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Twenty Years of International Equity Investing

Still a route to higher returns and lower risks?

Richard O. Michaud, Gary L. Bergstrom, Ronald D. Frashure, and Brian K. Wolahan

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International equity portfolio diversification is now well accepted by investors around the world. It was a novel concept, and perceived as unusually risky, when proposed originally in this Journal by Bergstrom [1975]. In the twenty years since, many other writers have described the risk reduction and return enhancement of carefully diversifying portfolios across different international equity markets. A comprehensive summary of the extensive literature appears in Solnik [1988].

In these two decades, the benefits of global portfolio diversification have been largely accepted by the academic and professional investment communities. At this point, it is of interest to consider two critical questions:

1. Has international equity diversification achieved its original objectives of raising return per unit of risk for U.S.-based and other global investors?
2. What new routes are open to future global investors?

THE CASE FOR GLOBAL INVESTING

The arguments for global portfolio diversification are — as laid out in the mid-1970s — centered on decreasing portfolio risk or increasing portfolio expected return relative to a comparable domestic portfolio. The seed of the argument was planted in Markowitz's [1959] classic work on portfolio efficiency.

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Theory

A prudent investor is concerned with a portfolio's expected return and its risk. Expected portfolio return is the weighted sum of each security's expected return. One widely used measure of portfolio risk is the variance. Portfolio variance depends on the variance of each security and the correlations among securities.

A portfolio is said to be Markowitz mean-variance efficient if it has the highest level of expected return at a given level of portfolio risk or, equivalently, the lowest level of risk for a given level of expected return. The curve describing all efficient portfolios is called the Markowitz mean-variance efficient frontier. By definition, all stocks and portfolios lie below or on the mean-variance efficient frontier.

These concepts are illustrated in Exhibit 1. Suppose a portfolio manager invests only in domestic stocks. In this case, the "domestic efficient frontier" reflects the optimal set of portfolios available. In the exhibit, the domestic portfolio A has maximum expected return for the given level of risk.

Now consider a global equity manager, whose stock universe is not confined to stocks in the domestic market. Typically, global managers invest in stocks in ten, twenty, or more countries. In this case, the global stock universe may include stocks with both higher and lower risks and expected returns than those in the domestic universe.

To account for differences in trading costs in foreign markets, expected returns in a global context are defined net of expected transaction and other costs for a domestic investor. Given the expanded set of stocks, the "global efficient frontier" generally plots above, as well as extends at either end of, the domestic efficient frontier.

Consequently, as illustrated in Exhibit 1, there is an efficient global portfolio B that will have less risk at the same level of expected return as portfolio A. Also, there is an efficient global portfolio C that will have more expected return for the same level of risk as portfolio A.

Globally diversified portfolios hold out the very real promise of less risk for the same level of expected return, or more return for the same level of risk, or both, than can be achieved with domestic portfolios. This is true for a U.S.-based investor as well as for one domiciled in Japan, Australia, the Netherlands, or any other country.

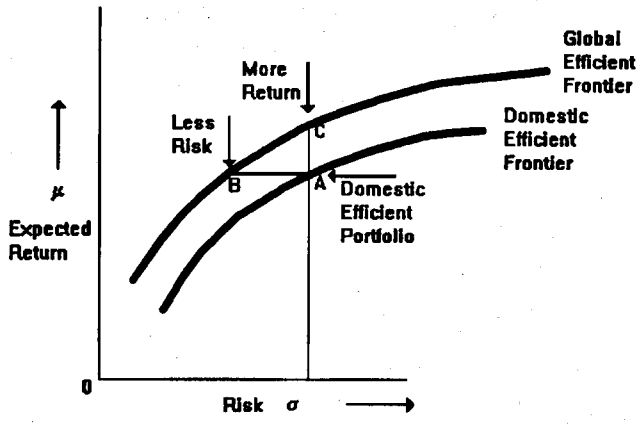
Markowitz's arguments provide a sound theoretical rationale for the obvious intuitive benefits of global portfolios: significant expansion of investment opportunities over those of a purely domestic investor. Global investment vastly widens the number of investment choices, leading to many opportunities for significantly improving performance.

Note that Markowitz theory is a normative theory of investment management. Consequently, active global strategies are potentially the major beneficiaries of the increased opportunities associated with global equity investment.

Grinold [1989] provides a noteworthy extension of Markowitz theory that can be applied to quantifying the theoretical superiority of active global to domestic investing. He shows that the value-added of an active investment strategy is approximately proportional to the square of the manager's information level times the number of independent decisions.

For a global active manager, the over- and underweighting of country markets relative to a global benchmark provides a number of opportunities for relatively independent investment decisions not available to a purely domestic investor. Consequently, the value of a global active investment strategy is potentially far richer than one based purely on domestic markets.

EXHIBIT 1
GLOBAL VERSUS DOMESTIC PORTFOLIO EFFICIENCY



Empirical Results

Empirical studies of international portfolio performance are inevitably country-, investment strategy-, and time period-dependent. One natural test is to com-

pare the performance of a passive international investment strategy in international developed markets to the performance of U.S. equities since 1975.[1] This is a true out-of-sample test of the original thesis. We represent the performance of U.S. stocks with the S&P 500 stock index and the U.S. dollar returns of international stocks with the capitalization-weighted Morgan Stanley Capital International Europe, Australia, and Far East (MSCI EAFE) index.

