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ABSTRACT

Do housing price fluctuations play an important role in the economic security of retirees, or is housing wealth just a sideshow to the determination of consumption and saving? Using panel data on saving from the Panel Study of Income Dynamics, and aggregate time-series data, I find that shifts in housing wealth do affect consumption and saving, especially for younger households. On the other hand, few elderly households appear to be tapping into their housing windfalls to finance retirement consumption. The precautionary saving approach can explain this puzzle. If housing wealth rises, households require less insurance against future contingencies, and will respond by spending more out of (nonhousing) wealth. But not every elderly household encounters a bad outcome requiring the liquidation of household equity. Hence the median elderly family will not actively spend housing windfalls. The theoretical and empirical results therefore suggest that housing wealth is not a sideshow.

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I. Introduction

Housing prices rose by 18 percent 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, 1988), 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 relative to 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, Skinner (1989) and Levin (1992) found little evidence that changes in housing wealth among homeowners generated offsetting saving responses. Housing prices may decline by 47 percent, 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 the context of 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 (Sheffrin and Thaler, 1988). In the mental accounting behavioral approach to saving, for

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

example, housing wealth is "non-fungible" (Levin, 1992); so that 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 affects how housing wealth is predicted to affect 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: (i) What is the marginal propensity to consume housing windfalls for existing (younger) homeowners? and (ii) What is the propensity to consume out of housing wealth at retirement for older homeowners? I test each of these hypotheses, as well as whether the *magnitude* of potential housing wealth changes are important for 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 one-dollar increase in housing wealth, a magnitude consistent with precautionary saving and life cycle models.

In the life cycle model, the housing windfall is used in part to finance retirement consumption. However, the PSID indicates 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 percent of the proceeds have been spent within 4 years.

Neither the standard life cycle model with moving costs or financial constraints, nor the mental accounting model or bequest model can adequately explain both of these 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 with assets formerly earmarked for bequests, but few households have even enough liquid wealth to provide for their own retirement, much less additional assets designated 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 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 increases consumption among middle-aged homeowners. Because housing wealth is held as a contingency against future risk, many homeowners will not experience the adverse risk. Hence in the population of elderly, only a small fraction will be observed to tap into their housing equity. In short, housing wealth is <u>not</u> a sideshow, but a

key component in insuring against retirement contingencies.

II. 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 age 40-60, while the second period corresponds to retirement, between ages 60-80. Housing purchase choices are 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 percent of households who are homeowners prior to retirement, and ignores the behavior of renters who may in fact purchase houses once they retire (e.g, Venti and Wise, 1989; also see Sheiner, 1989).

Let expected utility be written

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

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

where C_i is consumption, and h_i housing in period i, δ the time preference rate, and E the expectations operator. The endogenous indicator variable λ 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

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

The budget constraint is written

$$C_1 + \rho_1 h_1 + \frac{C_2 + \rho_2 h_2}{1+r} =$$

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

where r is the net rate of return, Y_i are labor earnings in period 1 and retirement income in period 2, ρ_i is the user cost of housing (and the implicit return on housing as an investment given that taxes are

ignored), P the price of a unit of housing in the second and subsequent periods, and 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 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 one-hundred percent reverse annuity implies $\nu = 1$, while the absence of a reverse annuity implies $\nu = 0$ (if ν is 0.8, for example, only 80 percent 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 ρh_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

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

Maximization of (1) subject to (4) yields the solution

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

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

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

and

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

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 ρ_2 has increased, perhaps because of demographic effects of population growth on a fixed supply of land. Then

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

To develop the intuition of the model, consider the case in which utility is log-linear ($\gamma = 1$) in which case ρ_2 will not affect the denominator K, so that the second term on the RHS of (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 not, or whether there exists reverse mortgages. This derivative holds only when the change in ρ_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 1 presents numerical calculations for a combination of hypothetical cases depending on the value of λ and ν, under the more empirically relevant case in which γ is equal to 3. A number of other assumptions were also made about the magnitude of the coefficients. For example, I assume that each period lasts for 20 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 δ were assumed to be 3%, which corresponds to 0.806 accumulated over 20 years. Below, we consider each of the hypothetical cases.

