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International index funds and the investment portfolio

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Abstract

Financial advisors often recommend that investors diversify their investments internationally and also use mutual funds with the lowest expenses. Recently it has been possible to use both of these strategies by purchasing an international index fund. This study considers international index funds as a means of portfolio diversification. Performance is evaluated using monthly return data on nine international indexes from January 1989 through December 1997. Returns are measured against the S & P 500 index returns. The results of statistical tests suggest that international index investing does not offer superior returns compared to the S & P 500 index but diversification benefits do exist.

JEL classification: G110; G29

Keywords: International indexes; Individual investors; Index funds

1. Introduction

Individual investors find many pieces of advice directed toward them. Some of this advice recommends that they should diversify internationally, they should include high-growth emerging market stocks in their portfolios, and they should buy low-expense index funds. In this paper we review the literature in these three areas. We then determine empirically if international index investing can better diversify a domestic portfolio. The results of this study may help investors determine if international investing combined with index investing can improve their portfolios.

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Investors have several options when choosing international equities. A domestic investor can invest directly in foreign securities that trade on foreign exchanges. But, the direct investor pays higher fees, may be handicapped by a lack of information and faces additional currency and political risks. Thus, other options may be indicated. One such option is the purchase of Euroequities, securities that are listed on any of the foreign stock exchanges and also on an American exchange. These dual-listings give Americans the chance to take advantage of international investing while avoiding the disadvantages of direct investment. Multinational Corporations (MNCs) that are based in the United States have significant exposure in foreign countries and offer a second option. A portfolio containing MNCs gains the increased diversity of foreign investment, but at the lower costs of domestic market investment. A third option is American Depository Receipts (ADRs). These receipts for shares of foreign companies held by U.S. banks offer the American investor international diversification. The bank converts the dividends from the foreign currency and pays them in dollars to the shareholder. ADRs are popular because investors do not have to leave the domestic market to invest in foreign firms.

A fourth, and often preferred, option for international investment is the purchase of shares in an internationally diversified mutual fund or closed-end fund. Of these funds, international index mutual funds are relatively new, and have not gone through the same tests as domestic funds. Although many pension funds and institutional investors already invest in international mutual funds, only a few studies have examined their performance. It seems reasonable that if there are benefits from both international investing and domestic index investing, there may be benefits from international index investing.

The next section reviews the relevant literature in this area. A description of the research design and data follows in the third section. The fourth section contains the empirical analysis. The last section offers the applications and conclusions.

2. Effects of international diversification and index investing

2.1. International investing

Hunter and Coggin (1990) show that international diversification can reduce investment risk to about 56% of the level that can be achieved with national diversification. Russell (1998) considers the options that investors have for international investing. He tests whether U.S. exchange-listed securities such as ADRs, MNCs, and closed-end country funds behave more like the New York composite Index than the market they represent. His study suggests that these securities do not provide diversification benefits for the U.S. investor.

Cumby and Glen (1990) evaluate the performance of international mutual funds to determine whether the managers are responsible for above average returns or if the returns are simply the result of international diversification. They find that these internationally diversified mutual funds have superior performance when compared to the U.S. stock market. The authors attribute this solely to the benefits of international diversification, rather

than to the performance of the active managers. After testing these funds against an international index, Cumby and Glen conclude that there is "no evidence that the funds, either individually or as a whole, provide investors with performance that surpasses that of a broad, international equity index over this same period". They also find that the funds systematically under-perform the indexes during the October 1987 stock market crash. Though their proponents often argue that active managers are able to avoid such crashes by moving cash in and out of securities, these findings suggest those active managers only magnify the losses.

Eun, Kolodny, and Resnick (1991) test U.S.-based international fund performance in terms of mean-variance efficiency. They evaluate the funds using the Jensen (1968), Sharpe (1966), and Treynor (1965) measures and find that the funds provide a valuable opportunity for international diversification. Of the thirteen funds, ten outperform the S & P 500 Index (S & P 500) when evaluated with the Sharpe ratio. When these funds are compared to the Morgan Stanley Capital International (MSCI) World Index (W) only two funds outperform the benchmark. These researchers also study the complementary effects of adding international funds to a U.S. benchmark, S & P 500. They conclude that a U.S. investor may benefit from adding any international fund, except the Canadian Fund.

