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Diversification Benefits from Foreign Real Estate Investments

Executive Summary. *Previous research has questioned the stability of international equity diversification. This study examines whether foreign real estate exists in a more segmented market and whether foreign real estate provides any diversification benefit beyond that obtainable from foreign stocks. Using data encompassing the stock market crash of 1987, foreign real estate was found to have a lower correlation with U.S. stocks than foreign stocks. This lower correlation is shown to be stable through time as foreign real estate has a lower correlation in nearly the entire time period. Foreign real estate was also found to have a significant weight in efficient international portfolios.*

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Introduction

Previous evidence suggests that real estate improves the mean variance efficiency of a diversified portfolio. Burns and Epley (1982), Miles and McCue (1982), Ennis and Burik (1991) and Gilberto (1993), all using Real Estate Investment Trust (REIT) data, find that including real estate investments in the United States improves the risk and return tradeoff for U.S. investors. Diversifying with international real estate is shown to be beneficial by a number of studies using a variety of data. These studies include: Sweeney (1989) using international rent indices, Giliberto (1990) using property share returns, Liu and Mei (1993) using foreign property trust and property-related securities, and Eichholtz (1996) using Limburg Institute of Financial Economics (LIFE) data for eight foreign countries and the U.S.

International diversification with stocks and bonds has long been advocated due to the low correlation between international equity markets (Solnik, 1974). However, recent evidence suggests that international diversification with stocks and bonds is least effective when investors need it the most. Bertero and Mayer (1990), King and Wadhwani (1990) and King, Sentana and Wadhwani (1994) find greater integration of world stock markets in the period surrounding the crash of 1987. Longin and Solnik (1995) use data from 1960–1990 and find increased correlation of international stock markets when stock market volatility increases. Sinquefield (1996) questions the wisdom of international stock diversification in general. Using the

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Europe Australia Far East (EAFE) stock portfolio, he does not find any benefits from international stock diversification, unless an investor concentrates on value and/or small firm stocks overseas.

A possible explanation for the failure of international stock diversification in improving mean variance portfolio efficiency is that stock markets are becoming more integrated internationally due to the opening of formerly closed economies, the cross listing of securities and improvements in security liquidity from technological advances. In an integrated international capital market, the action of arbitrageurs will ensure that assets of similar risk will offer the same return. However, arbitrageurs may be unable to ascertain the risk and required return of real estate internationally, due to differing appraisal methods throughout the world. Arbitrage may also be difficult due to the physically immovable and local nature of real estate. Hence, international real estate markets may be more segmented and offer greater mean variance efficiency in a portfolio for the investor, especially in times of greater stock market volatility.

The purpose of this article is to determine if international real estate investment offers diversification benefits superior to that available from international stocks in periods of high volatility. Previous research shows that real estate can add to portfolio diversification. Asabere, Kleiman and McGowan (1991) conclude that international real estate should improve portfolio efficiency for U.S. investors. Liu and Mei (1998) find that investing in international real estate securities provides additional diversification benefits beyond that associated with international stocks. The benefit comes primarily from the expected (currency related) portion of the return. Their study suggests that the results are time-period specific which has important implications for the current study. Ling and Naranjo (2002) find that, even after controlling for world-wide systematic risk, an orthogonalized country-specific factor is highly significant suggesting international diversification opportunities.

In this study, the risk and return from publicly-traded foreign real estate is compared to that for U.S. stocks, U.S. real estate and foreign stock investments. The correlations between U.S. and international investments are then examined over time to determine if international real estate investment has maintained its portfolio diversification benefits despite increased integration in world stock markets. The correlation between domestic stock returns and international real estate returns is examined during and following the stock market crash of 1987 to determine if world real estate markets still offer protection in times of higher stock market volatility and integration. Though previous research has found that international real estate increases the mean variance efficiency of U.S. portfolios, there is little evidence as to whether this benefit is stable over time and during periods of higher world stock market volatility. Lastly whether the addition of foreign real estate provides any risk/return benefit beyond that available from foreign stocks is examined by plotting the efficient frontier for various combinations of assets.

