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# THE RELATIONSHIP BETWEEN PORTFOLIO PERFORMANCE AND ASSET ALLOCATION POLICY - EQUITY

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## ABSTRACT

*Asset allocation is an important strategy for portfolio management. In its simplest terms, asset allocation refers to the process of adjusting the relative proportion of different asset classes in an investment portfolio. Asset allocation is based on the fact that both expected return and risk of each asset class are different. By combining asset classes in different proportions, it is possible to enhance the overall portfolio return and reduce risk. As per past research, it is believed that a portfolio return is dependent upon many important factors or strategies. The recognized strategies are a) Strategic Asset Allocation b) Sector/ Stock Selection, and c) Market Timing. The above strategies have also been recognized in the research papers of Hood, Brinson and Beebower (1986) and Singer, Beebower and Brinson (1991).*

## KEYWORDS

asset allocation, portfolio performance, mutual fund, portfolio optimization, investment strategies.

## 1. INTRODUCTION

The literature on Asset Allocation has for long been an area of interest for both theoretical and empirical research. This consists of the finding of new research, using a growing arsenal of econometric techniques for identifying new strategies to improve portfolio performance.

Creating a suitable Asset Allocation is a dynamic process, and it is the most important factor in deciding portfolio's expected Return and Risk. Portfolio's Asset Allocation should be as per individual's goals at any point in time. Following are the different Asset Allocation Strategies in Portfolio Management

***Strategic Asset Allocation***

Strategic Asset Allocation is the process of finding the right mix between different asset classes based on respective asset class outlook and investors willingness to take risk. Once the Asset Allocation is decided and finalized, the strategy of buy and hold is followed. The Allocation mix is not changed during the holding period of portfolio. For example, if Debt has historically given 10% per annum and Equity has given 20% then the Asset Allocation mix of 50% in Equity and 50% in Debt will give an expected return 15% per annum.

***Constant-Weighting Asset Allocation***

Constant Weighting Asset Allocation is also referred to as Market Timing or Reallocation.

Rebalancing is the next step after Strategic Asset Allocation. In Strategic Asset Allocation, the asset mix is not changed or disturbed during the holding period of portfolio. Because of the buy and hold strategy, the risk of the portfolio changes with time. If Equity market goes up then Equity allocation in portfolio goes up which leads to higher overall risk and if Equity market goes down then Equity allocation of portfolio comes down and leads to reduction of portfolio. This may not be good for investor because of diversion of risk of the portfolio from the long term goal. To correct this and to control the unwanted Risk in Portoflio, Rebalancing or Constant Weighting Asset Allocation is done. The deviation of asset mix is corrected and Portfolio is brought to the original mix of Strategic Asset Allocation. The deviation is corrected by selling the asset which has gone up from the pre-defined mix and buying the Asset which has gone down in percentage terms.

There are no predefined rules for timing the portfolio rebalancing or constant-weighting asset allocation. Research shows that Rebalancing at higher frequency may not add value because of higher trading cost. The commonly used rebalancing frequency is either once a year or whenever the variance is more than 5% in portfolio.

Constant-Weighting Asset Allocation is also referred as Rebalancing.

***Tactical Asset Allocation***

A big disadvantage of Strategic Asset Allocation is that it is rigid and not ready to take advantage of short-term opportunities which become available in market. Extra Alpha can be created in portfolio if Asset Allocation mix is changed depending upon the outlook and valuation level of Asset Class. The flexibility in Tactical Asset Allocation makes it a very powerful strategy to add value in portfolio.

Tactical Asset Allocation is also referred as Reallocation.

Tactical asset allocation is usually considered to be a moderately active strategy. The strategy may or may not give higher return. It completely depends on the accuracy of timing of the advisor or investor. If the timing is good, then it may lead to higher return. Tactical Asset Allocation is recommended only when someone has good knowledge of markets.

## 2. REVIEW OF LITERATURE

The literature on Asset Allocation has for long been an area of interest for both theoretical and empirical research. This consists of the finding of new research, using a growing arsenal of econometric techniques for identifying new strategies to improve portfolio performance.

**Ibbotson and Kaplan (2000)** used 5 asset classes in their study "*Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?*" Ibbotson and Kaplan "examined the 10 year return of 94 US balanced mutual funds versus the corresponding indexed returns. The linear correlation between monthly index return series and the actual monthly actual return series was measured at 90.2%". Ibbotson concluded "(1) that asset allocation explained 40% of the variation of returns across funds, and (2) that it explained virtually 100% of the level of fund returns".

