

Asset Allocation Revisited

by William E. O’Rielly, CFA and James L. Chandler, Jr.

Based on the ground-breaking 1986 study by Brinson, Hood and Beebower, it has been a commonly held belief for over a decade that asset allocation explains more than 90 percent of portfolio performance. In 1997, however, William Jahnke challenged many of the BHB tenets. Arguments on both sides of the fence continue over the importance of asset allocation. To add to the discussion, the authors present this study in which they have used a large set of mutual fund data and a random process of mixing mutual funds to test whether asset allocation is still as important today as BHB found it to be more than ten years ago.

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The notion of allocating assets within an investor’s total portfolio has been an especially hot topic over the past couple of years. Investors naturally responded to the collapse of the emerging markets by abruptly asking the proverbial question, “Why did I ever invest in that asset class in the first place?” Similar doubts have arisen about allocations to developed non-U.S. equities and small-cap U.S. equities.¹ It also has been common to hear investors question the prudence of continuing to maintain allocations to bonds.² Although such second-guessing seems to be a chronic reaction to market cycles, even the theoretical underpinnings of the importance of asset allocation have been challenged.³

For more than ten years, most investors and investment advisors have operated with the belief that asset allocation explains more than 90 percent of portfolio performance. The study that initially validated the importance of asset allocation is “Determinants of Portfolio Performance,” by Gary Brinson, Randolph Hood and Gilbert Beebower (BHB), published in the July/August 1986 issue of the *Financial Analyst Journal*.⁴ In contrast, William Jahnke challenges many of the BHB tenets in “The Asset Allocation Hoax,” published in the [February 1997](#) issue of the *Journal of Financial Planning*.⁵ Has BHB’s study been misinterpreted? Does Jahnke present sound criticisms of BHB? Several efforts of “point and counterpoint” on the BHB-versus-Jahnke debate are already on the record, but there is plenty of room for additional research and arguments.⁶

Ibbotson and Kaplan conclude in their 1998 study that the resolution of the debate depends on how the questions are posed.⁷ Further, Jahnke’s paper was followed by additional research conducted by Morningstar, which also concluded that asset allocation was not nearly as significant to actual investment results as had been originally understood.⁸ As a new entrant into this debate, this study includes various analyses of a random sampling of more than two million hypothetical portfolios of mutual funds to provide additional discussion of select BHB and Jahnke issues.⁹ To begin this paper, a brief recap of basic BHB and Jahnke arguments and rebuttals is warranted.

BHB Basics and Comments

In their 1986 research, BHB analyzed 91 large corporate pension plans that each had at least 40 quarters of performance history over the ten-year period 1974–1983. The 91 plans had used a variety of active management strategies, and the resulting multiple-manager composite portfolios of each plan had experienced a wide range of returns over the subject ten years. The authors tested whether these differences were attributable to investment policy (the strategic stock/bond/cash target of the overall plan) or investment strategy (short-term tactical shifts away from the long-term target and active management shifts away from the benchmarks).

Each portfolio was assigned one composite benchmark of stocks/bonds/cash based upon the plan’s average asset allocation over the 40-quarter period. The study used the R2 statistic to document that the investment policy decision explained, on average, over 93 percent of the variability of the plans’ returns. The R2 statistic measures the strength of a relationship between variables.¹⁰ The 91 plans had an average R2 of 0.93, indicating a strong relationship between the variability of a portfolio’s actual returns and the variability of a portfolio’s composite benchmark.

The BHB study did not conclude that manager selection and changing target allocations were unimportant aspects of investment supervision. Over the ten-year period, the 91 portfolios studied by BHB realized a wide range of annual returns, 5.85 percent to 13.4 percent, and some plans did outperform their assigned benchmark. Clearly there was potential for excess return for plans with successful market timing and one or more index-beating managers. Even so, BHB asserts that rational investors should give as much—if not more—consideration to investment policy (asset allocation) as they may devote to investment strategy (manager selection and market timing).

Jahnke Criticisms and Comments

In his [February 1997](#) article, William Jahnke contests many BHB observations. For instance, he criticizes the fact that the performance data used by BHB was gross of management fees and that BHB’s use of quarterly data dampens the impact of

compounding slight portfolio return disparities relative to the benchmarks. Regardless of the expenses an investor pays (within reason), the question of the importance of asset allocation remains potentially critical. BHB's failure to use net return data does not invalidate their conclusions as to the importance of asset allocation.

