

Where are the Gains from International Diversification?

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Section 1: Introduction

U.S. sponsors believe they benefit by investing in international equities. According to the Greenwich Research 1995 report, some 60% of 1,620 U.S. sponsors interviewed (corporate, public, endowment and foundations) use or will have started to use international equities by 1994. In overwhelming proportions, sponsors also believe that foreign equities should outperform U.S. equities, a view that seems to be common in academic and professional articles as well. Sponsors must also believe that foreign equities' variance and correlation with the U.S. are low enough to make them risk reducers for U.S. portfolios. Higher returns and lower risk are the whole point of international diversification.

This paper argues that EAFE and other foreign market-like portfolios fail both tests as diversifiers for U.S. sponsors. Such portfolios do not materially increase expected returns. Further, their variances and correlations with the U.S. are too high to make them good risk reducers. There are, however, other international asset classes that satisfy both tests. Asset classes based on value (high book-to-market) and size risk factors have the diversification efficacy market portfolios lack. The "typical sponsor" could use these assets to increase expected returns over 200 basis points a year.

This paper proceeds as follows. Section 2 deals briefly with the EAFE/S&P 500 historical results and then proposes a simple model of expected returns that can provide inputs for asset allocation exercises. Section 3 summarizes the behavior of the risk factor portfolios and the various risk premia. Section 4 conducts several simple experiments to show how the three risk-factor portfolios differ in their effects on portfolio diversification and portfolio expected returns.

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Section 2. Market, Size and Value: Dimensions of Expected Returns

From 1970 through 1994 EAFE does outperform the S&P 500, but only because foreign currencies outperform the dollar. The performance of the two indices in local currency is the same (table 1). Thus there is no empirical evidence that major international market-like portfolios reliably outperform the U.S. market. Without a difference in expected returns the benefits to U.S. sponsors from holding market-like foreign portfolios are small. Other asset classes hold more promise, however.

Table 1
**Summary Statistics for the S&P 500, and EAFE
 in \$U.S., Local Currency and "EAFE Currency."**

	Annual % Returns 1970-1994			
	S & P 500	EAFE (\$U.S.)	EAFE (Local)	EAFE (EAFE Currency)
Compound Return	10.97	13.21	10.52	2.37
Standard Deviation	15.90	23.35	20.35	12.46
Arithmetic Mean	12.13	15.48	12.42	3.07
Correlations				
EAFE (\$U.S.)	.57			
EAFE (Local)	.70	.85		
EAFE Currency	-.09	.49	-.05	

* EAFE (\$U.S.) is the dollar return on the the MSCI EAFE Index and EAFE (Local) is the local return of that index. EAFE Currency is the difference between the two. See the appendix for details.

Recent evidence (Fama and French, 1993A) shows that U.S. equity returns are well-described by a 3-factor asset pricing model version of that proposed by Merton (1973). The three factors are a market factor, a size factor and a value factor. While formal tests of non-U.S. returns are incomplete, preliminary evidence suggests that the same model applies to developed non-U.S. markets as well (Fama and French, 1993B and Capaul, Rawley and Sharpe, 1993). Two of the risk factors, the size and value factors, are associated with above market returns in both the U.S. and developed non-U.S. markets.

Formally, the expected return of a portfolio in the U.S. or non-U.S. market is

$$(1) E[R_p] = R_f + B[E(R_m)] + h[E(R_v)] + s[E(R_s)]$$

$E[R_p]$ means expected returns on portfolio p. R_f is riskless return. The m,v and s inside the brackets refer to market, value and size factors' returns. The B,h and s outside the brackets show the portfolio's sensitivity or exposure to the relevant factor. There is no reason to assume that market portfolios in different regions load differently on the value and size risk factors. This implies that for integrated markets, the expected return for a given risk premium is the same worldwide.

For those who prefer the notation, the worldwide equality of expected returns says

$$(2) E(R_{m,U.S.}) = E(R_{m,Intl})$$

$$(3) E(R_{s,U.S.}) = E(R_{s,Intl})$$

$$(4) E(R_{v,U.S.}) = E(R_{v,Intl}).$$

I believe that expressions (2), (3) and (4) are the most reasonable inferences from (1) and are consistent with historical data, but other inferences are not precluded. For example, segmented market models may lead to differential expected returns for country specific market portfolios or risk factor portfolios. However, the "EAFE" markets were probably much more integrated than segmented over the 1970-1994 period and surely are today.

