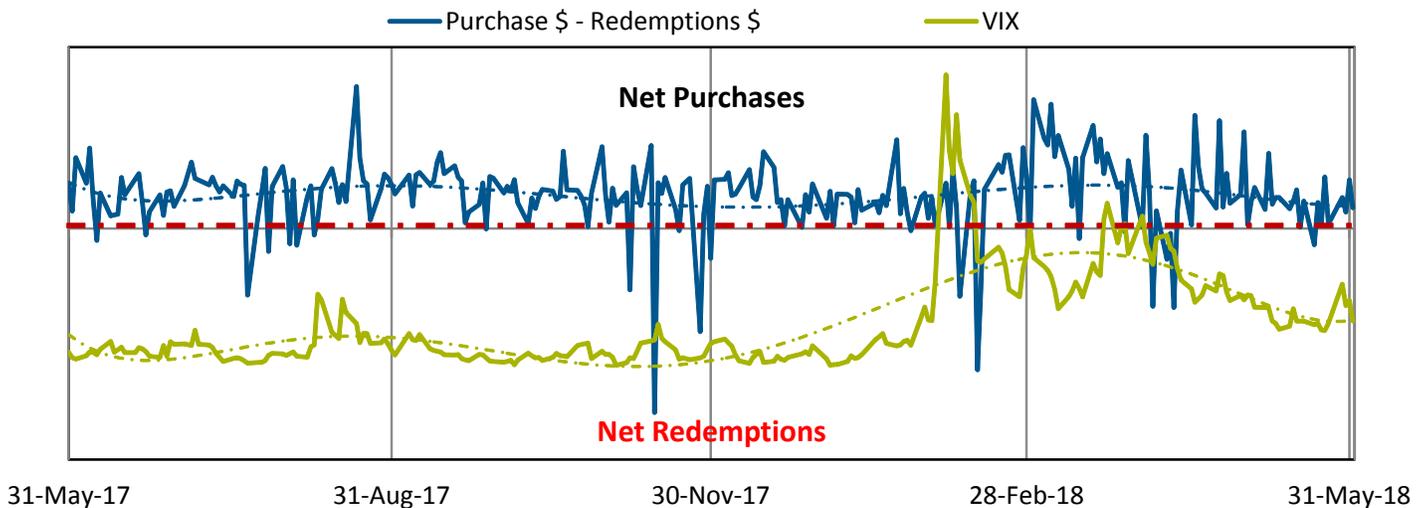


The market volatility and related trading activity occurred in less than a two month period. Mutual funds typically impose 90-day round-trip restrictions which should produce an increase in market timing alerts during this time.

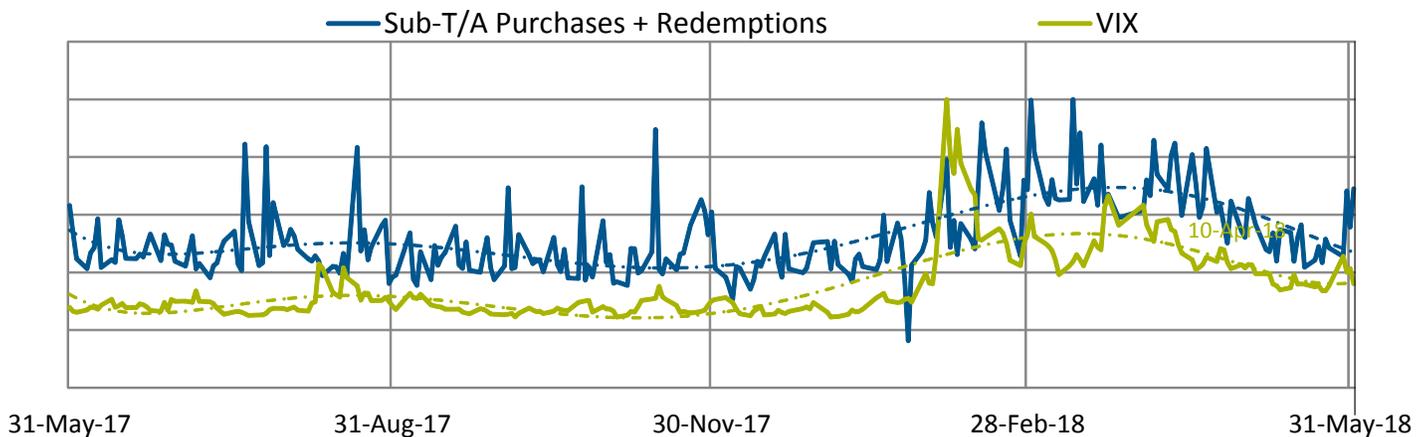
Looking at the net trade dollars in Figure 6, there is no discernable correlation until the market volatility period. During the period of high volatility, the trading shows redemptions during peak VIX levels and purchases during reduced VIX levels.