1) 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 costly adjust the optimal size of the housing stock and tap into equity at retirement. Then as Table 1 indicates, the

marginal propensity to consume out of a $1 windfall in housing wealth is only 2.5 cent.[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* her house. Finally, Table 1 also reports the annual (percent) 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 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; hence Table 1 reports an annual decline of 5% in housing equity; this is the yearly deaccumulation of housing stock that insures

[3] This is the annuitized annual flow of consumption over the 20-year period.

housing equity is exhausted at the end of the 20-year second period.

(2) 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 1, households also reduce their housing equity at an annual rate of 5% to insure that equity is exhausted by the end of the 20-year period.

(3) 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 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.

(4) 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. Hence Table 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 different ways: either households spend housing windfalls while young and draw down housing equity to tap into housing windfalls while retired, or they neither spend windfalls

while young or while old.

III. 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 Sheffrin 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]

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

Another approach is to consider how the presence of a bequest motive might 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 descendents enter 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 scenerio, 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. However, empirical data suggests that median households near retirement hold only $6600 in liquid wealth (Venti and Wise, 1991). If one presumes that most of this wealth wil 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

[5] Of course, the possibility remains that the $6600 represents liquid wealth after families have already spent largely from the housing windfalls of the 1970s. However, there is little evidence that the amount of liquid wealth has fallen dramatically since the 1960s (Hubbard, Skinner, and Zeldes, 1993).

make this story plausible.

The latter approach to bequests, that parents account for their childrens' 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.

IV. 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, however, 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 remains favorable, and a bad state, in which a spouse dies, out-of-pocket medical expenses jump, or inflation erodes nominal

[6] See Deaton (1992), Carroll (1991), Carroll and Samwick (1992), Caballero (1991), Skinner (1988), and Zeldes (1990) for a fuller discussion of the precautionary saving approach.

pension payments. In the good state, the family does not sell the house, and the moving cost m is not incurred. However, in the "bad" state, the change in circumstances are sufficiently large that it is optimal to sell the house and incur the psychic moving cost m. Once sold, the proceeds from the house can be used to finance consumption on needed medical care or consumption. Note that in this model, the possibilty of a future bad 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 (1) is rewritten

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

where π is the probability of the good state, denoted by superscript g and (1-π) 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

$$C_2^g = S(1+r) + Y_2^g$$
$$C_2^b = S(1+r) + Y_2^b + h_1^* P - \rho_2 h_2^b \qquad (10)$$

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 percent of the time, disposable income net of medical expenses Y_2 = $25,833, while in the bad state, occuring 25 percent of the time, Y_2 = $2500 (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 percent of the time, its impact on saving is

[7] If the household moves, they would be wise to set $h_2^* = 0$ given that reverse mortgages are assumed unavailable. I assume that they do in the simulations below.

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 one, 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 consumption, however, 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 percent of money income -- for a sizable fraction of lower income and older retirees. In the sections that follow, we 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 1, or to both two and three, would suggest that housing wealth is

unimportant in determining the financial status of households at retirement.

V. 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 percent 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 the average family at age 65 who is assumed to remain in the same house until death. As is shown below (and 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 $2000. 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 percent of money income, then a 47% slide in housing prices would reduce potential retirement consumption by nearly 15 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 percent. For couples, I assume that the annuity contract corresponds to a payment until the last member of the couple dies.[9]

Table 3 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 3 indicates that 23.86 percent of families age 65-74, and with income less than

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[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).

[10] Income brackets differ between the two age groups to adjust for lower average income levels among the "old-old."

$15,000, hold annuitized values of housing that exceed their money income by 50 percent. Forty percent of households aged 74 and above, and with money income less than $20,000, hold housing equity that exceeds 50 percent of money income. Even a 25% decline in housing wealth could potentially reduce the annuitized income stream by at least 12.5% (50 x .25) for a nontrivial fraction of the elderly population.[11]

A somewhat different calculation is to suppose that an individual sells 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 3/4 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 3 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

[11] Recall that these numbers only establish 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.

prevalent among older and higher income families, so that the implicit control group – older families who do not own a house – may not be a valid comparison group, given how little they account for in overall saving.

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 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]

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 either 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 ε is typically unspecified, but it reflects the

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

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 ε, 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,b). 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).

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

Figure 1a 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 1990 or both 1990 and 1991 yield a similar positive correlation).

