RESEARCH NOTE

The Importance of Asset Allocation Brinson *et al* Revisited – Again

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Brinson, Hood, and Beebower published their findings on the importance of asset allocation in the July/August 1988 issue of the *Financial Analysts Journal (FAJ)*. Their results continue to be cited—and sometimes misinterpreted—in support of the view that asset allocation is the most important decision for investors, with decisions regarding the use of active versus passive management being of secondary importance. Their article led to numerous other research efforts, including their own that critiqued, updated, or expanded on the original findings. The most recent of these are Ibbotson (2010) and Xiong, Ibbotson, Idzorek, and Chen (2010), which report that 1) market movements are more important than active management and asset allocation combined in explaining return variability over time and 2) active management and asset allocation are equally important in explaining the variation of excess returns *across* funds.

Lest the "headline" results of the latest work also be misinterpreted, this note attempts to put it and earlier results in perspective. We review, first, the early works of Brinson *et al* that investigated the importance of asset allocation policy in explaining pension fund performance and, second, the research that followed. As such, this represents only a partial review of academic and industry efforts to increase our understanding of old and new asset allocation issues. It is important to recognize that this literature reports descriptive statistics on various samples of pension funds or mutual funds over varying time periods. While instructive in dissecting the performance of sampled funds, this research does not set out to provide normative guidance. Furthermore, because the Brinson articles used pension fund data from 1974 to 1987, their results relate to simple traditional equity and fixed income mixes—quite unlike current institutional asset allocation policies. Related subsequent studies by other researchers likewise focused on less sophisticated pension funds and "balanced" mutual funds, thus avoiding what are surely measurement difficulties and thorny active-versus-passive issues stemming from the more recently utilized alternative asset classes like hedge funds and private equity. This fact renders the following discussion most applicable to the *traditional* portion of portfolios.

The Landmark Study by Brinson, Hood, and Beebower (1988)

Brinson, Hood, and Beebower (BHB) investigated the importance of asset allocation policy in explaining the performance of 91 pension plan investment portfolios over the period 1974 through 1983. These pension plans had allocations to U.S. stocks, bonds, cash equivalents, and what BHB deemed relatively unimportant "other" holdings of convertible securities, international stock, real estate, and private placements. To approximate each plan's long-term, "normal" asset allocation (AA) policy, BHB calculated the 10-year average weights of each plan's stock, bond, and cash holdings.[1] The benchmark for stocks was the S&P 500; for bonds, it was the Shearson Lehman Government/Corporate Bond Index; for cash, it was the 30-day Treasury bill.[2] BHB proceeded to compare each fund's actual returns with the returns it would have earned had it adhered to its normal AA policy and invested passively in the benchmark

[1] BHB 1) apportioned the "other" *pro rata* to fixed income, equities, and cash if "other" was small and 2) excluded the observation if "other" was large.

[2] During the ten years covered by this study, asset allocation policies were often viewed as simple stock/bond or S&P 500/Lehman Aggregate (now Barclays Aggregate) ratios. Growth and value style indexes were not yet available from providers like the Frank Russell Company.

indexes. Their objective was to show how active management contributed to pension plan returns and how AA policy explained the *variability* of plan returns over time.

While it may seem trivial given the prevalence of performance attribution analysis today, a major contribution of BHB was their approach to decomposing actual plan returns into components that allowed them to measure the contributions from market timing, security or manager selection, and an interaction term.[3] We spell out the return decomposition in order to clarify BHB results and compare them with the recent findings of Xiong, Ibbotson, *et al*.

A fund's total return, R, in a single period equals the sum of the actual asset class weights times their respective returns. Using the subscript "a" to denote actual and "i" to denote each of n asset classes (i =1, …, n) and summing over all asset classes, actual return can be expressed as

(1) $R_a = \sum W_{ai} \cdot R_{ai}$

Policy return equals the sum of the AA policy asset class weights times their policy returns, which are the passive returns of the appropriate index for each asset class. Using subscript "p" to denote policy, the AA policy return, P, is then

(2) $P = \sum W_{pi} \cdot R_{pi}$

BHB added and subtracted equation (2) from equation (1) and rearranged terms so that actual total return was expressed as follows (an accounting identity):