When looking at gross dollars shown in Figure 7 (trade amounts are additive instead of netted), upon the beginning of high volatility the trade dollars follow the VIX quite well. When analyzing the full period, a standard regression model shows that only 5% of the trading patterns are explainable by the movement in the VIX. However, when focusing on the period from February 5th and on, the trading patterns are 23% explainable by the movement in the VIX. Furthermore, the trend lines track very well. In any case, there is still no credible correlation between the trading patterns of the client base and the VIX.

**Figure 6**  
Category 1 Net Trade Dollars vs the VIX



**Figure 7**  
Category 1 Gross Trade Dollars vs the VIX



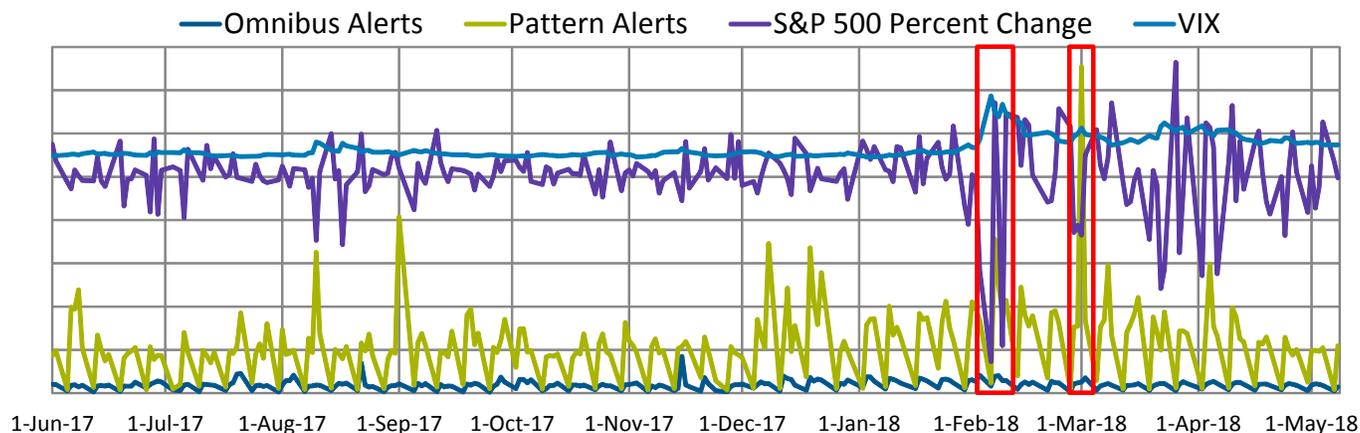
### Analysis 3: Market Timing Alerts and Actions

Although the analysis of overall fund trading activity of the client base analyzed versus the market did not result in a high degree of correlation, there is an expectation that individual market timers would correlate with movements in the market. To analyze this hypothesis, the alerts due to suspicious trading activity were compared to the market. The omnibus alerts that align with the market trading activity did not show correlation, which was expected based on the analyses to this point. The pattern tool alerts which represent individual market timing activity show a correlation with the extreme market volatility periods as highlighted by red boxes in Figure 8. However, there is unfortunately no strong correlation during normal market volatility.

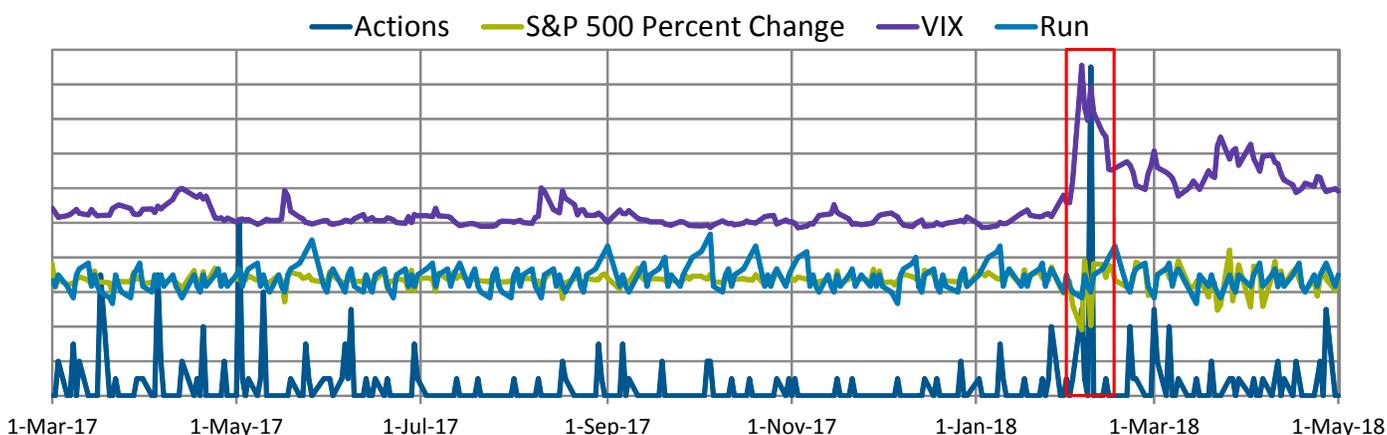
Taking the analysis a step further, the fund shareholder actions were compared to the market. Shareholder actions include market timing warning sent to traders and actual trading restrictions placed on shareholders. As with the other charts, the data in Figure 9 shows no strong correlation. However, what is again evident is that large market volatility does coincide with market timing (see the red box).