Jahnke also argues that asset allocation actually explains only 14.6 percent of portfolio performance in the BHB study. He notes that the ten-year annual returns of the 91 benchmark portfolios used by BHB ranged from 9.47 percent to 10.57 percent (a spread of 1.1 percentage points), while the ten-year annual returns of the 91 actual portfolios ranged from 5.85 percent to 13.4 percent (a spread of 7.55 percentage points). The expected range of 1.1 percentage points divided by the actual range of 7.55 percentage points equals 14.6 percent ($1.1 \div 7.55$)—thus, Jahnke's assertion that asset allocation only explains 14.6 percent of portfolio performance.

That the range of actual returns among the 91 plans is wider than the range of respective benchmark returns does not negate the fact that most of the funds studied did have a high R2 and did have returns close to their assigned benchmark. Anecdotally, if there had been a 92nd portfolio in the BHB study with a benchmark return of 4 percent and an actual return within the range of returns observed by BHB, would not Jahnke's ratio lead us to conclude that asset allocation accounted for 87 percent ($6.57 \div 7.55$) of the results? Although it is difficult to determine what Jahnke's ratio indicates, the possible motivation behind this element of his criticism of BHB may be supported by Craig MacKinlay, who demonstrates in the December 1998 issue of *The Journal of Investment Consulting* that the R2 measure "is related to variability not value."¹¹

Jahnke also seems to differentiate between the notions of variability and value by raising intuitively understandable points regarding the potential impact of compounding slight differences in quarterly returns over numerous years. He criticizes BHB for using quarterly data because the quarterly data captures the variation in returns, not the differences in ultimate investment outcome, which Jahnke believes is better expressed by either an annual or cumulative return.

In response, BHB should dust off their old data and run one regression using 91 observations of the actual annual or cumulative returns (the dependent variables) versus the annual or cumulative returns of each related benchmark (the independent variables). The t-statistic and the R2 of this cross-sectional regression may indicate the significance of the relationship between investment policy (target asset allocations as proxied by the blended benchmarks) and investment outcome as expressed by the actual annual or cumulative returns of the 91 plans in the sample.¹²

Ibbotson and Kaplan consider this issue from two different slants and conclude that (1) asset allocation explains 40 percent of the variation of returns across funds and (2) asset allocation explains, on average, virtually 100 percent of the level of fund returns. Gary Brinson has expressed general agreement with the Ibbotson-Kaplan conclusions.¹³

Another Jahnke criticism focuses on BHB's use of static benchmarks against which to evaluate or explain portfolios that may actually have been dynamic in many cases. BHB used the average asset allocation of each plan over the ten-year period, even though some of the plans may have had deliberate shifts in investment policy. Jahnke argues that this averaging process potentially dampens or masks the impact of shorter-term allocation shifts. In rebuttal, although the use of averaged benchmarks likely decreases the precision of the BHB analysis, this practice does not hide the importance of tactical allocations because any differences between the returns generated from the tactical shifts and the returns from the static (averaged) benchmarks would lower the R2 measures. For this study, however, our use of hypothetically constructed portfolios helps avoid this issue.

Asset Class Initial screen:	Allocation %	# of Funds Available	Screens Used to Determine Candidate Mutual Funds 10/98 Assets > \$100mm, Inception Date Before 1988
U.S. Large Cap Equity	50%	153	Morningstar Category = Large Value, Growth or Blend, % Stock > 85%, no index funds
U.S. Fixed Income	30%	38	Morningstar Category = Int. or Long-term Bond, Credit Quality = High Quality
U.S. Short-Term Fixed	10%	16	Morningstar Category = Short-term or Ultra-short Bond, Credit Quality = High Quality
Non-U.S. Equity	10%	25	Morningstar Category = Foreign Stock, % non-U.S. Stocks > 85%, No Index Funds

New Analyses

For this study, we have used a large set of mutual fund data and a random process of mixing mutual funds to test whether asset allocation is still as important today as BHB found it to be more than ten years ago. For our analyses, we established an asset allocation of

1. 50 percent U.S. large-cap equity
2. 30 percent U.S. fixed income
3. 10 percent U.S. short-term fixed income
4. 10 percent non-U.S. equity¹⁴

Each segment of this target allocation was implemented with one mutual fund from each asset class. Portfolios were randomly constructed with 1 of 153 different large-cap U.S. equity mutual funds, 1 of 38 different U.S. fixed income mutual funds, 1 of 16 different U.S. short-term fixed income mutual funds, and 1 of 25 different non-U.S. equity mutual funds. The set of funds from which these random drawings were made for each asset class cleared the screening process described in Table 1. These screens were used to (1) reflect some of the screening a rational and informed investor may employ and (2) reduce the problems frequently associated with the imprecision of conventional mutual fund labeling.¹⁵

Assuming the investor can choose one fund per category, a total of 2,325,600 (153 x 38 x 16 x 25) portfolios are available. Obviously, rational investors will attempt to conduct some level of fundamental mutual fund analysis to find funds with competitive performance, low expense ratios, appropriate fund size and sufficient management stability, rather than randomly choosing one of the 2.3 million options. But how important is fund selection at this point in the process? Does the fact that the target benchmark has already been established overwhelm any extra value that still can be added by selecting seemingly competitive funds in each asset class?

