

PENSION FUND INVESTMENT: FURTHER ANALYSIS OF FUND ALLOCATIONS TO REAL ESTATE

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The purpose of this study is to examine an alternative way of approaching the pension fund portfolio allocation problem and to provide an estimate of the percentage of funds that should be allocated to real estate. The study takes advantage of recently advanced procedures to construct more reliable estimates of returns to investment-grade property. In addition, the study suggests that in order to maximize the utility of individual pensioner's, pension fund managers should seek to minimize the volatility of the **total** personal wealth portfolio of individual pensioners, rather than simply the volatility of the fund itself. It is argued that because most pensioners have considerable equity in their homes, returns to housing should be included in the analysis when identifying efficient pension fund allocations.

The research methodology employed here is a three-step process. Initially, returns are estimated for stocks, bonds, investment-grade properties and housing for the 1972-1992 period. Second, the relative return characteristics of each of the asset classes are examined. Finally, alternative portfolios are constructed and efficient asset allocations to stocks, bonds, and investment-grade real estate compared between portfolios which consider the typical pensioner's 45 percent allocation to housing and portfolios that do not (0% housing allocation portfolios).

Using *ex post* returns from 1972 to 1992 this study finds that:

- Including a 45 percent allocation to housing in the analysis of a three-asset class portfolio (i.e., stocks, bonds, and property) has three primary effects:
 - (1) the efficient allocation to investment-grade property is reduced,
 - (2) the efficient allocation to bonds is slightly reduced, and
 - (3) the efficient allocation to stocks is increased.
- For portfolio real return targets of 5 to 6 percent (nominal return targets of 11 to 12 percent) efficient allocations of stocks, bonds, and investment property were:

	<u>(with 0% housing)</u>	<u>(with 45% housing)</u>
Common Stock	40% - 65%	65% - 85%
Long-Term Bonds	0% - 15%	0% - 10%
Investment Property	20% - 50%	0% - 30%

Note that the particular efficient allocation is highly dependent on the specific level of return targeted (real or nominal)

In addition, the return data indicate:

- Mean total annual returns (nominal) to investment-grade property and housing were 8.78% and 11.44%, respectively. This compares to 13.03%, 9.53%, and 7.55% total nominal returns to the S&P 500, long-term government bonds, and treasury bills.
- For nominal returns the return-to-volatility ratio (mean/variance) was greatest for housing returns and lowest for S&P 500 returns.
- Total annual returns (nominal and real) of investment-grade property were weakly correlated (negatively and positively) with total S&P 500 annual returns, and weakly to moderately correlated (negatively) with long-term bond returns.
- Total annual returns (nominal and real) of housing were weakly to moderately correlated (negatively) with total S&P 500 annual returns, and highly correlated (negatively) with long-term bond returns.
- Nominal returns to investment-grade property and housing were both highly correlated (positively) with inflation.
- Nominal and real returns to investment-grade property and housing were moderately

correlated (positively).

- The addition of investment-property to a stocks and bonds only portfolio, serves to significantly reduce the volatility of targeted portfolio returns.
- The addition of housing to a stocks, bonds, and property only portfolio, significantly reduces the volatility of targeted portfolio returns.