(3) $R_a = P + (R_a - P)$

$$R_a = \sum W_{pi} \cdot R_{pi} + \sum (W_{ai} - W_{pi}) \cdot R_{ai} + \sum W_{pi} \cdot (Rai - R_{pi})$$

R_a = AA Policy return + Return from (Policy + Timing) + Return from (Policy + Stock Selection)

In equation (3), the first term is the standard calculation of policy return—policy weight times passive benchmark return summed over the three asset classes (stocks, bonds, and cash) observed in this pension plan sample. The second term measures the incremental return due to actual weights deviating from policy weights, which would occur if the plan's manager chose to "time the market" and hold stocks, bond, and cash in different proportions to capture higher returns. The third term measures the incremental return due asset class returns deviating from the benchmark index returns, ostensibly from manager efforts to select stocks and/or bonds that differed from those in the benchmarks and capture above-average returns.

Equation (3) was the basis for their time-series analysis of total returns. For each of the 91 pension funds in their sample, BHB computed all terms in equation (3) for every quarter from 1974 through 1983. For each fund they regressed the time series of actual quarterly returns (R_a) on each of the three quarterly return component series. Thus, they ran three sets of 91 regressions and obtained an R^2 for each regression. They calculated the average R^2 for each set and found the following:

Table 1: Average Regression R^2s

Regression of R_a on Return due to:	Average R^2
AA Policy return	93.6%
AA Policy + Timing	95.3%
AA Policy + Stock Selection	97.8%

As R^2 measures the percentage of variability in R_a accounted for (or predicted) by the return component in each regression, BHB concluded that *on average* asset allocation explains 93.6% of *return variability over*

[3] Attribution analysis was not a standard analytical tool in the 1980's. We are well-acquainted with it today, especially as it is used to describe how active manager returns can be explained by their choice of sector weights (allocation decisions) versus security selection. Recall that depending on the software utilized, the interaction (cross-product) term may not be separately provided but instead arbitrarily included with either the allocation of security selection term.

time, and that market timing and stock selection have a marginal impact on that variability. (Nowhere in their article did BHB say that asset allocation explains 93.6% of *return.*)

Let us look at what BHB did in a simple setting that drives home the scope of their time series regression results. Specifically, suppose that the 91 pension plans all had an AA policy of investing 100% in U.S. large cap equities.[4] If each plan had 100% in large caps, BHB's dataset would have consisted of ten years of quarterly returns generated by the large cap investments within each plan. They would have then regressed the actual returns of each plan on the policy returns, which presumably would have been the returns of the S&P 500 index. So, suppose that the funds in BHB's sample invested in either the Vanguard S&P 500 fund or the actively managed Stralem Large-Cap Equity Strategy. BHB would have regressed either Vanguard's or Stralem's returns on the S&P 500 returns. Pretty simple—exactly what we see in a standard PerTrac manager report. The Vanguard fund would have an R^2 close to 100% since it almost perfectly replicates the S&P 500 index, while Stralem would have an R^2 of about 86%. If BHB's pension funds had all been invested in the Vanguard Fund, their study would have resulted in an average R^2 of about 100% and BHB's results would have been stated as "Asset allocation, on average, explains 100% of plan return variability over time." If BHB's pension funds had all been invested only in Stralem, the result would have been "Asset allocation, on average, explains 86% of plan return variability over time."

The simple example above is not intended to minimize or demean the contribution of BHB's research but to ensure that it is not misinterpreted. An R^2 tells us little to nothing about the level of returns. Neither does it tell us much about risk (standard deviation, beta).[5] This is precisely why we do not use *only* the R^2's produced in PerTrac reports. Before we draw many conclusions, we review total and excess returns, standard deviation, beta, etc. This example also points out the obvious fact that AA policy determines the basic market exposures of a fund while active market timing and/or stock picking operate "around the edges" of those market exposures.[6] A 100% allocation to U.S. large cap equities dictates that returns and variability over time will be similar to the S&P 500. If the allocation is implemented with active large cap managers, returns will deviate but be range-bound by the returns of stocks in the S&P 500.