In Exhibit 2, the annualized average return and risk of the S&P 500 and MSCI EAFE indexes are plotted at the end points of the curve. The international index returns are net dividends, which is a more appropriate comparison for a U.S.-based investor than gross dividends. The data show that an international index portfolio provides slightly more return, and more risk, than a domestic index over the period.

The performance of various passive global portfolios is illustrated by points along the curve. Each point represents a fixed and decreasing proportion of assets in the MSCI index and a corresponding increasing proportion of assets in the domestic index.

The data show that a passive global portfolio consisting of a 70% international/30% domestic mix of portfolios would have had nearly the same level of risk as the S&P 500 index and slightly more return. Exhibit 2 also shows that a global passive portfolio with roughly a 40/60 mix would have had significantly less risk, and slightly more return, than a purely domestic index portfolio.

In summary, publicly available empirical data for the last twenty years for passive global strategies provide a simple out-of-sample test that is consistent with the original thesis — international portfolio diversification increases return per unit of risk relative to a comparable U.S.-only portfolio. For passive global strategies, the empirical data are much more convincing as a way of lowering risk than enhancing return.

It is useful to note that the optimal ex post risk-minimizing level of international equity diversification over this period for a U.S.-based investor — a 40% allocation to international securities — is much higher than allocations to international equities typically found at present in domestic investors' portfolios (not to mention the levels of international diversification that would have been considered institutionally prudent in the mid-1970s).

UPDATE ON GLOBAL EQUITY RETURNS

Bergstrom [1975] presents U.S. dollar total return data for twenty major world equity markets for two periods ending June 30, 1975. Exhibit 3 provides similar returns for each of these same twenty equity

EXHIBIT 2
PORTFOLIO RETURN AND RISK — S&P 500 AND MSCI EAFE
JANUARY 1976-DECEMBER 1995

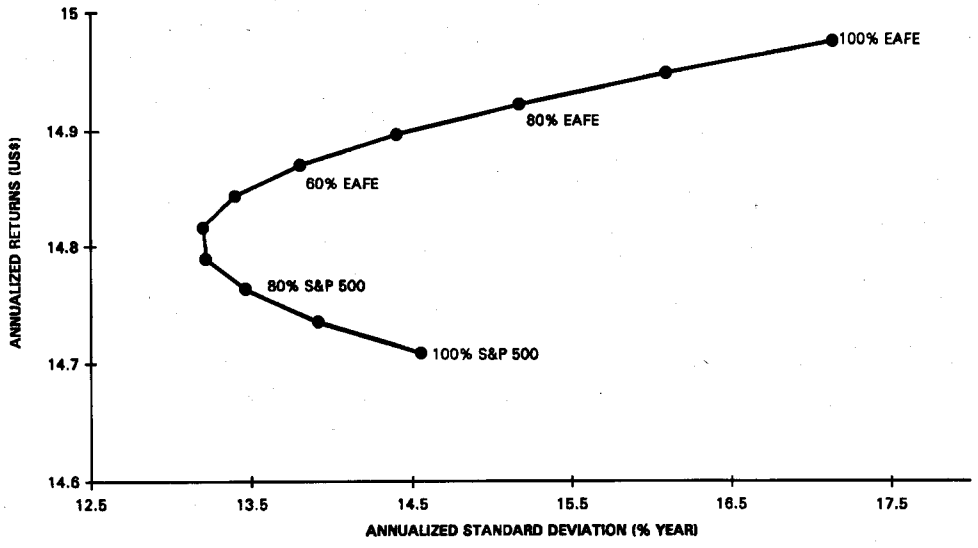


EXHIBIT 3
Compound Annual Total Returns — Percent per Year in U.S. Dollars

Market	Returns 1959-1975	Returns 1976-1995	Standard Deviation 1976-1995
Hong Kong	14.9	20.1	32.6
Netherlands	7.7	17.5	16.9
Sweden	11.5	16.3	23.4
Japan	14.9	16.1	23.4
U.K.	7.1	15.3	21.6
Belgium	8.9	15.2	19.7
Singapore	14.9	15.1	25.6
Switzerland	11.3	14.5	18.0
U.S.	6.8	14.2	14.4
France	6.3	12.8	23.9
Norway	12.2	12.0	27.1
Germany	11.4	11.9	20.7
Denmark	9.5	11.9	18.6
Australia	7.7	11.2	25.2
Austria	12.7	10.3	23.0
Italy	1.9	9.7	27.3
Canada	6.7	9.5	18.9
Brazil[a]	22.0	8.4	58.0
South Africa[b]	15.6	6.6	42.8
Spain	12.5	6.1	24.0

[a]Data source for Brazil is International Finance Corporation (IFC); for all other data, source is MSCI.
[b]1976-1992 performance based on MSCI SA Gold Mines; 1993-1995 based on MSCI South Africa equity index.

Note: Rank order correlation of 1959-1975 and 1976-1995 return series: –0.02.

markets for January 1959-December 1975 and January 1976-December 1995.

In the recent period, the U.S. market ranks ninth, with an annualized compound return of 14.2%. Hong Kong provided the strongest return of 20.1% annually, while Spain lagged, with a 6.1% annual return. Brazil, the best-performing market for the sixteen and a half years through mid-1975, provided a mediocre 8.4% return in U.S. dollars for the next twenty years. Likewise, the MSCI South Africa Gold Mines index, which ranked second through mid-1975, returned only 6.6% per year subsequently.

