

Homeownership and Investment in Real Estate Stocks

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Summary

Housing is both a source of shelter and, for its owners, an investment. One opinion sometimes heard is that because homeowners already own real estate, they should diversify their investment portfolios by not making additional real estate investments. The analysis reported here addresses this issue by providing an interpretation of owner-occupied housing as an investment and some statistics on the financial performance of houses and various financial assets, including REIT equities.

Owner-occupied housing differs from other investments in some significant ways. The dividend, or current return, on houses is not cash but rather the rental value of the service provided by the house, net of operating costs. Houses tend to be more highly leveraged than other investments, with most houses bought "on margin" through a mortgage loan. Houses are undiversified investments, in contrast to mutual funds or other investment vehicles that pool a number of equities and fixed-income securities. The tax treatment of owner-occupied housing is unique. And the transactions costs of buying and selling houses tend to exceed those of publicly traded securities.

These differences make it difficult to compare the investment performance of houses and financial assets. Two facts make it easier to analyze the appropriate portfolio strategies of homeowners, however. First, most people apparently first decide on their housing and then allocate their financial assets, conditional on that housing choice. Second, most of the variation in total return for houses comes from the capital gains component rather than the harder-to-measure current return, making it feasible to estimate the correlation between the returns on houses and those on other assets.

Simple statistics hint at the potential for diversification gains for homeowners who invest in real estate. The correlation between house price changes and the total return on REITs has been low over both the most recent ten years, 1992-2001, and also the full 25 years since 1976 for which comparable data are available. In addition, the risk/return performance of REITs has been competitive with that of other financial assets – including large cap stocks, small cap stocks, international stocks, long-term bonds, and short-term Treasury bills – over both of these historical periods.

The simple statistics are borne out by the investment performance of alternative model portfolios of assets. Over both the periods 1976-2001 and 1992-2001, financial portfolios with 10-to-20 percent allocations to REITs were generally able to achieve higher average annual returns, with no increase in volatility, compared to portfolios from which REITs were excluded. Importantly, this result

holds not only for renters, but also for homeowners who had one-third or two-thirds of their total wealth invested in their house.

The past is not a perfect guide to the future, but history indicates that many investors – owners and renters alike – could benefit from adding real estate stocks to their portfolios. Even for those with much of their wealth invested in their home, REITs have provided asset diversification and an opportunity to improve the risk/return performance of their investment portfolios.

Introduction

Owner-occupied housing is both a source of shelter and, like other physical and financial assets, an investment. Equity in their house is a substantial part of the overall wealth of the two-thirds of all U.S. households who are homeowners.¹ For most homeowners, their house is easily their largest single investment.

An important consideration for homeowners is how their homeownership should influence the composition of their investment portfolio. One opinion sometimes heard is that, because they already own real estate, homeowners do not need, and should perhaps even avoid, other investments in real estate. This perception is likely one reason why only 6 percent of all "defined contribution" retirement plans even offer participants the option to invest in real estate funds (PSCA, 2001).

There is little empirical evidence, however, of how homeownership should influence individual investors' positions regarding real estate stocks. The purpose of this analysis is to provide some pertinent statistical results on this issue, as well as an interpretation of owner-occupied housing as both a consumer good and an investment vehicle.

The analysis shows that, for a range of homeownership situations, inclusion of real estate stocks in the past would have improved the overall return and reduced the volatility of the investment portfolios, including home equity, for households with mid-range risk preferences. This outcome results from the low correlation between changes in house prices and the returns to real estate stocks, together with the historically competitive returns on real estate stocks relative to other financial assets. Although the past is no guarantee of the future, the results suggest that many homeowners, as well as renters, could benefit from inclusion of real estate stocks in their investment portfolios.

Owner-Occupied Housing as an Investment

Owner-occupied housing is first and foremost a consumer good. It provides housing services to its occupants, just as does renter-occupied housing. Measuring the cost of owner-occupied housing for its residents is, however, much more difficult than for renters, for whom the monthly rent check and utilities payments are the cost of shelter.

¹ According to the Federal Reserve's Survey of Consumer Finances, in 1998 the median net worth of home-owning households was \$132 thousand, and their median house value was \$100 thousand (Kennickell et al. 2000). Other Federal Reserve statistics suggest that owners' home equity averages about half of this house value (the rest being mortgage debt).

For homeowners, monthly cash outlays are a poor measure of the economic costs of housing. Some costs do not involve cash expenditures, and some cash outlays are not true economic costs. "User cost" measures of the expense of owner-occupied housing are recognized by economists as the most comprehensive and analytically justifiable measure of housing costs of homeowners. User cost considers both cash and non-cash costs and tax considerations.²

Although a consumer good, owner-occupied housing is also widely viewed as an investment. This is understandable, because owner-occupied housing shares several elements with financial assets. Capital gains potential, leverage, and tax aspects all give it a feel of an investment. (The user cost approach treats these investment features as offsets against other expense items.)

Personally owned automobiles share several attributes with owner-occupied houses. Cars are major assets, often financed with debt and provide services to their owners and also the potential for capital gains. But automobiles are not generally viewed as investments, presumably because their relatively rapid physical depreciation usually precludes capital gains. Exceptions to this rule include antique cars and automobiles in high-inflation or supply-constrained economies.

