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# 8 Is Housing Wealth a Sideshow?

Jonathan S. Skinner

## 8.1 Introduction

Housing prices rose by 18% in real terms during the 1970s, delivering a $700 billion windfall to homeowners. Housing prices are projected to decline by as much as 47% during the next few decades (Mankiw and Weil 1989), delivering a potential loss of $3 trillion to the next generation of homeowners. These changes certainly affect the accounting wealth of households, but do they really affect the welfare of households? More to the point, will the prospect of future housing-price downturns tarnish the golden years of retirement for the aging baby-boom generation?

In the conventional life-cycle model, a large decline in housing prices should have a strong impact on life-cycle wealth and hence on retirement consumption and welfare. But there is growing empirical evidence that housing wealth changes don't influence consumption and saving behavior. First, Venti and Wise (1991) showed that the annuitized value of housing wealth for the median homeowner is small compared with Social Security and pension wealth, so that a 47% decline in housing wealth would have only minor effects on living standards of the median homeowning retiree. Second, only rarely do the elderly spend down their housing equity at retirement. Merrill (1984) and Venti and Wise (1990) found that, when the elderly move, they are as likely to move into a larger house as a smaller house. Given the scarcity of reverse mortgages, this evidence suggests that the elderly either could not, or did not, tap into the housing windfalls from the boom years of the 1970s. Finally, Skin-

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ner (1989) and Levin (1992) found little evidence that changes in housing wealth among homeowners generated offsetting saving responses. Housing prices may decline by 47%, but if younger homeowners don't save more in response to the price decline, and if retired homeowners don't touch their housing equity, then the price change will have little impact on overall welfare. In short, trends and fluctuations in house prices and housing equity would be just a sideshow.[1]

This paper reconsiders the question of whether housing wealth is a sideshow. I address this question in three general models. The first is the orthodox certainty life-cycle model with the possibility of moving costs and the lack of well-functioning reverse mortgages. That is, one explanation for why housing wealth appears to be a sideshow is simply the presence of moving costs and the inability to tap into housing equity. The second model generalizes the life-cycle model to include a simple bequest motive or the existence of mental-accounting saving behavior (Shefrin and Thaler 1988). In the mental-accounting behavioral approach to saving, for example, housing wealth is "nonfungible" (Levin 1992); therefore changes in housing wealth in this model could have little impact on saving or lifetime welfare.

Finally, the third model considers how uncertainty about retirement income or out-of-pocket health expenses determines the effect of housing wealth on consumption and saving. In the precautionary approach, owner-occupied housing is used as a form of insurance; should the "bad" income or medical draw occur at retirement, housing equity is cashed out, both because of the need for additional cash and because the demand for housing services has declined.

Each of these three models holds different predictions for two key behavioral parameters: (1) What is the marginal propensity to consume housing windfalls for existing (younger) homeowners? and (2) What is the propensity to consume out of housing wealth at retirement for older homeowners? I test each of these hypotheses, as well as the importance of potential housing wealth changes in consumption decisions, using data on saving and housing wealth from the 1989 wave of the Panel Study of Income Dynamics (PSID) and aggregate time-series evidence.

The first behavioral parameter, whether people consume housing windfalls while they are young, is tested using two approaches: the Euler equation approach using aggregate time-series data, and quantile saving regressions using panel microeconomics data. For the aggregate data, the estimated effects are large and quantitatively important, swamping any wealth effects from the stock market. The panel data suggests a more modest effect, with a reduction in median younger homeowner saving of 1–2 cents for every $1 increase in housing wealth, an amount consistent with precautionary saving and life-cycle models.

1. With apologies to Morck, Shleifer, and Vishny (1990).

In the life-cycle model, the housing windfall is used in part to finance retirement consumption. However, the PSID suggests that few retirees actually draw down their housing wealth in any given year (also see Sheiner and Weil 1992; Ai et al. 1990). For those who do "cash out," it is often the consequence of changes in family composition such as widowhood, or because of adverse events such as health declines. Using saving data constructed from the 1984 and 1989 PSID wealth data, I estimate that for those who tap into housing equity, roughly 73% of the proceeds have been spent within four years.

Neither the standard life-cycle model with moving costs and financial constraints, nor the mental-accounting model or bequest model can adequately explain both empirical phenomena. In the life-cycle model, if housing windfalls are reflected in higher consumption while young, there is less nonhousing wealth to finance consumption at retirement. Hence there must be some way to tap into housing equity while retired, to supplement the depleted nonhousing wealth. In the mental-accounting model, housing wealth is nonfungible (i.e., a sideshow) that is consciously set aside, so that windfalls are unlikely to be spent while the homeowner is young. In the bequest model, the housing windfall is spent while young: households simply use the money that had been set aside for their inheritance. In turn, these households would bequeath at death their now more valuable house. The problem with this explanation is that few younger households have enough liquid wealth to provide for their own retirement, much less hold additional wealth available for bequests.

The precautionary saving model, however, can potentially reconcile both of the empirical findings that homeowners spend down housing windfalls while young, yet do not typically tap into housing windfalls while old. Housing wealth is a form of self-insurance that can be drawn upon in the bad state of the world in which liquid cash is needed and housing demand is low. Housing windfalls therefore reduce the need for other types of precautionary saving, and increase consumption among middle-aged homeowners. Because housing wealth is held as a contingency against future risk, many homeowners will not experience the adverse risk. Therefore in the population of elderly, only a small fraction will be observed to tap into their housing equity. In short, housing wealth is *not* a sideshow, but a key component in insuring against retirement contingencies.

## 8.2 The Life-Cycle Model with Financial or Moving Constraints

I first consider a very simple two-period life-cycle model. Because the major focus of this paper is on the saving behavior of middle-aged homeowners, and the dissaving behavior of the elderly, I assume that the first period corresponds to "middle age," say between 40 and 60, while the second period corresponds to retirement, between age 60 and 80. The choice of initial housing is ignored; each individual has already purchased a house. Households may change their

housing consumption at retirement in the second period, although doing so will entail a psychic moving cost.[2] In considering these results, it should be kept in mind that these results focus on the roughly 75% of households who are homeowners before retirement, and ignores the behavior of renters who may purchase houses once they retire (e.g., Venti and Wise 1989; see also Sheiner 1989).

Let expected utility be written

$$EU = U(C_1, h_1) + \frac{1}{1+\delta} E[U(C_2, h_2) + \lambda m], \tag{1}$$

where $C_i$ is consumption and $h_i$ housing in period $i$; $\delta$ the time preference rate; and $E$ the expectations operator. The endogenous indicator variable $\lambda$ is equal to one if the individual moves, and zero otherwise. The variable $m$ is the psychic cost of moving. Venti and Wise (1990), for example, estimate that such moving costs are sufficiently high to prevent most elderly families from moving, even when their housing equity diverges from their "desired" amount. To evaluate the magnitude, as well as the direction, of changes in consumption, I assume an isoelastic strongly separable utility function

$$U(C_i, h_i) = \frac{C_i^{1-\gamma}}{1-\gamma} + \mu \frac{h_i^{1-\gamma}}{1-\gamma}. \tag{2}$$

The budget constraint is written

$$C_1 + \rho_1 h_1 + \frac{C_2 + \rho_2 h_2}{1+r} = Y_1 + \rho_1 h_1^* + \frac{Y_2 + [\lambda(h_1^* - h_2^*)P + \rho_2 h_2^*]}{1+r} + \frac{\nu h_2^* P}{(1+r)^2}, \tag{3}$$

where $r$ is the net rate of return, $Y_i$ are labor earnings in period 1 and retirement income in period 2, $\rho_i$ is the user cost of housing (and the implicit return on housing as an investment, given that taxes are ignored), and $P$ is the price of a unit of housing in the second and subsequent periods; families are assumed to own the house in full at the beginning of period 1. Since everyone is initially a homeowner, consumed housing services, $h_1$, is equal to owned housing assets $h_1^*$. In the second period, households may either move to a smaller house but remain owner-occupiers ($h_1^* > h_2^* = h_2$), or simply sell their house and become renters ($h_2 > 0$, $h_2^* = 0$). The house is sold at the end of the second period.

There are two potential restrictions that prevent the individual from attaining the unconstrained optimum. The first is that moving costs $m$ are sufficiently high that the household does not move. That is, maximum lifetime utility corresponds to the (discrete) choice between $EU^*(\lambda = 0)$, in which no move takes

2. To simplify the model, I ignore the monetary costs of moving.

place but $h_2 = h_2^* = h_1^*$, and $EU^{**}(\lambda = 1)$, in which the move occurs, the cost $m$ is incurred, but the household is then free to choose a new level of housing services. Rather than focus on the explicit solution for whether the household moves or not, I will consider two cases in the analysis below. One is the case where few households move, because moving costs are high, or because neither housing prices $P$ nor second-period income $Y_2$ have unexpectedly changed by enough to make a move necessary. The second general case is one in which housing prices or second-period income have fluctuated by so much that most households are willing to undergo the moving costs $m$ to choose a new level of housing services.

