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The Policy Implications of Portfolio Choice in Underserved Mortgage Markets

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Abstract:

Home ownership 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 State over the last twenty 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 home ownership among low income families despite the risks then we argue that government agencies should share information about the risk and return of home ownership with its citizens. In addition, a direct subsidy through a tax credit may be both warranted and necessary to achieve the desired result.

JEL Classification: R21

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

Home ownership 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 home ownership 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 twenty 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 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 home ownership.

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-tem risks of home ownership. Finally the government should reconsider a tax policy which economically favors renting rather than buying by low income families.

The role of government sponsored agencies [GSE] in encouraging low income home ownership 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 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 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 6% per year of the homeowner equity investment.

The paper is organized as follows. The next section examines the historical data on housing as a financial investment. Section 1.1 contains an overview of available housing return data with Section 1.1.1 looking at returns and Section 1.1.2 risks. Section 1.2 then examines the policy implications. Section 2 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 3 concludes.

1 Housing as an Investment

1.1 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 fifty 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.

1.1.1 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% 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% over the period 1980 to March 2000. This represents an annualized rate of 4.2% over the past 21 years. Given that the Consumer Price Index rose at a 3.7% 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 across Atlanta, Chicago, Dallas and San Francisco ranged between .8% and 5.8% per year. This pattern continues today. Summary statistics for a selection of U.S. cities over the twenty year period ending in March of 1999 are provided in Table 1. The annual real returns for this larger collection of cities range from -1.9% to 3.3%.

Perhaps more troublesome in the table 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 2 the 10% nominal annual income return to the Lehman mortgage index exceeds the Houston market nominal return by 8% per year and the San Francisco market nominal return by 2.4% per year. Assuming the highest marginal tax rate over this period was 40%, it appears that the nominal after-tax mortgage income return exceeded home price appreciation in 9 of the 12 cities.

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 home owners.

1.1.2 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 6% to 8% 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 8% of transactions deviated by more than 10% 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%. Thus, even a well-constructed city wide 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 Tables 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 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

[1]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. There is thus 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.

idiosyncratic risk, non-temporal risk, and the trends in the index is 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.

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 autocorrelation in the housing markets, both Tables 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 the 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. Never-the-less, 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 home-owner's portfolio is 50% to 70%.

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)."[2] 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.[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 household's investment portfolio, then the volatility of the index and LTV ratio is of minor concern. However,

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

[3] See http://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 $1- L/(L+E)$.

for most homeowners in the U.S. 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 does 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% of the states, there exists at least one five year holding period in the last twenty years for which LTV ratios increased by more than 10%. 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% down payment by the end of the period.

In fact, the 30% figure understates the risk. Real estate transactions costs are typically on the order of 6% or more once commissions, title insurance, legal fees, and title transfer taxes are taken into account. Using 6% 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 8% interest rate, after 5 years approximately 5% 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 to not only 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

[5]For expositional simplicity the following discussion treats the District of Columbia as a state. Thus, there are 51 indices.

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 five-year period. If one includes a 6% transactions cost this figure jumps to 44 states!

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 home ownership 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 re-financing option. They link regional recessions to the inability to finance and the constraint on labor mobility.

1.2 Policy Issues and Implications of Risk and Return Measures

Even if home ownership yields positive externalities to the community it is irresponsible to simply encourage home ownership 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 home ownership among citizens of modest income. Home ownership 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 if not totally depleted.

Another important step is to encourage the development of markets and instruments that can help home-owners 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.