More formally, the rank order correlation of returns between the two time periods is –0.02, suggesting there is essentially no relationship between returns in the pre- and post-1975 intervals. This evidence indicates that simple extrapolation of historical returns has not been an effective methodology for predicting future country returns during the past two decades. These results also illustrate the substantial opportunities both to enhance returns from global investment, if return prediction frameworks can be developed, and mitigate some of the risks.

GLOBAL MARKET CORRELATIONS

The size and stability over time of correlations between country indexes impact the likely benefits of international investment. The analysis in Exhibit 4 provides estimates of the monthly correlations between the U.S. equity market, the MSCI EAFE index, and many MSCI foreign equity market indexes over the twenty-year period January 1976-December 1995. These estimates can be contrasted directly with similar correlations from the pre-1975 period estimated by Lessard [1976] for the period 1959 through 1973.

Of the fifteen markets for which there are correlations for both pre- and post-1975 periods, eight have higher correlations for the last twenty years, while six have lower correlations. There are some interesting differences.

For example, markets that were relatively highly correlated with the U.S. in the earlier period — Canada, Netherlands, and Switzerland — show somewhat lower numbers over the latest period, while Spain and Denmark (almost unrelated to the U.S. market in the earlier period) have higher correlations over the last two decades. Looked at in statistical terms, the rank order correlation between these two sets of long-term correlation estimates is 0.71, suggesting a surprisingly strong continuity in the long-term relationships among these equity markets.

While this very long-term evidence suggests there have not been dramatic changes in correlations between the U.S. and most important foreign equity markets, a frequently heard opinion is that the correlations between global equity markets have been increasing more recently. This view may have its origin in the belief that world equity markets are increasingly subject to common influences, and that global economies are becoming more highly synchronized. At least anecdotally, world equity markets do seem to have become more correlated in their movements during some

EXHIBIT 4
Comparison of Correlations to the U.S. Market — Monthly MSCI U.S. Dollar Total Returns*
January 1959-October 1973 and January 1976-December 1995

Market	Correlations for 1976-1995	Correlation Rank 1976-1995	Correlations for 1959-1973*	Correlation Rank 1959-1973
Australia	0.40	7	0.23	9
Austria	0.12	15	0.12	13
Belgium	0.40	8	0.46	4
Canada	0.68	1	0.80	1
Denmark	0.32	11	0.04	14
France	0.42	6	0.25	8
Germany	0.33	10	0.38	5
Italy	0.20	14	0.21	10
Japan	0.23	13	0.13	12
Netherlands	0.58	2	0.61	2
Norway	0.47	4	0.17	11
Spain	0.29	12	0.04	14
Sweden	0.39	9	0.33	6
Switzerland	0.46	5	0.49	3
U.K.	0.50	3	0.29	7

*Rank correlation between periods: 0.71.

recent periods, such as the October 1987 equity market crash and the decline in world bond markets that began in February 1994 when the U.S. Federal Reserve began to hike interest rates.

To address this question, we estimate the correlations of weekly returns for U.S. equities and the MSCI EAFE index by calendar quarter from 1980 forward. The correlation of U.S. to international stocks has averaged about 0.3 during this period. Although this correlation rises sharply in certain quarters (as in the fourth quarter of 1987), it is not at all clear from these data that there has been any significant secular trend in correlations, or that upsurges in correlations are more than episodic.[2]

A related claim is that international diversification is not as effective during declining markets, reducing the benefit when it would be most advantageous. To examine this issue, we estimate the correlations of weekly returns between international and U.S. equity indexes in two environments: 1) when the U.S. market is up or flat for a given week; and 2) when the U.S. market is down. The correlations are computed separately for each of these two return categories for each calendar year from 1980 through 1995.

The average correlation between U.S. and MSCI EAFE returns is roughly 0.3 when the U.S. market is up for the week, and 0.2 when the U.S. market is down. During this sixteen-year interval, there are only four years when the correlation of weekly returns was greater during a declining U.S. market than during a rising U.S. market. This evidence is consistent with the view that there has not been a significant reduction in the benefits of international diversification, even during periods when the U.S. market has declined.

EMERGING MARKETS

The term "emerging market" is typically applied to a number of country equity markets not included in major international equity market indexes yet that have significant economic activity and that may be suitable for institutional investment.[3] In recent years, many of these markets have become popular investment vehicles individually and collectively.

The rationale for investment in emerging markets is a natural extension of that for international diversification and is consistent with the argument described in Exhibit 1. Including emerging markets in a global portfolio will increase the opportunity set and can provide numerous occasions to add value. Such

countries represent investment opportunities today in the same way that many now-developed markets did twenty years ago.

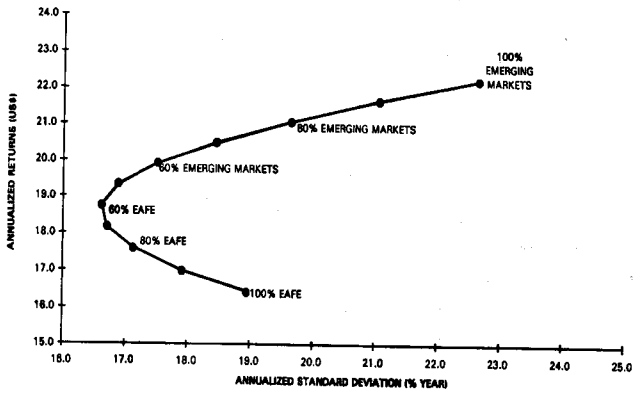
It is often convenient to think of emerging markets as a separate asset class rather than as an extension of the global investment opportunity set. While both approaches are fundamentally equivalent, many institutional investors prefer to separate their decision processes for developed and emerging markets. This choice is attributable in part to the relative novelty of emerging markets and heightened perceptions of risk. More substantively, emerging markets may require special expertise to deal with issues that are either unique or far more prominent than in developed markets. Such issues include transfer risks, property rights, settlement risks, liquidity risk, informational risks, and shareholder treatment (see Rowley [1995]).