As an investment, owner-occupied housing can be compared to financial assets, in particular equities and fixed-income securities. The total return to these financial assets is the income return (dividend) plus the capital gain. Owner-occupied housing has analogues to both of these return components, but it is easiest to first explain the similarities in terms of rental real estate, which is a middle ground between financial assets and owner-occupied housing.

Think in particular about a rental house as an investment. And abstract from financing issues by assuming that the house is owned "free and clear," with no mortgage. And let the calculations be "pre-tax." Under these conditions the dividend return is simply the net operating income (NOI), and the (unrealized)

² In a typical formulation, the annual user cost of a house of market value of V in year t is

$$uc_t = V_t \text{ times } [(1 + pr)(1-a) + d + op - g + tr]$$

where all terms in the brackets are annual proportions of V and are defined as follows: l is the weighted average of the cost of mortgage credit and the opportunity cost of the homeowner's equity; pr is the local property tax rate; a is the average income tax rate for homeowners; d is the rate of physical depreciation; op is operating expense; g is capital gains; and tr is the transactions cost in the years of purchase and sale. The average income tax rate, a , is a simplification and does not in this specification adjust for the standard deduction to which owners would be entitled if they did not itemize. For more on the user cost approach to measuring homeownership expenses see, for example, Patric H. Hendershott, "Home Ownership and Real House Prices: Sources of Change, 1965-1985," *Housing Finance Review* 7 (1988): 1-18.

capital gain is the change in market value of the house.³ The capitalization or "cap" rate commonly used in income property analysis – defined as NOI divided by market value – is a measure of the rate of dividend or current return.

Owner-occupied housing is similar to rental housing in terms of operating expenses and capital gains but differs in tax treatment and, especially, in operating revenue, because there is none. The owner-occupant receives no rent payments, but he does receive services to which a rental value could be assigned.⁴ At least two studies (Case and Shiller, 1990; Chinloy and Cho, 1997) have estimated the total return to owner-occupied housing by combining the change in house price (as the capital gains component) with the rental value less operating expenses (as a measure of the dividend or, as rental housing, the NOI). A common approach to estimating the investment properties of owner-occupied housing has been to ignore the hard-to-measure dividend or pseudo-NOI and to take the change in house price as the entire return.

Two features of owner-occupied housing have significant implications for its performance as an investment. First, a house is a single asset and, like a single corporate equity, offers no diversification benefit of the type afforded by, for example, mutual funds. This feature of houses, combined with their important position in many household portfolios, results in substantial investment risk for millions of homeowners. One recent study (Englund, Hwang, and Quigley, 2002) found "... large potential gains from policies or institutions that would permit households to hedge their lumpy investments in housing." Despite various proposals of methods for diversifying or hedging this risk (e.g., Case, Shiller, and Weiss, 1993; Geltner, Miller, and Snavelly, 1995), no such tool has yet become a market reality.

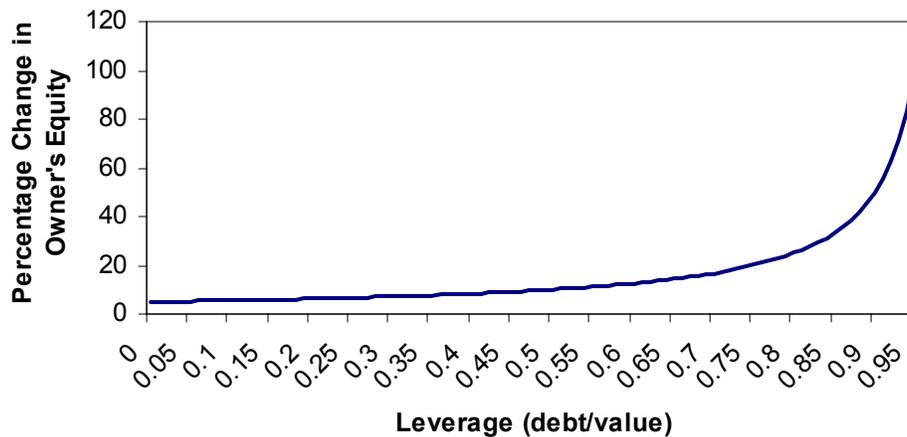
Second, compared to almost all financial investments made by individuals, owner-occupied housing is a highly leveraged investment. The vast majority of home buyers finance the purchase with a mortgage, and at the time of purchase the loan to value ratio on conventional mortgages has averaged roughly 75 percent in recent years, according to the Federal Housing Finance Board. This leverage amplifies the potential "return" and financial risk to owner's equity, as illustrated in Exhibit 1. This aspect of home purchase is financially identical to buying stocks on margin.

³ Net operating income is defined as revenues (in this case rents) less expenses of property operations including maintenance, utilities, and property tax. Excluded from the calculation are financing costs, depreciation allowances and tax considerations other than local property taxes.

⁴ This rental value approach is used in the Consumer Price Index to estimate the consumer cost of owner-occupied housing. The "owners' equivalent rent" component of the CPI uses local surveys to estimate what the sampled owner-occupied houses would rent for. Changes over time in that rent estimate is the CPI's measure of changes in the shelter costs of owner-occupants.