Solnik (1995) shows that the variability of returns for an internationally diversified portfolio is one-tenth that of a typical domestic diversified portfolio. Apap and Collins (1994) show that the performance of international mutual funds exceeds that of U.S. domestic mutual funds. The fluctuations of the U.S. dollar exchange rate have a negligible effect in the long run when the mutual fund invests in more than one country.

On the other hand, Droms and Walker (1994) find that international mutual funds do not offer excess risk-adjusted returns. However, the funds do offer an efficient means of investing in a broadly diversified portfolio of common stocks with returns that are appropriate for the risk exposure. Ho, Milevsky, and Robinson (1999) focus on retired investors who are consuming accumulated capital and the income from it. They show that retired U.S. investors do not benefit from international equity diversification.

2.2. Investing in emerging markets

Divecha, Drach, and Stefek (1992) show that modest investments in emerging markets are likely to reduce overall portfolio risk. Masters (1998) suggests that the ideal diversified portfolio consists of at least 6% allocated to emerging markets. Khanna (1996) recommends investing in emerging markets because their rapid economic growth provides for good returns. Even though the returns are volatile, these markets are poorly correlated to developed markets and, thus, offer good portfolio diversification benefits. Speidell and Sappenfield (1992) discuss the fact that global diversification depends on the correlations among countries. They suggest that as the developed markets move less independently of each other, the correlations among them increase. This decreases the potential for diversification benefits. On the other hand, emerging markets are less correlated with the developed markets; this increases their relative diversification advantage.

2.3. Index funds

Gruber (1996) questions why so many investors choose actively managed mutual funds when their performance, on average, is inferior to that of index funds. Bogle (1998) examines the relationships among risk, return, and cost. He shows that low-cost passively managed index funds deliver the highest risk-adjusted return for each category of mutual funds. Malhorta and McLeod (1997) show that mutual fund expenses are inversely related to the investor's returns. Hogan (1994) recommends that financial advisors use index mutual funds in an asset-class investing strategy. Hogan stresses that this strategy is consistent with modern portfolio theory and presents important cost advantages for clients.

2.4. International indexes

Although it is certain that international index funds have a lower correlation to the U.S. stock market than do domestic index funds, it is not clear whether they outperform typical domestic index strategies or actively managed international strategies. One difficulty in determining the performance of international index funds is that there is no accepted standard index like the S & P 500 (Masters 1998). More than 38% of the international equities are included in the MSCI European Australasia and Far East Index (EAFE), but there are a variety of other indexes to choose from.

Emerging market indexes were created in 1985 by the International Finance Corporation and in 1988 by MSCI. Investors expect indexes to closely track the market they follow, in this case the emerging markets. One of the problems associated with international indexes is that each is different in the way it tracks its underlying market. Another problem with emerging markets indexes is country weights. The global capitalization weight for a particular country can change dramatically over a short period of time. Because the benchmark tracks only emerging markets, new developed markets must be removed and new emerging markets must be added. Unstable and confusing weights lead to higher costs caused by higher turnover ratios. Transaction costs are another factor that lead to inefficiency and these are about five times those encountered in U.S. index funds.

2.5. Current study

Cumby and Glen (1990), Eun, Kolodny, and Resnick (1991), Solnik (1995), Apap and Collins (1994), and Droms and Walker (1994) find advantages in international mutual funds. Divecha, Drach, and Stefek (1992), Masters (1998), Khanna (1996), and Speidell and Sappenfield (1992) recommend investing in emerging markets. Gruber (1996), Bogle (1998), Malhorta and McLeod (1997), and Hogan (1994) find advantages in index funds.

In this paper, we ask, if investors should choose international mutual funds, and if they should choose index funds, should they then also choose international index funds including emerging markets index funds? We find no conflict with Ho, Milevsky, and Robinson (1999) who find no benefit in international diversification for retired U.S. investors. Unlike their study, this study concerns the accumulation phase.

3. Research design

To prove that international index funds are an excellent way for the domestic individual to invest, we perform tests to determine whether international indexes outperform domestic indexes and to determine whether there are the diversification benefits to investing in international index funds.

We first test the monthly return data of nine international indexes to determine whether they outperform the S & P 500 benchmark on a risk-adjusted basis. These tests include the Sharpe, Treynor, and Jensen measures. The Sharpe (1966) measure is the ratio of average risk premium to the total risk the portfolio faces during the evaluation period. This Sharpe measure is relevant for the investor choosing a specific fund for a major portion of his/her portfolio:

$$S_i = \frac{\bar{R}_i - \bar{R}_F}{\sigma_i} \tag{1}$$

where S_i is the Sharpe measure for index i;
$\bar{R}_i$ is the average return on index i;
$\bar{R}_F$ is the average risk-free rate;
σ_i is the standard deviation of returns on the index.

