

Active fund management: The case of global asset allocation funds

Norris L. Larrymore^{a,*}, Javier Rodriguez^{b,*}

^aDepartment of Finance, School of Business, SB-DNF, Quinnipiac University, 275 Mount Carmel Avenue, Hamden, CT 06518, USA

^bGraduate School of Business Administration, University of Puerto Rico, P.O. Box 23332, San Juan, Puerto Rico 00931

* Corresponding author. Tel.: +1-203-582-8913; fax: +1-203-582-8664.

E-mail addresses: norris.larrymore@quinnipiac.edu (N. Larrymore), and jrodriguez@uprrp.edu (J. Rodriguez).

* Tel.: +1-787-764-0000 ext. 2043.

Active Fund Management: The Case of Global Asset Allocation Funds

Abstract

This paper seeks to inform the debate on whether those who rebalance their portfolios with global asset allocation funds are correct. Using unique daily data and a modified Sharpe (1992) Return-based Style Analysis methodology to create a three index model, this paper examines the value of active fund management of global asset allocation funds over the period 1999 – 2003. Prior studies fail to consider the dynamic reapportioning of assets in measuring asset management performance. We introduce an alternative methodology derived from Sharpe (1992) Return-based Style Analysis to calculate attribution returns that serve to measure active fund management performance. We define an attribution return as the difference between the actual monthly fund return and the return that would have been generated applying the actual factor returns to the apportionment of assets in the previous month. Consistent with prior studies, our results suggest that a sample of global asset allocation funds add value to their investors, as evidenced by a positive and statistically significant attribution return for fund survivors. Not surprisingly, the subgroup of surviving funds outperforms subset of non-survivors.

JEL classification: F21, G11, G15

Keywords: Style analysis; Global asset allocation funds; Active fund management

1. Introduction

Global asset allocation funds are part of the family of hybrid mutual funds, which also includes domestic asset allocation funds, balanced mutual funds, and flexible portfolio funds. These funds differ from traditional global or international mutual funds in that they face fewer investment restrictions,[†] which along with information costs have heretofore discouraged investments abroad. Moreover, the fewer investment restrictions allow a fund manager to trade more frequently and move funds more freely among asset classes. Recently, hybrid mutual funds were being advertised in the popular press as a less risky alternative to hedge funds.[‡]

Global asset allocation funds are specifically chartered to invest overseas and adopt an asset allocation strategy that takes advantage of changing global market conditions and asset classes.[§] These investment strategies involve high degrees of diversification across global geographical markets. It is advantageous to invest abroad when the global asset allocation fund is referenced in U.S. Dollars (Hereafter, all references to dollars are U.S. Dollars), the non-U.S. investment is denominated in a foreign currency, and that foreign currency advances against the dollar. Active asset allocation managers have an additional instrument to benefit from favorable fundamentals in foreign stock markets, such as low inflation, falling interest rates, and economic growth.

[†] An international fund is a mutual fund that invests outside the country in which it is based. Global funds invest at least 25% of its resources in foreign investments.

[‡] Tergesen, Anne, 2004, Going the hybrid route, *BusinessWeek* December 20, 100-101.

[§] For example: Fidelity Global Balanced states in their prospectus that the fund invests in equity and debt securities, including lower-quality debt securities, issued anywhere in the world. Also, MFS Global Total Return states in their prospectus that the fund primarily invests in a balanced combination of global and fixed-income securities.

Additionally, these funds invest in both stocks and bonds worldwide, including U.S. securities. When short-term interest rates creep upward, when stock prices are relatively high, or when dividend yields are low compared with bond yields, fund managers can reposition toward bonds. These fixed income securities may include both corporate and sovereign debt in U.S. and non-U.S. markets. Money the fund does not deploy in stocks and bonds remains in the form of cash.

U.S. investors underexposed to foreign equity and fixed-income investments may find global asset allocation funds particularly attractive. Overseas investment provides hedging opportunities for those facing severe domestic market conditions. These funds offer an alternative to direct investment for those seeking to add more international exposure to their portfolios.

Global asset allocation funds make sense in portfolio strategies that seek a hedge against a downturn in the U.S. equity market. Global asset allocation funds dampen the swing in the stock portion of the investor's portfolio because the investor's money is spread over U.S. and foreign stocks, as well as U.S. and foreign fixed income securities.

Additionally, global asset allocation fund investors benefit from consolidation of funds. An investor might have varied investment objectives that can be accomplished with a fund to meet each. To save the bother and cost of trying to figure out how to allocate resources among these stock funds, bond funds, and money-market instruments, the investor can select among global asset allocation funds. With global asset allocation funds, that investor gets the same exposure using a smaller number of funds and reduces the mutual-fund sales commissions and/or some other types of fees, such as

annual expenses for each. In essence, global asset allocation funds offer a one stop-shop for investors seeking to diversify their portfolios.

