



**JOINT CENTER FOR HOUSING STUDIES  
OF HARVARD UNIVERSITY**

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**The Policy Implications of Portfolio Choice  
in Underserved Mortgage Markets**

**LIHO-01.8**

**William N. Goetzmann and Matthew Spiegel**  
August 2001

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**Low-Income Homeownership  
Working Paper Series**

# **Joint Center for Housing Studies**

## **Harvard University**

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This paper was prepared for the Joint Center for Housing Studies' *Symposium on Low-Income Homeownership as an Asset-Building Strategy* and an earlier version was presented at the symposium held November 14-15, 2000, at Harvard University. The Symposium was funded by the Ford Foundation, Freddie Mac, and the Research Institute for Housing America.

This paper, along with others prepared for the Symposium, will be published as a forthcoming book by the Brookings Institution and its Center for Urban and Metropolitan Policy.

All opinions expressed are those of the authors and not those of the Joint Center for Housing Studies, Harvard University, the Ford Foundation, Freddie Mac, and the Research Institute for Housing America.

## **Abstract**

Homeownership increases the incentive to maintain property and neighborhood, as well as decreasing the outflow of rents from low-income zones. However these benefits are not costless to homeowners. With a mortgage comes the possibility of default, the financial demands of maintenance, a reduction in alternate investment opportunities, an increased exposure to fluctuations in local economic conditions, and a drastic reduction in the liquidity of personal wealth.

Recently, policy makers have sought to increase mortgage lending in traditionally underserved markets. In this paper we consider the effects of this policy in light of the risk and return of housing and the current tax treatment of the home mortgage deduction. We find housing to be a relatively poor asset class in which to invest the bulk of family wealth. Trends in housing suggest that a large percentage of homeowners who bought and sold within a five-year horizon in the United States over the last 20 years lost money on the investment. Lowering the equity required to purchase a home does little to alleviate the problem. We show that the current tax code if anything encourages renting over buying and gentrification of low-income housing markets.

If the government wishes to encourage homeownership among low-income families despite the risks, then we argue that government agencies should share information about the risk and return of homeownership with its citizens. In addition, a direct subsidy through a tax credit may be both warranted and necessary to achieve the desired result.

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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 William Clinton  
The National Homeownership Strategy: Partners in the American Dream.  
U.S. Department of Housing and Urban Development, May 2, 1995.

## I. Introduction

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 paper examines the investment value of U.S. housing over the past 20 years. The results suggest that the capital appreciation of housing over the 20-year period from 1980 to 1999 was substantially less than the return to U.S. stocks, bonds and mortgage-backed securities over the same period. Although the comparison to stocks and bonds over the last two decades is somewhat unfair, given how well financial assets performed compared to historical norms, housing did not even fair well when compared to 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 20 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 relative 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 paper. 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 area wide 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 (GSE) 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. While relaxing the wealth constraints affecting tenure choice, (c.f. Gyourko, Linneman and Wachter 1998, Gyourko and Linneman 1996, Haurin, Hendershott, and Wachter 1996) increasing LTV ratios also add substantially to the risk of default. In addition, higher LTV ratios create conditions for increasing the volatility of housing prices (see Stein 1995 and Lamont and Stein 1997) 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 LTV's in underserved mortgage markets may encourage gentrification. Higher LTV ratios substitute downpayments 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 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 (1997) estimate that the necessary subsidy may be as much as six percent per year of the homeowner equity investment.

The paper is organized as follows. Section II examines the historical data on housing as a financial investment with an overview of available housing return data, including returns and risks. It then examines the policy implications. Section III examines how government tax and policies and changes to lending rules interact in the family's decision to purchase or rent any particular dwelling. Section IV concludes.

## **II Housing as an Investment**

### *Implications of the OFHEO Data*

The Office of 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 MSA's throughout the country. The quarterly indices cover all 50 states plus the District of Columbia and 328 metropolitan statistical areas (MSA), 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 transactions 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 home-owner is not diversified across a number of homes in his region (as is Fannie Mae and Freddie Mac being 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, since 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 1980 to March 2000. This represents an annualized rate of 4.2 percent over the past 21 years. Given that the Consumer Price Index 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 15-year interval average annual real returns across Atlanta, Chicago, Dallas, and San Francisco ranged between eight and 5.8 percent per

year. This pattern continues today. Summary statistics for a selection of U.S. cities over the 20-year period ending in March of 1999 are provided in Figure 1. The annual real returns for this larger collection of cities range from -1.9 percent to 3.3 percent.