Moving costs may restrict the ability of the elderly to get access to their home equity. The absence of reverse mortgages is another potential constraint. In a reverse mortgage, the bank supplements income of the "housing-rich" elderly, in return for title to the house at death. A 100% reverse annuity implies $\nu = 1$, while the absence of a reverse annuity implies $\nu = 0$ (if $\nu$ is 0.8, for example, only 80% of the housing equity would be eligible for a reverse mortgage). To the extent that perfect reverse mortgages do not exist, perhaps because of self-selection problems (so that $\nu < 1$) or because $h_2^* > 0$, there will always be "accidental" bequests of housing equity that yield no utility in this model.

The budget constraint is simplified by subtracting $\rho h_1^*$ from both sides of equation 3; when $\lambda = 0$, $\rho_2 h_2^*$ can also be subtracted from both sides. When the housing asset yields a normal return $r$, $P = \rho_2(1 + r)/r$, and equation 3 is rewritten

$$C_1 + \frac{C_2 + \lambda\rho_2 h_2}{1 + r} = Y_1 + \frac{Y_2}{1 + r} + \frac{P}{(1 + r)^2}[\lambda(1 + r)\, h_1^* + h_2^*(\nu - \lambda)]. \tag{4}$$

Maximization of equation 1 subject to 4 yields the solution

$$C_1 = \frac{L(\nu, \lambda)}{K(\lambda)}, \tag{5}$$

where the value of lifetime resources $L$ and the denominator $K$ are written

$$L(\nu, \lambda) = Y_1 + \frac{Y_2}{1 + r} + \frac{P}{(1 + r)^2}[\lambda(1 + r)h_1^* + h_2^*(\nu - \lambda)] \tag{6}$$

and

$$K(\lambda) = 1 + \left[\frac{1 + r}{1 + \delta}\right]^{1/\gamma}\left[1 + \lambda\left(\frac{\rho_2}{\mu}\right)^{-1/\gamma}\rho_2\right](1 + r)^{-1}. \tag{7}$$

To analyze how a change in the price of housing $P$ affects consumption and saving, one must first make some assumptions about *why* the price of housing has risen. The simplest approach is to assume that $\rho_2$ has increased, perhaps

because of demographic effects of population growth on a fixed supply of land. Then

$$(8) \qquad \frac{dC_1}{dP} = \frac{\frac{dC_1}{d\rho_2}}{\frac{dP}{d\rho_2}} = \frac{\lambda h_1^*(1+r)\ (\nu - \lambda)\ h_2^*}{(1+r)^2\ K(\lambda)} - \frac{C_1}{K(\lambda)}\frac{dK(\lambda)}{dP}.$$

To develop the intuition of the model, consider the case in which utility is log-linear ($\gamma = 1$), in which case $\rho_2$ will not affect the denominator $K$, so that the second term on the right-hand side of equation 8 can be ignored. Then the change in $C_1$ is just the present value of the discounted change in housing prices, depending on whether the individual moves, or whether reverse mortgages exist. This derivative holds only when the change in $\rho_2$, and hence in $P$, does not precipitate a move (i.e., the change in $P$ induces a switch from $\lambda = 0$ to $\lambda = 1$), and conversely.

Table 8.1 presents numerical calculations for a combination of hypothetical cases depending on the value of $\lambda$ and $\nu$, under the more empirically relevant case in which $\gamma$ is equal to three. A number of other assumptions were also made about the magnitude of the coefficients. For example, I assume that each period lasts for twenty years, first-period income is $40,000, and second period income $20,000. The share of housing services is assumed to be 25% of income in the first period, so that normalizing $\rho = 1$ yields housing services $h_1 = 10{,}000$. The annual interest rate $r$ and time preference rate $\delta$ were assumed to be 3%, which corresponds to 0.806 accumulated over twenty years. Below, I consider each of the hypothetical cases.

**Table 8.1** **The Marginal Propensity to Consume from Housing Wealth and Housing Equity Reductions: Four Cases in the Life-Cycle Model**

| Moving Costs | Reverse Annuities | MPC from Housing Wealth[a] | Reduction in Housing Equity (annualized)[b] |
|---|---|---|---|
| No moving costs ($m = 0, \lambda = 1$) | Perfect markets ($\nu = 1$) | 0.025 | −0.05 |
| No moving costs ($m = 0, \lambda = 1$) | Nonexistent markets ($\nu = 0$) | 0.025 | −0.05 |
| Large moving costs ($m > 0, \lambda = 0$) | Perfect markets ($\nu = 1$) | 0.014 | −0.05 |
| Large moving costs ($m > 0, \lambda = 0$) | Nonexistent markets ($\nu = 0$) | 0 | 0 |

[a]The annual marginal propensity to consume (MPC) in the first period from a $1 change in the value of housing wealth.

[b]The average implied fractional change in housing windfalls during the second retirement period. In other words, a value of −0.05 means that, for every dollar in housing windfalls, the life-cycle household will reduce equity at the rate of 5 cents per year, so that by the end of the twenty-year period, there is no equity remaining.

*No Moving Costs, Perfect Reverse Mortgages*

Consider first the standard life-cycle model with perfect reverse annuity markets and with small or nonexistent moving costs, so that homeowners can both tap into home equity at retirement and costlessly adjust the size of their house. Then as table 8.1 indicates, the marginal propensity to consume out of a $1 windfall in housing wealth is only 2.5 cents.[3] The results are not particularly sensitive to the Arrow-Pratt measure of risk aversion, the interest rate, or the time preference rate; it is essentially a wealth effect that depends on the ratio of housing wealth to overall lifetime wealth. There are two reasons why the impact is so small. The first is that the shift in the value of the asset is spread over a large number of years, so the change in the flow of consumption in any given year will be relatively small. More importantly, though, the housing capital gains are discounted back from the time when the homeowner actually *sells* the house. Table 8.1 also reports the annual (percentage) reduction in housing equity during the second period. The conventional life-cycle model implies an active reduction of housing equity at retirement, either by moving to a rental unit or by reverse mortgage arrangements. That is, if housing prices rise while people are young, life-cycle homeowners save less for retirement in other forms. To finance retirement consumption, they cash out the now increased housing wealth. No rational life-cycle homeowner dies with any housing equity remaining. Table 8.1 reports an annual decline of 5% in housing equity; this is the yearly deaccumulation of housing stock that insures housing equity is exhausted at the end of the twenty-year second period.

*No Moving Costs, Absence of Reverse Mortgages*

The life-cycle estimates above assume very well functioning markets for reverse mortgages. Will the assumption that reverse mortgages do not exist make housing wealth a sideshow? The answer is no. If moving costs are sufficiently low so that every homeowner can move, changes in housing prices will exert an effect both on consumption while young and dissaving while old that is equivalent to the life-cycle model with perfect reverse mortgage markets. The reason is that the ability to move, and the ability to obtain reverse mortgages, are substitute methods for obtaining housing equity. As shown in table 8.1, households also reduce their housing equity at an annual rate of 5% to insure that equity is exhausted by the end of the twenty-year period.

*Large Moving Costs, Perfect Reverse Mortgages*

Suppose next that the costs of moving are recognized, so that few elderly choose to change their housing wealth. Suppose also that reverse mortgage markets function very efficiently, so that $\nu = 1$. Once again, housing wealth is not a sideshow. While individuals do not move during the second period, they can extract all of the housing equity through reverse mortgages, so they do not

3. This is the annuitized annual flow of consumption over the twenty-year period.

die with any remaining housing equity. Because they cannot adjust the level of housing consumption in the second period, they cannot spend down their housing wealth to the same extent, so the marginal propensity to consume from housing wealth in the first period is somewhat less, 1.4 cents, relative to the two cases considered above. There is still complete deaccumulation of housing windfalls during the second period through the use of reverse mortgages.

*Large Moving Costs, Absence of Reverse Mortgages*

When both moving costs are large and financial barriers exist, housing wealth *is* a sideshow, in that the price of housing has no effect on saving or consumption decisions. Homeowners find it difficult to extract housing wealth in the second period, either because reverse mortgages are not available, or because moving costs are excessively high. If they cannot extract housing equity while old, they will not spend housing windfalls while young. Because housing equity is held until death, it becomes an unintended bequest yielding no value to the (life-cycle) consumer. Table 8.1 reports that the marginal propensity to consume from housing wealth while young is zero, and net deaccumulation of housing wealth while old is zero.

In sum, the prediction of the life-cycle model is that household wealth is treated in one of two ways: either households spend housing windfalls while young and draw down housing equity to tap into housing windfalls while retired, or they spend windfalls neither while young nor while old.

