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Housing Wealth Effects and the Course of the US Economy:
Theory, Evidence, and Policy Implications
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November 2008
W08-7

Housing wealth soared in the United States from 2000-2005. After tracking real income growth closely for at least the previous 30 years, house price appreciation catapulted ahead of income growth. Apart from a brief period during the dotcom bubble, home equity has long been the largest single component of household net worth and commanded a record share by 2005.[1] Moreover, because stock wealth is more concentrated than housing wealth, home equity is vital to more Americans.

This boom in housing markets was credited with fuelling consumer spending by making homeowners feel wealthier and inclined to spend more freely and borrow more liberally. The steady rise in the national homeownership rate beginning in 1994 and peaking in 2004 added to these "wealth effects" on consumer spending by contributing more than 5 million additional owners over and above the nearly 8 million attributable to household growth.[2]

At the same time, the transaction costs of refinancing dipped, mortgage rates fell sharply from 2000-2003, and credit was extended as never before to borrowers previously denied access due to past problems repaying their debts. This created a degree of liquidity for tapping housing wealth that was without precedent. Second mortgage debt outstanding (in the form of home equity lines and loans) increased $480 billion from 2000-2005 in 2007 dollars and the amount of real dollars cashed out through refinancing over those years was $826 billion, compared with $179 billion in the previous five years. Furthermore, turnover in the housing stock hit new highs (Figure 1). This increased borrowing and home sales helped cash-strapped homeowners, who might not otherwise have had the opportunity to spend from current housing wealth, to do so.

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[1] Federal Reserve Flow of Funds Tables.
[2] US Bureau of the Census. Housing Vacancy Survey, adjusted for the benchmarking to 2000 Census in 2002.

Figure 1: Turnover in the Housing Stock Hit New Highs in 2005

Existing Home Sales as a Share of the Owner Housing Stock (Percent)
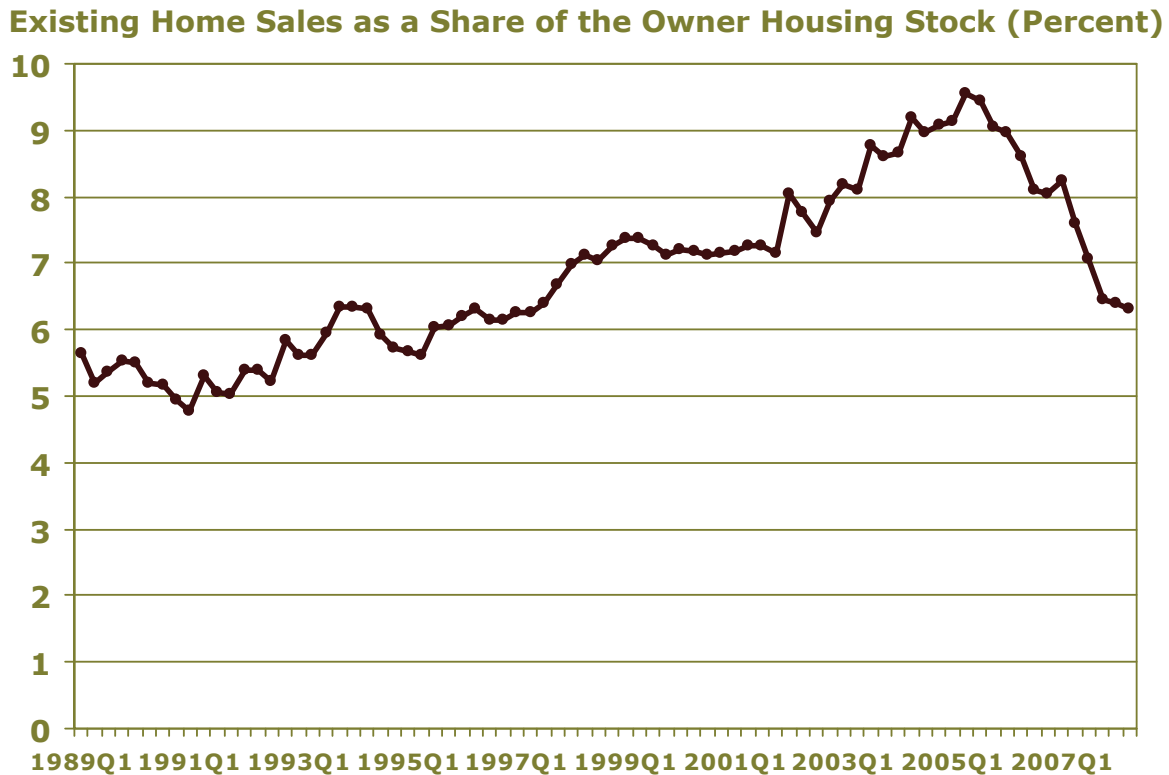
Note: Owner housing stock includes owner occupied housing and vacant for-sale homes.
Sources: National Association of Realtors, Total Existing Home Sales (single-family, condo & co-op; SAAR); US Census Bureau, Housing Vacancy Survey.

These favorable conditions for wealth effects of housing to fuel consumer spending had ended abruptly by 2007. On a weighted average basis home prices fell across all three major US indexes of house price change. The S&P/Case-Shiller index of repeat sales peaked in the second quarter of 2006 and had fallen 18.2 percent by the second quarter of 2008, while both the Office of Federal Housing Enterprise Oversight Purchase-Only Index and the Freddie Mac Conventional Mortgage Home Price Index had peaked by the second quarter of 2007, falling 2.3 and 3.5 percent respectively a year later. Nevertheless, the dominant role that housing wealth has played in the net wealth of households and in the strength of the economy will continue long after the painful correction in domestic housing and mortgage credit markets, and indeed in global capital markets precipitated by the US subprime meltdown, has ended.

Housing wealth effects have been studied extensively in the US and abroad. While there is general consensus, based on several approaches to modeling wealth effects, that rising home

values stimulate consumers to spend more than they would if their values were flat or declining, the estimates of the magnitude of the effect differ sharply and in some cases no effect has been detected. In addition, empirical evidence is mixed on the magnitude of the wealth effects relative to the magnitude of effects of other non-housing assets which appreciate and depreciate in value. Most, but not all, studies show changes in housing wealth have a larger impact than changes in other forms of wealth. Moreover, only recently has the possible effect on the magnitude and timing of wealth effects of the cost and availability of home equity loans and lines of credit, cash-out refinances, and realized capital gains been considered. Lastly, not much explicit attention has been paid to whether housing wealth effects are symmetric; that is whether the impact on consumer spending of a change in housing wealth has an equal impact on consumer spending whether prices rise or fall.

All these aspects of housing wealth are matters of great consequence for understanding consumer spending—which makes up more than two-thirds of total domestic product—and for formulating public policy on housing and the economy. This paper examines the importance of housing wealth to the balance sheets of the more than two-thirds of American households who own homes, to total tangible US assets, and to broader economic activity through the mechanism of housing wealth effects. The paper ends with conclusions based on the theory and evidence on wealth effects, and draws out the policy implications of what is known, thought, and not known about these effects.

Housing Wealth Trends

Housing is the cornerstone of household net worth. Though its share of aggregate wealth in the household sector has ebbed and flowed, it has usually exceeded that of other assets. Since 1970, the real estate share of household sector wealth has been markedly higher than the corporate equity share except for a brief period during the tech boom. After peaking at 32.3 percent in 1981, the real estate share fell to 23.5 percent in 1999, but recovered and has remained above thirty percent in recent years. (Figure 2).

