

9

Policy Implications of Portfolio Choice in Underserved Mortgage Markets

WILLIAM N. GOETZMANN AND MATTHEW SPIEGEL

Expanding homeownership will strengthen our nation's families and communities, strengthen our economy, and expand this country's great middle class. Rekindling the dream of homeownership for America's working families can prepare our nation to embrace the rich possibilities of the twenty-first century.

—President Bill Clinton, 1995

Homeownership in low-income neighborhoods has positive personal and social benefits. It provides residents with an incentive to maintain both their own property and the local neighborhood. Recent research also suggests that homeownership is associated with “life satisfaction” (Scanlon, 1999). Still, these externalities and “internalities” are not costless. A house is not only a dwelling; it is an investment asset. As such it has risk and return characteristics that should affect the purchase decision. This chapter examines the investment value of U.S. housing over the past twenty years. The results suggest that the capital appreciation of housing over the twenty-year period from 1980 through 1999 was substantially less than the return to U.S. stocks, bonds, and mortgage-backed securities over the same period. Although the comparison with stocks and bonds over the past two decades is somewhat unfair, given how well financial assets performed relative to historical norms, housing did not even fair well when compared with inflation. Returns to home investment exceeded inflation

in most states, but only by modest amounts over the period. Not only have returns been historically low, but, when price dynamics are properly accounted for, the risk is significant. Many homeowners in the United States over the past twenty years experienced extended periods in which their home equity was negative. This evidence alone is a compelling reason to reconsider the stated fundamental goal of expanding homeownership.

Despite its relatively poor performance as an investment vehicle, housing has a private consumption value that may induce people to hold it, and the positive externalities of owner-occupied housing are a strong inducement to encourage it. Thus there are clear policy implications of the evidence we present in this chapter. First, the government should be cautious about encouraging wholesale home purchases, especially by the most financially vulnerable in society. It should provide information about risk and return beyond simply helpful guidelines for accessing mortgage credit. Second, it should develop institutions and markets that allow homeowners to insure against local areawide housing price risk. Proposals for a housing futures market by Case, Shiller, and Weiss (1993) would appear quite beneficial, given the long-term risks of homeownership. Finally, the government should reconsider a tax policy that economically favors renting rather than buying by low-income families.

The role of government-sponsored agencies (GSEs) in encouraging low-income homeownership has been much debated, particularly with respect to their role in fulfilling the mandate of the Community Reinvestment Act. Of particular concern is the development of special programs to encourage higher loan-to-value (LTV) ratios in lower-income neighborhoods. Although increasing LTV ratios relax the wealth constraints affecting tenure choice, they also add substantially to the risk of default (see Gyourko, Linneman, and Wachter, 1998; Gyourko and Linneman, 1996; Haurin, Hendershott, and Wachter, 1996). In addition, higher LTV ratios create conditions for increasing the volatility of housing prices (see Stein, 1995; Lamont and Stein, 1999) and regional recessions (see Caplin, Freeman, and Tracy, 1997).

Besides household and macroeconomic risks associated with increased leverage in low-income neighborhoods, we argue that increasing LTVs in underserved mortgage markets may encourage gentrification. Higher LTV ratios substitute down payments for higher interest rates. However, the mortgage interest deduction provides a greater benefit to higher-income families. Thus allowing high LTV ratio loans in low-income areas may simply encourage higher-income individuals to purchase housing in underserved markets. Even if gentrification issues can be resolved, it is still not clear if increasing the acceptable LTV ratio will do much good. By renting from higher-income individuals, low-income families can capture part of the tax benefits from mortgage interest and property tax payments. Both of these benefits are lost upon purchase, and neither benefit is affected by the set of available low-income loan programs. The alternative to

increasing LTV ratios is a direct subsidy of home purchase in low-income neighborhoods. Ambrose and Goetzmann (1998) estimate that the necessary subsidy may be as much as 6 percent per year of the homeowner equity investment.

Housing as an Investment

The Office of Federal Housing Enterprise Oversight (OFHEO) was formed in 1992 as an independent agency within the Department of Housing and Urban Development. OFHEO has developed excellent housing price indices in a broad number of metropolitan statistical areas (MSAs) throughout the country. The quarterly indices cover all fifty states plus the District of Columbia and 328 MSAs, extending back to 1975. Calhoun (1996) describes their composition and method of construction. As of 2000, nearly 12.5 million repeat sales derived from Fannie Mae or Freddie Mac mortgage origination or purchase files were used in a weighted-repeat-sales estimation procedure based on Case and Shiller (1987) with the Goetzmann (1992) correction. These indices provide a rich source of information about the time-series behavior of U.S. housing as an investment over the past quarter-century. This information should be regarded as essential knowledge for every homeowner or potential homeowner.

Housing Returns

Treating housing as a pure investment vehicle implies that gains are realized through price appreciation, less taxes, upkeep, and transaction costs. Goetzmann and Spiegel (1997) show that the variation in the market value of the house over time is largely explained by local indices that track the capital appreciation of a home at the zip code level. If a home is maintained at the same quality level as other homes in its neighborhood, a neighborhood-level price index will typically explain 80 to 90 percent of the change in any one home's value. Thus even though an individual homeowner is not diversified across a number of homes in his region (as are Fannie Mae and Freddie Mac as residual claimants on homes on which they guarantee mortgages), the regional indices provided by OFHEO are useful measures of the return to individual home investment. However, because they are regional averages they understate the volatility of the return to investing in a single home in the area.