There are risks in holding global asset allocation funds. Conventional wisdom says that diversified portfolios under perform in hot times. The fund may hold bonds in emerging market economies that default. For example, in 1998, Merrill Lynch Global Allocation Fund performed poorly and attributed it to “financial turmoil” in emerging markets, including Russia and Latin America.** If the foreign currency declines against the dollar, the foreign portfolio’s value will be lowered after translation to dollars. Adverse fundamentals in foreign stock markets may appear. Inflation and/or interest rates may rise. The economy may contract.

Global asset allocation funds have not attracted the attention of academic researchers. The difficulty faced by researchers is that fund managers rarely report their allocation with a frequency higher than quarterly, but rebalancing actually occurs more frequently. Traditional performance measures may fail to correctly calculate the value they provide to their investors because conventional measures assume that allocation is fixed. This study introduces a measure of the previous month’s portfolio allocation, applying it in the current month’s return calculations. In doing so, fund managers are being evaluated each month by their own dynamic benchmark.

The rest of the paper is organized as follows. The literature review discusses other related work. Next, the data and method used to examine our research question are described. The empirical results expand the analysis with findings from tests. Then, we present the summary and conclusion.

** Gasparino, Charles and Pui-Wing Tam, 1999, Mutual fund laggards can teach lessons, *Wall Street Journal* January 29, C1.

2. Literature Review

Most previous research focused on international funds and many studies report that the performance of international mutual funds is no better than that of world indices. Using the security line measure in Jensen (1968, 1969) and the positive period weighting measure proposed by Grinblatt and Titman (1989), Cumby and Glen (1990) examine the performance of a sample of 15 U.S.-based, internationally diversified mutual funds for the period 1982-1988 and found no evidence that the funds, either individually or as a whole, provide investors with performance that surpasses that of a broad, international equity index over the sample period. Using a Sharpe performance measure, during a ten year period, 1977 – 1986, Eun, Kolodny, and Resnick (1991) show that most of the nineteen, U.S.-based international mutual funds in their study fail to outperform the MSCI World Index.

However, there is sufficient evidence to show that it is advantageous to internationally diversify an investment portfolio. Levy and Sarnat (1970) show that international diversification lowers correlation between portfolio assets. De Santis and Gerard (1997) argue for the long term benefits of holding a diversified portfolio.

Despite evidence favoring diversification gains, French and Poterba (1991) show that investors have been slow to adopt this practice and explore the reasons for “incomplete diversification.” Direct investment abroad had to overcome the perspectives of U.S. investors’ holding perceptions and the optimism that domestic markets are better, safer, and cost effective. Direct investment abroad was not the only way to accomplish low correlation. Funds that invest abroad have dispelled some of these misconceptions. Indirectly investing abroad through international and global funds, U.S.

investors might have achieved a more diversified holding than they would have otherwise through direct investment. Errunza, Hogan, and Hung (1999) find that by investing in foreign assets that trade in the U.S., investors can achieve the diversification benefits of assets that strictly trade outside the U.S.

Although global asset allocation funds and global (or world funds) funds have received little attention from academia, some studies of international mutual funds have included global funds as part of their overall sample. Eun, Kolodny, and Resnick (1991) noted earlier is one. Bhargava, Gallo, and Swanson (2001) studies 20 global mutual funds as part of their overall sample and finds that global funds outperformed the Morgan Stanley Capital International Index (MSCI). Shukla and Singh (1997) is one of the few papers that only study global funds, they provide evidence of superior performance by world equity mutual funds when compared with the MSCI world index.

Because this methodology is not based on a security market line framework, we avoid the problems presented in companion papers. Dybvig and Ross (1985a and 1985b) evaluate performance measurement when portfolios deviate from the security market line (SML) and expose the information issues with the SML analyses. Dybvig and Ross (1985a) analyze performance measurement when portfolios deviate from the security market line due to superior performance based on superior information and the question is posed, "What should we require of a new performance measurement technique?" The study answers that the measurement techniques should accurately measure performance. Next, the measure should be immune to gaming by managers who understand the technique being used to measure their performance. Finally, it should find practical

usefulness. In a second study, Dybvig and Ross (1985b) examine performance measurement when portfolios deviate from the security market line due to choice of inefficient markets or reference portfolios and finds that ranking of portfolios based on SML analysis depends on the choice of index. The method suggested in our study meets those criteria and addresses the finding in Dybvig and Ross (1985b).