**Meir Statman (2000)** "found that using the same parameters that explained BHB's 93.6% variance result, a hypothetical financial advisor with perfect foresight in *tactical* asset allocation performed 8.1% better per year, yet the strategic asset allocation still explained 89.4% of the variance. Thus, explaining variance does not explain performance. Statman says that strategic asset allocation is movement *along* the efficient frontier, whereas tactical asset allocation involves movement of the efficient frontier".

**Wolfgang Drobetz and Friederike Kohler (2002) "**found that by using the approach of Ibbotson and Kaplan (2000) on German and Swiss balanced mutual fund data they find that more than 80 percent of the variability in returns of a typical fund over time is explained by asset allocation policy, roughly 60 percent of the variation among funds is explained by policy, and more than 130 percent of the return level is explained, on average, by the policy return level".

**S. Fowdar (2008) "**investigate the contribution of asset allocation policy to the performance of seven Mauritian mutual funds has being analysed. This study investigated whether asset allocation policy does contribute to the performance of Mauritian mutual funds. There is significant divergence of opinion as to the exact amount of the contribution of asset allocation. Following the method used by Ibbotson and Kaplan (2000) and Drobetz and Köhler (2002), the study revealed that the policy return explained approximately 33 percent of the variability of total fund return over time, around 22 percent of the variation across funds was explained by policy, and nearly 20.43 percent of the policy return level is incorporated in total return level on average".

**James X. Xiong, Roger G. Ibbotson, Thomas M. Idzorek, and Peng Chen (2010**) "found that considerable confusion surrounds both time-series and cross-sectional regressions and the importance of asset allocation. Cross-sectional regressions naturally remove market movements; therefore, the cross-sectional results in the literature are equivalent to analyses of excess market returns even though the regressions were performed on total returns. In contrast, time-series analyses of total returns do not naturally remove market movements. With market movements removed, asset allocation and active management are equally important in determining portfolio return differences within a peer group".

## 3. NEED OF THE STUDY

The purpose of this study is to evaluate the contribution of Asset Allocation Strategies in Portfolio Performance. This study is also trying to increase the scope of research by analyzing the effect of holding period, different Asset Classes, Risk and other Asset Allocation Strategies.

Most of the research work in past has been done on Strategic Asset Allocation. By trying to work on other Asset Allocation Strategies, holding period, Asset Classes etc, the study will contribute significantly to Asset Allocation literature.

## 4. OBJECTIVE OF THE STUDY

The primary objective of the study is to understand the relationship between Asset Allocation Strategies and Portfolio Performance in India.

The study attempts to evaluate the following:

- Evaluate the contribution of Strategic Asset Allocation, Rebalancing, Reallocation and Sector/ Stock Selection in portfolio return and risk across time for Equity asset class.

## 5. METHODOLOGY

The first step in the analysis is to calculate total return TR from the contribution of four strategies. Strategic Asset Allocation Return, Rebalancing Return, Reallocation Return and Residual Return as under:

$TR_{it} = SR_{it} + ReR_{it} + RaR_{it} + R_{it}$ (5.1)

Where,

$TR_{it}$ = Total Return of Fund i in time t

$SR_{it}$ = Strategic Asset Allocation Return of fund i in time t

$ReR_{it}$ = Rebalancing Return of fund i in time t

$RaR_{it}$ = Reallocation return of fund i in time t

$R_{it}$ = Residual Return of fund i in time t

The **Asset Allocation Policy** of each fund consists of policy weights the sum total of which is equal to 1.

The **Strategic Asset Allocation Return** of a fund over a period of time can be calculated from Return of Benchmarks and Policy weights as follows:

$SR_{it} = Ws1_iR1_t + Ws2_iR2_t + .... + Wsk_iRk_t$ (5.2)

Where,

$Ws1_i$, $Ws2_i$.....$Wsk_i$ = 10 year average of policy weights of funds i

$R1_t$, $R2_t$....$Rk_t$ = Return on the Asset Class Benchmark in holding period t

k = Number of Asset Classes

i = Number of Funds

t = Time period

The **Rebalancing Return** of a fund over a holding period can be computed as follows:

$ReR_{it} = Ws1^*_iR1_t + Ws2_i^*R2_t + .... + Wsk_i^*Rk_t - SR_{it}$ (5.3)

Where,

$Ws1^*_i$, $Ws2^*_i$.....$Wsk^*_i = Wsk_i + \Delta$

$Wsk_i$ = 10 year average of policy weights of funds i

Δ = Increase/ Decrease in Weight at the time of Periodic Rebalancing.