Data

Monthly data from January 1986 to June 1995 from Morgan Stanley is used to examine U.S. and foreign stock portfolio returns. The returns are available in both dollar and local currency terms. Both dollar and local currency denominated returns are used since the risk and return profile of international investments from a U.S. perspective; the risk from exchange rate changes was examined separately. Monthly exchange rates are available from the Federal Reserve website. The National Association of Real Estate Investment Trust (NAREIT) is the source of the U.S. real estate return data.[1]

Standard and Poor's Global Vantage data was utilized to measure the returns from international real estate investments. Global Vantage provides monthly stock prices, dividends and split information necessary for return calculations and SIC codes necessary for industry identification. Firms must be classified in the two-digit SIC code 65 to be considered for inclusion in this study.[2] SIC 65 code includes property managers, title companies, real estate agents and construction firms. It might be interesting to know the types of securities specific to each country; however, it is difficult to be more specific since Global Vantage only classifies them in a general real estate classification.

Exhibit 1
Descriptive Statistics

Country	Number of Companies	Number of Monthly Observations
Canada	11	1,453
France	14	841
Great Britain	56	4,262
Hong Kong	32	2,597
Japan	15	1,761
Singapore	12	877
Total	140	11,791

Note: Table includes the number of real estate firms and total number of monthly observations within each country.

Also, although some U.S. investors may want to invest directly in foreign real estate, publicly-traded real estate firms were used to measure real estate returns due to the availability of data.[3]

The sample is then examined to identify countries with data for at least ten real estate firms in the time period studied. These countries are Canada, France, Great Britain, Hong Kong, Japan and Singapore. The number of firms within each country and the total number of observations are listed in Exhibit 1. Altogether there are 140 firms. The greatest number of firms is from Britain and the smallest number is from Canada.

Results

First, mean and median monthly returns and standard deviations for the stock portfolios and portfolios of real estate firms were calculated in local currency terms for January 1986 to June 1995. The results are presented in Exhibit 2. For individual country portfolios, mean stock and real estate returns are highest in Hong Kong (0.0187 and 0.0262, respectively) and second highest in Singapore (0.0138 and 0.0246, respectively). The standard deviation of stock and real estate returns is also highest in Hong Kong and Singapore. The country with the lowest mean real estate return is Canada (−0.0082) and Japan has the lowest mean stock return (0.0039). Canadian stocks and French real estate have the lowest risk, as measured by the standard deviation of returns.

Exhibit 2
Monthly Local Currency Returns

Country	Mean Return	Median Return	Std. Dev.	Correlation with U.S. Stock Index
Canadian stocks	0.0048	0.0033	0.0414	0.7595
Canadian real estate	−0.0082	−0.0126	0.0744	0.3929
French stocks	0.0087	0.0156	0.0628	0.5435
French real estate	0.0072	0.0047	0.0472	0.2900
Hong Kong stocks	0.0187	0.0160	0.0855	0.4629
Hong Kong real estate	0.0262	0.0227	0.1013	0.4246
Japanese stocks	0.0039	0.0030	0.0672	0.3266
Japanese real estate	0.0042	−0.0093	0.0909	0.3118
Singapore stocks	0.0138	0.0144	0.0744	0.6101
Singapore real estate	0.0246	0.0220	0.1108	0.5621
British stocks	0.0092	0.0137	0.0543	0.7609
British real estate	0.0103	0.0174	0.0754	0.5066
Equally-weighted portfolio of foreign stocks	0.0099	0.0145	0.0483	0.7369
Equally-weighted portfolio of foreign real estate	0.0107	0.0103	0.0566	0.6328
U.S. stocks	0.0092	0.0124	0.0438	1.0000
U.S. real estate	0.0061	0.0021	0.0327	0.6000

Note: Mean, median, standard deviation and correlation of monthly returns in local currency terms for stock indices and real estate investments from January 1986 to June 1995.