Since prior studies fail to consider the dynamic reappportioning of assets in measuring asset management performance, we introduce an alternative methodology derived from Sharpe (1992) style analysis to calculate attribution returns that serve to measure active fund management performance. Sharpe (1992) estimates attribution returns as a way to show the applicability of the style analysis. Blake, Elton, and Gruber (1993), Brown and Goetzmann (1997), Dor, Jagannathan, and Meier (2003), Fung and Hsieh (1997), Ibbotson (1996), and Myers, Poterba, Shackelford, and Shoven (2001) also estimate attribution returns. Blake, Elton, and Gruber (1993) design a model called QPS-6, a replicating portfolio with all index weights greater than zero. Ibbotson (1996) classified his sample of 205 equity mutual funds based on their attribution returns in order to test whether winning funds repeat. Myers, Poterba, Shackelford, and Shoven (2001) used attribution returns to compare an actual mutual fund with a copycat portfolio based on semiannual portfolio allocations.

We adopt the a modified Sharpe (1992) Return-based Style Analysis methodology of Comer, Larrimore, and Rodriguez (2006), which uses attribution returns to evaluate hybrid mutual fund managers, from 1997 to 2003, and finds that hybrid mutual fund managers did not appear to show forecasting skill as evidenced by negative attribution returns. However, in a simulation, we show that negative attribution returns may not necessarily

convey poor management skill and may be better explained by transaction costs and expenses. Since the fund returns are net of expenses and the equity, debt, and cash returns are a gross figure, including expenses, 1.0% in fees can be added back to the attribution returns, which then may become positive.

Through selection of this Return-based Style Analysis, we sought to address a concern in analyzing balanced funds raised by Blake, Elton, and Gruber (1993) that may produce upward-biased estimates of alphas. Blake, Elton, and Gruber (1993) noted that “Most studies of mutual fund performance ignore in their analyses the part of a fund’s portfolio invested in bonds.” They conclude that “studies that include balanced funds and do not include indexes that pick up the bond component produce upward-biased estimates of alphas.” Our multi-index model includes a bond index for the purpose of avoiding that bias.

We have considered the significance of Grinblatt and Titman (1993, 1994), which suggests that benchmarks that are mean-variance inefficient lead to incorrect inferences. Our primary reason for not using Grinblatt and Titman (1993) is that the study makes “use of the fund’s prior portfolio holdings to risk-adjust a fund’s average return.” For our unique daily data set, we do not have that information because these funds report quarterly and even then, allocation information found in Morningstar is incomplete. For that reason, we turned to using a modified Sharpe (1992) Return-based Style Analysis methodology to generate the prior period’s apportionment of assets.

3. Data and Methodology

Our primary reason for using this method of portfolio development follows the standpoint taken in Blake, Elton, and Gruber (1993) for mutual fund. Since global asset allocation funds do not take short positions, the allocations to their various asset categories cannot have negative sensitivities. Thus, a replicating portfolio of indices must exhibit positive portfolio weights. Ordinary least squares regressions, which are typically used for linear index models, can sometime produce negative weights. Positive weighting can be achieved through the quadratic programming solutions of Sharpe (1992), which are described later in this section.

To implement our chosen methodology, we need a monthly time series of each fund's portfolio allocations among stocks, bonds, and cash, which is unavailable due to quarterly reporting. Employing the Return-based Style Analysis methodology presented in Sharpe (1992) and Ibbotson (1996), we offset the absence of more frequent portfolio allocation information. A modified version of Sharpe's style methodology allows us to dynamically mimic fund allocations as conditions change in an integrated market. With daily fund and index data, we estimate a monthly time series of each fund's portfolio allocations and calculate attribution returns. To our knowledge, no other study uses daily data to examine global asset allocation funds.

3.1 Data

Daily net asset values and daily dividend distributions were collected from Bloomberg for mutual funds classified as global asset allocation fund as of

December 31, 1998 in the Morningstar Principia CD. Funds disclose information to the National Association of Security Dealers, which provides the data to Bloomberg. We start the study in 1999 because this is the first time data on global bond indices is available.

From this information, we constructed the daily fund return series for each fund, as shown below in equation 1, from the beginning of 1999, when this information first became available, through the end of 2003, the timeframe of the study, or until the funds ceased to exist, making this sample free from survivorship bias.

$$r_{f_i,t} = \frac{nav_{f_i,t} + div_{f_i,t}}{nav_{f_i,t-1}} - 1, \quad (1)$$

where

$r_{f_i,t}$: is the total return of fund i at the end of day t.

$nav_{f_i,t}$: is the net asset value of fund i at the end of day t.

$nav_{f_i,t-1}$: is the net asset value of fund i at the end of prior day.

$div_{f_i,t}$: are the dividend distributions of fund i on day t.