The Treynor (1965) measure uses systematic risk and allows the investor to compare the individual index returns to the market return, disregarding diversification:

$$T_i = \frac{\bar{R}_i - \bar{R}_F}{\beta_i} \tag{2}$$

where T_i is the Treynor measure for index i;
β_i is the Beta or systematic risk for index i.

For the Jensen (1968) measure we regress excess portfolio returns against excess domestic market returns. The intercept represents the Jensen measure. When the intercept is positive and statistically significant, superior performance is noted. This measure can also measure individual fund performance:

$$\alpha_i = (\bar{R}_i - \bar{R}_F) - [\beta_i(\bar{R}_M - \bar{R}_F)] \tag{3}$$

where α is the Jensen measure;
$\bar{R}_M$ is the average return on the market.

We then ask, are there diversification benefits to investing in international index funds? To answer this question we examine the correlation of the international index funds with the S & P 500. We attempt to answer the following questions: 1) Does a linear relationship exist between the individual international index returns and the S & P 500 returns?; 2) Does a linear relationship exist between the returns on the entire portfolio of international indexes and the returns on the S & P 500?

We use monthly return data from nine international indexes in this study. These indexes

Table 1
Returns for international indexes and S & P 500

Index	Average monthly return	Standard deviation
Developed markets		
Standard and Poor's 500 (S & P 500)	1.20%	0.0348
Europe Australasia Far East (EAFE)	0.50%	0.0496
World Ex-U.S. (W)	0.50%	0.0481
Pacific (P)	0.04%	0.0662
Emerging markets		
Europe & Middle East (EME)	0.80%	0.0833
Emerging Markets Free (EMF)	1.09%	0.0621
Emerging Markets Global (EMG)	1.37%	0.0612
Combined markets		
Americas Free (AF)	1.21%	0.0345
AC World Ex-U.S. (ACW)	0.50%	0.0466
Asia Pacific Ex-Japan (AP)	0.80%	0.0520
Average International (without S & P 500)	0.76%	0.0042

are those which international index mutual funds would attempt to match. The sample period is January 1988 through December 1997. We chose the indexes on the basis of region and data availability. The indexes encompass every region of the world and are formed, designed and updated by MSCI.

The S & P 500 is the benchmark U.S. index. The three month U.S. Treasury bill yield is the risk-free rate. We compute excess returns from this security.

4. Analysis of data and results

Table 1 lists the risk-return data for the nine international indexes and the S & P 500. Over the 1988 to 1997 period the average monthly return on the international indexes is 0.0076 or 0.76% per month. The average monthly return on the S & P 500 is 0.0120 or 1.2%. Of the nine international indexes only two return more than the S & P 500 index. The Emerging Markets Global Index (EMG) posts the largest monthly returns at 1.37% and the Pacific Index (P) returns the smallest at 0.04%.

The lowest standard deviation (SD) of returns is that of the Americas Free Index (AF) at 0.0345. The SD of returns on the S & P 500 is 0.0348. The index with the greatest SD (0.0833) is the Europe & Middle East Index (EME). The overall average SD of returns is 0.0560. The investor who seeks the lowest risk based on SD would consider the S & P 500 or the AF.

Table 2 lists the portfolio performance measures for the indexes. Based on the Sharpe measure, or full risk of the fund for each index, only AF outperformed the S & P 500. But AF has an S & P 500 component and is, therefore, somewhat correlated. The worst performer is P with a Sharpe measure of -0.0638. This statistic is much lower than the S & P 500 Sharpe measure of 0.2140. We fail to reject the null hypothesis that the average performance of international indexes is equal to or less than that of the S & P 500 index in terms of the Sharpe measure (excess return to variability).