Regressions that control for changes in disposable personal income and changes in the stock market are presented in Table 3. While changes in disposable personal income exert a strong influence on consumption changes, the stock market variable has little effect.[16] The regression implies that a one-percentage increase in housing wealth raises consumption by 0.10 percent (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 1b shows the residuals of consumption and housing

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

wealth changes conditional on changes in stock markets and DPI with the years 1990 and 1991 excluded; the estimated coefficient, shown in the figure, has a coefficient of 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 3) affects the coefficient on housing wealth only when the model is run using 2SLS with consumption growth lagged two years and DPI growth lagged both one and two years as instruments. In Column 3, of Table 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

[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.

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 4 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 0.143, with a t-statistic of 2.5. In sum, the evidence suggests a strong partial correlation between housing wealth and consumption.

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 $1000 in each year (in 1989 dollars), if the households were less than age 61, did not move, whose house was worth at least $2000, and who did not experience a major change in family composition during the 1984-89 period. A total of 1970 families remained. Quantile regressions, weighted by the 1989 family weights, are presented in Table 5. 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 5-year shift in wealth? Assume the housing price

change occurs in the midpoint of the 5-year period, then the coefficient should be divided by 2.5. Hence the coefficient in Column (1) of Table 5 implies a one-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) suggested that much of the decline in saving was the consequence of older rather than younger households. Columns (2) and (3) in Table 5 therefore separate out families headed by someone age 45 or older from those under age 45. The results contradict their estimates; the estimated 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). Qantile regression estimates that controlled for the presence of second mortgages, a possibe indicator of households eager to spend down their wealth (Manchester and Poterba, 1989) yielded similar results, but are not reported here.

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[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 5 yields an estimate of the marginal propensity to save equal to 8 cents per dollar of permanent income.

Finally, consider the same regression with positive and negative housing wealth gains separated (Columns 4 and 5, Table 4). The coefficients suggest that housing wealth gains are treated much differently than housing wealth declines. For those younger than age 45, the results imply an increase in saving of 10 cents per one-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, 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 macro data have suggested large effects, and the micro data more modest effects, of housing wealth on saving. The results taken together with Bosworth, Burtless, and Sabelhaus (1992) 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.

VI. 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, regardless of whether it occured because of windfalls or planned accumulation? 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 percent; by ages 80-85 the percentage drops to 59, with less than half owing their own house after age 85. They also report that for widows, homeownership falls by 12 percentage points, and median home equity by roughly 30 percent, 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 financial necessity.[20]

The results below uses data from 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.

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[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), however, 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.

I then use quantile regressions to consider at 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 6 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 percent, and mean income by 12 percent 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 percent, a smaller amount than the benchmark for nonmovers. Finally, for those moving into smaller houses, median income drops by 25 percent, and mean income falls

by 32 percent, substantially more than the reference group. Note that the mean and median income for this latter group was nearly identical in 1982 to those who did not move at all. Figure 2 shows these patterns, with 1982 income normalized at 100. After adjusting for the general downward trend in income, the pattern suggests that even at retirement, changes in family income exerts 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 3 shows these calculations. If an individual moved in 1986, for example, their "T-1" income 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 increase housing wealth flatten out (or rise relative to trend), while those who downsize 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 are 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 percent had become widows or widowers during 1984-89, compared to 10 percent for those who did not move.

However, it is not just family composition; 18 percent 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, somewhat implausibly, that the entire housing proceeds are spent in a few years. I now consider how housing equity extracted from the sale of housing affects the active saving variable. Note that when the house is sold for, say, $50,000, active saving is decreased by $50,000 unless the money is returned

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[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. However, few people over age 65 hold mortgages.

[22] By contrast, 21 percent 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.

through the purchase of other assets. Hence a coefficient of 1.0 corresponds to housing wealth being entirely spent by 1989. The null hypothesis of 0.0 corresponds to housing wealth being entirely saved. Table 6 reports quantile regressions of the type discussed in Section IV, with the sample restricted to homeowners age 55 and above in 1984. Net proceeds from the house sale is defined to be negative for those who move to smaller houses, zero for non-movers, 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 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 their 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 7. For those who sold their house in 1985-86, and reduced housing equity, 73 cents of every dollar was spent by 1989. In contrast, those who spent their wealth later in the sample period, 1987-89, spent only 59 cents of each dollar. These coefficient 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.

Those 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, there is a small group of individuals annually who 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.

VII. Conclusion

Recent fluctuations in housing prices has 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 presents 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 micro estimates in this paper suggest that for younger homeowners, a one-dollar increase in housing wealth reduces saving by 1-2 cents, a magnitude consistent with the certainty life cycle and the precautionary saving model. The macro estimates are substantially larger, corresponding to a roughly 6 cent increase in consumption when housing wealth rises by one dollar.

