

# Taxes and Foreign Real Estate Investment

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*Abstract.* In recent years studies examining international mixed-asset portfolios have failed to uncover any significant benefits from foreign real estate. These papers have concentrated their focus on foreign exchange rate risk as “the problem” with respect to foreign investments and therefore they sought solutions from traditional hedging tools such as leverage, options, forward contracts and even currency swaps. This study considers differences among countries in national income tax rates as a plausible explanation for the interest in foreign real estate investment. Hypothetically, it may be possible for investors to move a portion of their wealth to a foreign country and take advantage of lower marginal tax rates. After-tax returns from mixed-asset portfolios consisting of (1) domestic financial assets only, (2) domestic financial assets plus foreign financial assets, and (3) domestic financial assets, foreign financial assets and foreign real estate are evaluated. The findings indicate that there are no significant after-tax benefits for foreign investors from investment in U.S. real estate.

## Introduction

To date, researchers have failed to provide any meaningful evidence that foreign investors enhance their wealth when they invest in U.S. real estate (see Ziobrowski et al., 1991, 1993, 1995). These studies focused on the riskiness of U.S. real estate caused by volatile exchange rates and techniques to reduce that risk including such hedging instruments as currency options and forward contracts. Unfortunately nothing has produced an acceptable result in terms of higher mean-variance portfolio efficiency.

All of these earlier studies were done on a pre-tax basis. Normally, analysis of this type should produce acceptable results since most developed nations tax foreign asset returns at the same marginal tax rates as domestic asset returns (usually crediting the investor with any foreign taxes paid prior to the repatriation of funds). Such tax policies are, of course, designed to discourage capital flight to countries with lower tax rates. However, under certain conditions, it may still be possible for investors to take advantage of lower foreign tax rates. Although of questionable legality, the failure of the various national governments to exchange taxpayer income information makes such investments virtually impossible to trace. Few would argue with the precept that large amounts of cash can be easily moved across most international borders undetected. As an example, U.S. law permits citizens to enter or leave the country with up to \$10,000 in cash without any declaration. As most foreign travelers will attest, carrying even much larger amounts of currency from country to country is relatively risk free.

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Furthermore, in many cases foreign investors in U.S. assets may have no need to repatriate their funds to their home country. The foreign investor may have a future use for dollars as a frequent visitor to the United States for either business or pleasure. The foreign investor may find that dollars are a convenient medium of exchange for virtually all international transactions. If the after-tax (U.S.) returns from their U.S. investments are significantly higher than the after-tax returns from the investor's home-country investments (adjusted for the fluctuations in exchange rates), clearly it may be prudent for the foreign investor to establish a U.S. portfolio beyond the reach (or knowledge) of the investor's home-country government.

This study examines whether U.S. income tax rates can be used to enhance the after-tax return characteristics of U.S. real estate to foreign investors sufficiently to make these assets attractive to foreign investors in a mean-variance portfolio framework. The research covers the period 1973 to 1991. After adjusting the British pound and Japanese yen denominated returns from U.S. assets (financial and real estate) to reflect the payment of U.S. income tax (but avoiding any payment of tax on these assets to their respective home-country governments), a series of alternative efficient investment frontiers were constructed for British and Japanese investors using a standard Markowitz mean-variance analysis. These efficient frontiers were then compared to determine if U.S. real estate taxed only by the United States could improve the performance of a portfolio containing the foreign investor's home-country assets. All returns were measured on a five-year holding period to simulate the longer holding periods typically connected with real estate. The effects of transaction costs, leverage and short selling were not considered in the analysis.

## Methodology

Eight (8) efficient frontiers were generated for this study using the software package *Invest* from Haugen (1990). *Invest* performs a standard Markowitz-type mean-variance portfolio analysis which uses Lagrangian multipliers to find the minimum variance set. In essence, it minimizes the portfolio variance (the objective function) subject to the following three constraints, (a) the return on the portfolio equals a pre-selected target level  $E(R_p)$ , (b) the sum of the portfolio weights,  $W_i$ , must be one, and (c) each of the individual portfolio weights must be greater than or equal to zero (no short selling). Ten different  $E(R_p)$  are selected between the yield on the lowest return asset in the opportunity set and the yield on the highest earning asset to construct an entire efficient frontier. This is:

$$\text{Min } S_p^2 = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \sigma_{ij}, \quad (1)$$

subject to

$$\sum_{i=1}^n W_i R_i = E(R_p)$$

$$\sum_{i=1}^n W_i = 1$$

$$W_i \geq 0,$$

where  $\sigma_{ij}$  is the covariance between the returns of assets  $i$  and  $j$ ,  $n$  is the total number of assets in the opportunity set and  $R_i$  is the average return from asset  $i$ .

Four frontiers were constructed with all returns measured in pounds-sterling to simulate results available to a British investor. Returns measured in yen were used to produce the other four frontiers needed to simulate the Japanese perspective.

To examine the impact of taxes, we began by constructing baseline efficient frontiers from the after-tax returns of the foreign investors' respective home-country assets only. Next, efficient frontiers were constructed for both the British and the Japanese from opportunity sets composed of their respective home-country assets (after-tax) and U.S. financial assets (common stocks, government bonds and Treasury bills) taxed only by the U.S. government. It is logical to assume that foreign investors would favor financial securities over real estate because of ease in trading and market efficiency.

For the third pair of efficient frontiers, we added the after-tax returns from U.S. real estate to the after-tax returns of the foreign investor's home-country assets and the U.S. financial assets. As before, we assumed U.S. assets were taxed only by the U.S. government. When compared to the previously generated frontiers, we could approximate the magnitude of any diversification gains attributable solely to the U.S. real estate.