## 8.3 Mental Accounting and Bequest Motives

More general models of saving can also imply that housing wealth is a sideshow. If families maintain "mental accounts" in the sense of Shefrin and Thaler (1988) and Thaler (1990), individuals control their spending impulses by creating "nonfungible" types of assets that are either not spent or, if spent, are saved for emergencies. Levin (1992), for example, suggests that the marginal propensity to consume out of housing wealth is low for those families near retirement. Hence an increase in housing wealth is not predicted to cause households to increase consumption. There are two predictions of the mental-accounting model. The first is that windfall housing gains will not be reflected in higher consumption levels while young; in other words, the marginal propensity to consume from housing wealth is predicted to be zero for those who are not yet retired. The second prediction is that housing windfalls will be spent when the retired households are in financial distress, and only after other, more liquid assets are spent (Levin 1992).[4]

Another approach is to consider how the presence of a bequest motive might

4. This scenario is also consistent with a standard life-cycle model in which tax-preferred assets with the ability to step up the basis at death—that is, housing—are held longest, since they are most valuable as bequests.

affect predictions for how housing windfalls will affect consumption and saving. There are two types of bequest models; one in which bequests simply yield utility or value, and the other in which the utility of one's descendants enters one's own utility function. In the former case, housing windfalls would be consumed while young, with nonhousing assets previously earmarked for bequests devoted instead to financing retirement consumption, and the extra housing equity used for the bequest. In this scenario, one might observe a positive marginal propensity to consume housing wealth while young, with little drawdown of housing equity while old. Such a model presumes that there is enough nonhousing wealth, previously targeted for bequests, to provide liquidity for the younger homeowner with housing windfalls. Empirical data suggest that median households near retirement hold only $6,600 in liquid wealth (Venti and Wise 1991). If one presumes that most of this wealth will be devoted to maintaining consumption during retirement, there would be little remaining for bequests.[5] In other words, few families have the financial resources (and bequests) to make this story plausible.

The latter approach to bequests, that parents account for their children's utility functions, could imply that housing wealth would be a sideshow. If housing prices rise, parents may choose to pass along the windfall to their children so the next generation might afford the now more expensive housing. In other words, the dynastic bequest motive could neutralize the impact of housing wealth changes on consumption and saving.

## 8.4 The Precautionary Saving Model

To this point, the life-cycle model made the strong assumption of perfect certainty: households know future disposable income levels, and plan accordingly. The risk of shocks to income, health status, or widowhood during retirement could affect family saving and consumption decisions prior to and during retirement.[6] To capture the inherent uncertainty associated with retirement, consider a simple model in which there is a second-period good state, in which health and income remain favorable, and a bad state, in which a spouse dies, out-of-pocket medical expenses jump, or inflation erodes nominal pension payments. In the good state, the family does not sell the house, and the moving cost $m$ is not incurred. In the bad state, the change in circumstances is sufficiently large that it is optimal to sell the house and incur the psychic moving cost $m$. Once the house is sold, the proceeds can be used to finance consumption or medical costs. Note that in this model, the possibility of a future bad

5. Of course, the possibility remains that the $6,600 represents liquid wealth after families have already spent largely from the housing windfalls of the 1970s. There is little evidence that the amount of liquid wealth has fallen dramatically since the 1960s (Hubbard, Skinner, and Zeldes 1995).

6. See Deaton (1992), Carroll (1991), Carroll and Samwick (1992), Caballero (1991), Skinner (1988), and Zeldes (1989) for a fuller discussion of the precautionary saving approach.

state of the world can strongly affect consumption and saving plans while young, even if in fact the bad state does not occur.

The original utility function in equation 1 is rewritten

$$EU = U(C_1, h_1) + \frac{[\pi U(C_2^g, h_2^g) + (1 - \pi)\, U(C_2^b, h_2^b)]}{1 + \delta}, \tag{9}$$

where $\pi$ is the probability of the good state, denoted by superscript $g$, and $(1 - \pi)$ the probability of the bad state, denoted by $b$. It is convenient, but not crucial, to assume that reverse mortgage markets are nonexistent. As noted above, in the good state the homeowner does not move, so that consumed (and owned) housing in the second period is simply $h_1^*$. In the bad state, the homeowner moves, say because second-period disposable income $Y_2$ has declined. In this bad state, the individual has the opportunity to reoptimize with respect to housing consumed (and owned) in the second period.[7]

Consumption in each state is

$$C_2^g = S(1 + r) + Y_2^g, \tag{10}$$

and

$$C_2^b = S(1 + r) + Y_2^b + h_1^* P - \rho_2 h_2^b, \tag{11}$$

where $S$ is saving from the first period. That is, the family supplements the low disposable income in the bad state ($Y_2^b < Y_2^g$) by selling the house and using the proceeds either for rent or for nonhousing consumption.

This model can be solved easily for the parameters used in the certainty model above, but with the assumption that in the good state, which occurs 75% of the time, disposable income net of medical expenses $Y_2$ equals $25,833, while in the bad state, occurring 25% of the time, $Y_2$ equals $2,500 (on average, $Y_2$ is $20,000, as in the certainty model above). Given this assumption, the marginal propensity to consume from housing wealth is calculated to be 1.0 cents per dollar. The reason why the marginal propensity is relatively large is that a decline in housing wealth of $1 would imply a $1 fall in consumption during the bad state of the world. And while this bad state occurs only 25% of the time, its impact on saving is magnified by the relatively high marginal utility of consumption in that state.

While the precautionary saving model may resemble the life-cycle model in its implications for the marginal propensity to consume out of housing wealth in period 1, it differs in its prediction for the spending down of housing equity in period 2. Only in the bad state (25% of the time in the example above) does the household sell the house; otherwise there is no downscaling of housing wealth.

Before one can really test whether housing wealth affects saving and con-

7. If the homeowner moves, he or she would be wise to set $h_2^* = 0$, given that reverse mortgages are assumed unavailable. I assume that homeowners do in the simulations below.

sumption, one must first establish that housing wealth is an important component of financial resources at retirement inclusive of Social Security and pension wealth. Results from the PSID suggest that, while the annuity flow of housing is relatively unimportant for the median homeowner in the sample, it is quantitatively large—as much as 50% of money income—for a sizable fraction of lower-income and older retirees. In the sections that follow, I consider three empirical questions. The first is whether the magnitude of housing price changes on consumption and saving are large enough to matter. The second and third are, as noted above, whether families spend housing windfalls, and whether they dip into housing equity at retirement. A negative answer to question one, or to both two and three, would suggest that housing wealth is unimportant in determining the financial status of households at retirement.

## 8.5 Is Housing Wealth Important in the Financial Security of the Elderly?

Is the magnitude of housing equity large enough to make a difference in retirement consumption? Venti and Wise (1991) suggest that the reverse mortgage could supplement income for the median retired families by only 4–10% of their existing income. That is, even a complete loss in (annuitized) housing equity would have little impact on consumption. These hypothetical cases, however, are for household members aged 65 who expect to remain in the same house until death. As is shown below (and as Venti and Wise also mention), housing equity matters much more for a sizable fraction of the population: those with low income and above age 75.

The 1989 PSID wealth data are used to sample households with heads over age 65 and with reported money income in excess of $2,000. All values are weighted by the 1989 population weights. I calculate the annuity-equivalent value of housing wealth and contrast that with money income of the household.[8] One can therefore infer the potential impact on retirement consumption of a change in housing wealth (holding constant the price of housing services). For example, if a household's housing equity could be annuitized so that it yields 30% of money income, then a 47% slide in housing prices would reduce potential retirement consumption by nearly fifteen percentage points.

The annuitized value of housing is straightforward to calculate for single male or single female homeowners over age 65 by appropriate use of life tables and assuming a real interest rate of 3%. For couples, I assume that the annuity contract corresponds to a payment until the last member of the couple dies.[9]

8. This measure is different from the Venti and Wise (1991) calculation. It corresponds to the value of cashing out the house today and placing the money in a (perfect) annuity. By contrast, the Venti and Wise annuity measure corresponds to the present value of the remaining housing equity at death. In their case, the homeowner is allowed to remain in the house until death.

9. I am grateful to Michael Palumbo for letting me use his life tables for these three groups; see Palumbo (1993).

Table 8.2 presents the distribution of annuitized housing wealth (net of mortgage balances), as a percentage of income, by both age and household money income.[10] For example, table 8.2 indicates that 23.86% of families aged 65–74, and with income less than $15,000, hold annuitized values of housing that exceed their money income by 50%. Forty percent of households aged 74 and above, and with money income less than $20,000, hold housing equity that exceeds 50% of money income. Even a 25% decline in housing wealth could potentially reduce the annuitized income stream by at least 12.5% (50 × .25) for a nontrivial fraction of the elderly population.[11]

A somewhat different calculation is to suppose that an individual sells his or her house and moves to smaller rental quarters; how much money is left over from the housing sale to finance current consumption at an annuitized rate? Assume that housing rental return is 6% of the house value, and that the homeowner(s) move into rental property that is worth three-fourths of the original house. So after the house is sold, I set aside the present value of the annuitized rental stream, which in each year is assumed to be 4.5% of the original house value. The importance of the annuitized value of housing wealth that remains is shown in table 8.2 in italics. A substantial fraction of homeowners could still increase their income flow by downsizing their housing wealth. Nearly one-third of households who are over age 74, and whose income is less than $10,000, could increment their money income more than 50% by moving to smaller rental units.