2 Tax Policy, Government Policy and Housing Choice

2.1 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 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 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% down payment corresponds to setting D to .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 $C_\ell - C_h > (t_h - t_\ell)rDP$, 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 home ownership. 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 $(1-t_f)rP$ 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 $(1\text{-}t_f)rP + EP$ - 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 (δP) 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:

$$n(1-t_0) \quad = \quad (rP+\alpha EP)(1-t_0)-t_0\delta P-(1-t_g)gP \qquad \textbf{(1)}$$

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,

$$n \quad = \quad rP+\alpha EP-[t_0\delta P+(1-t_g)gP]/(1-t_0). \qquad \textbf{(2)}$$

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

$$t_f r+g \quad > \quad (1-\alpha)E+[t_0\delta+(1-t_g)g]/(1-t_0). \qquad \textbf{(3)}$$

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 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%.[6] Further assume depreciation can be taken on a straight line basis over 30 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 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%. If the landlord holds the building for 10 years then on average the government will recapture taxes equal to about 13% 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

[6]The 39.6% 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). 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. Table 3 provides a breakdown of how the results vary with the tax rate on the marginal landlord.

δ in equation (3) is becomes .396-.13. Currently the 30 year zero points mortgage annual percentage rate equals approximately 8.509%. From Tables 1 and 2 it would appear that annual capital gains on housing come to about 4% in the current inflationary environment. Assume maintenance runs about 2% of a home's value per year. Further assume third party maintenance only runs 20% 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%. To reach this marginal tax rate a family of four in a state with a 5% 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 home ownership.

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 Table 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% then families with a marginal tax rate of more than 9% would prefer to purchase their residence. This would certainly include most families.

2.2 Policy Proposals and Their Potential Impact on Low Income Home Ownership

In addition to the government's proposal to relax LTV ratios to encourage low income home ownership 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 publically 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% of the home would effectively reduce a family's incentive to modernize, improve, and maintain their home by X%. 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 home ownership.

The other academic proposal for reducing home ownership 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 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 home ownership 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.[7] 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.

3 Conclusion

U.S. housing policy has long encouraged home ownership 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

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

historical return and a serious risk of loss over multiple-year horizons. We argue that, if the government chooses to actively encourage home ownership it has the 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 home ownership 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 home ownership. 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.

4 References

Ambrose, Brent W. and William N. Goetzmann, 1998, "Risk and Incentives in Underserved Mortgage Markets," *Journal of Housing Economics* 7: (3) September 274-285.

Berkovec, James and Don Fullerton, 1992, "A General Equilibrium Model of Housing, Taxes and Portfolio Choice," *The Journal of Political Economy*, 100: (2) April, 390-429.

Breuckner, Jan K., 1997, "Consumption and Investment Motives and the Portfolio Choice of Homeowners," *Journal of Real Estate Finance and Economics*, 15: (2), October, 159-180.

Calhoun, Charles A., 1996, "OFHEO House Price Indexes: HPI Technical Description," Working Paper, Office of Federal Housing enterprise and Oversight.

Caplin, Andrew, Charles Freeman and Joseph Tracy, 1997, "Collateral Damage: Refinancing Constraints and Regional Recessions," *Journal of Money, Credit and Banking*, 29: (4) November, 496-516.

Caplin, Andrew, 1999, "Housing Asset Portfolios and the Reform of the Housing Finance Market," *TIAA-CREF Research Dialogues*, 59, February.

Case, Karl, Robert Shiller, and Allan Weiss, 1993, "Index-Based Futures and Options Markets in Real Estate," *Journal of Portfolio Management*, 19(2), 83-92.

Fratantoni, M.C. , 1998, "Homeownership and Investment in Risky Assets," *Journal of Urban Economics*, 44: (1) July, 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.

Goetzmann, William N., 1993, "The single-Family Home in the Investment Portfolio," *Journal of Real Estate Finance and Economics*, 6: (3) May, 201-222.

Goetzmann, William N. and Matthew Spiegel, 1997, "A Spatial Model of Housing Returns and Neighborhood Substitutability," *Journal of Real Estate Finance and Economics*, 14: (1-2) January-March, 11-31.

Goetzmann, William N. and Matthew Spiegel, 1995, "Non-Temporal Components of Residential Real Estate Appreciation," *Review of Economics and Statistics*, 77: (1) February, 199-206.