Finally, we constructed a pair of efficient frontiers to determine what effect, if any, real estate data smoothing might have on our results. The U.S. real estate data was adjusted for smoothing using the technique developed by Geltner (1993), then combined with the U.S. financial assets and the foreign investor's home-country assets, all after-tax, to produce these last two efficient frontiers. The adjusted U.S. real estate returns should be most representative of reality because they correct for errors made in appraisal valuation.

## Data

All the data for this study was originally obtained on an annual, pre-tax basis. The returns were denominated in the home-country currency of each asset in terms of capital appreciation and income. The data were adjusted for a five-year holding period including taxes and the conversion of returns to other currencies. Appendix A presents details of these calculations.

To extend each holding period to five years with the limited data series available, it was necessary to use overlapping holding periods.<sup>1</sup> Eun and Resnick (1988) used this method for increasing the holding period. The first period is 1973 to 1977, the second period is 1974 to 1978, and so on to produce fifteen distinct holding periods ending with the period 1987 to 1991.

For this study it was presumed that foreign investors purchased assets on January 1 of the first year and sold them on December 31 of the fifth year of each holding period. All assets were paid for with the investor's home-country currency. For U.S. assets, the home-country currency was converted to dollars at the exchange rate prevailing at the beginning of the holding period. Each year, the foreign investor paid taxes on any annual income (dividends or interest) received. After-tax income was assumed to be reinvested annually. At the end of the five-year holding period, the asset was sold and taxes on capital gains were paid based on capital gain tax rates in effect during the year of sale. Total returns from U.S. assets were then converted to the foreign investor's home-country currency at the exchange rates on December 31, of the last year. The funds were repatriated without being subjected to further taxation by the investor's home country.

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U.S., British and Japanese tax rates, 1973–1991, were provided by Ernst & Young. All exchange rates were from the *Wall Street Journal*.

In general, the British and Japanese national income tax systems are structured similarly to the U.S. system. The typical taxpayer adds all income from taxable sources and subtracts allowable exemptions and deductions to obtain taxable income. The types and amounts of deductions vary significantly from country to country. These deductions also changed significantly in each country during the period covered by this study. However, most of these changes in deductions, exemptions and credits were applicable to personal exemptions and deductions for dependents and not relevant to this study. However, the study considers all regulations related to investments including real estate depreciation and distinctions between the tax treatment of ordinary income and capital gains. We assume investors are taxed at the highest marginal tax rate.

Overall, the Japanese have historically taxed investors the lowest rates among the three countries examined in this study (Ishi, 1993). Until recently, for example, Japanese investors paid no tax on capital gains.<sup>2</sup> The British have the highest marginal tax rates. At one point, income from investments was taxed at a marginal rate of 98% in England (Kay and King, 1986). However, capital gains in Great Britain are adjusted for inflation so that only “real” capital gains are taxed.

All return data for U.S. stocks, bonds and bills is from Ibbotson Associates. Return calculations are presented in the classic monograph by Ibbotson and Sinquefeld (1982). Annual rates of income and capital appreciation from British stocks, bonds and bills are from Barclays de Zoete Wedd’s *BZW Equity-Gilt Study*. BZW calculates British common stock returns from the *Financial Times* All Share Index (capital appreciation) plus the dividend yield on that index (annual income). The return from British long-term government bonds is generated using the same technique used by Ibbotson and Sinquefeld (1982). Annual returns from British T-bills come from four consecutive ninety-one-day investments during each calendar year. The returns of Japanese stocks, bonds, and short-term interest rates came from Hamao and Ibbotson (1992). Their data was developed using the methodology of Ibbotson and Sinquefeld (1982).

The U.S. real estate returns are from Evaluation Associates, Inc. (EAI). The EAI Real Estate Fund Performance Index is based on the capital appreciation and income returns from over 100 real estate equity funds with combined assets totaling almost \$40 billion. Properties in the index are unlevered institutionally managed commingled real estate funds (CREF) of tax-free pension fund clients. The income component is rents less operating expenses. Capital appreciation is annual aggregate gain based on appraisals of more than 2000 properties included in the index.

With tax-free investors, depreciation is not relevant. However, in this study, depreciation is important. Depreciation reduces income taxes and increases after-tax cash flows. The benefits of depreciation depend on the investor’s marginal tax rate. Simplifying depreciation assumptions are made. First, foreign investors in U.S. assets had no “active” U.S. income to shield from tax (pre-1986). Second, foreign investors could not use depreciation-generated “losses” to shield income from financial assets, such as dividends or interest payments. Third, the annual depreciation was sufficient to shield the operating income component from taxation as ordinary income. Under these three assumptions,<sup>3</sup> the tax benefit from depreciation converts all ordinary income received from real estate to a capital gain. Also, it postpones payment of taxes until the asset is sold at the end of five years. The tax laws allow the investor to reduce ordinary income by

the amount of allowable depreciation but requires that the property basis be reduced by the amount of depreciation taken. This will result in a higher capital gain that is taxable at the time of sale. In this study, it is assumed that all income is capital gain taxed at the time of sale.

To correct for smoothing, we used an adjusted version of the EAI Index published by Geltner (1993). The adjustments made by Geltner are complex, and interested readers should look to the original article for a complete explanation. We have not included foreign real estate in this study because the quality of the data is questionable.<sup>4</sup>

One limitation of this study deals with the reinvestment of after-tax cash flows. In general, the continuous annual reinvestment of after-tax returns from dividends and interest payments into stocks, bonds and bills is realistic. However, the annual reinvestment of after-tax cash returns from real estate back into real estate may be problematic because of the large amounts of cash usually needed to acquire more real estate. We believe this approach is conservative and makes U.S. real estate as attractive as possible to foreign investors. In that way, if U.S. real estate failed to provide foreigners with any portfolio benefits, the findings could not be attributed to our assumptions.