OFHEO reports that the value of a single-family home in the United States grew by 138 percent over the period from 1980 to March 2000. This represents an annualized rate of 4.2 percent over the past twenty-one years. Given that the consumer price index (CPI) rose at a 3.7 percent annual rate over the same time period, this suggests a relatively modest rate of long-term asset growth. Similar results can be found in Goetzmann (1993). That paper uses index data from 1971 to 1985 (created by Case and Shiller, 1987) to estimate the risk and return of investment in a single-family home. During that fifteen-year interval, average

annual real returns in Atlanta, Chicago, Dallas, and San Francisco ranged between 5.8 and 8 percent per year. This pattern continues today. Summary statistics for a selection of U.S. cities over the twenty-year period ending in March 1999 are provided in table 9-1. The annual real returns for this larger collection of cities range from -1.9 percent to 3.3 percent.

Perhaps more troublesome is the difference between housing investment and the return on investment in mortgage-backed securities. The mortgage-backed securities comprising the Salomon Brothers and Lehman indices reported in the table are, for the most part, liabilities of homeowners. On a before-tax basis it appears that on average the cost of money to purchase a home far exceeds the growth in that same home's value. From table 9-2 the 10 percent nominal annual income return to the Lehman mortgage index exceeds the Houston market nominal return by 8 percent per year and the San Francisco market nominal return by 2.4 percent per year. Assuming that the highest marginal tax rate over this period was 40 percent, it appears that the nominal after-tax mortgage income return exceeded home price appreciation in nine of the twelve cities.

Although price indices give some idea of the growth in housing values, calculating the investor's return on the sale of a home requires the consideration of a number of other factors. Hendershott and Hu (1981), Case and Shiller (1990), and Goetzmann (1993) use rents, expenses, and tax variables to estimate after-tax returns to housing investment. These factors are extremely important because both maintenance and property taxes are costs unique to housing investments. Thus price indices may in general overstate the relative return a family can expect from their house, as opposed to assets such as stocks and bonds for which the rate of return is easy to calculate.

In sum, examining the most current measures of capital appreciation of homes in a number of U.S. cities over the past twenty years suggests that they are dominated as an investment asset. Nearly all markets displayed negative risk-adjusted returns over the period. Treasury bills would in general have been an attractive investment alternative. Given the poor performance of housing as an investment, it is thus surprising that housing continues to represent a significant proportion of American household portfolios. It also implies that the government should weigh housing policies in light of the dramatic trade-off between wealth accumulation by low-income families and the positive social externalities of owner-occupied housing in low-income neighborhoods. In light of this, the government has a responsibility to share this striking information about long-term housing returns with potential homeowners.

Housing Risk

Even with low expected returns, housing may still remain a somewhat attractive investment if it is a sufficiently "safe" vehicle. In our research, we have found it useful to break housing risk down into temporal and nontemporal components;

Table 9-1. Summary Statistics for Housing and Other Assets in Real Terms, March 1980-March 1999^a

City	Quarters	Geometric mean (percent)	Arithmetic mean (percent)	Standard deviation (percent)	Serial correlation (percent)	Sharpe ratio
Atlanta	80	0.747	0.964	6.699	-0.391	-0.269
Chicago	80	0.716	0.764	3.139	0.532	-0.638
Dallas	80	-1.105	-1.001	4.495	-0.228	-0.838
San Francisco	80	2.500	2.607	4.731	0.600	-0.034
Detroit	80	0.914	1.031	4.836	0.118	-0.359
Houston	80	-1.971	-1.890	4.028	0.263	-1.156
New York City	80	3.264	3.458	6.488	0.370	0.107
Newark	80	1.904	2.011	4.717	0.691	-0.160
Oakland	80	1.643	1.711	3.752	0.619	-0.281
Philadelphia	80	1.102	1.166	3.632	0.415	-0.441
St. Louis	80	-0.207	-0.154	3.269	0.157	-0.893
Washington, D.C.	80	0.483	0.535	3.247	0.419	-0.687
S&P 500 total return (TR)	80	13.330	14.633	17.211	-0.008	0.690
U.S. long-term government bond TR	80	6.417	7.378	14.569	-0.043	0.317
U.S. thirty-day Treasury bill TR	80	2.766	2.775	1.332	0.417	0.006
Salomon Brothers thirty-year GNMA TR ^b	80	6.122	6.617	10.417	-0.131	0.370
Salomon Brothers thirty-year FHLMC TR ^c	80	6.480	6.972	10.372	-0.065	0.406
Lehman Brothers mortgage index income return	80	9.891	9.898	1.262	0.971	5.650
Lehman Brothers mortgage index TR	80	6.127	6.602	10.192	-0.030	0.376
Lehman Brothers mortgage index capital appreciation	80	-3.260	-2.819	9.306	-0.041	-0.600

Source: Measurements are per year, annualized from quarterly housing MSA returns available from the Office of Federal Housing Enterprise Oversight (OFHEO). All financial asset returns from Ibbotson Associates, Chicago. The serial correlation is measured on quarterly returns.

a. All housing returns are in nominal terms.

b. GNMA = Government National Mortgage Association (Ginnie Mae).

c. FHLMC = Federal Home Loan Mortgage Association (Freddie Mac).

