

# The Asset Allocation Decisions Of Individual Investors

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## ABSTRACT

*The asset allocation decisions of individual investors are evaluated using survey data. By applying a methodology based on attribution returns we are able to assess the forecasting ability of a group of well-informed individual investors. We find that, if this group of investors follows their survey answers with investment actions, they add value to their overall wealth by actively managing their portfolios. These investors demonstrate good forecasting ability by effectively shifting their portfolio's allocations. Finally, using two different time partitions, based on the general state of the stock market, we find that this group of investors managed their portfolios better during poor market conditions.*

## INTRODUCTION

It is not certain how much of the return variability over time is explained by asset allocation (see Ibbotson and Kaplan (2000) and Brinson, Singer, and Beebower (1991)). But many academic and practitioners studies agree that asset allocation is a very, if not the most, important decision made by individual investors (see Sharpe (1990)). The purpose of this paper is to study the forecasting ability of individual investors based on their responses to the asset allocation survey of the American Association of Individual Investors (AAII). Our goal is to evaluate how effective this group of investors is in shifting their funds between the three major asset classes, namely stocks, bonds and cash. We use a methodology based on attribution returns that allow us to isolate the effect of these changes on the monthly portfolio return. Also, by using attribution returns instead of having a point estimate to evaluate performance (like Jensen's alpha), we have a monthly time series that enable us to perform more econometric tests.

We will focus on two key issues:

1. How effective are individual investors in shifting their asset allocations through time?
2. Are individual investors better in managing their portfolios during poor or good market conditions?

## SOME RELATED STUDIES

There have been many studies that look at the asset allocation decisions of individual investors. Most notably are the works by Barber and Odean (see Barber and Odean (2000) and (2001)) who, using data on individual brokerage accounts, find that the investment performance of individual investors is negatively affected by common mistakes presented in the behavioral finance literature.

Two studies have used the AAI asset allocation survey as a tool to study the asset allocation decisions of individual investors. Fisher and Statman (2000) devote a short section of their paper to this data set and report two important results. First, they found a positive and statistically significant relationship between the monthly change in the sentiment of individual investors (bullish or optimistic) and the monthly change in their stock allocation in their portfolios. Second, and a result closer to our project, they found a positive, although not statistically significant, relationship between actual stock allocation and future S&P 500 returns.

Anoruo, Bajtelsmit, Ramchander and Simpson (2003) report that an increase in expected inflation is associated with a decrease in households' allocations to stocks and a corresponding increase in bond allocation. Also, an increased expectation of lower interest rates is associated with significantly higher equity (stock) allocations. Finally, they find that investors increase their stock allocation and decrease their bond allocation when the Consumer Sentiment Index is greater than the average of the previous 36 months.

## METHODOLOGY

In this paper we study the asset allocation decisions of a group of individual investors. Our main goal is to study the performance of this group of investors from an aggregate perspective. A portfolio is constructed based on the monthly AAI survey answers. Passive indices are used as a measure of the performance in each of the asset classes (stocks, bonds and cash). The return for each month can then be calculated as a weighted average, with the weights being the allocations obtained from the survey, times their corresponding index returns. We will call this weighted average return the return on the individual portfolio.

Equation (1) shows the return generating process we are assuming:

$$r_t = w_t^S r_t^S + w_t^B r_t^B + w_t^C r_t^C \quad (1)$$

$r_t$ : is the month t return on the individual portfolio

$w_t^S$ : is the month t stock allocation

$r_t^S$ : is the month t return on the stock index

$w_t^B$ : is the month t bond allocation

$r_t^B$ : is the month t return on the bond index

$w_t^C$ : is the month t cash allocation

$r_t^C$ : is the month t return on a cash index.

Turning the attention to the asset allocation decisions of individual investors, a slightly modified version of a methodology common in the mutual fund literature is used to measure how effective individual investors are in their asset allocation decisions. We define the allocation excess return (AER), generally known as attribution return, as follows:

$$r_t^{AER} = r_t - (w_{t-1}^S r_t^S + w_{t-1}^B r_t^B + w_{t-1}^C r_t^C) \quad (2)$$

The AER is defined as the difference between the weighted average rate of return for the month t (computed using equation (1)) and the return that would have been generated by the asset allocation on month t-1 times the index returns for month t. This methodology allows us to isolate the excess return the investors receive on month t caused only by their allocation decisions.

