Country Allocation and Mutual Fund Returns

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Executive Summary
We examined the actual performance of 56 international and global mutual funds during 2001 to 2005. Our conclusions are:

- Time series analysis suggests that, on a month-to-month basis, country allocation explains 88% of the variation of fund returns and 21% of the variation of fund excess returns.
- Cross-sectionally, and over longer holding periods, country allocation explains a substantial (34%-50%) share of excess return variance.
- Together, size and country allocation explain as much as 60% of the cross-sectional variation of excess returns.
- In terms of performance contribution, country allocation appears to be a positive contributor to fund performance, while stock selection appears to add no value to international and global equity funds.

This paper provides new evidence on the relative importance of country allocation for international equity portfolios. Many studies have used factor analysis to address the issue (see, for example, Heston and Rouwenhorst (1995). This literature provides interesting insights, but—in our view—suffers from a key problem: The analysis is based implicitly on the assumption of perfect foresight. In contrast, this paper adopts a different framework and attempts to measure the historical importance of country allocation for actual international equity mutual funds. To do so, we use a return decomposition methodology analogous to that used by Brinson, Hood, and Beebower (1989), who examined the importance of asset allocation strategy relative to instrument selection in balanced portfolios (portfolios containing stocks, bonds, and cash). We apply this methodology to data provided by Emerging Portfolio.com on the actual mutual fund country allocations of 56 international and global mutual funds during 2001-2005. We find that, during the period covered by our study, 34%-50% of the variance of excess returns across international and global equity mutual funds is explained by their country allocation strategies. Combined, country allocation and style selection explain up to 60% of the cross-sectional variation. Finally, we find that country allocation marginally added to excess returns, while decisions other than country allocation (including stock selection) modestly subtracted from excess returns during the period of analysis.

1 Emerging Portfolio Fund Research, Inc. (EPFR) tracks equity and bond fund flows, cross border capital flows, country and sector allocations, and company holdings data from its universe of 10,000 international, emerging markets and US funds with $5 trillion in assets. EPFR data comes directly from funds or their administrators and includes funds registered in the major domiciles of North America, Europe, Asia and other offshore domiciles.
The Factor Analytic Approach
Many analysts have assessed the relative importance of country allocation using factor analysis. In their seminal paper, “Industry and Country Effects in International Stock Returns,” Heston and Rouwenhorst (1995) compared the relative importance of country and sector factors for developed markets. They found that the dispersion of country-factor returns was greater than that of sector-factor returns—which they interpreted as evidence that country factors dominate sector factors. The intuition behind this interpretation can be grasped by looking at an extreme example. Suppose that all countries have the same sector composition. If this is the case, a country’s factor return equals the excess return of the country portfolio. Similarly, a sector’s factor return equals the excess return of the global sector portfolio. If the variance of returns across countries is large relative to the variance across sectors, portfolio returns can be better enhanced by shifting $1 from the worst performing country to the best than by shifting $1 from the worst performing sector to the best. Ergo, country factors dominate.

An important criticism of the foregoing analysis is that it presumes perfect knowledge. The existence of variance is only an opportunity if it can be predicted. In a very important sense, the whole literature on country effects versus sector effects has been off base. The question should not be, Where is the variance greatest? But, rather, Where is the predictable variance greatest?

An Alternative Framework for Assessing Country Allocation
This paper assesses the importance of country allocation in practice by analyzing the performances of actual international and global equity mutual funds from January 2001 to August 2005. Using data on fund returns (gross of fund expenses) and country allocation weights, we decompose returns into country allocation and non-country allocation components.

We define the return to country allocation as the hypothetical return that would be achieved by a fund in a month, if the fund began the month with the country weights reported by Emerging Portfolio.com and invested passively within each country according to MSCI within-country stock weights, thereby achieving the MSCI country index return in each country. We assume no mid-month portfolio adjustments. Our estimate of the country allocation return includes a deduction for the estimated transactions costs associated with implementing an active country, passive stock-selection strategy.