Table 9-2. Summary Statistics for Housing and Other Assets in Nominal Terms: March 1980–March 1999

City	Quarters	Geometric mean (percent)	Arithmetic mean (percent)	Standard deviation (percent)	Serial correlation (percent)	Sharpe ratio
Atlanta	80	4.787	4.994	6.642	0.576	-0.287
Chicago	80	4.755	4.795	2.917	0.255	-0.721
Dallas	80	2.861	2.963	4.542	0.753	-0.866
San Francisco	80	6.611	6.718	4.833	0.627	-0.037
Detroit	80	4.962	5.064	4.595	0.088	-0.399
Houston	80	1.960	2.045	4.181	0.611	-1.161
New York City	80	7.406	7.604	6.692	0.516	0.106
Newark	80	5.991	6.101	4.873	0.715	-0.164
Oakland	80	5.719	5.795	4.051	0.596	-0.272
Philadelphia	80	5.157	5.217	3.608	0.654	-0.466
St. Louis	80	3.796	3.837	2.998	0.275	-1.021
Washington, D.C.	80	4.513	4.559	3.112	0.681	-0.752
S&P 500 total return (TR)	80	17.875	19.163	17.430	-0.316	0.704
U.S. long-term government bond TR	80	10.685	11.606	14.619	-0.317	0.322
U.S. thirty-day Treasury bill TR	80	6.888	6.898	1.493	0.825	0.000
U.S. inflation	80	4.011	4.023	1.620	0.824	-1.774
Salomon Brothers thirty-year GNMA TR ^a	80	10.378	10.848	10.443	-0.077	0.378
Salomon Brothers thirty-year FHLMC TR ^b	80	10.751	11.212	10.342	-0.065	0.417
Lehman Brothers mortgage index income return	80	10.000	10.007	1.295	0.867	2.401
Lehman Brothers mortgage index TR	80	10.383	10.831	10.188	-0.037	0.386
Lehman Brothers mortgage index capital appreciation	80	0.620	1.027	9.206	-0.148	-0.638

Sources: Measurements are per year, annualized from quarterly housing MSA returns available from the Office of Federal Housing Enterprise Oversight (OFHEO). All financial asset returns from Ibbotson Associates, Chicago.

Note: All housing returns are in nominal terms. The serial correlation is measured on quarterly returns.

a. GNMA = Government National Mortgage Association (Ginnie Mae).

b. FHLMC = Federal Home Loan Mortgage Corporation (Freddie Mac).

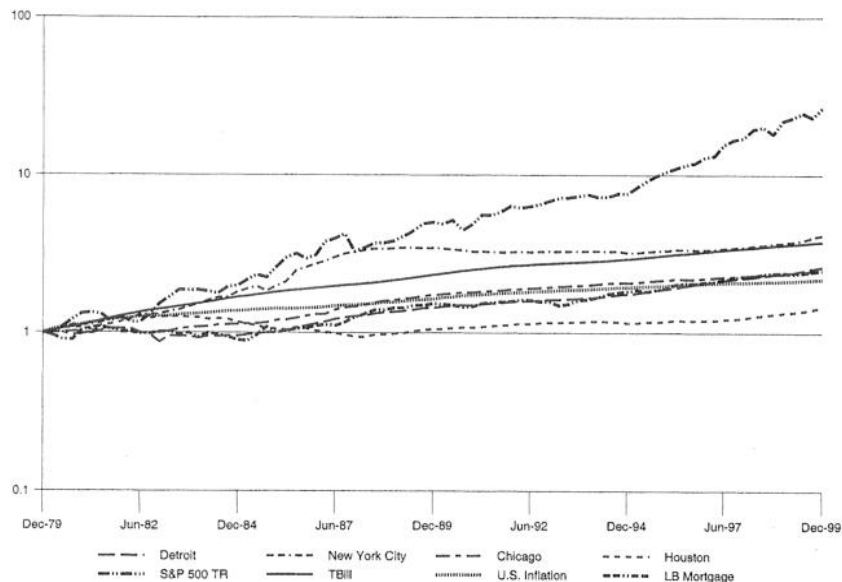
the temporal components grow with time and the nontemporal components are associated only with transactions. The nontemporal transactions-based risk is due to the illiquidity of housing and is most important when the holding period is short. Although housing markets are competitive, we find the transactions risk to be quite significant: as much as 6 to 8 percent in our studies of the San Francisco Bay Area (Goetzmann and Spiegel, 1995, 1997). Thus it has considerable impact on buyers who may need to move soon.

The temporal components are the risk of the citywide index, deviations of local neighborhoods around the index, and the idiosyncratic risk of the house—that is, the variation in the home price around the local neighborhood index. In our 1997 study of Bay Area housing we found that neighborhood effects were strong. Using zip code-level indices, we were able to fairly accurately predict the sales prices of homes. In our sample, only 8 percent of transactions deviated by more than 10 percent from our local indices. But over the five-year period from 1989 to 1994, we found dramatic variation across neighborhoods. The lowest-priced quartile of Bay Area housing experienced no price appreciation, while the highest-priced quartile experienced price appreciation of 23 to 36 percent. Thus even a well-constructed citywide index is likely to be averaging across dramatically different neighborhood growth rates. It is of some comfort that the returns to lower-income neighborhoods were relatively higher than returns to high-income neighborhoods and that, controlling for income, race was an insignificant factor in capital appreciation rates.