In sum, a change in housing prices may have relatively little effect on the annuitized income flow for the median household, especially among younger groups. However, it could have a large impact among a smaller group of poorer, older households. Furthermore, selling one's house and moving to rental units can—at least potentially—increase money income for a nontrivial percentage of elderly. If housing wealth is at least plausibly important in economic decisions at retirement, then does housing wealth affect saving and consumption behavior? I address this question in the next two sections.

## 8.6 Do Younger Households Consume Housing Windfalls?

One explanation for the saving slowdown of the 1980s is that housing wealth windfalls stimulated consumption. Capital gains from housing and land are not included in national income and product accounts, so a rise in the price of housing would have had no impact on measured income, but could cause consumption to rise. Thus the declining saving rate (as conventionally measured)

10. Income brackets differ between the two age groups to adjust for lower average income levels among the "old-old." The household's age bracket is determined by the age of the household head.

11. Recall that these numbers establish only the potential for housing wealth to be important. Annuity markets are not sufficiently developed to allow homeowners to extract their wealth at "fair" rates. Also, the presented numbers assume that the price of housing services has not changed as well.

**Table 8.2 The Annuity Value of Housing Wealth Relative to Income, 1989**

| | Percentage of Sample | Ratio of Annuitized Housing Wealth to Income | | | |
|---|---|---|---|---|---|
| | | Not Homeowner | <20% | 20–50% | >50% |
| Age 65–74, income < $15,000 | 38.70 | 36.70 | 17.27 | 22.17 | 23.86 |
| | | | *27.47* | *21.06* | *14.77* |
| Age 65–74, income $15–25,000 | 24.87 | 19.50 | 22.40 | 41.37 | 16.73 |
| | | | *42.33* | *32.46* | *5.71* |
| Age 65–74, income > $25,000 | 36.43 | 6.62 | 46.45 | 38.41 | 8.52 |
| | | | *73.64* | *17.61* | *2.82* |
| Age 65–74, total | 100.0 | 21.46 | 29.18 | 32.86 | 16.50 |
| | | | *47.74* | *22.64* | *8.16* |
| Age > 74, income < $10,000 | 46.03 | 44.58 | 6.67 | 10.38 | 38.37 |
| | | | *8.03* | *15.72* | *31.67* |
| Age > 74, income $10–20,000 | 26.05 | 35.89 | 5.31 | 18.19 | 40.61 |
| | | | *8.37* | *30.62* | *25.12* |
| Age > 74, income > $20,000 | 27.91 | 17.87 | 18.10 | 46.85 | 17.18 |
| | | | *28.10* | *44.30* | *9.72* |
| Age > 74, total | 100.00 | 34.86 | 9.51 | 22.59 | 33.04 |
| | | | *13.72* | *27.58* | *23.83* |

*Source:* Panel Study of Income Dynamics.

*Notes:* The numbers in roman typeface are the percentage of each age and income group for whom the annuity value of their house is within the given percentage of 1989 household money income. The numbers in italics are the percentage of each age and income group for whom the annuity value of their house minus the annuity value of the assumed cost of the rental housing is within the given percentage of 1989 household money income.

could have been the consequence of increased consumption by homeowners flush with windfall housing gains (Skinner 1994; Munnell and Cook 1991).

There have been two general approaches to testing this hypothesis.[12] First, aggregate linear time-series consumption functions have been estimated, using housing wealth as an independent variable. Bhatia (1987) used housing wealth, and Hendershott and Peek (1989) used tangible assets, to estimate that consumption rose between 4 and 5 cents per dollar of housing equity.

The second approach is to use microeconomic panel data. An important study by Bosworth, Burtless, and Sabelhaus (1991) documented the dramatic decline in household saving during the 1980s using both the Survey of Consumer Finance (SCF) and the Consumer Expenditure Survey (CES). They found that much of the observed decline in saving rates between 1963 and the 1980s (in the case of the SCF) and between 1972–73 and the 1980s (in the case of the CES) occurred among homeowners. For example, using the SCF, the saving rate declined by 6.4% for homeowners between 1963 and 1983–85,

12. See Skinner (1994) for a review of the literature on housing and saving.

but declined by only 0.5% for renters.[13] One problem with their comparisons is that owner-occupied housing is prevalent among older and higher-income families, so that the implicit control group—older families who do not own a house—may not provide a valid comparison, given how little they save.

Skinner (1989) followed a different microeconomic approach by using the panel aspect of the PSID to construct changes in family specific consumption (a weighted sum of consumption components in the PSID), and to regress these changes on income changes and housing price changes, using the Euler approach. Those results suggested that housing price shifts had no effect on consumption.[14]

### 8.6.1 New Tests Using Aggregate Time-Series Data

Consider first the conventional Euler approach (e.g., Hall 1988; see Deaton 1992) expressing consumption changes as a random walk;

$$\ln C_t - \ln C_{t-1} = \beta x + \varepsilon,$$

where $x$ comprises both factors that should matter (e.g., ex ante interest rates) and factors that, by the logic of intertemporal optimization, should not matter (e.g., lagged income and stock market changes). The variable $\varepsilon$ is typically unspecified, but it reflects the change in consumption that reflects new information revealed between time $t - 1$ and time $t$. The approach below is to measure whether changes in housing wealth between $t$ and $t - 1$ affect $\varepsilon$, and hence consumption choices, conditional on lagged consumption. One cannot place strong structural interpretations on these contemporaneous shocks, but they do allow one to ask whether the magnitude of the partial correlation between housing wealth and consumption is consistent with simulated marginal propensities of consumption.[15]

The change in housing wealth is defined to be the real change in the value of owner-occupied housing structure plus land, less real net investment in owner-occupied housing (Federal Reserve System 1993a, 1993b). Stock market wealth changes are the revaluation of household-owned corporate equity, based on Federal Reserve System (1993a), after adjusting for inflation. This definition of stock wealth therefore excludes pension wealth. Percentage changes in real housing wealth and real stock wealth are used as independent variables, along with the real change in disposable personal income (results are similar when real earnings are used).

13. Surprisingly, the same pattern was not repeated in Canada. Bosworth, Burtless, and Sabelhaus calculated that, in Canada between 1978 and 1986, saving rates fell by 1.3% for homeowners and by 3.1% for renters.

14. A study by Levin (1992) finds similar results for families in the panel Retirement History Survey. His sample consists of those nearing retirement or already retired, so they are not, strictly speaking, "young" homeowners.

15. The estimated regression result may also reflect anticipated changes in housing prices if, for example, wealth gains are serially correlated, although there is little evidence of serial correlation in housing windfall gains.

Figure 8.1 displays a graph of changes in housing wealth and changes in the log of total consumption (less durables) for each year 1950–92. The graph shows a strong positive correlation between housing wealth shifts and consumption growth, although the correlation is dominated by 1990, in which there was both a substantial drop in housing wealth and slow consumption growth. (It is shown below that excluding the anomalous years 1990 and 1991 yields similar results.)

Regressions that control for changes in disposable personal income (DPI) and changes in the stock market are presented in table 8.3. While changes in DPI exert a strong influence on consumption changes, the stock market variable has little effect.[16] The regression implies that a 1% increase in housing wealth raises consumption by 0.10% (with a *t*-statistic of 2.5). Converting this to a marginal propensity to consume from housing wealth (multiplying by the ratio of consumption to housing wealth) yields roughly 6 cents per dollar of housing wealth, which is larger than would be suggested by the life-cycle model.

Figure 8.2 shows the residuals of consumption and housing wealth changes conditional on changes in stock markets and DPI with the years 1990 and 1991 excluded; the estimated coefficient, shown in the figure, is 0.131, with a *t*-statistic of 2.5.[17] Splitting the sample into two parts, 1950–70 and 1971–92, had little effect on the housing wealth coefficients, 0.184 (*t*-statistic of 2.3) for the earlier period and 0.114 (*t*-statistic of 2.0) for the later period. In short, the large and significant marginal propensity to consume out of housing wealth seems robust to different selections of sample years.

Including the after-tax interest rate (columns 2 and 3 in table 8.3) affects the coefficient on housing wealth only when the model is run using two-stage least squares with consumption growth lagged two years and DPI growth lagged both one and two years as instruments. In column 3, the coefficient on housing wealth is reduced to 0.071, insignificant but still implying a large marginal propensity to consume out of housing wealth.