**Figure 1: Summary Statistics for Housing and Other Assets in Real Terms, March 1980 - March 1999**

City	Quarters	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Serial Correlation (%)	Sharpe Ratio
<b>Atlanta</b>	80	0.747	0.964	6.699	-0.391	-0.269
<b>Chicago</b>	80	0.716	0.764	3.139	0.532	-0.638
<b>Dallas</b>	80	-1.105	-1.001	4.495	-0.228	-0.838
<b>San Francisco</b>	80	2.500	2.607	4.731	0.600	-0.034
<b>Detroit</b>	80	0.914	1.031	4.836	0.118	-0.359
<b>Houston</b>	80	-1.971	-1.890	4.028	0.263	-1.156
<b>New York City</b>	80	3.264	3.458	6.488	0.370	0.107
<b>Newark</b>	80	1.904	2.011	4.717	0.691	-0.160
<b>Oakland</b>	80	1.643	1.711	3.752	0.619	-0.281
<b>Philadelphia</b>	80	1.102	1.166	3.632	0.415	-0.441
<b>St. Louis</b>	80	-0.207	-0.154	3.269	0.157	-0.893
<b>Washington DC</b>	80	0.483	0.535	3.247	0.419	-0.687
<b>S&amp;P 500 TR</b>	80	13.330	14.633	17.211	-0.008	0.690
<b>U.S. LT Gvt TR</b>	80	6.417	7.378	14.569	-0.043	0.317
<b>U.S. 30 Day TBill TR</b>	80	2.766	2.775	1.332	0.417	0.006
<b>SB 30 Yr GNMA TR</b>	80	6.122	6.617	10.417	-0.131	0.370
<b>SB 30 Yr FHLMC TR</b>	80	6.480	6.972	10.372	-0.065	0.406
<b>LB Mortgage Inc Ret</b>	80	9.891	9.898	1.262	0.971	5.650
<b>LB Mortgage TR</b>	80	6.127	6.602	10.192	-0.030	0.376
<b>LB Mortgage Cap App</b>	80	-3.260	-2.819	9.306	-0.041	-0.600

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

Perhaps more troublesome in the figure 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 figure 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 Figure 2 the 10 percent nominal annual income return to the Lehman mortgage index exceeds the Houston market nominal return by eight percent per year and the San Francisco market nominal return by 2.4 percent per year. Assuming 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 12 cities.



**Figure 2: Summary Statistics for Housing and Other Assets in Nominal Terms:  
March 1980 - March 1999.**

City	Quarters	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Serial Corr- elation (%)	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 DC	80	4.513	4.559	3.112	0.681	-0.752
S&P 500 TR	80	17.875	19.163	17.430	-0.316	0.704
U.S. LT Gvt TR	80	10.685	11.606	14.619	-0.317	0.322
U.S.30 Day TBill 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
SB 30 Yr GNMA TR	80	10.378	10.848	10.443	-0.077	0.378
SB 30 Yr FHLMC TR	80	10.751	11.212	10.342	-0.065	0.417
LB Mortgage Inc Ret	80	10.000	10.007	1.295	0.867	2.401
LB Mortgage TR	80	10.383	10.831	10.188	-0.037	0.386
LB Mortgage Cap App	80	0.620	1.027	9.206	-0.148	-0.638

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

While price indices give some idea of the growth in housing values, calculating the investor return to purchasing and then selling a home requires the consideration of a number of other factors. Hendershott and Hu (1981) and 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 since 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 other assets like stocks and bonds.

In sum, examining the most current measures of capital appreciation of homes in a number of U.S. cities over the past 20 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. In light of 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 tradeoff between wealth

accumulation by low-income families versus 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*