An important consideration in assessing the impact of the temporal components of residential real estate risk is the strong auto-correlation in the time-series of returns. Notice that annual standard deviation figures found in both tables 9-1 and 9-2 make it appear that housing returns are not particularly volatile. However, the high positive auto-correlations indicate that housing returns follow distinct trends, with current increases foretelling future increases and current declines foretelling future declines. This means that negative shocks to housing values persist; once prices in a region begin to decline they continue to decline. Figure 9-1 plots the price indices over the period. It is clear that housing returns do not follow a random walk.¹ Once a local housing market starts to drift lower it may be a long time before it recovers. Goetzmann (1993) shows that once idiosyncratic risk, nontemporal risk, and the trends in the index are accounted for, the annualized standard deviation of investing in a single home over a five-year period is roughly double the annual standard deviation of the city-level index.

1. See Spiegel and Strange (1992) and Spiegel (2001) for theoretical models that explain why economic forces naturally lead to predictably above or below normal expected housing returns. Thus there is no theoretical reason to believe that the serial correlation exhibited by the data is either due to a statistical artifact or likely to disappear if this information becomes more widespread in the market.

Figure 9-1. *Housing and Financial Markets*



The Sharpe ratio is a common performance measure used to risk-adjust the return that an asset class provides in excess of Treasury bills. It is certainly relevant to the home purchase decision in cases for which most of an investor's wealth will be invested in that asset class. Even if we ignore the extra risk to long-term investors resulting from nontemporal components, idiosyncratic risk, and auto-correlation in the housing markets, both tables 9-1 and 9-2 show that the Sharpe ratio is negative for every city other than New York. Thus, in very general terms, over the past twenty years most homeowners across the country could have achieved greater wealth accumulation by investing in Treasury bills than in a home. The one bright spot is that housing is correlated with changes in the CPI. Thus homeownership partially hedges out an important component of inflation.

Standard asset pricing models use diversification arguments to justify low expected returns if an asset has a low or negative correlation to the market portfolio. Negative beta assets could have expected returns below T-bills and still be a part of a diversified portfolio, since the asset returns move countercyclically. The betas of most housing markets are near zero, even when four lagged quarters on S&P 500 excess returns are used as regressors. Thus we do not argue that housing is mispriced from an asset-pricing model framework. Nevertheless, the low returns suggest that, at best, houses are being priced as if investors were completely diversified, something we know is not true given the large percentage the home typically represents in a portfolio. Caplin (1999) cites evidence from the

1995 survey of consumer finances indicating that the average fraction of assets represented by the house in a homeowner's portfolio is 50 to 70 percent.

Mortgages add another level of risk because they facilitate financial leverage. Though government agencies do not advertise default risks to the general public, they are clearly aware of them. OFHEO's primary mission consists of "ensuring the capital adequacy and financial safety and soundness of two government-sponsored enterprises (GSEs) the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac)."² In fact, the motivation for the indices is particularly telling. According to the OFHEO website:

OFHEO is required by its enabling statute—the Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (Title XIII of PL. 102-550)—to develop and administer a quarterly risk-based capital stress test to measure the capital adequacy of Fannie Mae and Freddie Mac. In the stress test, the statute requires OFHEO to use a house price index to account for changes in the loan-to-value (LTV) ratios of mortgages held or guaranteed by Fannie Mae or Freddie Mac.³

In other words, the indices are designed to allow regulators to quantify the risk that homeowner LTV ratios will become negative and thus leave the two agencies with inadequate collateral to cover the mortgages they have guaranteed. By the same token, however, the risk of increasing Fannie Mae and Freddie Mac LTV ratios is also the risk to homeowner equity.⁴ The very existence of OFHEO suggests that our own government recognizes that this risk is not trivial for the agencies.

Naturally, if the value of a home represents a relatively small portion of a household's investment portfolio, then the volatility of the index and LTV ratio is of minor concern. However, for most homeowners in the United States, and particularly those in underserved mortgage markets, a house will consume most of their savings. Thus a nontrivial chance of negative equity over a five-year investment horizon poses a serious concern.

What do the OFHEO data tell us about the historical variation in LTV ratios? Using quarterly housing return indices for each of the fifty states and the District of Columbia, we examined the minimum five-year holding period return.⁵ For 30 percent of the states there exists at least one five-year holding

2. See OFHEO's website: www.ofheo.gov/about.

3. See www.ofheo.gov/house/faq.html.

4. Let L equal the loan value and E equal the homeowner equity value. Then $L/(L+E)$ is the loan-to-value ratio. The homeowner's equity proportion is $E/(L+E)$ which equals $1 - L/(L+E)$.

5. For expositional simplicity the following discussion treats the District of Columbia as a state. Thus there are fifty-one indices.

period in the last twenty years for which LTV ratios increased by more than 10 percent. Thus an average family buying a home at the beginning of such a period would have seen its value drop far enough to wipe out a 10 percent down payment by the end of the period.

In fact, the 30 percent figure understates the risk. Real estate transaction costs are typically on the order of 6 percent or more once commissions, title insurance, legal fees, and title transfer taxes are taken into account. Using 6 percent as a benchmark, forty-one of these states exhibited price declines large enough to eliminate a homeowner's initial capital. Considering the increase in equity due to amortization over five years makes little difference. Assuming that the typical mortgage during this period had a thirty-year life and an 8 percent interest rate, after five years approximately 5 percent of the loan would have been paid off. Using these criteria, families in thirty-two states would have seen the value of their home decline enough not only to eliminate their initial savings, but also to eliminate the fraction of the loan they would have paid off to date. This has potentially serious consequences. If a low-income family with an out-of-area job opportunity cannot sell their home for more than the current mortgage, they may face the choice of either not moving or declaring bankruptcy. What about the simple question of whether a family might have a negative return on their investment? Ignoring transaction costs, thirty-three states had five-year periods in which a family would have lost money on their house in a given period. If one includes a 6 percent transactions cost, this figure becomes true for forty-four states!