Here is a brief description of the three risk factors:

The Market factor

The market factor refers to the general risk of equities that nearly all individual stocks and portfolios share. It is measured as the return on the overall equity market minus the 30-day T-Bill.

The Size Factor

The size risk factor is measured by the returns of small firms minus the returns of big firms (controlling for value effects, if possible).

The Value Factor

The value factor is based on the book-to-market ratio. Firms with high book-to-market ratios are defined as value stocks. Firms with low book-to-market ratios are defined as growth stocks. Returns on the factor are the returns on high book-to-market stocks minus the returns on low book-to-market stocks (controlling for size, if possible).

The high returns of small firms and high book-to-market firms reflect their prospective difficulty in generating earnings (Fama and French, 1993). Because these firms have poor earnings results and poor prospects, they have high costs of capital, which is the same as saying they have high expected returns on their stocks (and bonds). The high expected returns are merely compensation the market demands for investing in firms with poor earnings.

At the other extreme are the successful earnings firms: the big firms and firms with low book-to-market ratios, the growth firms. The high realized earnings and high prospective earnings of these firms means they are comparatively less risky in the earnings dimension and thus have lower cost of capital, which is another way of saying their stocks (and bonds) have lower expected returns.

Section 3. Behavior of Risk Factor Portfolios and Risk Premia

Tables 2 and 3 summarize the return behavior of the risk factors and portfolios based on them. Table 2 gives compound annual returns and standard deviations for portfolios formed along the market, value and size dimensions for both the U.S. and international markets. (These summaries and the portfolio experiments conducted in section 4 use a variety of indices and asset-class portfolios. The appendix describes these in detail.)

Table 2
Summary Statistics for Market, Size and Value Asset Class Portfolios
 Percent Returns in \$U.S.

U.S.

1964-1994

	Large Stocks			Small Stocks		
	Value	S&P 500 (Market)	Growth	Value	CRSP 6-10 (Market)	Growth
Compound Return (%)	13.9	10.2	9.2	17.2	12.7	11.7
Standard Deviation	16.9	15.4	16.9	25.0	26.1	28.3

International

	1970-1994		1975-1994			
	Large	Small	Value	Large	Growth	Small
	EAFE (Market)	Int'l. Small (Market)		EAFE (Market)		Int'l. Small (Market)
Compound Return (%)	13.2	20.9	21.9	16.3	UA	23.3
Standard Deviation	23.4	31.5	22.6	22.0	UA	28.5

Tables 3A & 3B give estimates of the market, value and size premiums. Table 3A provides estimates of the market (S&P 500 and EAFE) premium for two periods, 1926-1994 (U.S.) and 1970-1994 (U.S. and International). Forming a 50/50 global portfolio and subtracting T-bills gives a market premium of about 5% per year. Table 3B says that the annual value and size premiums are also about 5% each.

Table 3A
Market Risk Premium
Difference of Compound Returns
 Percent Per Year
 All Returns in \$U.S.

U.S.	Market (S&P 500)		T-Bills		Premium
1926-1994	10.2	-	3.7	=	6.5%
1970-1994	11.0	-	7.0	=	4.0%
International	Market (EAFE)		T-Bills		Premium
1970-1994	13.2	-	7.0	=	6.2%
Average Global Portfolio	Market (50% S&P 500 + 50% EAFE)		T-Bills		Premium
1970-1994	12.5	-	7.0	=	5.5%

Table 3B
Risk Premium for Value and Size Portfolios
Difference of Compound Returns
 Percent per year
 All Returns in \$U.S.

U.S. (1964-1994)	Value Premium	Size Premium
Large Value minus S&P 500	3.8	
CRSP 6-10 minus S&P 500		2.6
International		
Int'l. Small minus EAFE (1970-1994)		7.2
Int'l. Large Value minus EAFE (1975-1994)	5.6	
World-Wide Average (50% U.S., 50% Int'l.)	4.7	4.9

* The table calculates the value premiums relative to a market proxy and not to a growth proxy. Calculating value premiums relative to growth stocks adds about 1% each to the U.S. and international premiums.

Averaging risk premiums across geographic regions has statistical advantages. World-wide data increases sample sizes and probably provides estimates closer to the true but unobservable mean. This is especially true of the size premium which is uncorrelated across regions. Table 3C gives correlations and simple t-tests for the premiums using quarterly data.