In addition to comparing the fund shareholder actions to the market volatility, an additional analysis was added called “Run” and is shown in Figure 9. The Run tracked the number of days in succession the market moved in one direction. So a down day followed by two consecutive up days had a value of 2 where as one down day preceded by an up day had a value of -1. The runs had a maximum down run of four days (-4) and a maximum up run of eight days. In theory, successive up days would entice market timers to quickly sell and successive down days would entice market timers to buy back in. This evaluation also proved to have no correlation.

**Figure 8**  
Trading Alerts vs the Market



**Figure 9**  
Fund Shareholder Actions vs the Market



## CONCLUSIONS

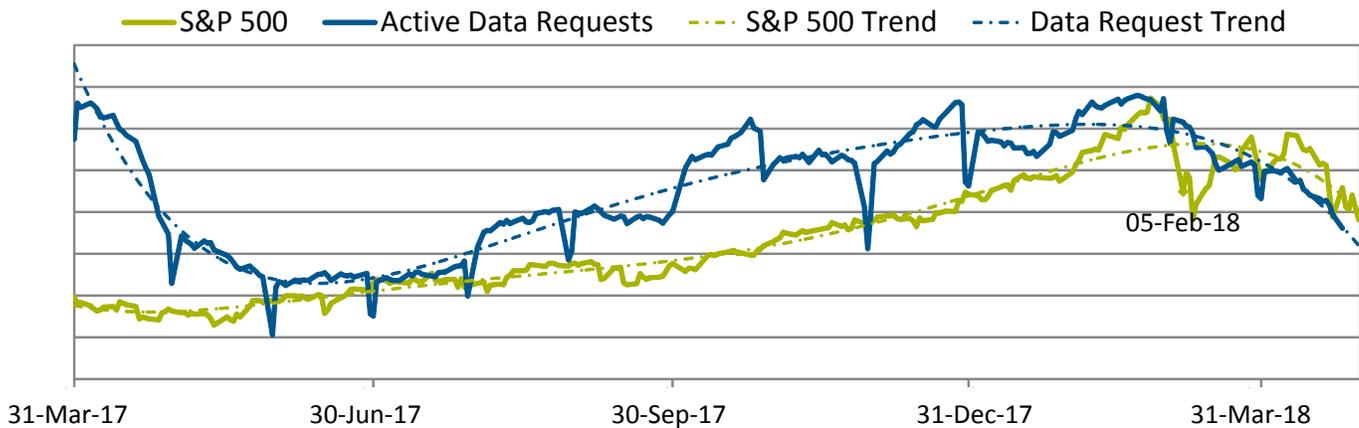
The hypothesis that volatile market activity would lead to an increase in market timing is marginal at best. The analysis showed that typical market volatility does not correlate to market timing activity. However, the analysis did show that during times of extreme volatility, there is an increase in mutual fund transaction volumes, trading alerts, and market timing violations.

In analyzing the trade pattern alerts along with trade volumes, the peaks did not occur at the peaks in market volatility, but shortly after. In one assessment (Figure 5: 2018 Category 1 Net Trades versus the VIX) the peak volumes occurred after the peak in market volatility. For mutual fund traders, it might have been either a delayed concern over potential losses that triggered a selling spree, or the delay in executing a mutual fund trade.

Finally, in performing this assessment, a curious finding was uncovered. The data requests from the fund clients for underlying trade data was overlaid on the S&P 500 index. For each day, all active detailed trading activity requests were totaled (if the analysis date was between the start and end date of the request period, then it was counted as active). The trading activity requests appeared to follow the S&P 500 index as it grew. However, when the Index began to fall during the market volatility period, the data requests also fell off. The only logical explanation that seems reasonable is that the fund companies believe that market timing is much more probable in a rising market than in a falling market, which makes sense as one cannot short mutual funds.

**Figure 10**

Active Data Requests vs the S&P 500 Index



Comments and questions from readers of this white paper are welcome. Additionally, if you would like to have more detailed data presented related to your funds we can incorporate that into a study . Please direct any feedback to:

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