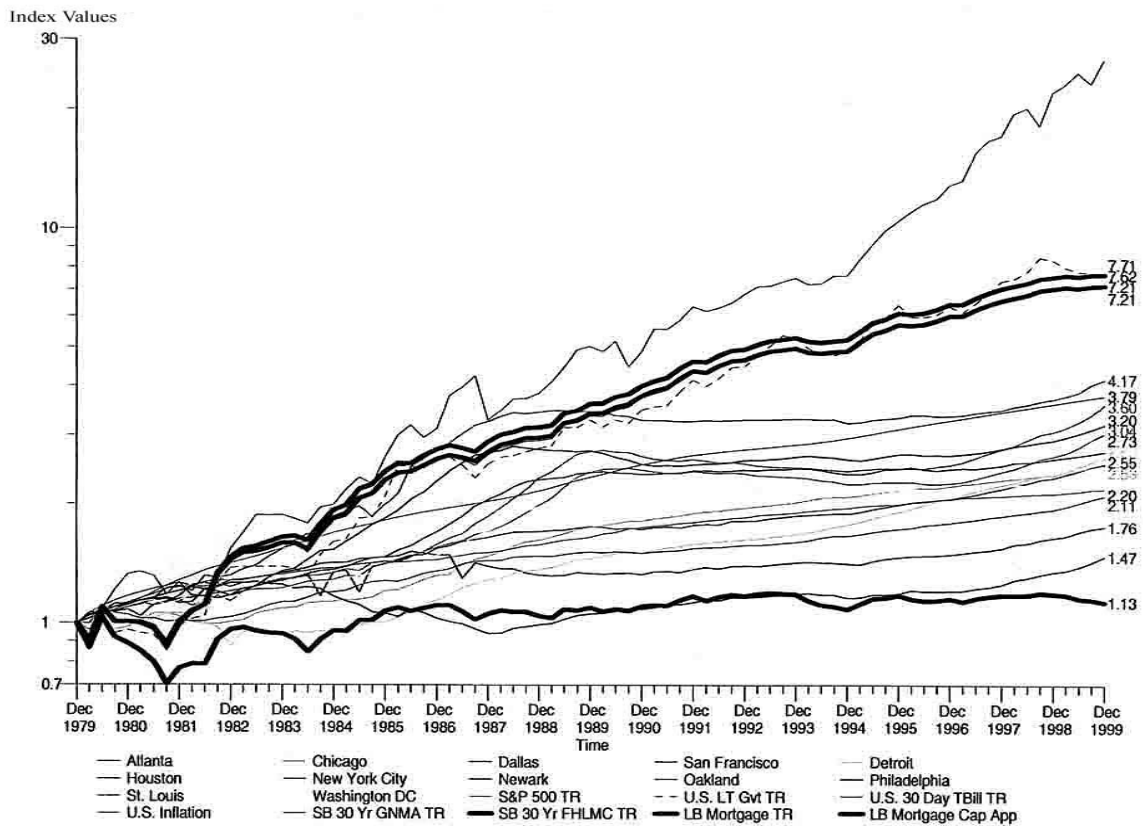
Even with low expected returns, housing may still remain a somewhat attractive investment if it is a sufficiently "safe" vehicle. In our research, we have found it useful to break housing risk down into temporal and non-temporal components the temporal components grow with time and the non-temporal components are associated only with transactions. The non-temporal 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 that the transactions risk to be quite significant as much as six to eight percent in our studies of the San Francisco Bay Area (Goetzmann and Spiegel 1995 and 1997). Thus, it has considerable impact on buyers who may need to move soon.

The temporal components are the risk of the city-wide 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 affects were strong. Using zip-code level indices, we were able to fairly accurately predict the sales prices of homes out-of-sample only eight percent of transactions deviated by more than 10 percent from our local indices. On the other hand, over the five-year period from 1989 to 1994, we found dramatic variation across neighborhoods. The lowest quartile of Bay Area zip codes housing returns experienced no growth, while the highest 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 annual standard deviation figures found in both Figures 1 and 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 3 plots the price indices over the period. It is clear that housing returns do not follow a random

walk.<sup>1</sup> 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, non-temporal risk, and the trends in the index are accounted for, the annualized standard deviation of investing in a single home over a five-year horizon is roughly double the annual standard deviation of the city-level index.

**Figure 3: Housing and Financial Markets**



<sup>1</sup> See Spiegel and Strange (1992) and Spiegel (2000) 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 the serial correlation exhibited by the data is due to either a statistical artifact, or likely to disappear if this information becomes more widespread in the market.

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 the investor's wealth will be invested in that asset class. Even if we ignore the extra risk to long-term investors resulting from non-temporal components, idiosyncratic risk, and auto-correlation in the housing markets, both Figures 1 and 2 show that the Sharpe ratio is negative for every city other than New York. Thus, in very general terms, over the past 20 years most homeowners across the country could have achieved greater wealth accumulation through investing in treasury bills rather than their own home. The one bright spot is that housing is correlated to 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 counter-cyclically. 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 on 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, since they facilitate financial leverage. While 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)."<sup>2</sup> In fact, the motivation for the indices is particularly telling. According to the OFHEO web site:

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.<sup>3</sup>

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

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<sup>2</sup> See OFHEO's website: <http://www.ofheo.gov/about/>.

<sup>3</sup> See <http://www.ofheo.gov/house/faq.html>.

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.<sup>4</sup> 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 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 non-trivial 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 50 states and the District of Columbia, we examined the minimum five-year holding period return.<sup>5</sup> For 30 percent of the states, there exists at least one five-year holding period in the last 20 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 transactions costs are typically on the order of six percent or more once commissions, title insurance, legal fees, and title transfer taxes are taken into account. Using six percent as a benchmark, 41 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 30-year life and an eight percent interest rate, after five years approximately five percent of the loan would have been paid off. Using this criteria families in 32 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 finds that they 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 or not a family might have a negative return on their investment? Ignoring transactions costs, 33 states had five-year periods in which a family would have lost money on their house in a given period. If one includes a six percent transactions cost this figure jumps to 44 states!