Comprehensive performance data for emerging market indexes are generally available beginning in 1985. Exhibit 5 shows the impact on realized risk and return of adding different allocations of an emerging markets index to an EAFE index portfolio for the 1985 to 1995 period.[4] Empirically, adding emerging markets to an EAFE index portfolio has provided substantial opportunity to increase return per unit of risk significantly over this recent period.

Emerging markets represent many interesting challenges for institutional investors. There is no particular homogeneity to country markets included in the indexes. Long-term correlations, both to other emerging markets and to developed ones, have been quite varied. Differences in economic development, industry composition, and local political factors, as well as fundamental perceptions of the sources of economic growth, have led to substantial divergences in return even over long periods of time. Of course, such risks are likely to be consistent with the investment opportunities available to thoughtful and disciplined investors.[5]

These risks and opportunities are further illustrated in Exhibit 6, which provides historical risks and returns for a variety of emerging and developed market countries over the last ten years.

EXHIBIT 5
PORTFOLIO RETURN AND RISK — EMERGING MARKETS AND MSCI EAFE JANUARY 1985-DECEMBER 1995



SMALL-CAPITALIZATION INTERNATIONAL EQUITIES

Investment in international small-capitalization stocks, once considered too risky or illiquid for institutional investors, is an additional avenue of potential portfolio diversification that was little explored twenty years ago. Following extensive academic and professional research in the 1980s, domestic small-capitalization equities have found a well-defined role in many

EXHIBIT 6
Annualized Equity Returns and Standard Deviation (%)
Major Developed and Emerging Markets
1986 Through 1995 in U.S. Dollars

	Return	Standard Deviation
U.S.	15.0	14.9
Canada	8.6	15.7
France	16.3	22.7
Germany	12.2	22.5
Japan	15.7	27.6
U.K.	16.2	20.5
Argentina	45.3	70.3
Brazil	32.3	71.0
Chile	43.6	27.7
Greece	33.7	43.6
Korea	20.3	29.3
Malaysia	19.1	27.2
Mexico	42.5	46.2
Philippines	42.8	37.8
Taiwan	33.6	51.0
Thailand	33.4	31.8

Note: Developed markets returns from MSCI with net dividends, except U.S. with total dividends. Emerging markets from IFC Global (total return) 1986-1987 and MSCI EM Free (total return) 1988-1995.

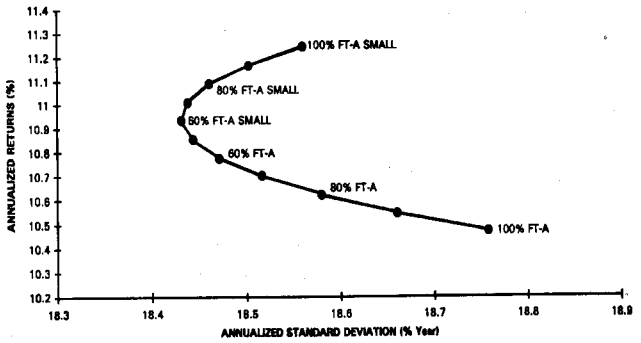
institutional portfolios (see Banz [1981]). Indeed, many sophisticated institutions consider domestic small-capitalization stocks a separate asset class in their asset allocation decisions.

International small-capitalization stocks are a natural extension of the domestic small-capitalization concept for portfolio diversification. Publicly available historical data for small-capitalization international indexes have been available only since 1987 when the Financial Times-Actuaries (FT-A) Euro-Pacific medium- and small-capitalization index was established.

Exhibit 7 compares the annualized quarterly returns for the FT-A medium- and small-capitalization index to the FT-A Europe and Pacific region index, for the 1987 to 1995 period. It also shows the risk/return characteristics of various passive allocations to medium- and small-capitalization equities relative to the large-capitalization index. While the data are for a more limited period than those for emerging markets, the empirical results suggest that international small-capitalization portfolios in the developed markets would have provided meaningful diversification benefits for global investors.

At a minimum, international small-capitalization stocks represent an extension of the investment opportunity set for global investors and a means of enhancing return or minimizing risk in the spirit of the relationships shown in Exhibit 1. Beyond this important point, however, and in spite of the support of long-term empirical data in many markets, the theoretical underpinnings of the small-stock premium and its implications for active management remain unsettled.

EXHIBIT 7
PORTFOLIO RETURN AND RISK
FT-A EUROPE AND PACIFIC INDEX WITH
FT-A SMALL EUROPE AND PACIFIC INDEX
JANUARY 1987-DECEMBER 1995



GLOBAL STOCK PRICING ANOMALIES

Over the last twenty years, considerable evidence has accumulated to indicate the existence of statistically significant "market anomaly" relationships between beginning-of-period values of various stock characteristics and ex post returns. These stock factors include: earnings-to-price ratio (E/P), book-to-price ratio (B/P), dividend yield, and firm size or market capitalization.[6] While most of the original studies were performed for the U.S. equity market, many have been extended to non-U.S. markets and similar relationships reported (see, for example, Hawawini and Keim [1997]). As a consequence, institutional active equity management is often based on portfolios tilted toward various market anomaly factors.