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 while old occurs 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 a income or 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.[23] 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 their housing wealth. Instead, households view housing equity as insurance to draw against should they be buffeted by external events. In this precautionary saving view, housing price fluctuations are not a sideshow.

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, it is often correlated with a steep decline in housing demand anyway, so that the wealth can be

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[23] Hubbard, Skinner, and Zeldes (1992) suggest that the presence of means-tested social insurance programs may discourage saving for precautionary purposes during retirement for families with low lifetime wealth. However, these families are also less likely to own houses.

extracted by selling.

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 (1988).[24] And while baby-boom homeowners are clearly worse off than early generations that did share 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 percent 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 40 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

[24] The Mankiw and Weil predictions have also been criticized by others; see Hendershott (1991) and other articles in the December 1991 issue of Regional Science and Urban Economics.

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 importantly, there are wide regional variations in housing wealth and housing prices even when aggregate price indexes 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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Table 1: The MPC From Housing Wealth and
Housing Equity Reductions: Four Cases in the Life Cycle Model

Moving Costs	Reverse Annuities	MPC From Housing Wealth	Reduction in Housing Equity (Annualized)
(1) No moving costs ($m = 0, \lambda = 1$)	Perfect Markets ($\nu = 1$)	0.025	-0.05
(2) No moving costs ($m = 0, \lambda = 1$)	Nonexistent Markets ($\nu = 0$)	0.025	-0.05
(3) Large moving costs ($m > 0, \lambda = 0$)	Perfect Markets ($\nu = 1$)	0.014	-0.05
4) Large moving costs ($m > 0, \lambda = 0$)	Nonexistent Markets ($\nu = 0$)	0	0

Notes: The third column describes the annual marginal propensity to consume in the first period from a one-dollar change in the value of housing wealth. The fourth column is 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 $1 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 20-year period, there is no equity remaining.

Table 2: The Annuity Value of Housing Wealth
Relative to Income, 1989

		Ratio of Annuitized Housing Wealth to Income			
	% of sample	Not Home-owner	< 20%	20-50%	> 50%
Age: 65-74 Inc: < $15,000	38.70	36.70	17.27 *27.47*	22.17 *21.06*	23.86 *14.77*
Age: 65-74 Inc: $15-25,000	24.87	19.50	22.40 *42.33*	41.37 *32.46*	16.73 *5.71*
Age: 65-74 Inc: > $25,000	36.43	6.62	46.45 *73.64*	38.41 *17.61*	8.52 *2.82*
Age 65-74 Total	100.00	21.46	29.18 *47.74*	32.86 *22.64*	16.50 *8.16*
Age: > 74 Inc: < $10,000	46.03	44.58	6.67 *8.03*	10.38 *15.72*	38.37 *31.67*
Age: > 74 Inc: $10-20,000	26.05	35.89	5.31 *8.37*	18.19 *30.62*	40.61 *25.12*
Age: > 74 Inc: > $20,000	27.91	17.87	18.10 *28.10*	46.85 *44.30*	17.18 *9.72*
Age > 75 Total	100.00	34.86	9.51 *13.72*	22.59 *27.58*	33.04 *23.83*

Source: PSID. The numbers in normal 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 alternative rental housing, assumed to be 4.5% of the housing value annually, is within the given percentage of 1989 household money income.

Table 3: Euler Equation Consumption Regressions

Dependent Variable	Nondur. & Services	Nondur. & Services	Nondur & Services	Nondur. & Services	Nondur.
Change in Housing Wealth(%)	0.108 (2.50)	0.110 (2.53)	0.071 (1.34)	0.052 (1.44)	0.143 (2.50)
Change in Stock Mkt Wealth(%)	0.002 (0.33)	0.001 (0.12)	0.012 (1.17)	0.052 (1.43)	0.009 (1.01)
Change in Real DPI(%)	0.511 (8.15)	0.503 (7.87)	0.629 (6.81)	0.528 (9.63)	0.644 (7.73)
Real After-Tax Interest Rate		0.030 (0.68)	-0.154 (1.44)		
Lagged Change in DPI(%)				0.059 (1.09)	
Lead Change in DPI(%)				0.187 (3.06)	
R^2	0.660	0.655	0.575	0.781	0.645
Instrumental Variables ?	No	No	Yes	No	No

Note: Dependent variable is the log change in consumption, 1950-92.
Sources: Data on stock market and housing wealth changes from Federal Reserve System (1993a,b). Consumption and income data from Survey of Current Business.