$R1_t$, $R2_t$....$Rk_t$ = Return on the asset class benchmark in period t

$SR_{it}$ = Strategic Asset Allocation Return of fund i in time t

k = Number of Asset Classes

i = Number of Funds

t = Holding period

Rebalancing of portfolio is done on a daily basis.

The **Reallocation Return** of a fund over a period of time can be calculated as follows:

$RaR_{it} = Wr1_{it}R1_t + Wr2_{it}R2_t + .... + Wrk_{it}Rk_t - ReR_{it}$ (5.4)

Where,

$Wr1_{it}$, $Wr2_{it}$.....$Wrk_{it}$ = Policy Weights of funds which changes as per Fund Manager's discretion on a daily basis

$R1_t$, $R2_t$....$Rk_t$ = returns on the asset classes in period t

$ReR_{it}$ = Rebalancing Return of fund i in time t

k = Number of Asset Classes

i = Number of Funds

t = Holding Period

**Residual Return** - Given the total return to the funds and the estimated strategic, rebalancing and reallocation returns of the funds, the residual returns which shows the Sector and Stock selection skills of a fund manager can be calculated as under

$R_{it} = TR_{it} - SR_{it} - ReR_{it} - RaR_{it}$ (5.5)

Where,

$TR_{it}$ = Total Return of Fund I in time t

$SR_{it}$ = Strategic Asset Allocation Return of fund i in time t

$ReR_{it}$ = Rebalancing Return of fund i in time t

$RaR_{it}$ = Reallocation return of fund i in time t

$R_{it}$ = Residual Return of fund i in time t

## 6. EMPIRICAL RESULTS

Various portfolio strategies are used to enhance the Return and reduce Risk in portfolio. Past research has shown that Strategic Asset Allocation is the most important strategy in portfolio performance. However not enough evidence is available on contribution of other strategies like Constant Weighting Asset Allocation, Tactical Asset Allocation, Residual, etc Some work has been done independently on strategies but combined effect on portfolio has not been observed. Impact of portfolio strategies across time on Return, Risk and Sharpe Ratio has also not been done.

The investigation came out with interesting results. It was observed that Strategic Asset Allocation is the most important strategy that contributes to the performance of a portfolio. The importance comes down with increase in holding period.

Rebalancing or Constant Weighting Asset Allocation is a risk reduction strategy and becomes important if the investment tenure is more than 3 years

Reallocation or Tactical Asset Allocation is an important strategy that contributes in portfolio performance across time for Return, Risk and Sharpe Ratio.
Residual or Sector and Stock Selection has relevance for Equity Asset class and is considered to be the second most important factor.
Investment horizon or holding period is the most important factor in reducing risk of the portfolio. The Return however reduces with time after 1 year. The contribution of holding period in Sharpe Ratio of portfolio is significant.

**TABLE 6.1: MEAN OF ROLLING RETURNS FOR DIFFERENT PORTFOLIO STRATEGIES ACROSS TIME**

| Return | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Fund | 16.0% | 16.5% | 18.5% | 14.6% | 13.2% |
| Reallocation | 13.1% | 13.2% | 14.5% | 11.6% | 10.5% |
| Rebalancing | 12.8% | 13.0% | 14.5% | 11.3% | 10.1% |
| Strategic Asset Allocation | 12.9% | 13.3% | 15.0% | 11.2% | 9.6% |

**TABLE 6.2: PERCENTAGE CONTRIBUTION OF STRATEGIES IN PORTFOLIO ACROSS TIME**

| RETURN – PERCENTAGE | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Residual | 15.9% | 17.7% | 20.3% | 19.1% | 18.2% |
| Reallocation | 1.6% | 1.1% | 0.3% | 1.3% | 2.3% |
| Rebalancing | 0.0% | -1.3% | -2.6% | 1.0% | 4.4% |
| Strategic Asset Allocation | 82.6% | 82.5% | 82.1% | 78.6% | 75.1% |

**TABLE 6.3: STANDARD DEVIATION OF ROLLING RETURNS FOR DIFFERENT PORTFOLIO STRATEGIES ACROSS TIME**

| STANDARD DEVIATION | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Fund | 16.6% | 20.2% | 25.2% | 10.6% | 5.2% |
| Reallocation | 17.0% | 19.6% | 21.1% | 9.0% | 5.0% |
| Rebalancing | 17.2% | 19.7% | 21.2% | 9.3% | 5.1% |
| Strategic Asset Allocation | 17.1% | 19.7% | 21.7% | 10.2% | 5.3% |