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<sup>4</sup> 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  $1 - L/(L+E)$ .

<sup>5</sup> For expositional simplicity the following discussion treats the District of Columbia as a state. Thus, there are 51 indices.

A number of authors have explored the risk of housing and the possibility of mortgage default. Berkovec and Fullerton (1992), Breuckner (1994), Wieand (1996) Meyers and Wieand (1999), Rosenthal, Duca, and Gabriel and Crone and Voith (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.

While positive externalities of homeownership are taken as given, there are potentially serious negative externalities associated with increased mortgage leverage as well. Lamont and Stein (1997) 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 (1977) observe that refinancing is difficult when loan-to-value ratios have increased, and thus homeowners cannot 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 web site 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. While 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 20 years a substantial number of the "beneficiaries" of this policy may find their meager savings severely diminished, if not totally depleted.

Another important step is to encourage the development of markets and instruments that can help homeowners lay off 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.

### **III. Tax Policy, Government Policy and Housing Choice**

#### ***How Taxes Can Undermine Other Housing Policies***

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?

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 consumption divided 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

30-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 (i.e., 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 policy makers 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 currently 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 that pays taxes at a rate of  $t_o$ . Since the property is rented, the federal government allows the landlord to deduct interest and maintenance expenses as well as depreciation ( $\delta P$ ) on the building prior to calculating the tax bill. In equilibrium, a competitive rental market should imply that landlords earn a zero economic rent and thus  $n$  must solve:

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

where  $t_g$  equals the capital gains tax rate on landlords and  $\alpha$  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,

$$(2) \quad n = rP + \alpha EP - [t_o \delta P + (1 - t_g)gP] / (1 - t_o)$$

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

$$(3) \quad t_f r + g > (1 - \alpha)E + [t_o \delta + (1-t_g)g] / (1 - t_o).$$



Notice that the result is independent of the downpayment 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 downpayment simply means a higher lost opportunity cost in exchange for an equal reduction in the expected cost of the mortgage. The only impact the downpayment requirement has is on whether or not purchasing is a feasible option.

Note from (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.<sup>6</sup> Further assume depreciation can be taken on a straight-line basis over 30 years. At first one might suppose that this implies that  $\delta$  equals .033 (1/30). However, once the building is sold, the depreciation taken until that date will then result in a capital gain 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 10 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  $t_o$  term in front of  $\delta$  in equation (3) becomes .396 - .13. Currently the 30-year zero points mortgage annual percentage rate equals approximately 8.509 percent. From Figures 1 and 2 it would appear that annual capital gains on housing come to about four percent in the current inflationary environment. Assume maintenance runs about two percent of a home's value per year. Further assume 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 five-percent income tax would need to earn over \$43,000 per year! Based on this, it seems that tax issues

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<sup>6</sup> 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 [http://www.quicken.com/taxes/articles/917555291\\_21562](http://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 3 provides a breakdown of how the results vary with the tax rate on the marginal landlord.

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 for 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. To obtain a feeling for the relationship Figure 4 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 nine percent would prefer to purchase their residence. This would certainly include most families.

**Figure 4: Tax Rate at Which Families are Indifferent Between Renting or Buying**

Landlord's Tax Rate	Tax Rate at Which the Family Is Indifferent
.2	.03
.25	.09
.3	.158
.35	.237
.4	.329

***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 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 since 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, while 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 their home by X percent. Based upon the arguments in both Shiller and Weiss (2000), and Spiegel (2000) reducing the maintenance incentive in this manner will likely result in a greater fraction of dilapidated homes in

targeted neighborhoods. The resulting blight will then destroy the positive externalities policy makers 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 their 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 thus unwilling to enter into an agreement like this 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 while high-income people frequently rent via a lease. The difference lies in the tax treatment. Unlike a house, the interest on a car loan is not tax-deductible.<sup>7</sup> Thus, allowing higher LTV ratios, equity sharing mortgages, or the emergence in 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.

#### **IV. 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 low correlation to 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

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

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 over investment in housing and higher leverage as potentially dangerous. Over-investment in housing by families with modest savings means under-investment 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. Due to 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 advantage of the program targeting such areas. The result may thus be gentrification, rather than low-income families with their own homes.

Even if higher income families can be prevented from accessing any new loan programs, there is still the issue of whether or not encouraging high LTV loans will convince 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.

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