Comparing real estate and stock returns within individual countries, the mean and median return from the real estate portfolio is greater in Hong Kong, Singapore and Great Britain. The stock portfolio provides greater mean and median returns in Canada and France. For all the countries except France, the standard deviation of returns is higher for the real estate investment.

In summary, the results in Exhibit 2 show that foreign real estate provides generally a higher return but greater risk than foreign stock investments. However, to evaluate the attractiveness of foreign real estate from a U.S. investor's perspective, the risk, return and correlations of foreign real estate returns must be measured in U.S. dollar terms. Exhibit 3 presents the monthly return statistics denominated in U.S. dollar terms.

For all countries except Canada, the dollar denominated returns in Exhibit 3 are higher than the local currency returns presented in Exhibit 2, reflecting the strengthening of the foreign exchange relative to the dollar during this time period. Likewise, dollar returns for both foreign stock and foreign real estate portfolios are higher at 0.0128 and

0.0138, respectively. However the standard deviation of returns is also higher in dollar terms except for Singapore stocks. Perhaps offsetting this increase in country specific risk however is the fact that the correlation of returns is lower for all country assets except Canadian real estate.

In Exhibit 3, the highest mean real estate returns were in Singapore (0.0283) and the highest stock returns were in Hong Kong (0.0188). The lowest risk, as measured by the standard deviation, is from investments in Canadian stocks and U.S. real estate. Relative to the U.S. stock portfolio, the lowest correlation of returns occurs in Japan for stocks and in France for real estate. In all foreign countries except Japan, the correlation of real estate returns with U.S. stock returns is lower than it is for stock investments in the same country, particularly in the case of France. In France, the correlation of stock with U.S. stocks (0.4817) is more than twice that of the correlation between French real estate and U.S. stocks (0.1912).

Comparing the equally-weighted portfolios of foreign and U.S. asset returns, the returns for the foreign stock and real estate portfolios are higher

Exhibit 3
Monthly U.S. Dollar Returns

Country	Mean Return	Median Return	Std. Dev.	Correlation with U.S. Stock Index
Canadian stocks	0.0052	0.0088	0.0465	0.7286
Canadian real estate	−0.0077	−0.0132	0.0790	0.4009
French stocks	0.0129	0.0084	0.0665	0.4817
French real estate	0.0117	0.0042	0.0587	0.1912
Hong Kong stocks	0.0188	0.0158	0.0857	0.4615
Hong Kong real estate	0.0263	0.0256	0.1014	0.4234
Japanese stocks	0.0124	0.0116	0.0809	0.2226
Japanese real estate	0.0129	−0.0044	0.1032	0.2376
Singapore stocks	0.0174	0.0193	0.0744	0.5979
Singapore real estate	0.0283	0.0246	0.1111	0.5539
British stocks	0.0104	0.0049	0.0604	0.6528
British real estate	0.0116	0.0154	0.0807	0.4465
Equally-weighted portfolio of foreign stocks	0.0128	0.0159	0.0502	0.6890
Equally-weighted portfolio of foreign real estate	0.0138	0.0185	0.0588	0.5898
U.S. stocks	0.0092	0.0124	0.0438	1.0000
U.S. real estate	0.0061	0.0021	0.0327	0.6000

Note: Mean, median, standard deviation and correlation of monthly returns in U.S. dollar terms for stock indices and real estate investments from January 1986 to June 1995.

than their U.S. counterparts. However these higher returns come at the expense of a higher standard deviation. In an international portfolio however, foreign real estate may still provide a benefit to the U.S. investor as the correlation of returns with U.S. stocks is lower than it is for U.S. real estate. This issue is addressed later when the efficient frontiers for combinations of asset classes are examined.

Overall, the results presented in Exhibit 3 suggest that the U.S. investor would benefit from international diversification. Except for Canada, asset returns are higher than those for U.S. assets. Though these foreign assets are accompanied by higher risk, the correlations between foreign assets and U.S. stock is less than 0.73 in all cases. Furthermore, foreign real estate has a lower correlation with U.S. stocks than do foreign stocks.