Exhibit 1

Effect of a Five Percent Change in House Value on Home Owner's Equity



For all these reasons, it is difficult to assess how owner-occupied housing has performed as an investment, and to compare its performance with that of financial assets. The conventional view, held by about three-quarters of all adults, is that houses are good investments (Fannie Mae, 1997). In practice, however, people view houses differently than their financial assets. Most households choose their housing and their financial investments independently. Many, it would seem, first decide on housing and then, having made their housing choice, select their financial assets. This is the perspective adopted in this study, as described later.

Houses in the Investment Portfolio

Several studies have examined how homeownership, as an investment, interacts with other portfolio choices. Goetzmann (1993) looked at price changes on houses and investment portfolio performance from combining that asset with stocks and bonds. One emphasis of his analysis was the geographic risk in having a house in just one metropolitan market. Brueckner (1997) demonstrated that the consumption motive for homeownership can distort investment decisions and portfolio allocations, because homeowners' housing investment must be at least as large as their housing consumption. He concludes, however, that for consumers with strong preferences for housing, portfolio inefficiency can be a rational balancing of consumption benefits against portfolio distortion. Another analysis (Ioannides and Rosenthal, 1994) looked at how the decision to own or rent housing is determined by both consumption and investment considerations. How homeownership should influence the composition of the financial portfolio at different stages of the life cycle is the

focus of a newly published study (Flavin and Yamashita, 2002), but that analysis considered only broad investment categories of stocks, bonds, and T-bills and did not consider income property as a separate asset class.

One recent study examines the role of REITs in investment portfolios. Conducted by Ibbotson Associates, and commissioned by the National Association of Real Estate Investment Trusts (NAREIT), the analysis found that REITs offer a significant source of portfolio diversification because of the generally low correlation of REIT returns to those of other types of investments (NAREIT, 2002). This diversification results in higher return, lower risk portfolios being available if REITs are included in the asset mix than if they are not.

This analysis builds on all the previous work, but in particular takes as its starting point the Ibbotson analysis and broadens it to include owner-occupied housing as an additional asset class. The central question addressed here is how homeownership affects the appropriate role of real estate securities in household investment portfolios.

Analysis

The research approach is to examine the quarterly returns on seven different asset classes over two periods. (For presentation the returns are annualized in some exhibits.) 1976-2001 is the longest time period for which comparable data are available on all the asset classes. The period 1992-2001 was selected to focus on the most recent ten years and coincides with what is generally viewed as the modern REIT era, in which many new public REITs were formed and REIT financial structures and operations differed in significant ways from those of the 1970s and 1980s.

The asset classes are described in Exhibit 2. For all but single-family houses, the returns are total returns. For houses the return is the change in house price. For all but single-family houses, individual investors can approximate the investment performance of these asset classes through stock and bond mutual funds. All of the non-housing asset classes and data sources used in this analysis are standard selections in investment research.

The house price index is from the Office of Federal Housing Enterprise Oversight (OFHEO). In recent years the OFHEO "repeat sales" index has become a preferred measure of house price change among real estate economists. Background information on the index is available at www.ofheo.gov.

It is important to note that the volatility of the national house price index understates the price volatility of individual houses, which will depend not only on the national market conditions but also on the local market and on the idiosyncrasies of individual houses. As discussed in the appendix, it is likely that the volatility in price of an individual house is at least twice as great as the index

volatility. Furthermore, because of the significant leverage produced by mortgage financing, as described above, even the volatility of individual house prices understates the volatility of homeowners' equity investment.

| Exhibit 2: Asset Classes Used in the Analysis | |
|--|---|
| <u>Class</u> | <u>Definition</u> |
| REITs | NAREIT Equity REIT Index |
| Houses | OFHEO National Repeat Sales Price Index |
| Large Stocks | S&P 500 |
| Small Stocks | Ibbotson U.S. Small Stock Series |
| International Stocks | MSCI EAFE Index |
| Bonds | 20-year U.S. Government Bond |
| T-Bills | U.S. 30-day Treasury Bills |
| Sources: NAREIT, OFHEO, Ibbotson Associates | |

The analysis that follows does not consider that idiosyncratic volatility, which means that the analysis will overstate the attractiveness of houses within an investment portfolio. At the same time, the analysis does not consider the current return (or dividend or pseudo-NOI) of owner-occupied housing. As described in the appendix, this is hard to measure, but by one approximation that current return has been roughly 4 percent annually in recent years. Similarly, the analysis does not consider the effects of leverage on the volatility and return on investments in owner-occupied houses. This simplification allows for a more direct comparison with the performance of financial assets, for which the analysis does not consider "marginized" purchases.

Results

House price increases were less than the total return on each of the other six asset classes over both time periods (Exhibit 3). The shortfall was considerable relative to all assets other than T-bills, which are included as a near-cash asset. The volatility of house prices was, however, less than that on all assets other than T-bills. If adjustments were made to include the dividend return from owner-occupied houses and the additional volatility of individual house prices beyond that in the index, houses would be likely closer to the middle of the rankings for both performance measures.