Using a random number generator, we sampled 10,000 of the 2.3 million options. This sampling was shown to be statistically significant.¹⁶ The results of this analysis confirm the BHB view that asset allocation plays a large role in determining the variability of the realized investment returns. Figure 1 details the range of R2 values and annual returns for the 10,000 sampled portfolios.

In our view, these results confirm certain aspects of the BHB study. The median R2 of 0.90 indicates that the 50/30/10/10 benchmark was a strong determinant of the variability of the returns and is quite similar to the average R2 of 0.93 observed by BHB. The range of annualized returns may be relevant to Jahnke's criticism that asset allocation is less of a determinant of longer-term performance. However, these findings appear similar in nature to the Ibbotson-Kaplan results described above; that is, asset allocation explains, on average, essentially 100 percent of investment outcome.

Since the independent factor in our model is not a random variable, we cannot conduct a cross-sectional regression similar to the exercise suggested for the dusted-off BHB data. However, the median annual portfolio return was close to the benchmark (11.96 percent versus 12.95 percent), while somewhat more than 70 percent of the hypothetical portfolios' realized annual returns fall within 1.66 percentage points of the benchmark's annual rate of 12.95 percent. Fund expenses may explain this gap, as the expenses of these blended funds typically exceeded one percent each year.

Same Funds—Different Mix

It is possible that the analysis described above provides results that are "dampened" because of the ten percent allocation included for the cash or short-term fixed component. There probably is less opportunity for active management to add value in a cash allocation, and expenses generally consume a greater portion of returns from cash or short-term funds than from equity or longer-term bond funds. Thus, we retested the data in Table 1 using 60 percent U.S. large-cap stock funds, 10 percent non-U.S. stock funds, 0 percent in cash and 30 percent in bonds. The funds used were screened in the same ways and randomly mixed 10,000 times, as described earlier.

The results of this alternative test were very similar to the results detailed in Figure 1. Specifically, the median R2 for the ten years of hypothetical monthly returns was 0.88; 95 percent of the random mixes had an R2 equal to or greater than 0.77 with the 60/10/0/30 benchmark. For annual returns, the median mix produced an annual return of 12.92 percent, while the benchmark produced an annual return of 13.14 percent. Further, more than 60 percent of the blended funds produced annual returns within 1.5 percentage points of the benchmark. The effective expenses of these hypothetical mixes would be greater than the first set of blended funds because this second set excludes the cash component (a component that would reduce the effective expenses of each mix). Again, the BHB view that asset allocation is a major determinant of the variability of returns is upheld by these analyses.

Same Funds—Different Time Periods

For shorter investment horizons, is the pull of asset allocation as strong, or does fund selection take on more significance? To further evaluate these hypothetical data and patterns, these same portfolios were tested over two consecutive five-year periods. Tables 2 and 3 show that the importance of asset allocation observed over the ten-year period generally held during each five-year component period. The range of returns was close to the benchmark, but the fund selection premia (both positive and negative) were somewhat more widely dispersed around the median for the shorter time frames.

BHB Vindicated?

These general observations indicate that asset allocation plays a dominant role in determining the variability of portfolio performance—a consideration that is likely very relevant to an investor's risk tolerance. Identifying top quartile managers or funds may enable investors to outperform the benchmark, but a majority of the hypothetical returns generated herein were closely grouped near the benchmark return for the subject periods. So, as BHB concluded more than ten years ago, investors should avoid allowing asset allocation to become a residual of the manager or fund selection process—a mistake that investors may be making less often now than in the past (thanks, at least in part, to BHB).