Table 4: Quantile Regressions for Active Saving:
Homeowners Who Did Not Move, Age ≤ 60

	(1) Full Sample	(2) Age ≥ 45	(3) Age < 45	(4) Age ≥ 45	(5) Age < 45
Housing Capital Gains	-0.025 (2.28)	-0.028 (2.86)	-0.054 (2.28)		
Housing Capital Gains (Positive)				-0.021 (1.51)	-0.010 (0.32)
Housing Capital Gains (Negative)				-0.097 (6.17)	-0.253 (4.29)
Age	467 (1.47)	1172 (2.12)	3399 (0.90)	1389 (2.41)	2984 (0.76)
Age^2	-3.14 (1.12)	-8.53 (2.02)	-51.03 (0.99)	-10.27 (2.32)	-45.83 (0.85)
Sex	-3883 (2.11)	-4336 (2.72)	-4469 (0.89)	-4783 (2.93)	-4927 (0.96)
Family Size	-2216 (3.86)	-3910 (6.42)	-247 (0.23)	-4041 (6.47)	-715 (0.65)
Change in Family Size, 1984-89	-940 (1.16)	-2843 (3.31)	-1624 (1.18)	-2930 (3.36)	-2077 (1.57)
Income in 1984	-0.098 (3.03)	-0.102 (3.68)	-0.105 (1.04)	-0.099 (3.44)	-0.160 (1.49)
Income in 1985	-0.209 (5.90)	-0.187 (5.90)	-0.076 (0.79)	-0.207 (6.26)	-0.010 (0.10)
Income in 1986	0.261 (5.99)	0.007 (0.17)	0.539 (5.47)	0.004 (0.09)	0.462 (4.52)
Income in 1987	-0.128 (3.64)	0.043 (1.38)	-0.319 (3.71)	0.049 (1.53)	-0.355 (3.99)
Income in 1988	0.106 (3.52)	-0.018 (0.68)	0.185 (2.29)	-0.020 (0.72)	0.243 (2.93)
Income in 1989	0.491 (15.57)	0.748 (26.94)	0.214 (3.23)	0.737 (25.00)	0.186 (2.72)
Constant	-13563 (1.52)	32512 (1.85)	-60132 (0.89)	-39724 (2.10)	-50302 (0.71)
Sample Size	1970	1264	706	1264	706

Absolute value of t-statistics in parentheses.

Table 5: Mean and Median Income of Homeowners in 1984, by Moving Status

Year	Did Not Move		Move into Larger House		Moved Into Smaller House (or rented)	
	median	mean	median	mean	median	mean
1982	22650	32437	25000	34380	21287	29993
1983	22022	32151	25688	34590	18507	30358
1984	21797	30264	28120	34160	19021	27746
1985	21209	30976	25047	35723	18435	26356
1986	20287	30151	26026	32733	16817	24214
1987	18922	28726	23175	33559	15893	22603
1988	18250	28974	21580	30378	14829	20581
1989	18400	28497	21428	32234	15939	20506
% 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 and above.

Table 6: Quantile Regressions for Active Saving:
Homeowners Age > 55

	Est. Equation 1	Est. Equation 2
	coefficient	coefficient
Net Housing Wealth	0.688 (25.87)	
Net Housing Wealth: sale in 1985-86, moved to less costly house (or rent)		0.734 (17.92)
Net Housing Wealth: sale in 1987-89, moved to less costly house (or rent)		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 (0.14)	1718.80 (1.49)
Age^2	-1.94 (0.18)	-11.81 (1.49)
Income in 1984	-0.109 (3.03)	-0.101 (3.92)
Income in 1985	-0.708 (13.60)	-0.561 (14.96)
Income in 1986	0.627 (9.98)	0.435 (9.64)
Income in 1987	0.321 (7.79)	0.302 (10.20)
Income in 1988	0.103 (3.36)	0.175 (7.88)
Income in 1989	0.148 (3.18)	0.141 (4.19)
Constant	-6669.68 (0.11)	-63447.97 (1.52)
Sample Size	922	922

Note: Absolute value of t-statistics in parentheses.