Of the seven assets, REITs ranked second or third in return, and fourth in volatility. The returns and volatilities of all the assets are generally consistent with estimates from other sources.

| Exhibit 3: Return and Volatility, by Asset and Time Period | | | | |
|---|----------------------|-------------------|----------------------|-------------------|
| <u>Asset Class</u> | <u>1976-2001</u> | | <u>1992-2001</u> | |
| | <u>Annual Return</u> | <u>Volatility</u> | <u>Annual Return</u> | <u>Volatility</u> |
| Single-Family Housing | 5.7% | 1.9% | 4.3% | 1.5% |
| REITs | 15.2% | 13.6% | 11.7% | 13.2% |
| Large Stocks | 14.0% | 15.3% | 13.2% | 14.8% |
| Small Stocks | 17.7% | 23.8% | 15.2% | 22.6% |
| Bonds | 9.8% | 12.3% | 9.5% | 9.2% |
| International Stocks | 12.1% | 17.6% | 4.9% | 14.6% |
| T-Bills | 6.8% | 1.4% | 4.6% | 0.5% |

source: author's calculations of data described in Exhibit 2

notes: Annual return is the compound annual rate of total return; except for single-family housing, where the return is the compound annual rate of change in the OFHEO house price index.

Volatility is the annualized quarterly standard deviation of the quarterly return (calculated as two times the quarterly standard deviation)

Even a first look at the low correlations between houses prices and REIT returns hints that there is a place for both in a diversified investment portfolio (Exhibit 4). Over the period 1976-2001 the correlation was slightly positive, and in 1992-2001 slightly negative. Overall, the correlations between house prices and REIT returns are among the lower (in absolute value) of any of the asset pairs shown in Exhibit 4. Consistent with the Ibbotson results, Exhibit 4 shows a lower correlation of REIT returns with those of most other asset classes in the past ten years compared to the longer period. Finally, note that the correlation between house prices and REITs over the full period 1976-2001 is lower than that between large stocks and bonds, two asset classes generally viewed as providing diversification against each other. Over the shorter period 1992-2001 these two correlations are about the same.

One might think that house prices and REIT returns would be more closely correlated, because it is all real estate. Real estate is not, however, one homogeneous market, but a large number of markets segmented by property type and geography, each with its own demand/supply balance – or imbalance –

at a point in time. Office buildings in Chicago, industrial buildings in Houston, hotels in New York, and shopping malls in Los Angeles face widely different market conditions. Individually and as a group, these property markets are only loosely linked to the market, or many geographic submarkets, for owner-occupied housing.

| Exhibit 4: Correlations in Quarterly Returns | | | | | | | |
|---|------------------|--------|----------|----------|--------|-----------|---------|
| | 1976-2001 | | | | | | |
| | Houses | REITs | Lrg Stks | Sml Stks | Bonds | Intn Stks | T-Bills |
| Single-Family Housing | 1 | | | | | | |
| REITs | 0.116 | 1 | | | | | |
| Large Stocks | -0.060 | 0.543 | 1 | | | | |
| Small Stocks | 0.161 | 0.660 | 0.749 | 1 | | | |
| Bonds | -0.223 | 0.315 | 0.253 | 0.097 | 1 | | |
| International Stocks | 0.094 | 0.400 | 0.604 | 0.438 | 0.252 | 1 | |
| T-Bills | 0.063 | -0.033 | -0.053 | -0.090 | 0.030 | -0.064 | 1 |
| | 1992-2001 | | | | | | |
| | Houses | REITs | Lrg Stks | Sml Stks | Bonds | Intn Stks | T-Bills |
| Single-Family Housing | 1 | | | | | | |
| REITs | -0.063 | 1 | | | | | |
| Large Stocks | -0.258 | 0.224 | 1 | | | | |
| Small Stocks | -0.052 | 0.356 | 0.669 | 1 | | | |
| Bonds | 0.127 | 0.172 | -0.099 | -0.222 | 1 | | |
| International Stocks | -0.217 | 0.077 | 0.663 | 0.356 | -0.093 | 1 | |
| T-Bills | 0.506 | 0.012 | -0.010 | -0.176 | 0.292 | -0.152 | 1 |

source: author's calculations of data described in Exhibit 2. For assets other than houses, return is the total return; for houses it is the percentage change in house price.

Portfolio Selection

Many, perhaps most, investors first make their housing decisions and then allocate their financial assets, conditional on that housing choice. This may not

be the best way to proceed, but likely how people actually behave.⁵ For purposes of this research, one advantage of this reality is that it eliminates the need for precise measures of total returns and volatility for individual houses. Once the decision has been made about the amount of housing to have in the portfolio, the house's return and volatility are less important for portfolio optimization than is the correlation between the house's return and that of other assets. As with rental housing, it seems likely that most of the variation in owner-occupied housing's return over time is attributable to the capital gains component, for which we have a reasonable proxy in the house price index.⁶ The price index understates the price volatility of individual houses, and so will overstate the correlation between house returns and those on other assets, but the relative rankings of those correlations should not be affected if the house-specific, idiosyncratic, price volatility is uncorrelated with returns on other assets, which seems most likely.