Table 3C
Panel A
**Differences of Market, Value and Size Premiums
and Correlations of Premiums**
Based on Quarterly Returns (%)
1975-1994

	Value Premium	Size Premium	Market Premium
	International minus U.S.	International minus U.S.	International minus U.S.
Arithmetic Mean	.39	.37	.54
Standard Deviation	3.84	7.85	7.82
Standard Error	.42	.88	.87
t	.93	.42	.62

Panel B

	EAFE minus T-Bills	S&P 500 minus T-Bills	U.S. Value Premium	Int'l. Value Premium	Int'l. Small Premium	U.S. Small Premium
EAFE minus T-Bill	1.00					
S&P 500 minus T-Bill	.62	1.00				
U.S. Value Premium	-.07	-.17	1.00			
Int'l. Value Premium	-.24	-.10	.33	1.00		
Int'l. Small Premium	-.15	-.03	-.00	.42	1.00	
U.S. Small Premium	.26	.38	.35	.10	.18	1.00

Standard Error = .11

Panel C

Arithmetic Mean	2.51	1.98	.79	1.18	1.60	1.23
Standard Deviation	9.69	7.83	3.57	3.02	6.19	6.09
t	2.3	2.3	2.0	3.5	2.3	1.8

* The international version of each premium is larger than the U.S. version, but none of the differences are close to significant. The largest t is .93 (Panel A). The two market premiums are correlated as are the two value premiums. The size premiums are uncorrelated. All of the quarterly average returns have t's above 2.00 except for U.S. small stocks.

Section 3. Portfolio Experiments. Where are the Gains from International Diversification?

This section examines the diversification efficacy of international market, value and size-based portfolios for U.S. sponsors. The first experiment shows whether an EAFE portfolio helps U.S. sponsors. Again, an asset class is useful if: 1) it has above market expected returns, and 2) its variance and covariance with U.S. assets are so low that its addition to the U.S. portfolio allows an increase in the equity/debt ratio without exceeding the initial (all U.S.) portfolio risk level. In Markowitz language, this portfolio is more efficient - it has a higher return at the same level of risk.

EAFE fails criteria 1 by virtue of the equal expected return assumption, equation (2) above. To enforce this assumption and examine criteria 2, EAFE's returns were reduced by 220 basis points each year to produce a series whose compound mean return equals that of the S&P 500 for the period 1970-1994. Table 4 shows how this adjusted EAFE changes a simple 60/40 S&P 500/LT Bond portfolio, P1. Portfolios P2-P4 show that adding EAFE offers trivial risk reduction, so little, in fact, that only a 1% increment in the equity/debt ratio is possible. Beyond that, the risk exceeds that of P1.

Table 4
EAFE and S&P 500 Portfolio Combinations:
Trying to Improve a Domestic 60/40 Mix Using Only EAFE
1970-1994

	Portfolio Combinations			
	P 1	P 2	P 3	P 4
S&P 500 Index	60	45	46	45
EAFE Index	0	15	15	16
LT Bonds	40	40	39	39
Annualized Return	10.4	10.6	10.6	10.6
Standard Deviation	11.4	11.3	11.4	11.4

Message: We can increase the equity/fixed ratio only 1% before exceeding the risk levels of P1. Diversification with market portfolios (EAFE) does not materially increase expected returns over a simple 60/40 all-U.S. portfolio.

Assumption: The compound returns of EAFE and S&P 500 are forced to be equal.

The second experiment tests whether the international value and size asset classes do much better. There are two changes from the first experiment. First, because there is no data for international value prior to 1975, the experiment covers only 1975 to 1994. Second, although the equal returns assumption is valid, equations (3) and (4) were not enforced by altering data the way EAFE was. This laxity does not change any conclusions. Further, using actual returns gives readers results in familiar terms and facilitates comparisons readers may wish to make.

Introducing risk factors beyond the market factor raises a subtle complication. If equity return behavior conforms to the kind of 3-factor model that Fama and French document, then there are two relevant implications. First, one can hold such factor-based (size and value) portfolios in greater than market proportion to increase total portfolio expected returns. Second, such a portfolio does have more risk but not necessarily a higher standard deviation than a plain market portfolio. In a 3-factor world, the convenience of a simple measure of portfolio risk disappears. Three risk measures are necessary: the amount of exposure to market risk, to value/growth risk, and to size risk. For the rest of the paper, I follow the conventional practice of showing the effects of different asset combinations on portfolio standard deviation. But the reader should be cognizant of the above distinctions.