A positive AER means that, on average, individual investors do have certain level of ability allocating their assets and they add value to their overall wealth by managing their portfolios. The performance of this group of investors is evaluated on a monthly basis by a benchmark created by themselves the month before. This implies that attaining a positive AER is evidence that, as a group, these investors beat an allocation-adjusted benchmark that changes through time.

AER is based on a methodology that has been used in several mutual fund studies. Most notable are the articles by Ibbotson (1996), Myers, Poterba, Schakleford, and Shoven (2001), and Dor, Jaganathan, and Meier (2003).

Ibbotson use attribution returns to test the hypothesis that winning funds repeat. Myers et al. use attribution returns to compare an actual mutual fund with a copycat portfolio based on semiannual portfolio allocations. Dor et al. use attribution returns to demonstrate the importance of selecting correct benchmarks. This methodology is also used by Comer, Larrimore, and Rodriguez (2004), who validate the method using simulations and evaluate hybrid mutual fund managers from 1997 to 2003. They find that hybrid mutual fund managers do not possess forecasting skills as evidenced by negative attribution returns.

## **DATA**

The main source of data for this study is the AAI Asset Allocation survey. The AAI is a not-for-profit organization that educates individual investors and provides them useful tools to better manage their finances. The AAI Asset Allocation survey is conducted monthly, and asks their members to disclose their actual portfolio allocations. The investors then answer the survey with their portfolio allocations, in percentage, for stocks, bonds and cash, respectively. Because of the nature of the American Association of Individual Investors, this data set best represents a sample of well-informed individual investors. The time period of the study runs from January 1988 until December 2002.

In order to estimate the return of the survey-induced portfolio from equation (1) we need data on the monthly returns for three market indices that represent the three major asset classes. We use the monthly return of the S&P 500 index to represent the stock portion of the portfolio. The Lehman Brothers government and corporate bond total return index is used for the bond monthly return and finally for the return on cash we use the return on the 90-day T-bill.

## **EMPIRICAL RESULTS**

### **Asset Allocations**

Descriptive statistics for all the variables used in this study are presented in Table 1. During this time period individual investors allocated more of their money into stocks. The mean stock allocation is almost 60%, followed by a mean cash allocation of 24%, and finally the mean bond allocation is about 16%. Figure 1 shows the graph of the mean allocations per year. This graph shows that during the complete sample period the same pattern was observed, individual investors allocated more funds into stocks, followed by cash and finally bonds. This group of individual investors increased their stock allocation during the latter part of the 1990s peaking in 1999; this pattern was followed by a sharp decrease in the demand for equity during the last part of the sample period.

### **911**

On a side note, the AAI allocation survey provides an opportunity to study the impact that major events have on the investments preferences of this group of individual investors. The events of September 11, 2001 (911) impacted all humans in different ways. It is important to mention that, since the time period of this study ends in December of 2002, we have a limited amount of data after 911. Regardless of the limited data, we set up to answer the following question: following the events of that day, are asset allocations of individual investors any different?

The results for this analysis can be found on Table 2. We find that after 911 investors increased their cash allocation and decreased their stock and bond allocations. The mean allocations for stock, bond and cash before 911 are: 60.17%, 15.96%, and 23.87%, respectively. After 911 these mean allocations are: 57.32%, 14.49%, and 28.17%. We find that the difference between the mean cash allocation before and after 911 is statistically significant at the one percent level. Also, the difference between the before and after mean bond allocation is statistically different at the five percent level. Finally, although this group of investor did lower their stock allocation after 911 the difference between the means is not significant. These results show how after 911 investors prefer to allocate more funds into safer investments.

### **Allocation Excess Returns**

We now turn the attention to the asset allocation decision of individual investors. Following the methodology presented above, we calculated AERs for the time period between January 1988 and December 2002 for a total of 180 observations. Table 3 Panel A shows descriptive statistics for the distribution of AERs. We find the average AER to be 0.03% and statistically different from zero at the 5% level. This result provides evidence that these investors do add value to their portfolios by actively shifting their funds between asset classes. A closer inspection to the distribution of AERs provides more evidence of effective portfolio management. During the sample period, in 106 months out of the total 180 (or about 59 percent) this group of investors attained a positive AER.