Housing wealth appreciation may be a leading indicator of future income gains, rather than exerting an independent effect on consumption. To control for this more fully, both lagged and lead changes in DPI are included in the consumption regression. The lead change in DPI is significant and reduces the coefficient on housing wealth to 0.052, which is roughly consistent with the life-cycle model (although the coefficient is no longer significant). Finally, column 5 in table 8.3 presents coefficient estimates for just nondurables. This controls for any spurious correlation between imputed housing values in consumption services and housing wealth. The coefficient on housing wealth is

16. Blinder and Deaton (1985) use much the same framework to find that shocks in unanticipated wealth affect consumption growth, although they do not distinguish among different types of wealth.

17. That is, the horizontal axis is the residual of housing wealth, and the vertical axis the residual of consumption, after controlling for the change in DPI and stock market wealth.

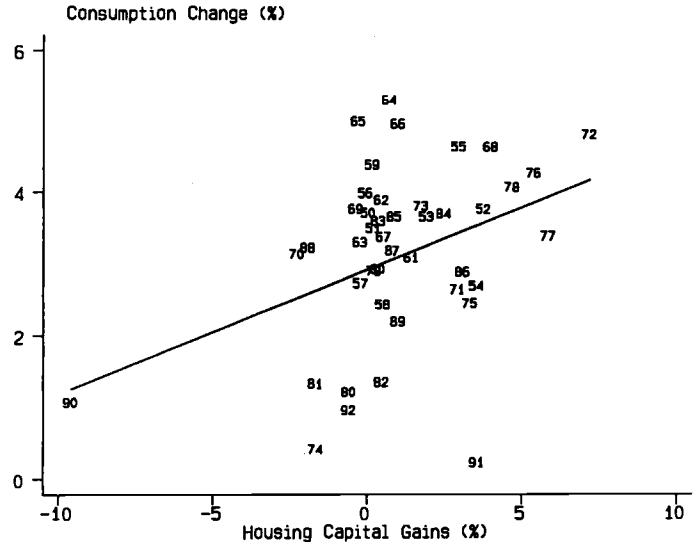


**Fig. 8.1 Percentage consumption change and housing wealth capital gains, 1950–92**

*Note:* Data from the year 1979 is superimposed on 1960.

**Table 8.3 Euler Equation Consumption Regressions (%)**

| Dependent Variable | Nondurables and Services | Nondurables and Services | Nondurables and Services | Nondurables and Services | Nondurables |
|---|---|---|---|---|---|
| Change in housing wealth | 0.108 | 0.110 | 0.071 | 0.052 | 0.143 |
| | (2.50) | (2.53) | (1.34) | (1.44) | (2.50) |
| Change in stock market wealth | 0.002 | 0.001 | 0.012 | 0.052 | 0.009 |
| | (0.33) | (0.12) | (1.17) | (1.43) | (1.01) |
| Change in real disposable personal income | 0.511 | 0.503 | 0.629 | 0.528 | 0.644 |
| | (8.15) | (7.87) | (6.81) | (9.63) | (7.73) |
| Real after-tax interest rate | | 0.030 | −0.154 | | |
| | | (0.68) | (1.44) | | |
| Lagged change in disposable personal income | | | | 0.059 | |
| | | | | (1.09) | |
| Lead change in disposable personal income | | | | 0.187 | |
| | | | | (3.06) | |
| $R^2$ | 0.660 | 0.655 | 0.575 | 0.781 | 0.645 |
| Instrumental variables? | No | No | Yes | No | No |

*Sources:* Data on stock market and housing wealth changes from Federal Reserve System (1993a, 1993b). Consumption and income data from Survey of Current Business.

*Notes:* Dependent variable is the log change in consumption, 1950–92. Numbers in parentheses are *t*-statistics.

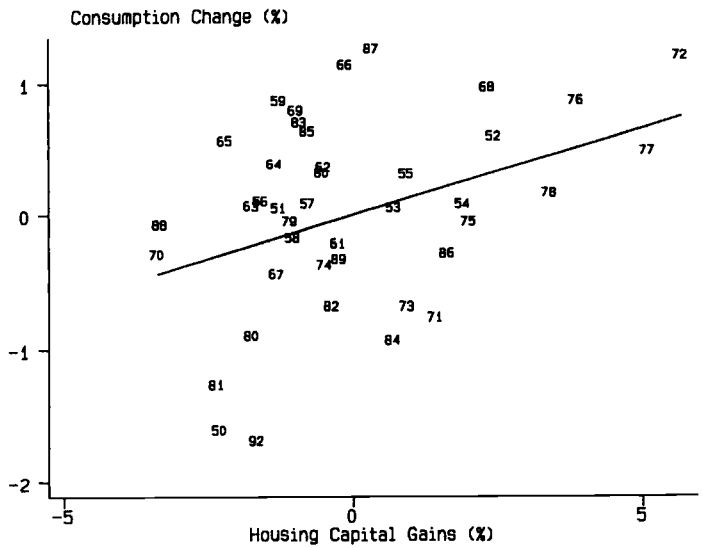


**Fig. 8.2 Percentage consumption change and housing wealth capital gains, 1950–92: conditional on income, stock market changes**

0.143, with a *t*-statistic of 2.5. In sum, the evidence suggests a strong partial correlation between housing wealth and consumption.

### 8.6.2 New Tests Using Microeconomic Data

The next step is to consider microeconomic tests of whether housing windfalls affect saving behavior. To do this, I use the 1989 wave of the PSID that includes detailed information on wealth in both 1984 and 1989. The 1989 wave contains a key variable, "active" saving, that attempts to net out capital gains (inactive gains) from the overall change in wealth between 1984 and 1989. Active saving is well suited to addressing the question of how housing windfalls affect saving choices. However, the definition of active saving makes it difficult to correct for inflation, and presupposes that households do not offset active saving in response to "inactive" saving through capital gains in stock, pension, and business assets.

Despite the attempt to remove inactive saving from this measure, the five-year saving rates are highly skewed. In the sample of households considered below, the mean of active saving is $10,918, with a standard deviation of $324,980. The problem of handling the very large outliers without ad hoc procedures for excluding observations suggests the use of quantile (median) regressions. The disadvantage of quantile regressions is that the estimated coefficients are for median savers, not average savers.

The household was included in the sample if total family money income was at least $1,000 in each year (in 1989 dollars), if the households were less than

age 61, did not move, had a house worth at least $2,000, and did not experience a major change in family composition during the 1984–89 period. A total of 1,970 families remained. Quantile regressions, weighted by the 1989 family weights, are presented in table 8.4. Note that the Income 1984 variable, for example, is income reported in the 1984 wave of the PSID, but it is asked about the previous calendar year.

The first column describes the quantile regression for the entire sample. The (dollar) change in real housing capital gains (less home-improvement costs) is shown in the first row. The coefficient on housing wealth is −2.5 cents (with a *t*-statistic of 2.28). How might this be converted to annual changes in saving, since the active saving measure reflects a five-year shift in wealth? Assume the housing price change occurs in the midpoint of the five-year period, then the coefficient should be divided by 2.5. Hence the coefficient in column 1 of table 8.4 implies a 1-cent reduction in saving for every dollar increase in housing wealth, a number somewhat less than the life-cycle model with either moving constraints or the absence of reverse mortgages, but equal to that implied by the precautionary saving model.[18]

Bosworth, Burtless, and Sabelhaus (1991) suggest that much of the decline in saving was the consequence of older rather than younger households. Columns 2 and 3 in table 8.4 therefore separate families headed by someone aged 45 or older from those less than 45. The results show that the estimated marginal effect is much larger for younger households, equal to a reduction of 5.4 cents in saving per dollar increase in housing wealth (or 2.1 cents after converting to annualized saving rates). This result casts doubt on the proposition that older households' saving behavior is more sensitive to a given dollar change in housing values. However, the overall impact of a given percentage increase in housing values may still fall more heavily on older households, since they tend to own more expensive houses. Quantile regression estimates that controlled for the presence of second mortgages, a possible indicator of households eager to spend down their wealth (Manchester and Poterba 1989), yielded similar results but are not reported here.

Finally, consider the same regression with positive and negative housing wealth gains separated (columns 4 and 5, table 8.4). The coefficients suggest that housing wealth gains are treated much differently than housing wealth declines. For those younger than 45, the results imply an increase in saving of 10 cents per dollar decline in housing wealth (after converting to annualized saving rates); by contrast, the effect on saving of increasing housing capital gains is only 0.4 cents, and insignificant. How should these results be interpreted? One possibility is that most homeowners in 1984 anticipated housing wealth gains during the next five years. For those who did experience a gain,

18. The model estimates also provide an estimate of the long-term marginal propensity to save from income. Summing up the income coefficients and dividing by five yields an estimate of the marginal propensity to save equal to 8 cents per dollar of permanent income.