## Test Results

Before- and after-tax mean five-year holding period returns, standard deviations and coefficients of variation for all U.S. assets are presented in Exhibit 1. The foreign-denominated returns from the U.S. assets reflect the full impact of exchange rate fluctuations throughout the holding period. The mean rates of return, standard deviations and coefficients of variation for the British and Japanese assets are shown in Exhibit 2. Returns from British and Japanese assets are presented in pounds-sterling and yen, respectively.

The conversion of the dollar-denominated returns to pounds caused higher mean rates of return (both before- and after-tax) because the dollar generally appreciated versus the pound throughout the test period. Converting the dollars into yen resulted in much lower returns reflecting the depreciation of the dollar against the yen during the same time frame. Japanese returns were pushed so low that Japanese investors in U.S. bills and bonds actually lost money over the nineteen-year sample period if they paid U.S. federal income tax on their investments. However, taxes did dampen the volatility of U.S. asset returns to both British and Japanese investors. This tax-induced reduction in risk was proportionately smaller than the reduction in return, thus taxes caused an increase in the coefficient of variation for all assets in both pounds and yen.

British taxes were the highest of the three countries, reducing total returns on British assets an average 58%. This indicates that British investors might have benefitted from the lower U.S. tax rates, especially since the dollar appreciated versus the pound. Comparing after-tax U.S. asset returns in pounds (Exhibit 1) to after-tax British asset returns (Exhibit 2) we find that in terms of mean return, the U.S. assets are competitive. But the U.S. assets remain very risky as a result of currency exchange rate fluctuations. The Japanese had the lowest tax rates, reducing total returns from Japanese assets only 36%. The comparison of the yen-denominated returns from U.S. assets both before- and after-tax to the returns of Japanese assets shows the U.S. assets to be relatively low in terms of mean return and high in terms of risk offering little prospect for wealth enhancement.

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**Exhibit 1**  
**Foreign-Denominated Mean Rates of Return, Standard Deviations and**  
**Coefficients of Variation from U.S. Assets: Both Before- and After-Tax,<sup>1</sup> Five-**  
**Year Holding Periods,<sup>2</sup> 1973–1991**

	Before Tax			After Tax		
	5-yr % Mean Return (Annualized) <sup>3</sup>	Standard Deviation (%)	Coefficient of Variation	5-yr % Mean Return (Annualized) <sup>3</sup>	Standard Deviation (%)	Coefficient of Variation
Dollar-Denominated Returns:						
U.S. Stocks	92.21 (13.96)	41.41	0.45	60.15 (9.88)	30.50	0.51
U.S. LT Gov. Bonds	61.25 (10.03)	46.28	0.76	23.38 (4.29)	30.77	1.32
U.S. T-Bills	48.89 (8.29)	12.91	0.26	19.02 (3.54)	5.83	0.31
U.S.R.E. Smoothed	73.34 (11.63)	30.41	0.41	54.90 (9.15)	24.91	0.45
U.S.R.E. Unsmoothed	64.82 (10.51)	38.46	0.59	48.58 (8.24)	29.89	0.62
Pound-Denominated Returns:						
U.S. Stocks	111.16 (16.12)	83.79	0.75	74.51 (11.78)	61.69	0.83
U.S. LT Gov. Bonds	79.61 (12.43)	86.29	1.08	35.28 (6.23)	55.33	1.57
U.S. T-Bills	66.93 (10.79)	66.23	.99	31.49 (5.63)	45.06	1.43
U.S.R.E. Smoothed	96.28 (14.44)	85.43	.89	75.45 (11.90)	76.53	1.01
U.S.R.E. Unsmoothed	86.57 (13.28)	83.64	.97	68.15 (10.95)	74.25	1.09
Yen-Denominated Returns:						
U.S. Stocks	50.06 (8.46)	50.79	1.01	24.31 (4.45)	36.56	1.50
U.S. LT Gov. Bonds	24.29 (4.44)	42.26	1.74	-5.53 (-1.13)	26.57	-4.80
U.S. T-Bills	18.17 (3.40)	39.14	2.15	-6.76 (-1.39)	25.04	-3.70
U.S.R.E. Smoothed	38.48 (6.73)	53.37	1.39	23.83 (4.37)	47.38	1.99
U.S.R.E. Unsmoothed	31.94 (5.70)	55.04	1.72	18.93 (3.53)	47.89	2.53

<sup>1</sup>Returns on U.S. assets are taxed by the U.S. government at the highest marginal tax rate prior to conversion into foreign currency. It is further assumed that neither the British nor the Japanese governments impose additional taxes on the U.S. asset returns.

<sup>2</sup>Fifteen overlapping five-year holding periods, for example, beginning 1973 to 1977, 1974 to 1978, etc. and ending 1987 to 1991 resulting in fifteen portfolio data points.

<sup>3</sup>The annualized return is the fifth root of (1 plus the five-year holding period return) minus 1.

**Exhibit 2**  
**Domestic Mean Rates of Return, Standard Deviations and Coefficients of**  
**Variation for British and Japanese Assets: Both Before- and After-Tax,<sup>1</sup> Five-**  
**Year Holding Periods,<sup>2</sup> 1973–1991**

	Before Tax			After Tax		
	5-yr % Mean Return <sup>3</sup> (Annualized) <sup>4</sup>	Standard Deviation (%) <sup>3</sup>	Coefficient of Variation	5-yr % Mean Return <sup>3</sup> (Annualized) <sup>4</sup>	Standard Deviation (%) <sup>3</sup>	Coefficient of Variation
British Stocks	164.49 (21.47)	78.91	.48	90.40 (14.17)	45.51	.50
British LT Gov. Bonds	93.47 (14.11)	26.21	.28	31.37 (5.61)	20.66	.66
British T-Bills	73.60 (11.66)	7.80	.11	18.29 (3.42)	12.08	.66
Japanese Stocks	106.49 (15.61)	70.68	.66	82.10 (12.74)	52.04	.63
Japanese LT Gov. Bonds	51.95 (8.73)	16.88	.32	23.55 (4.32)	13.41	.57
Japanese T-Bills	38.03 (6.66)	8.03	.21	19.15 (3.57)	3.58	.19

<sup>1</sup>Returns on British and Japanese assets are taxed at the highest marginal income tax rates imposed by their respective national governments.