3.2 Sample Characteristics

Table 1 shows the descriptive statistics of our fund sample. Our three-index sample of 27 funds consists of all mutual funds classified as global asset allocation funds as of December 31, 1998 in the Morningstar Principia CD. We excluded funds that reported greater than 10% of assets invested in

asset classes other than equities, fixed income and cash. Also, we deleted funds that clearly state in their prospectus the use of derivatives. This is important because the style analysis is not well suited for portfolios heavily invested in derivatives. For fund groups with multiple classes of shares, we only keep only the share class with the longest history.

3.3 Research Design

To implement the style methodology, we constructed daily return series on both the fund sample and the index benchmarks. For each fund, we used daily data to estimate monthly portfolio allocations. Our model included an index for each of the three major asset classes. The resulting three index model is defined below in equation 2.

$$r_{f_i} = b_{i,MSCI} r_{MSCI} + b_{i,globalbond} r_{globalbond} + b_{i,cash} r_{cash}, \quad (2)$$

where

r_{f_i} : is the fund daily return

r_{MSCI} : is the daily return on the MSCI World Index

$r_{globalbond}$: is the daily return on the Lehman Global Aggregate Index

r_{cash} : is the daily return on a 90 day treasury bill index.

We use the Lehman Short Treasury index, which is a weighted average of the returns of all bills with less than 90 days to maturity, taken from the Lehman Brothers fixed income database. Given our small sample size, the

simplicity of this model ensures that we have enough degrees of freedom for the estimation process and it offers simplicity for an individual investor, choosing to implement this method.

This technique requires for a monthly time series of each fund's portfolio allocation, which is not publicly available. The highest frequency of reporting fund portfolio allocations is quarterly and even that is incomplete. In order to mitigate this issue, we turn to the Return-based Style Analysis methodology first proposed by Sharpe (1992) and later by Ibbotson (1996). Style analysis allows us to estimate each fund's portfolio allocation from their daily return series, which is dynamically accomplished through quadratic programming problem, which renders, a set of weights on publicly available indices as estimates for the true portfolio allocations.

After estimating each fund's portfolio allocation's series, we calculated a time series of attribution returns. We define a fund's attribution return as the difference between the actual monthly fund return and the return that would have been generated by using the prior month's portfolio allocation and current month's actual returns of the index representing each asset class. In essence, fund managers are evaluated based on their own dynamic benchmark. Each month the manager must improve the portfolio allocation in order to generate a positive attribution return.

The daily return for each fund can be represented by the index model described below in equation 3.

$$r_{f_i} = \sum_{j=1}^k b_{ij} r_j + e_i, \quad (3)$$

where

r_{f_i} : is the daily total return of fund i

b_{ij} : is the exposure of fund i to asset class j

r_j : is the daily total return of asset class j

e_i : is the unexplained component of the fund return

Following the guidance of Dor, Jagannathan, and Meier (2003), the objective is to select a set of coefficients that minimize the unexplained component of the fund return, e_i . Because standard regression equations do not allow the imposing of restrictions, fund portfolio allocations (b_{ij}) are estimated as the solutions for the following quadratic program described below in equation 4.

$$\min \left[\text{var} \left(r_{f_i} - \sum_{j=1}^k b_{ij} r_j \right) \right], \quad (4)$$

where the weights are confined to the unit interval, and are positive because fund managers do not take short positions,

$$b_{ij} \in [0,1], \quad j = 1, \dots, k,$$

and

$$1 = b_{i1} + b_{i2} + \dots + b_{ik}.$$

These portfolio weights, which capture market risk, are the best monthly estimates of the fund portfolio allocations, replicating the allocation of the fund's assets. The R^2 , a goodness of fit measure, is the percent of variation in

the fund return that can be explained. For our purposes, it is calculated as described below in equation 5.

$$R^2 = 1 - \frac{\text{var}(e_i)}{\text{var}(r_{f_i})}, \quad (5)$$

where

$\text{var}(e_i)$: is the variance of the unexplained component of the fund return.

$\text{var}(r_{f_i})$: is the variance of the actual daily total return of fund i.

As noted in equation 4, the allocations to the style benchmarks, b_{ij} , are dynamically generated to minimize the variance of the attribution return. In minimizing the variance of the attribution return, the R^2 measure is maximized. R^2 will equal one if the model fits perfectly. That is, when there is no attribution return variance, the R^2 will equal one.

Dor, Jagannathan, and Meier (2003) note that passively managed funds have high R-squares. As illustrated below, such is seen in our three-index model, indicating that the fund employs a low level of active management. The R^2 for the three index model is 77.88%. Note that the R^2 is calculated after imposing constraints, so it may not equal the standard R^2 , which is represented by the variance of the weighted factors, $\text{var}\left(\sum_{j=1}^k b_{ij}r_j\right)$, divided by the variance of the residual or in this case the attribution return, $\text{var}(e_i)$.