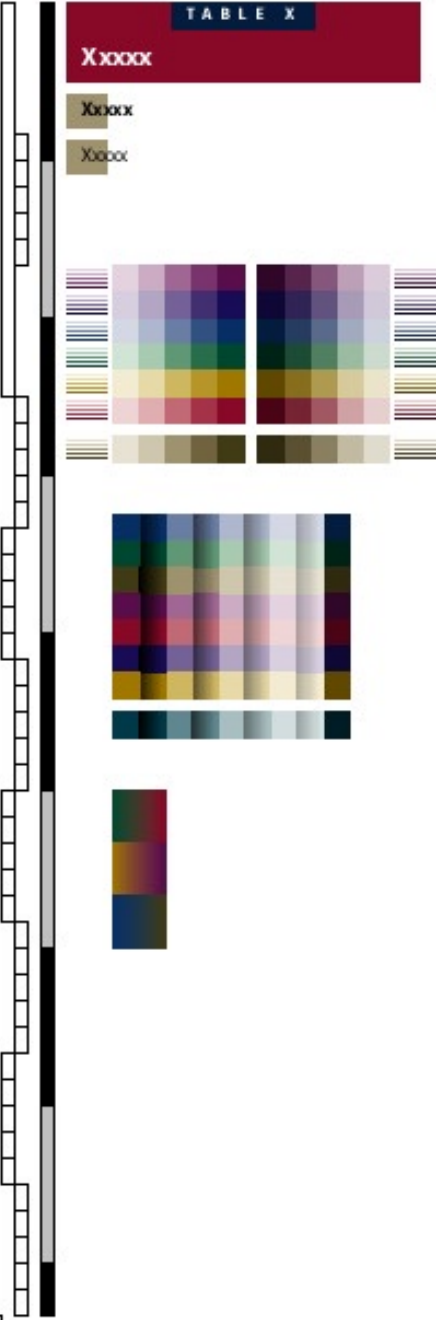
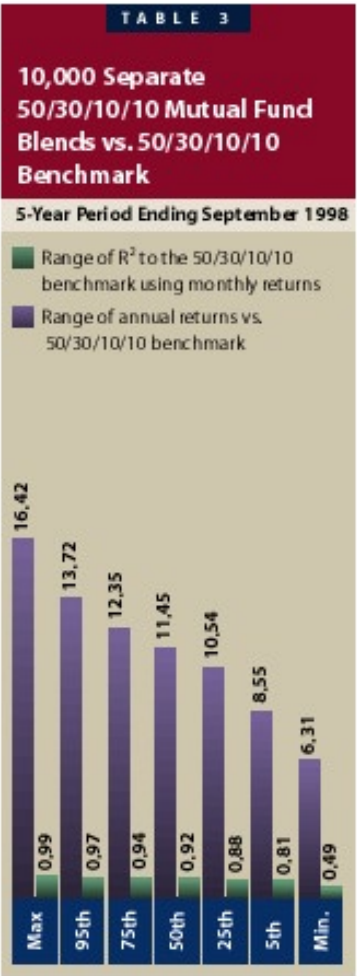
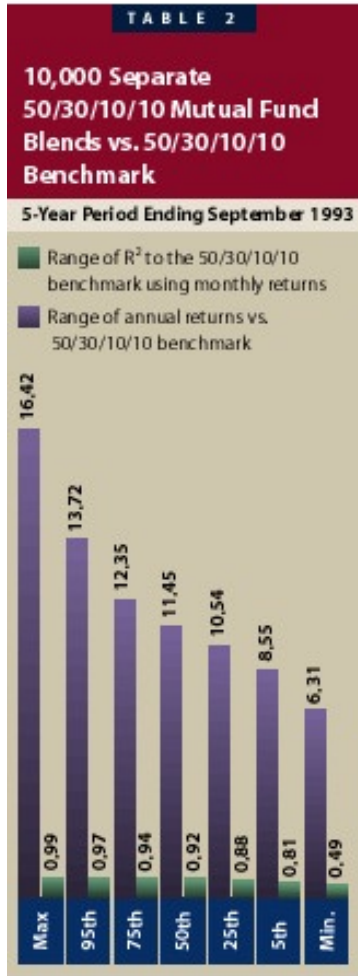
Perhaps the following simplified scenario captures much of this debate: An investor's current asset allocation is 60 percent stocks and 40 percent bonds. If the expected total return for stocks is ten percent a year and the expected total return for bonds is five percent a year, the investor's expected total return for this portfolio is, of course, eight percent a year. If the investor determines

that a nine percent return is needed (earlier retirement, higher spending rate by a foundation, and so forth), should the investor rely more on finding better asset management or on adopting a more aggressive asset allocation policy?¹⁷ Obviously, the investor's risk tolerance, ability to select managers or funds and many other factors are quite important. However, this dilemma may not be resolved fully without further testing of the importance of investment policy relative to different investment time horizons, different target asset allocations, and such. In other words, questions regarding asset allocation should be revisited, again.