<sup>2</sup>Fifteen overlapping five-year holding periods beginning, for example, 1974 to 1978 and ending 1987 to 1991.

<sup>3</sup>All mean rates of return and standard deviation calculations were based on the home-country currency of the assets. That is, British asset returns are denominated in pounds-sterling and Japanese returns are in yen.

<sup>4</sup>The annualized return is the fifth root of (1 plus the five-year holding period return) minus 1.

Adjusting the U.S. real estate data for smoothing results in lower mean returns and higher risk when the returns are received in dollars, both before- and after-tax. However, from a foreign perspective, smoothing has no impact on U.S. asset risk. Currency exchange rate risk blurs the distinction between the smoothed and unsmoothed riskiness of U.S. real estate because of its dominance over all other risk factors.

Correlation matrices for the British and Japanese investors, before-tax, are shown in Exhibits 3 and 4, respectively. Consistent with earlier studies, U.S. assets are positively correlated with British assets but show potential for diversification gains. Virtually no correlation existed between Japanese and U.S. assets, indicating the opportunity for portfolio risk reduction through diversification. This low correlation among the asset returns of different countries is typical. First observed by Grubel (1968), Solnik (1974) later explained that the low correlation was caused by the independent behaviour of the different national economies. The matrices also show that U.S. assets displayed high positive correlation among each other. This is explained by the common response of all U.S. assets to the same U.S. economy and exchange rate fluctuations.

**Exhibit 3**  
**British Investor Correlation Matrix (1973–1991) Before-Tax Returns, Received in Pounds-Sterling**

Asset	BCS	BGB	BTB	USCS	USGB	USTB	USRES	USREU
British Common Stocks (BCS)	1.00							
British Government Bonds (BGB)	.72	1.00						
British Treasury Bills (BTB)	<b>-.13</b>	<b>.11</b>	1.00					
U.S. Common Stocks (USCS)	<b>.47</b>	.71	<b>.32</b>	1.00				
U.S. Government Bonds (USGB)	<b>.25</b>	.58	<b>-.02</b>	.85	1.00			
U.S. Treasury Bills (USTB)	<b>.28</b>	.72	<b>.34</b>	.87	.77	1.00		
U.S. Real Estate Smoothed (USRES)	<b>.35</b>	.77	<b>.33</b>	.84	.69	.98	1.00	
U.S. Real Estate Unsmoothed (USREU)	<b>.38</b>	.76	<b>.36</b>	.79	.61	.95	.90	1.00

Bolded correlation coefficients are less than .50 indicating asset combinations that may produce significant diversification benefits.

**Exhibit 4**  
**Japanese Investor Correlation Matrix (1973–1991) Before-Tax Returns, Received in Yen**

Asset	JCS	JGB	JSTIR	USCS	USGB	USTB	USRES	USREU
Japanese Common Stocks (JCS)	1.00							
Japanese Government Bonds (JGB)	.59	1.00						
Japanese S-T Interest Rates (JSTIR)	-.50	<b>.18</b>	1.00					
U.S. Common Stocks (USCS)	<b>.08</b>	<b>-.01</b>	<b>-.02</b>	1.00				
U.S. Government Bonds (USGB)	<b>.25</b>	<b>.43</b>	<b>-.00</b>	.73	1.00			
U.S. Treasury Bills (USTB)	<b>-.26</b>	<b>.01</b>	<b>.43</b>	.83	.61	1.00		
U.S. Real Estate Smoothed (USRES)	<b>-.19</b>	<b>.06</b>	.50	.77	<b>.49</b>	.96	1.00	
U.S. Real Estate Unsmoothed (USREU)	<b>-.20</b>	<b>.03</b>	.51	.70	<b>.37</b>	.92	.99	1.00

Bolded correlation coefficients are less than .50 indicating asset combinations that may produce significant diversification gains.

Comparing Exhibits 3 and 4 with Exhibits 5 and 6, respectively, reveals that taxes further decreased the positive correlation between the U.S. asset and the foreign asset pairs. Among the fifteen U.S.-British asset pairs, the taxes reduced positive correlation in twelve cases, increased positive correlation in only two cases and correlation remained unchanged for one pair. Overall, the average correlation coefficient was decreased from .43 to .15. For U.S.-Japanese asset pairs, positive correlation decreased for twelve pairs and increased for three pairs, with the mean correlation coefficient going from .11 to -.10. This result should not be surprising. It suggests that there is no coordination of tax rates changes among different countries.

From the foreign perspective, the positive correlation among U.S. asset pairs remains high after-tax. This would also be expected since all U.S. asset after-tax returns are simultaneously affected by a general increase or decrease in U.S. income tax rates.



**Exhibit 5**  
**British Investor Correlation Matrix (1973–1991) After-Tax Returns, Received in Pounds-Sterling**

Asset	BCS	BGB	BTB	USCS	USGB	USTB	USRES	USREU
British Common Stocks (BCS)	1.00							
British Government Bonds (BGB)	.50	1.00						
British Treasury Bills (BTB)	<b>.07</b>	.80	1.00					
U.S. Common Stocks (USCS)	<b>.43</b>	<b>.48</b>	<b>.00</b>	1.00				
U.S. Government Bonds (USGB)	<b>.39</b>	<b>.53</b>	<b>.06</b>	.84	1.00			
U.S. Treasury Bills (USTB)	<b>.28</b>	<b>.23</b>	<b>-.20</b>	.90	.83	1.00		
U.S. Real Estate Smoothed (USRES)	<b>.31</b>	<b>.09</b>	<b>-.32</b>	.88	.70	.96	1.00	
U.S. Real Estate Unsmoothed (USREU)	<b>.30</b>	<b>.02</b>	<b>-.38</b>	.85	.63	.93	.99	1.00

Bolded correlation coefficients are less than .50 indicating asset combinations that may produce significant diversification gains.