Given each fund's monthly series of portfolio allocations, we calculate the attribution return for month t as described below in equation 6.

$$r_{att_i,t} = r_{f_i,t} - \sum_{j=1}^k b_{ij,t-1} r_{j,t} , \quad (6)$$

where

$r_{att_i,t}$:is fund i attribution return for month t

$r_{f_i,t}$:is fund i total return for month t

$b_{ij,t-1}$:is the average monthly exposure of fund i to asset class j during month t-1

$r_{j,t}$:is the total return of asset class j during month t.

A positive attribution return indicates that the fund manager beat a benchmark based on the prior month's estimated allocation. Although a manager can attain a positive attribution return through market timing ability, security selection ability, or both, it is difficult to tease out the proportion of each. In Lehman and Modest (1987), we learn that we can draw different inferences about a funds ability to beat a passive strategy, depending on the benchmark index used.

As a robustness check, Jensen's alpha is computed as the intercept from the regression, as described below in equation 7.

$$(R - R^f) = \alpha + \beta(R^b - R^f) + \varepsilon , \quad (7)$$

where

R = the total return of the individual fund.

R^f = the total return of 90 day Treasury Bill Index.

R^b = the total return of the MSCI World Index, which includes U.S. and foreign equities, representing Jensen's market benchmark.

The Jensen (1968) study parallels ours in a number of interesting ways, which makes it useful for comparison. The Jensen measure is a measure of the manager's forecasting ability and our measure is a measure of manager's forecasting ability. Both a positive alpha and a positive attribution return indicate a manager's ability to forecast security prices. However, both measures obscure the manager's market timing or asset selection ability, which we do not attempt to distinguish due to the complexity of decomposing the positive attribution return.

There are a few differences. First, with Jensen (1968), you have one beta over the interval of the study, which means that Jensen measures performance against a fixed model. Thus, when market conditions sour, the beta may be biased downward, which means that the estimated performance measure, α , will be biased upward. This bias occurs to a lesser degree with the attribution return since the attribution return narrows the interval over which the beta is updated. In our study, the beta is dynamically updated monthly.

Next, there is a difference in the number of factors. The Jensen model has one factor, treating equity alone. The attribution return has three factors, considering the sensitivity of fund returns to bonds and cash equivalents along with equities.

Finally, there are differential degrees of risk in these measures. With the dynamic updating of beta and the larger number of factors, the attribution return should more appropriately reflect a measure for its equivalent risk.

However, the Jensen alpha takes explicit account of effects of risk on the returns of the portfolios by subtracting the risk-free rate.

4. Empirical Results

We calculated the monthly attribution returns for the 27 global asset allocation funds in our sample and present the distribution of average attribution returns in Table 2. To arrive at the average attribution return, we first averaged the monthly time series of attribution returns for each fund and then average across funds. For the three index model, we computed attribution returns from February 1999 to December 2003. Consistent with the previous literature on global mutual funds, we find that, as a group, our sample of global asset allocation funds outperform their benchmarks as evidenced by a positive and statistically significant average attribution return of 0.205%. Our results are consistent with earlier works on global mutual funds, as earlier noted, see Bhargava, Gallo, and Swanson (2001) and Shukla and Singh (1997).

Further inspection of the distribution of attribution returns for the three index models presents more evidence of out-performance. In Table 2, we show that there are 20 funds out of a total of 27 (or 74%) with positive mean attribution returns. Of these, 8 mean attribution returns are statistically significant at the ten percent level or below. In contrast, only 7 funds (or 26%) attained a negative attribution return and none of these are statistically significant. As in Blake, Elton, and Gruber (1993), our fund returns are post-expenses and management fees, while the index returns are pre-expenses, so pre-cost performance may be even better.

Next, shown in Table 2, we estimated the more conventional alpha measure of Jensen (1968) for the group of 27 global asset allocation funds over the period February 1999 to December 2003, which is the same interval for our three index model calculation, so these two measures are directly

comparable. We find that our sample of global asset allocation funds outperform the MSCI World Index, with a mean alpha of 0.2677% and this value is statistically significant at the one percent level with a p-value of 0.005 and t-statistic of 3.08. This result is strikingly similar to the attribution return. Recall that the mean attribution return is 0.2051%. A more detailed inspection of the results shows that there are 22 positives and only 5 negative alphas. All the negative alphas are non-significant, but there are 11 positive alphas that are statistically significant (2 @ 1%, 4 @ 5%, and 5 @ 10%).