Houses play different roles in a individual or family's portfolio of investments over the life cycle. Most people begin their adult lives as renters, with none of their wealth in owner-occupied housing. Many become homeowners in their 20s or 30s, initially investing a significant proportion of their savings into the downpayment for the house. Over time this dominant role of the house in the investment portfolio may moderate, as wealth builds.

This life cycle is common, but other individuals will, by plan or happenstance, follow different paths. There are many possible scenarios for housing in the investment portfolio. In recognition, I have produced Markowitz "efficient frontiers" for asset allocations conditional on three different homeownership positions.⁷

Exhibit 5 gives the efficient investment frontiers, estimated for 1976-2001, for households with three different allocations to owner-occupied housing. The first, with zero allocation, are renters. The other allocations, 33 percent and 67 percent, represent homeowners of different life cycle stages, financial positions, and preferences for housing.

⁵ Even if the housing choice is assumed to be jointly determined with other financial decisions, the substantial transactions costs in buying and selling a house mean that moves will be infrequent and housing will be a fixed component of the typical household's portfolio for a long period of time, and most portfolio adjustments will be to the non-housing investments. This is essentially the approach adopted by Flavin and Yamashita (2002).

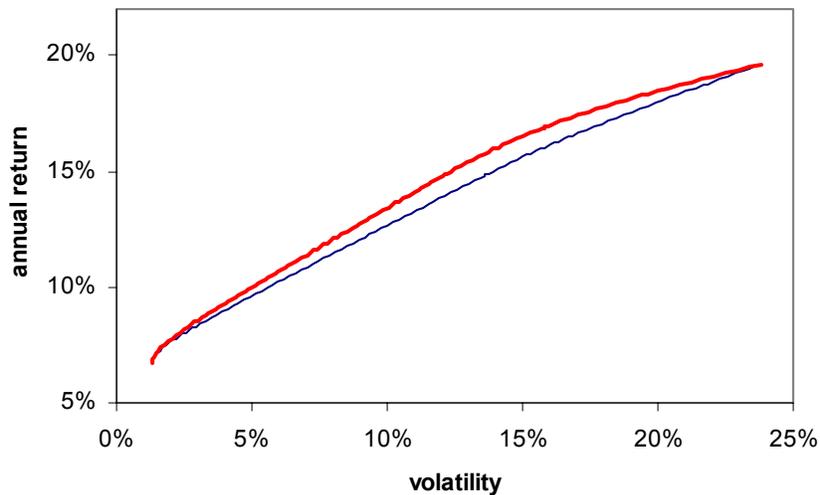
⁶ In the National Council of Real Estate Investment Fiduciaries (NCREIF) database of apartment properties, over the past 15 years the volatility (as measured by the standard deviation of annual return) of the appreciation component of the total return has been approximately 5 times the volatility of the income component.

⁷ The efficient frontier represents that set of portfolios that has the maximum rate of return for every given level of risk, or the minimum risk for every level of return.

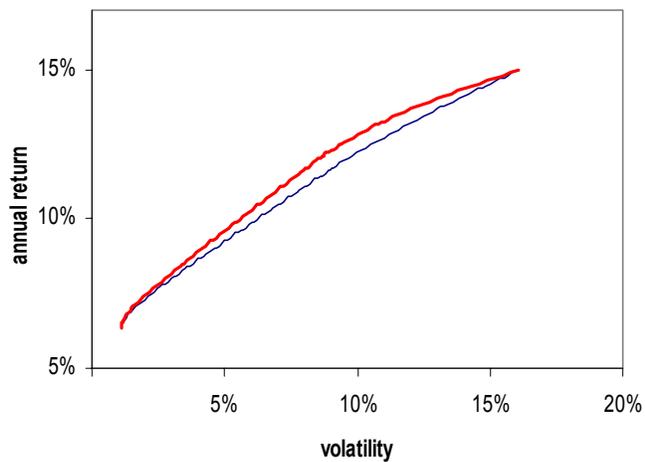
Exhibit 5

Efficient Investment Frontiers, with and without REITs
(upper line in each panel is the "with REITs" frontier)

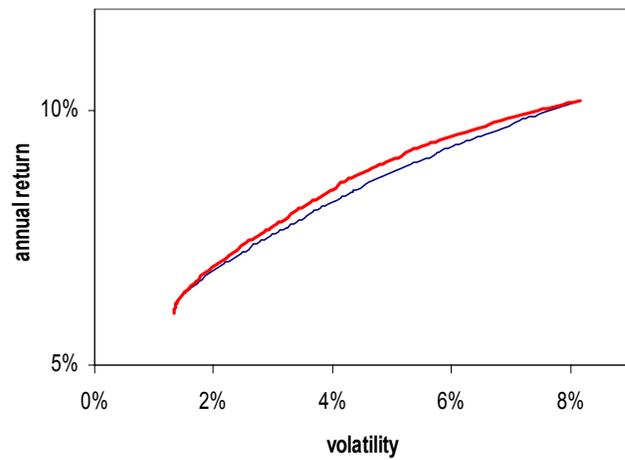
No Owner Occupied Housing in Portfolio



Owner Occupied Housing One-Third of Total Portfolio



Owner Occupied Housing Two-Thirds of Total Portfolio



Source: author's tabulations derived from data described in Exhibits 2-4.