**Exhibit 6**  
**Japanese Investor Correlation Matrix (1973–1991) After-Tax Returns, Received in Yen**

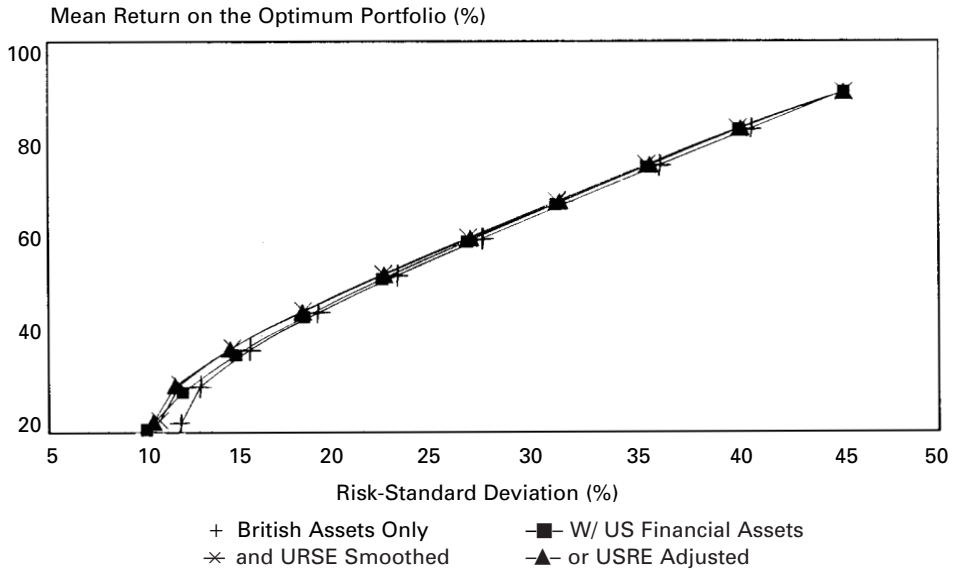
Asset	JCS	JGB	JSTIR	USCS	USGB	USTB	USRES	USREU
Japanese Common Stocks (JCS)	1.00							
Japanese Government Bonds (JGB)	.70	1.00						
Japanese S-T Interest Rates (JSTIR)	<b>-.77</b>	<b>-.41</b>	1.00					
U.S. Common Stocks (USCS)	<b>.04</b>	<b>-.20</b>	<b>-.30</b>	1.00				
U.S. Government Bonds (USGB)	<b>.17</b>	<b>.31</b>	<b>-.18</b>	.68	1.00			
U.S. Treasury Bills (USTB)	<b>-.16</b>	<b>-.29</b>	<b>.05</b>	.86	.68	1.00		
U.S. Real Estate Smoothed (USRES)	<b>-.03</b>	<b>-.34</b>	<b>-.10</b>	.82	<b>.49</b>	.93	1.00	
U.S. Real Estate Unsmoothed (USREU)	<b>-.03</b>	<b>-.39</b>	<b>-.12</b>	.77	<b>.38</b>	.87	.99	1.00

Bolded correlation coefficients are less than .50 indicating asset combinations that may produce significant diversification benefits.

The British efficient frontiers after-tax are shown in Exhibit 7. The composition of all optimum portfolios used to construct the efficient frontiers are in Appendix B. Some U.S. assets enter the optimum British portfolio at virtually every level of investor risk preference, but they never occupy more than 11.5% of the total portfolio. The diversification benefits attributable to the U.S. assets are only visible at the lowest levels of risk and are small. U.S. real estate reaches a maximum level of 10% of the optimum portfolio. However, the real estate provides no diversification benefits that are not more easily obtained from common stock. Furthermore, we found no significant difference in the performance of real estate, whether adjusted for smoothing or not.

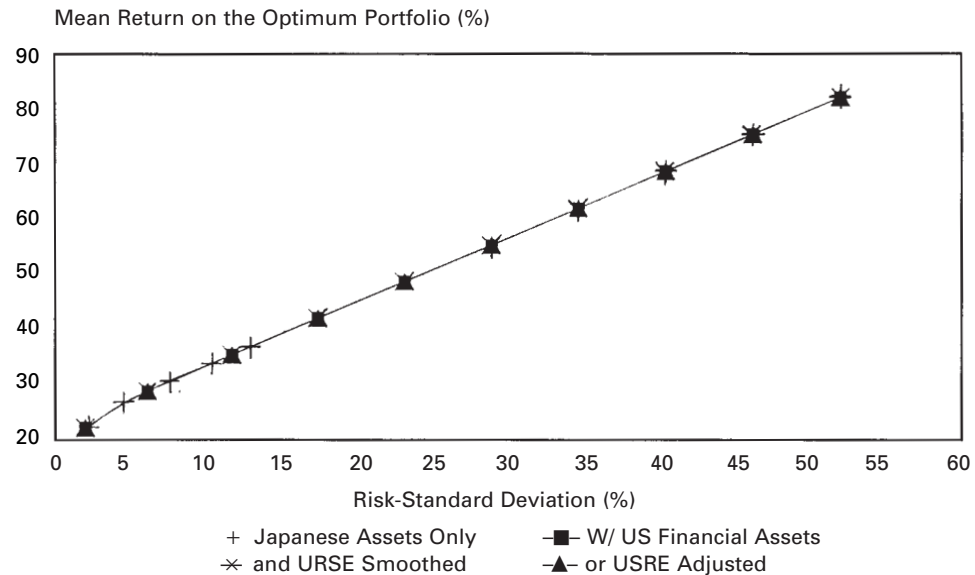
Japanese investors saw an even more dismal scenario (Exhibit 8). Because of the higher marginal tax rates, after-tax U.S. assets perform even worse than before-tax U.S. assets.