Figure 2: Except Briefly During the Tech Boom, Real Estate Has Been a Larger Share of Household Wealth than Stocks

Aggregate Share of Household Sector Net Worth (Percent)

Corporate Equities —■— Real Estate
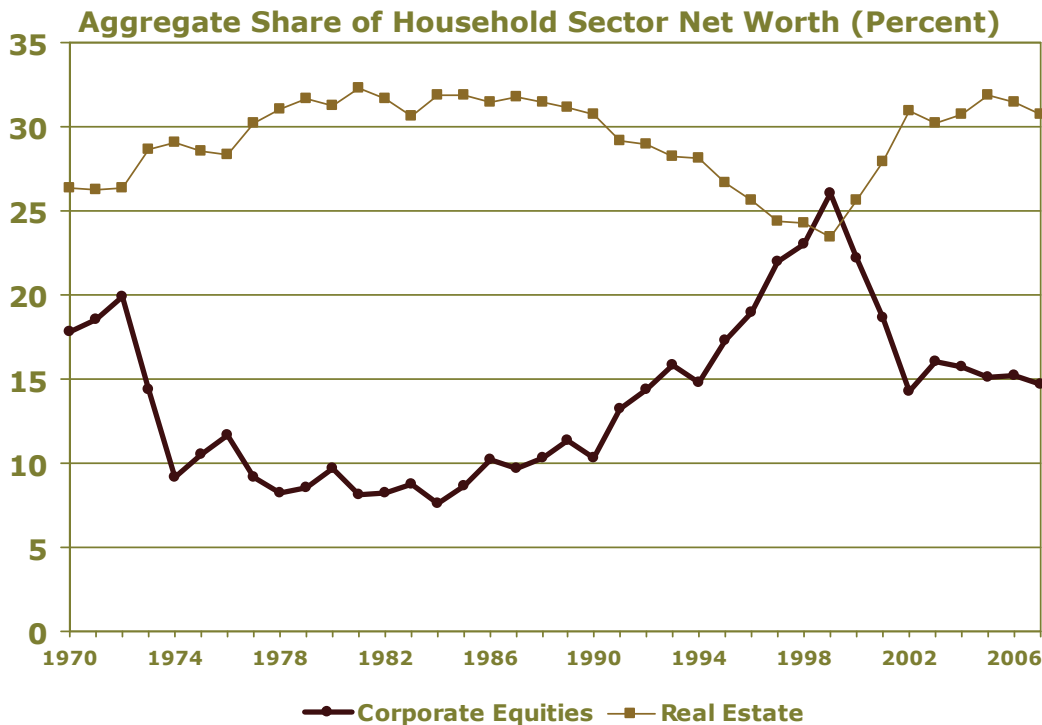
Notes: Corporate equities include both directly held stocks and mutual funds. Household sector includes both households and nonprofits.
Source: Federal Reserve Board Flow of Funds.

Not only is home equity a major part of the value of household assets, the total value of residential real estate has long been a significant component of the nation's tangible wealth. The real estate share of fixed assets and durable goods held steady at slightly over one-third during most of the 1980s. In the last two decades the share has increased gradually, starting at 33.7 percent in 1990 and reaching 35.7 percent in 2000 and 38.5 percent by 2005. Though the 2005 share is the highest since 1929, even at its lowest point in 1970 residential real estate was still 31.8 percent of national tangible assets.[3]


The Distribution of Housing Wealth

Among those who own homes, home equity is a larger fraction of wealth among younger, minority, and low-income owners than of others (Figure 3). Although the median home equity

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[3] Bureau of Economic Analysis, *Survey of Current Business*, September 2006.

share of household net worth is highest for those aged 65 and over, the aggregate home equity share of net wealth is highest, at 38.2 percent, for homeowners under the age of 35. The median ratio of home equity to net worth for minorities is roughly two-thirds, compared to less than half for whites. For homeowners in the bottom income quartile, the median ratio is 82.8 percent, compared to just 31.4 percent for top-quartile owners.

Figure 3: Home Equity is a Larger Share of Net Wealth for Low-Income and Minority Homeowners
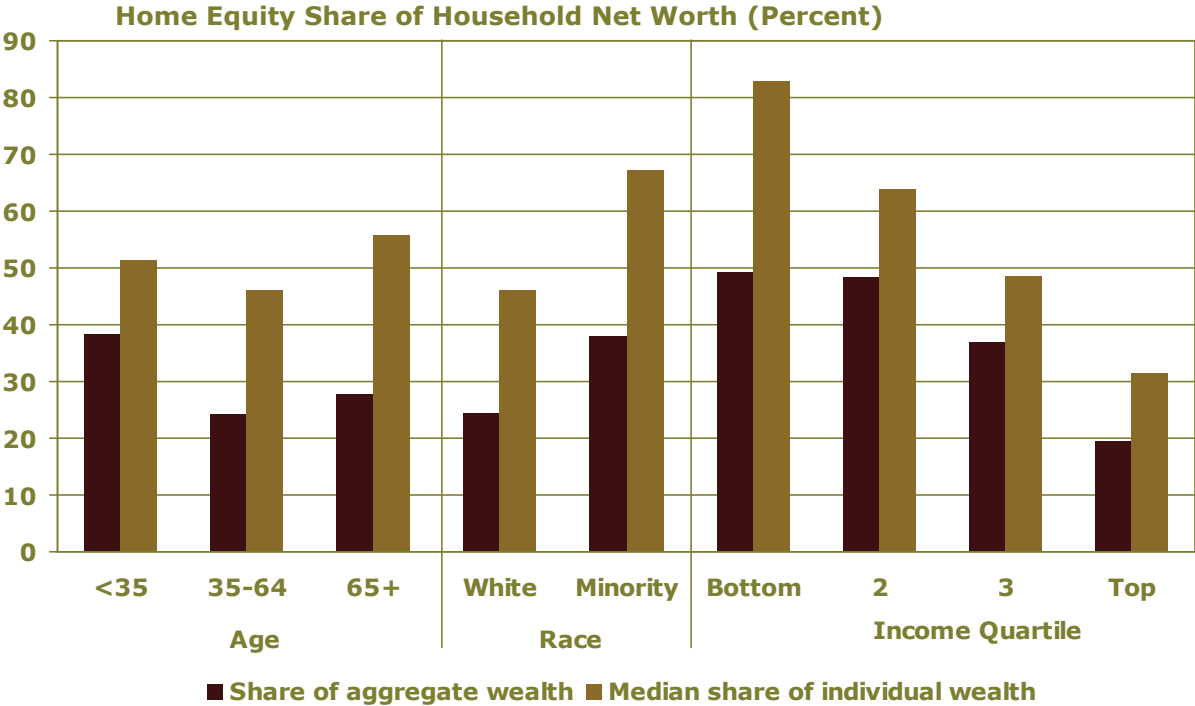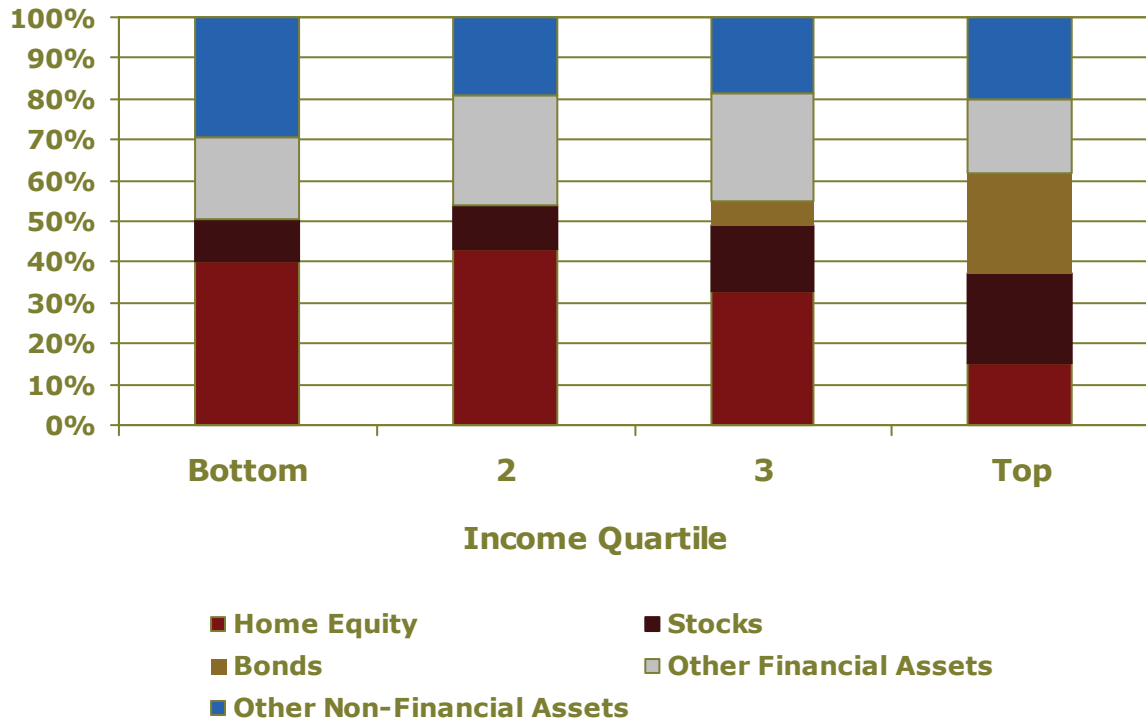

Notes: Whites are non-Hispanic. Minorities are all non-whites. Income quartiles are equal fourths of households sorted by household income.
Source: 2004 Survey of Consumer Finances.