Previous researchers (Bertero and Mayer, 1990; King and Wadhwani, 1990; and King, Sentana and Wadhwani, 1994) have found an increased integration of global financial markets during periods of higher volatility, such as the stock market crash of 1987. This study examines the correlations over time between the U.S. stocks and three asset classes: U.S. real estate, foreign stocks and foreign real estate investments. The correlation coefficients are computed on a rolling basis using monthly dollar denominated return data from the previous twelve months and are from January 1987 to May 1995. In Exhibit 4, the correlation between U.S. stocks and all three assets rise during the crash of 1987. However, the correlation between the U.S. stock market and foreign real estate is still less than that between U.S. stocks and foreign stocks and that between U.S. stocks and U.S. real estate. In addition, despite the increased integration of world economies, the correlation between foreign real estate and U.S. stocks is predominantly lower in the latter years of Exhibit 4.

The correlation between the U.S. market and foreign real estate is lower than that between U.S. stocks and foreign stocks for 98 of the 102 months examined. The exceptions are four months in 1993. Thus, the generally lower correlations for foreign real estate (compared to those for foreign stock)

shown in Exhibit 3 are stable throughout the Exhibit 4 time period. Foreign real estate also has a lower correlation with U.S. stocks than does U.S. real estate in 89% of the 102 months examined.

Two other interesting patterns are illustrated in Exhibit 4. First, foreign asset returns appear to decouple from U.S. stock returns in 1993. Further examination reveals that during 1993, the annual U.S. stock return of 6.9% lagged that of foreign stocks (35.8%) and that of foreign real estate (54.1%). Secondly, the correlation between foreign stocks and the U.S. stock market is lower than that between U.S. stocks and U.S. real estate in only 67 of the 102 months examined. It is popularly assumed that using foreign stocks provides diversification benefits partly in the form of lower correlations that are not available from U.S. assets. However, this is not overwhelmingly demonstrated in Exhibit 4.

In summary, the pattern presented in Exhibit 4 suggests that the lower correlation for foreign real estate is consistent through time, even in periods of increased volatility. Furthermore there is no pattern of increasing correlations through time. The fact that this degree of market segmentation is demonstrated with publicly-traded foreign real estate firms is even more remarkable.

Exhibit 5 presents two dollar denominated efficient frontiers: a domestic frontier consisting of U.S. stock and U.S. real estate and an international one consisting of U.S. stock, U.S. real estate and the six foreign country stocks. The latter frontier clearly dominates the former. The lowest standard deviation available without the inclusion of foreign stocks is 3.21%. This portfolio is weighted 17% in U.S. stocks and 83% in U.S. real estate. However, if foreign stocks are included as an alternative to U.S. stocks, the minimum standard deviation drops to 3.07% a month. This portfolio has investment weights of 74% in U.S. real estate, 17% in Canadian stocks, 4% in French stocks and 5% in Japanese stocks. The portfolio is totally divested of U.S. stocks to achieve this dominant risk reduction position.

The maximum return available from a domestic portfolio is 0.92% a month and consists entirely of