There are a number of key questions concerning the nature of the observed factor relationships with return. One of the most critical ones is whether they are economically significant and likely to persist. These and related issues have a direct impact on their practical value for active management.

The investment significance of these results is controversial (see Berk [1995], for example). If such factors are indicative of unmeasured or time-varying systematic risk, then they are likely to be persistent but not economically meaningful for active management. If the relationships are true market inefficiencies, their investment value may be significant, but they may not persist.

Even the long-term evidence of many academic studies may provide little confidence in their future economic significance. This is because, as Lo and MacKinlay [1990] note, for any time period, however long, some factor is likely to be found that is statistically significantly related to return. Because many long-term studies reuse the same data, they are likely to find similar "confirming" results with little out-of-sample reliability.

From a practical investment point of view, many of the academic controversies on market anomalies have little relevance. Experienced investors are well aware that few simple factor-return relationships persist period-by-period. It is of little investment value to know that a factor has worked well at forecasting return for the last fifty years if it has not worked for the last three years. Successful active management must also be concerned with dealing with the shorter-term dynamic character of markets.

The data in Exhibit 8 provide simple illustrations

EXHIBIT 8
Factor Correlations with Subsequent One-Year Total U.S. $ Return — Japan

	Cap*	E/P	B/P	CE/P	DDM	NE/P
1975	0.22	0.19	0.14	–0.03	0.24	0.19
1976	0.11	–0.01	0.03	–0.11	0.00	–0.05
1977	0.19	0.08	0.46	0.27	–0.06	0.01
1978	0.32	–0.02	0.26	0.12	0.09	0.10
1979	–0.08	0.03	0.12	0.13	0.02	0.08
1980	–0.02	0.16	0.06	0.16	0.14	0.09
1981	–0.33	0.19	0.25	0.21	0.11	0.17
1982	–0.07	0.25	0.08	0.03	0.31	0.26
1983	0.16	0.11	0.01	–0.05	0.24	0.23
1984	–0.10	0.0	0.02	0.02	–0.09	–0.06
1985	0.08	0.06	0.25	0.12	0.01	0.08
1986	–0.13	–0.02	–0.07	–0.02	–0.14	–0.15
1987	0.19	0.12	0.26	0.13	0.13	0.20
1988	0.07	0.06	0.12	0.09	–0.06	0.07
1989	0.52	0.03	0.13	–0.03	0.00	0.05
1990	0.11	0.15	0.16	0.11	0.17	0.16
1991	0.11	–0.01	0.07	0.03	0.05	0.04
1992	0.03	–0.01	0.04	0.03	0.02	0.02
1993	–0.18	0.11	0.27	0.23	0.23	0.27
1994	0.33	–0.17	0.25	–0.07	0.05	0.14
1995	–0.12	0.21	0.07	0.13	0.18	0.19
Average	0.07	0.07	0.14	0.07	0.08	0.10
Standard Deviation	0.20	0.10	0.12	0.10	0.12	0.11
T-Statistic	1.56	3.32	5.27	3.13	2.96	4.13

*Defined as the negative of the natural log of market capitalization.

of these and other important practical investment issues. Exhibit 8 provides twenty-one years of correlations of annual U.S. dollar total returns with six beginning-of-period stock factors for all stocks in the Japan MSCI country index. The stock factors are: 1) market capitalization (size); 2) earnings-to-price ratio; 3) book-to-price ratio; 4) cash earnings-to-price ratio; 5) dividend discount model return; and 6) normalized earnings-to-price ratio.[7] The average, standard deviation, and t-statistic (of the average) of annual correlations for each factor are given at the end of the table.

Except for firm size, all stock factors have statistically significant average correlation t-statistics over the 1975-1995 period. This indicates that a portfolio tilted toward positive values of these five significant factors is likely to have performed well over this period. Yet even a manager who chose (in hindsight) the single best predictive factor over this period in Japan — book-to-price ratio — would have experienced two recent consecutive years (1991-1992) and three additional consecutive years (1982-1984) with little added-value.

Such performance could have serious business consequences in the practical world of institutional investment management. In the case of the popular earnings-to-price ratio, only two of the last five years show correlations of sufficient size to provide significant positive performance (see Bergstrom and England-Markun [1982]). Similar situations pertain with other factors and in three other markets.

There are additional noteworthy issues illustrated in such data. Factors can differ significantly in predictive power in the same time period. In 1994, while book-to-price, capitalization, and normalized-earnings-to-price have positive correlations with return in Japan, the earnings-to-price correlation is large negative, and the correlations for cash earnings-to-price and

DDM are insignificant.

Also, the predictive power of factors has varied markedly from one market to another. Using similar analyses, while book-to-price is important in predicting returns in Japan and the United Kingdom, it is unimportant in Germany and of only marginal importance in France.

ADDRESSING CHALLENGES OF GLOBAL MANAGEMENT

The idiosyncratic nature of capital markets and their dynamic characteristics largely define the challenge to active global management, but there are some tools of the trade for addressing such issues.