**Exhibit 7**  
**British Efficient Investment Frontiers Five-Year Holding Periods—After Tax**



Holding periods: 1973-77, 1974-78 . . . 1987-91  
 All returns received in pounds

**Exhibit 8**  
**Japanese Efficient Investment Frontiers Five-Year Holding Periods—After Tax**



Holding periods: 1973-77, 1974-78 . . . 1987-91  
 All returns received in yen

U.S. financial assets never exceed 3% of the optimum Japanese portfolio and U.S. real estate never enters the portfolio, smoothed or unsmoothed.

It should be noted that this research is narrow in its focus. We have only examined income tax in the context of optimum portfolio investment as an explanation for the propensity of many foreign investors to purchase U.S. real estate. There are other plausible reasons. Safe haven may explain investment from some countries such as Hong Kong where the economic future is unclear. Vacation and retirement planning may provide a reason for the acquisition of so much property by the Japanese in Hawaii and California and it may also explain why the Canadians and British own so much property in Florida and the Southeast. Others have suggested that the Japanese, having low interest rates at home and thus a lower required rate of return, outbid U.S. investors for U.S. real estate and perhaps mistakenly ignored the potential for currency losses. Certainly, each of these ideas is worthy of future research.

However, this research, in combination with earlier studies, raises questions about foreign real estate as a pure investment. Foreign investors in U.S. real estate may be legitimately buying U.S. property for many logical reasons, but rational diversification for the sole purpose of improving portfolio performance does not appear to be one of them.

## Summary and Conclusions

The value of international real estate diversification has been challenged in recent years. There is no evidence that foreign real estate provides investors with any performance gains in a mean-variance context. One plausible explanation for the foreign interest in U.S. real estate may be tax evasion. This study takes the viewpoint of British and Japanese investors, the two largest groups of foreign buyers of U.S. real estate. The sample period was 1973 to 1991. A series of efficient frontiers were constructed for each foreign investor to estimate the positive diversification benefits available exclusively from U.S. real estate taxed only in the United States.

Overall, we found no evidence that foreign investors obtain any diversification gains that can be attributed specifically to U.S. real estate even when they evade additional taxation by their home country. Japan has lower marginal tax rates than the United States, therefore when Japanese investors are required to pay U.S. tax in lieu of Japanese tax it only exacerbates the problems for the Japanese uncovered in the earlier studies by Ziobrowski et al. (1991, 1993, 1995). British tax rates were somewhat higher than U.S. tax rates, thus after-tax U.S. asset returns looked better to British investors than before-tax U.S. asset returns relative to British assets. Unfortunately however, the U.S. assets still were not good enough and did not improve the efficiency of the British portfolio.

These results seem consistent with current foreign investor behavior. During the last few years, the Japanese have stopped buying U.S. real estate at the frenzied pace of the 1980s and have actually begun divesting themselves of their holdings (source: Kenneth Leventhal & Co.). This may suggest that U.S. real estate may have been nothing more than a short-term foreign investment craze. On the other hand, many foreign investors continue to hold vast amounts of U.S. property. However, the explanation for this behavior may not necessarily be found in higher portfolio performance.

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## Appendix A

This appendix describes the methodology used to calculate the after-tax five-year holding period returns of the various assets included in this study.

### Treasury Bills

Treasury bill returns were relatively easy to deal with because all returns received are taxed as ordinary income in all three countries. The annual after-tax return from home-country Treasury bills,  $R_n^t$ , during any year  $n$  can be written:

$$R_n^t = r_n^t (1 - t_n^t), \quad (A1)$$

where  $r_n^t$  is the before-tax return during year  $n$  and  $t_n^t$  is the highest marginal tax rate on ordinary income in the foreigner's home country for year  $n$ . Therefore, the five-year after-tax return,  $R_{5yr}^t$  to British investors from British Treasury bills or to Japanese investors from Japanese short-term interest rates (The Japanese Treasury bill equivalent) is:

$$R_{5yr}^t = (1 + R_1^t)(1 + R_2^t)(1 + R_3^t)(1 + R_4^t)(1 + R_5^t) - 1. \quad (A2)$$

To calculate the five-year returns to foreign investors from U.S. Treasury bills,  $R_{5yr}^{USt}$ , the adjustment is:

$$R_{5yr}^{USt} = (1 + R_{5yr}^{USt})(1 + R_{5yr}^{US2})(1 + R_{5yr}^{US3})(1 + R_{5yr}^{US4})(1 + R_{5yr}^{US5})(X_5/X_0) - 1, \quad (A3)$$

where  $X_n$  is the foreign exchange rate at the end of the  $n$ th year in the foreign investor's home-country currency per U.S. dollar and  $R_{5yr}^{USn}$  is the annual after-tax (at the highest marginal U.S. income tax rate) return from U.S. Treasury bills during the  $n$ th year of the five-year holding period.