A number of authors have explored the risk of housing and the possibility of mortgage default. Berkovec and Fullerton (1992); Brueckner (1997); Wieand (1999); Meyer and Wieand (1996); Rosenthal, Duca, and Gabriel (1991); and Voith and Crone (1999) all develop models that show the effect of systematic and unsystematic housing risk on the purchase or mortgage decision. Fratatoni (1998) and Ling and McGill (1998) provide empirical support for the importance of considering housing risk by showing that the housing and mortgage decision affects household preference for other risky assets. In particular, Ling and McGill find that, controlling for the price of the home, lower-income households are more likely to choose low mortgage debt.

Although positive externalities of homeownership are taken as given, there are potentially serious negative externalities associated with increased mortgage leverage as well. Lamont and Stein (1999) use housing data from several cities to explore the effect of leverage on the volatility of the housing price series. They find strong evidence that higher mortgage ratios in a city are associated with higher risk. Caplin, Freeman, and Tracy (1997) observe that refinancing is difficult when loan-to-value ratios have increased, and thus homeowners may not be able to take advantage of the refinancing option. They link regional recessions to the inability to finance and the constraint on labor mobility.

Policy Issues and Implications of Risk and Return Measures

Even if homeownership yields positive externalities to the community, it is irresponsible to simply encourage homeownership among modest-income groups via more aggressive lending. A home mortgage simply allows people to lever up their exposure to housing market risk. In addition, the opportunity cost of capital for a low-income household is severe. There are more attractive and liquid investments, and there are great benefits to diversifying an investment portfolio. U.S. housing policy does not effectively compensate low-income homeowners for these opportunity costs.

We suggest that HUD and other government agencies have a responsibility to disclose the historical facts to potential homeowners. The public should know about the low returns and high volatilities associated with housing. A perusal of the HUD website yields ample information about how to buy a home, indeed how to buy a HUD-owned home, but little information about how to consider the pros and cons of housing as an investment. Whereas one government agency has been established to collect information to carefully monitor the risks of housing as an asset, the other actively seeks to encourage homeownership among citizens of modest income. Homeownership may be the American Dream, but the government should not be overzealous in pushing mortgages and housing on those who cannot afford to invest in a low-returning and potentially risky asset. Otherwise it seems likely that sometime in the next twenty years a substantial number of the "beneficiaries" of this policy may find their meager savings severely diminished, or even totally depleted.

Another important step is to encourage the development of markets and instruments that can help homeowners avoid the risk of their home investment. Case, Shiller, and Weiss (1993) advocate the development of housing indices that can be used to develop home equity insurance products. Perhaps the government, through OFHEO, can provide the local index data to allow this to take place. In addition, government agencies should take the lead in developing these contracts. Of course, one problem with the creation of home equity insurance contracts is that they partially remove incentives for maintenance and upkeep, and they encourage gaming of prices by contract owners. Nevertheless, the potential exists to overcome these drawbacks and initiate programs that will make household asset portfolios safer rather than more risky.

Tax Policy, Government Policy, and Housing Choice

Poterba (1992) provides a simple model that describes how the tax code interacts with the housing market. His analysis focuses on the amount of housing families may wish to purchase but also contains a brief analysis of how it impacts the balance between rental and purchase markets. However, in the current setting we are interested in a slightly different question. Given the current

tax code, how will allowing higher LTV ratios impact low-income families? In particular, will it improve their ability to compete for owner-occupied housing and will it motivate them to buy rather than rent?

How Taxes Can Undermine Other Housing Policies

Housing markets are competitive. Thus low-income prospective homeowners compete with higher-income families for the same property. In fact, they potentially compete with higher-income families seeking the property for rental income. Will looser financing allow a low-income family to outbid a high-income family? A fairly straightforward analysis suggests not.

At the margin, higher-income families pay income taxes at higher rates than low-income families. This means that the mortgage interest deduction provides more value as a family's income increases. Thus decreasing the down payment levels (and thereby increasing the interest paid) may make it even less likely a low-income family will purchase a home. To see why, imagine that a house produces a consumption dividend of C_l to a low-income family and C_h to a high-income family. Absent taxes, the low-income family will try to outbid the higher-income family so long as C_l is greater than C_h . However, the mortgage interest deduction distorts this. An interest-only mortgage (and in the initial years the payments on a thirty-year mortgage are essentially interest only) provides a family with a tax benefit equal to $trDP$. Here, t equals the family's tax rate, r the mortgage rate, P the price of the house, and D the fraction of the price financed via the mortgage (a 10 percent down payment corresponds to setting D to 0.9). Thus the total benefit to a family equals $C + trP$. This implies that, with taxes, the low-income family will only outbid the high-income family if $C_l - C_h > (t_h - t_l)rDP$, with subscripts l and h denoting low- and high-income, respectively. Clearly, as D increases (that is, as the down payment declines), the more difficult it will be for the low-income family to win a bidding war. Ultimately, then, a loosening of lending requirements in low-income areas may actually produce gentrification rather than low-income homeownership. This is clearly not the impact envisioned by policymakers wishing to encourage high LTV loans in poor neighborhoods. Housing policy that targets regions for looser credit suffers from this fundamental limitation. To help lower-income buyers, it is necessary to provide them a relative advantage.