Although home equity is heavily concentrated among households in the top fifth of the income distribution, it is less so than other forms of wealth (Figure 4). Though households in the top income quartile hold almost 60 percent of home equity, their share of bonds by value is 96 percent and of stocks, 85 percent. Though holding only 6.3 percent of the nation's home equity, the bottom quartile of households still has nearly four times as large a share of housing wealth as it does of stocks, nearly twice as large a share as of other financial assets, and half again as large

a share as of other non-financial assets. Thus, changes in housing wealth affect more consumers and, presumably, that portion of consumer spending which responds to fluctuations in home values.

Figure 4: Especially Non-Housing Wealth is Heavily Concentrated in the Top Income Quartile

Notes: Income quartiles are equal fourths of households sorted by household income. Home equity includes both primary residences and other residential real estate (e.g. vacation homes). Stocks and bonds are those held directly and do not include mutual funds.
Source: 2004 Survey of Consumer Finances.

Leverage and Owner-Renter Disparities in Net Wealth

At any point in time, the wealth holdings of homeowners are dramatically greater than those of renters for all age, income, and racial and ethnic groups (Figure 5). Homeowners under the age of 35 have 20 times more wealth than their renting peers, but seniors 65 and over have 53 times the wealth of renters of similar ages, with a median net worth of $230,200 compared to just $4,300. The net worth of both minority and of low-income homeowners is both about 40 times

more than those of similar renters. Even though renters in the top income quartile have a median net worth of $60,700, that of top quartile owners is seven and a half times higher at $461,600.

Figure 5: Compared to Owners, Renters Have Little Net Wealth
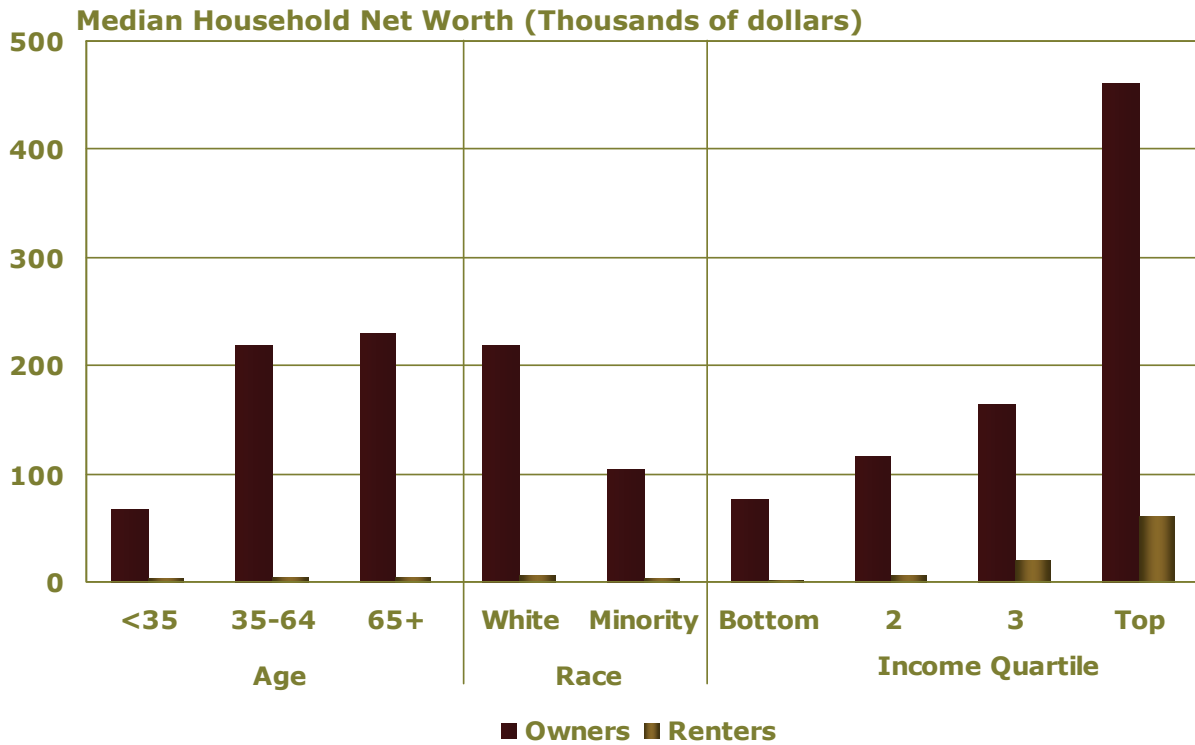
Median Household Net Worth (Thousands of dollars)

Notes: Whites are non-Hispanic. Minorities are all non-whites. Income quartiles are equal fourths of households sorted by household income.

Source: 2004 Survey of Consumer Finances.

Part of this wide disparity reflects self-selection – those most motivated to save and invest are also likely most motivated to own homes and start out as homeowners earlier in their lifecycles. It is difficult to control for this self-selection bias because standard datasets do not ask questions that might help distinguish between those who do and do not have such motivations. Even if such questions were asked, it would be hard to quantify responses. In one study that attempted to use prior period savings and investment among renters as a predictor of future transitions to homeownership and correlation with later housing wealth, the authors did not find a statistically significant effect (Di, Belsky, and Liu 2007).

That same study found that homeowners' greater wealth accumulation persisted even after obvious factors that might have caused owners to have more wealth were controlled for, including starting wealth when they first transitioned to ownership, income, education, and age. The main reason that those who invest in housing likely accumulate more wealth (even after subtracting equity borrowing which they can tap but renters cannot) is that homeownership presents a unique opportunity to earn a leveraged return on investment. Few households would be able to, or do, get credit to acquire stocks or bonds. But a majority of households are able to get mortgage credit at least at some point in their lives. Though just twenty years ago, 20 percent or greater down payments were the norm while 10 percent down payments were uncommon and down payments of 5 percent or less were rare, by the middle of the 2000 decade down payments of 10 percent were common and of 5 percent or less becoming so. Among first time home owners in 2007 that bought in 2005 or later, 23 percent had less than 10 percent equity in their home and 12 percent had less than 5 percent. Comparable shares in 1997 (first time owners who bought in 1995 or later) were 18 percent and 8 percent.[4]

Leverage provides an opportunity to translate small nominal or real gains in the value of housing into much greater ones. Even a 20 percent down payment boosts returns fivefold and a 5 percent down payment twenty-fold. The non-trivial fraction of borrowers who put no money down at purchase are in a position to benefit from large potential returns relative to whatever minimal transaction costs they incur. Leverage also means that while upside potential is unlimited, losses are capped at the amount of money put down.[5]

Of course, other items must be considered. There is a cost of capital, transaction costs are much greater for buying and selling homes than for moving among rentals, and the tax treatment of ownership and rental housing are different. Thus, the proper way to compare the costs of owning and renting is through a user-cost framework. Formally, the use cost of capital (U_c) for homeownership summed over n years for each of years "i" and purchase year "0" is:

$$\sum U_c = \{(1-t)[m_i + P_i(pr)_i] + P_i(d_i + op_i) + P_0(1-\alpha)(a)_i + pmi_i\} + P_i(tr_o + tr_n) + B_r(tr_r) - [g + t(nhd)]$$

[4] Department of Housing and Urban Development, 2007 American Housing Survey.
[5]Cross-sectional studies of differences in the wealth of owners and renters also do not control for the fact that those who fail in ownership (and reduce the wealth they may have accumulated) show up as renters. Thus, cross-sectional differences, even if they control well for income, education, and other factors, overstate the benefit to homeowners and disguise the very real fact that housing depreciates as well as appreciates in value at different points in time.

Where P_i = house value in year "i;" $G = (P_n\text{-}P_0)$ = house value in sale year minus house value in purchase year; t = owner's marginal tax rate; m = mortgage interest paid annually; pr = annual local property tax rate; d = annual depreciation rate of the housing stock; op = operating costs, including maintenance, repairs, and insurance; pmi = annual cost of mortgage insurance if any; upb = unpaid principal balance; tr_0 = transaction costs as a share of house value in any years the mortgage was refinanced; a = the rate of return on alternative investments, usually stocks or bonds; α = the percent of the house value financed; and nhd = non-housing tax deductions taken by the owner.

While all the elements in the calculation have an impact, those which dominate the user cost (and the relative costs of owning and renting for that matter) are price changes and the amount of leverage. Under exceptional circumstances, interest rates can also play a pivotal role, as when they soared in the early 1980s. But in the normal course, it is by how much home prices go up or down that makes the big difference. Indeed, backwards looking expectations about home prices (home prices will go up or down as much in the future as they did in the recent past) is credited with creating periods in which prices are driven well ahead of rents as households make a rough user cost calculation in their head before they decide how much they are willing to pay now to reap the rewards of expected appreciation later (Case and Schiller 1988, 1989; Glaeser and Gyourko 2008).