BHB also defined *active return* as the difference between actual and policy return, $R_a - P$. After additional "decomposition," they arrived at the following equation:

(4) $$R_a - P = \sum[(W_{ai} \cdot R_{pi}) - (W_{pi} \cdot R_{pi})] + \sum[(W_{pi} \cdot R_{ai}) - (W_{pi} \cdot R_{pi})] + \sum[(W_{ai} - W_{pi}) \cdot (R_{ai} \cdot R_{pi})]$$

$$R_a - P = \text{Marketing Timing return} + \text{Security Selection return} + \text{Interaction (cross-product) return}$$

BHB calculated each term in equation (4) on a quarterly basis for each of the 91 funds and obtained the following results:

Table 2: Annualized Active Returns

Active Return due to:	Average annualized active return	Minimum / maximum annualized active return
Marketing Timing	-0.66%	-2.68% / 0.25%
Security Selection	-0.36%	-2.90% / 3.60%
Interaction	-0.07%	-1.17% / 2.57%
Total	-1.10%	-4.17% / 3.69%

[4] In actuality, the plans had various policies of investing in fixed income, equities, and cash, with little or no weighting to the alternative asset classes that were far from the mainstream at the time.

[5] Of course, in the case of any index fund like Vanguard's the R^2 of about 100% does indicate that its tracking error is about 0%, and that its standard deviation of return and beta are nearly the same as the index's.

[6] Stated differently, active management is conditional on the AA policy.

Over this ten-year period about one-third of the 91 funds exhibited positive annualized active returns. BHB's major conclusion, however, was that *on average* active management detracted from fund returns relative to their passive policy returns

The Follow-up Study by Brinson, Singer, and Beebower (1991)

Brinson, Singer, and Beebower (BSB) followed up the 1988 study with an analysis of 85 pension plan returns over the period from 1977 to 1987. They repeated the BHB methodology and found that regressing actual returns on policy returns produced an average R^2 of 91.5% for this sample. For Policy + Selection, they found the average asset R^2 was 93.3%. For Policy + Timing,[7] the average R^2 was 96.1%. AA Policy continued to be the primary determinant of return *variability* over time, with active management playing a much smaller role.

BSB also repeated the calculation of actual total and active returns for this sample of pension funds. Actual annualized returns ranged from 10.34% to 19.95% with an average of 13.41%. Policy returns ranged from 12.43% to 14.56% with an average of 13.49%. Active returns ranged from -3.43% to 6.73% with an average of -0.08%. They concluded that *on average* active management does not add value.

Studies in Response to BHB and BSB

A number of articles followed the publication of BSB in efforts to investigate the questions about return levels and differences missing in BSB and to correct what many of the authors took to be misquotations and misinterpretations of BSB findings. (In the mid-1990's, even Jack Bogle said that 91.5% of fund *returns* were explained by asset allocation policy.) Jahnke (1997), Statman (2000), and Ibbotson & Kaplan (2000) are among the most pointed and frequently cited.

Ibbotson & Kaplan (IK) reproduced the BSB time series results using monthly returns from pension funds and "balanced" mutual funds. Although they obtained slightly lower R^2s, they agreed with the basic finding that long-term volatility is primarily determined by asset allocation. Recognizing that BHB and BSB focused on the question of long-term return variability, IK asked two additional questions: 1) Does AA policy explain the variation of returns *among funds?* and 2) What portion of the *level* of returns does AA policy explain? To answer the first, they ran cross-sectional regressions of actual fund returns on policy returns and found the R^2 was about 40%, meaning that differences in policy explained about 40% of the differences in returns for the funds in their sample. The other 60% is explained by the funds' differing levels of active management, style tilts, fees, etc.[8] To answer the second question they calculated the total policy return for each fund and divided it by the fund's actual return, thus obtaining the ratio of the passive policy return to the actual return, which would reflect active management. This ratio, on average, was found to be slightly higher than 100% when fees and expenses are taken into account. They concluded that the funds failed to meet their policy returns (that is, to add value) due to a combination of market timing, security or manager selection, management fees, and expenses.