Even if a policy of encouraging high LTV loans in underserved neighborhoods does not encourage the displacement of low-income families, there is still the question of whether it will actually increase ownership rates among the poor. All families must weigh the choice of buying versus renting when making their housing decision. For better or worse, the current tax code encourages high-income families to purchase and low-income families to rent. Consider a city in which a residence sells for P , and the mortgage interest rate equals r . In this city lives a family that faces a tax rate of t_f . If they purchase a house it will cost them

$(1 - t_f)P$ in after-tax interest and an additional EP in maintenance expenses, but they will then earn g in capital gains. For housing, capital gains are effectively tax free, so the owner will keep the entire amount. Thus the total after-tax cost of ownership comes to $(1 - t_f)rP + EP - gP$. Alternatively, the family can rent an identical home at a cost of n from another individual who pays taxes at a rate of t_0 . Because the property is rented, the federal government allows the landlord to deduct interest and maintenance expenses as well as depreciation (δP) on the building before calculating the tax bill. In equilibrium, a competitive rental market should imply that landlords earn a zero economic rent and thus n must solve:

$$(9-1) \quad n(1 - t_0) = (rP + \alpha EP)(1 - t_0) - t_0\delta P - (1 - t_g)gP,$$

where t_g equals the capital gains tax rate on landlords and α a measure of the inefficiency of third-party maintenance (so $\alpha \geq 1$). As Shiller and Weiss (2000) discuss, third-party maintenance is far less efficient than owner-occupied maintenance, and this should be accounted for in the cost calculations. So,

$$(9-2) \quad n = rP + \alpha EP - \frac{t_0\delta P + (1 - t_g)gP}{1 - t_0}.$$

Therefore it will only pay for a family to buy rather than rent, if:

$$(9-3) \quad t_f r + g > (1 - \alpha)E + \frac{t_0\delta + (1 - t_g)g}{1 - t_0}.$$

Notice that the result is independent of the down payment required to obtain the mortgage. This results from the fact that the equation properly accounts for the opportunity cost of tying up money in real estate rather than other investments of similar risk. A higher down payment simply means a higher lost opportunity cost in exchange for an equal reduction in the expected cost of the mortgage. The only impact the down payment requirement has is on whether purchasing is a feasible option.

Note from equation 9-3 that if a family pays taxes at a rate of zero (not unlikely for those with low incomes) and if the capital gains tax rate is less than or equal to the ordinary income tax rate (which it is), then under no circumstances will it pay for them to buy. This is irrespective of what LTV ratios the government may or may not persuade banks to use. By renting, a low-income family can at least capture part of the tax benefit via competition among landlords.

To get a feel for the point at which a family will actually purchase, consider the following scenario. Imagine the landlord pays taxes at a combined federal

and state rate of 39.6 percent.⁶ Further assume depreciation can be taken on a straight-line basis over thirty years. At first one might suppose that this implies that δ equals .033 (1/30). However, once the building is sold, the depreciation taken until that date will then result in a capital gains tax to be paid on the difference between the sale price and the building's book value. Thus the full depreciation allowance overstates by a considerable amount the benefit of the deduction. The current long-term capital gains tax rate equals 20 percent. If the landlord holds the building for ten years, then on average the government will recapture taxes equal to about 13 percent of the depreciation, and this figure is therefore the effective capital gains tax rate (t_g). Using these adjustments, the t_0 term in front of δ in equation 9-3 becomes $.396 - .13$. Currently the annual percentage rate for a thirty-year, zero points mortgage equals approximately 8.509 percent. From tables 9-1 and 9-2 it would appear that annual capital gains on housing come to about 4 percent in the current inflationary environment. Assume maintenance runs about 2 percent of a home's value per year. Further assume that third-party maintenance only runs 20 percent higher than owner-occupied maintenance. Plugging all these figures into the inequality implies that a family will only purchase a home if its marginal tax exceeds 32.1 percent. To reach this marginal tax rate, a family of four in a state with a 5 percent income tax would need to earn over \$43,000 per year! Based on this, it seems that tax issues may be playing a far more important role than mortgage down payment issues in discouraging low-income families from purchasing their homes. The natural conclusion is that targeting underserved communities for high LTV loans is unlikely to encourage homeownership.

One word of caution is in order about the above calculations. The marginal tax rate that causes a family to switch from renting to buying depends critically on the marginal tax rate of the marginal landlord. Table 9-3 presents figures for the cutoff point given varying tax rates on the marginal landlord. For example, if the marginal landlord faces a tax rate of 25 percent, then families with a marginal tax rate of more than 9 percent would likely prefer to purchase their residence. This would certainly include most families.

Policy Proposals and Their Potential Impact on Low-Income Homeownership

In addition to the government's proposal to relax LTV ratios to encourage low-income homeownership in underserved areas, there are currently two other proposals (that we know about) put forward by academics. The most recent is by

6. The 39.6 percent tax rate assumes that the landlord pays taxes at the top federal rate and lives in a state without an income tax (see www.quicken.com/taxes/articles/917555291_21562). While the assumption that the landlord does not pay state income taxes may seem to imply that a higher tax rate is in order, it should be remembered that it is the marginal landlord that sets rents in the market. Thus, if anything, the tax rate one should use is probably somewhat lower. Figure 9-1 provides a breakdown of how the results vary with the tax rate on the marginal landlord.