Notes: estimation is for 1976-2001; returns and volatility (standard deviation) are annualized..

Each panel in Exhibit 5 has two frontiers that diverge for mid-range levels of return and volatility. The upper frontier in each panel plots the set of efficient portfolios when all asset classes, including REITs, are eligible for inclusion in the portfolio. The lower frontiers are the efficient portfolios when REIT investments are not included but the portfolios are otherwise optimized. The fact that the "with REITs" frontiers are consistently above the "without REITs" frontiers illustrates that adding REITs to the investment portfolio improves the portfolio performance for a wide range of risk/return profiles and asset allocations to housing. This is the single most important finding of the study.

Note that the frontier is "pushed out" by REITs less as the allocation to owner-occupied housing increases. This is primarily because the high allocation to housing leaves less room for any alternative investment and the performance improvement that investment might bring to the portfolio. Also note that the ranges and levels of returns and volatilities decline as the housing share of the portfolio increases. This is attributable to the low historical rate and volatility of house price increases relative to the total returns and volatilities of the financial assets. (Refer back to Exhibit 3.)

Consistent with the means and standard deviations in Exhibit 3, the higher risk/return portfolios in each of the three housing scenarios depicted in Exhibit 5 tend to be dominated (subject to the housing constraint) by small cap stocks, and the lowest risk/return combinations by the T-bills.

The frontiers in Exhibit 5, when estimated for the period 1992-2001, also show performance gains when REITs are allowed to enter the investment portfolios, although the gains are less than those pictured in Exhibit 5.

The particulars of the efficient portfolios along the frontiers are described in Exhibit 6. The left half of the table gives the statistics for portfolios along the upper frontiers graphed in each panel of Exhibit 5. The right half of the table gives the corresponding statistics for the 1992-2001 period. As shown, a wide array of asset classes enters the optimal portfolios in the middle sections of each frontier.

As shown in the top panel in Exhibit 6, REITs have a significant weighting in the efficient portfolios regardless of estimation period or homeownership situation. This demonstrates that, based on the historical record, even those households with most of the wealth tied up in their house could have benefited from inclusion of REITs among their financial assets. It is not just renters (housing allocation = zero percent) who would have gained from REIT investments.

| Exhibit 6: Optimal Allocations for Portfolios of Mid-Range Risk | | | | | | |
|--|-----------|-------|-------|-----------|-------|------|
| Estimation Period | 1976-2001 | | | 1992-2001 | | |
| Fixed Allocation to Housing: | 0% | 33% | 67% | 0% | 33% | 67% |
| Asset Class | | | | | | |
| REITs | 38% | 26% | 14% | 19% | 15% | 6% |
| Large Stocks | 13% | 11% | 8% | 21% | 16% | 7% |
| Small Stocks | 6% | 3% | 0% | 19% | 18% | 20% |
| Bonds | 7% | 6% | 5% | 41% | 18% | 0% |
| T-bills | 35% | 21% | 6% | 0% | 0% | 0% |
| Intn Stocks | 2% | 0% | 0% | 0% | 0% | 0% |
| Houses | 0% | 33% | 67% | 0% | 33% | 67% |
| Total Allocations | 100% | 100% | 100% | 100% | 100% | 100% |
| For Portfolio Shown Above | | | | | | |
| ave. annual return | 12.0% | 10.0% | 8.0% | 12.0% | 10.0% | 8.0% |
| volatility (std. dev.) | 8.0% | 5.6% | 3.4% | 8.5% | 6.7% | 5.6% |
| Highest Risk/Return Portfolio | | | | | | |
| <u>Achievable with This Housing Allocation</u> | | | | | | |
| ave. annual return | 19.6% | 14.9% | 10.3% | 17.2% | 12.9% | 8.6% |
| volatility (std. dev.) | 23.8% | 16.0% | 8.3% | 22.6% | 15.0% | 7.6% |
| Lowest Risk/Return Portfolio | | | | | | |
| <u>Achievable with This Housing Allocation</u> | | | | | | |
| ave. annual return | 6.7% | 6.4% | 6.0% | 4.6% | 4.5% | 4.5% |
| volatility (std. dev.) | 1.3% | 1.1% | 1.3% | 0.5% | 0.7% | 1.0% |
| Source: author's tabulations of data described in Exhibits 2-4; returns and volatility (standard deviation) are quarterly results, annualized. | | | | | | |

Model Portfolios

The allocations to REITs in the efficient portfolios in Exhibit 6 are substantial and indicate the superior performance that has been available to investors who did include diversified REIT equities among their investments. Taken literally, the results indicate that households choosing mid-level risk portfolios should have allocated up to roughly half of their non-housing investment to REIT stocks. Although these statistical results are consistent with previous findings, REIT allocations this high are unrealistic, in part because if everyone did this, the resulting increased demand for REIT stocks would have driven their returns down substantially, especially because REITs are a small asset class compared to the other stock and fixed-income asset classes.