Exhibit 4
### Correlation of Assets with U.S. Stocks
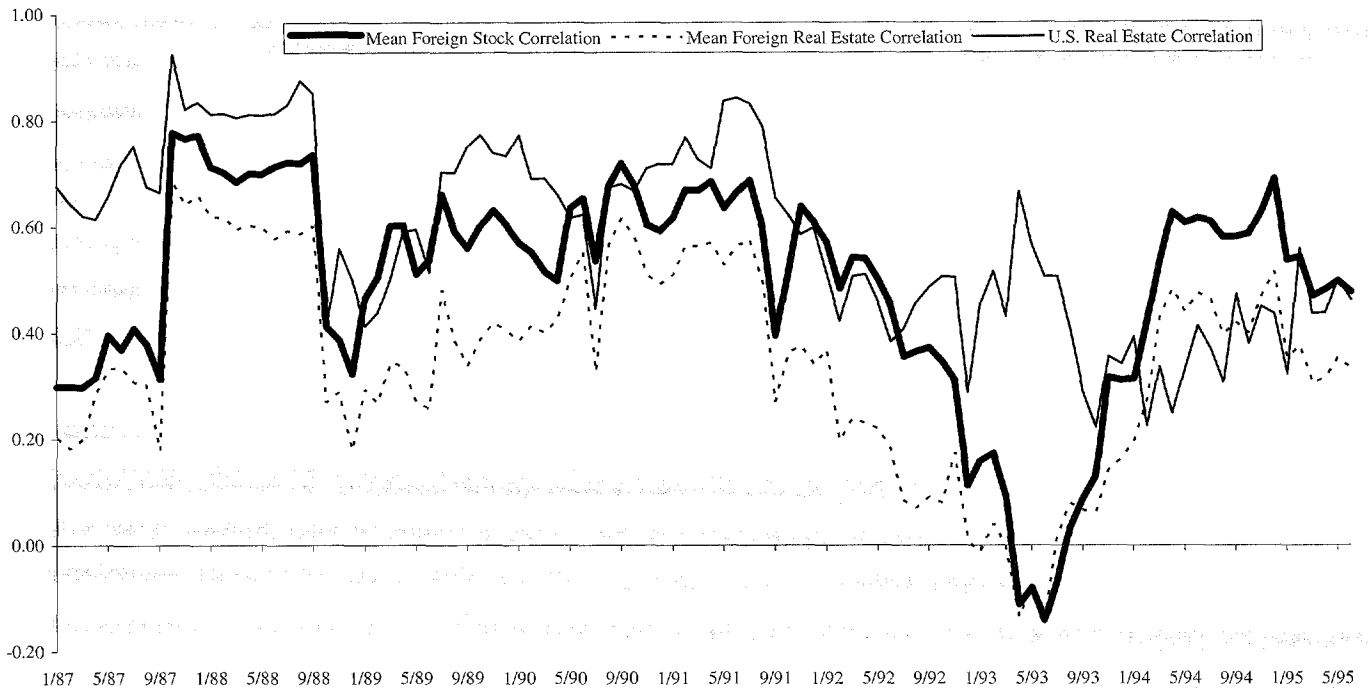
U.S. stocks. At the same standard deviation of 4.38% a month, the internationally diversified portfolio has a return of 1.26% a month, which adds over 4% ((1.26 − 0.92)*12) a year to the investor's return. The international portfolio has 8% invested in U.S. stocks, 27% in U.S. real estate, 17% in French and Hong Kong stocks, 12% in Japanese stocks and 19% in Singapore stocks. These weights correspond to a higher level of international diversification than typically recommended to U.S. investors.

At higher levels of risk, the international frontier provides higher levels of return not available on the domestic frontier by investing more heavily in Asian stocks and divesting of U.S. assets. At a 6.0% standard deviation, the international portfolio has a return of 1.65% a month and has asset allocations of 17% in French stock, 32% in Hong Kong stocks, 12% in Japanese stocks and 39% in Singapore stocks. At a 7.0% standard deviation/1.78% return level, the international portfolio has an asset allocation of only 2% in French stocks with the remaining amount invested in Asia as follows: 48%

in Hong Kong stocks, 5% in Japanese stocks and 46% in Singapore stocks. Though the results may reflect the time period of the data, it is still somewhat surprising that U.S. assets make up such a small portion of the international efficient frontier. This result is in contrast to Sinquefield (1996) who finds no value to international diversification unless the investor focuses on small stocks and/or value stocks.