After the evidence of superior performance presented above, we set up to study if these investors perform better or worse after making significant changes to their portfolios. Using the asset allocations from the AAII survey, we identified months when a major shift in the stock allocation occurred. We define a significant change in allocation as a stock allocation change greater than ten percent in absolute value. We find no evidence of aggressive portfolio changes, only seven major increases in the stock allocation and four major decreases were found. For those cases we calculated the mean attribution and find that after major increases the mean AER is positive, while a negative AER is found after major decreases. No major conclusions can be drawn from this analysis since none of these mean AERs are significantly different from zero.

To further study the asset allocation decisions of individual investors, we partitioned the time period of this study into two partitions, based on the state of the market and the economy in general. Then the monthly AERs' series is also partitioned to answer the following question: are individual investors better in managing their portfolios during good or poor market conditions? Table 3 Panels A and B shows the results of this analysis. First, Panel B shows the results given a partition that considers a poor market condition any month when the bond return is higher than the stock return. The results show that this group of investors does a better job managing their portfolios during poor market conditions. The average AER is 0.05% during poor market conditions and this value is statistically significantly different from zero at the five percent level. While the mean AER during good market conditions is 0.01%, this value is not different from zero. Although we find a higher AER during poor market conditions, we do not find that difference to be statistically significant.

Next we considered a second partition based on Bull and Bear markets. The data on Bull and Bear markets comes from TheDowTheory.com. This second partition allows us to study periods of consecutive months, rather than single months. The results can be found on Table 3 Panel C. As with the previous partition, this group of individual investors shows more ability in managing their portfolios during poor market conditions (Bear markets). During Bear markets the mean AER is 0.082% and statistically significantly different from zero, while during Bull markets this value is 0.014% and is not statistically significant. Also, as in the previous case, there is no significant difference between these two values. In conclusion, individual investors represented by this group are more effective managing their portfolios when they need it the most, i.e. during poor market conditions.

### **CONCLUDING REMARKS**

In this project we study the performance and asset allocation decisions of a group of well-informed individual investors. Our analysis is based on the responses to the AAII Asset Allocation Survey. We find that this group of investors, by effectively managing their portfolios, shows forecasting ability and potentially increased their wealth. We find that the mean allocation excess return (AER), that measures the ability to improve their asset allocation on a monthly basis, is positive and statistically significant.

Further, we considered two partitions based on the state of stock market in general and compared the mean AER for periods of good and poor economic conditions. Although we find no statistical difference between the mean AER for good and poor economic conditions, we do find that this group of investors manages their portfolios more effectively during periods of poor market conditions. For both partitions, during the poor economic conditions the mean AER is positive and statistically different from zero. Moreover, the mean AER during good economic conditions although positive, is not only lower than its counterpart, but is also not statistically significant.

As a caveat, we studied how the events of 911 affected the allocation's preferences of these investors. In general, we found that after 911 this group of investors increased their demand for safer investments as evidenced by a significant increase in cash allocations.

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**Table 1: Descriptive Statistics**

This table presents descriptive statistics for the monthly data on investors asset allocations as reported in the American Association of Individual Investors from 1988-2002 and on the monthly return of several market indices used throughout the study. All figures are in percentages.

<b>Panel A: Portfolio Allocations</b>					
<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Range</b>
Stocks	59.91	9.65	42.00	77.00	35.00
Bonds	15.82	4.08	6.900	24.00	17.10
Cash	24.25	6.63	11.00	38.56	27.56
<b>Panel B: Market Indices (monthly returns)</b>					
<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Range</b>
S&P 500	1.02	4.29	-14.37	11.41	25.78
Bond Index	0.15	0.73	-2.45	3.43	5.88
T-Bills	0.42	0.15	0.10	0.76	0.66

Table 2: Allocations Changes for 911

This table presents the mean stock, bond and cash allocations before and after 911. Also, the p-value for the statistical test of difference between the means is provided. All the figures are in percentages.