Multiple Valuation Forecasts

The practical investment issue of interest is how to use historical market anomalous factors to forecast active return and add value. The challenge is to deal with the fact that no single factor is beneficial in all time periods, and that factors can vary significantly in their predictive power by market and time period. The question is: What principles can be brought to bear to guide in the choice of factors and to help define their weights?

The benefits of stock pricing anomalous relationships are most likely to be observed in a multiple valuation setting that conforms to principles of optimal design. These principles are based on the pioneering work of Ambachtsheer and Farrell [1979] and developed in Michaud [1990].

Assume two factors are positively correlated with return and not strongly correlated with each other. Then it can be shown empirically (Ambachtsheer and Farrell) and theoretically (Michaud) that a combination of the two factors can have a higher correlation with return than the weighted average of the correlations of the two factors, and often a larger correlation than either of the two factors, with less variability. Consequently multiple valuation models, properly defined, can be information-synergistic and enhance predictive power while reducing forecast risk.

Multiple valuation models are not a free lunch. It is unlikely that simply adding factors will synergistically enhance information. The key conditions for synergy — factors with significant positive correlations with future return and low correlations with other factors — severely limit the number of factors that are likely to be useful and put a high premium on choosing the optimal set of factors and factor weights. Some statistical methods, such as factor analysis, can sometimes be employed to help define factors that enhance information synergy.

Transaction Costs

Some of the most serious concerns with respect to international investing in the 1970s relate to low liquidity and high transaction costs in non-U.S. equity markets. The encouraging news is that there has been much improvement. Transaction costs in most non-U.S. equity markets have declined substantially, while trading volumes have increased dramatically. One simple but suggestive positive indication of this trend is the decline in commission costs in many global markets. The 1984 estimates in Bergstrom et al. [1986] are four to ten times current estimates in many cases.

Commission costs are normally a small portion of the total cost of trading. The three components of total trading costs are fixed costs (commissions, fees, taxes), market impact (price change from the decision to trade), and opportunity costs (price change of stocks not traded). There are many factors that can have a significant effect on trade costs. These include: country market, broker, measures of liquidity, buy versus sell transactions, stock price momentum, or investment style.

Exhibit 9 presents recent estimates of the three major components of trading costs, as well as total costs, based on actual institutional activity in four major developed markets. They illustrate the differences and similarities in implementation costs that can be incurred in different countries over the same time period.[8] While the reliability of the data is necessarily limited, due in part to the short time period and the number of trades, the results suggest that opportunity and market impact costs can vary widely by market.

Global active managers can use the results of such empirical analyses to improve their trading processes and optimize investment performance. The recent availability of data may lead to customizing valuation processes to the expected trade cost characteristics of individual stocks. This is one of the largely unexplored vistas of modern global investing.

Currency Hedging Policy[9]

For the last two decades, the impact of currency exchange rates has been a much more important issue for global equity investors than in the pre-1975 era

EXHIBIT 9
Sample of Total Trade Costs (basis points) for 1993Q2 through 1995Q4[a]

	Sample Size (U.S. $ million)	Commission	Market Impact[b]	Opportunity Cost[b]	Total Cost
France	688	−10	−76	−18	−104
Germany	205	−10	−27	−7	−43
Japan	3,073	−10	−54	−44	−108
U.K.	1,731	−12	−66	−13	−91

[a]Source: "Plexus Global Monitor," Santa Monica, California.
[b]Market impact is measured as the difference between execution price and the market price at the time the order is initially placed. Opportunity cost is the price change over thirty trading days from initial order date for orders not completed. Note that, as package trades, taxes are not explicitly included by market in these estimates.

when most exchange rates were fixed and changes infrequent. One issue of interest is definition of an appropriate currency hedging policy for an internationally diversified equity portfolio.

Hedging policy defines the desired benchmark for a passive currency management program as well as for measuring active currency management performance, much as equity market indexes are typically used as performance measurement benchmarks. This policy decision is separable from the potential benefits of actively managing currencies.

A fairly broad consensus on currency hedging policy appears to be emerging, according to recently available research. We cite a few key articles spanning the policy spectrum of approaches to hedging policy to frame the issues.

The pioneering case for the optimality of 100% currency hedging is given in Perold and Schulman [1988]. Their examination of ten years of quarterly data (1978-1987) shows that a 100%-hedged equity portfolio for various countries would have experienced roughly 20% less volatility than an unhedged portfolio. Since currencies, in their argument, have a zero long-term expected return, 100% hedging reduces volatility at no loss of expected return (except for the cost of hedging). The impact of hedging policy on risk reduction depends on the proportion and kinds (equities, bonds, and so on) of non-domestic assets held.

Criticism of these results focuses on the time period-dependent character of the data. The 1978-1987 time period may not be representative of the long-term currency market environment. An additional open issue is the reliability of the dimension of the risk reduction estimates.

Froot [1993] challenges the view that currency exposure of international investments should be hedged. Using nearly 190 years of data, he shows that, while a 100%-currency hedged policy reduces risk substantially over short horizons, hedging often does not reduce risk at all over long horizons, and may in fact increase it. The basic reason is that hedge returns are driven by different factors over different time horizons, and hedges do not protect against the risk factors affecting long-term exchange rates.

Froot shows that the benefit of short-term hedging for equities diminishes significantly beyond a year or two. Because most pension plans and many other institutional investors have long investment horizons, a 100% hedging policy, or indeed any significant hedging policy, may have limited benefits.