Next, two frontiers were plotted: the international frontier shown in Exhibit 5 and the international frontier with foreign real estate added. This latter international stock and real property frontier includes investments in U.S. stocks, U.S. real estate and the six foreign stock and real estate markets in the study. As shown in Exhibit 6, the latter frontier dominates the former. The lowest standard deviation available from the international stock and property frontier is 2.92% with an accompanying return of 0.71%. This portfolio is weighted 66% in U.S. real estate, 15% in Canadian stocks, 1% in Japanese stocks and 18% in French real estate. In contrast, the frontier without foreign real estate

Exhibit 5
Risk and Return for Efficient Portfolios of International Assets
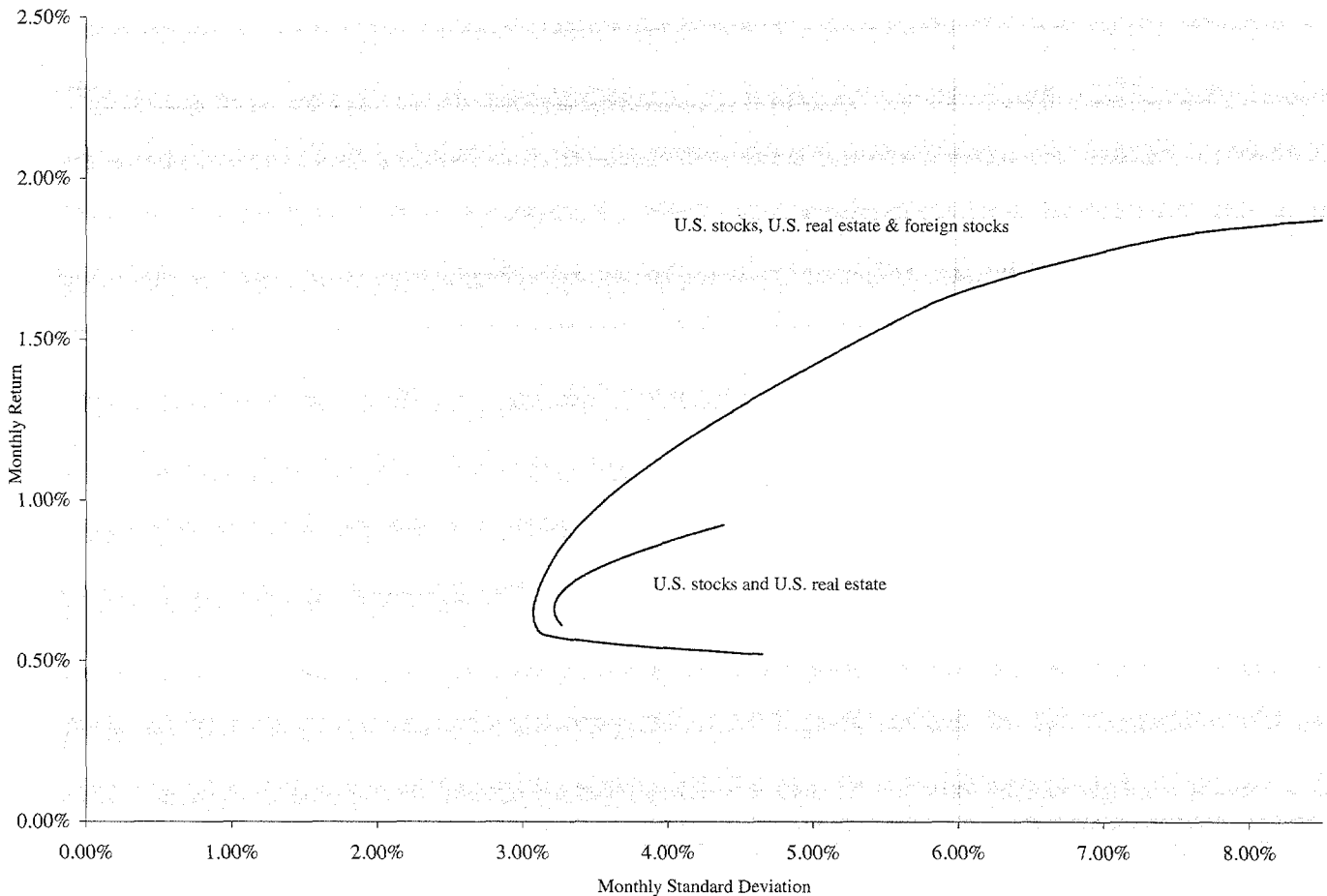
has a minimum standard deviation of 3.07% a month at which the monthly return is 0.67%.