More realistic allocations would involve smaller proportions of financial assets being invested in REITs. Even moderate allocations of 10 or 20 percent of the financial (that is, exclusive of owner-occupied housing, if any) portfolio generally result in performance gains. This is illustrated in the set of portfolios shown in

Exhibit 7. Shown are the annual rates of return attainable from efficient portfolios, at specified levels of volatility, when estimated over two different periods and subject to various constraints on asset allocations to houses and REITs. The results show that for most time periods, housing positions, and volatilities, financial portfolios with 10 percent or 20 percent REIT investments historically achieved higher annual returns than otherwise optimized portfolios without REITs. The differences are not great, but they are persistent. Only in a few low volatility portfolios does the higher risk/return performance of REITs result in lower portfolio returns when REITs are added.⁸

Conclusions

The historical record documents that over different estimation periods and a variety of homeownership situations, REITs could have improved the performance of investment portfolios of households with mid-level risk preferences, increasing the average return of those portfolios, decreasing their volatility, or both.

One cautionary note is that all the analysis has been done on asset classes and will not necessarily apply to investments in individual companies or debt instruments represented in any of the classes. But through index funds and other diversified investment vehicles, the asset classes shown in this analysis can be approximated within the portfolios of individual investors. Another caution is that, as mentioned above, if everyone added substantially to their REIT investments, returns would drop. Such a massive shift in investor behavior seems improbable, however. A last caution is a reminder that the results imply that REIT investments make the most sense for investors with mid-level risk/return preferences. Judging from historical performance, those investors with very low risk tolerance should focus more on investments such as T-bills that offer steady, if modest returns, and those investors with very high risk tolerance might achieve a higher long-run return, and volatility, by focusing on small cap stocks.

Even with these cautions, the simple statistics tell a clear story. The low correlation between REIT returns and house prices, combined with the historically attractive total return and moderate volatility of REITs, make it no surprise that REITs show up in the optimal portfolios estimated for both owners and renters. The past is not a perfect guide to the future, but history indicates that many investors – owners and renters alike – could benefit from adding real estate stocks to their portfolios.

⁸ The reason is that forcing REITs into very low volatility portfolios requires a compensating overallocation of low volatility (and low return) T-bills in order to achieve the target volatility. If REITs are permitted in these portfolios, but not at fixed 10 and 20 percent shares, they enter the optimal portfolios with shares of 4-to-5 percent (for 2 percent volatility, 1992-2001 estimation) and at these allocation levels improve portfolio performance.

Exhibit 7: Efficient Portfolios Performance Summary

expected total return per level of volatility (standard deviation)

1976-2001

No Owner-Occupied Housing in Portfolio (Renters)

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 7.6 | 9.0 | 10.2 | 11.4 | 13.8 | 16.1 |
| 10% REIT Constraint | 7.7 | 9.2 | 10.5 | 11.7 | 14.1 | 16.3 |
| 20% REIT Constraint | n/a | 9.2 | 10.6 | 11.9 | 14.4 | 16.5 |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

Owner-Occupied Housing is One-Third of Portfolio

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 7.3 | 8.6 | 9.8 | 11.1 | 13.2 | 14.9 |
| 10% REIT Constraint | 7.4 | 8.8 | 10.0 | 11.2 | 13.4 | n/a |
| 20% REIT Constraint | n/a | 8.9 | 10.2 | 11.4 | 13.4 | n/a |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

Owner-Occupied Housing is Two-Thirds of Portfolio

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|-----|------|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 6.8 | 8.2 | 9.3 | 10.2 | n/a | n/a |
| 10% REIT Constraint | 6.9 | 8.3 | 9.4 | n/a | n/a | n/a |
| 20% REIT Constraint | 6.9 | 8.4 | 9.4 | n/a | n/a | n/a |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

1992-2001

No Owner-Occupied Housing in Portfolio (Renters)

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|-----|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 6.2 | 8.0 | 9.7 | 11.5 | 13.5 | 15.0 |
| 10% REIT Constraint | 6.1 | 8.1 | 9.9 | 11.7 | 13.6 | 15.1 |
| 20% REIT Constraint | n/a | 7.8 | 9.9 | 11.7 | 13.6 | 15.1 |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

Owner-Occupied Housing is One-Third of Portfolio

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|-----|------|------|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 6.1 | 7.9 | 9.4 | 10.4 | 11.9 | n/a |
| 10% REIT Constraint | 6.1 | 8.0 | 9.6 | 10.5 | 12.0 | n/a |
| 20% REIT Constraint | 5.8 | 8.0 | 9.6 | 10.5 | 12.0 | n/a |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

Owner-Occupied Housing is Two-Thirds of Portfolio

| | Portfolio Expected Returns (%) | | | | | |
|---------------------|--------------------------------|-----|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| without REITs | 5.9 | 7.3 | 8.1 | n/a | n/a | n/a |
| 10% REIT Constraint | 6.0 | 7.4 | 8.1 | n/a | n/a | n/a |
| 20% REIT Constraint | 6.0 | 7.4 | 8.1 | n/a | n/a | n/a |
| Volatility | 2% | 4% | 6% | 8% | 12% | 16% |

Note: For homeowners, the percentage allocations to REITs pertain to the financial (non-housing) part of the investment portfolio. "n/a" indicates risk/return combinations that are unattainable for the specified housing and REIT allocations. See text for additional discussion.