The Vanguard Group (2003, 2006 and 2007) repeated the basic methodologies of BSB and IK using broader sets of data (longer periods, greater number of funds). Their results were consistent with those of earlier studies. While they did not rule out the possibility that active allocation and security selection *can* add value, they focused on the averages (and Sharpe's insights that a zero-sum game implies average returns must be less than zero after expenses) rather than the funds that outperform their policy returns. The most recent Vanguard samples included only "balanced" mutual funds, again suggesting that results are applicable to the traditional part of any asset allocation policy.

We summarize the results of research that follows the basic approach of BSB and IK in the table that follows:

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[7] In this article, the term "Timing" is renamed "Active Asset Allocation." Regardless of name, it is capturing deviations in actual asset class weights from policy weight. While deviations may well represent efforts to time the market movements of asset classes, they could also be the result of failing to rebalance to policy.

[8] IK also estimate that this R^2 would be about 80% if funds were half as active, and about 14% if funds were one-and-a-half times as active.

Table 3. Summary of Data and Research Results

Researcher	*Data set*	*Period*	*Effect on Total Return Variability (Avg. time series R^2)*	*Avg. Policy Return/ Avg. Actual Return*	*Effect on Differences in Total Returns across Funds (Cross-sectional R^2)*
Brinson *et al.* (1986)	91 pension funds	1974-1983	93.6%	112%	NA
Brinson *et al.* (1991)	82 pension funds	1978-1987	91.5%	101%	NA
Ibbotson & Kaplan (2000)	58 pension funds	1993-1997	88.0%	99%	35%
	94 US balanced funds	1988-1998	81.4%	104%	40%
Drobetz & Kohler (2002)	51 German & Swiss balanced funds	1995-2001	82.9%	134%	65%
Vanguard (2003)	507 US balanced funds	1962-2001	76.6%	114%	NA
	68 US balanced funds	Bear markets	69.7%	100%	NA
Vanguard Tokat *et al.* (2006)	227 US balanced funds	1966-2003	81.6%	122%	19%
Vanguard (2007)	189 US balanced funds	1966-2006	82.1%	108%	20%

The BSB-related research discussed thus far does not contradict the basic BSB results.[9] It focuses on asking questions beyond those asked by BSB, with authors usually contending that the level of return—not return variability over time—is of primary importance to investors. This literature suggests that active management (tactical asset allocation and security/manager selection) adds little value *on average* but does not attempt to end the debate about active versus passive management—and that debate has been discussed elsewhere.

Recent Studies

Follow-up studies have recently taken a slightly different approach. Ibbotson (2010) asserts that "The time has come for [the BHB/BSB] folklore to be replaced with reality." Xiong, Ibbotson, Idzorek, and Chen (2010) (hereafter, XIIC) revisited the BHB question of what explains total return variability over time and the question of what explains return differences across funds. Given the title of their *FAJ* article—"The Equal Importance of Asset Allocation and Active Management"—a careful reading is important.

[9] Kritzman and Page (2003) took a different, normative approach to the issue of whether asset allocation or security selection is more important and arrived at a somewhat surprising result. Using option valuation models they determined the value of skill associated with various investment activities. They asked which activities investors should emphasize if they are skilled and avoid if they are unskilled. Kritzman and Page showed that *asset allocation is the least important investment activity and that skill as an asset allocator is the least valuable skill to possess. In contrast, security selection is the most important investment choice, and skill as a security selector has the greatest value.* Their concluding advice was that *without specific knowledge of investor skill, the inescapable conclusion of our analysis is that most investors should focus on asset allocation, because it is the least demanding investment choice.*

XIIC decomposed returns differently than BHB did in an effort to measure the effects of market movements, differences in AA policy across funds, and active management. To show how XIIC's approach differed from BBH's, we continue with the notation used in the BBH equations (1)-(4) and define, as XIIC did, M = "market return." XIIC decomposed total return according to the following equation (their terminology):

(5) R_a = M + (P – M) + (R_a –P),

R_a = Market Return + Return from Detailed AA Policy + Return from Active Management

Recall that BHB used equation (3) and restated the (R_a -P) term to obtain two terms reflecting the two forms of active management—market timing and stock selection. XIIC left (R_a –P) as a single term to reflect the combined returns from market timing and stock selection. They divided the policy return term (P) into two parts, M and (P-M), whereas BHB left it as a single term.

What is M? XXIC define M as the market return and measure it as the average (equal-weighted) policy return of the peer fund group.