**Table 8.4** **Quantile Regressions for Active Saving: Homeowners Who Did Not Move, Age ≤ 60**

| | | Housing Capital Gains | | Asymmetric Housing Capital Gains | |
|---|---|---|---|---|---|
| | Full Sample (1) | Age ≥ 45 (2) | Age < 45 (3) | Age ≥ 45 (4) | Age < 45 (5) |
| Housing capital gains | −0.025 | −0.028 | −0.054 | | |
| | (2.28) | (2.86) | (2.28) | | |
| Housing capital gains (positive) | | | | −0.021 | −0.010 |
| | | | | (1.51) | (0.32) |
| Housing capital gains (negative) | | | | −0.097 | −0.253 |
| | | | | (6.17) | (4.29) |
| Age | 467 | 1,172 | 3,399 | 1,389 | 2,984 |
| | (1.47) | (2.12) | (0.90) | (2.41) | (0.76) |
| Age$^2$ | −3.14 | −8.53 | −51.03 | −10.27 | −45.83 |
| | (1.12) | (2.02) | (0.99) | (2.32) | (0.85) |
| Sex | −3,883 | −4,336 | −4,469 | −4,783 | −4,927 |
| | (2.11) | (2.72) | (0.89) | (2.93) | (0.96) |
| Family size | −2,216 | −3,910 | −247 | −4,041 | −715 |
| | (3.86) | (6.42) | (0.23) | (6.47) | (0.65) |
| Change in family size, 1984–89 | −940 | −2,843 | −1,624 | −2,930 | −2,077 |
| | (1.16) | (3.31) | (1.18) | (3.36) | (1.57) |
| Income in 1984 | −0.098 | −0.102 | −0.105 | −0.099 | −0.160 |
| | (3.03) | (3.68) | (1.04) | (3.44) | (1.49) |
| Income in 1985 | −0.209 | −0.187 | −0.076 | −0.207 | −0.010 |
| | (5.90) | (5.90) | (0.79) | (6.26) | (0.10) |
| Income in 1986 | 0.261 | 0.007 | 0.539 | 0.004 | 0.462 |
| | (5.99) | (0.17) | (5.47) | (0.09) | (4.52) |
| Income in 1987 | −0.128 | 0.043 | −0.319 | 0.049 | −0.355 |
| | (3.64) | (1.38) | (3.71) | (1.53) | (3.99) |
| Income in 1988 | 0.106 | −0.018 | 0.185 | −0.020 | 0.243 |
| | (3.52) | (0.68) | (2.29) | (0.72) | (2.93) |
| Income in 1989 | 0.491 | 0.748 | 0.214 | 0.737 | 0.186 |
| | (15.57) | (26.94) | (3.23) | (25.00) | (2.72) |
| Constant | −13,563 | 32,512 | −60,132 | −39,724 | −50,302 |
| | (1.52) | (1.85) | (0.89) | (2.10) | (0.71) |
| Sample size | 1,970 | 1,264 | 706 | 1,264 | 706 |

*Note:* Absolute value of *t*-statistics in parentheses. Dependent variable is the level of active saving during 1984–89.

the increased wealth was anticipated, and hence had no impact on consumption. But for those who experienced a loss, the loss was unanticipated, and hence engendered a real change in consumption and saving behavior.

In sum, the macrodata have suggested large effects, and the microdata more modest effects, of housing wealth on saving. The results taken together with Bosworth, Burtless, and Sabelhaus (1991) suggest that the empirical rate at which housing wealth is spent down by younger households is not inconsistent with the life-cycle models that allow for households to tap into housing equity,

and the precautionary saving model. It is inconsistent with the view of housing wealth as a sideshow.

## 8.7 Do Households Consume Housing Equity at Retirement?

The next empirical question is whether retired households spend housing windfalls by downsizing their houses. In practice, this question is difficult to answer because of the difficulty in matching all housing windfalls from past years with current retirees. So I address a more general question—do households, most of whom experienced housing windfalls during the 1970s, downsize housing to spend accumulated housing wealth during retirement? Presumably, a negative answer to the second question implies a negative answer to the first.

A number of recent studies have found little evidence of the gradual downsizing of home equity implied by the life-cycle model (Merrill 1984; Venti and Wise 1989, 1990; Feinstein and McFadden 1989). In fact, these studies have found that retired households on average are as likely to increase their housing equity as to decrease it. Merrill (1984) reports that more retired households switch from *renters* to *owners*, than from owners to renters, not a transition normally associated with life-cycle "downscaling." Additional evidence comes from Feinstein and McFadden (1989), who suggest that more than one-third of elderly households reside in dwellings with at least three more rooms than the number of inhabitants, and are hence "overconsuming" housing services.

Sheiner and Weil (1992) present persuasive evidence that elderly households do reduce their housing services, although it generally occurs later in the life cycle and is often precipitated by widowhood.[19] For example, the homeownership rates of all women aged 65–69 is 77%; by ages 80–85 the percentage drops to 59, with less than half owning their house after age 85. They also report that, for widows, homeownership falls by twelve percentage points, and median home equity by roughly 30%, in the four years after the husband's death. Based on comparisons of homeownership for high- and low-income households, they suggest that these changes in housing tenure are a consequence of taste changes rather than of financial necessity.[20]

The results below use data from the 1989 wave of the PSID to shed light on this question. I first consider differences in income patterns between those who moved and those who did not, and focus in particular on those who both moved and extracted housing equity. I then use quantile regressions to consider at

19. Venti and Wise (1989) and Feinstein and McFadden (1989) earlier noted the strong impact of events such as widowhood, children moving, or divorce on mobility decisions, but did not directly test the impact of such changes on ownership patterns. Also see Hurd (1989) and Hurd and Shoven (1989) for documentation of financial changes precipitated by widowhood.

20. Feinstein and McFadden (1989) suggest that families with both low incomes and low levels of liquid wealth are more likely to switch from owner-occupied to rental property conditional on moving.

what rate the equity removed (or put into) housing was reflected in changing consumption patterns.

To examine the pattern of housing wealth change among the elderly, I consider all those who were both homeowners and over the age of 54 in 1989. Consider three groups: those who did not move during the period 1984–89 (85.9%), those who moved and increased the market value of their house (5.8%), and those who moved and reduced the market value of their house (8.3%). Their weighted median and average family money income levels are presented in table 8.5 by year. Observations are not excluded because of family composition changes, since such changes are often causes of income declines (or increases in the case of remarriage). On average, those who moved into smaller houses were 1.5 years older than those who moved into larger houses.

For the group that did not move, median income declined by 19%, and mean income by 12% during the period. This is the likely consequence of a decline in labor income during retirement. Among those increasing housing equity, median and mean income declined by 14 and 6%, a smaller amount than the benchmark for nonmovers. Finally, for those moving into smaller houses, median income dropped by 25%, and mean income fell by 32%, substantially more than the reference group. Note that the mean and median income for this latter group was nearly identical in 1982 to that for the group who did not move at all. Figure 8.3 shows these patterns, with 1982 income normalized at one hundred. After adjusting for the general downward trend in income, the pattern suggests that, even at retirement, changes in family income exert a strong influence on housing demand.

A different view of this pattern is to normalize the level of income by its amount relative to the year in which the family moved. Figure 8.4 shows these calculations. If individuals moved in 1986, for example, their $T - 1$ income

**Table 8.5** **Mean and Median Income of Homeowners, by Moving Status, 1984**

| | Did Not Move | | Moved into Larger House | | Moved into Smaller House (or Rented) | |
|---|---|---|---|---|---|---|
| Year | Median | Mean | Median | Mean | Median | Mean |
| 1982 | 22,650 | 32,437 | 25,000 | 34,380 | 21,287 | 29,993 |
| 1983 | 22,022 | 32,151 | 25,688 | 34,590 | 18,507 | 30,358 |
| 1984 | 21,797 | 30,264 | 28,120 | 34,160 | 19,021 | 27,746 |
| 1985 | 21,209 | 30,976 | 25,047 | 35,723 | 18,435 | 26,356 |
| 1986 | 20,287 | 30,151 | 26,026 | 32,733 | 16,817 | 24,214 |
| 1987 | 18,922 | 28,726 | 23,175 | 33,559 | 15,893 | 22,603 |
| 1988 | 18,250 | 28,974 | 21,580 | 30,378 | 14,829 | 20,581 |
| 1989 | 18,400 | 28,497 | 21,428 | 32,234 | 15,939 | 20,506 |
| Percentage change, 1984–89 | −18.8 | −12.1 | −14.3 | −6.2 | −25.1 | −31.6 |

*Notes:* All medians and means weighted by PSID population weights. Age of head in 1984 is 55 or above.

