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Real Estate in Mixed-Asset Portfolios for Various Investment Horizons

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The allocation to real estate for various investment horizons is of keen interest to institutional investors, such as pension funds, insurance companies, and sovereign wealth funds. However, much of the research on the role of real estate in a mixed-asset portfolio relates to short-term horizons, for which the impacts of illiquidity and transaction costs will be severe. Hence, many of the extant studies have potentially overstated the role of real estate in diversifying a portfolio, at least over the short term. Moreover, existing studies usually focus only on direct or listed real estate and neglect exposures through non-listed real estate funds. Real estate is also rarely considered in conjunction with other alternative assets such as commodities, private equity, and hedge funds. This article aims at filling these gaps in the literature.

The choice of a relevant model is critical for allocation analysis over the investment horizon. A mean–variance framework is not appropriate, mainly because of the strong assumption of independent and identically distributed returns that underlies this model and imposes flat term structures of risk and returns. A more appropriate approach is to use a Vector Autoregressive (VAR) model to recognize that expected returns and risk change over time. In this context, return predictability is crucial because term structures are not flat. Using US data, we investigate asset allocations for various investment horizons by means of VAR models.

We contribute to the literature in several ways. First, we use several types of real estate exposure: direct, non-listed funds (core, value-added, and opportunistic), and Real Estate Investment Trusts (REITs). Second, we assess whether the results obtained with appraisal-based indexes are similar to those obtained with transaction-based indexes. Third, we consider a wide array of alternative asset classes, such as commodities, hedge funds, and private equity. Finally, the analyses are conducted for a long time period covering almost three decades and including the global financial crisis.

Our main results are as follows. For investment horizons of less than 2.5 years, the allocation to direct real estate, in a portfolio maximizing the Sharpe ratio and containing stocks and bonds, is zero because of the high transaction costs associated with the asset class. Over such horizons, the allocation to stocks and bonds is 20%–30% and 70%–80%, respectively. The weight of real estate increases to 10%, 15%, and 20.4%

for 5-, 10-, and 25-year horizons, respectively. The allocations to stocks and bonds decrease to reach 12.4% and 67.2%, respectively, for a 25-year horizon.

We address the issue of smoothing affecting appraisal-based series for direct real estate and non-listed funds, as well as private equity and hedge funds. Our analyses suggest that the desmoothing method we apply produces series that yield the same conclusions in terms of portfolio allocations as when transaction-based series are used.

We also compare the allocation to real estate when REITs or any of the three kinds of non-listed real estate funds are used together with direct investments. Open-end core funds are a good substitute for direct real estate in a portfolio. In addition, over short horizons of less than 4.5 years, for which direct investments are relatively uninteresting because of their high transaction costs, core funds are effective in gaining exposure to the asset class. Over such horizons, the allocation to core funds is around 10%. In contrast, REITs are found to have the lowest correlation with direct investments, even in the long run, and hence are poor substitutes for direct investments. We also conclude that REITs can be used in conjunction with direct investments over long horizons, but their weight remains low (6.4%). Despite exhibiting high correlations with direct real estate, value-added and opportunistic funds are found to be useless if direct investments are also included in the portfolio as a result of their high management fees. This is also due to the Sharpe ratio maximizing portfolios being relatively low-risk portfolios, while the volatility of these funds is large. If value-added and opportunistic funds are the only exposure to real estate in the portfolio, their allocation is zero over short horizons and below 4% over longer ones.

Finally, our results suggest that real estate is one of the most attractive asset classes, with an allocation converging toward 17% when other alternative asset classes are included. The allocation to stocks is almost zero for horizons of four years or more, whereas the weight exceeds 15% for horizons of one year or less. Bonds are still the most important class, with their allocation going from over 70% in the short run to about 50% in the long run. Commodities are of limited but constant interest (allocation of 4.5%). Private equity constitutes an appealing asset class; its allocation is 18% in the medium term and 14.7% in the long run. Hedge funds follow a similar pattern to that of private equity, with their allocation peaking at 15.1% for a three-year horizon and then converging toward 9%.

The paper has been published in the Journal of Portfolio Management and is available to its members on their [website](#). The paper is also available to PREA members via its [website](#).