An important limitation of Froot's analysis is that the long-term benefits of 0% hedging may have limited practical value for many institutional investors. This is because fund sponsors may need to consider near-term portfolio volatility in meeting funding objectives.

Jorion [1989] focuses on the impact of currencies on portfolio — instead of asset — volatility, and describes how hedging policy may be conditional on asset mix. This is an important practical issue, as most U.S.-based investors are invested primarily in U.S. assets. Using data for the eleven-year period 1978-1988, Jorion finds that the addition of international assets decreases portfolio risk whether or not the assets are hedged. The effect of hedging currencies reduces asset volatility and increases correlation with U.S. assets. Both the lower volatility and the higher correlation together imply that hedging barely reduces aggregate portfolio risk unless non-domestic assets are a substantial part of total assets.

Roughly, Jorion finds that 20% (of the overall

portfolio) is the minimum level of investment in non-domestic assets required to make currency hedging valuable. As with Perold and Schulman, Jorion's results can be critiqued because they are highly time period-dependent.

Black [1989] develops a single-period universal hedging policy formula that implies that hedging increases expected return for both participants. His results are independent of the level of non-domestic assets or investor risk aversion. Black's formula is controversial. Adler and Solnik's [1990] critique centers on Black's non-standard framework and a number of restrictive key assumptions. Froot [1993] also notes that investors must be willing to bear more than normal risk if they wish to take advantage of the positive expected returns described in Black.

Investment policy ideally depends on the nature of a fund's liabilities, funding status, institutional risk tolerance, and investment objectives. Many pension plan sponsors are likely to find that short-term asset and portfolio risk is an important corporate concern in the context of asset management monitoring, projected cash flows, and overall corporate objectives. In such cases, investment horizon, risk aversion, and other assumptions are likely to impact hedging policy.

From a purely investment perspective, assuming a fund with roughly 20% or less of non-domestic assets, a zero hedging policy benchmark may often be desirable. This policy is consistent with Jorion's and Froot's results.

If the percentage of non-domestic assets is significantly larger, a non-zero hedge policy may be appropriate in order to reduce some of the short-term currency risk. As a simple heuristic, a hedging benchmark of 50% of non-domestic assets may be a useful compromise policy that balances a pension plan's long-term investment interests with shorter-term corporate and plan funding requirements. Allowing managers to hedge up to perhaps 30% of their non-domestic assets seems a practical guideline for investors who wish to pursue some active management opportunities in currency markets.

Finally, it may be of interest to note that hedged U.S. investors would have experienced substantial underperformance relative to an unhedged position over the last twenty years, as the U.S. dollar has generally declined versus major foreign currencies.

Global Equity Asset Allocation

It is of interest for many global equity investors to define an efficient allocation among the three major global equity asset classes: domestic, developed, and emerging markets. The classic approach to this problem is to solve for Markowitz [1959] mean-variance efficient allocations using historical data.

As noted earlier, useful and consistent emerging market index data have been available only since 1985. Exhibit 10 illustrates the efficient frontier and historical annualized risk and average return of total monthly returns for these three asset classes adjusted for monthly U.S. T-bill return (return premiums).

Unsurprisingly, given the relatively large average return premium for emerging markets over this period, the efficient allocations include a large proportion in emerging markets at most risk levels. The question is, given data limitations and the character of portfolio optimization technology, whether useful investment information can be derived from this data (see Michaud [1989]).

It is convenient to define three reference portfolios — index, typical, and equal-weighted. The "index" portfolio has a 40/50/10% weighting in domestic, developed, and emerging markets, and represents an asset allocation roughly consistent with the current capitalization of a comprehensive global equity index. While standards are changing rapidly, a "typical" institutional global equity portfolio might include approximately 20% of assets in developed non-U.S. markets and none in emerging markets. Finally, an equally weighted portfolio is often a useful reference

EXHIBIT 10
RETURN PREMIUM EFFICIENT FRONTIER

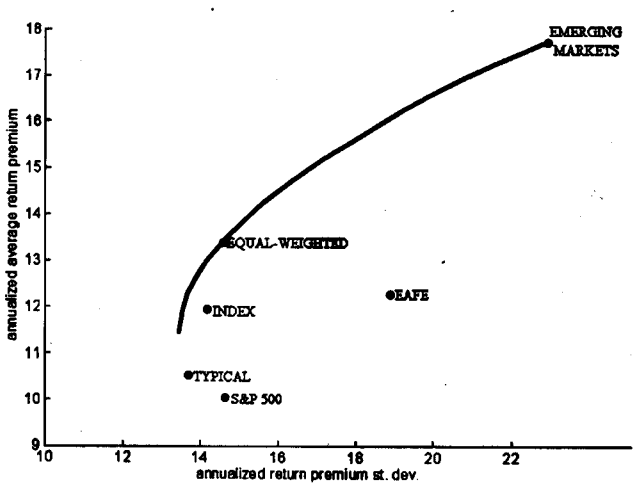
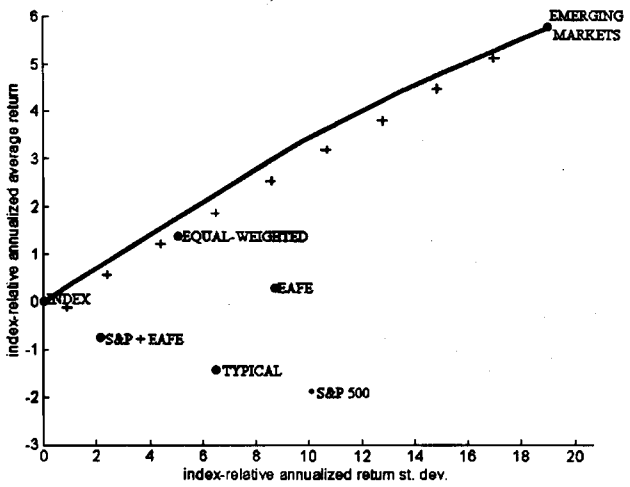


EXHIBIT 11
INDEX-RELATIVE RETURN EFFICIENT FRONTIER



point. The performance of all three reference portfolios illustrated in Exhibit 10 reflects the benefits of international diversification over this period.