So, another interpretation of their decomposed total return equation is

(5') R_a = Avg. Peer AA Policy Return + Return due to AA Policy Deviations from the Average AA + Return from Active Management

XIIC obtained return data for 587 balanced funds, 4,641 U.S. equity funds, and 400 international equity funds and estimated asset allocation policy returns using return-based style analysis.[10] They calculated each of the return components in equation (5) for each fund for each month from May 1999 through April 2009. Then, as BHB did for their 91 funds, XIIC ran time-series regressions with the following average R^2 results[11]:

Table 4. Average R^2s - Time-Series Total Return Variability May 1999-April 2009

Regression of R_a on Return due to:	Balanced Funds	U.S. Equity Funds	International Funds
Market Movement (M)	88%	83%	74%
Detailed AA policy (P-M)	20%	18%	19%
Active Management (R-P)	10%	15%	26%
Interaction Term	-18%	-16%	-19%
Total	100%	100%	100%

XIIC interpreted these results as showing that market movements explain the vast majority of a fund's return variability over time. Active management explains little of the variation in total fund returns over time.

We do not disagree with the conclusion that fund returns generally move with "the market," although find the definition of "market return" unusual. XIIC equate the peer group's average policy return with market return and seem to treat returns from policy differences as unrelated to market movements. A fund's market exposures are, after all, determined by its complete AA policy—not just the part of it that matches the average of its peer group. Nonetheless, the decomposition of P into M + (P-M) provided a way for XXIC to investigate their second question of how differences in AA policies explain differences in returns across fund. To pursue this, they investigated fund excess returns rather than total returns. Excess returns were defined as the difference between actual return and the market return (the average AA policy return for the peer group). Subtracting M from both sides of equation (5) gives the following excess return equation:

[10] For balanced funds they used 11 stock and bond indexes, For U.S. equity mutual funds XIIC used seven size and style indexes: Russell Top 200 Growth, Russell Top 200 Value, Russell Midcap Growth, Russell 2000 Growth, Russell 2000 Value, and cash. For international funds, they used 7 indexes and cash.

[11] Xiong, *et al* constructed an interaction term to force the R^2s to sum to 100%.

(6) $(R_a\text{-}M) = (P\text{–}M) + (R_a\text{-}P)$

Excess Market Return = Excess Market AA policy return + Active Management Return

Another interpretation of (6) is

(6') The difference between a fund's actual return and the average policy return of its peer group =

the difference between the fund's policy return and the average policy return of its peers

+ the fund's return from active management.

Removing the "market return" in each time period was equivalent to factoring out part of each fund's asset allocation policy (the average for the group). This left only a fund's AA policy difference and its use of active management to explain its excess market return (which, by definition, is also the amount by which its return differed from the average policy return). They regressed monthly excess market returns on the two component terms in equation (6) for all funds in their samples. Results are shown in the following table:

Table 5. Average R^2s – Time Series Excess Market Return Variations May 1999-April 2009

Regression of $(R_a\text{-}M)$ on Return due to:	U.S. Equity Funds	Balanced Funds	International Funds
Excess Market AA Policy (P-M)	48%	36%	49%
Active Management $(R_a\text{-}P)$	41%	39%	45%
Interaction Term	11%	25%	6%
Total	100%	100%	100%

From the results in Table 5, XIIC concluded that asset allocation policy and activement management are equally important *in explaining excess market return variations over time* within each of the peer groups. Let us not equate this conclusion with the broader statement that "asset allocation and active management are equally important" as the title of their paper suggests. They have answered a very specific question: If peer funds have different asset allocations and employ differing degrees of active management how will their excess "market return" differences depend on their AA policy and active management differences? In the time period 1999-2009 neither differences in policy or active management dominated.