Gyourko, Joseph and Peter Linneman, 1996, "Analysis of the Changing Influences on Traditional Households' Ownership Patterns," *Journal of Urban Economics*, 39: (3), May, 318-341.

Gyourko, Joseph, Peter Linneman and Susan M. Wachter, 1998, "Analyzing the Relationships among Race, Wealth and Home Ownership in America," *Journal of Housing Economics*, 8: December, 63-89.

Haurin, Donald, Patric Hendershott and Susan M. Wachter, 1996, "Borrowing Constraints and the Tenure Choice of Young Households," *NBER Working Paper* N. W5630.

Lamont, Owen and Jeremy C. Stein, 1999, "Leverage and House-Price Dynamics in U.S. cities," *Rand Journal*, 30: (3) Fall, 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), 113-151.

Poterba, James, 1984, "Tax Subsidies to Owner-Occupied Housing: An Asset Market Approach," *Quarterly Journal of Economics*, 99: (4) November, 729-752.

Poterba, James, 1992, "Taxation and Housing: Old Questions, New Answers," *American Economic Review*, 82(2), 237-242.

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): 243-258.

Shiller, Robert J., and Allan N. Weiss, 2000, "Moral Hazard in Home Equity Conversion," *Real Estate Economics*, 28(1), 1-32.

Spiegel, Matthew, and William Strange, 1992, "A Theory of Predictable Excess Returns in Real Estate," *The Journal of Real Estate Finance and Economics*, 5(4): 375-392.

Spiegel, Matthew, 2000, "Housing Return and Construction Cycles," Working paper Yale School of Management.

Voith, Richard P. and Theodore .M. Crone, 1999, "Risk and Return within the Single Family Housing Market," *Real Estate Economics*, 27: (1), Spring, 63-78.

Wieand, Kenneth, 1999, "The Urban Homeowner's Residential Location Decision in an Asset-Pricing Context," *Real Estate Economics*, 27: (4) 649-667.

Table 1: Summary Statistics for Housing and Other Assets in Real Terms: March 1980 – March 1999

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.

City	Quarters	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Serial Correlation (%)	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 DC	80	0.483	0.535	3.247	0.419	-0.687
S&P 500 TR	80	13.330	14.633	17.211	-0.008	0.690
U.S. LT Gvt TR	80	6.417	7.378	14.569	-0.043	0.317
U.S. 30 Day TBill TR	80	2.766	2.775	1.332	0.417	0.006
SB 30 Yr GNMA TR	80	6.122	6.617	10.417	-0.131	0.370
SB 30 Yr FHLMC TR	80	6.480	6.972	10.372	-0.065	0.406
LB Mortgage Inc Ret	80	9.891	9.898	1.262	0.971	5.650
LB Mortgage TR	80	6.127	6.602	10.192	-0.030	0.376
LB Mortgage Cap App	80	-3.260	-2.819	9.306	-0.041	-0.600

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

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.

City	Quarters	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Serial Correlation (%)	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