**TABLE 6.4: RATIO OF STANDARD DEVIATION BETWEEN DIFFERENT STRATEGIES ACROSS TIME**

| STANDARD DEVIATION – RATIO | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Fund*** | 96.8% | 102.64% | 116.43% | 103.45% | 98.03% |
| Reallocation** | 99.6% | 99.55% | 97.50% | 87.67% | 93.75% |
| Rebalancing* | 100.5% | 99.89% | 97.82% | 91.01% | 95.84% |
| Strategic Asset Allocation | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

*Rebalancing Standard Deviation/ Strategic Standard Deviation
**Reallocation Standard Deviation/ Strategic Standard Deviation
***Fund Standard Deviation/ Strategic Standard Deviation

**TABLE 6.5: SHARPE RATIO OF DIFFERENT PORTFOLIO STRATEGIES ACROSS TIME**

| SHARPE RATIO | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Fund | 0.03 | 0.13 | 0.47 | 0.76 | 1.27 |
| Reallocation | 0.02 | 0.09 | 0.37 | 0.55 | 0.77 |
| Rebalancing | 0.02 | 0.08 | 0.37 | 0.50 | 0.68 |
| Strategic Asset Allocation | 0.02 | 0.09 | 0.38 | 0.44 | 0.55 |

**TABLE 6.6: RATIO OF SHARPE RATIO FOR DIFFERENT PORTFOLIO STRATEGIES ACROSS TIME**

| SHARPE RATIO – RATIO | | | | | |
|---|---|---|---|---|---|
| **Portfolio Strategy** | **Daily** | **Monthly** | **1 Year** | **3 Year** | **5 Year** |
| Fund*** | 153.8% | 145.0% | 122.8% | 170.4% | 231.6% |
| Reallocation** | 104.8% | 100.4% | 97.2% | 123.6% | 140.1% |
| Rebalancing* | 99.1% | 96.9% | 96.4% | 113.5% | 124.2% |
| Strategic Asset Allocation | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

*Rebalancing Sharpe Ratio/ Strategic Sharpe Ratio
**Reallocation Sharpe Ratio/ Strategic Sharpe Ratio
***Fund Sharpe Ratio/ Strategic Sharpe Ratio

## 7. CONCLUSION

Globally lots of research has been done to understand the importance of Asset Allocation in Portfolio Performance. Majority of the work has been done in Developed Markets and limited research is available for Emerging Markets. In Developed Markets, the markets are assumed to be efficient which also gets reflected in higher contribution of Asset Allocation strategy to Portfolio Performance. The emerging markets which has weak or semi strong level of efficiency may have less contribution by Asset Allocation in Portfolio Performance. This study tries to investigate this difference in contribution.
The investigation came out with interesting results. It was observed that Strategic Asset Allocation is the most Strategic Asset Allocation is the most important factor that contributes to the performance of a portfolio. The importance comes down with increase in holding period.
Rebalancing or Constant Weighting Asset Allocation is a risk reduction strategy and becomes important if the investment tenure is more than 3 years
Reallocation or Tactical Asset Allocation is the second most important strategy that contributes in portfolio performance across time for Return, Risk and Sharpe Ratio.
Residual or Sector and Stock Selection adds values only for 5 Years and beyond.
Investment Horizon or holding period is the most important factor in reducing risk of the portfolio. The Return however reduces with time after 1 year. The contribution of Time in Sharpe Ratio of portfolio is significant.

## 8. SCOPE FOR FUTURE RESEARCH

Future Research should be conducted in the following areas to strengthen the existing literature.

- As per this study, Residual plays an important role in emerging country like India. There are many factors which may contribute to Residual like Stock Selection, Sector Selection, etc. Research can be done to analyse the strategies which play significant role in contribution to Residual. This may help in better management of portfolio.
- This study analysed the portfolio strategies like Strategic Asset Allocation, Constant Weighting Asset Allocation and Tactical Asset Allocation. Researchers can study the impact analysis of other Asset Allocation strategies like Constant Proportion Asset Allocation, Asset Allocation using Options etc.
- It will be interesting to evaluate the results with more Asset Classes like Real Estate, Gold and Alternate Investment. Having Asset Classes with different correlation may make some portfolio strategies more relevant and to some they can make irrelevant.

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