The Rising Tide of Mortgage Debt

Aggregate home equity as a share of aggregate housing wealth declined over the course of the 1990s (and until home prices peaked nationally in 2006) both because average down payments declined and because owners borrowed against their equity as never before. After that time, equity borrowing slowed. But by 2008 lenders were demanding larger down payments and the aggregate debt outstanding held steady while the aggregate value of housing assets deflated. As a result home equity as a share of house value eroded even more (Figure 6).

Figure 6: The Equity Share of Home Value Has Been Falling for More than Two Decades
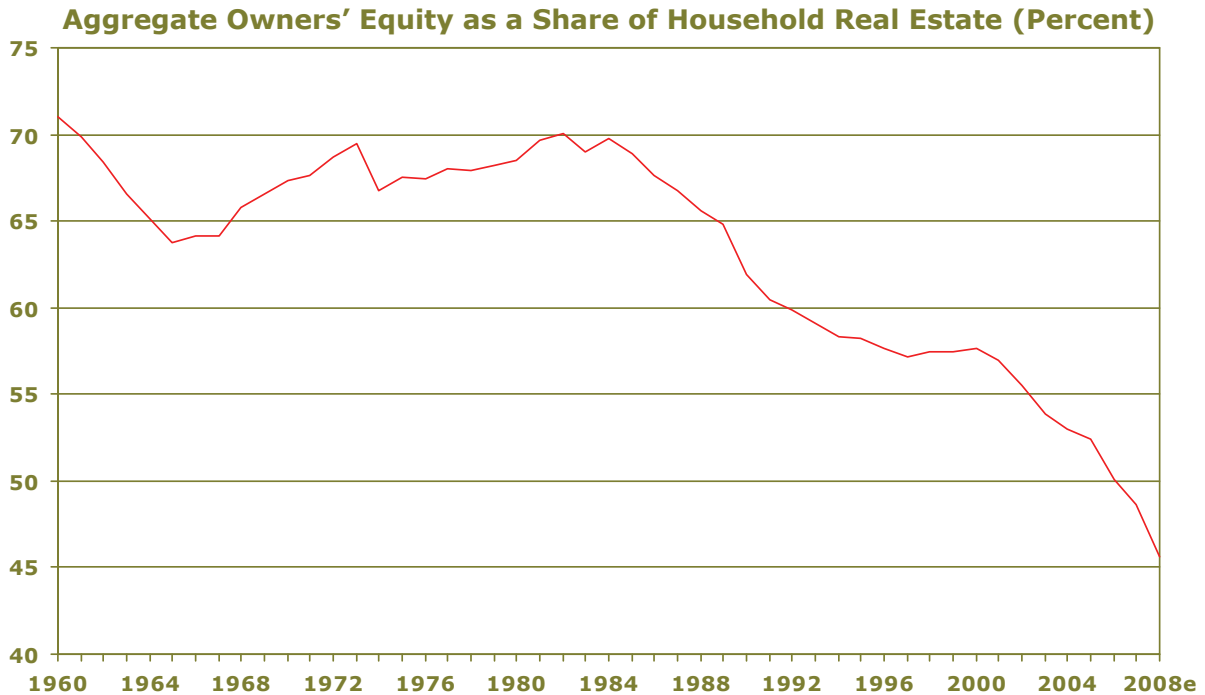
Aggregate Owners' Equity as a Share of Household Real Estate (Percent)

The willingness of borrowers to start out with lower debt and then take on higher amounts of debt, and a larger share of mortgage debt relative to their home values is showing up across age groups in their cohort mortgage-debt (Masnick et al. 2006). Comparing homeowners in 1990 and 2000, older age groups have shown an increasing propensity to borrow, increasing both their debt balances and the age at which they can expect to be mortgage-free (Figure 7). This shift toward greater indebtedness later in life may mean that these cohorts will still be carrying heavy debt loads past the peak earning ages of 45-54 and even into retirement age, forcing them to work longer, sell their homes, or find an alternate way to support continued high living expenses as their income declines.

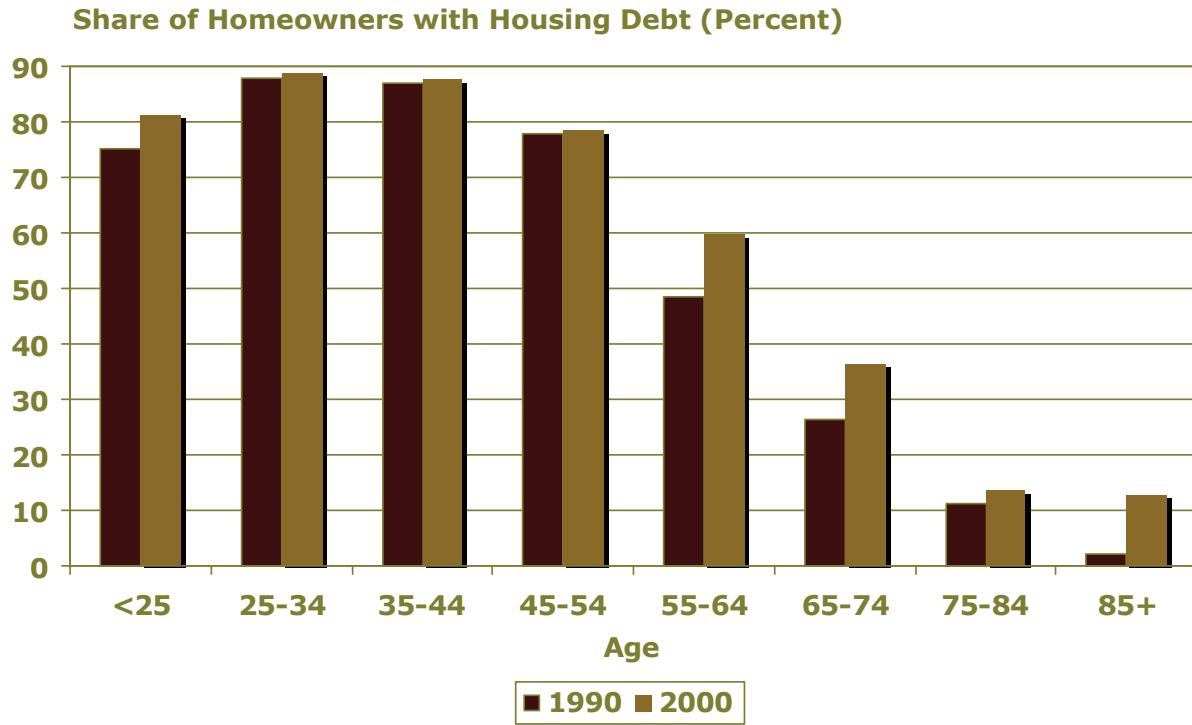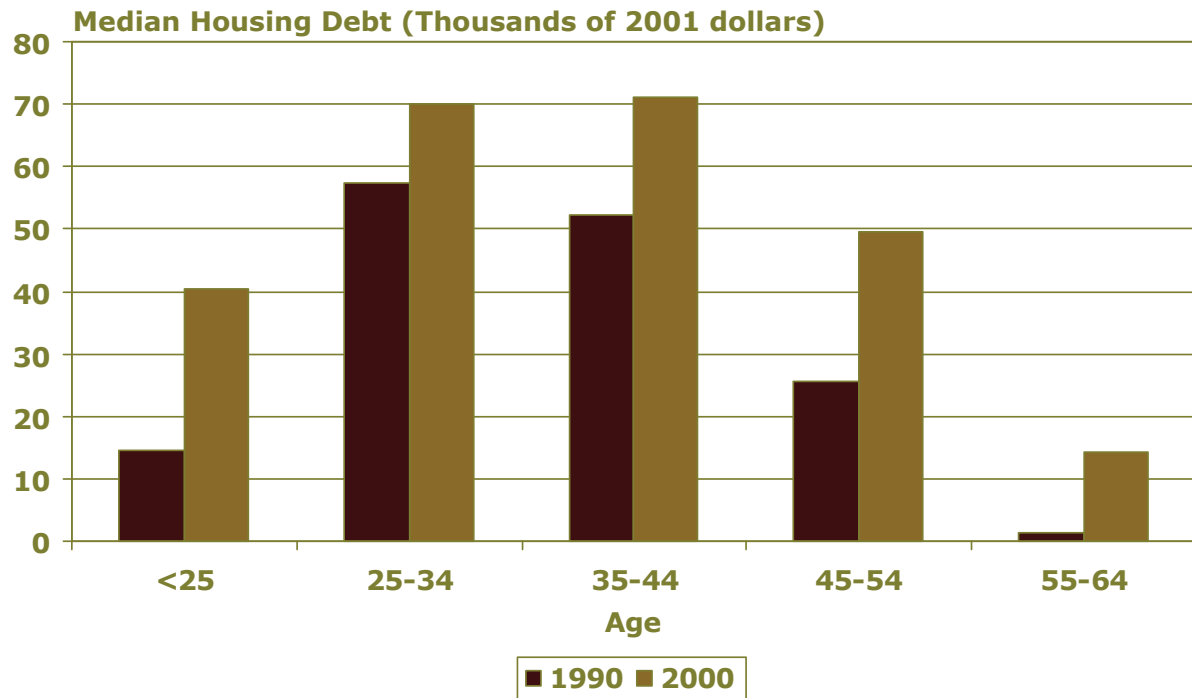**Figure 7a: More Homeowners are Carrying Higher Debt Loads Later in Life**

Share of Homeowners with Housing Debt (Percent)

Age

■ 1990 ■ 2000

Figure 7b:

Median Housing Debt (Thousands of 2001 dollars)

Age

■ 1990 ■ 2000

Source: Masnick et al. (2006).