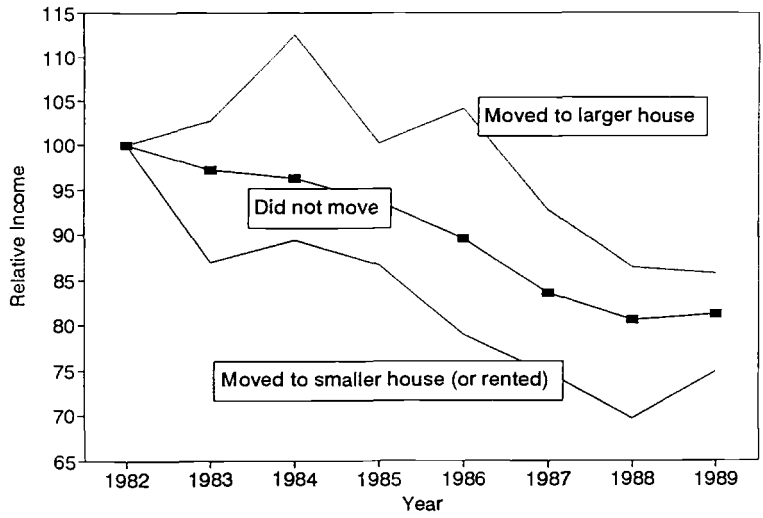


**Fig. 8.3 Income by moving status (1982 = 100)**

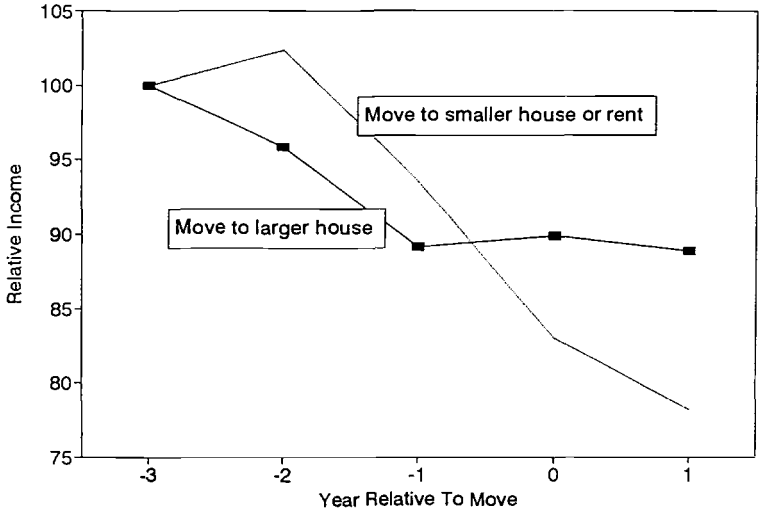


**Fig. 8.4 Average income by moving status, by year relative to move (1982 = 100)**

level is from the 1986 wave (applicable for 1985), and their $T + 1$ income level is from the 1988 wave. Both samples show a decline in family income in years $T - 3$ and $T - 2$. The difference becomes apparent in the year of the move, where income of those who increased housing wealth flattens out (or rises relative to trend), while income of those who downsized continues to fall.

In sum, families who experience an income downturn appear to be more likely to cash out their housing wealth than those who do not, a result that is consistent with much of the previous literature. Partly this is because of a change in family composition; of those who reduced housing equity, 19% had become widows or widowers during 1984–89, compared to 10% for those who did not move. However, it is not just family composition that matters; 18% of those who *increased* housing equity were widows.[21]

A better predictor of housing wealth reductions is unexpected shocks, such as health reasons and widowhood. For those who moved, 35% responded that they did so because of outside events such as health reasons, divorce, retirement because of health, or eviction. Of those who replied that their move was precipitated by an unexpected shock, 79% reduced their net housing equity.[22] In sum, widowhood is not the only initiating reason for downsizing. A decline in income or an unexpected health problem also initiates households to tap into housing equity.

Is the housing equity spent? Past studies have had difficulty finding the proceeds of housing sales in subsequent asset reporting (Sheiner and Weil 1992), suggesting that the entire housing proceeds are spent in a few years. I now consider how housing equity extracted from the sale of housing affects active saving. Note that, when the house is sold, for say $50,000, active saving is decreased by $50,000 unless the money is returned through the purchase of other assets. A coefficient of 1.0 corresponds to housing wealth being entirely spent by 1989. The null hypothesis corresponds to housing wealth being entirely saved. Table 8.6 reports quantile regressions of the type discussed in section 8.6, with the sample restricted to homeowners aged 55 and above in 1984. Net proceeds from the house sale are defined to be negative for those who move to smaller houses, zero for nonmovers, and positive for those buying a larger house.

The coefficient on the net proceeds from the house sale is 69 cents per dollar of housing wealth change (column 1 of table 8.6), and is highly significant. This result implies that, by 1989, 69 cents of every dollar withdrawn from housing sales has been consumed, and 31 cents saved, from the typical housing sale.

It is likely that the coefficient of housing wealth on saving differs depending on whether the household increased or decreased its housing equity, and when during the sample period the house was sold. To test this, consider four categories of housing wealth change, shown in column 2 of table 8.6. For those who sold their house in 1985–86 and reduced housing equity, 73 cents of every

21. An alternative explanation for the increase in housing equity among some widows is that they moved from a large house with a mortgage to a smaller house bought with cash, although few people over age 65 hold mortgages.

22. By contrast, 21% who moved did so because of "purposive consumption reasons," conventional anticipated life-cycle reasons involving reduced space or lower rent. See question V16651 in the *1989 PSID*.

**Table 8.6** **Quantile Regressions for Active Saving, Homeowners Aged > 55**

| | Equation 1 Coefficient | Equation 2 Coefficient |
|---|---|---|
| Net housing wealth | 0.688 | |
| | (25.87) | |
| Net housing wealth: sale in 1985–86, moved to less costly house (or rented) | | 0.734 |
| | | (17.92) |
| Net housing wealth: sale in 1987–89, moved to less costly house (or rented) | | 0.590 |
| | | (26.65) |
| Net housing wealth: sale in 1985–86, moved to more costly house | | 1.144 |
| | | (21.63) |
| Net housing wealth: sale in 1987–89, moved to more costly house | | 1.055 |
| | | (23.83) |
| Age | 220.81 | 1,718.80 |
| | (0.14) | (1.49) |
| $Age^2$ | −1.94 | −11.81 |
| | (0.18) | (1.49) |
| Income in 1984 | −0.109 | −0.101 |
| | (3.03) | (3.92) |
| Income in 1985 | −0.708 | −0.561 |
| | (13.60) | (14.96) |
| Income in 1986 | 0.627 | 0.435 |
| | (9.98) | (9.64) |
| Income in 1987 | 0.321 | 0.302 |
| | (7.79) | (10.20) |
| Income in 1988 | 0.103 | 0.175 |
| | (3.36) | (7.88) |
| Income in 1989 | 0.148 | 0.141 |
| | (3.18) | (4.19) |
| Constant | −6,669.68 | −63,447.97 |
| | (0.11) | (1.52) |
| Sample size | 922 | 922 |

*Note:* Absolute value of *t*-statistics in parentheses.

dollar was spent by 1989. In contrast, those who sold their house later in the sample period, 1987–89, spent only 59 cents on each dollar. These coefficients taken together imply that roughly half of housing wealth is spent near the time of the housing sale, with an additional 5 cents per initial dollar of housing capital (net of interest) spent in subsequent years.

People who "upsized" by moving into more expensive housing did not appear to do so by spending down reported assets; the coefficient exceeds 1.0 regardless of when the housing transaction occurred. Perhaps realized capital gains or other sources of wealth not measured by active saving were used to finance the housing expansion. In sum, each year a small group of individuals downsize their housing stock in response to an adverse shock to disposable family income. For this group, housing wealth appears to be used in financing

extraordinary consumption in the year of the sale, and in financing subsequent consumption at an approximate actuarial rate.

## 8.8 Conclusion

Recent fluctuations in housing prices have led to some concern that the windfall gains enjoyed by many of those currently retired could be matched in the future by windfall losses when the baby-boom generation retires. This paper has considered whether housing price fluctuations play an important or unimportant role in the economic security of retirees—that is, whether housing wealth is just a sideshow to the determination of consumption and saving.

The empirical results in this and other papers present a somewhat paradoxical view of housing wealth. On the one hand, housing wealth does appear to affect the saving behavior of homeowners prior to retirement. The microestimates in this paper suggest that, for younger homeowners, a $1 increase in housing wealth reduces saving by 1–2 cents, a magnitude consistent with the certainty life-cycle and the precautionary saving model. The macroestimates are substantially larger, corresponding to a roughly 6-cent increase in consumption when housing wealth rises by $1.

According to the life-cycle model, if households respond to housing windfalls while young by saving less for retirement, they should be using those housing windfalls while old to help finance retirement consumption. However, the results suggest that housing wealth windfalls affect consumption for the elderly only for a small group of people buffeted by adverse economic events.