XXIC point out that results will depend on the peer group and the time period. This deserves a bit more discussion: Recognize that XIIC took the AA policy question down to smaller and smaller portions of the portfolio when they separately analyzed U.S. equity funds and international funds. Consider what we have learned about the sample of U.S. equity funds. XIIC estimated an average policy return for small-cap, mid-cap, and large-cap funds which may have had either core, value, or growth tilts and defined that policy return as the "market return." They proceeded to explain how individual fund excess "market returns" varied in relation to variations in 1) policy return differences between the fund and the average and 2) the fund's own active returns. We would certainly expect that any small-cap fund returns would differ from the average policy returns of *all* U.S. equity funds, and that most of the differences would be explained by the fact that small-cap funds do not allocate to large-cap equities. The same can be said for any other individual U.S. equity fund, unless it is specifically designed to allocate according to the average allocation policy of all U.S. funds. The analogy also applies to, say, an emerging market fund in comparison to the average international fund.

Are we surprised that active management differences are almost equally important in explaining "excess market return" variations? Given the unusual design of this investigation and the fact that we are observing regressions on regressions (remember that XXIC estimated policy returns for funds), probably not. We do, however, prefer to think about individual mutual funds in the context of the enormous body of theoretical and empirical research that specifically targets their performance issues.

So, while interesting in a "micro" sense, this study draws attention away from what we consider the more important role of asset allocation policy—specifically as a framework for structuring an investor's entire portfolio to be efficient and optimal given asset class return and risk expectations and the investor's particular risk and return preferences.

Final Comments

While empirical studies can be insightful and extremely useful in supporting or refuting theory, we think the Brinson *et al* –related studies have little more to offer. Once determined and implemented, asset allocation policy determines the market exposures in a portolio and its expected returns and risk. Actual portfolio returns will primarily depend on its market exposures. If active instead of passive management is utilized, returns will be marginally improved if we select skilled managers and lowered otherwise. It is difficult to argue with the results from either empirical or theoretical work that *on average* active management adds no net value; it is the quest for the above-average results that continues to occupy researchers and investors. Likewise, researchers continue to investigate the difficulties of determining asset allocation policy, whether it be in terms of forecasting asset class risk and return or of meshing policy with portfolio objectives.

The literature referenced in this note may be useful when reviewing the traditional portion of an asset allocation policy, but it is not immediately relevant when policy contains allocations to alternative asset classes where investment strategies clearly involve market timing and/or security selection and where manager selection appears to be critically important. The 2010 articles will probably elicit a series of responses just as the original BHB article did. This approach to empirically investigating asset allocation issues has not been put to rest, but investors should not lose sight of the forest for the trees.

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References

Brinson, G., Hood, R., Beebower, G., "Determinants of Portfolio Performance," *Financial Analysts Journal,* July/August 1986, pp. 39-44.

Brinson, G., Singer, Beebower, G., "Determinants of Portfolio Performance II: An Update," *Financial Analysts Journal,* 47, 3, 1991, pp. 40-48.

Davis, J., Kinnery, F., and Sheay, G., "The Asset Allocation Debate: Provocative Questions, Enduring Realities," Investment Counseling & Research, The Vanguard Group, 2007. Revised and updated version of Tokat, Y., Wicas, N., and Kinniry, F., "The Asset Allocation debate: A Review and Reconciliation," *Journal of Financial Planning, 19(10), 2006, pp. 5*2-63.

Drobetz, W. and Kohler, F., "The Contribution of Asset Allocation to Portfolio Performance," *Financial Markets and Portfolio Management, 16(2), 2002, pp. 219-233.*

Ibbotson, R., "The Importance of Asset Allocation," *Financial Analysts Journal,* March/April 2010, pp.18-20.

Ibbotson, R. and Kaplan, P., "Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?" *Financial Analysts Journal,* January/February 2000.

Jahnke, W., "The Asset Allocation Hoax," *Journal of Financial Planning,* February 1997, pp. 109-113.

Kritzman, M. and Page, S., "The Relative Importance of Asset Allocation and Security Selection: Evidence from Global Markets," *Journal of Asset Management,* Winter 2003.

Statman, M., "The 93.6% Question of Financial Advisors," *Journal of Investing,* Spring 2000, pp. 16-20.

Surz, R., Stevens, D., and Wimer, M., "Investment Policy Explains All," *Journal of Performance Measurement,* Summer 1999, pp. 43-47.

Xiong, J., Ibbotson, G., Idzorek, T., Chen, Peng, "The Equal Importance of Asset Allocation and Active Management," *Financial Analysts Journal,* March/April 2010, pp. 22-30.