Home Equity Extraction

Unlike other forms of wealth in which it is usually possible to sell fractional shares to raise cash, the only way to extract equity from homes is to either sell a home and purchase a home of lesser value or borrow more against home equity. Furthermore, the transaction costs of buying and selling homes are enormous relative to selling, say, stocks or bonds. Financial asset sales involve small commissions and fees while the services of a real estate broker alone typically amount to several percentage points of the selling price, not to mention moving costs, legal costs, and the closing costs on the next home if continuing as an owner. To tap equity, therefore, owners must either sell their homes and purchase one of lesser value or borrow against their home equity. This raises the possibility that housing wealth will have different effects on consumer spending when more homes are being sold and when home equity borrowing is more vigorous than when they are not, especially for households that lack savings or other assets they can sell to spend from newfound housing wealth.

Thus, it is worth taking measure of the full extent of home equity borrowing over the recent past. The ability to tap home equity as never before and at a time when interest rates were historically low in nominal and real terms, as we will see below, appears at a minimum to have pulled forward some of the long-term effects of housing wealth on consumer spending and may even have increased it as the price discovery process added to households' perceived wealth. In theory, choking off home equity borrowing should have a similarly compounding, depressing effect, though this has not been studied yet in the recent period.

Forms and Trends in Extractions

Former Chairman of the Federal Reserve Board, Alan Greenspan, viewed home equity extraction as so important that even as the sitting chairman, he co-authored a paper that produced a set of consistent time series of home equity extractions. He grouped these into realized capital gains upon sale, equity extracted through paying off one mortgage and replacing it with a larger one, and second mortgage borrowing (Greenspan and Kennedy 2005).

Some simple charts tell the tale: the amount of home equity extraction through borrowing soared during the 2000s in a truly epic manner (Figure 8). In 2005 total real mortgage equity extracted through home equity loans and cash-out refinancing was $1,880 for every adult and child in the United States, nearly ten times the level in the early 1990s. Though equity extraction

through home equity borrowing peaked in 2004, and cash-out from refinancing peaked in 2005, neither dropped significantly until 2007, and even then the combined total still amounted to $1,136 per capita.

Figure 8: Home Equity Extraction through Borrowing Soared During the 2000s
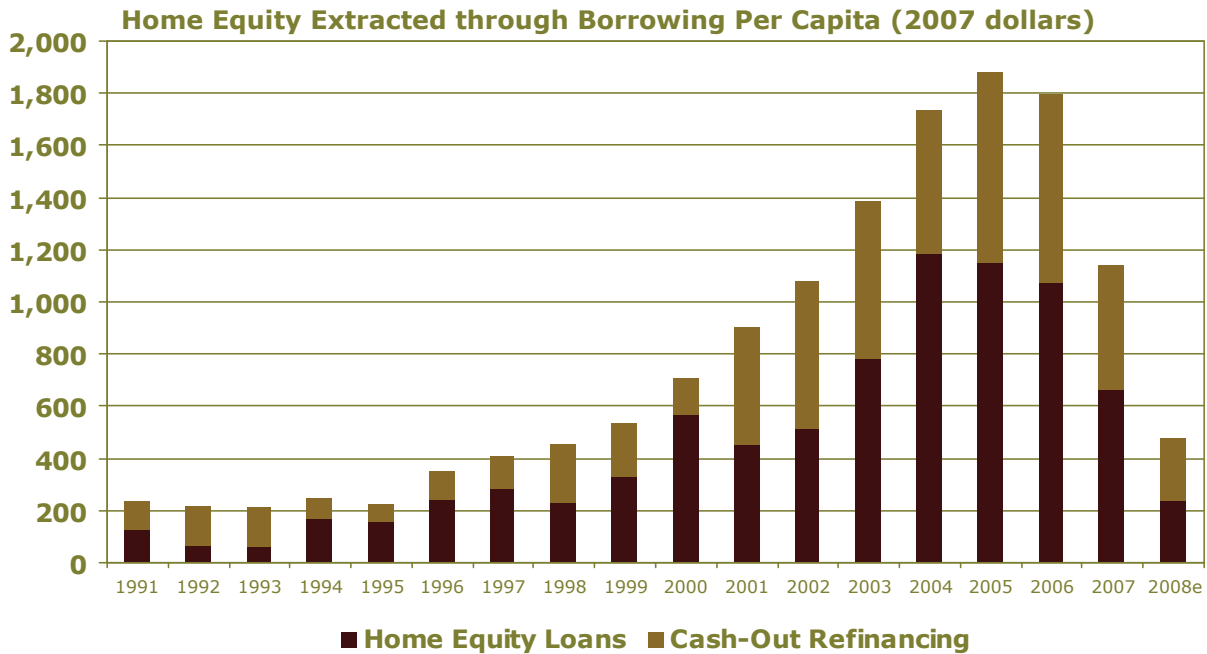
Notes: Dollar values adjusted for inflation using the CPI-U for All Items. 2008 figure based on first two quarters only.
Source: US Census Bureau, Population Estimates; US Federal Reserve Board, Mortgage Equity Withdrawal Data from Greenspan & Kennedy (2005) as assembled by Moody's Economy.com.

The velocity of home sales also reached new levels, unlocking additional stores of home equity and converting it to cash in the pockets of consumers (Figure 9). In 2005 realized capital gains on sale reached almost one trillion dollars. While most of these proceeds were likely put towards a down payment for the next home purchase, if one is to believe a recent 2003 NAR survey, 18 percent of net sale proceeds are put to other uses, which in this case amounts to nearly $180 billion (Greenspan and Kennedy 2007). However, this too has done a recent about face, dropping by half by 2007.

Figure 9: Home Sales also Reached New Levels, Unlocking Additional Stores of Home Equity
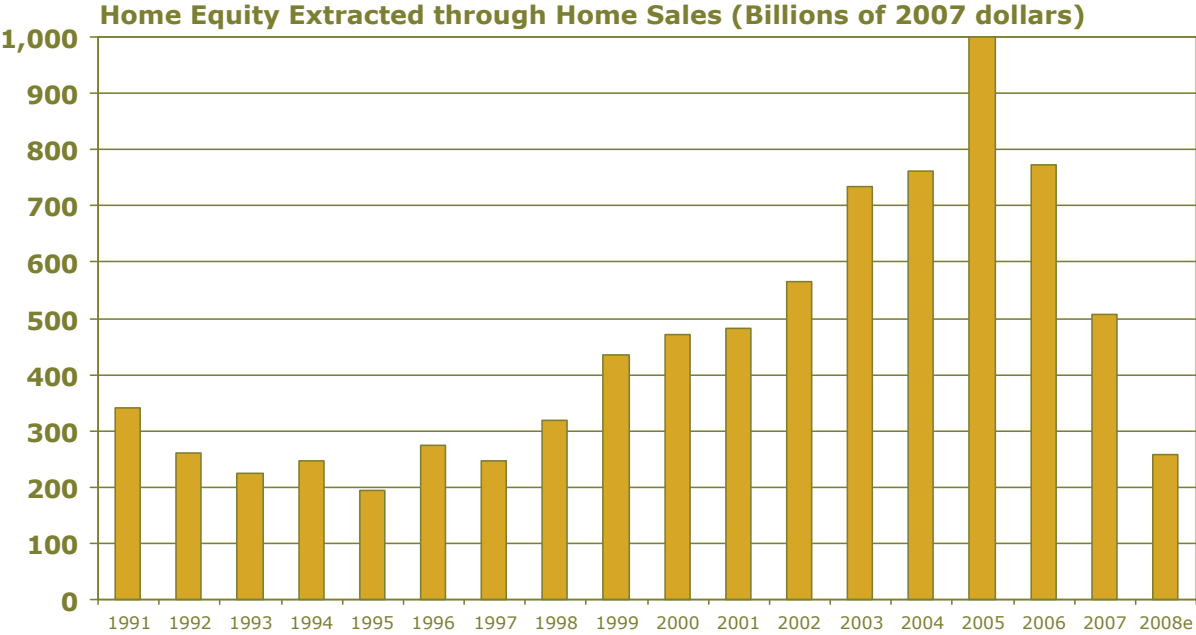

Notes: Does not exclude equity reinvested in another home. Dollar values adjusted for inflation using the CPI-U for All Items. 2008 figure based on first two quarters only.