References

- J.K. Brueckner, "Consumption and Investment Motives and the Portfolio Choices of Homeowners," *Journal of Real Estate Finance and Economics* 15:2, 159-180 (1997).
- C. Calhoun, "OFHEO House Price Indexes: HPI Technical Description," Office of Federal Housing Enterprise Oversight, March 1996.
- K. Case and R. Shiller, "Forecasting Prices and Excess Returns in the Housing Market," *AREUEA Journal* 18 (1990): 253-274.
- K. Case, R. Shiller, and A. Weiss, "Index-Based Futures and Options Markets in Real Estate: A Big Future for Real Estate in Institutional Portfolios, If ...," *Journal of Portfolio Management*, Winter 1993, pp. 83-92.
- P. Chinloy and M. Cho, "Housing Returns and Restrictions on Diversification," *Real Estate Finance* Fall 1997: 57-63.
- P. Englund, M. Hwang, and J. Quigley, "Hedging Housing Risk," *Journal of Real Estate Finance and Economics* 24 (2002).
- Fannie Mae, *The 1997 Fannie Mae National Housing Survey*, Fannie Mae, 1997.
- M. Flavin and T. Yamashita, "Owner-Occupied Housing and the Composition of the Household Portfolio," *American Economic Review* (March 2002): 345-362.
- D. Geltner, N. Miller, and J. Snavely, "We Need a Fourth Asset Class: HEITS," *Real Estate Finance* 12 (Spring 1995), pp. 71-81.
- W. N. Goetzmann, "The Single Family Home in the Investment Portfolio," *Journal of Real Estate Finance and Economics* 6: 201-222 (1993).
- Y.M. Ioannides and S.S. Rosenthal, "Estimating the Consumption and Investment Demands for Housing and Their Effect on Housing Tenure Status," *Review of Economics and Statistics* (1994):127-140.
- Arthur B. Kennickell et al., "Recent Changes in U.S. Family Finances: Results from the 1998 Survey of Consumer Finances," Federal Reserve Bulletin, January 2000.
- National Association of Real Estate Investment Trusts, "Ibbotson Update Finds REITs Improve Portfolio Performance Over Time" press release, May 14, 2002.

PSCA: Profit Sharing/401(k) Council of America, *44th Annual Survey of Profit Sharing and 401(k) Plans*, 2001.

Appendix

Estimating Total Return and Volatility for Owner-Occupied Housing

The capital gains component of the total return to owner-occupied housing is reasonably approximated by changes in the OFHEO price index. To get the total return, the dividend return must be estimated. This is difficult to do, in part because the current "revenue" for owner-occupied housing is not a cash rent, but rather the imputed rent that the owner would have to pay if he or she were to rent that house in their local market.

One approach for estimating the total return to owner-occupied housing is based on the fact that owner-occupied and rental housing are substitutes. It is unlikely that the total return is greatly different between these two tenure forms. If it were, consumers would switch to the tenure form with the greater return (or, equivalently, the lower cost of housing themselves). The National Council of Real Estate Investment Fiduciaries (NCREIF) estimates that the total return on apartment properties owned by pension funds has averaged approximately 9 percent annually over the past 15 years. Of this return, approximately 8 percentage points have been current income (NOI) and the rest has been appreciation. If the total return to owner-occupied housing were also 9 percent, that would imply that the current income or dividend return, or the "cap" rate, has been approximately 4 percent, because house prices have averaged 5 percentage points of annual return. I use this 9 percent total return figure as an estimate for owner-occupied housing, but it is only an approximation because of differences in tax treatment, debt financing, transactions costs between owner-occupant and rental housing, and general housing market conditions over time. In rental housing, the cap rate has been fairly stable for several years, further evidence that the capital gains component is responsible for most of the variation in real estate's return over time. This same pattern seems likely to apply to owner-occupied housing.

As for volatility, as mentioned in the text the volatility of a house price index will understate the volatility of the price of an individual house. This is both because houses and their micromarkets evolve differently over time, and also because

any house will be subject to random "noise" in its actual purchase and sales prices. A technical literature discusses these issues in some detail within the framework of the repeat sales price index used in this analysis. While beyond the scope of this study to precisely calibrate this house-specific volatility component, which will vary across time and place, it appears safe to conclude that for annual periods it is at least as large as the volatility in the national house price index itself. I base this judgment on the analysis in Calhoun (1996), together with current OFHEO "volatility estimates" posted on www.ofheo.gov and in Goetzmann (1993), especially page 207; estimates in Englund et al. (2002) are also supportive. In other words, while in Exhibit 3 the house price index volatility is shown as 1.9 percent and 1.5 percent for the two time periods, the volatility experienced by individual homeowners is at least twice these levels.

About the Author

Jack Goodman provides economic and demographic research to the real estate industry through his firm, Hartrey Advisors. He previously was Chief Economist at the National Multi Housing Council and has served on the research staffs of the Federal Reserve Board and Urban Institute and on the economics faculty at the University of Virginia. He has consulted overseas for the World Bank and USAID and has chaired the Planning and Housing Commissions of Arlington County, Virginia. He has a Ph.D. in Economics from the University of Michigan.