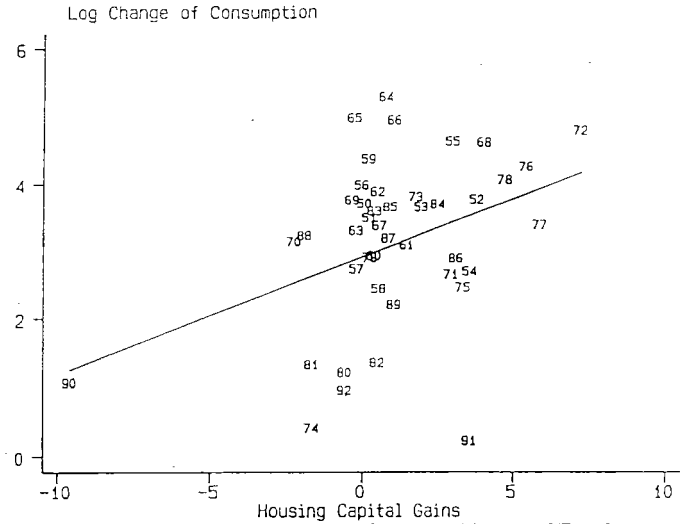

Fig. 1a: Housing Wealth and Consumption, 1950-92

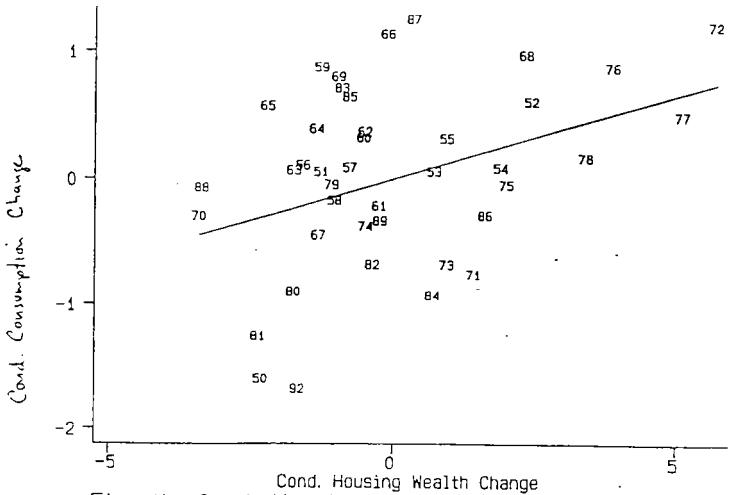

Fig. 1b: Cond. Housing Wealth & Consumption

Figure 2: Income By Moving Status
(1982 = 100)

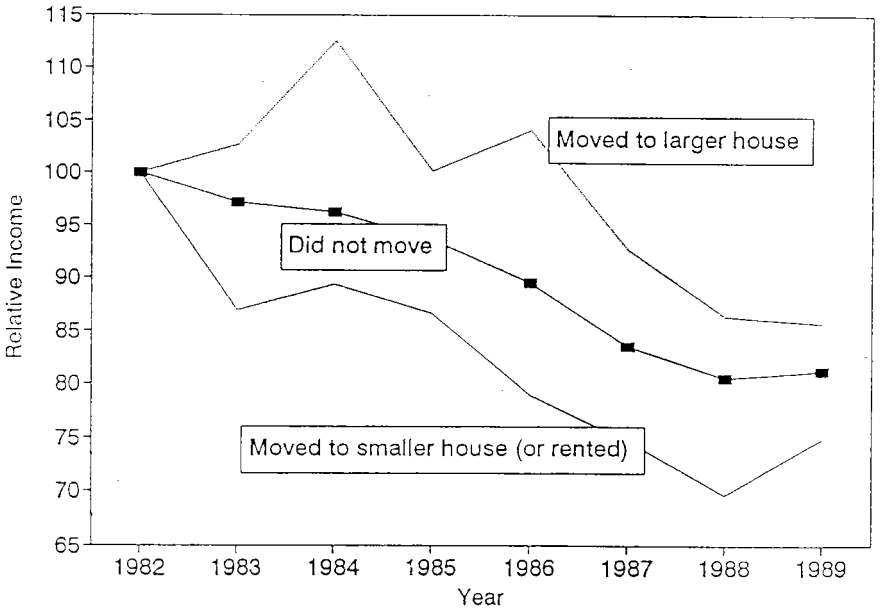

Figure 3: Avg. Income By Moving Status
By Year Relative to Move (1982 = 100)