Sources: US Federal Reserve Board, Mortgage Equity Withdrawal Data from Greenspan & Kennedy (2005) as assembled by Moody's Economy.com.

Reported Home Equity Borrowing Spending Patterns

      Surveys of how households use cash that is freed up through home equity borrowing are instructive. According to the Surveys of Consumers, in 1997 home equity loan borrowers used proceeds to repay other debts 61 percent of the time, and paid for home improvements in 45 percent of cases. The shares were reversed for home equity lines of credit, with 49 percent using proceeds to repay other debts, and 69 percent paying for home improvements. Thirty seven percent of line borrowers, and six percent of loan borrowers, purchased cars, while other consumer expenditure uses included education, medical and business expenses, and vacations (Canner et al. 1998). In 2001 and 2002, 51 percent of borrowers who took out cash when refinancing used proceeds to pay other debts, while 43 percent paid for home improvements and 25 percent used proceeds for consumer expenditures. The dollar share put toward home

improvements was larger, at 35 percent, compared with 26 percent for debt repayment and 16 percent for consumer expenditures (Canner et al. 2002).

It is also revealing to consider how home equity is used by those in extreme financial distress to avert disaster by studying how consumers in bankruptcy used cash out. In an unpublished 2007 survey of 658 bankrupt homeowners and former homeowners, fully 43 percent said they had refinanced a mortgage and 32 percent had borrowed against equity at some point before filing. Though some borrowers cited changing their loan terms as a motivator, the major reason given for taking out post-purchase loans was debt consolidation. That is, 62 percent of home equity borrowers and 53 percent of refinancing owners who filed for bankruptcy first used home equity to pay down other debts. Other reasons for tapping equity included paying for home improvements (48 percent of home equity borrowers and 28 percent of refinancing owners), paying off medical bills (17 and 13 percent respectively), financing a business (11 and 6 percent), and getting cash for day-to-day needs (2 and 5 percent).

These survey findings and descriptive results, however, leave open the question as to whether the additional spending would have occurred anyway in the absence of home equity borrowing. In theory, rising wealth should trigger further spending regardless. Households can borrow in other ways to finance consumption and investment when they have greater wealth. While borrowing against home equity is usually less expensive because it is secured and tax-advantaged, there are other ways to borrow, and many households can simply spend more from current income and save less or sell other assets for cash. Nevertheless, given the important role that debt plays in financing consumption, and considering the low savings rates and thin holdings of non-housing assets among many households in the US, it is not unreasonable to want to test for possible effects of freeing liquidity constraints on housing wealth effects.

Housing Wealth Effects

The theoretical exposition and empirical testing for wealth effects is far more formal than the simple caricature it is reduced to for communication to lay audiences. The notion that consumers spend more as their wealth increases, while intuitive, is rooted in life-cycle theory. This theory also explains why consumers tend to borrow earlier in life and later save more.

The most direct antecedent to life-cycle theory was the permanent-income hypothesis posited by Friedman (1957). Friedman put forward the theory that consumers base their current

consumption decisions in part on expectations of their future income. Ando and Modigliani (1963) extended this idea by positing that households smooth their consumption over their lifetimes by borrowing against future earnings early in life, building wealth and repaying debts in the middle of life, and spending down wealth and using government transfer payments late in life. More specifically, lifecycle theory holds that current consumption (C) of any individual household i is a function of life expectancy (LE), expected labor income and government transfer payments YE, wealth entering the period (W), and a personal discount rate (D) that captures time preference for consumption. In other words, at any time t:

$$C_i = LE_i + YE_i + W_i + D_i.$$

There are several observations to make about this formalization. First, notice that it refers to an individual household. The theory holds that each household will have its own expectation as to how many years it will be until each member in the household dies, what their expected income from labor and transfers will be, a known level of wealth, and an individual time preference for consumption today versus consumption in the future. Thus, approaches that use macroeconomic methods to estimate wealth effects implicitly assume that the aggregate data reflect millions of individual choices and expectations.

Notice also that this formulation does not distinguish between different forms of wealth. Thus, the model is largely mute on the question of whether different forms of wealth might, for any number of reasons, have different effects. But also notice that life expectancies play a pivotal role. The model assumes that households smooth their consumption over the expected remaining period of the lives of its members. Thus, if there are differences (and there are) in the average ages of people with different assets, the model does imply a higher wealth effect for assets held by older people on average (less time left to spend it over their lifetimes). Finally, note that current period wealth does play a role so that as overall wealth in a nation increases, over time the wealth effects should be larger. Thus, though simple, the model does generate specific predictions.

This theory, like all, is an abstraction from reality. One of the important simplifying assumptions is that consumers do not face any liquidity constraints. In fact, the model basically assumes that consumers have unimpeded and costless access to perfect capital markets. This, of

course, is not the case. There are many barriers to accessing credit markets and there are costs of tapping them. Furthermore, these barriers and costs vary over time.

Another important simplifying assumption is that households plan to spread out their savings and consumption so that on the last householder is penniless on last day of his or her life and not a day sooner. This plan of course would be difficult to get right even if one intended it because lifespan is uncertain and difficult to predict. In addition, it does not take into account motivations many have to bequeath their wealth to heirs or charities. In practice, it is clear that many people do have a motivation to bequeath wealth (Browning and Crossley 2001). Indeed, far from being smooth, consumption over the lifecycle is lumpy and not characterized by the amount of borrowing early in life and savings in middle age predicted by the life-cycle model (Courant, Gramlich, and Laitner 1984). Nevertheless, several microeconomic estimations of wealth effects have found that these effects are smaller among younger than older consumers, as the theory predicts (Fellowes and Mabanta 2007, Li and Yao 2007).

In reality, the model abstracts from a spate of uncertainties that prevent actual smoothing of life-cycle consumption (Hubbard, Skinner, and Zeldes 1994). People do not know with certainty how much they will earn in the future, when and for how long and how many times they will experience employment gaps, when and for how long they will pair up with additional earners in a household, how long they will live, their medical expenses, and what the returns to their investments will be. Nor do these models take account of findings that mental accounts are managed differently. Thaler (1990) found that individuals form "mental accounts" and treat the accounts for current income, current assets, and future income differently. He found that the marginal propensity to consume from current income is close to unity, from future income near zero, and from current assets somewhere in between. This helps explain a key finding not predicted by the lifecycle model: consumers spend more heavily from windfall current income gains than from increases in current asset values and do not spread out windfall spending smoothly over time (Courant, Gramlich, and Laitner 1984).

All of this notwithstanding, the simple intuition of the model is compelling. And testing of it has produced results largely—though by no means entirely—consistent with the theory's predictions. Macroeconomic studies, especially, have found a relationship between wealth gains and consumption. In some cases, the overall effect is surprisingly close to what the model would suggest ought to occur in the aggregate given the average age of consumers and published life

expectancies. Belsky and Prakken, for example, find a 5.5 cent marginal propensity to consume from a dollar of housing wealth which accords with average ages and life expectancies. Moreover, it is most common to find wealth effects in the 3 to 7 cent range (Poterba 2000).

Others have balked at the notion that these empirical results provide confirmation of life-cycle theory. Poterba and Samwick (1995) have posited that future expectations, not actual stated values of wealth, may matter most. Morck et al. (1990) have argued that asset prices are correlated with future output so higher asset prices may just be a leading indicator of future output that governs consumption. Romer (1990) argued that it is consumer confidence that influences both spending from wealth and overall consumption. Less refuted is that there is an empirical effect of aggregate wealth gains on aggregate consumer spending under most specifications and in most places.