One way to reconcile these two empirical regularities is to view housing wealth as a precautionary "buffer" that can be cashed out in the event of an income or a health downturn, or widowhood, when the demand for housing services is likely to decline as well. This precautionary saving view of the household can potentially explain the puzzle of why housing wealth affects saving while young but is rarely used by the elderly to finance consumption. If housing wealth declines, households hold less insurance against future contingencies and will respond by saving more to build up (nonhousing) wealth for future contingencies during retirement. Since not every elderly household encounters a bad outcome requiring the liquidation of housing equity, one can also explain why the median elderly family doesn't spend down its housing wealth.

Viewing housing wealth as a buffer against contingencies during retirement can also explain why the demand for reverse mortgages has not been strong. Retired households do not wish to draw down their housing equity in the good states of the world because it is a contingency against the bad state of the world. And if the bad state of the world occurs—poor health or a serious financial setback—households desiring to economize on housing services would want to sell their house in any case. At that point, equity in the house can be cashed out and used for subsequent consumption or medical bills.

A somewhat different issue is whether housing prices will decline by as much as Mankiw and Weil (1989) suggest. In a general equilibrium model of housing demand and supply, McFadden (1992) predicts a gradual flattening of housing prices in the future, rather than the sharp decline forecast by Mankiw and Weil (1989).[23] And while baby-boom homeowners are clearly worse off than early generations that shared in the dramatic upswing in housing prices, McFadden finds that the impact of these differences on consumer welfare are quite small. He predicts that feasible lifetime consumption for generations born around 1950 will be lower by only 0.7% because they lost out on the housing capital gains of the earlier generations.

Suppose that the McFadden projections are correct, and aggregate housing prices remain stable for the next forty years. Then wouldn't the logic of this model suggest that housing prices should be unimportant? The answer is no, for two reasons. First, I use as a benchmark housing equity of a generation that has profited from the large housing price increases of the 1970. Current households may expect more housing wealth appreciation than actually occurs, a result given support by the empirical findings that housing wealth downturns exert a much larger impact on saving than housing wealth upswings. If households make saving plans based on expected housing wealth appreciation, their retirement plans may be inadequate if housing prices remain constant.

Second, and more important, there are wide regional variations in housing wealth and housing prices even when aggregate price indices are flat. Households in the Northeast during the late 1980s, for example, experienced wide fluctuations (both positive and negative) in housing prices during a period when aggregate prices were relatively constant. Both of these considerations suggest that the economic well-being of future and current generations will be affected by whether they made money, or lost money, on their house. That is, housing wealth is not a sideshow.

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## Comment

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This paper is about a very important topic, and it exhibits much of the usual clarity of thought that one associates with the author. We know that housing wealth represents a large fraction of total household wealth for many Americans, particularly the elderly. The question that Skinner addresses is what would be the consequences if the same demographic forces that drove up housing prices so dramatically in the 1970s were to drive them sharply lower over the next few decades. The author uses the 1989 projection of Mankiw and Weil of a 47% decline in real housing prices over the next thirty years or so as a backdrop for his evaluation of whether changes in housing prices affect aggregate consumption, saving, and individual economic welfare.

The Mankiw and Weil prediction comes about because they forecast a sharp decline in the growth in housing demand as the baby-boom generation ages and as the baby-bust generation enters into its home-buying years. A couple of things should be noted about the Mankiw and Weil prediction and its impact on Skinner's study. First, if the slowdown in the growth of housing demand is predictable and well understood, it would be anticipated and would affect housing prices today as well as in the future. To the extent that declines in

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housing prices were not surprises, but rather anticipated, they would not be expected to affect consumption and saving decisions significantly as the expected decline indeed occurs. The point of this is that, in an empirical investigation of the effect of changes in housing prices on consumption and saving, it would be desirable to be able to separate surprising price changes from those that were anticipated. This would be difficult and is not attempted in Skinner's paper. Second, the very uneven demographic structure of the U.S. population can be expected to affect asset prices more generally, not just housing prices. For example, pension funds have been accumulating assets and contributing massively toward national saving in the past ten to fifteen years. However, when the baby-boom generation retires, one can anticipate that pension funds will cease being net accumulators of assets and may in fact attempt net sales of the stocks and bonds that the baby-boom generation has set aside for retirement. This change on the part of pension funds could affect real interest rates, stock prices, and housing prices, for that matter. If the pattern of pension fund demands for assets is anticipated, the effects on saving and consumption may already be operative and the uneven demographic structure may already be affecting intertemporal asset prices.

Housing assets are different in important ways from other assets. First, owner-occupants both own an asset and consume the services generated from that asset. In one sense, owning a house is a bit like having a lifetime subscription to a magazine or a lifetime membership in a golf club. If you own one of these lifetime claims and do not intend to sell it, then changes in the price of lifetime memberships does not affect your welfare. This phenomenon is one of the reasons that Skinner is writing this paper; it opens up the possibility that changes in housing prices are just a sideshow and do not have major welfare implications. Presumably assets such as stocks, bonds, and bank accounts do not directly provide consumable services in the same way as a house does, and therefore the welfare consequences of changes in their value is less ambiguous. Second, one needs to keep in mind the significant difference between the effects of price levels and the effects of anticipated price changes. Expected price declines would cause an increase in the rental cost of housing while a low level of housing prices would translate into a low imputed rent for owning a home. Ideally one would separately include in one's investigation of the effect of housing prices on saving, consumption, and welfare both price-level effects and price-change effects.

One of the reasons that this is an important paper is that, as is often the case, economists have a surplus of theories regarding the effect of changes in housing prices on behavior. Skinner examines four widely used models regarding lifetime consumption and asset allocation and finds their predictions quite distinct. This raises one's hopes that maybe the facts can sort out the theories for us. There are several reasons why house prices could be simply a sideshow. First, people might behave as if they lived forever, perhaps because of a bequest motive such that they treat their heirs as a continuation of their own life.

If people lived forever (and if houses provided an infinite stream of housing services), then changes in housing prices would not affect those who were never going to sell. Second, institutional constraints such as high moving costs and capital market imperfections (such as an absence of reverse annuity mortgages) and a lack of a bequest motive might combine so as to make a homeowner indifferent to the price of her or his home. Finally, people might treat housing assets separately from other financial assets (in a separate "mental account") and not think of them as marketable, liquid assets.

There are other economic models that tell us that house prices should matter for consumption and saving decisions. First, the traditional life-cycle model predicts dissaving during retirement, including the downsizing of one's house. Second, a precautionary saving model would suggest that housing equity can serve as a valuable contingent asset in the event that the household experiences bad financial luck. These models would place houses as one of the assets in a "self-insurance" system for the household. Higher equity in a house would improve the condition of the self-insurance fund. Finally, if you have a general bequest motive and not one defined only in terms of housing, then higher house values implies larger bequests, and this will affect one's complete lifetime consumption/saving plan.

I think that Skinner's investigation into which of these models most closely conforms to observations is interesting. I also must admit to some pleasure in my reading of his conclusion that the precautionary motive for saving is most consistent with the facts. The simple life-cycle model fails because the elderly as a whole do not reduce their housing demand as much as that model would predict. The infinite-horizon model fails because changes in housing prices do affect behavior, a great deal for a minority of the population. I find the institutional-rigidities model fairly unconvincing because I think that capital markets are pretty well developed. For instance, even if there are not widely available reverse annuity mortgages, the elderly can still consume a good fraction of their home equity while remaining in their house. They could do this by using traditional mortgages or home equity loans. The fact may be that most of them do not consume their equity, but this does not support the model that constrains them for doing so. In fact, in the precautionary savings model only those who experience economic setbacks would be expected to avail themselves of the equity in their home (either by borrowing or by selling).

I found Skinner's investigation into whether the "middle-aged" change their saving and spending habits depending on house appreciation interesting, but to be honest I don't think that he added much to the Bosworth, Burtless, and Sabelhaus study that he references. They found that the much-documented decline in savings rates between the 1960s and 1980s was much more dramatic for homeowners than for nonhomeowners. In fact, almost all of the decline in personal saving was accounted for by homeowners. This is pretty solid evidence that homeowners were increasing consumption and spending some of their accrued housing capital gains. Skinner looks at this issue with both a

macro- and a microanalysis. The microstudy uses new data and finds qualitatively the same result as Bosworth, Burtless, and Sabelhaus, so it can be interpreted as verifying and supporting their conclusion. The macroanalysis is also broadly consistent.

Skinner provides ample evidence that, for a large subset of the elderly, housing wealth is important enough to make the investigation worthwhile. He finds that those who suffer income declines are much more likely to tap their home equity. He finds that, while for most people their ex post behavior will not be that different with dramatically lower housing prices than it would have been in the absence of such a decline, for the minority who are forced to use the self-insurance value of having considerable housing equity, the decline makes them significantly worse off. To answer the question posed in the title of the paper, housing prices are not a complete sideshow. While the consequences of a 47% decline in prices would not be devastating for many, it would be harmful to most and seriously harmful to those who are at least fortunate.

It is my feeling that Skinner's findings are one more nail in the coffin for the simple life-cycle model and one more bit of evidence in support of the precautionary model of saving.

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