### U.S. Real Estate

Given our assumption that all real estate returns are taxed as capital gains at the end of the five-year holding period and all intermediate cash flows are reinvested in real estate, the after-tax holding period return to the U.S. investor from U.S. real estate,  $R_{5yr}^R$ , would be:

$$R_{5yr}^R = [(1 + r_1^R)(1 + r_2^R)(1 + r_3^R)(1 + r_4^R)(1 + r_5^R) - 1](1 - t_5^R), \quad (A4)$$

where  $r_n^R$  is the before-tax return from U.S. real estate in the  $n$ th year and  $t_5^R$  is the highest marginal tax rate on capital gains received in the last year of the five-year holding period. A foreign investor in U.S. real estate who is taxed only by the U.S. government would have a five-year holding period return of:

$$R_{5yr}^{USR} = [1 + R_{5yr}^R](X_5/X_0) - 1. \quad (A5)$$

### Common Stocks and Bonds

The computations for common stocks and bonds include both long-term capital gains and annual ordinary income from dividends or interest payments. Assuming an initial investment of  $P_0$  (pound in the case of British common stock or bonds, yen in the case of Japanese assets and dollars in the case of U.S. assets) the total after-tax value of the local investor's portfolio at the end of the first year,  $P_1^{AT}$ , would be:

$$P_1^{AT} = P_0(1 + r_c^1) + P_0(r_1^1)(1 - t_1^1), \quad (A6)$$

where  $r_c^1$  is the capital appreciation component of the first year's return and  $r_1^1$  is the income component.  $P_0(1 + r_c^1)$  is the value of the common stock or bonds at the end of year 1.  $P_0(r_1^1)$  is the dividend or interest received during year 1 and  $P_0(r_1^1)(1 - t_1^1)$  is the after-tax cash flow received. Assuming the reinvestment of all after-tax cash flows, the total value of the asset at the end of year 2,  $P_2^{AT}$ , is:

$$P_n^{AT} = P_1^{AT}(1+r_n^c) + P_1^{AT}(r_n^i)(1-t_n^i) . \quad (A7)$$

The total value at the end of any intermediate year  $n$ , years 2 through 4,  $P_n^{AT}$ , can be written:

$$P_n^{AT} = P_{n-1}^{AT}(1+r_n^c) + P_{n-1}^{AT}(r_n^i)(1-t_n^i) . \quad (A8)$$

At the end of the fifth and final year of the holding period, the result is:

$$P_5^{AT} = [P_4^{AT}(1+r_5^c) - P_0](1-t_5^c) + P_0 + P_4^{AT}(r_5^i)(1-t_5^i) \quad (A9)$$

and

$$R_{5yr}^{CS} = (P_5^{AT} - P_0) / P_0 , \quad (A10)$$

where  $R_{5yr}^{CS}$  is the after-tax five-year holding period return from common stock (or long-term government bonds).

The foreign investor in U.S. common stock (or long-term government bonds) is taxed only by the U.S. government and the five-year holding period return is:

$$R_{5yr}^{USCS} = [1 + R_{5yr}^{CS}](X_5/X_0) - 1 . \quad (A11)$$

## Appendix B Composition of All British and Japanese Optimum Portfolios

### Exhibit B1 British Domestic Financial Assets Only After-Tax Returns, Received in Pounds-Sterling

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
British Common Stock	4.98	15.54	26.09	36.65	47.21	57.77	68.33	78.88	89.44	100.00
British Government Bonds	—	—	—	—	—	—	—	—	—	—
British Treasury Bills	95.02	84.46	73.91	63.35	52.79	42.23	31.67	21.12	10.56	—
Mean Portfolio Return (%)	21.98	29.49	37.10	44.72	52.33	59.94	67.56	75.17	82.78	90.40
Standard Deviation (%)	11.86	12.83	15.36	18.85	22.85	27.14	31.60	36.17	40.82	45.51

### Exhibit B2 British and U.S. Financial Assets After-Tax Returns, Received in Pounds-Sterling

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
British Common Stock	1.22	12.35	22.98	30.89	40.75	50.62	60.48	70.34	80.20	100.00
British Government Bonds	—	—	—	—	—	—	—	—	—	—
British Treasury Bills	88.56	79.38	70.71	63.33	52.31	41.28	30.26	19.24	8.21	—
U.S. Common Stock	—	—	.83	5.78	6.94	8.10	9.26	10.42	11.59	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	10.22	8.27	5.48	—	—	—	—	—	—	—
Mean Portfolio Return (%)	20.52	28.28	36.05	43.81	51.58	59.34	67.11	74.87	82.63	90.40
Standard Deviation (%)	10.90	11.95	14.65	18.11	22.09	26.40	30.89	35.51	40.19	45.51

**Exhibit B3**  
**British and U.S. Financial Assets with U.S. Real Estate (Smoothed) After-Tax Returns, Received in Pounds-Sterling**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
British Common Stock	.41	10.56	20.70	30.84	40.99	51.13	61.28	71.42	81.57	100.00
British Government Bonds	—	—	—	—	—	—	—	—	—	—
British Treasury Bills	92.94	82.37	71.80	61.24	50.67	40.10	29.53	18.97	8.40	—
U.S. Common Stock	—	—	—	—	—	—	—	—	—	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	—	—	—	—	—	—	—	—	—	—
U.S. Real Estate (Smoothed)	6.65	7.07	7.50	7.92	8.34	8.77	9.19	9.61	10.03	—
Mean Portfolio Return (%)	22.38	29.94	37.50	45.06	52.61	60.17	67.73	75.28	82.84	90.40
Standard Deviation (%)	10.77	11.81	14.47	18.07	22.14	26.47	30.95	35.52	40.15	45.51

**Exhibit B4**  
**British and U.S. Financial Assets with U.S. Real Estate (Unsmoothed) After-Tax Returns, Received in Pounds-Sterling**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
British Common Stock	—	10.45	20.94	31.44	41.93	52.43	62.16	71.43	80.70	100.00
British Government Bonds	—	—	—	—	—	—	—	—	—	—
British Treasury Bills	92.36	81.80	71.26	60.72	50.19	39.65	29.07	18.46	7.84	—
U.S. Common Stock	—	—	—	—	—	—	2.29	6.00	9.71	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	—	—	—	—	—	—	—	—	—	—
U.S. Real Estate (Unsmoothed)	7.64	7.75	7.80	7.84	7.88	7.92	6.48	4.12	1.75	—
Mean Portfolio Return (%)	22.10	29.69	37.27	44.86	52.45	60.04	67.63	75.22	82.81	90.40
Standard Deviation (%)	10.44	11.56	14.34	18.03	22.18	26.57	31.10	35.68	40.49	45.51