Finally, as shown in Table 2, when the correlation between alpha and the attribution return is calculated, we find a statistically significant value for the Pearson correlation of 0.533 with a p-value of 0.004. The Pearson correlation adds evidence that the attribution return and the Jensen alpha measure have strongly similar capabilities. Additional support can be found in the number of positive alphas and attribution returns. We find that 19 of the 27 funds that comprise the sample have both positive alpha and attribution returns. Moreover, of the 27 funds in the sample, 20 have positive attribution returns, meaning that 95% of these funds also have a positive alpha. Generally, under the more traditional Jensen (1968) alpha measure, this sample of global asset allocation funds shows more over-performance than when our alternative attribution returns measure is employed, which is expected because, as discussed in the method section, we expected the alpha to be biased upward.

In Table 3, we present the results of comparing average attribution returns of sub-samples of surviving and non-surviving funds and not surprisingly find that the subgroup of surviving funds outperforms the group of funds that cease to exist during the 1999 – 2003 interval of the study, as evidenced by a positive and significant attribution return of 0.3012%. For the exiting funds,

the average attribution return is 0.0849%, and not statistically significant. The difference between the average attribution return for survivors and non-survivors is 0.2162%.

With regard to goodness of fit of the model, we ran a style analysis on an equally weighted portfolio of all the funds in existence on any given day during the sample period of the study and Table 4 displays the results of this estimation. The primary finding in Table 4 is that the model does well in explaining fund returns. Panel A shows the results for the entire sample period and Panel B does so by year. For the entire sample period, the adjusted r-squared is 0.8714, and for the individual yearly estimation the adjusted r-squared ranges from a low of 0.8027 to a high of 0.9338. Also, in all the estimations the estimated portfolios weights are significant at least at the five percent level.

Table 5 presents the difference between the actual allocations on Morningstar and CRSP and what the portfolio weights of an equally weighted portfolio for each quarter. The problem is that we are comparing three portfolio weights (stocks, bonds, and cash), but these funds invest in a wide variety assets. In the results shown on Table 5, the cash weights are always very high compared to the ones they report. Fund reporting is quarterly, sporadic, and for those that report, it is incomplete, with funds less than fully invested. For instance, we observe that Morningstar portfolio weights do not change very much from quarter to quarter.

Generally, actual allocations reflect a point in time t . Style analysis gives you the average allocation over a monthly time period, $t-1$ to t , so the comparisons may not be valid. For example, suppose a fund is 60% stock, 40% bond for everyday of the month except the last one when it switches to

80% stock, 20% bond. Now, suppose the last day of the month is the reporting day and you run a monthly style regression. The estimated style allocation will be close to 60/40, which would not match the reported allocation of 80/20.

5. Summary and Conclusion

This paper addresses concerns of those investors who believe that traditional performance measures may fail to correctly assess asset value and subsequently managerial performance of global asset allocation funds and is the first study to do so using daily data. Focusing on global asset allocation funds, this study applies the Return-based Style Analysis methodology of Sharpe (1992) to the measurement of active fund management performance. Through dynamic programming, we infer allocation across asset classes without having complete composition information of assets in each class. With these estimated allocations, attribution returns for the 27 funds that comprise our sample were calculated during the 1999-2003 time period. Confirming the findings of earlier global fund studies, we find that our sample of global asset allocation funds adds value to their investor portfolios. When the three index model is employed we find a positive and statistically significant, average attribution return. Further evidence of out-performance is evident when the more traditional performance measure alpha is used as evidenced by a positive and statistically significant mean alpha, during the study sample period. Finally, the two performance measures used here, attribution returns and alpha, are positively correlated and this correlation is statistically significant.

6. Acknowledgements

The authors gratefully acknowledge the help of George Comer who provided extensive comments and some of the index data. We also thank John R. Aulerich, Michael Boldin, Martin Cherkes, and seminar participants of the 2005 Midwest Finance Association Meeting and Paul Rivera and seminar participants of the 2005 Global Conference on Business & Economics. We are grateful to Mitchell Ratner and seminar participants of the 2006 Eastern Finance Association Conference for helpful suggestions. Rodriguez we would like to thank Mary C. Ferreira and Vivian Acosta (both from the University of Puerto Rico) for their excellent research assistance. Rodriguez acknowledges financial support from the Graduate Business School at the University of Puerto Rico. Larrymore acknowledges financial support provided by the Quinnipiac University School of Business.