Portfolio Allocation	Mean Allocations		Difference (p-value)
	Before 911	After 911	
Stocks	60.17	57.32	0.160
Bonds	15.96	14.49	0.039**
Cash	23.87	28.17	0.009***

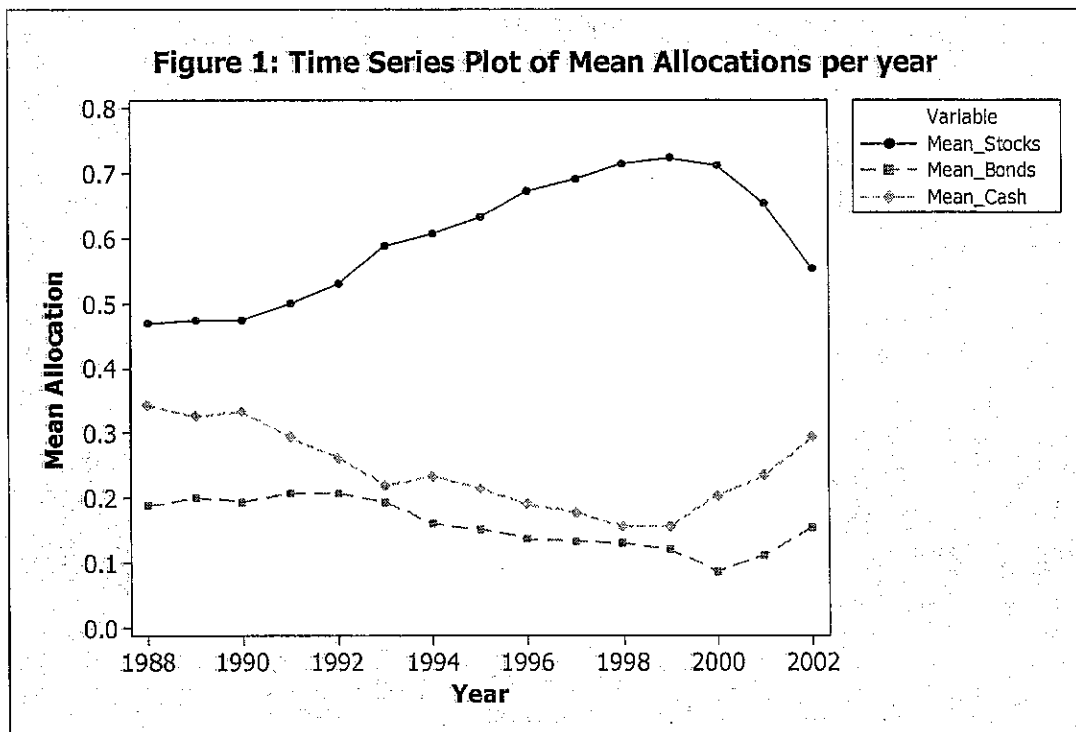
\*\*\*, \*\*, \* Denotes statistical significance at the .01, .05 and .10 level respectively.

Table 3: Asset Allocation Assessment

This table presents an assessment of the asset allocation decisions of individual investors based on their responses to the AAIL asset allocation survey. Three time periods are presented, the full sample period (which runs from January 1988 until December 2002) and two time partitions based on market conditions. Also, the p-value (in parenthesis) for the statistical test of the difference between the mean and zero is provided. All figures are in percentages.

Panel A: Asset Allocation Excess Returns for the full sample period					
Variable	Mean	Standard Deviation	Minimum	Maximum	Range
AER	0.0261**	0.139	-0.5411	0.6079	1.149
	(0.013)				
Panel B: Mean Asset Allocation Excess Return for the first partition (bond's return versus stock returns)					
	Poor Market Conditions	Good Market Conditions	Difference		
Number of Months	69	111			
AER	0.048**	0.012	0.036		
	(0.010)	(0.322)	(0.102)		
Panel C: Mean Asset Allocation Excess Return for the second partition (bull versus bear markets)					
	Poor Market Conditions (Bear Markets)	Good Market Conditions (Bull Markets)	Difference		
Number of Months	32	148	m		
AER	0.082*	0.014	0.067		
	(0.055)	(0.112)	(0.116)		

\*\*\*, \*\*, \* Denotes statistical significance at the .01, .05 and .10 level respectively.



NOTES