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2 A country factor return—say the Australian factor return—can be interpreted as the excess return (in this section, excess return is defined as the return in excess of the MSCI world return) on an Australian portfolio with the same sector composition as the world portfolio. A sector factor return—say the Energy factor return—is the excess return on a world Energy portfolio with the same geographical composition as the MSCI world return.
Equation 1: \[ R^F = R^A + \lambda \]

The return equation can be easily recast to reflect the composition of a fund's performance relative to its benchmark:

Equation 2: \[ (R^F - R^B) = (R^A - R^B) + \lambda \]

Where:

- \( R^F \) = Fund return, gross of expenses
- \( R^A \) = Fund country allocation return = \( \sum w^F_i * r^B_i - c \)
- \( \lambda \) = Fund return due to everything other than country allocation
- \( R^B \) = Fund benchmark return = \( \sum w^B_i * r^B_i \)
- \( w^F_i \) = Fund weight for country \( i \)
- \( w^B_i \) = Benchmark weight for country \( i \)
- \( r^B_i \) = Benchmark return for country \( i \)
- \( c \) = Estimated country allocation transactions cost

This paper’s strategy is to assess the relative importance of country allocation by looking at Equations 1 and 2 in three ways:

- **Time-series analysis:** What percent of the average fund’s month-to-month return variance is explained by the country allocation return?
- **Cross-sectional analysis:** What percent of the return variance across funds can be explained by country allocation returns?
- **Performance analysis:** What are the contributions of country allocation versus other investment decisions for the average fund’s excess return?
Discussion of Data Set

This paper analyses mutual fund returns gross of the expenses reflected in fund expense ratios. In other words, we examine the sum of the net fund return to the investor plus fund expenses. By examining gross returns, we restrict our focus to portfolio management performance.

To calculate country allocation returns, the study uses Emerging Portfolio.com’s database of the monthly country allocation weights of 56 international and global equity mutual funds. For the average fund, the database provides 37.5 months of data covering various spans during January 2001 – August 2005. The average fund’s assets under management averaged $2.3 billion during the period. Net fund returns were collected from Factset and Bloomberg with the guidance of tickers provided by Emerging Portfolio.com. Expense ratios were obtained from Bloomberg. Benchmark returns were provided by Morgan Stanley Capital International (MSCI).

Using fund country allocation weights and MSCI country benchmark returns, we were able to calculate gross allocation returns. These figures can be interpreted as the returns funds would have achieved with their country allocation choices had they remained passive stock selectors and invested in each country’s benchmark index without transactions costs. In cases where an allocation share was assigned to a residual category (for example, “other Europe”), we used the MSCI All-Country World Index (ACWI) as a proxy in the calculation. This may produce a modest amount of noise in our estimates and therefore decrease the estimated explanatory power of country allocation for fund returns.

We then estimated the transactions costs associated with country allocation for each fund by directly measuring allocation transactions volumes and charging 50 basis points for each developed market transaction and 150 basis points for each emerging market transaction. We believe that our estimates are conservative, both in terms of the estimated cost per transaction and in terms of the volume of transactions. The volume estimates are probably overstated, because it appears that in some cases high turnover estimates resulted from categorization shifts (for example, in one case a large shift of weight appeared to occur from “other Europe” in one month to specific European countries in the next month). By subtracting these estimated costs from the gross allocation returns, we arrived at our estimates for country allocation returns. Across the 56 funds in the data set, turnover averaged 48% annualized, and transactions costs averaged 0.59% annualized (Figure 1).

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Transactions for each country were estimated as the absolute value of the difference between the current weight and the lagged weight adjusted by the country’s relative return (one plus the country return divided by one plus the fund return).
Excess returns were calculated using MSCI EAFE as the benchmark for mutual funds with international mandates and MSCI All-Country World for stocks with global mandates. These indexes were used as benchmarks for all funds, including those with value, growth, small cap, or large cap mandates.