For many institutional investors, the most appropriate measure of portfolio risk is not total risk but residual risk relative to the return of a given equity benchmark. An institutional active manager mandate is often defined by guidelines that specify a 3%-6% annual residual or index-relative risk target. The historical index-relative risk and average returns and efficient frontier for the asset classes and portfolios in Exhibit 10 are given in Exhibit 11.

Exhibit 11 shows that portfolios with substantial allocations to emerging markets significantly outperformed over the January 1985-December 1995 period. For example, for an annual residual risk of 5%, the efficient asset allocation is approximately 50% EAFE, 15% S&P, and 35% emerging markets. Such an allocation is likely to appear excessively risky to many institutional investors because of its large underweighting in U.S. securities. It is also likely to be unreliable, as the efficient frontier solutions are, in general, "error-maximized."[10] Note, however, that the equal-weighted portfolio is nearly efficient with a residual risk of about 5%.

To analyze the data further, define a portfolio "S&P + EAFE" consisting of an equal weighting in the S&P and EAFE indexes. The index-relative risk and average return of the S&P + EAFE portfolio is also displayed in Exhibit 11. The sequence of +s in the Exhibit moving upward from the S&P + EAFE portfolio indicates the residual risk and return of an increasing allocation to emerging markets, in steps of 10%, relative to the S&P + EAFE portfolio.

This sequence of portfolios shows that an asset mix consisting of an equal weighting in the U.S. and developed markets plus a minimum of 10% in emerging markets is nearly efficient. Consequently, efficient frontier portfolios are well-approximated by an equal weighting of EAFE and U.S. markets with the remainder (10% minimum) in emerging markets.

This result indicates that, roughly, an efficient asset allocation's active risk can be viewed as associated with the degree of allocation to emerging markets. Finally, allocations to emerging markets of 10% to 30% appear to be consistent with levels of active risk normally associated with institutional global equity mandates.

SUMMARY AND CONCLUSION

As anticipated, marketplace evidence for the last twenty years indicates that thoughtful international equity diversification can improve the risk/return characteristics of investors' portfolios. Much of the potential improvement in return is in the form of increased opportunities to add value with active management; passive global investing may be most useful for reducing risk.

Although the challenges of successfully implementing international equity programs are clearly different now from two decades ago, the current opportunities are also considerably greater. The availability of many additional equity markets, especially rapidly growing emerging markets, the enormous growth in the number of available stocks, particularly of smaller companies, and great improvements in marketplace liquidity, trading methods, and quality of information are some of the most noteworthy and positive changes.

Looking forward, we envision the development of larger and more accurate data bases that will support increasingly sophisticated research on the behavior of capital markets and the development of more advanced risk measurement and forecasting tools. While global portfolio diversification is no longer a *new* route to higher returns and lower risks, as it was two decades ago, the decades ahead are likely to see the globalization of portfolios become the norm for investment management.

ENDNOTES

[1]By developed markets we mean the approximately

twenty equity markets included in indexes such as the Morgan Stanley Capital International EAFE index, the Financial Times-Actuaries Europac index, or the Salomon Brothers Europe and Pacific index.

[2]All correlation data are available upon request.

[3]The list of markets normally considered to be "emerging" may vary significantly by investment institution and index provider. A current list might include Argentina, Brazil, Chile, China, Colombia, Czech Republic, Greece, India, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Taiwan, Thailand, Turkey, Venezuela, and Zimbabwe. Over time the list is likely to be expanded to include additional markets in Eastern Europe, the Pacific Basin, the Middle East, and Africa.

[4]Emerging markets are represented by the International Finance Corporation's (IFC) Global Index for 1985-1987 and by the Global Investable Index after its inception in 1988.

[5]For accessible discussions of some "economic growth" controversies that impact perceptions of financial value, see Krugman [1996] and "Economic Growth" [1996].

[6]For the P/E ratio, see Basu [1977]; for dividend yield, see Litzenberger and Ramaswamy [1979]; for market capitalization, see Banz [1990]; for P/E and size, see Reinganum [1979]; and for book-to-price and market capitalization, see Fama and French [1992].

[7]DDM is a variation of a standard dividend discount model used by many investment organizations. See Michaud and Davis [1982]. NE/P is the inverse of current price-to-book ratio divided by time-weighted average return on equity.

[8]The data are estimated trade costs dollar-weighted over the indicated time period from buy and sell trades. The data are average costs for a variety of trade types, and may not reflect all attempted trades.

[9]This discussion is based on Michaud [1994].

[10]A term coined in Michaud [1989] to describe the investment impact of the instability of mean-variance optimization on optimized portfolios.

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