There have been many ways wealth effects have been tested and wide differences in results with respect to the magnitude and timing of effects, the impact of liquidity constraints and home equity borrowing costs on effects, if effects are symmetrical when home values are rising or falling, and if they differ in timing and magnitude from non-housing wealth effects. Each of these is discussed below.

Approaches to Testing and Estimating the Effects

There are two principal methods used to estimate housing wealth effects. One fits models to macroeconomic data while the other fits them to microeconomic data. Within these broad categories, a host of different model specifications and variables are utilized and applied to different datasets, over different timeframes, and in a variety of different countries. It is customary to use a measure of personal consumption expenditures even though, at least in the US, such a measure does not cleave precisely to theory. In fact, personal consumption expenditures include durable good spending when what should be included to be consistent with theory is the imputed flow of services derived from the stock of durable goods (Belsky and Prakken 2004). The accuracy of house price measures, which are at the heart of testing for a housing wealth effect, is subject to question. In the US the three most widely used measures— two of them based on repeat sales and one on the median of homes sold through the Multiple Listing Services maintained by state and local associations—differ in their volatility and range. Choice of measure, or making an implicit choice by using a government series like the Flow of

Funds account that estimates aggregate changes in housing wealth, makes a difference. The same is the case for many other variables, including the values of corporate equities.

Many macroeconomic models take a log-log form. In this specification, the coefficient on the housing value variable can be directly interpreted as the percent change in monthly, quarterly or annual consumption brought about by a monthly, quarterly, or annual percent change in housing value. Not surprisingly, these coefficients, in all studies that find an effect, are always a fraction since the spending down of wealth is parceled out over a considerable period of time (which theory predicts is based on life expectancies) and added wealth does not cause people to spend more than the addition. A host of different controls are included to account for other factors that drive changes in consumption, but the most notable and important are labor income, transfer payments, and asset income.

In the context of microeconomic analysis, the measures of spending used depend on the specific question asked rather than on national income and product accounts which are heavily massaged by government agencies to provide a basis for macroeconomic analysis. In these microeconomic models it is also common to use more readily available homeowners' estimates of value rather than actual revealed market prices. In some respects, though, this has the advantage of gauging people's perceived values and, in the absence of refinancing or selling, it is these perceived values that may well govern spending. Also, many surveys that contain detailed information on wealth also contain detailed information on savings and different categories of assets, but do not have much information on consumption. Studies using these surveys look mostly at the effect of changes in home values on savings and portfolio composition (Haurin and Rosenthal 2004). Still, a reduction in savings is tantamount to an increase in current consumption.

The Magnitude and Timing of the Effects

There are two ways of expressing the magnitude of wealth effects. The elasticity of consumption with respect to housing wealth is the percent change in spending brought about by a 1 percent change in house value. The marginal propensity to consume (MPC) is the aggregate amount by which consumption increases relative to aggregate wealth and is usually expressed as a number of cents on the dollar. The MPC is therefore influenced not only by the elasticity of consumption but also by the ratio of wealth to consumption at any point in time.

The overwhelming majority of studies find a housing wealth effect and the size of the impact is material. However, there is considerable variation in the magnitude of these effects from no impact to large ones. The smallest impacts were found in microeconomic studies by Skinner (1989) and Englehardt (1996). Using household survey data in the US covering the period 1969-1979, Levin (1998), for example, did not find a statistically significant relationship between housing capital gains and the marginal propensity to consume. Lettau and Ludvigson (2001) found essentially the same thing using a macroeconomic approach, and Tan and Voss (2003) the same using data from Australia. Two studies of the influence of wealth expectations also produced no effect (Thaler 1990, Hoynes and McFadden 1997). But these studies are the exceptions.

The Federal Reserve of the United States has been estimating wealth effects since the 1960s. These estimations were based on models that constrained the housing wealth effect to two times the stock effect through the early 1990s. These estimates found that the marginal propensity to consume from housing wealth was about 6 cents in 1978, 8 cents in 1983, and 7 cents in 1985. After lumping housing wealth in with all other forms of non-housing wealth in revisions to the model made in the early 1990s, the constraint on the size of the non-financial wealth effect relative to the stock effect was lifted. After this revision the Federal Reserve found that this effect was about 7-8 cents. Belsky and Prakken (2004) found a 5½ cent effect in the US when modeling macroeconomic data dating back in some cases to 1960. They found that housing reached fourth-fifths of these long-run effects within one year. Case, Quigley and Shiller (2005) used data for the US from 1982 to 1999 to estimate the effect in the US and found an elasticity of 0.05 -0.09 percent. Kishor (2007), examining US macroeconomic data from 1952-2002, found a marginal propensity to consume from housing wealth of 7 cents on the dollar. Cross-country comparisons using macroeconomic models are consistent with these effects. Case, Quigley, and Shiller (2005) across 17 OECD countries found housing wealth effect elasticities of between 0.11 and 0.17. Looking at OECD countries, Ludwig and Slok (2002) found similar results. Sierminska and Takhtamanova (2007), using micro-data on wealth, found that elasticity of consumption with respect to housing wealth was 0.12 in Canada, 0.10 in France, and 0.13 in Finland. They report that Pichette and Tremblay (2004) found a similar value for Canada using a macroeconomic estimation. Raymond et al. (2007) found an elasticity of 0.10–0.15 in Hong Kong from 1983-2005, and Kim (2003) found an elasticity of 0.229 from 1988-2003 in Korea.

While these estimates clearly vary, effects in the 0.10 percent to 0.17 percent range for every 1 percent change in housing value are not uncommon, and low-end estimates fall in the range of 0.03 percent to 0.05 percent.

Microeconomic analysis has the benefit of enabling researchers to test for differences in wealth effects by subgroups. One might expect from the theory, for example, that spending from housing wealth will be lower for those with a stronger bequeath motivation but greater for the old without such a motivation because they have fewer years over which to draw down the increased wealth. Skinner (1989) found no propensity to increase consumption from changes in housing wealth among seniors, reflecting either strong bequest incentives or reticence to trade down or borrow to tap housing wealth. Yet Li and Yao (2007) find an increased propensity for seniors to downsize in response to house price risk. In addition, Campbell and Cocco (2007) found that in the UK higher home prices had a larger impact on the consumption of older homeowners than others. With respect to income, Fellowes and Mabanta (2007) found that lower income people in the US increase their borrowing as they age and that low-income seniors take on more revolving credit than younger low-income people. Haurin and Rosenthal (2004) used the Survey of Consumer Finance and the Longitudinal Survey of Youth to examine income differences as well. They found that a one dollar increase in house price appreciation raised debt from 13 cents to 16 cents for their full samples but by different amounts for three income groups studied.

Home Equity Withdrawal Effects

Very little work has been published on the potential influence of relaxing liquidity constraints on the magnitude or timing of housing wealth effects. Recall that the life-cycle theory of consumption assumes that consumers have costless and unrestricted access to credit. This is, of course, not the case. Those with low credit scores have difficulty accessing capital markets, and access varies over time in response to cycles of tightening and loosening underwriting standards. Furthermore, interest rate movements can have a dramatic impact on how much consumers borrow to support consumption.

Canner, Dynan, and Passmore (2002) speculated that home equity withdrawals might have an influence on housing wealth effects because owners may discover their home is worth may than they thought when they refinance or sell. The idea that homeowners will discover that

their homes are worth more than they thought is supported by studies which have found that homeowners on average do underestimate their home's value (Kain and Quigley 1972; Goodman and Ittner 1992). Thus, when they go to sell or refinance, owners may find they have more wealth than they thought and spend more accordingly. In addition, Canner and his colleagues contended that some homeowners are both liquidity constrained and have their wealth locked up in a home. Thus, the only way they can tap it is to sell or borrow against it.

The only study to directly test for separate home equity withdrawal effects in the US found that home equity withdrawals had a significant but temporary effect of boosting consumption by about 5 cents for every dollar increase in liquidations (Belsky and Prakken 2004). Accounting for home equity withdrawals also increased the model fit. Given that the 5 cent effect found is smaller than the 25 cents on the dollar suggested by survey data in the US of how much consumers say they spend on consumption, this likely reflects substitution of home equity borrowing for other forms of credit consumers would have used to spend from their greater wealth.

Time Series Properties of Wealth Effects

Few studies have tested to see whether wealth effects are different when home values are going up than when they are going down. Most studies fit models that show wealth effects making a positive contribution to consumption during periods of increasing values and negative contributions during periods of falling values. The most convincing evidence that wealth effects may be asymmetric comes from a study by Case, Quigley, and Shiller (2005). This study found an asymmetric effect in six models of spending based on both data from 14 countries and the US states. Interacting the house value term with dummy variables for periods of declining and increasing prices consistently produced statistically significant differences in the coefficients on the wealth effect. Though the magnitude of the effects varied across the six models, the signs were consistent. Periods of decline produced negligible negative effects and periods of increases produced far larger and positive effects on consumer spending. However, Engelhardt (1996) found the opposite. Modeling panel data on households in the US, he found that households reduced spending when real capital gains fell and did not change their spending much when they increased.