As shown in Exhibit 5, the maximum return from a U.S. investor's portfolio that excludes foreign real estate is 1.88% with a standard deviation of 8.57% a month. At this same return, the international stock and property portfolio has a lower standard deviation of 5.73%. This portfolio is composed of 10% U.S. real estate, 6% Japanese stocks, 32% French real estate, 27% Hong Kong real estate, 3% Japanese real estate and 22% Singapore real estate. It is interesting that 84% of this portfolio is invested in foreign real estate. When international diversification advice is given to the U.S. investor, foreign real estate is not usually mentioned as a recommended component of that diversification.

The frontiers in Exhibit 6 also demonstrate that the inclusion of foreign real estate provides returns not otherwise available. At a 10% standard deviation, the return to the international stock and property portfolio is 2.78% a month. As noted, the highest return from foreign stock diversification alone is 1.88% a month. This portfolio has 23% invested in Hong Kong real estate and 77% invested in Singapore real estate.

The results illustrated in Exhibit 6 indicate that diversification into foreign real estate provides lower risk and higher return than that attainable from a frontier of U.S. stock, U.S. real estate and foreign stock. In Exhibit 4, foreign real estate was shown to have a lower correlation with U.S. stocks than that between foreign stocks and U.S. stocks.

Exhibit 6
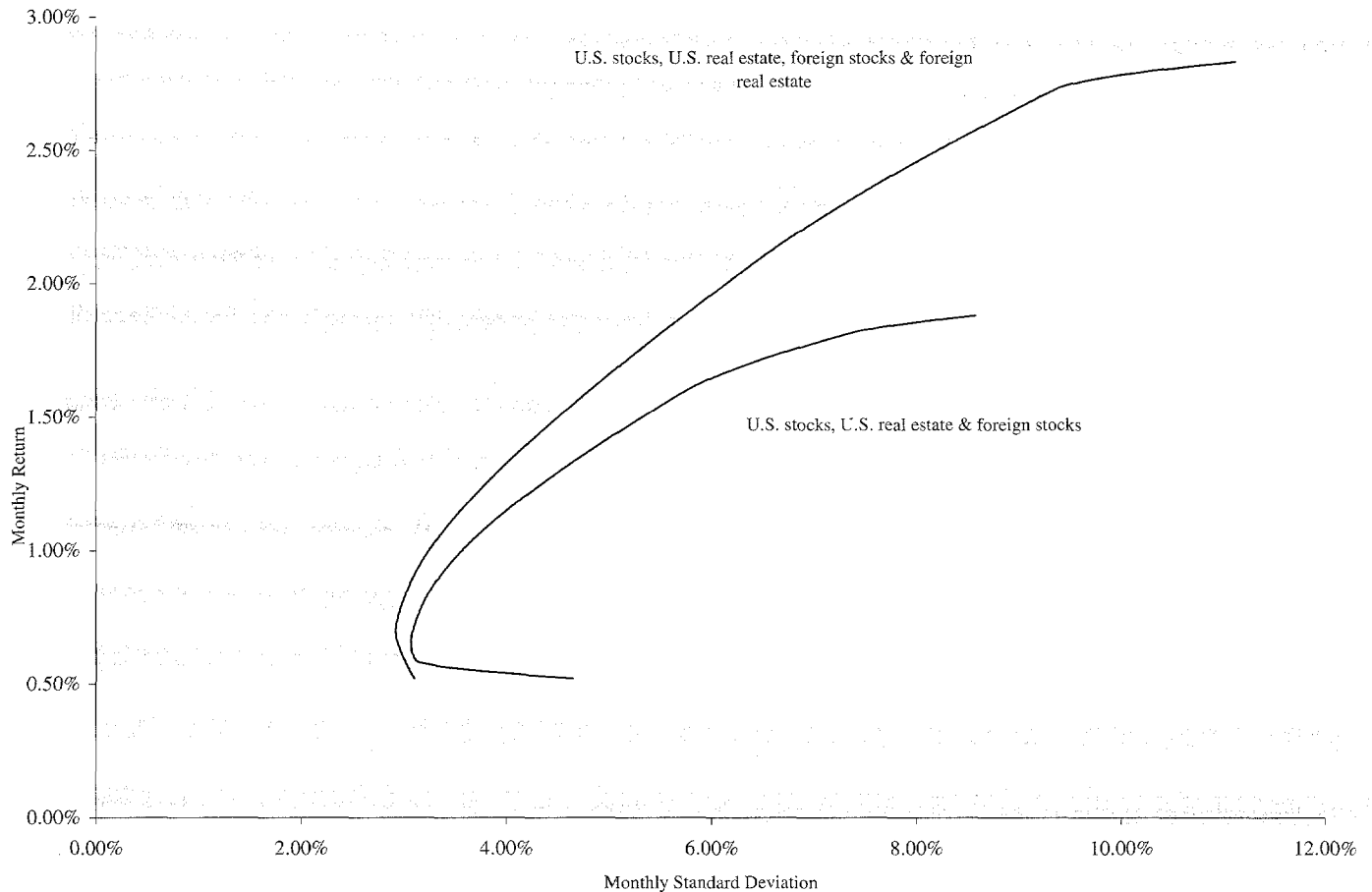**Risk and Return for Efficient Portfolios of International Assets**