**Time Series Analysis**

Our time-series analysis of Equation 1 consists of a regression of each fund’s monthly returns against the fund’s country allocation returns. Intuitively, we expect this regression to produce a good “fit” or R-Squared—which in this case measures the percent of fund return variance that can be explained by country allocation return variance. The reason we expect a good fit is that country equity returns tend to be correlated with one another. Consequently, if it is a good month for equities globally, most equity funds are going to perform well, regardless of country allocation. Because of this, the high observed time series R-squared of 88% does not in itself make a strong statement in favor of the importance of country allocation (see Figure 2).

Brinson, Hood, and Beebower (1986) performed an analogous return decomposition in their study of the importance of asset allocation vs. instrument selection for balanced portfolios (consisting of stocks, bonds, cash, and other instruments). Their time-series analysis included time-series regressions of fund returns against benchmark returns and against asset allocation returns (see the first two rows of Figure 2).⁴ Their results for balanced funds are quite similar to our analogous figures for international and global equity mutual funds.

Time-series regressions based on Equation 2 provide a more demanding test. For Equation 2 to fit well, a high percent of a fund’s excess return (relative to its benchmark) would have to be explained by the country allocation excess return. The mere fact that global equities tend to be correlated will not support a high R-Squared. The empirical results suggest that about one-fifth of the average fund’s excess return variance over time can be explained by country allocation excess returns (Figure 2). Brinson, et al (1989) did not run a parallel time-series regression for balanced funds, so we have no basis for comparison.

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⁴ Instead of the phrase “benchmark” return, they used “policy” return, which they measured as the return a fund would have had in a given month, if the fund held its 10-year average weighting in each asset class and each asset class had the same return as the asset class’ passive index. The asset allocation return was defined as the return assuming the fund held its current asset class weighting and each asset class had the same return as the asset class’ passive index.
Figure 2

<table>
<thead>
<tr>
<th>Equation:</th>
<th>Simple R-squared*</th>
<th>Weighted R-squared**</th>
<th>Corresponding Figure from Brinson, et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation 0: Fund Return and Benchmark Return</td>
<td>73%</td>
<td>72%</td>
<td>93%</td>
</tr>
<tr>
<td>Equation 1: Fund Return and Allocation Return</td>
<td>88%</td>
<td>89%</td>
<td>95%</td>
</tr>
<tr>
<td>Equation 2: Excess Fund Return and Excess Allocation Return</td>
<td>21%</td>
<td>22%</td>
<td>?</td>
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</table>

* Funds with less than 12 months of data (11 out of 56 funds) were excluded from the calculations.
** Weighted by the number of months of data available for each fund.

Cross-Sectional Analysis

The paper’s cross-sectional analysis examines the variance of returns across the funds in our data base. The analysis differs from the time-series work in one less-than-obvious respect: For each fund, the cross-sectional analysis focuses exclusively on cumulative return performance. This presents a problem: The holding periods for the various funds do not line up perfectly. Data for some funds span as many as 55 months, but less than twelve months for 11 of the 56 funds in the data base. Our solution to this problem is to focus on Equation 2, which is cast in terms of excess returns. We calculate both the fund excess return and the country allocation excess return over the appropriate holding period for each fund. In the cases where we run simple cross-sectional regressions, we include only funds with at least 12 months of data (45 observations). We include all 56 funds, however, when we use weighted least squares, with each fund’s weight in the regression equal to the number of months of data used in calculating the fund’s excess return.