The debate in recent years over the relative importance of asset allocation has prompted several new research efforts to retest the assertions in the original Brinson, Hood & Beebower work from 1986 as well as to test William Jahnke's 1997 challenge to this doctrine. This article introduces new research and references other new research relevant to this debate. The findings herein defend Brinson's conclusions while debunking some (but not all) of Jahnke's arguments.

Benchmark

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FIGURE 1

10,000 Separate 50/30/10/10 Mutual Fund Blends vs. 50/30/10/10 Benchmark

10-year period ending September 1998



Endnotes

1. See Andrew Gluck, "When the Whole Sky Falls," *Dow Jones Investment Advisor*, December 1998, p. 19; and Brian O'Connell, "Questioning Small-Cap Viability," *Financial Planning*, November 1998, pp. 67–72.
2. See Richard H. Thaler and J. Peter Williamson, "College and University Endowment Funds: Why Not 100% Equities?" *The Journal of Portfolio Management*, Fall 1994, pp. 27–37; and Laurence B. Siegel, "Are Stocks Risky? Two Lessons," *The Journal of Portfolio Management*, Spring 1997, pp. 29–34.
3. For example, see "Heretics Second Guess Diversification Dogma," *Money Management Letter*, February 22, 1999, p. 1.
4. Also see the update of the original BHB work, "Determinants of Portfolio Performance II: An Update," Gary P. Brinson, Brian D. Singer and Gilbert L. Beebower, *Financial Analysts Journal*, May–June 1991, pp. 40–48.
5. At least one study precedes Jahnke that also raises doubts about the BHB conclusions: "The Importance of the Asset Allocation Decision," Chris D. Hensel, Don Ezra and John Ilkiw, *Financial Analyst Journal*, July/August 1991, pp. 65–72.
6. Gary Brinson shares his own perspective on the debate in "The Changing Face of Asset Management," Jonathan Burton, *Dow Jones Asset Management*, May/June 1999, p. 20.
7. "Does Asset Allocation Policy Explain 40%, 90%, or 100% of Performance?" Roger G. Ibbotson and Paul D. Kaplan, www.ibbotson.com/research, December 1998, revised April 1999.
8. "Asset Allocation: Revisiting the Debate," *Morningstar*, February 27, 1997.
9. Numerous articles debating the BHB-versus-Jahnke points include "The Grinch Who Stole Asset Allocation," Robert N. Veres, *Dow Jones Investment Advisor*, December 1997, pp. 56–60; "Asset Allocation: The Debate Continues," Wendi Webb, *Registered Representative*, January 1998, p. 78; "The Hoax Is For Real," William Jahnke, *Financial Planning*, February 1998; and "Asset Allocation Hoaxes and the Creation of Straw Men," Brian D. Singer, *Journal of Financial Planning*, October 1997. Much of this debate is covered on Jahnke's Web site: www.financial-design.com.
10. An R² of 1.0 indicates a perfect linear relationship. For example, if one knows the temperature in Celsius, the temperature in Fahrenheit is determined with the following linear equation: Temperature Fahrenheit = 1.8 x Temperature Celsius + 30. These variables have a perfect linear relationship.
11. "Asset Allocation and Stock Selection: On the Importance of Active Strategies," A. Craig MacKinlay, *The Journal of Investment Consulting*, December 1998, pp. 18–21.
12. This single cross-sectional regression using 91 sets of observations of annual or cumulative returns contrasts with BHB's method of running 91 different time series regressions (one for each pension plan) using quarterly data and then averaging the R² of each regression.
13. Hensel, Ezra and Ilkiw, op. cit.; Burton, op. cit.
14. This target allocation is benchmarked by the blend of 50 percent S&P 500 Stock Index (dividends reinvested), 30 percent Lehman Bros. Government/ Corporate Bond Index, 10 percent Lehman Bros. 1–3 Year Government Bond Index, and 10 percent MSCI EAFE non-U.S. Developed Country Stock Index.
15. The screen for at least ten years of mutual fund performance history allows for both the testing of the data across shorter, consecutive periods and, hopefully, the reduction of survivorship bias within the sample (essentially creating a sample of survivors). Although using only funds with at least a ten-year record may cause a survivorship problem relative to the entire universe of funds, most rational and informed investors would generally employ a similar screening filter. Nevertheless, the survivorship issue remains potentially important. See Stephen J. Brown, William Goetzmann, Roger Ibbotson, and Stephen Ross, "Survivorship Bias in Performance Studies," *Review of Financial Studies*, December 1992.
16. A t-statistic test was done on the sample observations.
17. We thank Robert A. Jaeger, CIO of Evaluation Associates, for suggesting the relevance of this simple concept.