Table 9-3. *Tax Rate at Which Families Are Indifferent between Renting and Buying*

<i>Landlord's tax rate</i>	<i>Tax rate at which the family is indifferent</i>
.2	.03
.25	.09
.3	.158
.35	.237
.4	.329

Source: Authors' calculations.

Caplin (1999), who proposes the issuance of equity sharing contracts. Under this proposal, families would own half of their house and investors the other half. At first glance this is an appealing proposal because it helps to ameliorate the price risk faced by families due to fluctuations in the price of their home. Simultaneously, it frees them to invest in a better diversified portfolio and offers the potential for increased liquidity via investment in publicly traded securities. However, though this policy looks good from the perspective of portfolio diversification, it may suffer from a severe moral hazard problem. As Shiller and Weiss (2000) explain, it is very difficult to write enforceable contracts on home maintenance. Given this constraint, it seems likely that an equity-sharing contract for X percent of the home would effectively reduce a family's incentive to modernize, improve, and maintain the home by X percent. The arguments in both Shiller and Weiss (2000) and Spiegel (2001) suggest that reducing the maintenance incentive in this manner would likely result in a greater fraction of dilapidated homes in targeted neighborhoods. The resulting blight would then destroy the positive externalities policymakers hope to induce through homeownership.

The other academic proposal for reducing homeownership risk was put forth by Case, Shiller, and Weiss (1993). They would have a service produce a local area real estate price index. Homeowners could then short the index when they purchased their home, thereby immunizing their portfolio from fluctuations in housing prices that are beyond their control. On purely theoretical grounds this is a very appealing solution. Unlike equity sharing contracts, it does not raise moral hazard concerns. A family that ignores the maintenance requirements to their own house will see it fall in value relative to the index and thus feel the full brunt of the home's decline in value. Thus this proposal provides all the benefits of diversification without reducing the likely production of externalities families create when they look after their home. Of course, the fact that this proposal has not been implemented implies that it too is flawed. Here, however, the flaws may be psychological more than economic in nature. Many families may feel "cheated" if upon the sale of their home they lose all of the gain to the holder of their futures contract and may thus be unwilling to enter into an agreement like

... in the first place. In addition, there remains the pricing of such a contract. If the index has gone up in value but the home in question down, it is likely that the family will simply declare bankruptcy and the contract will go unpaid. Before a liquid market in housing futures can arise, questions such as these will need to be resolved.

However, no policy proposal is likely to change homeownership rates in underserved areas so long as the current tax code remains in place. Poor people do not rent simply because they are poor. After all, poor people typically purchase cars and high-income people frequently rent via a lease. The difference lies in the tax treatment. Unlike the interest on a house, the interest on a car loan is not tax-deductible.⁷ Thus allowing higher LTV ratios, equity-sharing mortgages, or the emergence of a local area futures contract will not have any impact so long as the government continues to "pay" low-income families to rent via the tax code. Until that is changed, all other proposals are likely to be ineffective.

Conclusion

U.S. housing policy has long encouraged homeownership, and there are a number of arguably good reasons to do so. When held in a diversified portfolio, housing provides a hedge against a major component of inflation and has a low correlation with financial assets. Nevertheless, it is dangerous for homeowners to devote too much of their wealth to an asset that has low historical return and a serious risk of loss over multiple-year horizons. We argue that if the government chooses to actively encourage homeownership, it has the responsibility to inform potential homeowners of the risks. Beyond providing information, the government should also seek new ways of helping homeowners to lay off unwanted local housing risk, perhaps by facilitating insurance contracts as suggested by Case and Shiller. We see policies that encourage overinvestment in housing and higher leverage as potentially dangerous. Overinvestment in housing by families with modest savings means underinvestment in financial assets that will grow and provide income for retirement. In fact, encouraging homeownership among low-income families will only increase the wealth gap in the United States.

Another policy problem relates to the way the tax code may interact with any attempts to encourage low-income homeownership. Because of the progressivity of the tax code, the interest deduction on a mortgage is worth more to higher-income families than to lower-income families. Since raising the LTV ratio effectively raises the interest payments, the tax code will in fact encourage higher-income families to move into underserved areas in order to take advan-

7. For the wealthy, leasing also offers some tax benefits if the lessee can claim the car as a business expense.

tage of the program targeting such areas. The result may thus be gentrification, rather than making it possible for low-income families to own their own homes.

Even if higher-income families can be prevented from accessing any new loan programs, there is still the issue of whether encouraging high LTV loans will persuade low-income families to buy rather than rent. Again a model of the tax code is instructive here. By renting, low-income families can capture some of the mortgage tax deduction via competition among high-income landlords. Unless the tax code changes, low-income families will find themselves financially better off, on average, by renting rather than buying.

Given the above issues, what should the government do? The neighborhood externalities homeowners provide should not be dismissed. Furthermore, since these externalities are a public good it is clear that the government has a role to play in their creation. However, changing LTV requirements within poor neighborhoods does not seem to be the answer. Instead, we would suggest a direct mortgage interest subsidy. Such a subsidy would make housing financially more attractive to low-income residents and have the added benefit of making ownership a financially sensible alternative to renting.