Table 2
Performance measures for international indexes and S & P 500

Index	Sharpe		Treynor		Jensen	
		Rank		Rank		Rank
S & P 500	0.21	2	0.01	4	1.89	5
AP	0.07	5	0.00	6	1.13	6
EME	0.04	6	0.01	1	3.71	1
AF	0.22	1	0.01	5	1.92	4
ACW	0.01	7	0.00	7	0.17	7
EAFE	0.01	9	0.00	9	0.15	8
W	0.01	8	0.00	8	0.14	9
P	−0.06	10	−0.01	10	−1.85	10
EMF	0.10	4	0.01	3	2.89	3
EMG	0.15	3	0.01	2	3.19	2
Average International	0.06		0.01		1.27	

On the basis of the Treynor measure four indexes, EME, AF, Emerging Markets Free (EMF), and EMG, outperform the S & P 500. However, the average index has a 0.0050 Treynor measure, lower than the S & P 500 Treynor measure of 0.0074. We fail to reject the null hypothesis that the average performance of international indexes is equal to or less than that of the S & P 500 index in terms of the Treynor measure (excess returns to nondiversifiable risk). However, four individual indexes outperform the S & P 500.

The results of the Jensen measure of abnormal performance are very similar to those of the Treynor measure. AF and the emerging markets indexes, EME, EMF, EMG, outperform the S & P 500 in terms of the Jensen measure. The S & P 500 outperforms the average of the international indexes which was only 1.2692. We fail to reject the null hypothesis that the average performance of international indexes is equal to or less than that of the S & P 500 index in terms of the Jensen measure. However, when we test individual indexes against the S & P 500, three emerging market indexes outperform the domestic benchmark: the EMG, EMF, and EME indexes. These results agree with Sinquefield (1996) who found that investing in EAFE and similar indexes does not diversify a U.S. portfolio.

Table 3 lists the results of the regression of the international indexes on the S & P 500:

$$E_{SP500} = a + E_{AP} + E_{EME} + E_{ACW} + E_{EAFE} + E_W + E_P + E_{EMG} + E_{EMF} + \varepsilon \quad (4)$$

where E is the excess returns (monthly index return − monthly T-Bill return).

We eliminated AF as an independent variable because it is highly correlated to the dependent variable. The variation in EAFE, W (World Ex-US), P, and EMF significantly explains some variation in the S & P 500 index. EAFE and P are negatively correlated to the S & P 500; W and EMF are positively correlated to the S & P 500.

Table 4 lists the results of nine regressions of the individual international indexes on the S & P 500:

$$E_{SP500} = \alpha + E_I + \varepsilon \quad (5)$$

where I is one of the international indexes.

Table 3
Regression of the international indexes on S & P 500

Index	Coefficient	*t*-statistic
Constant	0.003	1.098
AP	−0.016	−0.199
EME	−0.050	−1.501
ACW	−1.959	−1.475
EAFE	−9.582	−5.906*
W	12.856	6.157*
P	−0.599	−5.046*
EMG	0.153	1.440
EMF	0.143	1.929*

* Statistically significant at the 95% level.

The regression of AF indicates a high degree of correlation; the others explain only a small portion of the variation in the S & P 500.

Clearly, diversification potential exists when investing internationally. The variation in the above indexes explains between 0.31% and 94% of the variation in the S & P 500. This shows that one can diversify with many of the indexes. Selecting a fund that is based on an index that has little correlation to the U.S. market will allow a portfolio to grow consistently and steadily.

5. Conclusions and applications

The results of this study suggest that investment into international mutual funds that are based on international indexes may offer significant diversification benefits. However, the performance of the average international index does not outperform the S & P 500 benchmark. The Sharpe, Treynor, and Jensen measures prove that the emerging market indexes do outperform the S & P 500.

Applying this study to the current investment climate is extremely important and useful

Table 4
Individual regressions of international indexes on S & P 500

Index	Constant	Coefficient	*t*-statistic	R^2
AP	0.0086	0.3413	6.1680*	0.2438
EME	0.0112	0.0239	0.6017	0.0031
AF	−0.0008	1.0086	43.1363*	0.9404
ACW	0.0096	0.3603	5.7459*	0.2186
EAFE	0.0098	0.3178	5.2955*	0.1920
W	0.0097	0.3379	5.5116*	0.2047
P	0.0113	0.1664	3.5008*	0.0941
EMF	0.0093	0.1932	3.8442*	0.1113
EMG	0.0083	0.2275	4.6052*	0.1523

* Statistically significant at the 99% level.

because more people are investing in mutual funds. International index funds provide another alternative for investors. This study urges caution for those investors who seek to maximize returns. However, it does suggest that the diversification one can gain from international index funds is significant and important.

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