We began the cross-sectional analysis by focusing on “core” international and global mandates; that is, we excluded funds with value, growth, large cap, or small cap mandates. We found that country allocation excess returns explain 34% of the variation of fund excess returns (Figure 3). The estimated slope of 0.87 is reasonably close to the level we would expect (unity). The near-zero intercept suggests that fund managers neither helped nor hurt performance through stock selection. The majority of funds, however, fell below the 45 degree line—the Mendoza line—below which fund returns due to everything other than country allocation (\(\lambda\)) are negative.\(^5\)

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\(^5\) If you hit below .200 in major league baseball, you are known to be hitting below the Mendoza line.
We subsequently expanded the universe to include large cap, small cap, value, and growth mandates. We ran cross-sectional regressions across the 45 funds for which there were at least 12 months of data (Figure 4). At 42%, the R-squared was higher than for the “core” universe, but so was the intercept, at 1.7. The high slope reflects the fact that funds with small cap mandates not only exhibited high \( \lambda \) values, but also were successful at country allocation. The high \( \lambda \) values, however, did not stem from stock selection per se, but rather from style bias. Although the small cap funds with high \( \lambda \) values produced cumulative returns that exceeded the MSCI EAFE and ACWI indexes, none of them outperformed the MSCI global small cap index.

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6 This R-Squared is very close to the 39% cross-sectional finding of Ibbotson and Kaplan (2000) in their study of balanced funds.
We implemented weighted least squares to deal with the potential problem that the database has more observations for some funds than for others (and that, therefore, the results may be unduly swayed by funds with relatively short holding periods). The weighted results suggest an even greater explanatory power—52 percent—for country allocation excess returns than in the un-weighted regression (Figure 5, top panel).

As a final step, we added two dummy variables: a small cap dummy and a value-growth dummy. The small cap dummy variable equals zero for all fund without a specific small cap mandate. For a fund with a small cap mandate, the small-large cap dummy equals the relative performance of global small cap equities vs. the MSCI ACWI during the fund’s cumulative return period. For funds with large cap mandates, the small cap dummy equals the negative of the relative return performance of small cap equities. The value-growth dummy was constructed in an analogous manner. For funds without value or growth mandates, the value-growth dummy equals zero. For value funds, the value-growth dummy equals the relative return of value vs. growth during the fund’s cumulative return period. For growth funds, the value-growth dummy equals the relative return of growth vs. value during the fund’s cumulative return period.

The small cap dummy had a great deal of explanatory power during the period—much more than the value-growth dummy. In the weighted regression, the combination of country allocation excess return and size mandate explained about three-fifths of the variance of fund excess returns in the period. These results suggest that, during the sample period, country allocation was important, and the combination of country allocation and style selection was dominant.
Performance Analysis

Do funds add value through country allocation? Do they add value through active stock selection within countries? The answers are Yes to the first question and No to the second. The fund managers in our sample were able to get country allocation right—not by a long shot, but at least marginally. The 0.5% average country allocation excess return across 45 funds was statistically significant, with a t-statistic of 1.85. The average $\lambda^7$ across 45 markets, however, was a statistically insignificant -0.1% (Figure 6).

The average $\lambda$ across funds with small cap mandates was 4.0%. This excess return, however, has nothing to do with “stock selection” per se. To the contrary, the average mutual fund in the small cap category actually underperformed the MSCI small cap index by 2.8%. Consequently, the positive average $\lambda$ across small cap mutual funds was solely attributable to the fact that they invested according to the small cap style, which happened to outperform during the period.

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7 Gross return attributable to everything other than country allocation.
### Decomposition of Gross Fund Excess Returns*

<table>
<thead>
<tr>
<th></th>
<th>45 Funds**</th>
<th>Core Funds***</th>
<th>Value</th>
<th>Growth</th>
<th>Large Cap</th>
<th>Small Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Fund Excess Return</td>
<td>0.4%</td>
<td>-0.1%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>-3.0%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Country Allocation Excess Return</td>
<td>0.5%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.6%</td>
<td>-0.6%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Lambda****</td>
<td>-0.1%</td>
<td>-0.4%</td>
<td>0.0%</td>
<td>-0.4%</td>
<td>-2.4%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

* Excess returns are defined relative to either MSCI EAFE or ACWI, depending on the fund's mandate.
** Includes all funds with return histories at least 12 months long.
*** Excludes small cap, value, and growth mandates
**** Gross return attributable to everything other than country allocation

### References