Differences from Non-Housing Wealth Effects

Although a handful of studies find no or barely any evidence of housing wealth effects, the overwhelming majority do. Similarly, of studies that separately estimate housing and stock (corporate equity) wealth effects, the vast majority show a stronger housing than stock effect. The life-cycle consumption theory, with its punishing set of simplifying assumptions, leads to only one reason for a possible difference—the average age of the holders of different assets. But taking a more practical view of the set of factors that might cause the timing and magnitude of effects to diverge, there are several important differences between stock and housing wealth (Catao 2002, Green 2002, Belsky and Prakken 2004, Case, Quigley and Shiller 2005).

First, stock wealth may be viewed as more volatile than housing wealth. If this is the case, one would expect spending from stock wealth to be lower and slower to ramp up to its long-run effect because consumers feel they can count less on the permanency of stock than housing gains. If volatility does drive differences in wealth effects, more volatile stocks should also produce smaller wealth effects than less volatile stocks. Looking just at differences among stocks, Edison and Slok (2001) found this to be the case. Testing more directly for the impact of volatility and the degree of permanence in shocks to stock versus housing values, Kishor (2007) finds evidence that shocks to housing values were more permanent in the US from 1952-2002 and that this helped explain the estimated 4 cent larger marginal propensity to consume from housing than stock wealth.

Second, differences in the tax treatment of housing and stocks could lead to differences in wealth effects. Specifically, the waiving of taxes on real estate assets at bequest might make those with a bequest motivation hang on to housing wealth longer than stock wealth. However, because spending is fungible, this is not a compelling argument. On the other hand, and more importantly, the waiving of capital gains taxes on sales of primary residences might increase the per dollar spending from a gain in wealth because that wealth is not reduced by taxes in the minds of consumers. Hence, the impact of tax differences is ambiguous, although it tilts towards a larger wealth effect for housing than stocks.

Third, price discovery is less certain and more costly in housing than stock markets (Case, Quigley, and Shiller 2005). Heavy volumes of stocks are traded daily, and one can follow the value of a stock literally minute to minute. Houses on the other hand are heterogeneous and trade infrequently. This makes it more difficult to get an accurate assessment of house values.

Typically, owners have to incur appraisal costs to get a decent approximation. Although there are now websites that purport to show daily changes in individual home values, these are not likely accurate, especially during times when homes are especially thinly traded such as during the sales slowdown that enthralled the US in 2007 and 2008. The greater ease in discovering stock prices, though, has an ambiguous influence on wealth effects because it mingles with differences in stock and house price volatility. If in fact volatility, as the evidence suggests, is a significant influence on the magnitude and timing of effects then the impact of sudden movements in stock markets will be discounted and of movements in housing amplified (but in the case of homeowners only after they incur the costs to get a clearer reading on their home's value).

Fourth, and linked to price discovery, is liquidity. Selling stock incurs far lower transaction costs and portions of stock holdings can be readily sold. To tap home equity requires either selling a home and buying one of lesser value or borrowing against home equity. Both actions are more costly than selling stocks, and the latter action involves making a simultaneous decision to take on debt. However, in theory, households that have greater housing wealth and want to spend from it can sell stocks to do so or use other forms of borrowing. To the degree that borrowing against home equity is less costly it is a preferred form of borrowing if a decision is made to finance consumption. Still, those without stocks to sell and disinterested in borrowing to finance consumption may forgo spending out of housing wealth gains in a way that they would not for stock gains. Liquidity considerations, therefore, at least for some, are likely to blunt housing wealth effects relative to stock effects, all else equal.

Fifth, as pointed out by Thaler (1990) and noted above, some forms of wealth may be framed in the minds of their owners as being for long-term savings and others for current use. Poterba (2001) develops this notion specifically in the context of stock wealth effects, invoking it as a possible reason for his finding that wealth effects are larger for stocks held directly than for stocks held in retirement accounts. Absent information on the mental accounting tendencies of consumers with respect to the different assets they hold, the influence of any differences in housing and stock mental accounting are ambiguous.

In sum, there are many reasons to expect that housing and stock wealth effects might be different, but in many cases the impact of the drivers of these difference are ambiguous. On the margins, these reasons tip towards expecting stronger and faster housing wealth effects because both tax treatment and volatility favor larger housing wealth effects.

In the end, though, the question of if and in what direction housing wealth effects differ from stock wealth effects is an empirical question. And the answer to that question is that the majority of studies that have tested for differences have found housing wealth effects to be much greater than stock wealth effects. These studies include the Federal Reserve (Brayton and Mauskopf 1985), Bank of England (2000), the International Monetary Fund (Ludwig and Slok 2002), Case, Shiller, and Quigley (2005), Tse, Man, and Choy (2007), Hrung (2002), Bayoumi and Edison (2003), Kim (2003), Pichette (2004), Benjamin, Chinloy, and Jud (2004), Sierminska and Takhtamanova (2007), Bhatia (1987), and Kishor (2007). Many of these papers estimate housing and stock wealth effects in multiple countries. Both in the US and abroad, using microeconomic and macroeconomic data, these papers often find housing wealth effects to be at least two times and often four or more times greater than stock wealth effects. Indeed, in many stock effects are found to be negligible but housing wealth effects are found to be on the order 0.7-0.17 percent change in consumption for every percent change in housing value. Against these studies are a few that find smaller housing wealth effects (Dvornak and Kohler 2003, Berg and Bergstrom 1995, Levin 1998, and Boone and Girouard 2002). Belsky and Prakken (2004) did not find a material difference in the magnitude of the effects, but did find that housing wealth effects reached their long-run magnitude much faster than stocks, consistent with the view that consumers view housing gains as more lasting so wait less to start spending from these gains.

Conclusions

After lifting the US economy for years following the 2001 recession, housing wealth effects reversed in 2007. While most of the studies reviewed above imply that the drop in US home values and home equity withdrawals will drive down consumption spending via the housing wealth effect, the single study that has tested for asymmetries suggests that the impact going down maybe muted relative to the large boost in spending going up. Indeed, Case, Quigley, and Shiller (2005) found historically negligible effects of falling prices on consumption in the US. For policy makers, uncertainty around how much housing wealth effects may run in reverse during down markets is unwelcome. It leaves economic policy makers and business decision makers alike uncertain just how much pressure consumer spending will come under.

At the broadest level, the fact that rising housing wealth lifts consumption when prices are increasing (as the preponderance of evidence suggests) is consistent with the life-cycle view

of smoothing consumption over the lifecycle. But its close association in the US over much of the period after 2000 with the tapping of home equity to produce these effects has raised a raft of public policy concerns. First, it has resulted in what most feel is a major substitution of mortgage debt for consumer debt. As a consequence, lenders have less of a cushion against losses and defaults during periods of price declines and borrowers less recourse to restructure their debts. In addition, consumer debt is more readily discharged in bankruptcy than housing debt. This leaves borrowers more vulnerable to financial meltdowns from which they cannot recover. Second, it leaves homeowners more vulnerable to scam artists that try to press owners to keep refinancing while packing fees into the new mortgage each time. Third, it means that people, as we have seen, are borrowing against home equity later in life. This means many will have to service debts later into retirement at a time when most are on a fixed income. This will place further pressure on social safety nets. Fourth, it leaves a key source of consumer liquidity tied to house values, amplifying the systemic risks posed by house price declines. Smith and Searle (2008) have also taken note of the fact that less and less of the proceeds of home equity borrowing are finding their way back into housing and more and more into consumption. This long-term trend is viewed as corrosive of wealth accumulation.

Leverage is all important to the absolute and percent return on housing assets. Thus, the tightening of credit standards in 2008 has reduced upside potential returns on investment for new entrants to the market and has elevated downside risks. By leveraging less, the value of homes purchased will be lower, all else equal, and thus the ratio of household wealth to consumption and with it the marginal propensity to consumed from wealth. This could be a drag on the positive influence of house price growth on consumption once the current turmoil has passed.

Summing up, housing wealth effects make a difference to the economy, and the appreciation or depreciation of housing values which drive them make an enormous difference to the balance sheets of over two in three American households. Efforts by policy makers to avoid large swings in values would produce more stability in the economy while providing an opportunity to build wealth in housing with less risk, though also with potentially lower reward.

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