Portfolio P7 (table 5) shows the starting S&P 500/bonds 60/40 combination and P8 is the version with 15% in EAFE. These represent “typical” sponsor portfolios. The modest risk reduction from P7 to P8 is slightly better than for the entire 1970-94 period. The return increase is spurious because equation 2 is relaxed.

Table 5
Substituting Value and Small Stocks Portfolios for EAFE
 1975-1994

	Portfolio Combinations						
	P7	P8	P9	P10	P11	P12	P13
S&P 500 Index	60	45	45	45	45	30	30
CRSP 6-10 Small	0	0	0	0	0	5	5
U.S. Large Cap Value	0	0	0	0	0	10	12
EAFE Index	0	15	0	0	0	0	0
Intl Small Strategy	0	0	0	15	7.5	7.5	9
Intl Value Strategy	0	0	15	0	7.5	7.5	10
SL Gov/Corp Index	40	40	40	40	40	40	34
Annualized Return	12.8	13.2	14.1	14.5	14.3	14.9	15.6
Standard Deviation	10.1	9.8	9.7	9.4	9.5	9.6	10.1

Message:

P9: International Value stocks reduce the risk of a domestic portfolio as well as or better than EAFE. Unlike EAFE, however, International Value stocks increase expected returns.

P10: International Small stocks reduce the standard deviation of a domestic portfolio better than EAFE. Unlike EAFE, however, they increase expected returns.

P11: International Value and Small stocks together reduce the standard deviation of a domestic portfolio. Unlike EAFE, however, they increase expected returns.

P12: Shifting from a U.S. market portfolio (e.g., S&P 500) to U.S. Value and U.S. Small stocks increases expected returns without increasing the portfolio's standard deviation.

P13: Using international value and small stocks allows an increase in the equity/debt ratio and thereby an increase in expected returns.

Portfolios P9 through P12 improve expected returns in accordance with criteria 1. They shift money to risk factor asset classes that have above-market expected returns. P13 shows that they satisfy the more demanding criteria 2. P13 shifts 6% from bonds to domestic value, international value and small stock asset classes. P13 has the same standard deviation as P7 but a return that is 280 basis points higher (240 basis points after subtracting the returns of "EAFE Currency" for 1975-1994). Of that increase, 70 basis points comes from shifting assets from bonds to higher performing asset classes.

At this stage, the story is essentially complete. It is easy to further improve the portfolio by reducing the maturity of the bond holdings, but that change is beyond the purpose of this paper.

Conclusion and Interpretation

EAFE and international market-like mandates are popular with U.S. sponsors. The rationale seems to be that the international equity market has higher expected returns than the U.S. equity market and can substantially diversify U.S. portfolios. The empirical evidence for the period 1970-1994 does not support either claim. Nor is there a theoretical basis for the expected return argument. Asset pricing models do not posit geographic regions as risk factors.

Recent research for the U.S. market shows that two risk factors, value and size, explain differences in expected returns across equity portfolios. Preliminary evidence suggests that the same factors work in foreign markets as well. Portfolios that hold above-market proportions of value and small stocks have above-market expected returns. International value stocks and international small stocks diversify U.S. portfolios more than EAFE. In fact, a sensible reason to diversify internationally is to “load up” on value stocks and small stocks without concentrating in one geographic region. If one does not wish to concentrate in such stocks, then international diversification may be unnecessary.

Appendix

For the U.S. market, the S&P 500 series and for the risk-free rate the 30-day treasury bill series were used, both from Ibbotson & Sinquefeld (1994). For U.S. small stocks the CRSP 6-10 Index was used (Center for Research in Security Prices, University of Chicago, CRSP). CRSP forms this index by ranking all NYSE stocks (operating companies only) by market capitalization and forming ten groups each containing the same number of firms. AMEX and NASDAQ firms, based on their market values, are then assigned to the appropriate size group. A value weighted portfolio of groups 6 through 10 constitute the index. Reranking occurs at the end of each calendar quarter.