Appendix A

Funds in the Study
Advantus Intl Balanced A
Bailard, Biehl Diversified
Brinson Global
Carillon Capital
Delaware Global Assets A
Fidelity Asset Manager
Fidelity Asset Manager: Growth
Fidelity Global Balanced
Fremont Global
IDS Global Balanced A
Invesco Adv MultiFlex C
Invesco Multi-Asset Allocation
Kemper Worldwide 2004
MAS Multi-Asset-Class Institutional
Merrill Lynch Global Allocation A
MFS World Asset Allocation A
MFS World Total Return A
Oppenheimer Multiple Strategic A
Permanent Port
Putnam Asset Allocation: Bal A
Putnam Asset Allocation: Cons A
Putnam Asset Allocation Growth A
Smith Barney Intl Balanced A
SoGen International
Stellar Investment
USAA Cornerstone Strategy
Vanguard Horizon Glob Asset

References

- Bhargava, R., Gallo, J. G., Swanson, P. E., 2001. The performance, asset allocation, and investment style of international equity managers. *Review of Quantitative Finance and Accounting* 17, 377-395.
- Black, F., Litterman, R., 1992. Global portfolio optimization. *Financial Analysts Journal* 48, 28-43.
- Blake, C. R., Elton, E. J., Gruber, M. J., 1993. The performance of bond mutual funds. *Journal of Business* 66, 371-403.
- Bollen, N. P. B., Busse, J. A., 2004. Short-term persistence in mutual fund performance. *Review of Financial Studies* 18, 569-597.
- Brown, S., Goetzmann, W., 1995. Performance persistence. *Journal of Finance* 50, 679-698.
- Brown, S., Goetzmann, W., 1997. Mutual fund styles. *Journal of Financial Economics* 43, 373-399.
- Brown, S., Goetzmann, W., Park, J., 2000. Hedge funds and the asian currency crisis. *Journal of Portfolio Management* 26, 95-101.
- Chan, K., Covrig, V., Ng, L., 2005. What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *Journal of Finance* 60, 1495-1534.
- Chen, J., Hong, H., Huang, M., Kubik, J. D., 2004. Does fund size erode mutual fund performance? The role of liquidity and organization. 94, 1276-1302.
- Comer, G., 2006. Hybrid mutual funds and market timing performance, *Journal of Business* 79, 771-797.
- Comer, G., Larrymore, N., Rodriguez, J., 2006. Controlling for fixed income exposure in portfolio evaluation: Evidence from hybrid funds," working paper.
- Comer, G., Larrymore, N., Rodriguez, J., 2006. Measuring the value of active fund management: The case of hybrid mutual funds. working paper.
- Cumby, R. E., Glen, J. D., 1990. Evaluating the performance of international mutual funds. *Journal of Finance* 45, 497-521.
- De Santis, G., Gerard, B., 1997. International asset pricing and portfolio diversification with time-varying risk. *Journal of Finance* 52, 1881-1912.
- Dor, A. B., Jagannathan, R., Meier, I., 2003. Understanding mutual fund and hedge fund styles using return based style analysis. *Journal of Investment Management* 1, 97-137.
- Droms, W. G., Walker, D. A., 1994. Investment performance of international mutual funds. *Journal of Financial Research* 27, 1-14.
- Dybvig, P. H., Ross, S. A., 1985a. Differential information and performance measurement using a security market line. *Journal of Finance* 40, 383-399.
- Dybvig, P. H., Ross, S. A., 1985b. The analytics of performance measurement using a security market line. *Journal of Finance* 40, 401-416.
- Elton, E., Gruber, M., Blake, C., 1996. Survivorship bias and mutual fund performance. *Review of Financial Studies* 9, 1097-1120.
- Elton, E., Gruber, M., Das, S., Hlavka, M., 1993. Efficiency with costly information: A reinterpretation of evidence from managed portfolios. *Review of Financial Studies* 6, 1-22.
- Errunza, V., Hogan, K., Hung, M., 1999. Can the gains from international diversification be achieved without trading abroad? *Journal of Finance* 54, 2075-2107.

- Eun, C. S., Kolodny, R., Resnick, B.G., 1991. U.S.-based international mutual funds: A performance evaluation. *Journal of Portfolio Management* 17, 88-94.
- French, K. R., Poterba, J. M., 1991. Investor diversification and international equity markets. *American Economic Review* 81, 222-226.
- Fung, W., Hsieh, D., 1997. Empirical characteristics of dynamic trading strategies: The case of hedge funds. *Review of Financial Studies* 10, 275-302.
- Glassman, D. A., Riddick, L. A., 2006. Market timing by global fund managers. *Journal of International Money and Finance*, Forthcoming.
- Grinblatt, M., Titman, S., 1993. Performance measurements without benchmarks: An examination of mutual fund returns. *Journal of Business* 66, 47-68.
- Grinblatt, M., Titman, S., 1994. A study of monthly mutual fund returns and performance evaluation techniques. *Journal of Financial and Quantitative Analysis* 29, 419-444.
- Ibbotson, R., 1996. Do winning mutual funds repeat? *TMA Journal* 16, 50-53.
- Jensen, M., 1968. The Performance of mutual funds in the period 1945-1964. *Journal of Finance* 23, 389-416.
- Johnson, W. T., 2004. Predictable investment horizons and wealth transfers among mutual fund shareholders. *Journal of Finance* 59, 1979-2012.
- Lehmann, B. N., Modest, D., 1987. Mutual fund performance evaluation: A comparison of benchmarks and benchmark comparisons. *Journal of Finance* 42, 233-265.
- Levy, H., Sarnat, M., 1970. International diversification of international portfolios. *American Economic Review* 60, 668-675.
- Myers, M., Poterba, J., Shackelford, D., Shoven, J., 2001. Copycat funds: Information disclosure regulation and the returns to active management in the mutual fund industry. Working paper, MIT.
- O'Neal, E. S., 1999. Mutual fund share classes and broker incentives. *Financial Analyst Journal* 55, 76-87.
- Sharpe, W., 1992. Asset allocation: Management style and performance measurement. *Journal of Portfolio Management* 18, 7-19.
- Shukla, R., Singh, S., 1997. A performance evaluation of global equity mutual funds: Evidence from 1988-95. *Global Finance Journal* 8, 279-293.