References

- Ambrose, Brent W., and William N. Goetzmann. 1998. "Risk and Incentives in Underserved Mortgage Markets." *Journal of Housing Economics* 7 (3): 274-85.
- Berkovec, James, and Don Fullerton. 1992. "A General Equilibrium Model of Housing, Taxes and Portfolio Choice." *Journal of Political Economy* 100 (2): 390-429.
- Bruelckner, Jan K. 1997. "Consumption and Investment Motives and the Portfolio Choice of Homeowners." *Journal of Real Estate Finance and Economics* 15 (2): 159-80.
- Calhoun, Charles A. 1996. "OFHEO House Price Indexes: HPI Technical Description." Working Paper. Washington: Office of Federal Housing Enterprise and Oversight.
- Caplin, Andrew. 1999. "Housing Asset Portfolios and the Reform of the Housing Finance Market." *TIAA-CREF Research Dialogues* 59 (February).
- Caplin, Andrew, Charles Freeman, and Joseph Tracy. 1997. "Collateral Damage: Refinancing Constraints and Regional Recessions." *Journal of Money, Credit and Banking* 29 (4): 496-516.
- Case, Karl, and Robert Shiller. 1987. "Prices of Single-Family Homes since 1970: New Indexes for Four Cities." *New England Economic Review* (September-October): 45-56.
- . 1990. "Forecasting Prices and Excess Returns in the Housing Market." *American Real Estate and Urban Economics Association Journal* 18 (3): 253-73.
- Case, Karl, Robert Shiller, and Allan Weiss. 1993. "Index-Based Futures and Options Markets in Real Estate." *Journal of Portfolio Management* (January): 83-92.
- Fratantoni, M. C. 1998. "Homeownership and Investment in Risky Assets." *Journal of Urban Economics* 44 (1): 27-42.
- Goetzmann, William N. 1992. "The Accuracy of Real Estate Indices: Repeat-Sales Estimators." *Journal of Real Estate Finance and Economics* 5 (1): 5-53.
- . 1993. "The Single-Family Home in the Investment Portfolio." *Journal of Real Estate Finance and Economics* 6 (3): 201-22.
- Goetzmann, William N., and Matthew Spiegel. 1995. "Non-Temporal Components of Residential Real Estate Appreciation." *Review of Economics and Statistics* 77 (1): 199-206.

- . 1997. "A Spatial Model of Housing Returns and Neighborhood Substitutability." *Journal of Real Estate Finance and Economics* 14 (1-2): 11-31.
- Gyourko, Joseph, and Peter Linneman. 1996. "Analysis of the Changing Influences on Traditional Households' Ownership Patterns." *Journal of Urban Economics* 39 (3): 318-41.
- Gyourko, Joseph, Peter Linneman, and Susan M. Wachter. 1998. "Analyzing the Relationships among Race, Wealth and Homeownership in America." *Journal of Housing Economics* 8: 63-89.
- Haurin, Donald, Patric Hendershott, and Susan M. Wachter. 1996. "Borrowing Constraints and the Tenure Choice of Young Households." Working Paper W5630. Cambridge, Mass.: National Bureau of Economic Research.
- Hendershott, Patric, and Sheng Cheng Hu. 1981. "Inflation and Extraordinary Returns on Owner-Occupied Housing: Some Implications for Capital Allocation and Productivity Growth." *Journal of Macroeconomics* 3 (2): 177-203.
- Lamont, Owen, and Jeremy C. Stein. 1999. "Leverage and House-Price Dynamics in U.S. Cities." *Rand Journal* 30 (3): 498-514.
- Ling, David C., and Garry A. McGill. 1998. "Evidence on the Demand for Mortgage Debt by Owner-Occupants." *Journal of Urban Economics* 44 (3): 391-414.
- Meyer, Richard, and Kenneth Wieand. 1996. "Risk and Return to Housing, Tenure Choice and the Value of Housing in an Asset Pricing Context." *Real Estate Economics* 24 (1): 113-51.
- Poterba, James. 1992. "Taxation and Housing: Old Questions, New Answers." *American Economic Review* 82 (2): 237-42.
- . 1994. "Tax Subsidies to Owner-Occupied Housing: An Asset Market Approach." *Quarterly Journal of Economics* 99 (4): 729-52.
- Rosenthal, Stuart, John Duca, and Stuart Gabriel. 1991. "Credit Rationing and the Demand for Owner-Occupied Housing." *Journal of Urban Economics* 30 (1): 48-63.
- Scanlon, Edward. 1999. "The Impact of Homeownership on the Life Satisfaction of African Americans." Working Paper. Center for Social Development, Washington University.
- Shiller, Robert J., and Karl E. Case. 1996. "Mortgage Default Risk and Real Estate Prices: The Use of Index-Based Futures and Options in Real Estate." *Journal of Housing Research* 7 (2): 243-58.
- Shiller, Robert J., and Allan N. Weiss. 2000. "Moral Hazard in Home Equity Conversion." *Real Estate Economics* 28 (1): 1-32.
- Spiegel, Matthew. 2001. "Housing and Construction Cycles." *Real Estate Economics* 29 (4): 521-51.
- Spiegel, Matthew, and William Strange. 1992. "A Theory of Predictable Excess Returns in Real Estate." *Journal of Real Estate Finance and Economics* 5 (4): 375-92.
- Stein, Jeremy. 1995. "Prices and Trading Volume in the Housing Market: A Model with Down-Payment Effects." *Quarterly Journal of Economics* 110 (2): 379-406.
- Voith, Richard P., and Theodore M. Crone. 1999. "Risk and Return within the Single-Family Housing Market." *Real Estate Economics* 27 (1): 63-78.
- Wieand, Kenneth. 1999. "The Urban Homeowner's Residential Location Decision in an Asset-Pricing Context." *Real Estate Economics* 27 (4): 649-67.