The U.S. value and growth series use the CRSP size sorts to distinguish small (groups 6-10) from large (groups 1-5). One additional sort is necessary. Fama and French rank all NYSE firms in terms of their book-to-market (btm) ratios. This sort is independent of the size sort. They then form ten btm groups with each group having the same number of firms. AMEX and NASDAQ firms are then assigned to the appropriate btm group. The three highest btm groups (8-10) are the value firms and the three lowest btm groups (1-3) are the growth firms. The various value and growth series come from combinations of the two sorts. For example, large value firms are in both size groups 1-5 and the three highest btm groups. The value and growth series are net of estimated trading costs that occur when companies enter or leave the index. Reranking is annual, at the beginning of each July, from 1963 through 1991. From 1992 on it takes place at the end of each calendar quarter. The U.S. value and growth series are courtesy of Dimensional Fund Advisors Inc.

There are four international series: market, value, growth and small. EAFE (Morgan Stanley Capital International) serves as the market proxy. The value and growth series are analogous to the U.S. series. The firms are ranked in terms of the book-to-market ratio on a country-by-country basis. Within each country the 30% of firms with the highest ratios are value stocks and the 30% with the lowest ratios are growth stocks. The rankings occur annually, each July, starting 1975. The international value and growth series are computed by Ken French and are courtesy of Dimensional Fund Advisors Inc.

The DFA international small stock series is a universe of small firms having virtually no overlap with EAFE, the large stock index. In fact, only 7% of EAFE is in the size range covered by the small stock series. There are four regional components: United Kingdom, European Continent, Japan and the Pacific Rim. The ranking procedures to determine the size break point differs from region to region. In all regions except Japan, the upper bound for small firms, in U.S. dollars, is less than the upper bound for the CRSP 6-10. There are over 3000 firms in the series held in approximate market proportion within a region. The

regional modules enter the index at different times. The series starts with the Japanese and U.K. small stock components in 1970. The Continental component enters in July 1988 and the Pacific Rim module in October 1989.

At year-end 1993, the largest stock, the number of stocks and the average market value of small firms for each of the regions of the world are:

Region	Number of Stocks	Largest Company in "Buy Range" (\$Million)	Average Size (\$Million)
U.S.	4266	633	125
Japan	635	785	424
U.K.	735	380	107
Continental	883	594	210
Pacific Rim	694	573	220

The Japanese small company module is, for 1970 through March 1986, all the stocks in the "smaller half" of the Tokyo Stock Exchange, first section. The index holds each stock in proportion to market value. Reranking the stocks on the exchange in terms of size occurs at the end of each June and December. From April 1986 on the module is the DFA Japanese Small Company Fund. This fund is a passive portfolio that buys all companies in the "smaller half" of the first section and holds them until they enter the top 40% of companies in terms of market value. Reranking to determine new size breakpoints occurs at the end of each calendar quarter.

The U.K. small company module is the Hoare Govett Small Companies Index from 1970 through March 1986. From April 1986 it is the DFA U.K. Small Company Fund. This fund ranks the companies in the FTA All Shares index (the "old" index of 650 names, not the newer 800 stock index) by market value and forms 10 size groups. Group 1 holds the largest firms, group 10, the smallest firms. Each group has the same number of companies. The fund "buys" companies in the size range of groups 6 through 10. It hold companies in proportion to market value. Most of the portfolio companies are outside the FTA index. The fund sells companies that migrate above the 5th size group.

The Continental small company module is the DFA Continental Small Company Fund. It combines the FTA indices from each of the countries it invests in. It ranks this combined index by market value and forms 10 size groups. Group 1 holds the largest stocks, group 10 the smallest stocks. Each group has the same number of companies. The buy range for the fund is groups 9 and 10. Group 8 is the hold range. Above that is the sell range. The fund holds stocks in proportion to market value.

The Pacrim small company module is the DFA Pacific Rim Small Company Fund. It combines the FTA indices from each of the countries it invests in. It ranks this combined index by market value and forms 10 size groups. Group 1 holds the largest stocks, group 10 the smallest stocks. Each group has the same number of companies. The buy range for the fund is groups 8, 9 and 10. Group 7 is the hold range. Above that is the sell range. The fund holds stocks in proportion to market value.

Long-Term bonds are the Shearson Lehman Government Corporate Index from 1973-1994. From 1970-72, they are an 80/20 combination of intermediate treasury bonds and long-term corporate bonds, both from Ibbotson, Sinquefeld. Elton, Gruber, Das and Hlavka (1993) show that this 80/20 mix approximates well the Shearson Lehman Index.

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