Table 1
 Overview of Data

Number of funds	27
Average total net assets	555
Median total net assets	205
Average stock allocation (%)	52.23
Average bond allocation (%)	29.92
Average cash allocation (%)	10.26
Average range of stock allocations (%)	19.43
Average range of bond allocations (%)	9.06
Average range of cash allocations (%)	10.5
Annual portfolio turnover (%)	93.5
Annual expense ratio (%)	1.25

Table 1 presents descriptive statistics for the sample of global allocation funds over the sample period 1999-2003. All values are averages across all funds in the sample. Averages are calculated by first calculating the average value for each individual fund over the time period and then calculating the cross section mean. Return data is from Bloomberg. The range of stock, bond, and cash allocations are based on the minimum and maximum annual portfolio weights provided by CRSP.

Table 2
Attribution Returns and Alphas

		Three Index	Alpha
Number of funds		27	27
Average Return/Jensen's	Attribution	0.205%**	0.2677%***
Standard Deviation		0.4417%	0.4518%
Maximum Value		1.5420%	1.39%
Minimum Value		-0.837%	-0.7242%
Number of Positive Values		20	22
Number of Negative Values		7	5
Positive and Significant Values (at 10 percent or below)		8	11
Negative and Significant Values (at 10 percent or below)		0	0
Pearson Correlation		0.533 with p-value 0.004	

*, **, *** Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table 2 shows the distribution of attribution returns for the 27 global asset allocation funds in our sample for the 3 index model and the distribution of the results for the Jensen's alpha. The time period is from February 1999 until December 2003. Attribution returns are calculated as the difference between the actual monthly fund return and the return that would have been generated by the previous month portfolio allocation.

Table 3
Survivorship

Panel A: Three Index		
	Number of funds	Average Attribution Return
Survivors	15	0.3012%***
Nonsurvivors	12	0.0849%
Difference		0.2162%

*, **, *** Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table 3 shows a comparison of average attribution returns between surviving and nonsurviving funds.

Table 4
 Estimation of the Portfolio Weights for an Equally Weighted Portfolio

Panel A: Estimated Portfolio Weights for the Complete Sample Period

Asset Class	Weight	t-value
Stocks	0.4834***	91.92
Bonds	0.1310***	8.32
Cash	0.3854***	22.22
Adjusted R-Squared	0.8714	

Panel B: Yearly Estimated Portfolio Weights

Year	1999	2000	2001	2002
2003				
Stocks	0.4731*** 0.5137***	0.4895***	0.4994***	0.4620***
Bonds	0.0798** 0.1857***	0.0757**	0.1457***	0.1249**
Cash	0.4470*** 0.3004***	0.4346***	0.3548***	0.4129***
Adjusted R-Squared	0.8656 0.9338	0.8828	0.9220	0.8027

***, **, * denotes statistical significance at the 1, 5 and 10 percent level, respectively.

Table 4 shows the results from a style analysis performed on an equally weighted portfolio composed by all the existing funds in any given day during the complete estimation period (January 1999 – December 2003). Panel A of the table presents the estimated portfolio weight and corresponding *t-value* for the complete sample period. Panel B shows the yearly average exposure.

Table 5
 Comparison of Estimated and Actual Mean Asset Allocations

Panel A: Morningstar			
	SasEstimate	Morningstar	t Statistic
Stock	0.494954	0.534439	-3.717
Bond	0.126978	0.297856	-12.316
Cash	0.378068	0.095661	14.93
Panel B: CRSP			
	SasEstimate	CRSP	t Statistic
Stock	0.500589	0.573697	-5.948
Bond	0.136484	0.302434	-15.091
Cash	0.362927	0.05988	15.831

Two Sample Paired t-test for the Means of SasEstimate and Morningstar or CRSP Asset Allocations