Table 3: 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

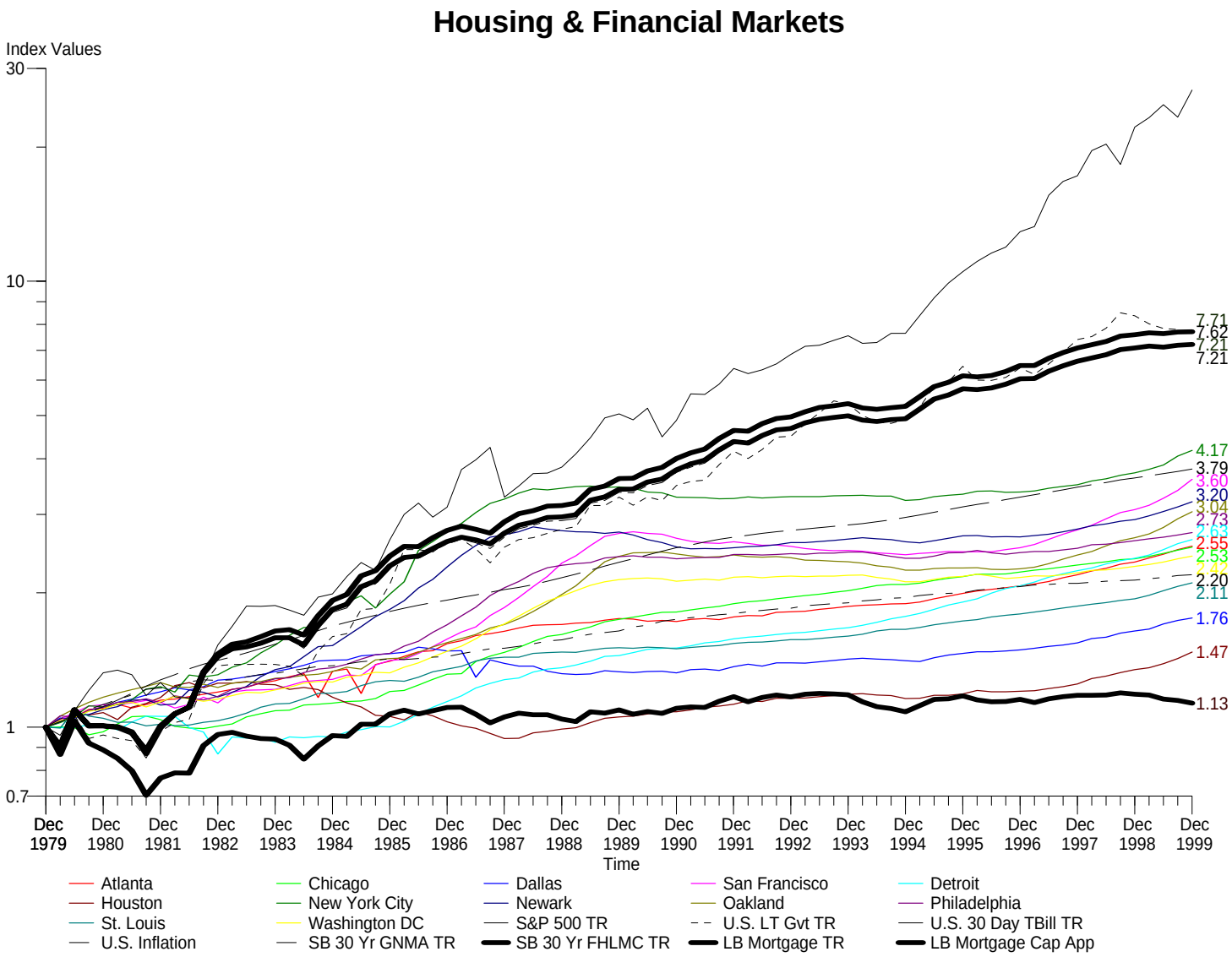
Housing & Financial Markets
Index Values
30
10
1
0.7
7.71
7.62
7.21
7.21
4.17
3.79
3.60
3.20
3.04
2.73
2.63
2.55
2.53
2.42
2.20
2.11
1.76
1.47
1.13
Dec 1979
Dec 1980
Dec 1981
Dec 1982
Dec 1983
Dec 1984
Dec 1985
Dec 1986
Dec 1987
Dec 1988
Dec 1989
Dec 1990
Dec 1991
Dec 1992
Dec 1993
Dec 1994
Dec 1995
Dec 1996
Dec 1997
Dec 1998
Dec 1999
Time
Atlanta
Chicago
Dallas
San Francisco
Detroit
Houston
New York City
Newark
Oakland
Philadelphia
St. Louis
Washington DC
S&P 500 TR
U.S. LT Gvt TR
U.S. 30 Day TBill TR
U.S. Inflation
SB 30 Yr GNMA TR
SB 30 Yr FHLMC TR
LB Mortgage TR
LB Mortgage Cap App

Figure 1