**Exhibit B5**  
**Japanese Domestic Financial Assets Only After-Tax Returns, Received in Yen**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
Japanese Common Stock	5.19	12.28	18.38	23.68	28.34	57.86	68.40	78.93	89.47	100.00
Japanese Government Bonds	—	—	—	—	—	—	—	—	—	—
Japanese S-T Interest Rates	94.81	87.72	81.62	76.32	71.66	42.14	31.60	21.07	10.53	—
Mean Portfolio Return (%)	22.42	26.88	30.72	43.06	36.99	55.57	62.20	68.84	75.47	82.10
Standard Deviation (%)	2.16	4.45	7.55	10.37	12.88	28.97	34.73	40.50	46.27	52.04

**Exhibit B6**  
**Japanese and U.S. Financial Assets After-Tax Returns, Received in Yen**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
Japanese Common Stock	4.87	15.46	26.02	36.59	47.15	57.71	68.27	78.84	89.40	100.00
Japanese Government Bonds	.32	—	—	—	—	—	—	—	—	—
Japanese S-T Interest Rates	92.14	82.13	71.81	61.49	51.17	40.85	30.53	20.20	9.88	—
U.S. Common Stock	2.67	2.41	2.17	1.92	1.68	1.44	1.20	.96	.72	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	—	—	—	—	—	—	—	—	—	—
Mean Portfolio Return (%)	22.37	29.01	35.64	42.28	48.92	55.55	62.19	68.83	75.46	82.10
Standard Deviation (%)	1.92	6.07	11.70	17.42	23.18	28.94	34.71	40.49	46.26	52.04

**Exhibit B7**  
**Japanese and U.S. Financial Assets with U.S. Real Estate (Smoothed) After-Tax Returns, Received in Yen**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
Japanese Common Stock	4.87	15.46	26.04	36.53	47.03	57.53	68.03	78.53	89.03	100.00
Japanese Government Bonds	.32	—	—	—	—	—	—	—	—	—
Japanese S-T Interest Rates	92.14	82.15	71.73	60.66	49.58	38.50	27.42	16.34	5.27	—
U.S. Common Stock	2.67	2.06	—	—	—	—	—	—	—	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	—	—	—	—	—	—	—	—	—	—
U.S. Real Estate (Smoothed)	—	.33	2.23	2.81	3.39	3.97	4.55	5.13	5.70	—
Mean Portfolio Return (%)	22.37	29.01	35.64	42.28	48.92	55.55	62.19	68.83	75.46	82.10
Standard Deviation (%)	1.92	6.07	11.67	17.39	23.13	28.89	34.65	40.41	46.18	52.04

**Exhibit B8**  
**Japanese and U.S. Financial Assets with U.S. Real Estate (Unsmoothed) After-Tax Returns, Received in Yen**

Portfolio Asset	Percentage of Total Portfolio Invested in Each Asset									
	1	2	3	4	5	6	7	8	9	10
Japanese Common Stock	4.87	15.46	26.02	36.59	47.15	57.71	68.27	78.84	89.40	100.00
Japanese Government Bonds	.32	—	—	—	—	—	—	—	—	—
Japanese S-T Interest Rates	92.14	82.13	71.81	61.49	51.17	40.85	30.53	20.20	9.88	—
U.S. Common Stock	2.67	2.41	2.17	1.92	1.68	1.44	1.20	.96	.72	—
U.S. Government Bonds	—	—	—	—	—	—	—	—	—	—
U.S. Treasury Bills	—	—	—	—	—	—	—	—	—	—
U.S. Real Estate (Unsmoothed)	—	—	—	—	—	—	—	—	—	—
Mean Portfolio Return (%)	22.37	29.01	35.64	42.28	48.92	55.55	62.19	68.83	75.46	82.10
Standard Deviation (%)	1.92	6.07	11.70	17.42	23.18	28.94	34.71	40.49	46.26	52.04

## Notes

<sup>1</sup>The study period covers the nineteen years since 1973 when currencies have been allowed to float.

<sup>2</sup>Many argue that the low Japanese tax rates account for the Japanese having the highest savings rates in the world. Although the numbers change from year to year, in 1988 Japanese households saved approximately 17% of their disposable income. This compares to British households which saved only 4% of their disposable income (McCauley and Zimmer, 1989).

<sup>3</sup>Some foreign investors may have generated "active" U.S. income or used "paper losses" to shield dividends and interest from U.S. tax. Also, over the past twenty years the importance of depreciation has fluctuated considerably. During some years it not only allowed the investor to shield the annual operating income that was produced by the real estate but also shielded income from stocks, bonds and even wages in some cases. During other times, the U.S. tax code was far less generous. Our assumption that depreciation shielded all operating income during the test period is reasonable but we recognize it as a limitation to the study.

<sup>4</sup>Omitting the home-country real estate from the foreign investor's investment opportunity set was likely to cause us to underestimate the performance of their domestically available portfolios. This, in turn, could potentially cause us to overvalue the benefits available to foreigners from U.S. real estate and mistakenly accept the hypothesis that U.S. real estate provides foreign investors with significant diversification gains. Conversely however, the foreign real estate data may be smoothed or the returns grossly enhanced by foreign real estate fund managers. Including such data in this study might greatly exaggerate the efficiency of home-country portfolios for foreigners, and thereby falsely eliminate any possibility for U.S. real estate to provide benefits to foreigners. In this case, we might mistakenly reject the hypothesis that U.S. real estate provides diversification gains to foreigners. Given the results of all the earlier studies which showed no diversification benefits to foreign investors from U.S. real estate, we opted to eliminate the foreign real estate from the study.

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