Exhibit 6 suggests that the less integrated nature of foreign real estate is beneficial to the internationally diversified U.S. investor.

Conclusion

Previous research has questioned the wisdom and stability of international equity diversification. Foreign stocks have been shown to have a higher correlation with U.S. stocks during periods of increased volatility, the very time when a U.S. investor needs diversification the most. This study has examined the effects of international diversification using data surrounding the stock market crash of 1987 in order to measure the value of foreign diversification in a period of increased volatility and greater uncertainty. Returns from U.S. stocks, U.S. real estate, foreign stocks and publicly-

traded foreign real estate were examined to determine whether foreign real estate exists in a more segmented market than foreign stocks and whether foreign real estate provides diversification benefits beyond those from foreign stocks.

For five of the six countries examined, foreign real estate had a lower correlation with U.S. stocks than foreign stocks did. This lower correlation was also shown to be stable through time as foreign real estate had a lower correlation than foreign stocks in 98 of the 102 months examined. These lower correlations provided lower risk and higher return when foreign real estate is added to a portfolio of U.S. assets and foreign stock. Additionally, foreign real estate had a significant, sometimes majority, weight in the efficient international portfolios. Though current investment advice may

routinely fail to mention foreign real estate as a portfolio component, the results suggest that the absence of foreign real estate reduces return and increases risk for a U.S. investor. These results are all the more remarkable because they are generated with publicly-traded foreign real estate firms. Whether additional benefits are available from direct foreign real estate investments is an issue for further research.

Endnotes

1. REITs can be classified as equity, hybrid or mortgage REITs. An equity REIT has at least 75% of its investment portfolio invested in income-producing real estate and a mortgage REIT has at least 75% of its portfolio in real estate financial instruments such as residential and commercial mortgages and construction loans. A hybrid REIT has an investment mix of both real estate and mortgages. The all-REIT portfolio that is capitalization weighted and represents all equity, mortgage and hybrid REITs is used in this study.

2. Standard and Poor's assigns industry classifications for foreign firms using the Standard Industrial Classification codes.

3. Though these publicly-traded companies have prices that are readily observable, it still might be expected that their underlying assets have markets that are segmented in nature and difficult to appraise, thus leading to diversification benefits to the U.S. investor. Corgel, McIntosh and Ott (1995) provide an overview of the literature of REITs and conclude that they are a hybrid, behaving both as common stocks and direct real estate investments.

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